RIIO-ED1 Business Plan Commitments Report 2015-2023

Year Eight - 2022/23

31 October 2023

Electricity Distribution

nationalgrid

NGED's Business Plan Commitment Report

In June 2013, Western Power Distribution (WPD) published a Business Plan for the eight year period from April 2015 to the end of March 2023. National Grid Electricity Distribution (NGED) is the new name for WPD following the purchase by National Grid in 2021, and hence this is the first business plan commitment report for NGED, but continues with the commitments agreed for RIIO-ED1. The Business Plan detailed the network investment we intended to deliver, how much it would cost and the benefits that would be provided to customers and stakeholders.

The eight year period aligns with the Ofgem regulatory price control review period, known as RIIO-ED1; the first for electricity distribution to be determined using the Revenue = Incentives, Innovation and Outputs framework. The RIIO model is designed to offer Distribution Network Operators (DNOs) strong incentives to meet the challenges of delivering a low carbon, sustainable energy sector at value for money for existing and future customers.

The NGED Business Plan contains 76 outputs (or commitments) established for the RIIO-ED1 period. This document is the Business Plan Commitments Report as required by Standard Licence Condition (SLC) 50. It describes the progress made towards delivering the commitments made within the NGED Business Plan. The report also provides details of further initiatives and new developments since the publication of the Business Plan.

Structure of NGED's Business Plan Commitments reporting

In order to meet the requirements of different stakeholders we have produced reports in different formats. These enable the reader to select the report type that best meets their requirement for either a high level summary or detailed understanding of our actions. The options available are shown below.

- A single page high level performance snapshot (as required by Ofgem Business Plan Reporting Guidance) providing a set of data which will be common across each of the DNOs, allowing a high level performance comparison.

yourpowerfuture.nationalgrid.co.uk/Performance-Snapshot-BP-Commitments-Report-2022-23

- A summary report for interested stakeholders which provides an overview of our performance in key areas.

yourpowerfuture.nationalgrid.co.uk/summary-business-plan-commitments-report-2022-23

- This comprehensive report for expert stakeholders which provides detailed information on our progress against the full range of commitments made within the Business Plan, including expenditure.

Electronic Document Navigation

There are two ways to navigate to individual sections of the document, we have included:

- a hyperlinked list of sections below; and
- 'buttons' on the right hand side of every page.

Both will navigate to the contents page for the relevant section and from there it will be possible to navigate within each section.

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RIIO-ED1 Business Plan Commitments Report

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Foreword, Performance Snapshot & Executive Summary

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Foreword

National Grid Electricity Distribution (NGED) provides a safe and reliable electricity service to over 8 million customers. We look after a network of wires, poles, pylons, cables and substations; distributing electricity to homes and businesses across the Midlands, South Wales and the South West.

NGED is part of the largest electricity transmission and distribution business in the UK, putting National Grid at the heart of a clean, fair and affordable energy future.

This report marks the end of the eight-year RIIO-ED1 price control and therefore contains information about performance against annual 2022/23 targets and the price control period as a whole.

Looking back at RIIO-ED1, we have demonstrated a track record of providing excellent customer service and reliable network performance. NGED has continued to beat regulatory targets for customer satisfaction, customer interruptions and customer minutes lost.

Input from our customers shapes the services that we provide. We have used a range of approaches to understand and respond to customer need, undertaking regular workshops and direct face-to-face discussions to engage over 42,000 stakeholders during the year, using their feedback to shape our processes and future plans.

We always seek to respond to the changing needs of our customers and 2022/23 provided new challenges, with customers hit hard by the rising cost of living. I am proud of the support that we provide via our established fuel poverty partnerships and this year alone we have supported over 24,000 fuel poor customers to save £15.2m.

In support of the Government's Net Zero and decarbonisation of transport, heating and energy aspirations, we continue to build increased network utilisation, maximising the use of our existing network by adopting and contracting with 572MW of flexibility services during the year.

The commitments made as part of our RIIO-ED1 business plan were determined in 2013 and over the subsequent years of the price control period the industry has seen unprecedented levels of change with a shift in the roles undertaken by distribution network operators. We have aimed to deliver our original commtments, outperforming expectations where possible, whilst responding to change, evolving how we operate the network to create a flexible energy system.

As a business we are focussed on matching the pace of change within the industry, recognising a transformation in the way that people will use electricity and the significant changes in demand placed on our network. The final settlement of our RIIO-ED2 contract leads the business into an exciting but challenging new phase, developing our operational efficiency whilst delivering the same great service to our customers. The work undertaken during RIIO-ED1 has established a strong base for the delivery of our RIIO-ED2 regulatory contract. I am excited for the future and look forward to reporting on future progress.

Cordi O'Hara, President, NGED

Performance Snapshot for 2022/23

1.1 This performance snapshot is based upon the requirements specified by Ofgem in the Business Plan Commitments Report guidance document, replicating the data submitted in table SI1 of the annual regulatory reporting pack.

	West Midlands	East Midlands	South Wales	South West
Number of Customers				
No. of Customers on DNOs network	2,522,965.0	2,696,717.0	1,155,365.0	1,653,816.0
Network Length				
Overhead lines (km)	23,093.1	20,628.9	17,875.5	27,448.5
Underground lines (km)	43,052.7	54,914.7	18,293.8	23,961.1
Other (Subsea cables) (km)	0.4	-	8.9	83.7
Total DNO Network Length (km)	66,058.6	75,454.7	36,193.1	51,443.5
Total Expenditure (TOTEX)*				
Total Expenditure (£m)*	252.3	264.2	132.7	205.2
RIIO-ED1 allowance (£m)*	266.6	264.6	123.6	222.0
% of Allowed	0.9	1.0	1.1	0.9
Quality of Service (unweighted)**				
Customers Interrupted (including exceptional events)	46.1	31.9	41.0	45.9
Customers Minutes Lost (including exceptional events)	27.4	20.5	20.8	31.4
Customers Interrupted (excluding exceptional events)	44.3	31.9	41.0	45.9
Customers Minutes Lost (excluding exceptional events)	26.3	20.5	20.8	31.4
Unrestricted Domestic Tariff (adjusted for typical consumption)				
Tariff Charge (£)*	87.9	83.7	101.0	104.4
Connections				
Time to quote (LVSSA) (Days)	1.8	1.8	2.0	3.4
Time to connect (LVSSA) (Days)	30.3	30.2	33.9	45.7
Customer Satisfaction				
Overall Broad Measure of Customer Satisfaction score (out of 10)	8.9	9.0	9.2	8.9
Social Obligations				
Individual stakeholder Engagement and Consumer Vulnerability score (out of 10)				6.5
Incentive on Connections Engagement (ICE) - penalties incurred under the ICE scheme (£)				
To be confirmed				
Safety - qualitative summary				
In 2022/23 the accident rate for NGED as a whole was 0.72 accidents per 100 staff. The accident rate is well below the 10% improvement rate set for RIIO-ED1. In 2022/23 there were no improvement notices or prosecutions from the HSE.				
Environmental impact - qualitative summary				
NGED's business carbon footprint has reduced by 36% in comparison to our benchmark year of 2012/13, we have beaten our in-year target for 2022-23.				
Innovation - qualitative summary				
NGED has delivered 24 innovation projects during 2022/23. We have seen a significant take up of flexibility initiatives, including procurement of flexibility service via the Flexible Power brand which has procured 572MW of flexible services for operation during 2022/23.				

*Values are quoted in 2012/13 prices, as this is the price base used for setting allowances, within licence conditions and within Ofgem financial models. Costs incurred in 2022/23 have been deflated to be comparable to the allowances.

**The values shown are based upon data submitted to Ofgem in table SI1 as part of annual reporting on 31 July 2023. The values in SI1 vary to those stated in other sections of this report. SI1 states the total unweighted impact, whereas in this report we compare performance to targets (which includes application of weighting factors defined by Ofgem). Other differences may arise due to the values used for exceptional event exclusions which are not finalised by Ofgem until after 31 July 2023.

RIIO-ED1 commitments performance summary on a page

1.2 The table below provides a high-level indication of delivery against the 76 RIIO-ED1 commitments. Each output is hyperlinked to the related detailed part of the report.

	Safety	
1	HSE Intervention	✓
2	ESQCR clearances	✓
3	Inspection and maintenance	✓
4	Accident frequency	✓
5	Powering Improvement	✓
6	Working with trade unions	✓
7	Investigating accidents	✓
8	Substation security	✓
9	Educational sessions	✓
10	Safety Literature	✓
	Reliability	
11	Network performance	✓
12	Speed of restoration	✓
13	12 hour outages	✓
14	Guaranteed standards	✓
15	Worst served customers	✓
16	Flood defences	✓
17	Tree clearance (resilience)	✓
18	Black start resilience	✓
	Environment	
19	LCT response time	✓
20	Identifying LCT hotspots	✓
21	Uprating assets – LCT hotspot areas	✓
22	Developing smart solutions	✓
23	Using smart solutions	✓
24	Oversizing transformers for losses	✓
25	Uprating cables for losses	✓
26	Lowering vehicle emissions	✓
27	Energy efficiency – buildings	✓
28	Reducing waste to landfill	✓
29	Reducing BCF	✓
30	Reducing oil leaks from cables	✓
31	Reducing SF_6 leaks	✓
32	Installing bunds	✓
33	Undergrounding lines in AONBs	✓

	Key
✓	Achieved
✓	Progress made, but not fully delivered
✗	Not met

	Connections	
34	Time to connect (all market segments)	✓
35	Customer service	✓
36	Customer surveys – distributed generation	✓
37	Online project tracking	✓
38	Online information	✓
39	Connection surgeries	✓
40	Improving processes	✓
41	Guaranteed standards	✓
42	Raising awareness of competition	✓
43	Extending the scope of contestable work	✓
	Customer Satisfaction	
44	BMCS	✓
45	CSE certification	✓
46	Telephone response times	✓
47	Abandoned calls	✓
48	Call taker availability	✓
49	Providing restoration times	✓
50	Customer call backs – faults	✓
51	Customer call backs – non faults	✓
52	On demand services	✓
53	Self service options	✓
54	Customer Collaboration panel	✓
55	Stakeholder workshops	✓
56	Stakeholder report	✓
57	One day complaint resolution	✓
58	Ombudsman complaints	✓
59	Power for life	✓
	Social Obligations	
60	Understanding of vulnerable customers	✓
61	Training staff to recognise vulnerability	✓
62	Contacting PSR customers	✓
63	Improving PSR data	✓
64	Working with suppliers on PSR issues	✓
65	Publicising the PSR	✓
66	Providing crisis packs	✓
67	Contacting medically dependent customers during faults	✓
68	Practical support during power cuts	✓
69	Feedback from customers	✓
70	Working with local resilience forums	✓
71	Database of referral agencies	✓
72	Fuel poverty website links	✓
73	Awareness campaigns of fuel poverty assistance	✓
74	Fuel poverty training for staff	✓
75	Identification of vulnerable households	✓
76	Outreach services	✓

Executive Summary

Who we are and what we do

1.3 National Grid Electricity Distribution (NGED) is the new name for Western Power Distribution (WPD) which was purchased by National Grid in 2021 and fully rebranded in 2022. We are part of the largest electricity transmission and distribution business in the UK, sharing the common goal of ensuring that everyone can have clean, fair and affordable energy, well into the future.

1.4 NGED is a Distribution Network Operator (DNO) and distributes electricity to over 8 million customers across the West Midlands, East Midlands, South Wales and the South West. Our role is to:

- operate our network assets effectively to 'keep the lights on' for our customers;
- maintain our assets so that they are in a condition to remain reliable;
- fix our assets if they get damaged or if they are faulty;
- upgrade the existing networks or build new ones to provide new electricity supplies or additional capacity to our customers; and
- operate a smart system by managing two-way power flows and flexibility services.

1.5 We have a Distribution System Operator (DSO) function which reports to a separate Director for DSO. As part of this function, we are developing the processes and systems that allow us to adopt lower cost flexible solutions to manage power flows and constraints on the network. This will help us to provide the network capacity for growth in locally connected generation, electric vehicle charging, domestic heating and the storage of energy.

1.6 In 2022/23 our costs made up around £97 (in 2022/23 prices) of a domestic customer's annual electricity bill.

Our track record

1.7 Our staff put customers first, treating customers the way they would like to be treated themselves. We have planning and delivery teams based locally, allowing local knowledge to be used to provide a fast and efficient response.

1.8 Our track record shows we consistently:

- deliver excellent network performance, restoring customers' supplies quickly after power cuts;
- provide great customer service, scoring highly in Ofgem's customer satisfaction surveys;
- deliver our work programmes, adjusting them as circumstances change, but never losing sight of getting them completed; and
- support vulnerable customers, providing additional assistance and helping them to save money.

Our stakeholders

1.9 Our stakeholders' views are important and we engage directly with stakeholders across our business, using a range of engagement techniques.

1.10 We have used stakeholder input to shape and refine the services we provide.

Our RIIO-ED1 commitments

1.11 During RIIO-ED1 we committed to delivering 76 outputs in the following categories.

Category	Commitment overview
Safety	To minimise the safety risks associated with operating the network
Reliability	To maintain a reliable supply of electricity and make the network more resilient to external events
Environment	To reduce NGED's impact on the environment and facilitate the use of low carbon technologies (LCTs)
Connections	To enable customers to connect to the network
Customer Satisfaction	To provide excellent customer service
Social Obligations	To meet the needs of vulnerable customers

Safety

1.12 Safety is at the heart of everything we do. During RIIO-ED1 our target was to improve on our Distribution Price Control Review 5 (DPCR5) accident frequency rate by 10%. We beat this target.

1.13 Our accident frequency rate for NGED as a whole during 2022/23 was 0.72 accidents per 100 staff.

1.14 Some of the actions undertaken in 2022/23 to promote safety improvements include:

- Development of our risk assessment arrangements to better support safe working practices.
- Delivery of behavioural safety training at trainee conferences and staff briefings.
- A review of operational rules and procedures to ensure safety when working on the network.
- Revisions to incident investigation process (policy documents were updated with training and guidance provided to staff).
- Improved communication of lessons learned from incident investigations.
- Implementation of Employee Resource Groups – voluntary groups that support members through the sharing of experience.
- Providing line managers with mental resilience training programmes.
- Providing role based mental resilience training to targeted staff groups.
- Training additional Mental Health First Aiders.
- Conducting a business wide mental health awareness training programme which included videos and intranet articles as well as offering continued support through our Employee Assistance Programmes.

1.15 We also continued to deliver safety messaging and literature to the public. During the course of RIIO-ED1 we have delivered a total of 7,260 educational sessions to 159,678 schoolchildren and delivered 4,660,990 instances of safety literature to customers, targeting those individuals who could be exposed to higher risks as a result of their work or social activities.

1.16 We have worked cooperatively with the Health and Safety Executive to ensure that our practices and policies continue to be compliant with health and safety legislation, but also to seek out and apply best practice in the management of safety.

Reliability

1.17 We continue to invest in the network - maintaining equipment, replacing poor condition assets, providing additional network capacity and undertaking tree clearance to help prevent power cuts. We have also installed remotely controlled equipment that allows us to speed up the restoration of supplies when power cuts do happen.

1.18 Over the eight year RIIO-ED1 period, we committed to ensuring that on average customers would have 16% fewer power cuts and have their electricity supplies restored 23% quicker. We have surpassed these targets, with a 42% reduction in the number of power cuts and a 49% reduction in the average duration of power cuts.

1.19 NGED recognises the inconvenience of long duration power cuts. Originally we proposed to reduce the number of customers off supply for more than 12 hours by 20% over the course of RIIO-ED1 but we have decided to go beyond this original target. As a result, we have reduced the number of customers off supply for more than 12 hours from 10,748 in 2012/13 to only 1,257 in 2022/23, an 88% reduction.

1.20 In RIIO-ED1, Ofgem defined worst served customers as those that have had more than 12 higher voltage interruptions over a three year period. During the price control, we aimed to reduce the number of customers classified as 'worst served' by 20%. Based on 2014/15 performance this required a reduction of 6,812 customers over the eight year period. Over RIIO-ED1 we have undertaken projects impacting 15,263 customers, far exceeding our original target.

1.21 As well as routine tree clearance to maintain safety clearance distances, we have a resilience programme to clear trees that could fall into overhead lines during storms. For RIIO-ED1, we increased the volume of resilience tree cutting and we have delivered the higher volumes of activity.

1.22 Substations that become flooded can lead to a loss of power to many of our customers for extended periods. We protected the highest risk substations during the previous price control period (DPCR5) and committed to protecting an additional 75 substations against flooding over the course of RIIO-ED1. We have exceeded the eight year work programme, carrying out works at 86 substations.

1.23 Whilst the likelihood of widespread power loss is low, we are working to ensure that, should such an event occur, we can continue to operate the network during a 'Black Start'. This work involves increasing the resilience of battery systems used for controlling equipment and communications. Our programme of works has been completed in all licence areas.

1.24 Cyber security is becoming increasingly important to ensure that services are not disrupted by malicious cyber-attacks. NGED is carrying out various activities to strengthen cyber defences to minimise the risks.

Environment

1.25 The NGED RIIO-ED1 Business Plan separated environmental outputs into those that support the increase of low carbon technology and those that reduce NGED's impact on the environment.

1.26 Since proposing our Business Plan in 2013 the energy sector has seen significant change, including the rapid growth of renewable generation, increasing numbers of electric vehicles, new technologies connecting to the distribution network and changes in the energy demands of consumers.

1.27 To accommodate these changes in a cost effective manner distribution networks have become smarter and more flexible. We first published our strategy to introduce Distribution System Operator (DSO) functionality in 2017 – proposing to use innovative solutions to defer higher cost network reinforcement.

1.28 We continue to evolve, update and implement our DSO function and have taken a range of actions during 2022/23 including:

- Ongoing procurement and deployment of flexibility services. We procured an additional 154.2MW of flexibility services, counteracting some services no longer available, leading to a total available contracted flexibility of 572MW. In the year we dispatched over 1.7GWh of flexibility services, deferring the need for physical network reinforcement.
- Engaging with flexibility service providers to identify and implement changes to procurement routes to remove barriers and increase the accessibility for participation in distribution flexibility markets.
- Continued support for the industry Open Networks project to develop common processes across DNOs and the ESO.
- Building on the solutions identified through our Regional Development Programmes work with the Transmission Electricity Systems Operator (ESO) to enhance linkages between our respective control rooms and develop coordinated thinking.

1.29 Our extensive innovation programme is providing a range of solutions to adapt the network to changing customer requirements. During 2022/23, we had 24 active Network Innovation Allowance (NIA) innovation projects funded through Ofgem's innovation stimulus, alongside three Network Innovation Competition (NIC) projects, which brings our RIIO-ED1 total to 79 NIA and 4 NIC projects.

1.30 The impact of NGED's activities on the environment is monitored by measuring our business carbon footprint (BCF). We have committed to reducing our BCF by 5% over the course of RIIO-ED1. After establishing this target in 2012/13, our BCF increased during the remainder of the previous DPCR5 price control. Since the start of RIIO-ED1 we have worked to improve performance and have now achieved a 36% reduction in our BCF in comparison to 2012/13.

1.31 We have activities in place aimed at reducing 'technical network losses' (the losses associated with power flowing through the network). Losses reduction activities include the proactive replacement of assets with poor losses performance and discontinuing the use of new assets which result in higher losses. We review our Losses Strategy on an annual basis to ensure that we take into account changes in technology, government approach and the views of industry experts and our stakeholders.

1.32 Power lines can have a detrimental impact on the landscape, especially where they pass through iconic areas. We committed to improving visual amenity in National Parks and Areas of Outstanding Natural Beauty (AONBs) by replacing 55km of overhead lines with underground cables over the course of RIIO-ED1. We have completed schemes removing 39.5km of overhead lines across NGED's licence areas. We have seen progressive advancement during the price control, but there have been issues that have delayed some projects.

Connections

1.33 At the start of RIIO-ED1, Ofgem introduced a new incentive to drive DNOs to provide a faster connection service for single connections (LVSSA) and small scale connection projects (LVSSB). This incentive considers the time to provide a quote and once the quote is accepted the time taken to deliver the connection(s). At the mid-point of the price control, Ofgem reviewed and enhanced the targets. In 2022/23 we outperformed Ofgem's enhanced targets for 'time to quote' and 'time to connect' in 13 out of 16 measures.

1.34 NGED engages extensively with connection stakeholders to ensure that the services we deliver meet their needs. This had led to the production of an annual plan of enhancements to systems and processes. Our connection engagement activities are documented and explained in more detail within our annual submissions for Ofgem's Incentive for Connections Engagement (ICE).

1.35 Our 14 initiatives in the 2022/23 ICE Plan were all completed and they focused on the use of the latest digital technologies and data innovations to deliver a more efficient, flexible and responsive customer service. We have made progress in a range of high priority areas, including:

- Introducing a new Connections Website to make it simpler, more intuitive and customer focused;
- Enhancing our provision of customer online application self-serve tools;
- Developing a customer friendly online LV self-serve budget estimate costing tool;
- Providing further information on options for customers approaching reinforcement trigger points for major connections at 33kV and above.

1.36 We strive to meet the needs of connection customers and as a result we score highly in customer satisfaction surveys. In 2022/23 we achieved an average of 8.99 out of 10 for our DNO group in the Connections part of Ofgem's Broad Measure of Customer Satisfaction (BMCS).

1.37 The Guaranteed Standards of Performance (GSOPs) for connections set out the minimum service standards that DNOs must meet under the statutory framework. We have set ourselves the challenging target of achieving zero failures under these standards. In 2022/23 we had only 30 failures (out of 127,385 services provided) and a further 4 failures in Competition in Connection standards (out of 13,124 services provided).

1.38 Third party connection providers continue to expand their capabilities and we work with them to develop processes that facilitate competition within the connections market. We have continued with trial processes for contestable work covering self-determined points of connection, self-approved designs and HV connections completed by the Independent Connection Provider (ICP).

Customer satisfaction

1.39 NGED continues to score highly against Ofgem's Broad Measure of Customer Satisfaction, exceeding Ofgem's target of 8.2 in all licence areas for all three elements (supply interruptions, connections and general enquiries).

1.40 Listening to our customers and stakeholders is important to us. We have engaged with a range of stakeholders through a variety of events including Customer Panels, general stakeholder workshops and focused subject specific discussions. This engagement has helped us to understand and refine our service delivery in line with customer need.

1.41 Our telephone response times are fast. On average fault and emergency calls in 2022/23 were answered in 3.5 seconds.

1.42 We provide an estimated time of restoration for all calls related to power cuts. Call centre staff regularly refresh the estimates with updates from field staff. This 'live' information is also published on the NGED website and available in the NGED Power Cut app.

1.43 When customers call us in relation to a fault we call them back to update them on the progress of the fault and to check if they need any assistance. In 2022/23, we were able to contact 99.55% of customers who had been in contact about a fault and proactively texted over 1,078,662 customers during power cuts. We also provide a range of options for customers to access information on our website.

1.44 We try to get things right, but sometimes things go wrong. When we get complaints we try to resolve them quickly. Our approach has led to us resolving 86.98% of complaints within one day, beating our RIIO-ED1 target of 70%.

Social obligations

1.45 We recognise that we have to provide enhanced services for customers in vulnerable situations, especially those who would be impacted as a result of being without power.

1.46 The details of customers in vulnerable situations are held on our Priority Services Register (PSR) and the number of people currently on the PSR exceeds two million. Over time, this data can become out of date and we have a team of people contacting vulnerable customers to review and update the records. During 2022/23 the data cleanse team made 931,879 contacts.

1.47 We have continued to work with a range of expert partners in order to improve our understanding of the needs of vulnerable customers. This helps to shape the services that we provide. During 2022/23 we developed an additional 31 new PSR referral networks, taking the total to 180 organisations that we can refer PSR customers to for help and assistance.

1.48 To help vulnerable customers during power cuts we undertake a range of activities. During 2022/23, we distributed 1900 crisis packs (as part of our target of issuing 10,000 packs during RIIO-ED1), made proactive contacts, via calls and texts to PSR customers during power cuts and provided support via the Nationwide Caterers Association during 21 prolonged power cuts.

1.49 We consider the factors that can impact vulnerability, including cold homes and energy affordability. NGED works with a range of fuel poverty partners to identify opportunities to save customers money. During 2022/23 we supported 24,463 fuel poor customers to save £15.2 million.

Expenditure

1.50 Our RIIO-ED1 Business Plan specified expenditure of £9.2bn over the eight year period, of which £7.0bn was related to costs under our control, referred to as Totex.

1.51 Across the whole of RIIO-ED1, NGED actual Totex expenditure is 2.0% lower than allowances for costs within the price control at £6.86m.

1.52 Total spend on load related Capex expenditure, incurred in providing additional capacity on the network, is 5% lower than forecast at £639.4m. While expenditure on general reinforcement was lower than forecast (a spend of £431.1m compared to allowances of £613.6m), there was significantly more expenditure associated with network reinforcement required for new connections, which was four times higher than forecast at £208.4m.

1.53 Non-load related Capex expenditure (of which two thirds is on the replacement and refurbishment of poor condition assets), was 10% lower than forecast at £2.13bn. This has been driven by lower than forecast expenditure on asset replacement, diversions and operational IT, offsetting higher than forecast expenditure on quality of supply, safety and overhead clearances and environmental investment.

1.54 Spend on network operating costs (including inspections, repair and maintenance, faults and tree cutting) was 10% higher than forecast at £1.57bn. Fault expenditure was 6% higher than allowances at £859.3m; Tree cutting was 21% higher at £327.7m and Repairs and Maintenance was 28% higher at £192.2m. .

1.55 Non-operational Capex includes the purchase of new IT systems, property, vehicles, and small tools and equipment. Overall expenditure was 8% higher than forecast at £348.3m

1.56 Closely associated indirect costs (related to the costs of staff and systems that enable the work on the network to be carried out such as network design and planning) was 6% higher than forecast at £1.54bn.

1.57 Business support (including Human Resources, Finance and Regulation) costs have been 12% lower than forecast at £665.8m.

Performance summary of all 76 outputs

Safety

Meeting health and safety law		
1	No improvement notices, prohibition notices and prosecutions from the Health and Safety Executive.*	No improvement notices were issued or prosecutions made relating to the current price control during 2022/23. We have appealed two HSE prohibition notices, issued in previous regulatory years, and will provide details of the outcome at the end of the appeals process.
2	Complete work programmes to meet the Electricity, Safety, Quality and Continuity Regulations (ESQCR) 2002. ESQCR requires that overhead lines are a safe distance from either structures or the ground.	We have completed the programme for clearance distances to structures for all regions. We have completed 100% of the work scheduled in 2022/23 relating to the required ground clearance distances.
3	Complete inspection and maintenance programmes every year.	We completed all of the work scheduled for the year except for a very small number of tasks. We put in place appropriate plans to manage these safely until the work was completed.
Reducing accidents		
4	Reduce our overall rate for the frequency of accidents by 10%.*	Our accident rate in 2022/23 is better than the 10% improvement target set for the whole of RIIO-ED1.
5	Continue to play an active part in the ENA's 'Powering Improvement' initiative, which aims to lead to improved safety performance.	We took an active role in the Powering Improvement steering group to help develop materials to support the theme of promoting a positive health and safety culture.
6	Work with our trade unions to improve safety performance, including the use of more 'behavioural safety' initiatives.	During RIIO-ED1 NGED has delivered a wide variety of behavioural safety training to its staff. Using this training as a foundation, during 2022/23 we have continued to reinforce key behavioural safety principles.
7	Investigate all accidents involving members of the public, contractors or our own staff to make sure that learning points are quickly understood and communicated.**	We investigated all 71 incidents that happened during the year (48 staff accidents, 14 contractor accidents and 9 significant incidents involving the public).
Substation security		
8	Improve security measures at 50 substation sites to reduce the number of repeat break-ins.*	The number of repeat break-ins has been lower than predicted. In RIIO-ED1, we have upgraded security measures at 21 sites that have had repeat break-ins.
Educating the public		
9	Organise and run over 1,000 educational sessions to provide safety information to over 400,000 schoolchildren.*	We have exceeded our target and have delivered a total of 23,371 educational sessions to 546,350 schoolchildren
10	Continue to publish literature on maintaining safety around electrical apparatus and send more than 500,000 copies of this literature to targeted landowners, businesses or leisure operators.*	Over the course of RIIO-ED1, we have issued over 4,821,587 instances of safety leaflets and made these available to targeted groups through social media.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Reliability

Network performance		
11	Improve network performance by the end of RIIO-ED1 so that, on average, customers will have 16% fewer power cuts and have their electricity supplies restored 23% quicker. *	Customer interruptions have reduced by 42% and customer minutes lost have reduced by 49% from the underlying performance benchmark.
12	Make sure that at least 85% of customers have their power restored within an hour of a high voltage fault happening.**	85.35 % of customers had their power restored within one hour of a high voltage fault.
Guaranteed Standards of Performance (GSOPs)		
13	Reduce by 20% the number of customers experiencing a power cut which lasts for 12 hours or more.*	The number of customers without electricity for more than 12 hours (where the GSOP applied) was 1,257, an improvement of over 88% on our 2012/13 benchmark performance. Customers received a set payment where we failed to achieve the GSOP.
14	Achieve no failures on all other GSOPs.**	There were only 70 failures across all other categories.
Worst served customers		
15	Reduce by 20% the number of customers classified as worst served.*	During the course of RIIO-ED1 projects to reduce the number of worst served customers have been put in place for 15,461 customers. Our target for the whole of RIIO-ED1 was 6,812 customers
Making our network more resilient		
16	Apply flood defences to 75 substations, reducing the risk of both damage to equipment and power cuts due to flooding.*	We have achieved our RIIO-ED1 targets. Across the whole of RIIO-ED1 we installed flood defences at 86 substations.
17	Speed up the programme of tree clearance (specifically related to storm resilience) by 40%, with the aim of clearing 700km of overhead lines per year (delivering the programme five years earlier than suggested by Government guidelines).*	We have met the RIIO-ED1 target and completed the programme of tree clearance for resilience that we committed to for the whole of RIIO-ED1.
18	Improve substation battery life to last for 72 hours if there is a major, network-wide power loss.*	We have completed our programmes for resilience of protection batteries, SCADA batteries and telecommunications site supplies.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Environment

Make it possible for more people to use low carbon technologies (LCTs)		
19	Improve by 20% the time taken to provide a response to customers who want to use LCTs.*	We are continuing to see a rapid increase in the number of LCT enquiries we receive but new systems put in place during 2022/23 have enabled us to reduce our response time to 0.69 days, a 76% reduction from our benchmark performance.
20	Identify LCT hotspots using information from smart meters, expert organisations and local authorities, and use this information when making decisions.	The development of the "Network Investment Forecast Tool" has enabled us to add predicted LCTs to our LV network and highlight areas that will reach capacity.
21	Selectively replace assets using larger assets in areas where more LCTs may be connected to our network.	We carried out 87 projects using larger assets, as a result of using information about LCT hotspots. This is a 207% increase from last year's activities.
22	Reduce costs for future customers by developing smart solutions to provide alternative and innovative techniques for managing our network.	We had a wide range of innovation projects in progress during the year.
23	Provide additional network capacity by using traditional or 'smart' methods.	We have continued to develop the Flexible Power brand and now have 294 substations using flexibility
Reduce technical network losses		
24	Install oversized transformers when replacing assets in areas where demand for power may become higher than equipment can cope with.	We installed 56 oversized transformers, a 266% increase on last year's performance
25	Use larger cables when installing new network in LCT hotspots.	We installed 6.6km of larger cable in LCT hotspots.
Reduce the carbon footprint of the business		
26	Make sure all replacement vehicles have lower CO_2 emissions than those they are replacing.	NGED operational vehicle emissions have reduced by 11% compared to 2012/13. This has included reduced emissions from both NGED and contractor vehicles.
27	Make sure all new or substantially refurbished buildings meet, as a minimum, the 'excellent' standard under the Building Research Establishment Environmental Assessment Method (BREEAM).**	During 2022/23 NGED applied for BREEAM certification for a new building in Ludlow, we are waiting for the decision and we are still awaiting the results of an application from 2020/21 for refurbishment works at one site.
28	Reduce the amount of waste sent to landfill by 20% over the first two years of RIIO-ED1 and 5% per year after this.	We have seen a reduction of 37% in the amount of waste sent to landfill, and we have achieved our target for the whole of RIIO-ED1.
29	Reduce our carbon footprint by 5%.*	Our business carbon footprint has reduced by 36% compared with 2012/13.
Reduce the environmental risk of leaks from equipment		
30	Reduce by 75% the amount of oil lost through leaks from oil-filled cables.*	The volume of oil leaked from fluid filled cables fallen by 45%, while we have missed our ambitious target in this area we continue our efforts to repair leaks quickly and replace these assets to reduce the amount of oil leakage.
31	Reduce by 17% the amount of SF6 gas that is lost from switchgear.*	The amount of SF_6 gas lost as a percentage of the total amount of SF_6 used on our network has reduced from 0.47% in 2015/16 to 0.14% in 2022/23 for the whole of our area.
32	Install effective oil containment 'bunds' around plant containing high volumes of oil.*	We have completed work on 237 new and refurbished bunds so far in RIIO-ED1, going further than our forecast of 104 bunds.
Improve the appearance in National Parks and Areas of Outstanding Natural Beauty (AONBs)		
33	Replace 55km of overhead lines in National Parks and AONBs with underground cables.*	In RIIO-ED1, we have replaced 39.5km of overhead lines with underground cables for visual amenity in AONBs.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Connections

Provide a faster and more efficient connections service		
34	Meet Ofgem's targets for the overall 'time to quote' and 'time to connect' for single domestic connections and small commercial connections. Improve the overall time taken to provide a quote for all other customer groups by 20%.*	We outperformed Ofgem's targets for 'time to quote' and 'time to connect' for single domestic connections and small commercial connections in 13 out of 16 measures, but we have missed our targets for some of the other customer groups.
35	Provide excellent customer service so that customers continue to rank us as the top-performing DNO group in customer satisfaction surveys.**	We are one of the top performing DNOs for the Connections Customer Survey in Ofgem's Broad Measure of Customer Satisfaction, scoring an average of 8.87 out of 10 for our DNO group.
36	Carry out surveys with distributed generation customers to find out if they are satisfied with our service and identify where we could improve.	We achieved a score of 8.59 out of 10 for distributed generation customer satisfaction surveys. We have specified a range of improvements within our work plan for the Incentive on Connections Engagement (ICE).
Improve communication with customers		
37	Develop and improve the way we process online connection applications and make it easier for customers to track the progress of their application online.	We developed our "Enquiry Tracker" website to allow ICP/IDNO users to track enquiries from application to connection. Details have been published in our ICE work plan.
38	Make sure that the information we provide in documents and online is effective.	We have improved the information we provide in documents and online in line with stakeholder feedback.
Enhance engagement with major customers		
39	Host 'surgeries' every three months to help connection customers to understand our processes.	In 2022/23 we held 31 Community Energy Surgeries with 152 participants, 40 Community Energy dissemination events for 728 stakeholders and 4 community energy events for 80 stakeholders.
40	Work with major customers to identify where our processes can be improved and quickly put in place any changes.	We engaged with over 18,800 stakeholders through events and customer satisfaction surveys. The actions in our ICE work plan are based on suggestions we received from these events and surveys.
Guaranteed Standards of Performance		
41	Aim to achieve no failures of the connection GSOPs.**	There were 30 failures against the connection Guaranteed Standards of Performance during 2022/23. We had a further 4 failures against Competition in Connection standards, which relate to services we provide that cannot be carried out by competitors.
Further developing a competitive market		
42	Improve customer awareness of other connection providers and regularly check that customers understand the options available to them.	We provide clear information for customers explaining that they can use other connection providers. We carry out a yearly survey to measure customer awareness. The 2022-23 survey showed that 84% of customers who had a new connection were aware of other providers.
43	Work with other connection providers to extend the type of work they can carry out, including high voltage and reinforcement work.	In agreement with stakeholders, CIC stakeholder engagement is now incorporated into our Customer Connections Steering Group (CCSG). Three sessions took place during 2022/23 and we used feedback to improve our processes.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Customer Satisfaction

Customer service		
44	Continue to be the top-performing DNO group across all elements of the Broad Measure of Customer Satisfaction.**	Across RIIO-ED1, NGED is a top-performing DNO group for overall customer satisfaction. The rating combines results of the three surveys for supply interruptions, connections and general enquiries.
45	Maintain certification to show that we meet the Customer Service Excellence standard.**	We were awarded 'Compliance Plus' status for 47 of the 57 standards. We were the highest-scoring UK organisation out of all those accredited.
Telephone response		
46	Respond to phone calls quickly, answering them within two seconds.**	Our average response time for customer calls was 3.51 seconds for fault and emergency calls
47	Limit the number of calls that are abandoned before we can answer them to less than 1%.**	0.56% of calls were abandoned, significantly better than our target
48	Always provide customers with the option to talk to a member of staff when they call our contact centre.	Our systems allow us to make sure that customers are always provided with the option to talk to a member of staff.
Communication with customers		
49	Provide a restoration time for every power cut.**	All power cuts have an estimated restoration time which is updated as further information is provided by field teams.
50	Contact all customers who have been in contact about a fault.**	We contacted 99.55% of customers who contacted us about a fault.
51	Contact customers within two days of receiving an enquiry which was not about a fault.**	We contacted 87.15% of customers who contacted us with an enquiry which was not about a fault within two days.
52	Provide 'on-demand' messaging through text and social media for customers who want to be kept informed in other ways, rather than a phone call.	We provided on-demand messaging through text and social media and we proactively send text messages during high voltage power cuts.
53	Develop 'self-service' options for customers to find information online.	We hosted 23,076 webchat conversations, 46,984 Priority Services Register applications were made online and we had 2,125,453 hits on our online map showing details of individual power cuts.
Involving stakeholders		
54	Continue to host a customer collaboration panel where our President will meet with our expert stakeholders four times a year.	The Customer Panel met four times during the year.
55	Continue to host at least six stakeholder workshops each year.	We hosted three virtual workshops, four in person workshops and an additional two hybrid workshops where stakeholders could attend either online or in-person.
56	Continue to produce a stakeholder report every year providing an update on the actions we have taken as a result of stakeholder involvement.	A yearly Business Plan Commitments summary report and the separate detailed report replace the stakeholder report.
Complaints		
57	Resolve at least 70% of complaints within one day.**	We resolved 86.98% of complaints within one day.
58	Continue to have a target of no complaints where the Ombudsman has to get involved.**	There were 4 complaints referred to the Ombudsman. The ombudsman did not rule against NGED in any of these cases.
Guaranteed Standards of Performance awareness		
59	Continue to send the 'Power for Life' publication to all customers and make sure it promotes the GSOPs.**	We last issued 'Power for Life' to all customers in April 2021. It included information on GSOPs.

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** Target to be achieved each year of RIIO-ED1

Social Obligations

Improving understanding of vulnerability		
60	Work with expert partners to improve our understanding of the needs of customers in vulnerable situations	We worked with a wide range of expert partners and were certified to the British Standards Institute Standard BS18477, which specifies requirements for responding to customers in vulnerable situations.
61	Train staff to recognise the signs of vulnerability.	We provided specialist training to the Priority Services Register (PSR) teams and contact centre staff. Field staff are trained on registering customers to the PSR.
Improving the data held on the Priority Services Register		
62	Contact vulnerable customers at least once every two years to check the details we hold on the Priority Services Register.	We continue to maintain and develop the Priority Services Register (PSR), proactively contacting over 2 million PSR customers during 2022/23 (931,879 through our data cleanse team 1,078,662 during power cuts)
63	Improve the quality of Priority Services Register data by working with other agencies and sharing information.	We increased the number of referral partners that we work with to 180 in total. We added 31 new partners in 2022/23, with the aim of achieving a better balance in the types of agencies that we work with.
64	Co-ordinate meetings with suppliers to agree criteria for vulnerability.	29 'common needs codes' are now in use across the industry.
Improving the services provided for customers in vulnerable situations		
65	Raise awareness of the Priority Services Register.	We worked with a range of organisations, including other utilities and fire and rescue services, to raise awareness of the PSR and used advertisements on Radio, in print and social media.
66	Make 10,000 crisis packs available.*	Over the RIIO-ED1 period we have issued 10,894 crisis packs, exceeding the target by 9%
67	Contact all customers who depend on a power supply for medical reasons every three hours during power cuts.**	In 2022/23 there were 53,919 customers who depend on a power supply for medical reasons that were affected by power cuts lasting longer than 3 hours. We make concerted efforts to contact such customers throughout the outages.
68	Continue to provide practical support through the British Red Cross and other organisations as appropriate.	British Red Cross support was not required in 2022/23. However we did use the help of the National Caterers Association during 21 prolonged power cuts, supporting 205 customers in total.
69	Ask for feedback from customers in vulnerable situations about our service.	We achieved customer satisfaction ratings of 9.1 out of 10 from customers on the PSR who had received a routine call to check their personal details.
70	Develop ways of sharing information with local resilience forums.	We work with local resilience forums across our four licence areas.
Reducing fuel poverty by supporting customers to access help		
71	Build a database of regional agencies we can refer customers to for help.	There are fuel poverty projects in all our areas, working with a network of support agencies.
72	Work with partners to develop links to and from our website.	Details on our fuel poverty projects and links to partner organisations are available on our website.
73	Develop joint information and awareness campaigns, and co-ordinate with partners to provide customers with help.	Our Power Up programme helped 7,886 customers save over £2.9 million in 2022/23.
74	Provide fuel poverty training to our staff who have contact with members of the public.	We provide staff in our contact centre with customised training on fuel poverty and customers in vulnerable situations.
75	Use data analysis to help identify areas with a high concentration of vulnerable households.	We use data analysis to identify areas with a high concentration of vulnerable households.
76	Develop local outreach services.	'Affordable Warmth' schemes helped 12,243 customers to save over £12.3 million this year.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Introduction

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23

31 October 2023

Electricity Distribution

nationalgrid

Introduction

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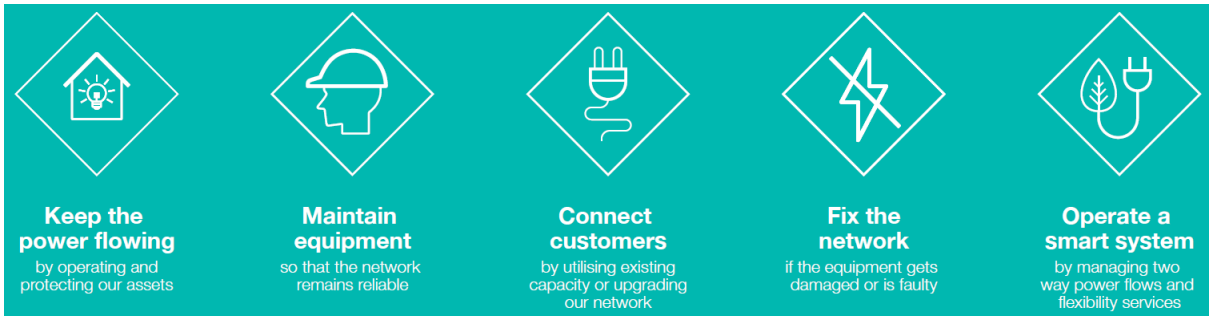
2 Introduction

Who we are and what we do

2.1 National Grid Electricity Distribution (NGED) is the new name for Western Power Distribution (WPD) which was purchased by National Grid in 2021. We are now part of the largest electricity transmission and distribution business in the UK. This means that we will be able to work together to ensure everyone can have clean, fair and affordable energy, well into the future.

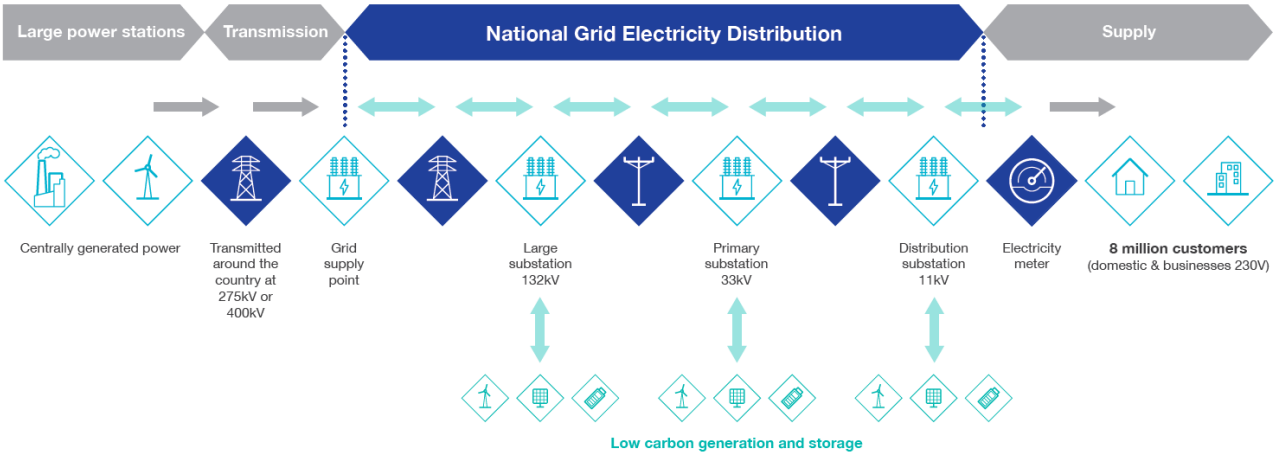
2.2 NGED is a Distribution Network Operator (DNO) and distributes electricity to 8 million customers across the Midlands, South Wales and the South West. Our role is to:

- operate our network assets to 'keep the lights on';
- maintain our assets so that they are in a condition to remain reliable;
- fix our assets if they get damaged or if they are faulty;
- upgrade the existing networks or build new ones to provide additional electricity supplies or capacity to existing and new customers; and
- operate a smart system by managing two-way power flows and flexible services.



2.3 All of these tasks are carried out with the highest regard for the safety of our staff, contractors and members of the public.

2.4 This network sits between what was traditionally known as the National Grid transmission network and supply to customers. More recently the drive towards a low carbon economy has led to increasing levels of generation directly connected to the distribution network and rapid growth of new forms of electricity demand such as electric vehicles and battery storage.



2.5 These changes mean that we will need to change the way that we operate our network. We will have a greater need to forecast energy production and usage, and actively manage energy flows across the network. To achieve this we have established a Distribution System

Operator (DSO) function with greater responsibility for forecasting network demands and identifying which parts of the network require extra capacity.

2.6 Our distribution network consists of transformers (which convert electricity from one voltage to another), underground cables and overhead lines (which carry electricity across long distances), switches (to turn on, off or to alter the routing of electricity) and service connections (which take the electricity into customers' premises or provide the connection of generation).

2.7 The NGED network comprises:

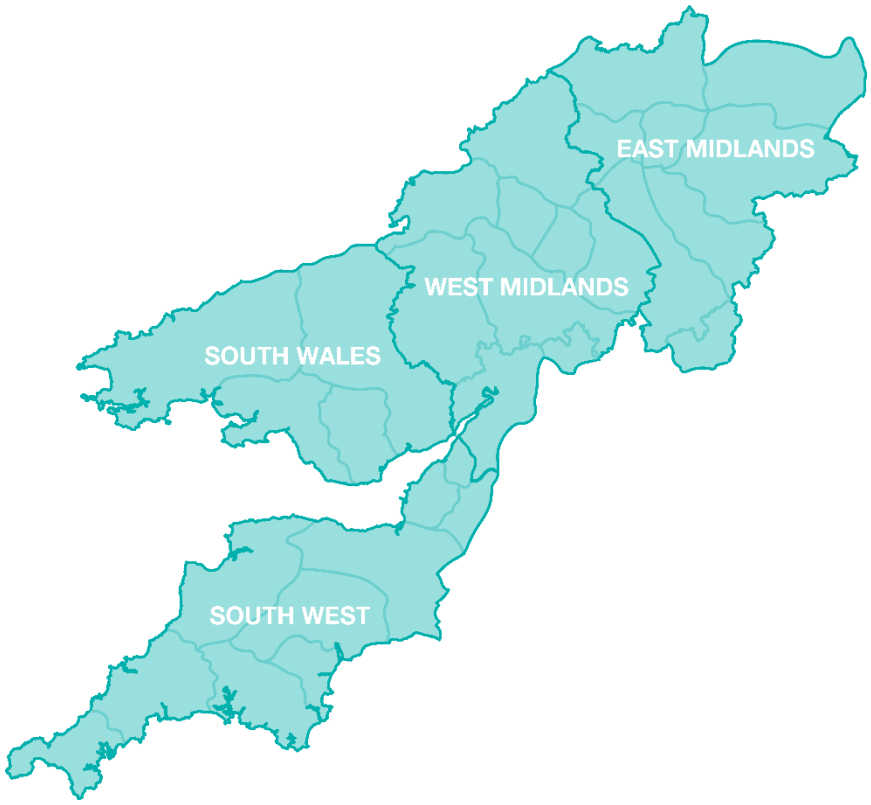
Network Assets

Asset Type	Units	West Midlands	East Midlands	South Wales	South West	NGED Total
Overhead Lines	**km**	23,000	21,000	18,000	27,000	89,000
Underground Cable	**km**	43,000	55,000	18,000	24,000	140,000
Transformers	**Each**	51,000	45,000	41,000	54,000	191,000
Switchgear	**Each**	86,000	102,000	37,000	82,000	308,000
Poles	**Each**	360,000	276,000	285,000	438,000	1,360,000
Towers (Pylons)	**Each**	3,000	5,000	2,000	3,000	14,000
Customer Numbers	**Each**	2,523,000	2,697,000	1,155,000	1,654,000	8,029,000
Licenced Area	**km^2**	13,300	16,000	11,800	14,400	55,500

*NGED total may not reconcile due to rounding.

2.8 Our network is the largest in the UK, covering every kind of geography and demography from densely populated residential areas to widely dispersed rural communities.

2.9 We provide power to large cities such as Birmingham, Bristol, Cardiff and Nottingham, and rural communities in counties such as Cornwall, Pembrokeshire and Lincolnshire across our region.



2.10 Our teams are based in local offices where they take responsibility for local issues, deliver local work programmes and respond quickly to local power cuts.

2.11 At NGED we are committed to providing a safe, stable and reliable electricity supply whilst delivering the highest quality of customer service.

2.12 Our vision is to be at the heart of a clean, fair and affordable energy future and this ambition is underpinned by our values to:

Do the right thing

- Stand up for safety every day
- Put our customers first
- Be inclusive, supporting and caring for each other
- Speak up, challenge and act when something doesn't feel right

Find a better way

- Embrace the power and opportunity of diversity
- Increase efficiency to help with customer affordability
- Work with others to find solutions for customers
- Commit to learning and new ideas

Make it happen

- Take personal ownership for delivering results
- Be bold and act with passion and purpose
- Focus on progress over perfection
- Follow the problem through till the end

2.13 We continue to look for and make use of innovative techniques and encourage creativity so that we carry out our work in an effective and efficient manner. This helps to ensure value for money for our customers and stakeholders and a fair return for our shareholders.

2.14 Even though we are actively facilitating competition in some of the services we provide (such as new connections) we are a natural monopoly within the geographic area we serve. We are, therefore, regulated by the Office of Gas and Electricity Markets (Ofgem).

2.15 Ofgem issues licences to DNOs that set out the obligations and responsibilities of the companies and also determines the revenues they are allowed to earn each year. NGED has four licences covering the four geographic areas of the West Midlands, East Midlands, South Wales and the South West.

2.16 Periodically, Ofgem scrutinises the Business Plans of DNOs through a price control regime. This determines how much DNOs are allowed to charge in total per year for network investment, operating costs and allowed returns.

2.17 This charge, known as the Distribution Use of System charge (DUoS), is payable by the electricity suppliers who, in turn, incorporate it into electricity charges to customers.

2.18 In 2022/23 our costs account for around £97 of the average annual domestic customer's electricity bill.

NGED's RIIO-ED1 Business Plan

2.19 The NGED RIIO-ED1 Business Plan was developed during 2012/13, looking forward ten years to March 2023. It sought to balance the needs of current customers (network performance, customer service and social obligations) with the needs of future customers (long term reliability and environmental issues), leading to an investment programme based upon efficient costs and refined through thorough stakeholder engagement.

2.20 Ofgem assessed all the licensees' Business Plans during the autumn of 2013, carrying out extensive benchmarking analysis. As part of the assessment process Ofgem had the facility to award fast track status to Business Plans that were well-justified.

2.21 NGED is very proud of being the only DNO to be awarded fast track status. The Business Plan was fast-tracked by Ofgem in February 2014, being accepted in full. The plan can be found on our website:

www.nationalgrid.co.uk/our-riioed1-business-plan

2.22 The Business Plan specifies the investment proposals, the expenditure and how this will benefit customers and stakeholders.

Forecast expenditure

2.23 In the RIIO-ED1 Business Plan, NGED proposed an overall 8-year expenditure of £9.2bn of which £7.0bn was covered by costs under our control, referred to as Totex. The remaining £2.2bn covers costs that are outside the control of NGED and 'passed through' to the charges we make to electricity suppliers.

2.24 Performance against this forecast is shown in the expenditure section of this report.

Outputs (commitments)

2.25 The Business Plan specified outputs in six main categories.

- Safety
- Reliability
- Environment
- Connections
- Customer Satisfaction
- Social Obligations

2.26 For some outputs there are specific regulatory targets. For others, the Business Plan stated a voluntary improvement target or described the service that was to be provided.

2.27 The performance against these targets and the progress made in developing enhanced or new services is described within this document.

Developing our approach to reporting

Ofgem guidance

2.28 The requirement for the Business Plan Commitment Reporting is defined within Standard Licence Condition 50. The guidance requires an annual report to be published each year on or before the 31 October which provides information on performance against Business Plan commitments.

2.29 The guidance does not specify the format, structure or contents of the report, but instead requires DNOs to shape the report to the requirements of stakeholders.

Stakeholder engagement

2.30 As part of our Stakeholder Engagement Strategy we hold an annual round of general stakeholder workshops which provides the opportunity to introduce key topics to a range of stakeholders and gain feedback on our approach.

2.31 As a result of the feedback gained from our 2015/16 workshops we adopted a three tier approach to Business Plan commitments reporting, producing:

- a one page performance summary;
- a summary report of around 20 pages providing an overview of performance in key areas for interested stakeholders; and
- a comprehensive report for expert stakeholders providing detailed performance information.

2.32 Following our 2017 workshops we listened to stakeholders and enhanced the existing expenditure information that we provided and simplified the technical explanations included within our detailed reporting.

2.33 We used our 2018 workshops to update stakeholders on our ongoing performance and to identify areas that have evolved since putting together the Business Plan in 2012/13. In response to this update stakeholders asked us to include additional reporting within this document for the following areas:

- Our inclusion into the business of the Distribution System Operator;
- Flexible Connection offers;
- Electric vehicles; and
- Cyber security.

2.34 We have therefore included a section on each of these areas in this report, providing an introduction to the subject matter, and an explanation of our activities and future plans.

2.35 For 2022/23, as we close RIIO-ED1, we include commentary on performance against overall price control commitments.

Useful links

NGED's 2022/23 submissions for the Incentive on Connections Engagement.
yourpowerfuture.nationalgrid.co.uk/our-engagement-groups/connection-customer-engagement/incentive-for-connections-engagement

Competition in Connections Code of Practice.
connections.nationalgrid.co.uk/competition-in-connections-code-of-practice

NGED's Competition in Connections webpage.
connections.nationalgrid.co.uk/competition-in-connections

NGED's 2022/23 submissions for the Stakeholder Engagement and Customer Vulnerability Incentive.
yourpowerfuture.nationalgrid.co.uk/ofgems-secv-incentive

NGED's Environment Report.
nationalgrid.co.uk/customers-and-community/environment

NGED's Losses Strategy.
nationalgrid.co.uk/smarter-networks/losses

NGED's Innovation Strategy.
nationalgrid.co.uk/innovation/innovation-strategy

NGED's RIIO-ED1 Business Plan.
yourpowerfuture.nationalgrid.co.uk/our-future-business-plan/our-riioed1-business-plan

Link to NGED's webpage for Guaranteed Standards of Performance.
nationalgrid.co.uk/customers-and-community/guaranteed-standards

Link to our video guides for Community Energy Schemes.
nationalgrid.co.uk/customers-and-community/community-energy/community-energy-animations

Link to information on our DSO strategy
nationalgrid.co.uk/dso/dso-strategy

Safety

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Safety

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3 Safety

3.1 Safety is fundamental to everything we do.

3.2 NGED has committed to a range of outputs to improve overall safety performance. These aim to minimise the safety risks to staff, contractors and members of the public.

3.3 The safety outputs are in four themes.

- Compliance with health and safety law.
- Reducing accidents.
- Substation security and theft of equipment.
- Educating the public.

Regulatory framework

3.4 There are no Ofgem incentives for safety because the primary requirement from Ofgem is compliance with the requirements set out in legislation and enforced by the Health and Safety Executive (HSE).

OHSAS 18001 to ISO 45001 transition

3.5 NGED is certified to the ISO 45001 standard for Health and Safety Management. Previously NGED had certification to OHSAS 18001, but this was withdrawn by BSI in March 2021. As part of the transition, NGED's approach has been audited by accredited external assessors who attended a range of offices, depots and worksites.

Overview of safety outputs

Meeting health and safety law		
1	No improvement notices, prohibition notices and prosecutions from the Health and Safety Executive.*	No improvement notices were issued or prosecutions made relating to the current price control during 2022/23. We have appealed two HSE prohibition notices, issued in previous regulatory years, and will provide details of the outcome at the end of the appeals process.
2	Complete work programmes to meet the Electricity, Safety, Quality and Continuity Regulations (ESQCR) 2002. ESQCR requires that overhead lines are a safe distance from either structures or the ground.	We have completed the programme for clearance distances to structures for all regions. We have completed 100% of the work scheduled in 2022/23 relating to the required ground clearance distances.
3	Complete inspection and maintenance programmes every year.	We completed all of the work scheduled for the year except for a very small number of tasks. We put in place appropriate plans to manage these safely until the work was completed.
Reducing accidents		
4	Reduce our overall rate for the frequency of accidents by 10%.*	Our accident rate in 2022/23 is better than the 10% improvement target set for the whole of RIIO-ED1.
5	Continue to play an active part in the ENA's 'Powering Improvement' initiative, which aims to lead to improved safety performance.	We took an active role in the Powering Improvement steering group to help develop materials to support the theme of promoting a positive health and safety culture.
6	Work with our trade unions to improve safety performance, including the use of more 'behavioural safety' initiatives.	During RIIO-ED1 NGED has delivered a wide variety of behavioural safety training to its staff. Using this training as a foundation, during 2022/23 we have continued to reinforce key behavioural safety principles.
7	Investigate all accidents involving members of the public, contractors or our own staff to make sure that learning points are quickly understood and communicated.**	We investigated all 71 incidents that happened during the year (48 staff accidents, 14 contractor accidents and 9 significant incidents involving the public).
Substation security		
8	Improve security measures at 50 substation sites to reduce the number of repeat break-ins.*	The number of repeat break-ins has been lower than predicted. In RIIO-ED1, we have upgraded security measures at 21 sites that have had repeat break-ins.
Educating the public		
9	Organise and run over 1,000 educational sessions to provide safety information to over 400,000 schoolchildren.*	We have exceeded our target and have delivered a total of 23,371 educational sessions to 546,350 schoolchildren
10	Continue to publish literature on maintaining safety around electrical apparatus and send more than 500,000 copies of this literature to targeted landowners, businesses or leisure operators.*	Over the course of RIIO-ED1, we have issued over 4,821,587 instances of safety leaflets and made these available to targeted groups through social media.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Meeting health and safety law

Output (1)	No improvement notices, prohibition notices and prosecutions from the Health and Safety Executive.	

3.6 NGED works cooperatively with the HSE to ensure that practices and policies continue to be compliant with legislation and to identify and apply best practice.

3.7 The HSE can impose the following sanctions where compliance is breached.

- If the HSE believes that there is a serious risk of harm it has the option to stop activities immediately using a Prohibition Notice.
- Where there is a significant breach of law the HSE has the power to issue a formal Improvement Notice.
- Where HSE inspectors observe a 'material breach' of health and safety legislation during an inspection, they may levy a 'fee for intervention' to cover the cost of inspection visits. Whilst these fees are not fines, the HSE does expect that remedial actions will be carried out.

3.8 During 2022/23 there have been no improvement notices or prosecutions from the HSE.

3.9 We are awaiting the outcome of our appeals against two prohibition notices that were issued by the HSE during 2016/17 and 2020/21.

Output (2)	Complete work programmes to meet the Electricity, Safety, Quality and Continuity Regulations (ESQCR) 2002. ESQCR requires that overhead lines are a safe distance from either structures or the ground.	

3.10 The Electricity Safety, Quality and Continuity Regulations 2002 (ESQCR) specify requirements for clearance to objects and ground as detailed below.

- Regulation 17 deals with the height of overhead lines and specifies the clearances to ground for roads and other situations. This allows safe operation of activities under the lines.
- Regulation 18 requires that overhead lines are positioned away from buildings and structures to reduce the risk of inadvertent contact. This was a new obligation introduced in 2002 that required DNOs to identify locations where overhead lines were close to structures and remove the hazard by modifying, diverting or undergrounding the lines.

3.11 Work programmes for Regulation 18 are complete.

3.12 For Regulation 17 (clearance to ground), NGED has established a risk based assessment process that measures the existing clearance height and assesses locational risk. The results determine the timescales for rectification of low ground clearance defects and therefore provide ongoing deadlines for the forward workplan (between 3 and 13 years). Initial assessments were completed in 2016, leading to a programme of defect rectification. The required timeframes for resolving defects can extend up to thirteen years and as a result there will be activity that continues into RIIO-ED2 and the start of RIIO-ED3.

3.13 The achievement of resolving defects within the required timeframes is monitored through key performance indicators. At the close of 2022/23 there were no Regulation 17 defects that had not been rectified within the timeframes indicated by the risk assessment process.

Output (3) Complete inspection and maintenance programmes every year.

3.14 One method of ensuring that the network remains safe is through regular and thorough inspection, defect rectification and maintenance.

3.15 Cycles of inspection and maintenance are built into our asset management systems so that maintenance and inspection 'tasks' are generated for assets in line with the frequency specified in policy. Local teams use the tasks to manage inspection and maintenance work and the completion of tasks is monitored through weekly key performance indicators sent to managers. NGED targets the completion of all inspection and maintenance tasks within the required period so that no arrears exist.

3.16 In addition to the weekly reports, managers use an online 'dashboard' system for monitoring progress in carrying out operational tasks. This provides a high level view of progress and the ability to drill down into the underlying data, which is updated automatically on a daily basis.

3.17 The programme for inspection and maintenance work is managed over a calendar year and all tasks are expected to be completed within the year. Occasionally arrears may arise as a result of issues such as access to a site. A risk assessment, including any planned remedial action, is completed where maintenance arrears arise. All risk assessments are reviewed by the Network Services Manager who has responsibility for all activities within the licence area.

3.18 Condition assessments are carried out during inspection and maintenance work. The results are recorded as either condition statuses, test results or defects. NGED policy requires defects to be fixed with the clear instruction throughout policy documents of 'DON'T IGNORE DEFECTS – FIX THEM'. Risk assessment approaches have been developed that lead to deadlines for defect rectification and the clearance of defects within the deadlines is monitored in key performance indicators.

3.19 All field teams are issued with iPads for recording of information. We continue to introduce new bespoke applications and develop existing ones to enhance the variety of records available, improve ease of access, and allow for automatic information updates from site. This has included the introduction of an Asset Management application (app), which allows engineers to record the commissioning and decommissioning of assets live from site. The app also allows for the tracking of assets from delivery at Plant Centres, temporary storage at local depots and final commissioning on site, preventing any issues with stock lying idle and allowing short notice identification of available assets in the event of an unexpected asset failure.

3.20 Enhancements such as these ensure that our mechanisms for capturing information about the current status of the network are efficient and effective.

Reducing accidents

Output (4) Reduce our overall accident frequency rate by 10%.

3.21 Safety is a high priority for NGED and during RIIO-ED1 NGED has committed to reducing the overall accident rate involving our own staff by 10%, in comparison to the average accident rate for the previous regulatory period, DPRC5.

3.22 A number of methods are used to minimise the risk of accidents. This includes the provision of clear processes and procedures, effective training, encouraging staff to take personal responsibility for safety, a range of audit processes, investigating incidents and sharing the learning from investigations.

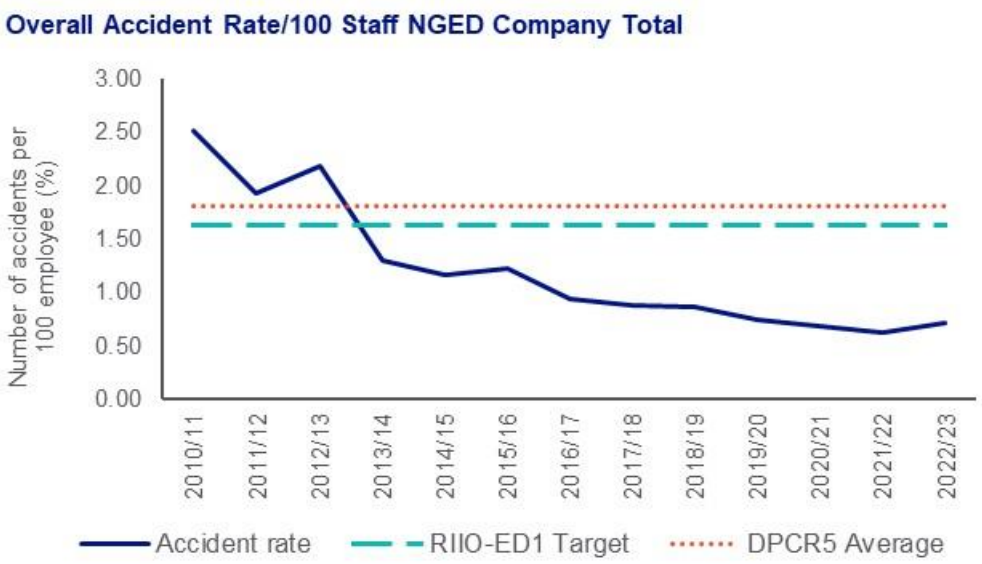
3.23 Each year, a safety action plan is produced based on recent accident reports, near misses, industry incidents and any legal, regulatory or industry wide initiatives.

3.24 In 2022/23 a range of initiatives were used to promote improving safety including:

- Development of risk assessment arrangements to better support safe working practices;
- Behavioural safety training at trainee conferences and staff briefings;
- A review of operational rules and procedures to ensure safety when working on the network;
- Revised incident investigation process (policy documents were updated with training and guidance provided to staff);
- Improved communication of lessons learned from incident investigations;
- Implementation of Employee Resource Groups – voluntary groups that support members through the sharing of experience;
- Providing all line managers with bespoke mental resilience training programmes,
- Providing role based mental resilience training to targeted staff groups;
- Training additional Mental Health First Aiders;
- Conducting a business wide mental health awareness training programme which included videos and intranet articles as well as offering continued support through our Employee Assistance Programmes.

3.25 Accident frequency rate is derived from the annual number of accidents and the number of staff, and is expressed as 'accidents per 100 members of staff'. This allows performance to be compared across differently sized teams and organisations. The accident rate includes both accidents which have resulted in lost time absence and those where the individual has been able to continue to work despite the accident.

3.26 In 2022/23 the accident rate for NGED as a whole was 0.72 accidents per 100 staff. The accident rate has continued to stay well below the 10% improvement rate set for RIIO-ED1 as shown in the chart below.



3.27 During the year, advice and information have been provided to staff around the themes of:

- general health and wellbeing with a focus on the benefits of physical activity;
- awareness of asbestos and best practice;
- slips, trips and falls and manual handling;
- positive management of ill health; and,
- safe practices at work.

3.28 During 2022/23 NGED launched a 'Safe to Say' scheme, to provide staff with a way to raise concerns anonymously. While this initiative is aimed at any type of concern, staff have used it to highlight some safety issues.

3.29 As a part of the safety training sessions, staff have been encouraged to report 'near misses' (as these provide learning opportunities for improvements) and there have been discussions on the evolution from a 'blame culture' to a 'learning culture'.

3.30 All staff have received a series of four training sessions from their team leaders discussing themes around 'reasons to stay safe'. These explored the personal impact of safety incidents on ourselves and others.

Output (5)	Continue to play an active part in the ENA's 'Powering Improvement' initiative, which aims to lead to improved safety performance.

3.31 NGED continues to actively participate in the industry strategy 'Powering Improvement', which is a cross-sector strategy to bring about continuous improvement in safety and occupational health in the energy generation and networks sectors. The Powering Improvement initiative started in 2010 and each year has had a specific theme. Over the course of RIIO-ED1 this has included:

2015 Working with contractors
2016 Managing occupational ill health risks
2017 Asset management
2018 Human and organisational factors
2019 Review of progress and developing the next phase of 'Powering Improvement'
2020 Phase 3 2020 – 2025 & beyond
2021 Managing occupational health
2022-23 Promoting a positive health and safety culture

3.32 Powering Improvement is supported by member companies of the Energy Networks Association (ENA) (the industry body for UK transmission and distribution network operators for gas and electricity), member companies of the Association of Electricity Producers (the trade association for the UK generators), trade unions and the HSE.

3.33 The Powering Improvement theme for 2022 and 2023 was 'promoting a positive health and safety culture' with a focus on demonstrating good levels of commitment to health and safety: from senior management and trade unions, ensuring that clear and effective communication channels are developed and maintained for staff at all levels, and to encourage worker involvement and proactive participation in company processes to drive improvement.

3.34 The NGED Safety team produced a package of videos and presentations that were used at the company SHE conferences to promote discussion around a positive health and safety culture including the development of fair culture in incident investigation.

3.35 The Occupational Health team has focused on achieving a positive balance between quantitative and qualitative analysis of health data, developing strategies to safeguard the health of employees, such as mechanisms for reporting on mental health. The team are also involved in the analysis of the impact of a move to a low carbon future, working with suppliers at an early stage to identify how the design, procurement, installation and operation of new equipment can be managed to reduce potential risks to the health of the workforce.

Output (6)	Work with our trade unions to improve safety performance, including the use of more 'Behavioural Safety' initiatives.

3.36 NGED works with trade union representatives to improve the health and safety of staff and to build on behavioural safety principles. The company facilitates quarterly safety forums with trade unions, with four meetings per annum in each of the four NGED licence areas and four meetings per annum at a company level.

3.37 Company level meetings are timed to occur after local forums so that issues can be escalated and learning from any local discussions can be implemented company wide.

3.38 Standard topics for discussion at local forums include:

- a review of policy changes and any safety bulletins that have been issued;
- a summary of performance; and
- a review of specific accidents, operational incidents and near misses in order to understand the causes and share learning.

3.39 Additional topics covered in local forums for 2022/23 included the following:

- Carrying out appropriate security screening, including criminal background checks, for new and existing staff to standards set by British Standards Institute and the Disclosure and Barring Service.
- Reviewing areas where National Grid Group and NGED can work more closely together and developing new ways of working that benefit the whole organisation.
- Training of additional mental health first aiders.
- Publishing mental health training on the company intranet with a focus on recognising warning signs, asking for help and using coping strategies.
- Reviewing and issuing a new Hybrid Working Policy for safe working practices at home and in the office.

3.40 Trade union safety representatives were informed of all accidents and have the remit to independently investigate accidents if they wish to do so. Trade union safety representatives have access to the same training provided for supervisors carrying out Site Safety Visits, enabling them to independently audit operational sites.

Behavioural safety

3.41 Behavioural safety goes beyond setting rules and enforcing compliance; it focusses on changing attitudes so that staff assume responsibility for their own safety and the safety of others by acting on training, following instructions and challenging others when they see safety rules about to be broken. With this is mind all of our training methods used discussion topics to encourage all staff to consider how their individual actions affects their environment and their colleagues, and reassurance for colleagues who want to report unsafe behavior through either anonymity or direct means through the shift to a 'no blame culture'.

3.42 As part of our activities to promote safety, annual safety conferences are held across the licence areas. The 2022/23 conference included a behavioural topic on demonstrating examples of poor decision making and asking "you wouldn't, would you?'

3.43 We also held a Trainee Safety Conference in December 2022 that all new trainees attended. The conference covered the same range of safety topics as the main conferences and also included a session with our President where we remembered past colleagues who had suffered severe consequences of uncontrolled risks. There was a dedicated session on encouraging trainees to challenge out of date or potentially unsafe practices they might come across.

3.44 In 2022, we launched a series of safety sessions for all staff, presented by team leaders and managers. These promoted discussions around each individual's 'reason to stay safe', compelling individuals to consider their own quality of life and the people they love who would be impacted by any sort of accident or injury. This was aimed at getting staff to recognise the potential consequences of incorrect safety behavior.

Output (7)	Investigate all accidents involving members of the public, contractors or our own staff to make sure that learning points are quickly understood and communicated.

3.45 Whilst every effort is made to prevent incidents or accidents, they may still occur. When they do occur, NGED has committed to ensure that they are quickly investigated so that the causes can be understood and that appropriate action is taken without delay. This relates to any accident or incident – whether it involves staff, contractors or members of the public.

3.46 We continue to work to embed the impact of previous training and events into our day to day processes. Examples for 2022/23 include the following:

- We have shifted the focus of the way in which we investigate lost time injuries, considering the potential harm the incident could have caused rather than focusing on the actual injury that occurred. In this way we encourage staff to think about the potential risks that unsafe working practices carry rather than dismissing events as minor because of the actual outcome.
- We are actively promoting near miss reporting, using investigations into near miss events to explore the learning opportunities that such events can provide.
- Since 2020, we have worked hard to shift our culture from a perceived culture of blame to adopt a 'Fair Culture' when investigating incidents, focusing on lessons learnt.

3.47 During 2022/23 there were 48 staff accidents, 14 contractor accidents and 9 significant incidents involving the public. All 71 were investigated.

3.48 The information gathered from investigations is used to promote improvements in safety performance. Learning from such events, together with general information on good practice and new company initiatives is proactively shared with staff through a range of mechanisms.

- Safety articles are regularly featured within the company's staff magazine (Powerlines).
- When an incident occurs the investigating manager produces an investigation report identifying learning points. A summary of these reports is emailed on a monthly basis to line managers for cascade and discussion in team brief meetings.
- Where incidents could have had more significant consequences a Safety Bulletin is issued and cascaded. Each bulletin provides an explanation of the issue, relevant learning points and the actions required by individuals to avoid recurrence in the future.

3.49 Staff are encouraged to identify opportunities to improve safety performance and have the facility to submit details of 'near misses' (incidents that could have resulted in an accident) either manually using the 'Safety Flash' system or using the company iPads. This information can be submitted anonymously should they wish to do so.

3.50 In 2022/23, 63 near misses were reported and 40 safety suggestions were submitted. All reports were collated centrally by the Safety Team and then submitted to local management teams to review and action as appropriate; no actions were outstanding for the regulatory year.

Substation security

Output (8)	Improve security measures at 50 substation sites to reduce the number of repeat break-ins.

3.51 The financial value of metals can lead to theft from the network. Such theft can lead to electricity supplies being interrupted and sites being left in a hazardous state, exposing NGED employees and members of the public to increased risks.

Increasing primary substation security

3.52 Following the acquisition of the Midlands licence areas in 2011, NGED committed to upgrading security measures at all sites in the West Midlands and East Midlands to bring them up to the level of protection provided in the South West and South Wales. Enhancements would ensure that all grid and primary sites would be provided with an intruder system as a minimum, with higher risk sites also being fitted with CCTV and/or electric fences.

3.53 Substations are categorised according to risk. This includes an assessment of the strategic importance of the substation to the network and whether there is a history of intrusion or theft.

3.54 In order to determine the works required at each site, local site surveys were carried out and consequently we revised the number of sites requiring enhancements.

3.55 We have completed the works in the West Midlands and installed enhancements at 78% of the sites in East Midlands. The original targets, revised targets and volumes completed are detailed below:

Substation security enhancements – Midlands

	West Midlands	East Midlands
Initial forecast of sites requiring upgraded security during RIIO-ED1	372	553
Sites requiring upgraded security – post site survey and risk assessment	182	330
Security enhancements completed during RIIO-ED1	225	257

Monitoring repeat break-ins to substations

3.56 NGED has committed to enhancing substation security measures at locations where thieves regularly attempt to break in.

3.57 Analysis of repeat break-ins commenced in 2015/16 and in 2022/23 there was one substation that was targeted more than once during the year.

3.58 Since the start of RIIO-ED1 we have undertaken permanent upgrading works at 21 sites that were the subject of repeat break-ins.

Educating the public

Output (9) Organise and run over 1,000 educational sessions to provide safety information to over 400,000 schoolchildren.

3.70 Children and other members of the public may not always be aware of the potential dangers from the electricity distribution network. This lack of awareness can lead to them becoming exposed to more risk during certain play, leisure or work activities.

3.71 During RIIO-ED1, NGED committed to providing over 1,000 educational sessions to 400,000 schoolchildren about the potential dangers of electricity.

3.72 Since the start of RIIO-ED1, we have delivered a total of 23,371 sessions to 546,350 schoolchildren across our four licence areas, exceeding our RIIO-ED1 target.

3.73 The breakdown of sessions delivered during 2022/23 is as follows:

Educational sessions delivered 2022/23

Area	No. sessions	No. children benefitted
West Midlands	646	31,909
East Midlands	2,431	27,154
South Wales	1,774	28,194
South West	767	21,756
Total	5,618	109,013

3.74 As well as traditional engagement with schools and community groups we have been piloting more innovative ways to engage with our customers. For example, we have put on street performances during school holidays with partners such as theatre groups and magicians. These events attract crowds who we can then share educational materials with. They proved popular and we received positive feedback from customers.

3.75 In addition to the provision of formal sessions and printed materials, in 2022/23 NGED has grown its offering of electricity and safety resources available to schools through a standalone Power Discovery Zone an interactive, curriculum-linked website to include videos and games.

Output (10)	Continue to publish literature on maintaining safety around electrical apparatus and send more than 500,000 copies of this literature to targeted landowners, businesses or leisure operators.

3.76 NGED recognises that those engaged in work or recreational activities near network assets may be unaware of the potential hazards around them. NGED produces a range of information leaflets describing the dangers of overhead lines, electricity substations and underground cables and distributes these to individuals or groups potentially at risk due to their work or leisure activities. NGED holds a database of customer groups likely to fall into this category so that literature can be distributed to individuals who have the potential to be exposed to electrical safety risks.

3.77 During RIIO-ED1, NGED committed to distributing 500,000 copies of safety literature to specific landowners, business or leisure activity providers whose activities could be higher risk if undertaken near our equipment.

3.78 Safety literature continues to be distributed in traditional paper based formats, but increasingly social media is used to promote safety information and direct individuals to electronic copies of our literature on the NGED website. This process can be monitored so that the number of individuals who click on online safety literature as a result of a social media post can be logged.

3.79 Safety literature entitled 'Think Safe, Stay Safe' highlights the dangers of electricity and provides examples of the type of activities that could be a risk to health.

3.80 In 2022/23 a total of 337,806 safety 'leaflets' were issued or made visible to customers. Our cumulative total for the RIIO-ED1 period is 4,821,587 'leaflets' issued.

3.81 During 2022/23 information was distributed in a variety of ways as detailed below.

- Campaigns promoting electrical safety reached 160,597 customers through social media. This reach consisted of posts on a range of safety topics including farming, electrical fire safety, and child safety.
- 176,183 landowners with NGED equipment on their land were sent literature as part of the wayleaves process associated with these assets.
- Street performances demonstrated our message and attracted customers so we could share our safety literature

3.82 Using a varied range of media helps to get the public safety message to a diverse range of individuals.

Reliability

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23
31 October 2023

Electricity Distribution

nationalgrid

Reliability

Contents

4 Network reliability

4.1 Network reliability is a high priority for NGED and we have committed to achieving a range of improvements during RIIO-ED1 so that our customers have fewer and shorter power cuts.

4.2 Network Reliability outputs are in four themes.

- Network performance
- Guaranteed Standards of Performance (GSOPs)
- Worst served customers
- Enhancing network resilience

Regulatory framework

4.3 Ofgem recognises that network reliability is important to customers and therefore has introduced a number of incentive mechanisms.

- The Interruption Incentive Scheme – which provides targets for reducing the average number of power cuts (Customer Interruptions) and the average duration of those power cuts (Customer Minutes Lost). DNOs can earn financial rewards or suffer financial penalties dependent on performance.
- Guaranteed Standards of Performance, implemented under The Electricity (Standards of Performance) Regulations 2015, require licensees to make direct payments to customers where specified performance standards are not achieved.
- Worst served customers – DNOs can recover costs associated with investment for customers who experience high volumes of power cuts.
- Network asset risk indices are used to track the delivery of asset replacement and refurbishment work. Unjustified under-delivery against targets will be penalised but justified over-delivery can lead to additional funding.
- Funding has been provided for enhancing the resilience of the network. Resilience is the ability of electricity distribution networks to continue to supply electricity to customers during disruptive events, such as severe storms, floods or black start events.

4.4 Some of the outputs committed to by NGED go beyond this framework with the aim of delivering excellent service for current customers and a reliable network in the longer term.

Overview of network performance outputs

Network performance		
11	Improve network performance by the end of RIIO-ED1 so that, on average, customers will have 16% fewer power cuts and have their electricity supplies restored 23% quicker. *	Customer interruptions have reduced by 42% and customer minutes lost have reduced by 49% from the underlying performance benchmark.
12	Make sure that at least 85% of customers have their power restored within an hour of a high voltage fault happening.**	85.35 % of customers had their power restored within one hour of a high voltage fault.
Guaranteed Standards of Performance (GSOPs)		
13	Reduce by 20% the number of customers experiencing a power cut which lasts for 12 hours or more.*	The number of customers without electricity for more than 12 hours (where the GSOP applied) was 1,257, an improvement of over 88% on our 2012/13 benchmark performance. Customers received a set payment where we failed to achieve the GSOP.
14	Achieve no failures on all other GSOPs.**	There were only 70 failures across all other categories.
Worst served customers		
15	Reduce by 20% the number of customers classified as worst served.*	During the course of RIIO-ED1 projects to reduce the number of worst served customers have been put in place for 15,461 customers. Our target for the whole of RIIO-ED1 was 6,812 customers
Making our network more resilient		
16	Apply flood defences to 75 substations, reducing the risk of both damage to equipment and power cuts due to flooding.*	We have achieved our RIIO-ED1 targets. Across the whole of RIIO-ED1 we installed flood defences at 86 substations.
17	Speed up the programme of tree clearance (specifically related to storm resilience) by 40%, with the aim of clearing 700km of overhead lines per year (delivering the programme five years earlier than suggested by Government guidelines).*	We have met the RIIO-ED1 target and completed the programme of tree clearance for resilience that we committed to for the whole of RIIO-ED1.
18	Improve substation battery life to last for 72 hours if there is a major, network-wide power loss.*	We have completed our programmes for resilience of protection batteries, SCADA batteries and telecommunications site supplies.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Network performance

Output (11)	Improve network performance by the end of RIIO-ED1 so that, on average, customers will have 16% fewer power cuts and have their electricity supplies restored 23% quicker.

4.5 NGED committed to improving network performance by the end of RIIO-ED1 so that on average customers would have 16% fewer power cuts (measured by Customer Interruptions) and have their electricity supplies restored 23% quicker when a power cut occurs (measured by Customer Minutes Lost).

4.6 The proposed degree of improvement was supported by stakeholders and in some cases was more challenging than targets originally proposed by Ofgem. These more stretching targets were incorporated into the Ofgem incentive mechanism called the Interruptions Incentive Scheme (IIS) – which provides financial rewards or penalties depending on performance against these targets.

4.7 Since establishing the targets we have achieved improvements in network performance. In comparison to a 2012/13 baseline reference the number of power cuts has reduced by 42% and the average duration of power cuts has reduced by 49%. This performance beats the targets for the end of RIIO-ED1.

Performance for Customer Interruptions

4.8 Customer Interruptions are expressed as the average number of interruptions per 100 customers. The following tables and charts compare performance against targets.

Unplanned Customer Interruptions targets

	Baseline reference	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Percentage improvement
West Midlands	93.7	89.9	88.5	86.7	85.0	83.3	81.7	80.0	78.3	76.7	75.1	20%
East Midlands	58.8	56.0	55.7	51.9	51.1	50.4	50.1	49.9	49.6	49.4	49.1	16%
South Wales	55.5	52.6	52.5	50.1	49.9	49.6	49.4	49.1	48.9	48.6	48.4	13%
South West	57.4	57.1	56.8	55.7	55.4	55.1	54.8	54.6	54.3	54.0	53.7	6%
NGED Total	69.1	66.5	65.9	63.5	62.6	61.7	61.0	60.3	59.6	58.9	58.2	16%

Unplanned Customer Interruptions actual (excluding exceptional events)

	Baseline reference	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Percentage improvement compared to baseline
West Midlands	93.7	73.6	67.6	63.1	56.1	53.2	52.8	46.2	42.6	44.5	44.3	53%
East Midlands	58.8	48.7	45.0	41.7	43.2	46.0	38.9	37.2	39.0	36.6	31.9	46%
South Wales	55.5	45.8	52.6	45.0	38.0	44.9	37.9	40.5	35.9	35.2	41.0	26%
South West	57.4	49.3	47.9	48.5	48.3	58.2	48.0	42.7	55.2	47.4	45.9	20%
NGED Total	69.1	56.3	53.9	50.4	47.6	50.6	45.0	41.7	42.9	41.1	39.9	42%

2022/23 performance is based upon NGEDs submission of data, which at the time of publication of this report had not been verified by Ofgem.

4.9 For 2022/23, performance for Customer Interruptions beats the overall RIIO-ED1 improvement target in all four licence areas.

Performance for Customer Minutes Lost

4.10 Customer Minutes Lost are expressed as the average length of time in minutes that customers are without power (excluding short power cuts that are under three minutes). The following tables and charts compare performance against targets.

Unplanned Customer Minutes Lost targets

	Baseline reference	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Percentage improvement
West Midlands	66.7	52.5	51.9	51.1	50.3	49.5	48.7	47.9	47.1	46.4	45.6	32%
East Midlands	45.2	38.2	38.0	37.8	37.6	37.3	36.5	35.7	34.9	34.2	33.5	26%
South Wales	28.7	27.6	27.6	27.5	27.5	27.4	27.4	27.3	27.3	27.2	27.1	6%
South West	35.1	36.1	35.9	35.8	35.6	35.4	35.2	35.0	34.8	34.6	34.4	2%
NGED Total	47.7	40.8	40.5	40.2	39.8	39.4	38.8	38.2	37.7	37.2	36.6	23%

Unplanned Customer Minutes Lost actual (excluding exceptional events)

	Baseline reference	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Percentage improvement
West Midlands	66.7	35.3	30.7	28.4	27.1	26.6	27.0	24.2	24.3	25.3	26.3	61%
East Midlands	45.2	24.4	21.5	19.9	20.4	22.7	21.3	21.3	22.0	20.8	20.5	55%
South Wales	28.7	25.1	24.2	20.7	19.5	22.7	19.4	18.9	19.6	19.6	20.8	27%
South West	35.1	32.9	31.1	29.0	30.1	34.1	32.4	30.1	34.5	29.4	31.4	11%
NGED Total	47.7	29.7	26.7	24.5	24.4	26.2	25.1	23.6	24.9	23.8	24.6	49%

2022/23 performance is based upon NGEDs submission of data, which at the time of publication of this report had not been verified by Ofgem.

4.11 For 2022/23, performance for Customer Minutes Lost is better than the overall RIIO-ED1 improvement target in all four NGED licence areas.

Our approach to improving network performance

4.12 NGED aims to improve network performance by:

- reducing the number of faults that occur;
- reducing the number of customers affected by a fault; and
- reducing the time it takes to restore supplies when a fault occurs.

4.13 The following sections detail a range of supporting activities that we monitor to ensure that we continue to achieve improved network performance.

Reducing the number of faults

Completing inspection and maintenance programmes

4.14 NGED regularly inspects and maintains the network to identify poor condition assets, repair defects and replace worn components that could otherwise lead to faults.

4.15 Ensuring the completion of inspection and maintenance work programmes assists in limiting faults by addressing conditions that could lead to asset failure.

4.16 Local teams manage inspection and maintenance work. Company policy dictates the completion of set tasks within specific time periods and the completion of tasks is monitored by managers through weekly key performance indicators, so that no arrears exist.

Removing defective poles

4.17 NGED places a high priority on the replacement of poor condition wooden poles. Overhead lines are regularly inspected and poles found in poor condition are flagged on our asset management system with a target for them to be removed from the network within a year.

4.18 This activity provides safety, reliability and resilience benefits. It removes weak points from overhead line networks; reducing the likelihood of failure, especially during severe weather conditions.

4.19 We use key performance indicators to ensure that defective poles are removed within 12 months of being identified. During 2022/23, each NGED licence area met the requirements.

Replacing assets

4.20 The condition of network assets degrades over time and as a result NGED has an ongoing programme of asset replacement and refurbishment. The work is primarily carried out to maintain the reliability and safety of the network.

4.21 We assess the impact of asset replacement and refurbishment by using network asset indices based upon risk. The risk assessment considers the likelihood of an asset failing (asset health) and the consequences of the failure (criticality). Assets in good condition have a lower risk than assets in poor condition, so the act of replacing a poor condition asset with a new asset reduces risk levels.

4.22 For RIIO-ED1, Ofgem placed an obligation upon all DNOs to work together to produce a common methodology for the way in which asset health, criticality and risk are assessed. This is referred to as the Common Network Asset Indices Methodology (CNAIM). This work was completed in 2016 and the targets for risk reduction during RIIO-ED1 were restated using CNAIM in December 2016.

4.23 Targets have been established by considering the risk reduction that will be delivered by specific RIIO-ED1 asset replacement and refurbishment programmes. The targets are derived from the difference between two forecast positions:

- risk at the end of 2022/23 without any intervention; and
- risk at the end of 2022/23 with planned asset replacement and refurbishment interventions.

4.24 The targets are specified as overall RIIO-ED1 targets. The table below shows both risk points delivered during 2022/23 and our performance towards the overall targets for RIIO-ED1. All four licence areas have exceeded the targets.

Network asset indices performance

	West Midlands	East Midlands	South Wales	South West	NGED Total
RIIO-ED1 total target*	-17,228,200	-12,530,218	-9,816,502	-16,310,684	-55,885,603
Risk points reduction delivered during RIIO-ED1*	-21,083,013	-15,771,872	-12,276,614	-17,662,103	-63,507,738
2022-23 delivered risk points reduction*	-1,303,071	-1,636,392	-1,024,261	-1,517,043	-3,963,724
Percentage of RIIO-ED1 target delivered	122.4%	125.9%	125.1%	108.3%	113.6%

* The target and delivered risk point values are based upon the values that would be seen in 2022/23 to enable direct comparison to the targets

Reinforcing the network to provide enough network capacity

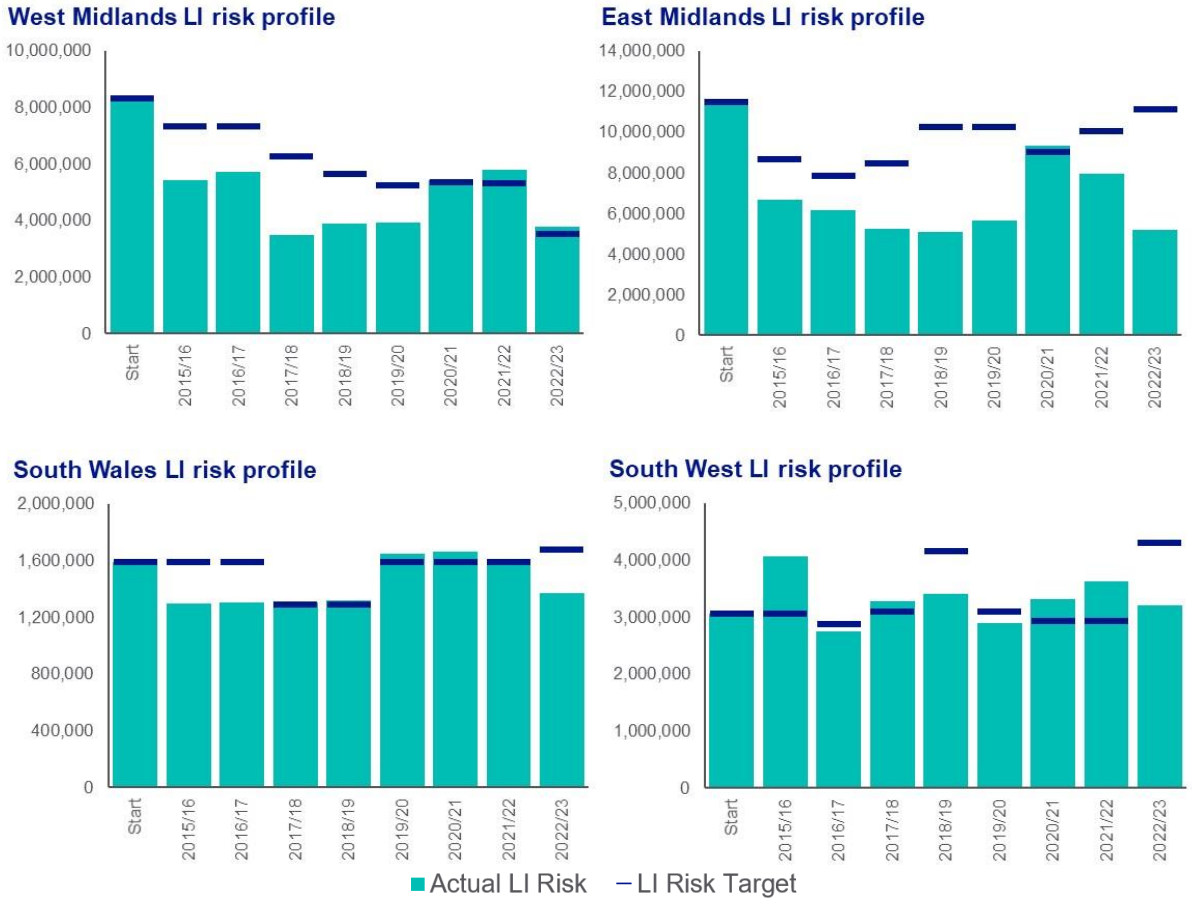
4.25 The amount of power that the network can carry (referred to as the capacity of the network) is limited by the rating and capability of equipment and the way in which these assets are configured. As more connections are made to the network, or customers use more electricity, spare capacity is used up and intervention is required to prevent assets overloading and failing.

4.26 This intervention can be through:

- managing the load to reduce the maximum demand on the network or
- reinforcing the network to provide more capacity - either by adding more assets or replacing existing assets with higher rated equipment which can carry greater load.

4.27 The network is regularly assessed to determine whether intervention work is required to reflect changing circumstances. For 33kV, 66kV and 132kV substations, Ofgem has specified the use of a Load Index (LI) which compares maximum demand to capacity. The result is converted to an LI rank, with LI1 representing a substation with significant spare capacity and LI5 representing a fully utilised substation. The LI ranking is converted to risk points by using a weighting factor for each LI rank. As demand increases more capacity is used up leading to a higher LI rank and higher LI risk points. When interventions take place more capacity is provided which lowers the LI risk.

4.28 In developing the RIIO-ED1 Business Plan we forecasted how load would grow and specified when we expected to carry out interventions. This resulted in a forecast risk profile over the RIIO-ED1 period. Progress against the forecast risk profile is shown below.



4.29 All NGED licence areas, with the exception of West Midlands, are below their Load Index targets for the end of RIIO-ED1.

P2 compliance

4.30 DNOs have a licence obligation to manage networks to meet the requirements of Electricity Networks Association Engineering Recommendation for Security of Supply P2. This specifies the expected capability of the network to meet demands under defined outage conditions.

4.31 In order to prevent situations where the standard cannot be met, network reinforcement work is carried out in advance of networks becoming 'non-compliant'. However, there may be situations where demand increases occur more rapidly than forecast or where there are delays to reinforcement work.

4.32 Where networks become overloaded to the extent that the requirements of P2 cannot be met, the requirement for temporary relief from the licence obligation is identified. These temporary exemptions are referred to as derogations.

4.33 Derogations must be submitted to Ofgem and an action plan developed to achieve compliance.

4.34 At the close of 2022/23, there are no Ofgem derogations to standard P2.

P2 derogations

	West Midlands	East Midlands	South Wales	South West	NGED Total
Ofgem derogations	0	0	0	0	0
Self-derogations	0	0	0	0	0

Using technology to locate faults before they occur

4.35 During 2016/17, NGED purchased new fault location equipment that allows the location of faults to be identified before they become an issue. The equipment can monitor transient faults (recurrent, non-permanent faults), collecting data that provides a location of where the problem could be. This allows a proactive approach to be adopted so that a transient issue is removed before it becomes a permanent fault.

4.36 We continued to invest in this equipment and smart devices are installed on intermittent faults where fuses operate. The benefit of installing the devices is measured by considering the number of customer interruptions that have been avoided as a result of installation.

4.37 There are currently a total of 1,494 low voltage reclosing units deployed across the four licence areas. During 2022/23, these units have operated 2,103 times, which benefited approximately 41,860 customers, and avoided the need to dispatch resources to restore supplies following a permanent fault. We continue to explore the possibilities of these devices and potential future development.

Completing routine tree clearance programmes

4.38 Trees can cause interruptions by falling into overhead lines or by branches coming into contact with equipment.

4.39 Routine tree cutting is carried out on a cyclical basis to provide clearance from equipment as detailed within Industry Standard ENA TS 43-8. This prevents tree related faults and keeps the public safe.

4.40 This routine clearance is supplemented by a separate resilience clearance programme which focusses on the potential damage that can be caused by trees in strong winds.

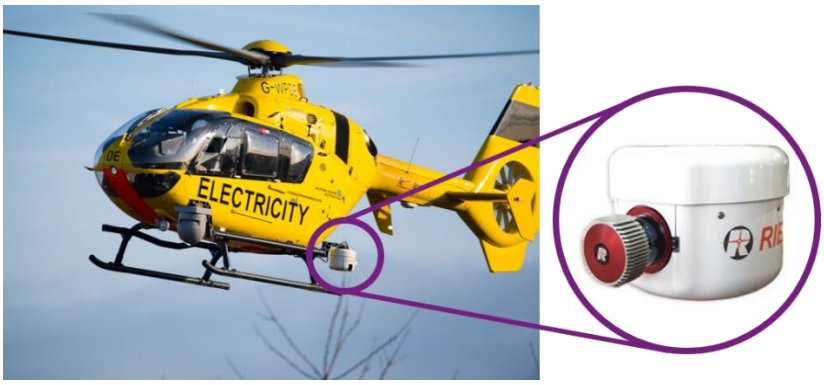
4.41 For routine clearance, spans of overhead lines are inspected and will either be declared clear of tree proximity or cutting will be undertaken to achieve the required clearance distances. The volume of clearance will vary across licence areas depending on the size of the network, the nature of the network i.e. whether it is largely urban or rural, and tree population density.

4.42 During 2022/23 the following volumes of spans were cut.

Routine tree cutting (number of spans cut) in 2022/23

	West Midlands	East Midlands	South Wales	South West	NGED Total
LV (spans)	18,502	12,163	6,111	14,337	51,113
HV (spans)	23,870	14,456	14,045	10,949	63,320
EHV (spans)	225	41	360	5	631
132kV (spans)	676	429	482	509	2,096

4.43 We continue to invest in technology to improve network reliability. We have invested in LiDAR (light detection and ranging) technology to enhance our vegetation management capabilities. LiDAR systems fitted to each NGED helicopter are capable of measuring the distance to multiple targets including conductor and vegetation by illuminating with a pulsed laser light and measuring the reflected pulses with a sensor. This allows more accurate identification of where trees are close to overhead lines and better targeting of clearance work. By having more effective processes we aim to reduce tree related faults.



4.44 The first scanning programme began in September 2020 and analysis of the resulting data is allowing us to operate a more effective vegetation management programme by prioritising spans of highest risk.

4.45 Effective tree clearance assists in the reduction of tree related faults and within RIIO-ED1, NGED targeted an overall 20% reduction in both high voltage (HV) and low voltage (LV) tree related faults. At LV, the 20% improvement was targeted in each licence area. At HV, a 37% improvement in tree related faults was targeted in West Midlands which would lead to an overall NGED improvement of 20%.

HV tree related faults

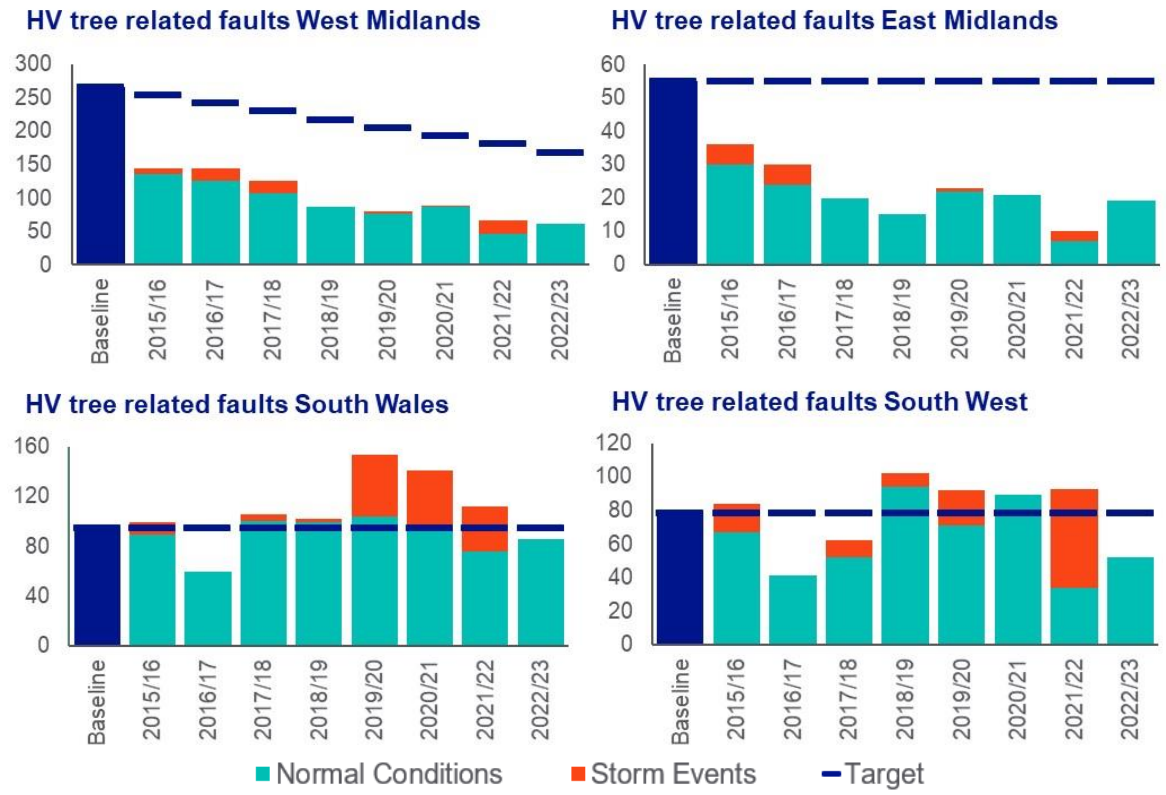
4.46 Performance in 2022/23 shows a 56% improvement in the number of HV tree related faults for NGED as a whole compared to our baseline performance; the performance for each licence area against target can be seen below.

HV tree related fault targets

	West Midlands	East Midlands	South Wales	South West	NGED Total
Underlying performance (4 year average from 2009/10 to 2012/13)	226	55	94	78	493
Target - end RIIO-ED1	168	55	94	78	395
Percentage improvement - target	37%	0%	0%	0%	20%

HV tree related fault actual

	West Midlands	East Midlands	South Wales	South West	NGED Total
Underlying performance (4 year average from 2009/10 to 2012/13)	226	55	94	78	493
2022/23 performance – end RIIO-ED1	61	19	86	52	218
Percentage improvement - actual	77%	65%	9%	33%	56%



4.47 Performance in the West Midlands and East Midlands licence areas shows a significant improvement during RIIO-ED1. Performance in South Wales and South West generally beats the targets when normal conditions are considered, but storms have caused performance to exceed the targets in a number of years.

LV tree related faults

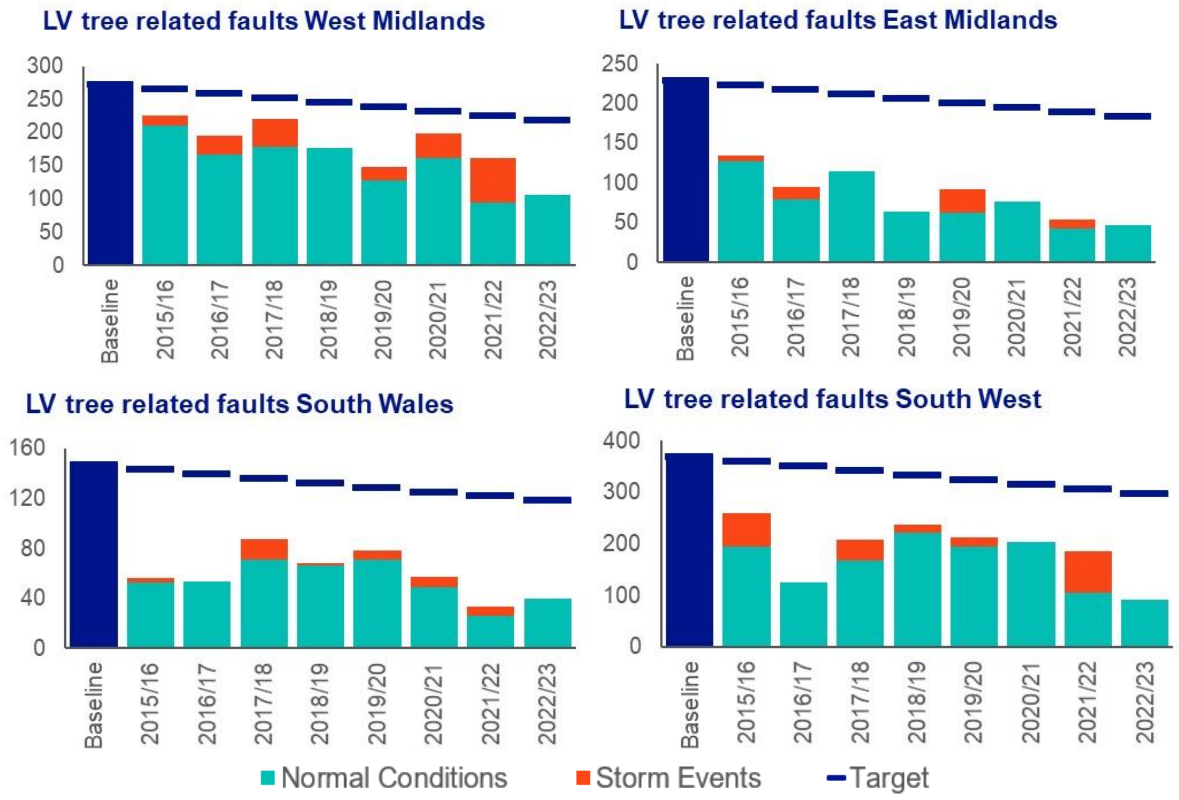
4.48 Performance during 2022/23 shows a 72% improvement in the number of LV tree related faults for NGED as a whole; the performance for each licence area against target can be seen below.

LV tree related fault targets

	West Midlands	East Midlands	South Wales	South West	NGED Total
Underlying performance (4 year average from 2009/10 to 2012/13)	272	229	147	369	1,017
Target - end RIIO-ED1	218	184	118	297	817
Percentage improvement target	20%	20%	20%	20%	20%

LV tree related fault actual

	West Midlands	East Midlands	South Wales	South West	NGED Total
Underlying performance (4 year average from 2009/10 to 2012/13)	272	229	147	369	1,017
2022/23 performance – end RIIO-ED1	107	47	40	92	286
Percentage improvement - actual	61%	79%	73%	75%	72%



4.49 All licence areas have beaten the end of RIIO-ED1 target as well as beating the targets every year during the price control.

Reducing the number of customers affected by power cuts

4.50 As well as taking preventative steps to limit the number of faults, NGED has installed technology that aims to reduce the number of customers affected when a fault occurs.

Network automation

4.51 Reductions in the number of customers affected by HV faults are achieved by subdividing the network into smaller protection zones so that fewer customers go off supply and by increasing the amount of network automation to quickly re-route and restore power.

4.52 The subdivision of the network is achieved by installing additional equipment which protects the network, such as circuit breakers and intelligent fuses.

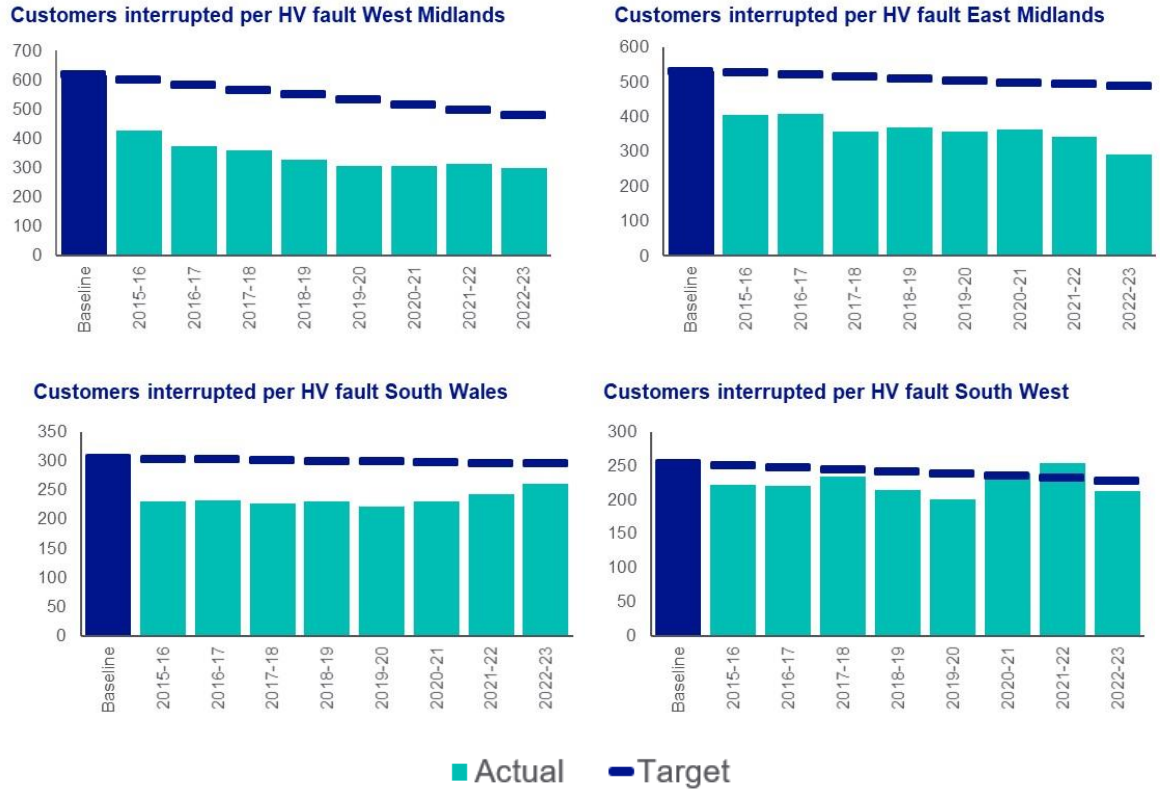
4.53 The use of remote control allows electricity supplies to be quickly rerouted or 'switched' without the need to send a person to site. These switching operations can be initiated by staff in our control centre or automatically by computer algorithms. The algorithms use information from fault passage sensors to indicate which section of the network contains the fault and then communicate with remotely controlled devices to restore supplies to the maximum number of customers possible in less than three minutes.

4.54 The application of this technology results in an improvement in the average number of customers affected by faults. The table below shows performance in 2022/23.

Average number of customers interrupted per unplanned HV incident

	West Midlands	East Midlands	South Wales	South West
Benchmark performance (five year average 2008/09 to 2012/13)	617	531	304	253
Target performance – end of RIIO-ED1	480	487	295	228
2022/23 performance – end of RIIO-ED1	299	291	261	213

4.55 All of our licence areas have achieved our overall target for the end of RIIO-ED1.



Reducing the time it takes to restore supplies

4.56 NGED has a clear focus on restoring supplies quickly.

Managerial focus

4.57 NGED promotes a culture which prioritises getting customers back on supply.

4.58 Clear management focus on speedy restoration of electricity supplies in the event of a fault has led to significant improvements in performance over a number of years. This has been supported by initiatives such as Target 60.

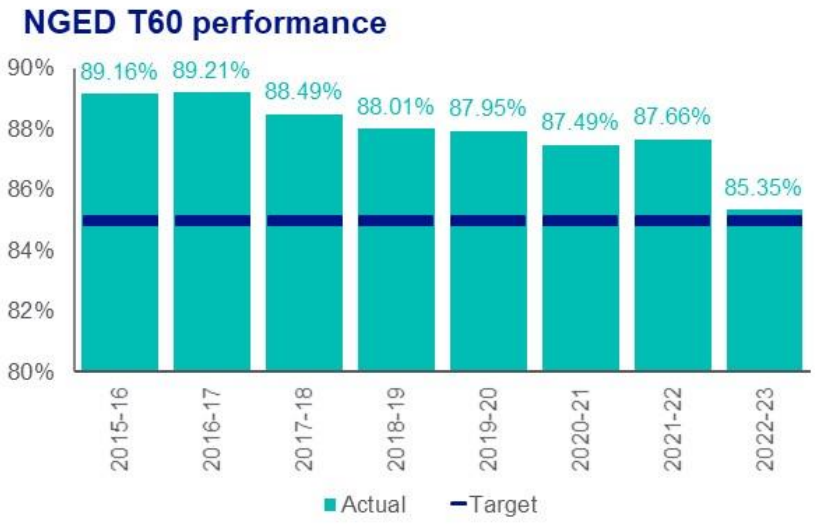
Output (12) Make sure that at least 85% of customers have their power restored within an hour of a high voltage fault happening.

4.59 An internal initiative called 'Target 60' measures the percentage of customers who are restored within one hour of when a high voltage (HV) fault occurs. During RIIO-ED1 NGED committed to achieving a Target 60 performance that exceeds 85%. The following table shows NGED overall performance has exceeded this target in 2022/23.

Target 60 - restoration within one hour of an HV fault (% of customers)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Performance 2022/23	85.54%	84.05%	88.61%	84.28%	85.35%

4.60 This result continues our track record of outperformance against the target as shown below, albeit that there has been a reduced performance compared to previous years.



4.61 Where Target 60 is not achieved for an individual incident, the local Team Manager investigates why and produces a report to identify the factors that contributed to failure. This report is escalated to senior managers so that learning points can be considered. In this way we continuously identify opportunities to improve performance.

Guaranteed Standards of Performance (GSOPs)

4.62 Statutory regulations set guaranteed standards of performance that DNOs must meet in relation to network reliability. Customers are entitled to payments where DNOs fail to meet the standards.

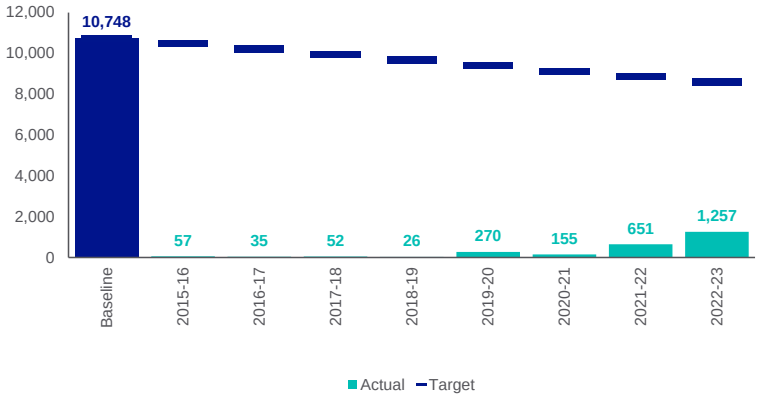
Output (13) Reduce by 20% the number of customers experiencing a power cut which lasts for 12 hours or more.

4.63 GSOP Electricity Guaranteed Standard (EGS2) requires DNOs to restore customer supplies within 12 hours of an outage in normal weather. This is an enhancement to the previous requirement of 18 hours; a change which was introduced from the start of RIIO-ED1.

4.64 As part of the RIIO-ED1 Business Plan, targets were set with reference to a baseline performance in 2012/13 and NGED committed to reduce by 20% the number of customers experiencing interruptions lasting 12 hours or more.

4.65 Subsequently we have placed a greater focus on this and actual performance has surpassed these targets, with the number of customers experiencing interruptions lasting 12 hours or more being significantly reduced compared to the baseline.

Interruptions lasting 12 hours or more subject to GSOP payments



4.66 The process for calculating the length of an outage allows exemptions in certain circumstances – for example where there is no access to the customer property or where the customer themselves requests a delay in the works required to restore supplies. Where an exemption is applied and the clock is stopped, the DNO is not required to make a GSOP payment to the customer if the 12 hour standard is not met. In January 2019, Ofgem clarified where exemptions could be applied and therefore performance since 2019/20 has been based upon the revised guidance. In the table below we have shown the targets with exemptions applied and performance both with and without exemptions for 2022/23.

Customers affected by interruptions lasting 12 hours or more

	West Midlands	East Midlands	South Wales	South West	NGED Total
Reference performance in 2012/13 (after exemptions applied).	5,080	3,367	272	2,029	10,748
Target performance - end of RIIO-ED1 (after exemptions applied)	4,064	2,694	218	1,623	8,599
2022/23 performance (total after exemptions – GSOP payments made)	126	615	26	490	1,257
2022/23 performance (total before exemptions)	257	615	52	543	1,467

Output (14) Achieve no failures on all other GSOPs.

4.67 In addition to the restoration of supplies in normal weather, The Electricity (Standards of Performance) Regulations 2015 also specify a range of other requirements. Detailed information on these guaranteed standards can be found on our website.

nationalgrid.co.uk/customers-and-community/guaranteed-standards

4.68 NGED has set itself a tough target to have zero failures against all the other guaranteed standards.

4.69 During 2022/23 there were only 70 failures across other categories, with most being associated with non-notification of planned interruptions and missed payments.

Guaranteed Standards of Performance failures in 2022/23 (excluding restoration of supply within 12 hours)

	West Midlands	East Midlands	South Wales	South West	NGED
Main fuse failure	3	0	0	1	4
Multiple interruptions	6	0	0	2	8
Major incident	0	0	0	0	0
Rota disconnection	0	0	0	0	0
Planned interruptions	1	9	18	8	36
Voltage enquiries	0	0	0	0	0
Missed appointments	1	1	0	0	2
Missed payments	2	0	0	18	20
Storm supply restoration	0	0	0	0	0

4.70 As promised in the RIIO-ED1 Business Plan, NGED has voluntarily doubled the value of payments for failures against guaranteed standards to provide additional recompense where service has failed to meet minimum expectations.

Making improvements for worst served customers

Output (15) Reduce by 20% the number of customers classified as worst served.

4.71 Within RIIO-ED1, Ofgem has defined worst served customers as those that experience 12 or more higher voltage interruptions over a three year period (with a minimum of three interruptions experienced in each year of the three year period).

4.72 Improvements for worst served customers aim to reduce the number of interruptions for customers who experience an unusually poor level of service. Often these customers are connected to remote parts of the network that are predominantly served by overhead lines.

4.73 DNOs have access to funding to improve the reliability of the network for these customers. Recovery of expenditure is dependent on defined improvements in service following the works. NGED engaged with stakeholders to determine the level of improvement required, resulting in a decision to target a 20% improvement in performance for each circuit worked on, with a maximum average spend per customer of £800.

4.74 Targets for the number of worst served customers have been based upon actual worst served customer numbers from 2014/15. The RIIO-ED1 business plan committed to a 20% reduction, which suggested a reduction of 6,812 to 27,246 as shown in the table.

Worst served customer numbers – updated targets

	West Midlands	East Midlands	South Wales	South West	NGED Total
Reference performance in 2014/15	10,723	19	9,701	13,615	34,058
20% reduction	2,145	4	1,940	2,723	6,812
Target performance - end of RIIO-ED1	8,578	15	7,761	10,892	27,246

4.75 The number of worst served customers is significantly lower than the targets set for the end of RIIO-ED1. The following table shows the number of worst served customers in 2022/23

Worst served customer numbers actual

	West Midlands	East Midlands	South Wales	South West	NGED Total
Customers classified as worst served in 2022/23	2,843	192	931	1,325	5,291

4.76 The type of work carried out to make improvements varies depending on fault history and the opportunities available to reduce the number of future faults, but includes solutions such as:

- the installation of additional automated switching so that fewer customers are affected when faults occur;
- the installation of bird flight diverters where birds fly into overhead lines and cause faults;
- changing equipment which is prone to damage in exposed areas with high winds.

4.77 The following table shows the number of worst served customers targeted by the projects carried out during RIIO-ED1, which is more than double the number of customers originally targeted to get improvements.

Worst served customers targeted by projects

	West Midlands	East Midlands	South Wales	South West	NGED Total
Customers targeted for worst served customer work in RIIO-ED1 to date	7,399	1,102	3,652	3,308	15,461

Making our network more resilient

4.78 Resilience refers to the ability of the network to continue to supply electricity during severe weather and to have the capacity to recover from widespread system shutdowns. Network resilience is monitored in three areas.

- Flooding
- Resilience tree cutting
- Black start

4.79 At the request of stakeholders we have also included information on the actions that we take in relation to the security of our network control and information technology systems (also referred to as cyber security).

Output (16) Apply flood defences to 75 substations, reducing the risk of both damage to equipment and power cuts due to flooding.

4.80 Climate change predictions suggest that widespread flooding will become a more regular occurrence. Although flooding can often be limited to relatively small areas of ground, substations often supply customers across much wider areas. Inconvenience can therefore be caused for customers who may not be directly affected by flood water themselves.

4.81 Flood risk is assessed based on the probability that flooding will affect electricity supplies and the number of customers likely to be impacted. Flooding is categorised as either fluvial or pluvial.

- Fluvial flooding – floods related to river or coastal sites.
- Pluvial flooding – floods related to excessive rainwater (flash flooding).

4.82 Data provided by the Environment Agency has been used to identify substation sites that are at risk of fluvial flooding and during RIIO-ED1 NGED committed to installing flood defences at 27 sites. We have carried out work for fluvial flooding at 36 sites, nine more than planned, as shown in the table below.

RIIO-ED1 Fluvial flood defences (sites)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Target sites at risk of fluvial flooding	0	14	12	1	27
Flood defences installed	6	19	6	5	36

4.83 At the time of developing the RIIO-ED1 Business Plan there was no data available on pluvial flooding so it was estimated that 48 sites would require flood defences. Subsequently, Environment Agency data has been used to identify a list of substations at potential risk and local teams have undertaken site surveys to assess risk levels, supplemented by independent, detailed, hydrological surveys. Work undertaken for pluvial sites during RIIO-ED1 is as follows.

RIIO-ED1 Pluvial flood defences (sites)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Target sites at risk of pluvial flooding	13	16	8	11	48
Flood defences installed	10	11	19	10	50

4.84 In total, we have exceeded our target of 75 sites and applied flood defences to 86 locations during RIIO-ED1.

Output (17)	Speed up the programme of tree clearance (specifically related to storm resilience) by 40%, with the aim of clearing 700km of overhead lines per year (delivering the programme five years earlier than suggested by Government guidelines).	✓

4.85 The resilience of overhead lines to storms is determined by how well they can withstand severe weather. Overhead line fault rates are influenced by the following:

- The condition of overhead lines;
- The design strength of overhead lines;
- Routine tree clearance;
- Resilience tree clearance;
- Weather conditions.

4.86 During RIIO-ED1, NGED proposed to increase the amount of resilience tree work to improve overhead line resilience.

Resilience tree clearance

4.87 Severe storms can cause network faults and lead to interruptions in supply for large numbers of customers. In particular strong winds can lead to overhead lines being damaged by trees.

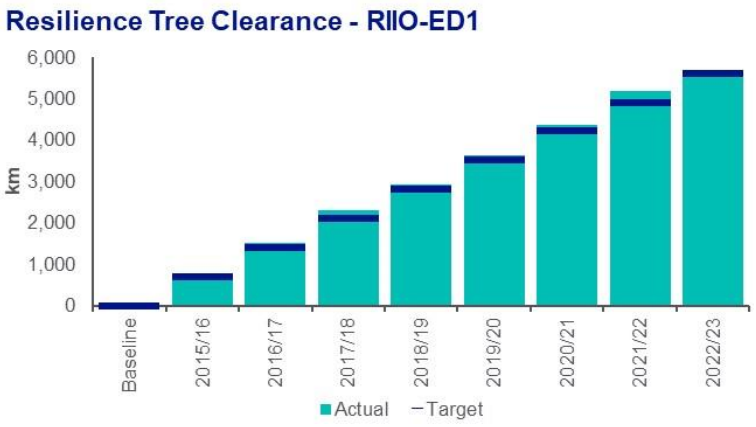
4.88 Following storms in October 2002, legislation was changed to require DNOs to clear trees from strategic overhead lines to a resilient standard to prevent damage should a tree be blown over. The resilience standard requires a greater distance between trees and overhead lines compared to clearance distances required for routine tree clearance. The government's impact assessment considered making 20% of the network resilient within 25 years.

4.89 In preparation of the RIIO-ED1 Business Plan, stakeholder engagement showed strong support for additional clearance work and NGED has therefore committed to increasing the amount of resilience tree clearance by 40% to complete the 25 year programme five years earlier than originally planned. Our performance during RIIO-ED1 to date is shown below.

Tree clearance – resilience cutting

	West Midlands	East Midlands	South Wales	South West	NGED Total
Target for RIIO-ED1 (km)	1,448	1,296	1,192	1,688	5,624
Actual – RIIO-ED1 to date (km)	1,372	1,406	1,113	1,714	5,605
Percentage of programme complete	95%	109%	93%	102%	**100%**

4.90 We have reached our target by continuing to carry out the programme for the whole of RIIO-ED1 as demonstrated below.



Output (18)	Improve substation battery life to last for 72 hours if there is a major, network-wide power loss.

4.91 Although they are extremely rare, a number of blackouts across the world (prior to the start of RIIO-ED1 in the USA, Europe and across India) highlighted that very widespread supply interruptions can occur. Events can be triggered by a coincidence of circumstances, which due to network running arrangements cause disconnection of customers to cascade as each alternative network reacts to the situation. Recovery from the blackout - a 'Black Start' - can take a number of days as generation stations return online and network loads are balanced with the output of generation.

4.92 The electricity industry has developed a standard which requires major substations to have the resilience to enable safe re-energisation following either a full or partial shutdown of the electricity network lasting up to 72 hours. The main consideration is the length of time that battery systems will last – this includes protection, SCADA and telecommunication system batteries.

4.93 During RIIO-ED1 NGED has committed to making all substation battery systems at major substations and associated communications infrastructure resilient to the 72 hour standard. This has been achieved, but the numbers carried out vary slightly to the original forecast volumes.

Protection batteries

4.94 To make protection batteries resilient to 72 hours we install load disconnection schemes which, in the event of a prolonged loss of power to the substation, will disconnect the battery load to prevent battery drainage. The targets and actual volumes are shown below.

Resilience of protection batteries

	West Midlands	East Midlands	South Wales	South West	NGED Total
RIIO-ED1 target (includes both EHV and 132kV protection batteries)	240	621	236	366	1,463
Protection batteries made resilient during RIIO-ED1	238	591	233	375	1,437

SCADA batteries

4.95 SCADA battery arrangements have been reviewed on a site by site basis to determine the most efficient method to achieve resilience; this could be by replacing batteries or enhancing capacity depending on other work requirements at the sites. During RIIO-ED1 we have declared 1,289 batteries resilient to the 72 hour standard.

Resilience of SCADA batteries

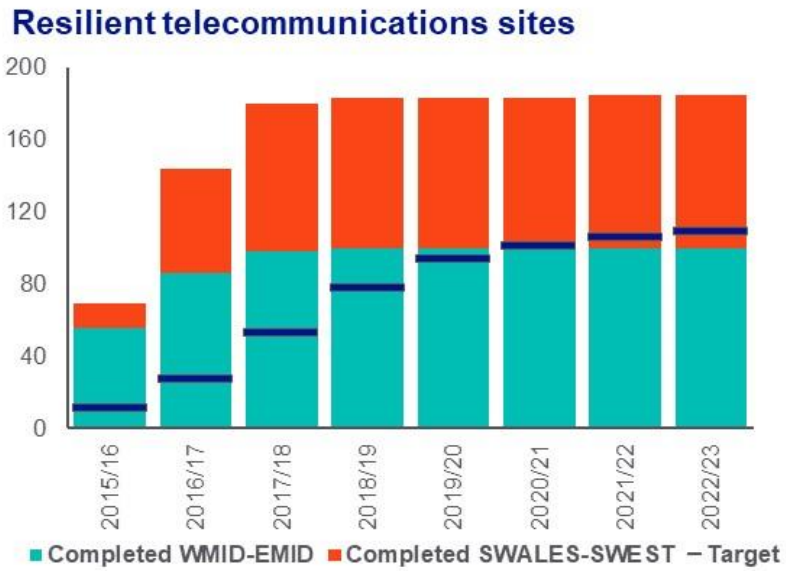
	West Midlands	East Midlands	South Wales	South West	NGED Total
RIIO-ED1 target (includes both EHV and 132kV protection batteries)	254	586	190	403	1,433
SCADA batteries made resilient during RIIO-ED1	229	592	95	373	1,289

Telecommunication sites

4.96 Alongside substation battery resilience, the resilience of key telecommunications systems is required for successful recovery from a Black Start event. During RIIO-ED1 NGED targeted the upgrading of systems at 109 telecommunications sites in West Midlands and East Midlands by either installing additional battery capacity or on-site generation

4.97 During the course of 2015/16 additional work was also identified at sites in South Wales and the South West.

4.98 We have upgraded 100 sites in the East Midlands and West Midlands along with an additional 85 sites in the South West and South Wales.



* Sites completed for South Wales and the South West are additional as they were not part of the original targets in our RIIO-ED1 Business Plan.

4.99 Performance in each licence area is detailed below.

Resilience of telecommunication sites

	West Midlands	East Midlands	South Wales	South West	NGED Total
Sites identified as part of the RIIO-ED1 Business Plan	43	66	0	0	109
Sites made resilient during RIIO-ED1	45	55	50	35	185

Non-operational sites

4.100 In advance of RIIO-ED1, resilience work was undertaken to upgrade generator capacity at 18 non-operational sites (e.g. offices that would be used to co-ordinate resources during a black start). No further requirements have been identified for non-operational sites.

Cyber security – maintaining the resilience of our network and information systems

4.101 The control and information systems that we use play a vital role in the operation of our network and the disruption of these systems could cause power failures. Systems could be a target for malicious cyber-attacks and our resilience to such actions is therefore important in our efforts to maintain network performance and security of supply.

4.102 The term cyber security describes the technology, processes and controls that can be put in place to protect systems against such attacks.

4.103 We take the protection of our assets and systems very seriously. This means that we design and protect our systems to defend against attacks and have robust policies and procedures in place to ensure that we do not put these systems at risk when carrying out our operations.

4.104 Cyber security risks are changing as the industry increasingly adopts digital technology and becomes more reliant on IT and telecommunications for data acquisition, monitoring and control of the network.

4.105 The government recognises the need to ensure the security of network and information systems across the UK and in May 2018 introduced the Network and Information Systems (NIS) Regulations. The NIS regulations are designed to achieve a high, common level of network and information systems security across the UK. The legislation requires NGED to demonstrate active cyber security risk management, report incidents that disrupt energy supply and take action to rectify those incidents. A significant amount of work has been completed to-date in ensuring NGED's compliance with the NIS 'Basic Profile'.

4.106 NGED works closely with government departments (including the National Cyber Security Centre) and other energy companies to share information that ensures the company is aware of and can react to the latest issues for threats.

4.107 Since the introduction of the NIS regulations we have:

- Set-up and expanded a dedicated Cyber Security team within NGED to cover Monitoring, Incident Response, Engineering, Training & Awareness, Vulnerability Management, Risk & Policy, Governance and Penetration Testing to cover IT & Operational Technology (OT) environments.
- Implemented a holistic risk management framework for our IT/OT environments.
- Introduced a Security Information and Event Management (SIEM) system for monitoring and analytics.
- Implemented a scheduled system penetration testing programme to identify system vulnerabilities.
- Instigated end user cyber security awareness programmes.

4.108 Work in year 8 of RIIO-ED1 has focused on further maturing our IT cyber security systems and processes and has included:

- Improved physical security at NGED's data centres.
- Implementation of Multi Factor Authentication (MFA) for end user computing.
- Introduction of supply chain cyber security guidance and controls.
- Implementation of IT asset management systems and end point security tools.
- Independent external audits to review our cyber security management system in order to identify and mitigate ongoing threats and vulnerabilities.
- Increased monitoring capabilities for IT and OT systems including alerting and response capabilities, threat intelligence and vulnerability management.

Environment

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23
31 October 2023

Electricity Distribution

nationalgrid

Environment

Contents

5 Environment

5.1 Business Plan commitments for the environment cover two distinct areas: facilitation of a move to a low carbon economy and a reduction of the impact of NGED's activities on the environment.

5.2 Environment outputs are in five themes.

- Facilitating increased volumes of low carbon technologies (LCTs).
- Reducing technical network losses.
- Reducing the carbon footprint of the business.
- Reducing the environmental risk of leaks from equipment.
- Improving visual amenity in National Parks and Areas of Outstanding Natural Beauty (AONBs).

5.3 Changes to the way that electricity is generated and consumed requires electricity networks to adapt for the challenges of a low carbon future. As a result we are reporting on additional areas of work that have become integral to our business and the delivery of our RIIO-ED1 Business Plan. These are detailed in a section called 'Developments in the Energy System'.

Regulatory framework

5.4 Environmental impacts caused by DNO activities are not financially incentivised; instead they are reliant on a reputational system of league tables to demonstrate the effectiveness of the management of environmental issues.

5.5 Ofgem has placed a licence obligation on DNOs to reduce losses where it is cost effective to do so. In addition in RIIO-ED1, Ofgem introduced a discretionary reward incentive mechanism to encourage DNOs to develop and adopt innovative ways of reducing losses.

5.6 DNOs have a requirement to produce and publish an annual Environment Report which details the activities carried out in relation to environmental matters and facilitating the low carbon transition. The report compliments the content of this section and can be found on the NGED website at the following link:

nationalgrid.co.uk/customers-and-community/environment

Some of the performance comparisons may be different in the Environment Report because it compares current performance to 2014/15 performance, in line with specified reporting requirements. This may be different to some of the comparisons shown in this report, which uses different baseline references that were specified within the RIIO-ED1 business plan. In the following sections the baseline year/s for comparison are clearly stated.

Green Recovery

5.7 In 2020/21 we worked alongside the ENA, Ofgem and the industry, to draw up plans to unlock early investments in our network to support the Government's transition to net zero.

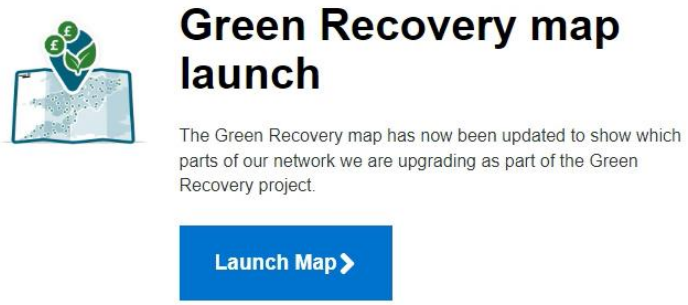
5.8 We proposed investment in over 70 Green Recovery projects, which were in addition to the original RIIO-ED1 plan. The projects enable us to upgrade and build new electrical infrastructure and substations, unlocking network capacity, benefitting a large number of potential distribution generation connections across our licence areas.

5.9 The 'recovery' aspect of these projects was intended to support the wider economic recovery following the Covid-19 lockdown. The provision of additional network capacity enables the industries that rely on having network capacity to 'recover'. By focussing on the parts of the network that support net zero, the projects were described as being 'green'. Hence 'Green Recovery'.

5.10 In February 2021 we launched our Green Recovery map which shows the parts of the network proposed to have an upgrade as part of our Green Recovery projects.

5.11 During the course of RIIO-ED1 we have completed 43 schemes and continue to work on 16 schemes. This is at a cost of £34.4million.

5.12 More information relating to Green Recovery can be found on our website at the following link: www.nationalgrid.co.uk/green-recovery



Overview of environmental outputs

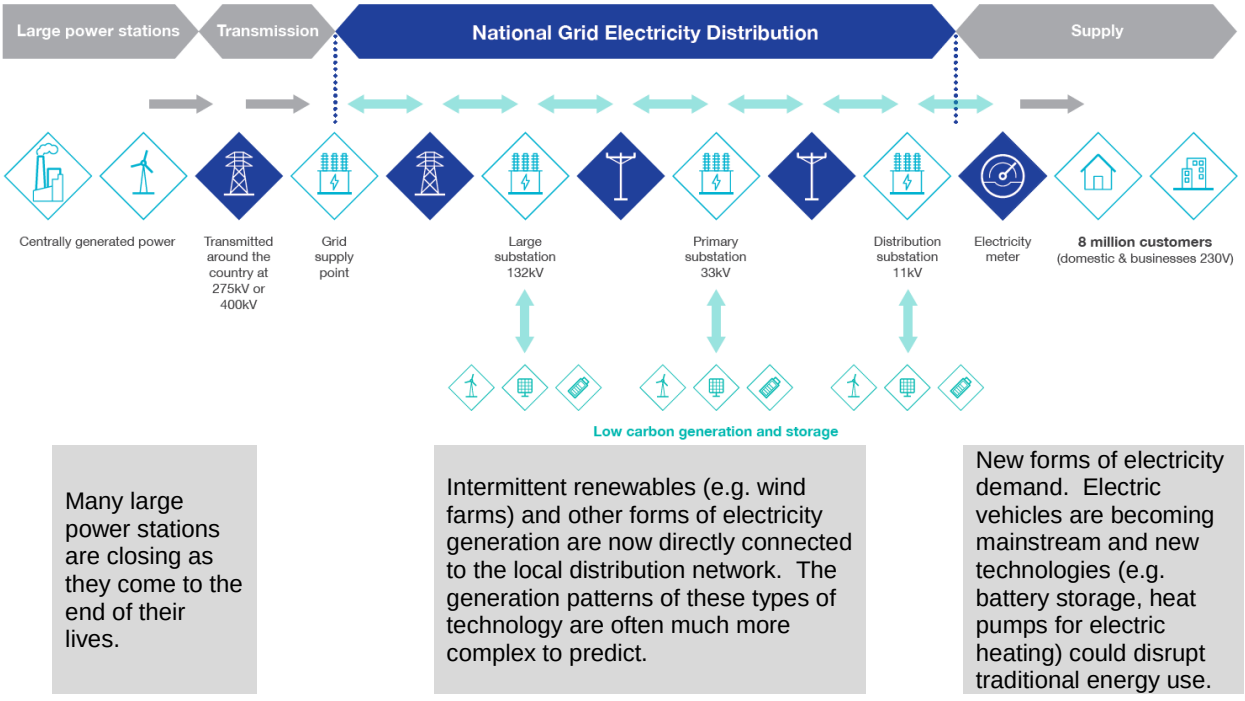
Make it possible for more people to use low carbon technologies (LCTs)		
19	Improve by 20% the time taken to provide a response to customers who want to use LCTs.*	We are continuing to see a rapid increase in the number of LCT enquiries we receive but new systems put in place during 2022/23 have enabled us to reduce our response time to 0.69 days, a 76% reduction from our benchmark performance.
20	Identify LCT hotspots using information from smart meters, expert organisations and local authorities, and use this information when making decisions.	The development of the "Network Investment Forecast Tool" has enabled us to add predicted LCTs to our LV network and highlight areas that will reach capacity.
21	Selectively replace assets using larger assets in areas where more LCTs may be connected to our network.	We carried out 87 projects using larger assets, as a result of using information about LCT hotspots. This is a 207% increase from last year's activities.
22	Reduce costs for future customers by developing smart solutions to provide alternative and innovative techniques for managing our network.	We had a wide range of innovation projects in progress during the year.
23	Provide additional network capacity by using traditional or 'smart' methods.	We have continued to develop the Flexible Power brand and now have 294 substations using flexibility
Reduce technical network losses		
24	Install oversized transformers when replacing assets in areas where demand for power may become higher than equipment can cope with.	We installed 56 oversized transformers, a 266% increase on last year's performance
25	Use larger cables when installing new network in LCT hotspots.	We installed 6.6km of larger cable in LCT hotspots.
Reduce the carbon footprint of the business		
26	Make sure all replacement vehicles have lower CO_2 emissions than those they are replacing.	NGED operational vehicle emissions have reduced by 11% compared to 2012/13. This has included reduced emissions from both NGED and contractor vehicles.
27	Make sure all new or substantially refurbished buildings meet, as a minimum, the 'excellent' standard under the Building Research Establishment Environmental Assessment Method (BREEAM).**	During 2022/23 NGED applied for BREEAM certification for a new building in Ludlow, we are waiting for the decision and we are still awaiting the results of an application from 2020/21 for refurbishment works at one site.
28	Reduce the amount of waste sent to landfill by 20% over the first two years of RIIO-ED1 and 5% per year after this.	We have seen a reduction of 37% in the amount of waste sent to landfill, and we have achieved our target for the whole of RIIO-ED1.
29	Reduce our carbon footprint by 5%.*	Our business carbon footprint has reduced by 36% compared with 2012/13.
Reduce the environmental risk of leaks from equipment		
30	Reduce by 75% the amount of oil lost through leaks from oil-filled cables.*	The volume of oil leaked from fluid filled cables fallen by 45%, while we have missed our ambitious target in this area we continue our efforts to repair leaks quickly and replace these assets to reduce the amount of oil leakage.
31	Reduce by 17% the amount of SF6 gas that is lost from switchgear.*	The amount of SF_6 gas lost as a percentage of the total amount of SF_6 used on our network has reduced from 0.47% in 2015/16 to 0.14% in 2022/23 for the whole of our area.
32	Install effective oil containment 'bunds' around plant containing high volumes of oil.*	We have completed work on 237 new and refurbished bunds so far in RIIO-ED1, going further than our forecast of 104 bunds.
Improve the appearance in National Parks and Areas of Outstanding Natural Beauty (AONBs)		
33	Replace 55km of overhead lines in National Parks and AONBs with underground cables.*	In RIIO-ED1, we have replaced 39.5km of overhead lines with underground cables for visual amenity in AONBs.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Developments in the energy system

5.13 The way in which electricity is generated has changed significantly over the last few years with more generators being connected to the distribution network. In addition the way electricity is consumed is changing with continued growth of electric vehicles and the use of heat pumps for domestic heating. There are also emerging technologies such as large scale battery storage which can store the excess energy being produced and release it back to the network at times of high demand. As a result DNOs have the challenge of managing different power flows across the distribution network. This requires the evolution of systems and processes for forecasting demand and managing the network.

5.14 The changes are summarised in the diagram below.



Our DSO Strategy

5.15 To meet the future energy needs of our customers, NGED has established a Distribution System Operator (DSO) function and established processes to operate the network more flexibly, forecasting supply and demand in more detail and avoiding, where possible, the need for costly conventional reinforcement of the network by contracting for flexibility services from distributed energy resources and locally managing generation output, load and power flows.

5.16 We are also beginning to facilitate better, whole system, outcomes by ensuring customers can provide services up to the transmission system operator, which may avoid the need for transmission reinforcement.

5.17 The implementation of our DSO strategy will affect the entire network, utilising a mixture of hardware enablers and process enhancements to deliver outputs as customer need dictates.

5.18 Our DSO strategy can be found at the link below.

nationalgrid.co.uk/dso/dso-strategy

Our actions during 2022/23 to implement our DSO plan

5.19 NGED has maintained a strong focus on developing the governance arrangements surrounding our DSO functions, working with stakeholders to identify and address potential conflicts of interest. These have led to a number of mechanisms being put in place to assure the credibility of the decisions of the DSO function.

5.20 During 2022/23 we carried out a range of actions including:

- Continued procurement and operation of flexibility services. We procured an additional 154.2MW of flexibility services with total available contracted flexibility now at 572MW. In the year we dispatched over 1.7GWh of flexibility services.
- Enhancing the routes to market for flexibility service providers to increase participation. We engaged with flexibility service providers to make changes to our procurement routes to remove barriers and increase the accessibility of our services.
- Continuing to support the Open Networks project to develop common processes and standardise service terms across DNOs and the ESO for Primacy, Pre-qualification and Settlement.
- Building on the solutions identified through our Regional Development Programmes with the Electricity Systems Operator (ESO) to form more links between our respective control rooms and develop joint thinking.

Flexibility

5.21 Electricity networks require network capacity to be sufficient for the loads on the network. As demand increases, more capacity is required. The traditional approach to providing additional capacity has been to reinforce the network by installing larger capacity assets or additional assets.

5.22 NGED has been at the forefront of adopting flexibility services which use lower cost alternatives to capital investment. The flexibility services manage the power flowing through the network by establishing agreements with customers such as generators to increase or curtail output or demand customers to reduce loads, in response to network constraints.

5.23 This has required NGED to establish and facilitate new markets for customers to provide flexibility solutions. This is a key objective of NGED's DSO strategy.

5.24 During RIIO-ED1 our approach to reinforcing the network has changed and we have committed to assessing our load related reinforcement investment for more economic delivery by flexibility services. We have adopted a 'Flexibility First' approach which explores the potential use of flexibility services ahead of carrying out more costly capital investments.

Signposting

5.25 We publish 'signposting' information describing constraints that may trigger significant load related reinforcement. This signposting directs flexibility providers to the different distribution network needs that may develop.

5.26 We provide a Network Flexibility Map to display where NGED's network is currently seeking flexibility, or is likely to do so in the future.

5.27 Further information on signposting can be found at the following link.

nationalgrid.co.uk/network-flexibility-map

Flexible Power

5.28 During RIIO-ED1 we launched 'Flexible Power' to deliver the procurement of demand response services – putting in place commercial agreements with customers who can reduce their load under the instruction of the DNO. This enables NGED to accommodate increasing demand for electricity whilst managing the requirement to reinforce the network. Four other DNOs have adopted our Flexible Power platform.

5.29 In 2022/23 we have continued to see the development of Flexible Power. We have procured an additional 154.2MW of flexibility services with total available contracted flexibility now at 572MW. In the year we dispatched over 1.7GWh of services.

Flexible Generation Connections

5.30 Standard generation connections allow customers to export up to the full rated capacity in their connection agreement at all times of normal network operation. The customer is free to use the capacity assigned to their generator at any level they choose. These agreements require the network to have the capacity available, even if it is not being used.

5.31 There are parts of the network where high volumes of connected distributed generation lead to insufficient capacity available to provide further generators with standard generation connection agreements without undertaking costly and time consuming network reinforcement. Flexible connections were developed through our innovation programme and provide a lower cost alternative.

5.32 Flexible connection agreements contain some form of curtailment arrangement on the customer. There are two main types of flexible connections, load managed and timed, which are detailed in the following table.

Flexible connection offers

Load Managed Connections			Timed Connections
Active Network Management (ANM)	**Intertrip Connections**	**Export/Import Limited**	**Timed/Profiled Connections**
This solution is the most complex and is used mostly with larger new connections. Zones of the network have been enabled to allow control systems to automatically manage the output of generators, constraining output at times when the network capacity is limited.	Remote control or 'intertrip' technology is used to constrain generator output when certain network conditions are identified.	Requires customers to cap their import from or export to the network; allows customers to connect renewable generation or storage whilst protecting the distribution network.	Output is permitted during specific time periods when historical data analysis shows that the network would not be adversely affected.

5.33 The implementation of ANM requires changes to be made to control systems. The rollout of ANM has been prioritised on higher voltage networks where benefits are most likely to be seen. Since 2020 any area of our network can be triggered for ANM if the conventional reinforcement cost is greater than £600k. So in effect all areas are now available for ANM where it is needed. The majority of flexible connections have been for the connection of generation, however the principles of flexible connections can also be used for demand connections and storage.

Distribution Future Energy Scenarios (DFES)

5.34 Understanding the impact of distributed generation and emerging technology growth on the network will be an ongoing requirement. We have therefore worked with environmental consultants Regen to inform strategic network planning and investment. This work has considered future energy scenarios, which are aligned to those used by the Transmission Electricity System Operator (ESO), to forecast volumes of low carbon technologies and the energy resources that may be connected to the network in the future.

5.35 The scenario projections are mapped geographically to our network to derive a regionally specific outlook. NGED has been publishing DFES reports since 2016 and they are available across all four licence areas.

5.36 To provide more up to date regional information to our stakeholders, NGED has now moved to an annual cycle of DFES publications where all four licence areas are updated simultaneously and aligned to the latest ESO Future Energy Scenarios.

5.37 We have shared these studies, and the underlying data, with Local Authorities and Local Enterprise partnerships as part of discussions on their regional energy strategies.

Network Development Plan (previously known as Regional Strategic Investment Options Reports)

5.38 As part of Electricity Distribution Standard Licence Condition SLC25B, we publish a Network Development Plan (NDP) to outline how we expect to develop the Extra High Voltage (EHV) networks in over a ten year period. We use the data in the DFES studies to identify where network constraints will arise and when investment in additional network capacity is required. Any constraints identified are evaluated using the Distribution Network Options Assessment (DNOA), which outlines the optimal investment pathway to take, which includes both flexibility solution and capital network investment.

5.39 Network Development Plan reports can be found on our website at the link below.

nationalgrid.co.uk/dso/network-development-plan

Whole system outcomes

5.40 It is important that we work with other parties to identify the optimal and most cost efficient solutions across the energy system.

5.41 The ENA Open Network Project is coordinating activities across all DNOs, the Transmission ESO and Transmission Operators. It has looked at all functions of the DSO including system operation, markets, coordination, planning, flexibility services, etc. This coordination has had a positive impact on ensuring the safe, reliable and economic operation of the distribution and transmission networks as the use and operation of the whole system changes.

5.42 NGED's Whole System Coordination Register demonstrates the processes and activities we have undertaken to coordinate and cooperate with other electricity network licensees and to consider proposals from systems users which seek to advance the efficient and economical operation of our network. It also details NGED's ED2 whole system ambitions and deliverables, the document can be accessed

nationalgrid.co.uk/dso/whole-system-coordination-register

Whole system outcomes – Strategic Connections Group

5.43 NGED has contributed to the Strategic Connection Group (SCG) which is seeking to address the delays being caused by the existing 'first-come, first-served' approach to connections. The SCG is looking at three main themes:

- Distribution Queue Management (QM)
- Transmission and Distribution interface
- Connection and management of electricity storage customers

5.44 The group has developed a number of proposals including:

- Allowing DNOs to manage smaller more agile projects within agreed technical limits at each boundary point with the transmission system. Creating clear and consistent boundary rules between transmission and distribution will help to manage the queue and accelerate customer connections.

- Establishing a coordinated approach to how the queue is managed between transmission and distribution networks where connections are dependent on both transmission and distribution network capacity.

- Moving to a 'first ready, first connected' approach, where customers that reach agreed milestones will be prioritised for connection, where there is no detrimental impact to others ahead of them in the queue.

Whole system outcomes – Regional Development Programmes

5.45 To understand the impact of changes to the whole electricity system we have developed Regional Development Programmes (RDPs). These strategic studies take a whole system approach to ensuring that future capacity requirements across both transmission and distribution networks can be managed.

5.46 RDP2 focused on the South West peninsular and concluded that, due to the likely higher penetrations of renewables in that geographical area, additional capacity for generation was required, however in the short-term, flexibility was the most economical solution. Now the analysis phase is completed, implementation of coordinated flexibility is underway.

5.47 RDP4 looked at the issue of demand constrained networks due to the connection of energy storage, concluding that, although energy storage could potentially increase demand at times of high demand, it was unlikely to do so and that flexibility would be a more economical solution than conventional reinforcement for managing the demand.

5.48 Further information on RDPs can be found on our website at the following link.

nationalgrid.co.uk/dso/regional-development-programmes

The impact of changing demand - electric vehicles

5.49 One example of the changing nature of demand is the growth of battery electric vehicles (EVs).

5.50 Across a year, a typical electric car uses a similar amount of electricity as an average home. Growth in electric vehicles therefore has the potential to significantly alter daily load profiles and increase the amount of power used.

5.51 In anticipation of this large scale change in energy usage NGED has developed an EV strategy document, detailing our plans to support the development of EV charging infrastructure, ensuring that drivers of EVs are able to charge their vehicles in a manner convenient to them.

5.52 We have developed a new packaged substation solution, which allows quicker provision of power to larger scale EV charge point operators.

5.53 Stakeholder feedback in 2022/23 asked us to consider accessible EV charging facilities. We have committed to partner with mobility charities, consumer groups and local authorities to identify needs, outline an implementation plan and conduct a pilot scheme to trial practical ideas.

5.54 Further information on our EV strategy can be found on our website at the following link.

nationalgrid.co.uk/smarter-networks/electric-vehicles

The impact of changing demand – heat pumps

5.55 The growing use of Heat Pumps using electricity is another area which we expect to significantly alter daily load profiles and increase the amount of power used.

5.56 Our Heat Pump strategy outlines our plans to ensure that a suitable electrical system exists for all the heating requirements in all situations.

5.57 The Heat Pump strategy is built on extensive stakeholder engagement and is tailored to the requirements of different types of stakeholders. This includes Local Authorities, who are beginning to take the lead on installing and retro fitting heat pumps in social housing and housing association sites.

5.58 During 2022/23, NGED has continued to work on innovation projects to meet the challenges of growth in Heat Pumps. On the Parc Eirin project, NGED is working in partnership with homebuilders to fit 250 new homes with a full suite of low carbon technology including heat pumps. NGED will monitor the estate to generate demand profiles to inform future load forecasting.

5.59 Further information on the Heat Pump strategy can be found on our website:

National Grid - Low Carbon Heating

Making it possible for more people to use low carbon technologies

Output (19) Improve by 20% the time taken to provide a response to customers who want to use LCTs.

5.60 When a customer wishes to install LCTs they are required to provide technical details of the planned installation to their distribution network operator so that the impact on the network and other customers can be assessed.

5.61 As part of our RIIO-ED1 Business Plan we committed to improving by 20% the time taken to respond to these customer notifications.

5.62 In 2017/18 we introduced reporting to enable us to establish a benchmark and track response time to customers.

5.63 The table below shows the 20% improvement target to be achieved by the end of RIIO-ED1, the intermediate annual targets and our performance.

Time to respond to connect low carbon technologies

	Benchmark performance	2018/19	2019/20	2020/21	2021/22	2022/23
Target for low carbon technology response time (working days)	2.93	2.81	2.69	2.58	2.46	2.34
Performance to date	-	2.83	3.66	4.18	1.70	0.69
Number of notifications received	3,451	8,950	11,264	17,882	42,062	64,240

5.64 During 2022/23 we have seen a 60% reduction in the time it takes to respond to customers compared to 2021/22, in the context of a significant (53%) increase in the volume of notifications we received. Since establishing the benchmark in 2017/18, we have seen a 19x increase in the volumes of enquiries and reduced the time to provide a response from 2.93 days to 0.69 days.

5.65 To achieve these improvements at a time of significant growth in domestic LCT notifications, we developed a new, streamlined connections process for households wishing to connect a heat pump or EV charger. The new process, implemented in 2021, is centralised in order to ensure speed and consistency and allows for connections to be approved on the same/next day with any remedial works taking place following connection. In 2022/23 this service was further developed to have an on-line self-serve option which will generate automated responses.

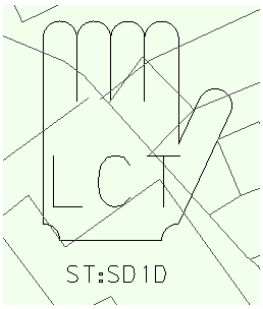
5.66 Larger installations require a more detailed assessment of their potential impact on the network. These are dealt with as connection enquiries and our response time performance is embedded within the timeframes published for connection 'time-to-quote'.

Output (20)	Identify LCT hotspots using information from smart meters, expert organisations and local authorities, and use this information when making decisions.

5.68 LCT hotspots are areas of the network where there is a clustering of LCTs that can lead to a need to reinforce the network due to their combined impact.

5.69 Using scenario modelling data created as part of our RIIO-ED2 submission, the list of potential LCT hotspots has been refreshed. The "Network Investment Forecast Tool" was used to add predicted LCTs to our LV network and highlight areas of LV cable or transformers that would reach capacity. This list of assets has become the basis for the new LCT Hotspot listing. Volumes of hotspots have increased as a result of this new forecast and dataset.

5.70 Potential LCT hotspots are flagged within NGED's asset register database and the mapping system has an 'LCT hand symbol' adjacent to LCT hotspot substations. These flags and symbols make local planning teams aware of the LCT hotspots.



5.71 When work is planned that affects these locations, planners are prompted to consider uprating works (using larger sized transformers or cables rather than replacing like-for-like). This uprating provides additional capacity to accommodate increased network demands.

Output (21)	Selectively replace assets using larger assets in areas where more LCTs may be connected to our network.

5.72 The NGED RIIO-ED1 Business Plan forecast that 7% of asset replacement activity would occur within LCT hotspot areas. Instead of replacing assets like-for-like, larger capacity assets can be installed to cater for future LCT growth.

5.73 A new NGED policy for the use of LCT hotspot data was introduced in May 2015 and this data has progressively influenced asset replacement project planning. In 2022/23, 46 asset replacement projects used larger capacity assets.

Output (22)	Reduce costs for future customers by developing smart solutions to provide alternative and innovative techniques for managing our network.

5.74 Smarter ways of operating the network and providing capacity are being researched, trialled and tested with the aim of implementing new techniques into business processes.

5.75 NGED's Innovation Strategy provides details of our ongoing programme of innovation. The strategy is reviewed and re-issued on an annual basis.

5.76 In addition to the above strategy, we also contribute to a joint electricity innovation strategy for network companies. This strategy is published by the Energy Networks Association and can be found at the link below.

www.energynetworks.org/creating-tomorrows-networks

5.77 In RIIO-ED1 there were two regulatory sources of funding for innovation projects: the Network Innovation Allowance (NIA) provided funding for smaller projects and the Network Innovation Competition (NIC) was a competitive tendering process where projects get assessed by an expert panel and selected projects win funding. During 2022/23 we introduced a number of new NIA projects. The full range of NIA projects active during 2022/23 are detailed below.

Name	Project aim
Active Creosote Extraction (ACE)	The project looks at creating a new method to extract creosote from redundant wood poles to such levels that they can be deemed as non-hazardous waste.
ANM – Balancing Coordination Demonstration (ABCD)	To design and test modifications to an Active Network Management system and trial new data exchanges to co-ordinate operation with Balancing Services.
Approach for Long-term Planning Accounting for Carbon Assessment (ALPACA)	Develop a whole life carbon management framework underpinned by a whole life carbon management tool. These resources will aim to facilitate achieving our carbon reduction targets and assisting with the annual reporting of embedded carbon.
Assessment of Climate Change Event Likelihood Embedded in Risk Assessment Targeting Electricity Distribution (ACCELERATED)	Project ACCELERATED will utilise the latest climate science to understand how performance functions of distribution assets may change due to climate change and will develop a climate change impact assessment procedure to be able to consider adaptation measures at the planning stage (when required).
Automatic Location of Arc-faults through Remote Monitoring (ALARM)	Test the feasibility of a technical alternative and lower cost fault locating device and derive insight into the potential to more widely and cost-effectively deploy such monitoring equipment to circuits showing early indications of damage.
ARC-Aid	This project will trial a new type of fault indicator (Metrysense 5000) which will help to locate faults in a shorter time compared to a full line patrol, therefore reducing operational costs and Customer Minutes Lost (CMLs). This will also decrease the time a live conductor could potentially be on the ground, and therefore will reduce the risk to members of the public.
Demand Forecasting Encapsulating Domestic Efficiency Retrofits (DEFENDER)	This project aims to develop an understanding of the electricity demand profile of UK domestic building stock pre- and post-retrofits to building fabric. This will enable us to produce a methodology for integrating pre- and post-retrofit domestic demand profiles into network forecasting.
Energy Planning Integrated with Councils (EPIC)	To build on the existing DFES and analyse its impact (which is currently used to create NGED's Network Options Analysis reports which consider the 132kV and EHV networks). It will determine how to create a local energy plan and the impact this will have at LV and HV.
Flexible Operation of Water Networks Enabling Response Services (FLOWERS)	Analyse the potential capacity on South West Water's network for Flexibility within the time difference between when water is pumped and stored and when it is used by the system.
Generating Additional Markets for Mature Access to Flexibility (GAMMA Flex)	To build on the learning of Intraflex and gain better understanding of what is needed to enhance liquid flexibility market. Includes creation of market designs that would allow, secondary trading, demand turn up, and other services, which will enable participants the opportunity to stack revenues from adjacent markets. It will be delivered by designing a set of market blueprints that

	envisage how each service will interact and fit in the future flexibility market place. The outputs will provide important insights needed to progress our aims and understanding for flexibility markets.
Hydrogen Economy: Reassessing Approaches to Connecting Large Electrolyser Sites (HERACLES)	HERACLES investigates efforts by hydrogen developers, original equipment manufacturers, carbon intensive industries and innovators to grow the hydrogen economy in the UK, in order to understand the challenge for electricity networks from targets to produce 10GW of hydrogen in the UK by 2020.
Network Event and Alarm Transparency (NEAT)	An investigation into how the alarms in the new ANM and SVO systems relate to the alarms within PowerOn or to each other. Approaches and prototypes will be generalised so they may be applied to future systems or systems used by other DNOs.
OHL Power Pointer	Trial of a device capable of self-power operation to provide real-time voltage, current and power flow information. This information will be used to more accurately assess network operation.
Peak Heat	To study the degree of impact that heat pumps will have on LV networks, during the average winter day, the average winter peak as well as in a 1 in 20 winter event. In addition it will investigate the market for domestic thermal storage and the ability of thermal storage to help solve constraints on the distribution network.
Pre-fix	Builds capability to detect and locate emerging HV faults as well as locating the causes of unplanned outages. The project will promote the use of equipment that we already purchase rather than dependency on specialist devices and data platforms.
Solving Intelligent LV – Evaluating Responsive Smart Management to Increase Total Headroom (SILVERSMITH)	The project will investigate compliance issues that are expected to grow on our Low Voltage network as Low Carbon Technologies (LCT) and Distributed Generation (DG) connections increase.
System HILP Event Demand Disconnection (SHEDD)	The objectives of the project is to design and test a new Low Frequency Demand Disconnection (LFDD) scheme to maximise its future performance as the network continues to decarbonisation, Distribution Generation (DG) integration increases, and system inertia continues to decrease.
Smart Meter Innovations and Test Network (SMITN)	The phase and feeder to which a single phase customer is connected has historically not been captured or where given has often been shown to be incorrect. With the expected increases in load at LV from heat pumps and Electric Vehicle charge points, there is a risk that the degree of unbalance on a network could become significant. In addition there are still issues with low carbon technology installations not being registered with Distribution Network Operators (DNOs). At the same time, most LV networks are not monitored and the profiles used for planning do not incorporate the data that is becoming available from smart meters. This project aims to solve the problems of missing or incorrect data for LV networks by applying algorithms to smart meter data in novel ways.
Take Charge	The Motorway Services Take Charge project will specify, design, test and trial a brand new standardised package solution for delivering large capacity to Motorway Service Areas (MSAs) in a more cost and time effective manner compared to traditional solutions, to enable rapid car and van EV charging.
Vulnerability and Energy Networks, Identification and Consumption Evaluation (VENICE)	Seeks to address issues related to consumer vulnerability, the pandemic, fuel poverty and our communities. The project will develop models for predicting the impact of the pandemic on the network, developing profiles for predicting customer vulnerability and methods and techniques to engage communities in the Net Zero challenge.

5.78 The project below is a collaborative NIA project.

Name	Project aim
System HILP Event Demand Disconnection (SHEDD)	To design and test a new Low Frequency Demand Disconnection (LFDD) scheme to maximise future performance as the networks continue to decarbonise, Distribution Generation (DG) integration increases, and system inertia continues to decrease.

5.79 In 2022/23 we had two active NIC projects:

Name	Project aim
DC Share	To assist in the facilitation of rapid EV charging equipment by providing appropriate network connections where they are needed, whilst making optimal use of the available network capacity. DC Share will facilitate rapid charging in constrained areas using available latent capacity across a number of substations.
Equitable Novel Flexibility Exchange (EQUINOX)	EQUINOX will be the first NIC project dedicated to addressing the challenges DNOs face with the electrification of heat. The project will develop novel commercial arrangements and supporting technologies that unlock flexibility from residential low carbon heating, while meeting the needs of all consumers, including the fuel poor and vulnerable.

5.80 Further detail on the impact of our Innovation Strategy can be found in our annual Environment Report and our Losses Strategy.

Smart meters

5.81 The government has mandated that by June 2025 every home in Great Britain will be offered a smart electricity and gas meter. Smart meters are capable of being read remotely and newer models, known as SMETS2 smart meters, will have additional functionality such as the ability to trigger a 'last gasp' message to provide notification of loss of supply.

5.82 To date around 58% of our domestic and small business customers now have a smart meter, an 18% increase from the previous year, with newer properties more likely to have a smart meter than older properties.

5.83 Data from SMETS2 meters is periodically downloaded by a separate regulated organisation called the Data and Communications Company (DCC). In preparation for utilising smart meter data, NGED has established the infrastructure required to receive data transfers from the DCC and gained Ofgem's approval for a data privacy plan, which identifies how we will collect, maintain, secure and use customer consumption data.

5.84 We have introduced routine data collection from smart meters via the DDC for monthly total consumption for domestic customers and aggregated Half Hourly load data from all the smart meters on an LV feeder – where the LV feeders have high levels of smart meter coverage (i.e. at least 75% of the customers have a smart meter)

5.85 Smart meters will give NGED much greater visibility of the operational state of the low voltage network and as a result will enhance core business activities, including fault management, and network planning. We are proposing to use data from smart meters in tandem with dedicated LV network monitoring to gain confidence in using smart meter data for network decisions.

5.86 To date we have introduced a process to initiate voltage investigations where we receive repeated voltage alerts for customers via the smart meters and we are refining the process to filter out spurious alarms.

5.87 The Smart Meter Innovations and Test Network (SMITN) project has extended the data gathering from smart meters, such as configuring them to capture one minute average voltage data. SMITN is looking at how smart meter data can help confirm customer attributes such as the phase and feeder they are connected to and whether Low Carbon Technology such as EV chargers or Photovoltaic Generation is present at their homes. SMITN will also investigate the best methods to estimate the load profiles for entire LV feeders based on the aggregated half hourly values for those customers with smart meters.

Output (23)	Provide additional network capacity by using traditional or 'smart' methods.

5.88 The UK's electricity system is undergoing a period of rapid change as distribution network customers invest in generation and alter their consumption behaviours to influence a lower carbon future. To enable a greater volume of demand, generation and storage to be connected, our networks are becoming smarter.

5.89 Traditional methods of providing additional capacity include installing additional assets or larger assets. At higher voltages, such reinforcement work can be costly and take time to deliver. While traditional methods of reinforcement will continue to be used, increasing use is being made of smarter interventions.

Flexible Power

5.90 Flexible Power was created by NGED and the brand was first used in February 2019 to announce a procurement cycle for demand response. There are three different types of flexibility services that can be provided. These are:

- Secure – managing peak demand
- Dynamic – supporting the network during planned maintenance
- Restore – supporting the network following unplanned faults i.e. as a result of equipment failure

5.91 We have continued to develop the Flexible Power brand and in 2022/23 we have 294 substations utilising flexibility with 572MW of flexibility services contracted so far.

Flexible Connections

5.92 As well as providing a quotation for traditional connection arrangements, we offer flexible connection agreements to new connection customers. These contain some form of curtailment arrangements that enables the connections to be made more quickly where a standard connection is not possible without network reinforcement.

5.93 The number of flexible connection quotations and uptake of flexible connections was at its highest in 2022/23 as shown below.

Flexible connections – uptake during RIIO-ED1

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Quotations issued	232	126	174	157	65	285	678	1013
Quotations accepted	42	5	27	64	27	101	253	367

Reduce technical network losses

5.94 The amount of energy that enters an electricity network is more than the amount that is delivered to customers, losses can occur in a number of ways but the majority of losses result from the heating effect of energy passing through cables and wires, leading to around 5% of the electricity entering the network being lost as a result of 'technical network losses'.

5.95 In addition to practical losses, the environmental impact of this is that more electrical energy has to be produced to counteract the effect of the losses. In line with Ofgem's licence obligations all DNOs are required to keep losses as low as reasonably practicable.

5.96 Our work to reduce these losses forms a part of our strategy towards creating extra network capacity and reduce our impact on the environment.

5.97 Our approach to reducing technical network losses is based on a combination of approaches including using larger lower loss assets and revisions to network planning principles to ensure that methods for reducing losses are engineered into the design of the network.

5.98 We use innovation projects to build our understanding of how and when losses occur and to ensure that we are at the forefront of technological advancements that have the potential to improve our losses performance.

5.99 Further detail on these innovation projects can be found in the Losses Strategy which is updated annually and published on the company's website.

Ofgem's Losses Discretionary Reward

5.100 In RIIO-ED1, Ofgem introduced a discretionary reward for DNOs that undertake additional work to reduce losses. The mechanism operates in three tranches.

- Tranche 1 – Forward looking plans.
- Tranche 2 – Actions undertaken by DNOs.
- Tranche 3 – Backward review of losses management activities.

5.101 In July 2016 NGED was awarded a total of £160,000 as part of tranche 1 (12% of the maximum reward available). No DNOs were awarded payments under Tranches 2 or 3.

Losses strategy

5.102 Our Losses Strategy to date has been based on achieving loss reduction by installing assets with lower losses when assets need changing. Since 2020/21 we have moved focus to areas of the network that could have increased losses as a result of increased loads for LCTs.

5.103 We intend to analyse smart meter data to more effectively manage network losses by influencing how the network is designed and informing active network control measures to achieve loss reductions.

5.104 Losses are also being considered as part of our Electric Vehicle strategy, where we are installing three-phase supply cables in all new build developments which will both provide losses benefits and provide more network capacity to enable quicker EV charging.

Output (24)	Install oversized transformers when replacing assets in areas where demand for power may become higher than equipment can cope with.

5.105 During RIIO-ED1 NGED has committed to installing oversize transformers when carrying out work in areas of predicted load growth. The volumes were forecast based upon work done with the Centre for Sustainable Energy in identifying potential LCT hotspots and these locations being coincident with work on the network.

5.106 As well as providing additional capacity, oversizing transformers in anticipation of future load growth provides a losses benefit until the additional capacity of the transformers is used up.

5.107 The volumes of oversized transformers installed during 2022/23 are shown in the table below. Our performance is improving each year with our activities in 2022/23 being the best so far. This year we installed 35 more oversized transformers than in 2021/22.

Installing oversized transformers

	Forecast (per annum)	Actual 2022/23
Distribution transformers	109	56

5.108 Whilst the numbers of oversized transformers are lower than forecasted, we continue to undertake a range of other activities to reduce technical network losses.

Discontinuation of small sized transformers

5.109 Investigations with manufacturers have identified that smaller size transformers produced higher losses when compared to larger sized transformers carrying the same load. Consequently NGED has discontinued the use of small size ground mounted and pole mounted transformers to obtain loss reduction benefit.

5.110 As well as providing a losses benefit, using larger sized transformers provides additional network capacity to allow for future demand growth.

5.111 The following table shows the volume of smaller size transformers that would have been used during RIIO-ED1 to date had they not been discontinued. Overall 6,747 larger capacity transformers have been installed in RIIO-ED1.

Volume of small size transformers no longer used

Transformers	NGED total (units)
Discontinuation of 315kVA ground mounted transformers	2,132
Discontinuation of 16kVA single phase pole mounted transformers	4,518
Discontinuation of 25kVA three phase pole mounted transformers	97

Replacement of pre-1958 transformers

5.112 Transformers that pre-date 1958 were built to a range of designs and specifications that preceded the BEBS-T1 standard which introduced a maximum level for losses.

5.113 NGED has introduced a requirement to replace pre-1958 transformers and this requirement is incorporated into decision making when planning works on the network.

Output (25) Use larger cables when installing new network in LCT hotspots.

5.114 In addition to installing oversize transformers, installing larger sized cables where demand is forecast to be higher also provides a losses benefit until the additional capacity is used up.

5.115 The forecast volumes and actual volumes are shown in the table below.

Installing oversized cables

	Forecast (per annum)	Actual 2022/23
LV cables	75km	6.6km

5.116 The amount of oversized cable being installed in LCT hotspots remains lower than forecast.

Discontinuation of small sized cables

5.117 Losses are reduced in larger size cables (assuming the same amount of electrical energy flows through the larger cable). This means that adopting larger assets as a standard will progressively reduce losses as those larger assets are installed.

5.118 The following table shows the length of smaller sized cable that would have been used during RIIO-ED1 had it not been discontinued. By using a larger size cable with lower losses there has been an overall loss reduction benefit. Overall 6,881 larger sized cables have been installed in RIIO-ED1.

Length of small size cable no longer used

Cable type	NGED total (km)
Discontinuation of 95mm^2 11kV cable	1,457
Discontinuation of 95mm^2 LV cable	2,303
Discontinuation of 16mm^2 service cable	3,121

Reduce the carbon footprint of the business

Output (29) Reduce our carbon footprint by 5%.

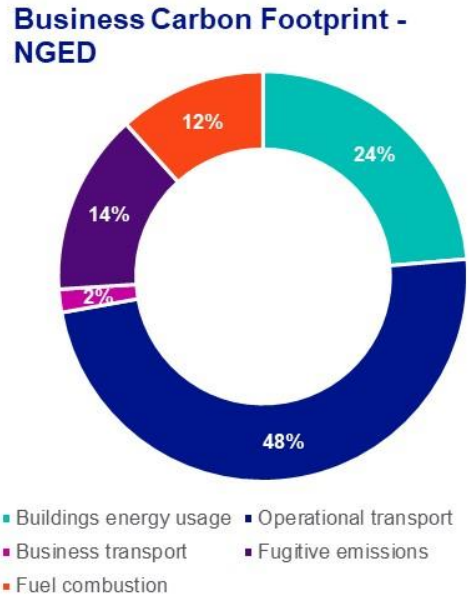
5.119 Business Carbon Footprint (BCF) represents the impact on the environment from operational activities and is measured and reported using equivalent tonnes of carbon dioxide (tCO_2e). It takes account of building energy usage (including substation electricity usage), emissions from vehicles, fuel combustion and release of greenhouse gases (fugitive emissions). Consequently NGED has initiatives in all these areas to reduce their contribution to the overall measure.

5.120 As illustrated in this chart, the main contributors to NGED's BCF are operational transport and buildings energy usage.

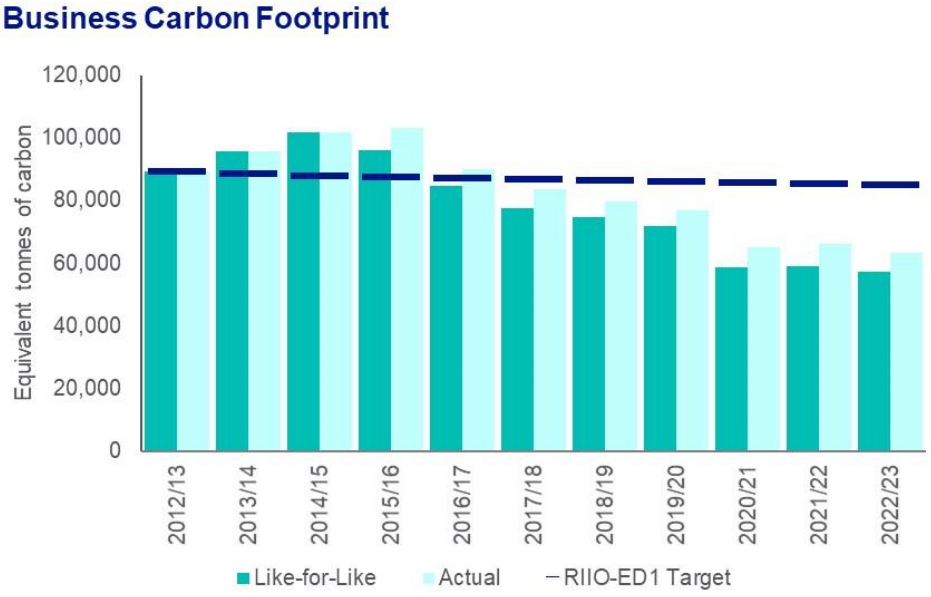
5.121 During RIIO-ED1, NGED has committed to reducing BCF by 5% compared to a 2012/13 reference position.

5.122 During 2017/18 we enhanced the data we collect for SF_6 by also including the volume of gas 'missing' from scrapped equipment. This data is only available for the RIIO-ED1 period and was not included in the original baselines or targets so we have provided additional comparisons that show performance on a like-for-like basis.

5.123 The below chart shows our actual BCF performance alongside BCF performance on a like-for-like basis (i.e. excluding new data for SF_6).



5.124 Our BCF performance under both measures is below target, achieving a 36% improvement compared to 2012/13 (on a like-for-like basis).



Output (26)	Make sure all replacement vehicles have lower CO_2 emissions than those they are replacing.

5.125 Our network is spread over an area of 55,500 km^2 and consequently we need to operate a large fleet of vehicles to allow our staff to serve this territory effectively.

5.126 When operational vehicles reach the end of their useful lives we are committed to replacing them with more efficient, lower carbon models. Details of replacements for some of our most commonly used operational vehicles are shown below;

Emissions – operational vehicle replacements 2022/23

Previous vehicle	CO_2 emissions (grams per km)	Current vehicle (2022/23)	CO_2 emissions (grams per km)
Ford Fiesta Van 1.5 Euro 6	96	Renault Zoe Van EV	0
Ford Fiesta Van 1.5 Euro 6	96	Nissan e-NV200	0
Transit Connect SWB Euro 6	135	Nissan e -NV200	0
Transit Connect LWB Euro 6	138	Nissan e-Townstar - New for April 2023	0
Transit 320 Custom Euro 6	191	Vauxhall e-Vivaro EV	0
Transit 350 MWB RWD Euro 6	196	Vauxhall e-Vivaro EV	0
LANDROVER 110 MEWP	295	Isuzu DMAX MEWP New 2021> Model Euro 6	216

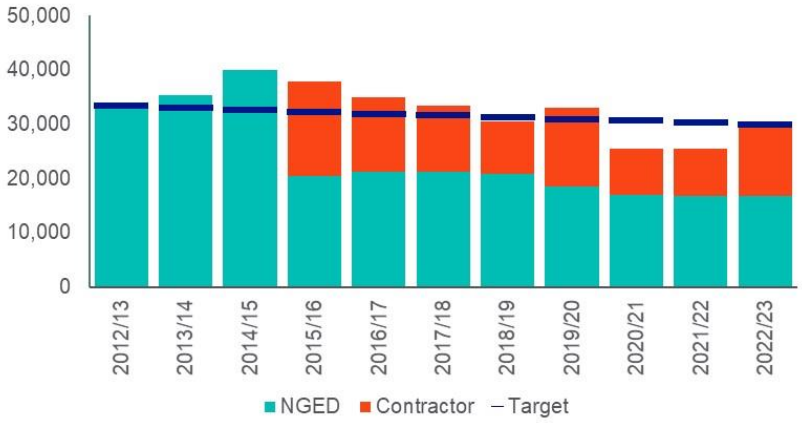
5.127 As a result of the work conducted so far, NGED has been able to begin working towards a transition to electric vehicles. To date we have introduced 178 electric light commercial vehicles across the company. In addition we have installed 204 rapid electric vehicle chargers at offices and depots.

5.128 The table shows that adoption of electric vehicles leads to zero emissions. As we progressive replace the existing fleet of internal combustion engine vehicles, we will progressively reduce the BCF impact of the NGED fleet.

5.129 To reduce emissions from existing vehicles, NGED utilises a driver behaviour system to ensure operatives are driving as efficiently as possible.

5.130 While NGED operational vehicles and contractor operational vehicles accounted for 48% of overall BCF reported in 2022/23, NGED (and its contractors) have achieved an 11% reduction in emissions compared to the baseline year of 2012/13as shown below.

Operational vehicle emissions



Contractor data was not separately identified prior to 2015/16

Output (27)	Make sure all new or substantially refurbished buildings meet, as a minimum, the 'excellent' standard under the Building Research Establishment Environmental Assessment Method (BREEAM).

5.131 NGED has an extensive property portfolio of offices that vary in age and construction type. NGED has committed to ensuring that opportunities for improving energy efficiency are maximised when building refurbishment is undertaken.

5.132 When refurbishment is carried out the work is assessed against the Building Research Establishment Environmental Assessment Method (BREEAM) standards. In line with the standards, the maximum rating that can be achieved for refurbishment works is 'Very Good', whilst new builds can achieve the maximum rating of 'Excellent'.

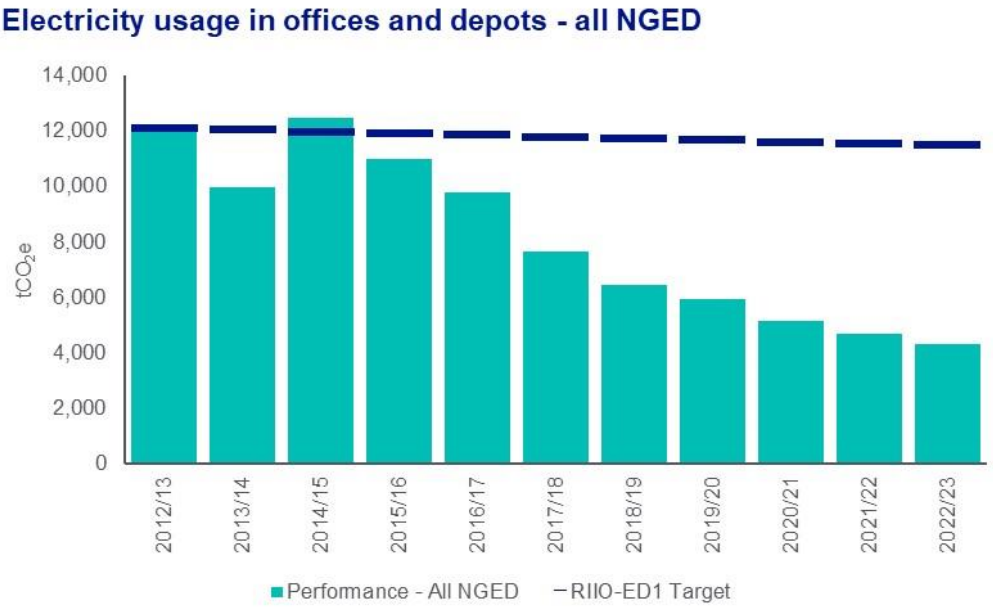
5.133 During 2022/23 a new building was completed in Ludlow and there was a refurbishment to a roof in Huthwaite. We have applied for BREEAM certification and are awaiting a response. We are still awaiting the result of our BREEAM application for the refurbishment works completed at Swansea depot during 2020/21 but all other previous building refurbished during RIIO-ED1 have achieved the maximum rating.

Reducing electricity usage in offices

5.134 During RIIO-ED1 NGED proposed to save 5% of electricity used in offices and depots.

5.135 Local depots and offices are encouraged to consider initiatives to save energy. Site managers receive a monthly report of electricity usage to assist them in targeting improvements. Local initiatives, such as the replacement of standard lighting with energy saving LED lighting, are complemented by company-wide initiatives to encourage energy efficiency.

5.136 Overall progress in relation to the RIIO-ED1 targets for a reduction in electricity usage is shown below. We have achieved a 65% reduction in comparison to our benchmark year of 2012/13.



Output (28)	Reduce the amount of waste sent to landfill by 20% over the first two years of RIIO-ED1 and 5% per year after this.

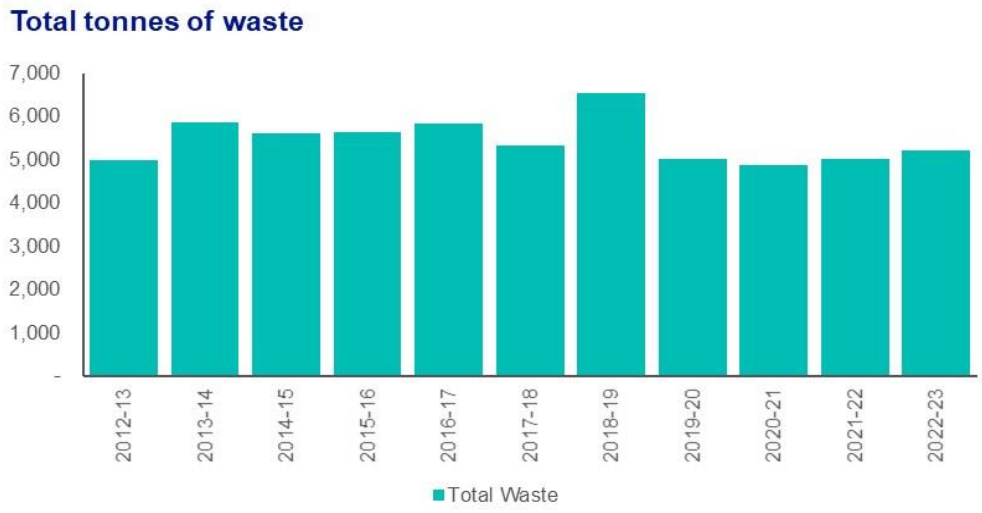
5.137 NGED's business activities create waste. This includes metal from overhead lines, cables and redundant switchgear; wood from wooden poles; packaging from new components; paper from offices and various forms of plastic.

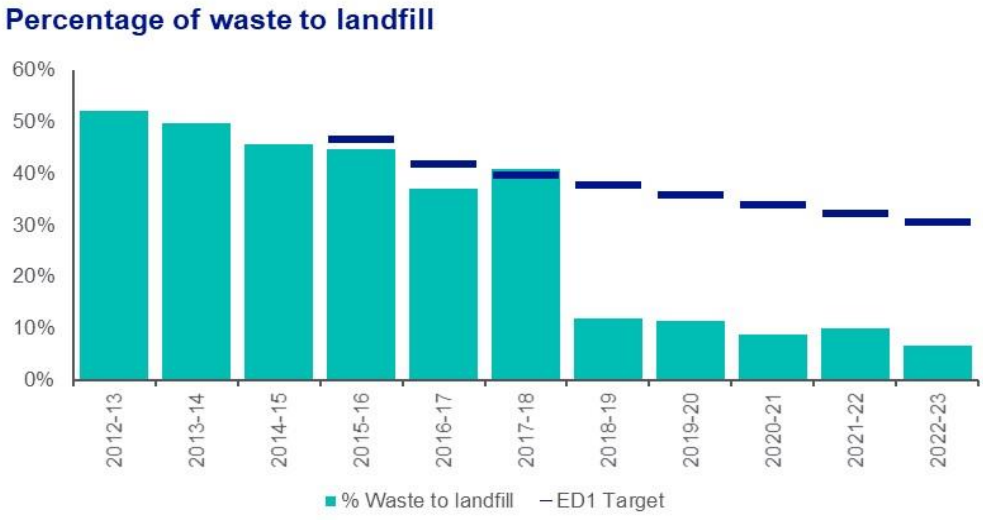
5.138 NGED has for a number of years, segregated and recycled waste, where possible, to limit the amount being sent to landfill.

5.139 During RIIO-ED1, NGED has committed to investigating the opportunities to reduce the waste being produced in the first place but also to reduce the amount of residual waste being sent to landfill by 20% over the first two years and 5% per annum thereafter. As the tonnage of waste produced annually will vary dependent upon the amount of work being carried out, our target for the amount sent to landfill is expressed as the percentage of overall waste.

5.140 We work closely with all of our waste contractors to ensure that, where possible, waste is diverted from landfill. During 2022/23 the total tonnage of waste produced has decreased by 3% compared to the previous year. The proportion of this waste sent to landfill has significantly surpassed the target for the fifth consecutive year.

5.141 Our performance can be seen below:





Environment Standard ISO 14001 (2015)

5.142 We are committed to demonstrating effective and responsible environmental management and since 2011 NGED has been certified to the ISO14001 Environmental Management Systems standard.

5.143 During 2022/23 our environmental management system (EMS) achieved re-certification to the revised ISO14001:2015. Our external certification body NQA raised no major or minor non-conformances. Any Opportunities for Improvement (OFI) identified by the audit were actioned as appropriate.

5.144 To ensure compliance with the standard, each depot has an Environmental Management Plan. These plans provide a mechanism for improvement, identifying site specific environmental objectives. Each plan identifies targets and associated monitoring requirements and reviews environmental facilities and processes.

Five key approaches on the new ISO14001:2015

Environmental Competence Management System

5.145 During 2022/23 we successfully implemented a Competence Management System (CMS) for the management of environmental permits. The Competence Management System (CMS) is how we demonstrate that employees are technically competent to manage the environmental permits which we have throughout the business (30 in total). It is a legal requirement for NGED as a permit holder to be able to demonstrate to the Environmental Regulators (Environment Agency and Natural Resources Wales) via a certified CMS or other qualification, that our nominated employees are technically competent.

Reduce the environmental risk of leaks from equipment

5.146 Electrical equipment may contain oil or gas that is used to improve insulation properties or enhance cooling. Leaks can occur from time to time when equipment is damaged or seals deteriorate and steps are taken to minimise the environmental impact of such leaks.

5.147 The main options available to reduce the environmental impact of any leaks are quick repairs when damage occurs and replacement of the equipment in poorest condition with the highest leakage rates.

Output (30)	Reduce by 75% the amount of oil lost through leaks from oil-filled cables.	

5.148 Some older types of higher voltage cables (33kV and above) contain oil based fluids to assist in the insulation of the cables. These cables sometimes leak, either as a result of third party damage, age related degradation or ground movements. New cable designs do not use this technology so the problems associated with these cables will reduce over time as the populations are reduced through replacement.

5.149 NGED committed to reduce the volume of oil escaping from fluid filled cables by 75% over the 8 year RIIO-ED1 period through the use of PFT tagging and the replacement of poor condition fluid filled cables.

Application of PFT tagging

5.150 Fluid levels in all our cables are monitored remotely and loss of pressure triggers alarms within our control centres. This allows us to react quickly to a fluid leak event. However, traditional methods of leak location (using freezing techniques) can be a lengthy process.

5.151 A tagging system has been introduced which uses a small amount of Perfluorocarbon tracer (PFT) chemical. This is incorporated into the fluid and if a leak occurs can be readily detected above ground to pinpoint leaks quickly and to speed up the repair process. This reduces costs, inconvenience to customers and the volume of oil lost to the environment.

5.152 During RIIO-ED1 NGED committed to applying PFT to cables with a history of leakage and internal policy reflects this requirement.

Replacing poor condition fluid filled cable

5.153 Across the RIIO-ED1 period NGED committed to replacing 1% of the poorest condition cables.

5.154 Decisions on the replacement of cables are based on a variety of factors including, but not limited to, leak rates. The leakage of oil can be based on degradation of the cable's outer sheath, which is hard to repair, but can also be caused by problems related to the cable joints or fluid pressurising systems.

5.155 Joints, pressurising tanks and associated pipework can be refurbished in circumstances where the cable itself is still sound and there may be occasions where replacing the cable is unnecessary even though the leak rate is high. Conversely a section of cable could have a relatively low leak rate and yet be in an environmentally sensitive location where the leak of any oil could have a more significant impact – for example where a cable runs adjacent to a canal or other water course.

5.156 Target removal volumes were based on the length of fluid filled cables in service during 2014/15.

5.157 During the course of RIIO-ED1 we have decommissioned a total of 85.3km of fluid filled cables, representing a total reduction of 11% of our overall population of this asset type. 58.2km relates specifically to condition related disposals. We have significantly exceeded our RIIO-ED1 target of removing 1% of fluid filled cables as shown below.

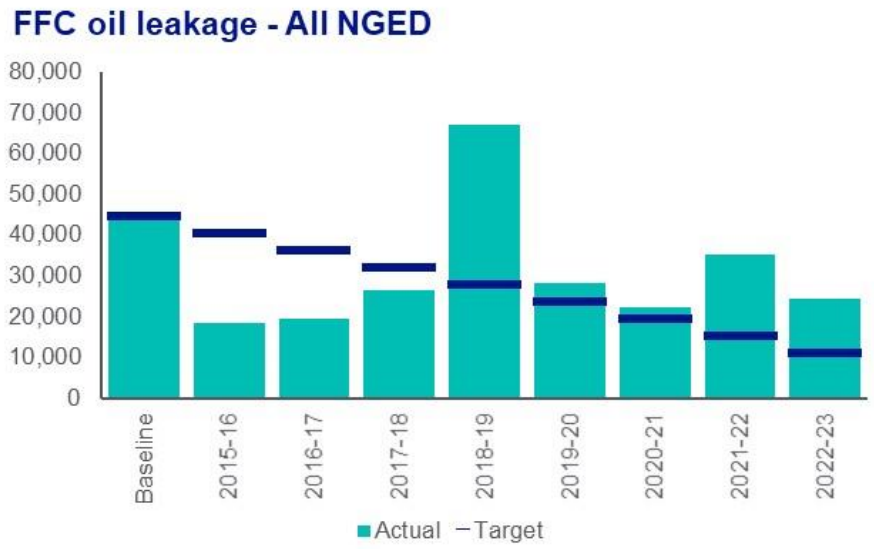
Fluid filled cable removals (km)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Population 2014/15	315.6	277.4	60.8	115.8	769.5
Forecast 1% removals (total RIIO-ED1)	3.2	2.8	0.6	1.2	7.7
Disposals during RIIO-ED1 – condition	44.3	12.0	1.9	0.0	58.2
Disposals during RIIO-ED1 – other	10.2	11.5	2.1	3.3	27.1
Disposals during RIIO-ED1 – total	54.5	23.4	4.0	3.3	85.3

* NGED total may not reconcile due to rounding

Leakage performance

5.158 The amount of oil leakage each year depends on the types and locations of the leaks. The chart below shows how this can vary from year to year. Our aspiration was to achieve a 75% reduction from the base year. In 2022/23 the volume of oil leaked from fluid filled cables is 45% lower than the baseline period. While this falls short of the target it is a significant improvement.



5.159 The data shown above reflects fluid filled cable losses reported within each year of RIIO-ED1, and does not take into account any oil subsequently recovered as a result of work undertaken by our Contaminated Land Specialists. Further detail on the beneficial impact of these activities can be found in our Environment Report.

5.160 Performance in 2022/23 was impacted by a small number of large leaks.

5.161 In the South Wales region deterioration of one cable resulted in the loss of over 4,400 litres of oil. The leak location was identified and repaired, which involved replacing the oil feed pipework between oil tanks and pumping position.

5.162 In the West Midlands, leakage was also as a result of leaks on a single circuit. PFT tagging was used to locate that the source of the leak was a joint, which had been disturbed through ground movement. On this circuit, 4,700 litres of oil were lost.

Output (31) Reduce by 17% the amount of SF6 gas that is lost from switchgear.

5.163 SF_6 gas is used throughout the industry as an insulating medium in switchgear. Although it provides many benefits, it is a potent greenhouse gas.

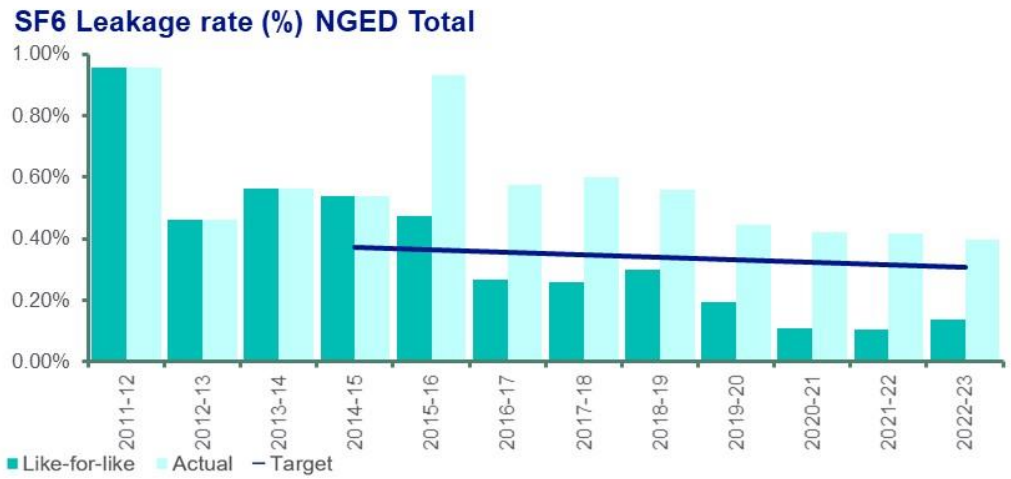
5.164 When replacing switchgear, we replace any 11kV distribution assets that leak and higher voltage assets if they have leaked three times or have an unrepairable leak.

5.165 Leaks are identified by either a low gas alarm being triggered via control systems or from a low gas reading on a gauge being identified during a switching operation or a routine substation inspection. When a leak becomes apparent the source of the leak is located so that a strategy can be developed to manage the situation, taking into account the potential for repairs and the lead times for replacement switchgear.

5.166 During RIIO-ED1, NGED committed to reducing the rate of SF_6 leakage by 17% based upon a four year average of emissions between 2009/10 and 2012/13.

5.167 During 2017/18 we enhanced the data we collect for SF_6 by also including the volume of gas 'missing' from scrapped equipment. As this data was not included in the original information used to set targets we have shown performance on a like-for-like basis (without the extra data) to show performance on a consistent basis as the targets. We also show the actual reported amount (including the extra data).

5.168 On a like-for-like basis our performance in 2022/23 beat the target, but performance with the extra data shows that the amount actually leaked is higher than target.



5.169 NGED continues to work towards improving SF_6 leakage performance. We treat leaks with urgency and we are actively seeking alternatives to SF_6.

5.170 NGED engaged with all major developers of SF_6 free apparatus in 2022/23 and offered to sponsor a number of non SF_6 products through the ENA Notice of Conformity process (NoC) which helps manufacturers to gain approval to sell equipment to UK DNOs.

5.171 Following a successful trial in 2021/22, we have continued to install non SF_6 145kV live tank circuit breakers. We now have four active units, and have plans to install more.

Output (32) Install effective oil containment 'bunds' around plant containing high volumes of oil.

5.172 Large transformers, bulk oil containers and some items of switchgear contain large volumes of oil. This poses a risk of contamination should a leak arise, especially where the equipment is near water courses, water tables or drainage ditches.

5.173 Containment walls or 'bunds' can be constructed around the equipment to prevent oil leaking into the environment. These are designed to be able to contain the full volume of oil that is in the equipment. Bund pumps are installed to keep the bunds clear of water. These pumps can discriminate between oil and water and stop pumping when oil is detected.

5.174 During RIIO-ED1, NGED committed to ensuring that all 33kV, 66kV and 132kV transformers and other equipment containing oil in excess of 1,500 litres would have either a new bund installed or an existing bund refurbished to ensure effectiveness.

5.175 An initial forecast estimated that a volume of 104 bunds would be required. Site surveys, undertaken to assess the requirement for either the repair of an existing bund or the establishment of a new bund, have resulted in higher volumes of activity being carried out to those originally forecasted

5.176 We have completed work on 237 bunds as detailed below.

Oil containment bunds completed during RIIO-ED1

	West Midlands	East Midlands	South Wales	South West	NGED Total
New bunds	1	15	18	4	38
Refurbished bunds	50	21	47	81	199
Total bunds	51	36	65	85	237

Improve appearance in National Parks and Areas of Outstanding Natural Beauty (AONBs)

Output (33) Replace 55km of overhead lines in National Parks and AONBs with underground cables.

5.178 NGED operates 89,000km of overhead lines predominantly in rural locations. Whilst overhead lines are widely accepted as being part of the countryside, there are a number of National Parks and Areas of Outstanding Natural Beauty (AONBs) across the NGED geographical footprint containing iconic sites where the removal of NGED overhead lines would improve the visual amenity.

5.179 The main method of improving visual amenity, whilst maintaining supplies, is to replace the overhead lines with underground cables. Following stakeholder engagement NGED committed to undergrounding 55km of overhead line during RIIO-ED1 by working with representatives from AONBs and National Parks.

5.180 Each licence area has a steering group consisting of NGED staff and representatives from AONBs and National Parks. These groups are responsible for identifying projects and prioritising where the work will take place. NGED provides information and appropriate assistance to stakeholders to help them in scheme selection including budget costing and feasibility assessments. The acceptance and delivery of projects is dependent on the views of the steering group and the timescales to develop and implement schemes can vary.

5.181 We close RIIO-ED1 having undergrounded 39.5km of overhead lines, 72% of the target. We have seen progressive progress during the price control, but there have been issues that have delayed some projects.

Undergrounding in National Parks and AONBs (km)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Target for RIIO-ED1	14	10	10	21	55
Performance during RIIO-ED1	14.1	10.0	4.2	11.3	39.5

5.182 The West Midlands and East Midlands regions achieved their overall RIIO-ED1 targets, but the landscape and terrain in AONBs within South Wales and the South West have created additional challenges.

Case Study – Wye Valley Greenway Cycle Path

An example of some of the challenges and complexities faced when carrying out undergrounding work was the replacement of overhead lines in the Wye Valley AONB where the scheme was within a used quarry and ran alongside the new Wye Valley Greenway Cycle Path.

- Wayleave agreements were required from a landowner, who was very often outside of the UK and therefore contact was limited, prolonging the legal negotiations.
- The area is in a Site of Specific Scientific Interest and Special Area of Conservation. In order to protect the area, permissions are required from Natural England which require an Environmental Impact Assessment. This assessment identified protected species in the area and subsequently placed restrictions on when the works could be completed.
- The job involved the removal of several poles in the quarry which was very difficult to access.
- Undergrounding this line required a special diamond cut trench through the quarry.
- It also required a temporary road to be constructed on one of the side cliffs in order to access the HV pole where the cable terminates.

Connections

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23
31 October 2023

Electricity Distribution

nationalgrid

Connections

Contents

6 Connections

6.1 Where a customer requires a new electricity supply NGED is responsible for providing a connection. There are three main categories of customer: demand (customers who use electricity); generation (customers who generate electricity and may wish to export it to the network); and unmetered connections (customers with equipment that does not have its own meter such as street lighting).

6.2 During RIIO-ED1 there has also been growth in the number of customers interested in energy storage connections. Energy storage is considered to be demand when consuming power and generation when exporting power.

6.3 Within these categories there are varying customer 'types' with different needs and expectations ranging from small connection customers looking for a single service connection to major connection customers managing multiple/complex connections.

6.4 The objective of the connections outputs is to provide an excellent service for customers connecting to the network whilst facilitating competition in the connections market. The connections outputs are in five themes.

- Provide a faster and more efficient connections service.
- Improve communications with customers.
- Enhance engagement with major customers.
- Deliver guaranteed standards of performance.
- Facilitate a competitive connections market.

Regulatory framework

6.5 Ofgem has a package of incentive mechanisms to promote improvements in the connections service and these incentives influence NGED's approach to connections. The incentives are as follows.

- The Broad Measure of Customer Satisfaction (BMCS) results in rewards or penalties for customer service. Part of the mechanism measures customer satisfaction via a survey aimed at small connection customers.
- The Time to Connect incentive focusses on the time taken to provide small connection customers with a quotation and once the offer is accepted the time taken to complete the necessary works.
- The Incentive on Connection Engagement (ICE) penalises DNOs that do not engage adequately with major connection customers.
- Guaranteed Standards of Performance (GSOPs) are a legal obligation where customers are eligible for specified payments where a DNO fails to deliver specific levels of performance.

6.6 Ofgem is also keen on promoting competition in connections in order to provide customers with a choice of providers to undertake the physical connections work. Since the start of RIIO-ED1, regulatory policy for connections has continued to evolve with the development of a code of practice for competition in connections. The requirements of the code of practice have influenced delivery against the outputs proposed in the NGED RIIO-ED1 Business Plan.

6.7 Furthermore, the growth in low carbon technology, high volumes of distributed generation and installation of electricity storage has led to greater constraints on the network requiring more flexible approaches to managing capacity. Both Ofgem and the government department of Energy Security and Net Zero (formerly Business, Energy and Industrial Strategy (BEIS)) have recognised a greater need for flexibility services and rules and requirements will continue to evolve into RIIO-ED2 as the market for flexibility services grows.

Overview of connections outputs

Provide a faster and more efficient connections service		
34	Meet Ofgem's targets for the overall 'time to quote' and 'time to connect' for single domestic connections and small commercial connections. Improve the overall time taken to provide a quote for all other customer groups by 20%.*	We outperformed Ofgem's targets for 'time to quote' and 'time to connect' for single domestic connections and small commercial connections in 13 out of 16 measures, but we have missed our targets for some of the other customer groups.
35	Provide excellent customer service so that customers continue to rank us as the top-performing DNO group in customer satisfaction surveys.**	We are one of the top performing DNOs for the Connections Customer Survey in Ofgem's Broad Measure of Customer Satisfaction, scoring an average of 8.87 out of 10 for our DNO group.
36	Carry out surveys with distributed generation customers to find out if they are satisfied with our service and identify where we could improve.	We achieved a score of 8.59 out of 10 for distributed generation customer satisfaction surveys. We have specified a range of improvements within our work plan for the Incentive on Connections Engagement (ICE).
Improve communication with customers		
37	Develop and improve the way we process online connection applications and make it easier for customers to track the progress of their application online.	We developed our "Enquiry Tracker" website to allow ICP/IDNO users to track enquiries from application to connection. Further developed our customer portal, online applications and domestic EV charging applications. Details have been published in our ICE work plan.
38	Make sure that the information we provide in documents and online is effective.	We have improved the information we provide in documents and online in line with stakeholder feedback.
Enhance engagement with major customers		
39	Host 'surgeries' every three months to help connection customers to understand our processes.	In 2022/23 we held 31 Community Energy Surgeries with 152 participants, 40 Community Energy dissemination events for 728 stakeholders and 4 community energy events for 80 stakeholders.
40	Work with major customers to identify where our processes can be improved and quickly put in place any changes.	We engaged with over 18,800 stakeholders through events and customer satisfaction surveys. The actions in our ICE work plan are based on suggestions we received from these events and surveys.
Guaranteed Standards of Performance		
41	Aim to achieve no failures of the connection GSOPs.**	There were 30 failures against the connection Guaranteed Standards of Performance during 2022/23. We had a further 4 failures against Competition in Connection standards, which relate to services we provide that cannot be carried out by competitors.
Further developing a competitive market		
42	Improve customer awareness of other connection providers and regularly check that customers understand the options available to them.	We provide clear information for customers explaining that they can use other connection providers. We carry out a yearly survey to measure customer awareness. The 2022-23 survey showed that 84% of customers who had a new connection were aware of other providers.
43	Work with other connection providers to extend the type of work they can carry out, including high voltage and reinforcement work.	In agreement with stakeholders, CIC stakeholder engagement is now incorporated into our Customer Connections Steering Group (CCSG). Three sessions took place during 2022/23 and we used feedback to improve our processes.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Provide a faster and more efficient connections service

6.8 As part of the RIIO-ED1 Business Plan, NGED committed to providing a faster and more efficient connections service. Three outputs were identified to measure our performance against this commitment, including a commitment to improve the overall time taken to deliver a connection by 20%.

6.9 As connection processes have evolved, it has become clear that some customers do not necessarily require a faster service for the provision of the connection; they require an appropriate and timely service. This means that they want the connection works to be delivered in line with their project timescales rather than simply as quickly as possible.

6.10 Around 63% of connection projects that we made during the regulatory year were for small connection customers (single domestic connections referred to as LVSSA and 2-4 domestic connections or a small commercial connection not requiring reinforcement work known as LVSSB). For these customers we are committed to meeting both the time to quote and time to connect targets set as part of Ofgem's Time to Connect incentive.

6.11 For all other market segments we continued to work to achieve our commitment to improve the overall time to quote by 20%.

6.12 We measure customer satisfaction with our connections service using Ofgem's Broad Measure of Customer Satisfaction and our own surveys for Major Connections customers and Distributed Generation customers, aiming to go beyond Ofgem's target of 8.2 out of 10 and achieve our own stretching target of 8.8 out of 10. In 2022/23 we achieved a rating of 8.87. We are committed to responding to customer requirements to improve connections processes and our actions are detailed for outputs 37 to 40. Our initiatives and their delivery are monitored through Ofgem's Incentive on Connections Engagement (ICE).

6.13 Recognising that timeliness is more important than speed for time to connect in some market segments, output 34 of our RIIO-ED1 Business Plan has been reworded as follows.

Output (34)	Meet Ofgem targets for time to quote and time to connect for single domestic connections and small commercial connections. Improve the overall time to provide a quote (for all other market segments) by 20%.

2022/23 performance for the Time to Connect incentive

6.14 The following table shows NGED's performance against the Ofgem Time to Quote and Time to Connect targets for LVSSA and LVSSB market segments in 2022/23. Ofgem targets were tightened for years 5-8 of RIIO-ED1 and we have beaten targets in 13 of the 16 measures (except South Wales time to connect for LVSSB and South West time to connect for LVSSA and LVSSB).

	Time to Quote (average number of days)		Time to Connect (average number of days)	
	LVSSA	LVSSB	LVSSA	LVSSB
West Midlands	1.81	3.55	30.34	35.95
East Midlands	1.82	4.21	30.15	36.41
South Wales	2.03	4.48	33.88	48.24
South West	3.42	4.64	45.69	53.05
Ofgem target	4.84	7.84	39.28	47.94

2022/23 Time to Quote performance for all other connections

6.15 There are no regulatory time to quote targets for all other market segments, and therefore NGED has set specific targets for time to quote with the aim of achieving 20% improvement on benchmark performance (derived from an average of 2013/14 and 2014/15) by the end of RIIO-ED1.

Time to Quote performance for non-incentivised market segments (working days)

Market segment	LV	HV	DGLV	DGHV	EHV
Benchmark (2 year average 13/14 14/15)	8.5	11.2	11.4	36.7	37.2
End of RIIO-ED1 target (20% improvement)	6.8	8.9	9.2	29.4	29.7
2022/23 performance	9.1	14.5	27.0	33.0	44.9

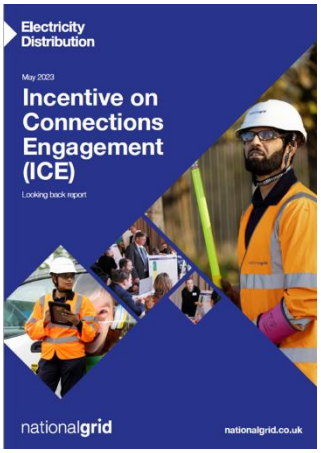
6.16 Although performance for 2022/23 is behind target in all categories, NGED regularly reviews processes to ensure that timescales are as short as possible and that feedback from customers informs improvements.

6.17 Delivery of connections quotes has been made more efficient by improving the information available to customers before an application is made, improving the systems used to make an application and developing clear processes for each stage. We have also introduced a website based application process and established a central administrative service for dealing with high volumes of LCT connection notification and enquiries.

Output (35)	Provide excellent customer service so that customers continue to rank us as the top-performing DNO group in customer satisfaction surveys.	✓
Output (36)	Carry out surveys with distributed generation customers to find out if they are satisfied with our service and identify where we could improve.	✓

6.18 During RIIO-ED1, NGED has committed to delivering excellent customer service so that NGED continues to be ranked as the top performing DNO group.

6.19 NGED recognises that customer satisfaction is very important to the success of the business. This applies to the whole connections process, from pre-application processing through to final work on site. During the process, customers interact with different NGED staff and all interactions should be of an equally excellent standard.



6.20 Ofgem's Incentive on Connections Engagement (ICE) was introduced at the start of RIIO-ED1 to incentivise DNOs to understand and meet the needs of customers. Our ICE workplan details the steps that we take to engage with customers and to implement improvements based on feedback. The documentation that we submit each year to evidence this work can be found on our website.

6.21 To understand how customers view NGED's service, and to assess the impact of our ICE workplan, we use the following surveys to measure the satisfaction of connections customers.

- The customer satisfaction survey score obtained as part of Ofgem's Broad Measure of Customer Satisfaction (BMCS). This assesses customer satisfaction specifically for small connection customers (in the LVSSA and LVSSB market segments).
- An NGED implemented survey for major demand customers (any customer not classified as LVSSA or LVSSB). This survey is undertaken on a monthly basis.
- An NGED implemented survey for distributed generation (DG) customers. This survey is carried out on a monthly basis to align with the major customer.

6.22 The two NGED surveys replicate the survey approach taken for BMCS.

2022/23 performance in customer satisfaction surveys

6.23 Ofgem specifies a target of 8.2 out of 10 for the customer satisfaction score part of BMCS and DNOs gain rewards or penalties relative to this target. In order to drive the business to provide service ahead of expectations, NGED has set a stretching internal target of 8.8.

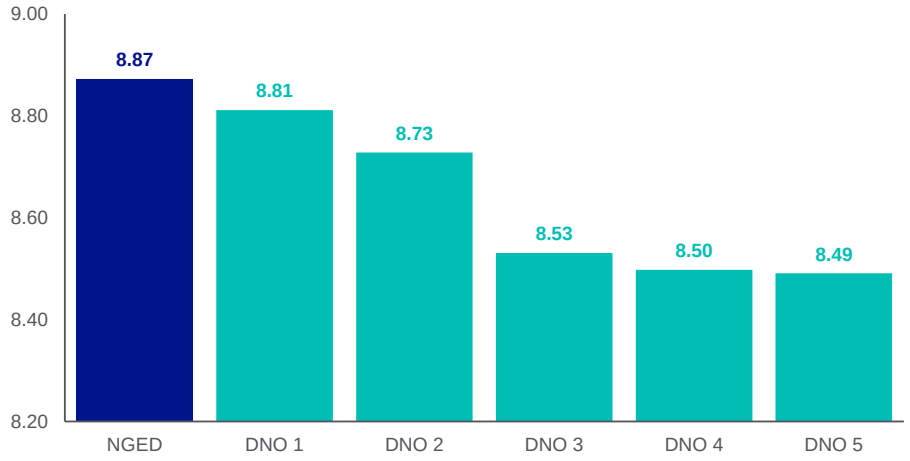
6.24 NGED's 2022/23 performance for the three different customer groups is shown in the following table. We beat the stretching internal target for small Connections. The scores for major connections and distributed generation were lower than target and we will continue to seek feedback from stakeholders in each customer group in order to identify best practice and improve our processes and service.

Connection customer satisfaction survey results 2022/23

Customer Groups	Ofgem target	Internal Target	Result
Minor Connections (LVSSA and LVSSB)	8.2	8.8	8.87
Major Connections	n/a	8.8	8.4
Distributed Generation	n/a	8.8	8.59

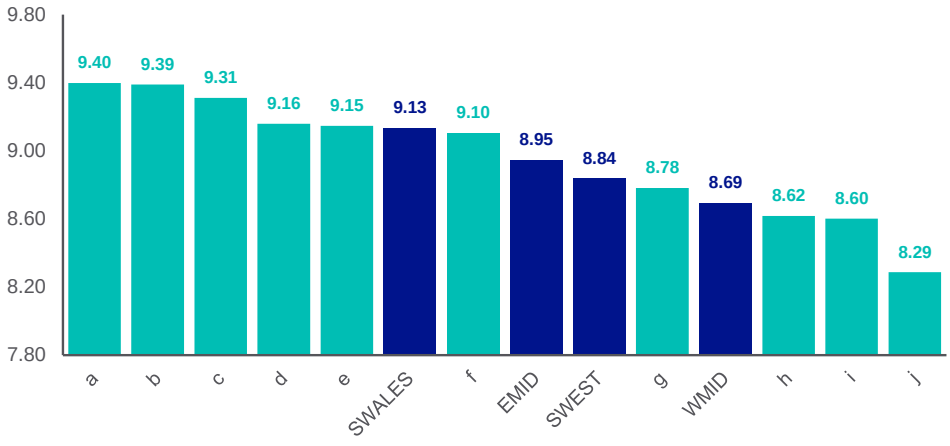
6.25 The BMCS customer survey score for LVSSA and LVSSB connections provides a method of comparing DNO performance across the industry. Considering the results across the whole of RIIO-ED1, customers have rated NGED as the top-performing DNO group.

RIIO-ED1 average connections BMCS score by DNO group



6.26 However, performance across the industry is improving making annual performance increasingly competitive. In 2022/23, even though performance was significantly above Ofgem's target of 8.2, NGED licence areas were ranked in the middle positons across all fourteen DNOs

2022/23 connections BMCS score by DNO



6.27 NGED's performance is achieved through a strong culture of customer service embedded throughout the organisation, supported by a variety of management performance indicators which ensure customer service is treated as a priority.

6.28 Further improvement to processes, systems and customer interactions are being sought to return NGED's performance to the top ranking.

Improve communication with connections customers

Output (37)	Develop and improve the way we process online connection applications and make it easier for customers to track the progress of their application online.

6.29 We continue to develop connections systems and processes in response to stakeholder feedback.

6.30 Customers are able to either apply for a new connection online or download a version of the application form to be completed on paper.

6.31 Stakeholders requested an online interactive mapping tool to help them save time and find the information they need to make decisions. We engaged with them to understand their requirements and we have implemented changes to allow them to check transactions and track progress online.

6.32 In addition, we streamlined our connection agreement process so, where we require a Connection Agreement for a customer connecting into the low voltage network, we now provide an acknowledgement of the connection which does not require a counter-signature from the customer.

Domestic Electric Vehicle Charging Connections

6.33 Our new self-serve connections website allows customers to apply online for an Electric Vehicle charge point connection and get an instant response. This service takes around 10-15 minutes to complete and replaces our previous system where customers were asked to complete a lengthy form and wait 24 hours for a response. This new service speeds up the connection process, leads to greater customer satisfaction and supports the UK's journey to decarbonisation.

6.34 Following positive feedback from customer, steps to introduce a similar self-serve process to speed up the connection of heat pumps and solar panels are underway.

Enquiry Tracker

6.35 During 2020/21 a new portal system, called Enquiry Tracker, was launched to allow improved communication with Independent Connection Providers (ICPs) and Independent Distribution Network Operators (IDNOs). The portal allows access to the relevant information through a registration process. The Enquiry Tracker has now fully replaced the previous system, known as CIRT.

6.36 It enables the user to upload relevant documents, request additional information or updates, track enquiries from initial application through to final connection. The tracker covers applications for new Competition in Connection (CIC) connections, submitting Point of Connection (POC) Self Determined connections and submitting notifications for all CIC LV and HV works.

6.37 Following a trial in 2021/22 to investigate the potential to open up Enquiry Tracker to a wider variety of non-ICP major customers, we have developed the first phase of a web based customer portal for an end to end scheme progression for other major customers. We continue to monitor feedback and will build in enhancements as necessary.

Output (38)	Make sure that the information we provide in documents and online is effective.

6.38 NGED has committed to ensuring that customers requiring a connection receive clear information on the process. Information is provided to customers online via our website, through our contact centre staff or by direct contact with local planners. We regularly update the information provided to customers to ensure that it meets customer requirements.

6.39 The NGED website provides a valuable source of information and we undertake regular stakeholder engagement to identify potential improvements that could be made to the guidance that we provide.

6.40 Stakeholder requests and the improvements that we make as a result are detailed within NGED's ICE workplan, which can be viewed on our dedicated ICE internet page.

6.41 Some of the improvements introduced during 2022/23 include.

- Reviewing and updating Statement of Works (SoW) information on our website to provide information in a clear and accessible format. The SoW Appendix G information page has been revised to allow customers to easily navigate through to the relevant grid supply point and download the information easily.
- Improving our guidance on completing application forms for G98 or small G99 connection applications. This includes example application forms and example drawings. The G99 Connection Procedures page of our website gives clear guidance on which Energy Networks Association (ENA) forms are required at each stage of the process. This includes the new G99 Fast Track SGI 1, 2 and 3 processes. It also provides the key actions for the customer to undertake in order to connect a Power Generating Module.
- Updating our Connection Agreement to include information on the ongoing costs associated with our Distribution Use of System (DUoS) charges and published a new page on our website called 'Ongoing Charges'. We now signpost customers to these sources of information as part of the initial application stage to ensure transparency.
- Updating our guide for Local Authorities to help them with converting their fleets to zero emission or battery electric vehicles (EV); the guide has been downloaded 230 times. We have also updated our EV Strategy and the Capacity Map to help customers like Local Authorities to plan public charging infrastructure; this was accessed 3,819 times.
- Publishing a webpage with guidance to help community group energy schemes get access to Network Innovation Allowance (NIA) funds. We also held 152 surgeries and dissemination events involving 960 stakeholders to publicise this provision.

Improve our engagement with major customers

Output (40)	Work with major customers to identify where our processes can be improved and quickly put in place any changes.

6.42 Major connection customers (large site developers, multiple site developers and distributed generation customers) have a wide range of requirements for their connections, and the connection arrangements can be complex.

6.43 In RIIO-ED1, Ofgem introduced a penalty-only incentive to encourage DNOs to improve interaction with major connection customers. The Incentive on Connection Engagement (ICE) required DNOs to engage with major customers, develop improvement plans and implement changes.

6.44 The ICE penalties only apply to market segments that Ofgem has deemed as being non-competitive; however it is important to NGED that we engage with all connection stakeholders and NGED's ICE improvement plans are therefore focused on all market segments (irrespective of whether they relate to ICE incentives).

6.45 The incentive mechanism requires DNOs to submit reports to Ofgem detailing forward looking plans and reporting on previous proposals.

6.46 NGED's ICE submission for 2022/23 provides further detail on NGED's connections engagement and resultant actions. The submission can be found at the link below.

yourpowerfuture.nationalgrid.co.uk/our-engagement-groups/connection-customer-engagement/incentive-for-connections-engagement

6.47 The main principle of the stakeholder engagement that we undertake is that it must lead to action. During 2022/23 we delivered 14 initiatives through our ICE workplan, including the following:

- Conducting trials for virtual audits and inspections as a part of CiC inspection policy with the aim to provide better transparency to customers during post acceptance processes.
- Improved the guidance to customers on completing G98 or small G99 installation applications including the provision of example application forms and schematic drawings.
- Simplifying the online information on charging methodology and system charges, and improved signposting to the relevant information earlier in the application process in order to be more transparent about costs and payment schedules.
- Identifying EV charging needs of disabled drivers, exploring practical ideas for discussion with stakeholders, outlining implementation plans and planning pilot schemes to trial the ideas

6.48 The following sections detail some of the mechanisms used to engage with connection stakeholders and the actions resulting from these interactions.

Customer Connections Steering Group

6.49 During 2022/23, we continued to work with our Customer Connection Steering Group (CCSG). The CCSG was formed in 2013 and meets on three occasions per annum, hosted by our directors and senior managers.

6.50 The CCSG is made up of a range of stakeholders representing a cross section of connection customers in order to provide a balanced view of connection issues. The CCSG provides feedback on proposed initiatives and assists with strategic direction, ensuring that we identify the priority areas for our ICE initiatives.

Stakeholder workshops

6.51 On an annual basis NGED holds stakeholder workshops, which are open for all stakeholders to attend. These workshops include specific elective sessions dedicated to connections activity. During 2022/23, following feedback from stakeholder workshops, we improved our software to reduce unnecessary process steps and we changed our connection offer letters so that they now contain clearer information.

6.52 In November 2022 we hosted a hybrid Connections workshop where stakeholders were able to participate online alongside the stakeholders attending in person. The aim of this workshop was to:

- gather feedback on our Connection Strategy, and
- discuss the digitalisaton of connections and Low Carbon Technologies (LCT) notification processes to tackle the higher volume of connections anticipated in RIIO-ED2.

6.53 The feedback from stakeholder workshops enables us to validate our proposed ICE workplan outputs and rank stakeholder priorities. Further detail of stakeholder sessions can be found at the following link: yourpowerfuture.nationalgrid.co.uk/workshops-and-events

Community Energy workshops

6.54 NGED has carried out Community Energy Workshops since 2014/15. These workshops provide an engagement opportunity specifically for stakeholders involved with community energy projects. These community led projects allow groups of households and businesses to install local generation plants or microgeneration with the benefit of bulk buying.

6.55 Our activities are designed to ensure that Community Energy stakeholders are not left behind or disadvantaged when seeking entry to new markets. We aim to increase awareness, build knowledge and the ability to participate. During 2022/23 we hosted four community energy workshops.

6.56 We also continue to promote Community Energy through social media to raise awareness of the funds, materials and information made available by NGED to support Community Energy Groups.

6.57 Our resulting actions included publishing a dedicated online page with guidance on 'Getting Finance for Community Energy'.

Net Zero Surgeries

6.58 During 2022/23 we offered Net Zero Surgeries where stakeholders could request meetings with a local team to help their efforts in achieving decarbonisation. We also held an event for Developers and Housing Builders to discuss NGED's connection strategies, RIIO-ED2 and the net zero future.

Distributed generation (DG) owner operator (DGOO) forum

6.59 We introduced a customer forum for DG owners and operators during 2016/17 as a result of feedback from DG stakeholders identifying that they needed more information on planned system outages and constraints affecting their connections. Outage costs can be significant to the DG sector and stakeholders told us that it is important for them to be able to forecast to owners/investors when there will be outages.

6.60 We held four DGOO meetings during 2022/23, attended by companies representing a significant proportion of NGED's connected DG.

6.61 The forum provides input into the development of the ICE workplan, prompting new initiatives throughout the year. For example in 2022/23 customers asked for a longer range view of outages to help with financial planning, our portal now shows outages for the current year and we are exploring how we can improve on this

6.62 Further information on the forum can be found on our website at:

yourpowerfuture.nationalgrid.co.uk/our-engagement-groups/connection-customer-engagement/distributed-generation-owner-operator-forum

Local authorities workshops

6.63 NGED hosts Local Authorities Workshops to provide local stakeholders with an update on the investment being made in their local network over the following year, learn about our low carbon strategies, discuss the impacts of specific schemes and deliver coordinated local development plans.

6.64 During 2022/23, we engaged with every Local Authority in our region and found that they are all at different stages of their task to create a Local Area Energy Plan (LAEP). As a consequence we have developed an online template for a Local Area Energy Plan (LAEP) which has received positive feedback.

6.65 We also hosted 11 local investment workshops for 102 stakeholders involved in growth agendas, such as Council Officers and Developers. The sessions provide opportunity for NGED to disseminate information and for stakeholders to provide feedback about their priorities in relation to electricity network.

Senior manager contact for major customers

6.66 Stakeholder feedback has indicated that major customers can benefit from a single point of contact where they deal with a large number of schemes. As a result a senior manager point of contact was introduced in 2016/17.

6.67 The role of the senior manager contact is to liaise with the customer to understand the range and scope of works they propose to undertake with NGED and act as a senior escalation point of contact to resolve issues. We have continued to offer this contact to major customers and extended the availability of this service to local government authorities and local enterprise partnerships to support long-term planning for connections growth. There were 86 customers choosing this option during 2022/23.

Output (39)	Host ‘surgeries’ every three months to help connection customers to understand our processes.

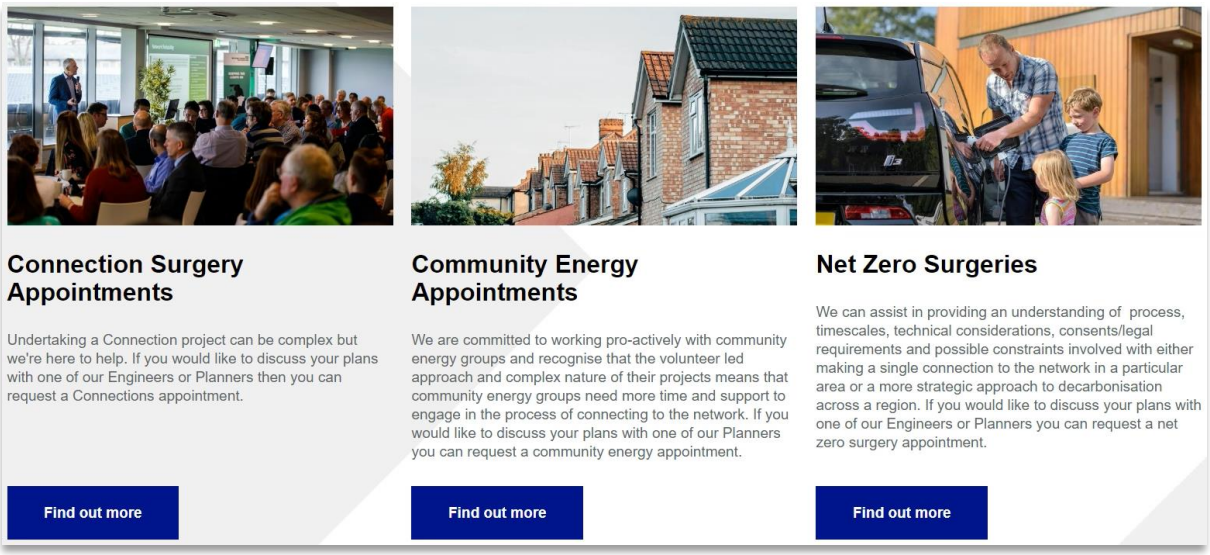
6.68 Local ‘surgeries’ for connections customers continue to be promoted.

6.69 In the first two years of RIIO-ED1 we advertised set surgery dates in specific locations in a range of relevant publications. We found however that customers were more interested in attending individual meetings arranged with a planner/engineer within their local depot with some simple queries being resolved over the phone.

6.70 We have therefore amended our approach, rather than advertising set dates over the year we offer customers the opportunity to arrange a surgery (referred to as a connection appointment) at a time and location that suits their application.

6.71 We now offer customers the opportunity to make either a Connections Surgery Appointment, a Community Energy Appointment or a Net Zero Surgery. Giving customers the opportunity to discuss plans with us at an early stage helps us to identify any potential network reinforcement and complexity issues that may arise. Customers can establish the viability of an individual scheme before committing to a formal application and incurring associated costs (including assessment and design fees).

6.72 In 2022/23 we held 31 Community Energy Surgeries with 152 participants, 40 Community Energy dissemination events for 728 stakeholders and 4 community energy events for 80 stakeholders.



Connections Guaranteed Standards of Performance

Output (41) Aim to achieve no failures of the connection GSOPs.

6.73 During 2022/23 NGED provided 127,385 services that were subject to the connections guaranteed standards and failed to achieve the standard in only 30 instances.

6.74 The Connection Guaranteed Standards of Performance detail minimum levels of service and set out the level of payments to customers where these standards are not met. There are thirty connection guaranteed standards of performance covering all aspects of connection provision. There are also further standards that cover services provided under competition in connection.

6.75 Each failure against a guaranteed standard results in a payment to the customer, with the majority of connection standards having a per day cumulative penalty.

6.76 For RIIO-ED1, NGED voluntarily doubled the value of payments for any failures against guaranteed standards.

6.77 During RIIO-ED1, NGED committed to a tough challenge, targeting zero failures against all of the connection guaranteed standards. In 2022/23 we have had 30 failures against the connection GSOPs, and only a further four failures against Ofgem's Competition in Connection standards. The overall performance is summarised in the table below:

Connections Guaranteed Standards Performance

Guaranteed Standards	Failures	Services	%age
Budget estimates and quotations	5	56,754	0.01%
Other connections related services	0	56,134	0.00%
Unmetered services	25	14,497	0.17%
Total	**30**	**127,385**	**0.02%**
Competition in connection standards	4	13,124	0.03%

6.78 We aim to learn from every failure and maintain high standards of service.

Further developing a competitive market

Output (42)	Improve customer awareness of other connection providers and regularly check that customers understand the options available to them.

6.79 Prior to the introduction of competition for the provision of connections, customers could only request a connection from the incumbent DNO. It is now possible for third parties to carry out connections work, 'in competition' with the DNO.

6.80 The industry has a code of practice to facilitate competition; this covers the processes, practices and requirements that a DNO will use where an ICP seeks to undertake contestable works. The code therefore influences some of the actions required by DNOs to facilitate competition.

6.81 Over time, the scope of contestable connections work which can be undertaken by third party providers has gradually been extended. NGED has committed to both improving customer awareness of third party providers and to extending the types of work that can be undertaken by these providers.

6.82 To ensure that connection customers are aware that alternative providers exist, we provide links to competition in connection information on the main connections page of the NGED website; our connection process flowcharts include the option of using third party connection providers and we include information about the availability of flexible connection providers in connection packs sent to customers.

6.83 In September 2021 we undertook a review of the existing information we publish about the role of ICPs and IDNOs to ensure that information is as clear as possible, this included providing links enabling customers to locate ICP and IDNO companies operating in NGED's area. We also placed a banner on the main connections page promoting the fact that customers have a choice on who constructs or owns new network.

6.84 Annual customer satisfaction surveys include questions designed to gauge customer awareness of alternative providers. The surveys ask large connection and distributed generation customers who have obtained a connection from NGED whether they were aware that they could have asked a third party to provide the connection.

6.85 Awareness continues to increase and the 2022/23 results of the survey show that awareness is high with 84% of customers aware that they can use an alternative provider to deliver their new connection.

Raising awareness of the Code of Practice

6.86 NGED contributed to the development of the industry's Competition in Connections (CIC) Code of Practice and has implemented internal policies and procedures to ensure compliance. Information and guidance is also published on our website.

Output (43)	Work with other connection providers to extend the type of work they can carry out, including high voltage and reinforcement work.

6.87 NGED actively assists competition by developing processes and systems to allow third party connection providers to extend the scope of what they can do.

Working with connection providers

6.88 We carry out specific engagement with Competition in Connection (CIC) stakeholders to ensure that we receive detailed feedback to enable us to make improvements in this area.

6.89 During 2017/18 we created a forum to focus on the specific needs of CIC stakeholders; the CIC group. The group provided feedback on our CIC services, reviewing proposals for improvement initiatives and informing the development of the ICE workplan.

6.90 The number of attendees has progressively reduced since the forum was created and in 2021/22 we agreed with stakeholders to incorporate the forum into the activities of the Customer Connection Steering Group.

6.91 In 2022/23 NGED trialled the use of virtual audits and inspections of ICP work to improve our post acceptance inspection programme. The ICP virtual audits provide a more efficient service to customers and feedback from stakeholders has been positive. We are now in the process of finding a virtual audit partner to implement this on a wider scale.

6.92 In 2022/23 we have provided online education and training for 550 colleagues involved in CIC in response to the considerable growth in the market.

6.93 We continue to make progress towards digitalising the process between the DNO and ICP.

Extending contestable work

6.94 Since 2013, NGED has been developing processes that allow third parties to carry out work on the HV network. Initially this focused on HV jointing, allowing third party jointers to carry out physical connection work on site. This was followed by the introduction of processes to allow third parties to carry out their own switching, testing and commissioning.

6.95 The scope of work that can be undertaken by competitors has gradually increased and this has been facilitated further by NGED's response to the implementation of the CIC Code of Practice. We have been working with CIC stakeholders to develop processes for determining the point of connection to the network, approving the design of the connection and the delivery of connection work on site.

6.96 In response to CIC feedback we have updated policy to enable ICP connections to the overhead HV network and expanded the scope of LV disconnections associated with developments. ICPs are undertaking disconnections of LV services where they are able to.

6.97 We have also published guidance for new ICP entrants providing an overview of working in NGED's region.

Design of Points of Connection

6.98 We have implemented processes that allow ICPs to self-determine the point of connection to the existing network (for the majority of straightforward connections).

6.99 These processes were implemented in September 2015 and we have seen the following volumes during 2022/23.

Determined points of connection (all voltages)

	Volumes	%
Self-Determined POC by ICP	32	0.35%
NGED Determined POC	9,220	99.65%
Total POC's	9,252	

6.100 In addition, ICPs have the option to design the network connection without the need for design approval from NGED. Processes and procedures for authorised ICPs to carry out self-approval have been developed to facilitate competition in connections and the volumes during 2022/23 were as follows.

Approval of ICP designs (all voltages)

	Volumes	%
ICP Self-Approved Design	378	29%
NGED Design Approval	943	71%
Total POC's	1,321	

6.101 Implementation has been assisted by the ICE initiatives delivered during 2022/23, such as self-service tools and automated approvals, which enhanced the policy and procedures for self-design by ICPs, but the proportions of activity carried out by ICPs have remained broadly the same since 2018/19.

Delivery of physical connection work

6.102 We work with stakeholders to support the development of competition in connections work.

6.103 Various arrangements have been put in place including allowing third party jointers to carry out physical connection work on site, introduction of processes to allow third parties to carry out their own switching, testing and commissioning and implementation of hybrid agreements where switching is undertaken under NGED's safety rules whilst the associated jointing work is undertaken under the ICP's safety rules.

6.104 In 2022/23, 87 of the 529 HV points of connection were completed by third parties.

HV Point of Connections (POCs) completed

	2015/16		2016/17		2017/18		2018/19		2019/20		2020/21		2021/22		2022/23	
	Volumes	%	Volumes	%	Volumes	%	Volumes	%	Volumes	%	Volumes	%	Volumes	%	Volumes	%
HV connected by ICP	10	4	15	7	19	8	36	13	74	30	36	11	87	23	87	16
HV for ICP connected by NGED	214	96	213	93	225	92	233	87	174	70	296	89	300	76	442	84
Total POCs	224		228		244		269		248		332		387		529	

Customer Satisfaction

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23
31 October 2023

Electricity Distribution

nationalgrid

Customer satisfaction

Contents

7 Customer satisfaction

7.1 The provision of excellent customer service for NGED's 8 million customers is a core business objective.

7.2 NGED has committed to a range of outputs to improve customer satisfaction.

7.3 The Customer Satisfaction outputs are in six themes.

- Customer service
- Telephone response
- Communication with customers
- Stakeholder engagement
- Complaints
- Guaranteed Standards of Performance awareness

Regulatory framework

7.4 Ofgem assesses customer service using the Broad Measure of Customer Satisfaction (BMCS). BMCS is an incentive mechanism that provides rewards or penalties in three areas of customer service – customer satisfaction, complaints and stakeholder engagement.

7.5 Customer satisfaction is assessed through a survey and deals separately with three types of interaction.

- Customers requesting a connection (minor connections only).
- Customers experiencing a supply interruption.
- Customers making a general enquiry.

7.6 The complaints element of the BMCS results in penalties where DNOs do not meet specified target performance. The measure is subdivided into four components with greater weighting applied to repeat complaints and complaints that take longer than 31 days to resolve.

7.7 The final part of the BMCS considers stakeholder engagement with rewards available for DNOs that engage well and use the information obtained to improve the service provided to customers. This incentive has been strengthened to encourage DNOs to focus more on issues relating to vulnerable customers.

Overview of customer satisfaction outputs

Customer service		
44	Continue to be the top-performing DNO group across all elements of the Broad Measure of Customer Satisfaction.**	Across RIIO-ED1, NGED is a top-performing DNO group for overall customer satisfaction. The rating combines results of the three surveys for supply interruptions, connections and general enquiries.
45	Maintain certification to show that we meet the Customer Service Excellence standard.**	We were awarded 'Compliance Plus' status for 47 of the 57 standards. We were the highest-scoring UK organisation out of all those accredited.
Telephone response		
46	Respond to phone calls quickly, answering them within two seconds.**	Our average response time for customer calls was 3.51 seconds for fault and emergency calls
47	Limit the number of calls that are abandoned before we can answer them to less than 1%.**	0.56% of calls were abandoned, significantly better than our target
48	Always provide customers with the option to talk to a member of staff when they call our contact centre.	Our systems allow us to make sure that customers are always provided with the option to talk to a member of staff.
Communication with customers		
49	Provide a restoration time for every power cut.**	All power cuts have an estimated restoration time which is updated as further information is provided by field teams.
50	Contact all customers who have been in contact about a fault.**	We contacted 99.55% of customers who contacted us about a fault.
51	Contact customers within two days of receiving an enquiry which was not about a fault.**	We contacted 87.15% of customers who contacted us with an enquiry which was not about a fault within two days.
52	Provide 'on-demand' messaging through text and social media for customers who want to be kept informed in other ways, rather than a phone call.	We provided on-demand messaging through text and social media and we proactively send text messages during high voltage power cuts.
53	Develop 'self-service' options for customers to find information online.	We hosted 23,076 webchat conversations, 46,984 Priority Services Register applications were made online and we had 2,125,453 hits on our online map showing details of individual power cuts.
Involving stakeholders		
54	Continue to host a customer collaboration panel where our President will meet with our expert stakeholders four times a year.	The Customer Panel met four times during the year.
55	Continue to host at least six stakeholder workshops each year.	We hosted three virtual workshops, four in person workshops and an additional two hybrid workshops where stakeholders could attend either online or in-person.
56	Continue to produce a stakeholder report every year providing an update on the actions we have taken as a result of stakeholder involvement.	A yearly Business Plan Commitments summary report and the separate detailed report replace the stakeholder report.
Complaints		
57	Resolve at least 70% of complaints within one day.**	We resolved 86.98% of complaints within one day.
58	Continue to have a target of no complaints where the Ombudsman has to get involved.**	There were 4 complaints referred to the Ombudsman. The ombudsman did not rule against NGED in any of these cases.
Guaranteed Standards of Performance awareness		
59	Continue to send the 'Power for Life' publication to all customers and make sure it promotes the GSOPs.**	We last issued 'Power for Life' to all customers in April 2021. It included information on GSOPs.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Customer service

Output (44)	Continue to be the top-performing DNO group across all elements of the Broad Measure of Customer Satisfaction.

7.8 NGED committed to remaining the top performer in the customer satisfaction survey part of Ofgem's Broad Measure of Customer Satisfaction.

7.9 There are three separate customer satisfaction surveys that are carried out covering connections, supply interruptions and general enquiries.

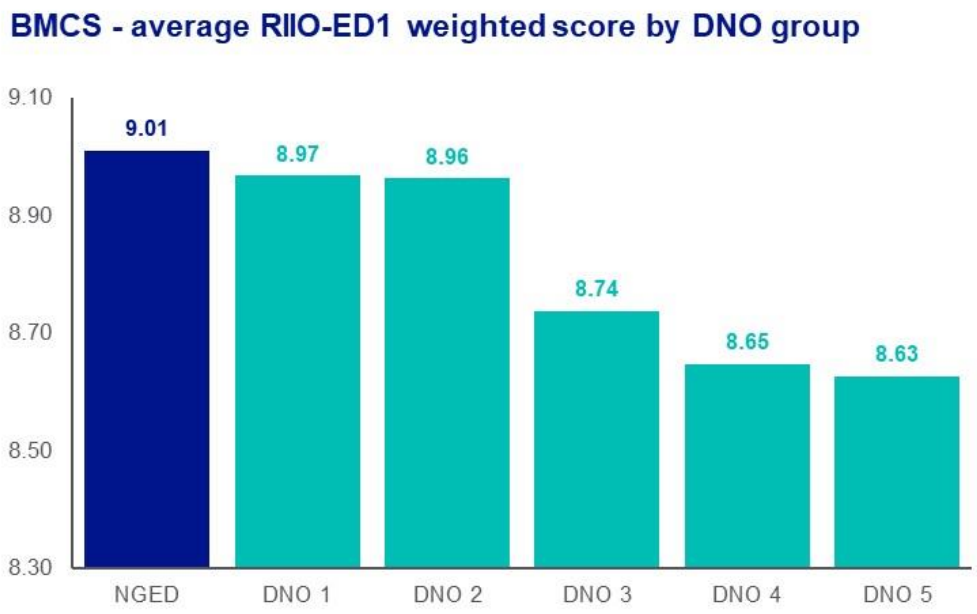
7.10 Performance in each component is subject to separate assessment, leading to rewards or penalties based upon comparison against a target score of 8.2 out of 10. In RIIO-ED1, Ofgem has placed a greater emphasis on connections within incentive reward and penalty mechanisms. The relative weighting for the three categories is shown below.

Relative weighting of customer satisfaction survey	
Connections	50%
Supply interruptions	30%
General enquiries	20%

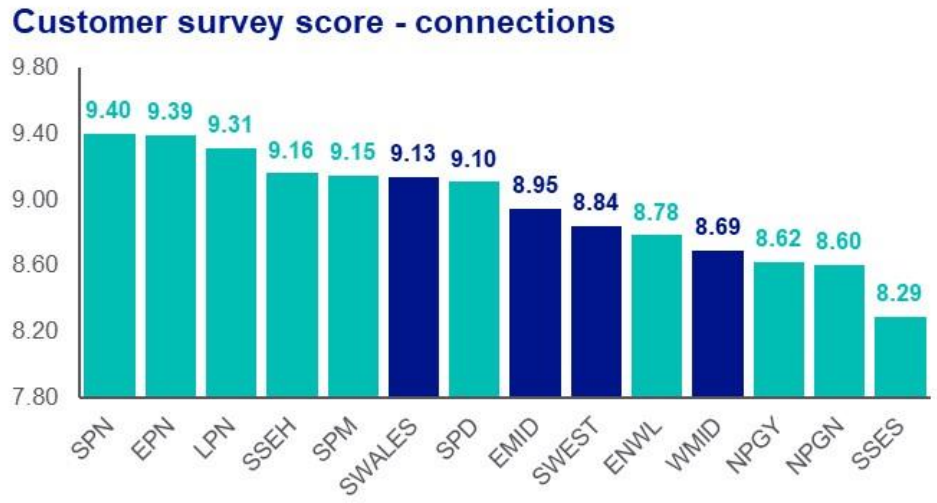
7.11 This relative weighting can be used to combine the scores from the three components into an overall customer satisfaction score.

Overall customer satisfaction

7.12 NGED is the top performing DNO group compared with other DNOs when considering the scores for the whole RIIO-ED1 period (amalgamating results for the three surveys for connections, supply interruptions and general enquiries across RIIO-ED1 to date), as shown below.



7.13 While NGED has been the leading DNO at the start of RIIO-ED1, performance across the whole industry is progressively improving making it more difficult for NGED to maintain top performance position. The 2022/23 performance in the three separate components is shown below for each licence area.



7.14 Further improvement to processes, systems and customer interactions are being sought across all areas to return NGED's performance to the top ranking.

Output (45)	Maintain certification to show that we meet the Customer Service Excellence standard.

7.15 In order to gain an independent view of customer service NGED committed to maintain certification to the Customer Service Excellence standard. The Customer Service Excellence standard is a Government scheme which recognises organisations that provide effective and excellent customer service.

7.16 NGED has been certified to the standard since 1992 (when it was known as the Charter Mark).

7.17 Every year Customer Service Excellence assessors review customer service against five criteria.

- Customer insight
- Culture of the organisation
- Information and access
- Delivery
- Timeliness and quality of service

7.18 In 2022/23 NGED maintained its performance level achieving a 'Compliance Plus' rating for 47 out of a total of 57 standards (receiving a compliance rating for all others). NGED was the highest scoring UK organisation out of 600 companies.

7.19 This year also saw us mark 30 years of outstanding customer service, externally accredited by Customer Service Excellence (CSE) and ten years of achieving the Standard for Inclusive Provision (BS18477).

Telephone response

Output (46) Respond to phone calls quickly, answering them within two seconds.

7.20 Allowing customers to speak to someone is an essential part of good customer service. We continue to operate regionally based in-house contact centres that are adequately staffed to provide a fast response.

7.21 Where circumstances lead to exceptionally high call volumes we expand the number of call takers by using trained staff across our business to maintain service levels. We also provide facilities for contact centre and other trained staff to take calls at home, should bad weather prompt this need.

7.22 We recognise that customers can be frustrated when their calls are not answered quickly, so NGED focusses on answering calls quickly and has a track record of doing so.

7.23 During RIIO-ED1 we have committed to an ambitious target of answering calls within two seconds. While we have achieved this in prior years, the target has been missed since 2020/21 when a large number of our agents began working from home during the Covid 19 pandemic. Communication network limitations mean that some time delay occurs when routing calls from NGED systems to these agents.

7.24 Our telephone answering is fast and the average response times for fault and emergency calls in 2022/23 are detailed in the table below. Overall, the average response time in 2022/23 was 3.51 seconds, an improvement on our response times in 2020/21 which is when agents started to work from home.

Average response time for customer calls (seconds)

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22*	2022/23
West Midlands	1.75	1.81	2.09	1.87	2.15	5.24	20.23	4.30
East Midlands	1.46	1.89	1.97	1.56	2.25	5.19	18.54	4.01
South Wales	1.45	1.45	1.59	1.39	1.50	5.47	20.17	2.95
South West	1.40	1.51	1.70	1.44	1.75	5.78	22.11	2.80
NGED Total	1.51	1.66	1.84	1.56	1.91	5.42	20.26	3.51

* Note – response times in 2021/22 were impacted by storms Arwen and Eunice; disregarding these two events the average response time was 5.1 seconds.

Output (47) Limit the number of calls that are abandoned before we can answer them to less than 1%.

7.25 Abandoned calls arise when customers decide to hang up before they speak to a call taker. This typically arises when customers are being kept on hold for a long time. NGED's approach of answering calls quickly results in very few abandoned calls. During RIIO-ED1 we have committed to a target of having less than 1% of our inbound calls being abandoned.

7.26 In 2022/23, 0.56% of fault and emergency calls were abandoned, beating our target.

Communication with customers

7.27 Keeping customers informed and updated about enquiries and services is important.

7.28 NGED uses a variety of methods to ensure that communication remains effective and appropriate for our broad customer base. During RIIO-ED1, we have committed to developing new channels of communication beyond the traditional telephone and written methods – including online, e-mail, text, smart phone and social networks.

Output (48) Always provide customers with the option to talk to a member of staff when they call our contact centre.

7.29 When a customer calls about a fault, NGED uses recorded messages to provide information relating to the area where the incoming call is placed. These messages are updated as more information about supply interruptions becomes known.

7.30 Whilst providing recorded messaging is adequate for many customers, some prefer to speak to a call taker to find out further information or to get reassurance about when supplies will be restored. The telephony system used by NGED always provides customers with the option to talk to a call taker.

Output (49) Provide a restoration time for every power cut.

7.31 When supplies are interrupted, customers require information about when they will be back on supply. In the RIIO-ED1 Business Plan, we stated that we would be obtaining regular progress updates from field staff in order to provide a restoration time for every outage.

7.32 During RIIO-ED1 we have introduced a process whereby an estimated restoration time (ETR) is automatically populated into our incident management systems. The initial ETR estimates are based on an analysis of the details of the fault – i.e. whether it affects the high or low voltage network, and typically how long it takes for specific fault types to be resolved.

7.33 All contact centre staff have access to the data and can ensure that customers are kept well informed in relation to the likely timeframes for restoration of supply.

7.34 During the course of a fault, dispatch teams gather information from field staff at regular intervals to update the ETR. The incident management system automatically reviews the ETR status of each fault every five minutes and uses an algorithm to prompt members of the dispatch team to update these in advance of the ETR expiring.

7.35 The data about ETRs is linked to the NGED website and the NGED Power Cut app which provides automatic alerts to customers. This enables customers to keep track of the ETR without having to contact NGED directly.

7.36 Additionally, we have introduced a service for PSR customers, proactively contacting them via voice and text messages to let them know about power cuts and the estimated restoration. Where automated voice messages are sent to PSR customers they have the option to be immediately transferred through to a NGED advisor.

Output (50) Contact all customers who have been in contact about a fault.

7.37 When customers contact NGED because they are off supply the main thing they want to know is when the power will be restored. While we provide an estimated time of restoration when the customer calls through automated messaging and the Power Cut app, this may change as the fault progresses. For these situations NGED has implemented a process of proactively contacting customers.

7.38 When a customer calls about a power outage their details are logged and automatically added to a call back list. When not taking inbound calls, contact centre staff progressively work through the call back list during the course of the fault. Customers who are medically dependent on electricity are given priority.

7.39 The call back process can result in a contact centre team member speaking to the customer, leaving a message or sending a text message. Where there is no reply or an engaged tone the customer's details will be returned to the call back queue.

7.40 A small proportion of customers reject a call back or do not provide contact details and on occasion we also receive calls from third parties who are not able to provide the customer's contact details.

7.41 During 2022/23 call backs (or another form of contact) were made to 99.55% of customers who were in contact about a fault.

Output (51) Contact customers within two days of receiving an enquiry which was not about a fault.

7.42 When customers make any non-fault related general enquiry, their details are logged by central administrative staff and a prompt is created for local teams to contact the customer.

7.43 During RIIO-ED1, NGED has committed to contacting customers with non-fault enquiries within two working days. During 2022/23, we had over a quarter of a million enquiries and responded to 98% within two working days as shown below.

Customers contacted within two days of a non-fault enquiry (%)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Number of enquiries	74,650	82,061	36,524	68,144	261,379
Percentage contacted within 2 working days	99.53%	96.86%	99.03%	97.39%	98.06%

7.44 In order to achieve these levels of performance NGED uses a more challenging internal target of contacting customers within one day. Where contact has not been made within one working day of the enquiry, an automated email is sent to the local manager, which is repeated daily until the contact is made.

7.45 There are occasions where the customer does not respond to telephone contact and in these circumstances an email or letter is sent to the customer to identify next steps so that the enquiry can be either progressed or closed.

Output (52)	Provide 'on-demand' messaging through text and social media for customers who want to be kept informed in other ways, rather than a phone call.

7.46 During RIIO-ED1 NGED has committed to providing network information for customers through on demand messaging via text and social media – sending information to customers who wish to be kept informed.

7.47 We monitor social media in several ways

- Likes are where individuals show their interest in social media content by positively indicating that they like the content,
- Followers are individuals who subscribe to a social media account to receive regular updates and posts in their news feeds,
- Engagements are interactions with social media content,
- Impressions are views of social media content.

Twitter

7.48 NGED started to use Twitter to interact with customers in July 2013. The number of Twitter followers has grown year on year, increasing from 13,666 in 2015/16 to 47,124 in 2022/23. Our Twitter feed provides updates on outages (using the handle #powercut) and enables customers to interact with us, ask questions and provide information. We proactively tweet on all faults where over 500 customers are off supply and on faults that have prompted a number of social media queries or calls. We also use Twitter to promote NGED information campaigns such as public safety.

7.49 We seek to use Twitter innovatively to raise awareness of the business and to interact with our customer base on various electricity related issues – often reaching customers who might be less likely to engage via more traditional methods.

Facebook

7.50 NGED launched a profile on Facebook in February 2015, using it as a mechanism to provide customers with information on outages but also to raise awareness on key matters such as landowner safety, child safety, our apprenticeship scheme and our annual customer awareness campaign 'Power for Life'.

7.51 We look to post on Facebook once a day, on average, providing engaging content with regular features, latest news updates, business/industry information and key messages promoting who we are and what we do.

	2018/19	2019/20	2020/21	2021/22	2022/23
Total Likes	14,919	19,493	22,100	26,270	26,825
Engagements	117,831	213,656	208,616	528,742	219,831
Impressions	5,480,828	4,968,927	3,230,926	10,601,535	4,300,919

LinkedIn

7.52 We launched a NGED LinkedIn page in February 2017 page, LinkedIn is used to provide business news and to promote general campaigns as well as information on careers within NGED. We use the page as a forum to generate discussion on our business and the wider industry.

	2018/19	2019/20	2020/21	2021/22	2022/23
Total followers	6,212	12,363	18,923	29,128	207,645
Engagements	4,453	8,210	6,631	99,803	25,786
Impressions	249,615	450,543	487,327	1,771,881	535,502

Instagram

7.53 Instagram enables us to promote NGED to a new, potentially younger, audience. We aim to post interesting and eye-catching imagery, relevant to the business, while using hashtags to generate a following.

	2018/19	2019/20	2020/21	2021/22	2022/23
Total followers	1,231	2,238	2,928	4,023	4,085
Engagements	92,122	504,263	497,128	25,056	9,958
Impressions	158,726	540,765	525,904	1,906.231	4,019,009

Text messaging

7.54 In 2015/16 we introduced a system to send proactive text message updates to customers affected by power cuts. In 2016/17 it was developed into a two way text messaging service so that customers could respond to our messages with queries; this was initially introduced for deaf/hard of hearing customers but we have expanded usage to include all customers.

7.55 Customers who have contacted us regarding a power cut are automatically added to a list to receive a proactive call back to provide them with updates regarding the fault. While call backs are generally made by phone a number of customers prefer receiving them via a text message.

7.56 There are exceptions to using text messages – for example we will always call customers on our Priority Services Register and if customers have experienced a supply interruption within the last week we will also ensure that they receive a phone call rather than a text message. Customers are given the opportunity to respond by text and we answer queries and provide further information in this way.

Output (53) Develop 'self-service' options for customers to find information online.

7.57 We ensure that our website is accessible to all customers, supporting individuals with a range of needs such as impaired vision, dyslexia or customers for whom English is a second language. A dedicated 'accessibility' page is clearly signposted on every page of the website. The page provides guidance on a range of options including adjusting font size, altering background colour and the availability of free software to support our customers.

7.58 We have a number of mechanisms designed to enhance the accessibility of the website. This includes the following:

- 'ReciteMe' which has the ability to convert to speech, reading out content to the user. The function allows translation into 103 languages, provision of text to speech and larger font.
- 'Robobraille' allows customers to quickly convert information or documents on our website into audio books, braille or another format.
- Animated videos on a variety of topics with British Sign Language make sure that deaf and hard of hearing customers can access key advice.

7.59 There are a number of 'self-service' options made available on the NGED website including the following:

- Webchat functionality allows visitors to the website to communicate online in real time with a NGED advisor 24 hours a day. Usage of the functionality is high, 23,076 chats took place during 2022/23 with customers indicating 94.4% satisfaction.

- A Power Cut app that can be downloaded, enabling individuals to register a post code so that they receive an automatic alert if a power cut occurs. The app also allows customers to report power cuts, register for the Priority Services Register and self-diagnose problems such as a fuse box trip or a pre-payment meter issue. During 2022/23 the app was downloaded 14,423 times.

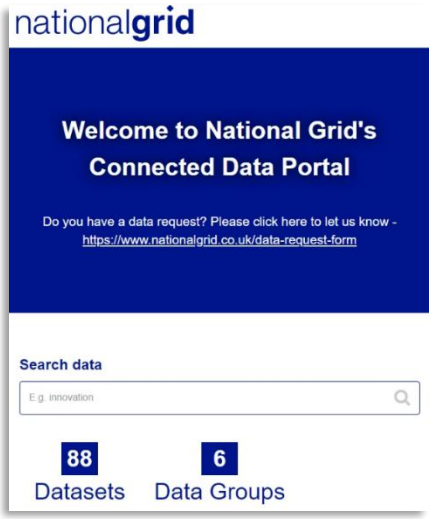
- A power cut map with integrated Twitter feed messages is available on our website, allowing quick and easy reporting of power cuts and access to live and updated fault information. The map had 2,125,453 million hits during 2022/23.

- A network capacity map which allows users to quickly view the capacity status at each of our primary substation sites – including storage, capacity headroom and reinforcement cost information. The map enables potential connection customers to assess the feasibility of schemes without the need for a formal application and was accessed 30,905 times this year.

- In 2018/19 we introduced a 'storm mode' for our website – in the event of a storm a simplified homepage permanently displays our power cut map, provides a link to PSR information and live power cut storm reports. This provides customers with vital information during widespread disruption.

- Connected Data Portal (CDP) was launched in 2021/22 to assist users in understanding how we are using digital technologies to meet the future requirements of the network. The CDP went live in March 2021 and has received 43,775 hits so far.

- A Flexibility Map, enabling customers to determine where flexibility services are currently required and likely to be needed in the future to aid their planning. The map was published on our new Flexible Power website which saw 1,890 hits in 2022/23. The website includes a Flexibility Valuation tool which allows customers to estimate value of providing flexibility services.



7.60 Usage of our self-service options has grown in most areas since 2014/15; a snapshot of the usage of some of our services is shown below.

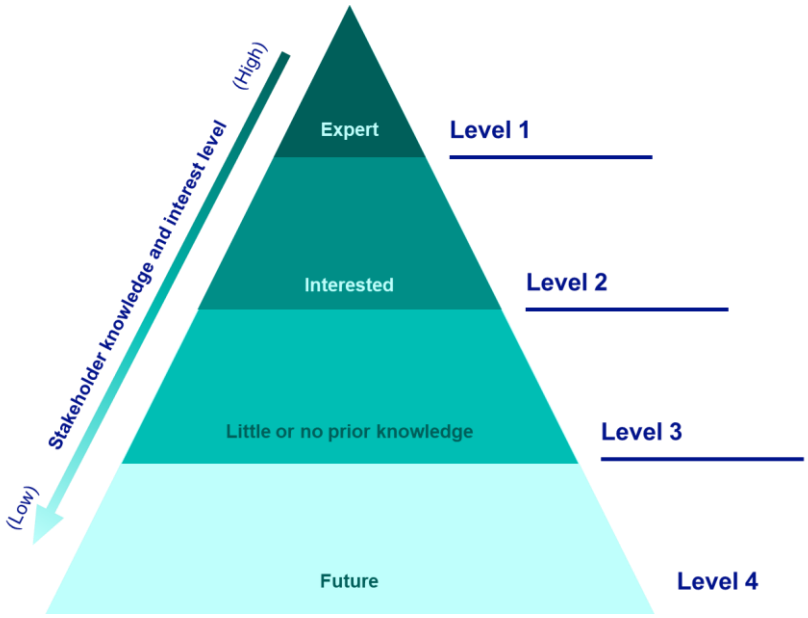
Usage of 'self-service' online information

Self-service option	2014/15	2022/23
Power cut map	323,837 hits	2,125,453 hits
Post code search	575,533 hits	416,720 hits
Online connection applications	2,811 applications received	15,532 applications received
Find your distributor	85,150 hits	25,011 hits
Who is my supplier (*went live in Jan '15)	31,803 enquiries	836,224 enquiries
Priority Services Register applications (online)	1,555	46,984

Involving stakeholders

7.61 Regular stakeholder engagement is used to improve day to day operations and inform business priorities. NGED has a database of approximately 5,500 stakeholder contacts, categorised into customer segments, allowing targeted engagement on specific issues.

7.62 We engage with stakeholders on a variety of levels, dependent upon their knowledge and level of interest as demonstrated in the diagram below.



Stakeholder Level	Engagement methods	
Level 1: Expert Stakeholders we work closely with to build their knowledge to an 'expert' level, or those who already have an indepth knowledge of connections activities.	• Customer Connection Steering Group • Stakeholder workshops • Consultations • Bilateral meetings	• Industry working group • External industry events
Level 2: Interested Stakeholders who interact regularly with NGED for connections activities and have a sizeable knowledge and interest in the area.	• Stakeholder workshops • Consultations • Bilateral meetings • Distributed Generation Suvey	• Connection Surgeries • Community energy events
Level 3: Little or no prior knowledge Stakeholders who may only interact once or occasionally for connections activities and have little knowledge of NGED or this area.	• Distriuted generation & customer surveys • Connection Surgeries • Annual stakeholder & ICE reports	• Website • Media awareness campaign • Social Media
Level 4: Future Stakeholders who may want connections in the future and may have no knowledge of NGED or this area.	• Connection Surgeries • Annual stakeholder & ICE reports • Community energy events & guide	• Media awareness campaign • Social media • Website

7.63 Part of the Broad Measure of Customer Satisfaction relates to stakeholder engagement. For RIIO-ED1, Ofgem has placed a greater emphasis on service for vulnerable customers as part of the assessment of DNO performance.

7.64 Under Ofgem's Stakeholder Engagement and Consumer Vulnerability (SECV) incentive, all DNOs provide information to an Ofgem expert panel about their stakeholder engagement

activities and consumer vulnerability programme and the panel score each company's performance.

Output (54)	Continue to host a customer collaboration panel where our President will meet with our expert stakeholders four times a year.

Customer Engagement Group

7.65 In preparation for the RIIO-ED2 price control, Ofgem set expectations for enhanced engagement, requiring DNOs to design, establish and resource Customer Engagement Groups (CEG) to scrutinise their Business Plans. During 2018/19 NGED appointed an independent Chair, agreed terms of reference and membership role descriptions, confirmed contracts with 14 members and started holding regular meetings.

7.66 In developing the RIIO-ED2 business plan, a number of CEG sub-groups were established to make better use of the knowledge of CEG members to provide more focused assessment of Business Plan proposals. A member of the CEG chaired each sub-group at which business experts provided details of RIIO-ED2 proposal. The CEG chair produced a summary of the discussions and recorded any CEG challenges. Closed CEG meetings (where only members of the CEG attend) were used by the CEG to freely discuss their observations, which were supplemented by open meetings where NGED representatives joined the discussions.

7.67 NGED values the input of the CEG and agrees with the CEG chair who has stated "The CEG will fulfil a vital role to ensure customers are placed at the heart of [NGED]'s plans for the future and that actions and decisions made by the company are truly positioned to deliver the long-term interests of consumers".


CEG Chair Duncan McCombie

7.68 During 2022/23 there have been regular CEG meetings addressing a range of Business Plan topics. There is a dedicated website for the NGED CEG where there are more details about the CEG members and minutes from the meetings. This can be found at:

customerengagementgroup.nationalgrid.co.uk

Customer Panel (previously known as the Customer Collaboration Panel)

7.69 During 2019/20 in anticipation of the appointment of the CEG, NGED redefined the role of its established Customer Panel. This has included the following.

- A new independent Customer Panel leader has been appointed to chair member-only closed sessions and to coordinate with members to set agendas.
- The introduction of 12 new members with expertise in low carbon technologies, DSO transition, Local Enterprise Partnerships representing regional concerns, consumer representatives and wider stakeholders from key segments including businesses, utilities, charities and the health sector.

7.70 The Customer Panel continues to meet quarterly, led by a NGED Director or the President. It critically reviews NGED's current performance, provides strategic steer on NGED's priorities for the future and acts as a sounding board for new ideas. To enable members to do this, the Customer Panel is provided with full transparency regarding NGED's performance and early sight of its plans for the future.

7.71 The Panel exists to provide expert advice and opinions and to work collaboratively with NGED to devise effective solutions and improvements for customers. The Customer Panel debates a broad range of activities - from the impact of EVs in the future, to power cut response times. Members provide steer throughout the lifecycle of a project: raising areas of

customer concern; providing advice and collaborative input to help NGED devise actions to address them; and, reviewing the impact post-delivery and suggesting further refinements.

7.72 Each meeting of the Customer Panel includes a session focusing on a different strategic priority. The topics covered during 2022/23 included the following:

- Factors that affect network resilience, such as demand on the network, asset replacement, increasing load on the network and fault detection technology.
- Low Carbon Technologies.
- Community Matters Fund and fuel poverty issues
- Winter Preparedness.
- Piloting additional Surgeries.

7.73 The Customer Panel provides independent challenge with the aim of improving service delivery for all customers. The Panel has produced a report which explains its role and some of the key highlights of their work with NGED during 2022/23. This report can be found on our website at the following link:

yourpowerfuture.nationalgrid.co.uk/our-engagement-groups/customer-panel

Output (55) Continue to host at least six stakeholder workshops each year. 

7.74 In addition to the Customer Panel, NGED engages with a wider audience through an annual round of generic stakeholder workshops. These have been carried out each year for the last 12 years and in 2022/23 we hosted nine workshops, over two series of events, with stakeholders from a range of backgrounds, covering all customer groups.

7.75 In June 2022, we hosted three virtual workshops focused on the RIIO-ED2 themes of Connectability, Sustainability, and Vulnerability and Affordabillity. Each workshop had a discreet theme covering one of the topics.

7.76 In September 2022, we hosted four in person workshops and two hybrid events (where stakeholders could attend either online or in person) in: Birmingham; Bristol; Milton Keynes; Nottingham; Cornwall and Cardiff. Each workshop included four sessions covering:

- A smart and flexible network, connections, community energy and innovation;
- Environment and sustainability;
- Customers in vulnerable situations, the Social Contract and customer service;
- Network resilience, safety, business IT and cyber security, and workforce resilience.

7.77 The workshops are designed to encourage dynamic roundtable discussions allowing stakeholders to share their views.

7.78 A summary report detailing the output of these sessions can be found on our website. To view these documents please use the following weblink.

yourpowerfuture.nationalgrid.co.uk/workshops-and-events

Output (56)	Continue to produce a stakeholder report every year providing an update on the actions we have taken as a result of stakeholder involvement.

7.79 A detailed report will continue to be produced every year providing an update of progress toward delivering RIIO-ED1 output measures.

7.80 The summary report will be produced concurrently with this detailed report and will focus on the key areas of interest indicated by stakeholders. The 2022/23 summary report is published on WPD's website; this can be found at the following link.

yourpowerfuture.nationalgrid.co.uk/summary-business-plan-commitments-report-2022-23

Complaints

7.81 NGED endeavours to get things right first time but sometimes things can go wrong. When complaints are received they are treated with urgency and with an aim to resolve them to the customer's satisfaction quickly. Local team managers are responsible for dealing with complaints; actively contacting customers, visiting them where necessary, to understand what can be done to put things right.

7.82 Performance in relation to complaints is measured within Ofgem's Broad Measure of Customer Satisfaction (BMCS) in four categories.

- Complaints unresolved after the first full working day
- Complaints remaining unresolved after 31 days
- Repeat complaints
- The number of Energy Ombudsman decisions that go against the DNO

7.83 NGED aims to have leading performance in each of these categories, avoiding penalties from Ofgem. Penalties are incurred if the combined score for complaints is above 8.33. For 2022/23, the whole industry has beaten this target, but NGED's performance remain significantly better than the target.

7.84 Our performance against the four categories is detailed in the following sections.

Output (57) Resolve at least 70% of complaints within one day.

7.85 NGED has committed to resolving at least 70% of complaints within one full working day, after the complaint has been received. This target has been achieved and exceeded in each of the four NGED licence areas.

Complaints resolved in one day (%)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Percentage of complaints resolved in day 1 – 2022-23	89.61	89.15	86.87	83.19	86.98

Complaints resolved within 31 days

7.86 NGED's focus on dealing with complaints quickly means that 98.07% are resolved within 31 days.

Complaints resolved within 31 days (%)

	West Midlands	East Midlands	South Wales	South West	NGED Total
Percentage of complaints resolved within 31 days – 2022/23	99.09%	99.02%	97.77%	96.65%	98.07%

Repeat complaints

7.87 A repeat complaint occurs where a customer returns to NGED at a later date to complain about the same issue. There were no repeated complaints during 2022/23.

Output (58) Continue to have a target of no complaints where the Ombudsman has to get involved.

7.88 Where customers are dissatisfied with a DNO's response to a complaint they have the option to raise their complaint with the industry Ombudsman. During RIIO-ED1 NGED has committed to ensuring that every complaint is adequately dealt with by NGED staff with zero complaints needing to be investigated by the Ombudsman.

7.89 The NGED output is subtly different to the Ofgem measure which forms part of the BMCS: Ofgem measures when an Ombudsman decision is made against a DNO, whereas the NGED output aims to prevent complaints being referred to the Ombudsman in the first place. However, customers may still seek an investigation via the Ombudsman.

7.90 During 2022/23 there were four complaints raised with the industry Ombudsman. In all cases the ombudsman did not rule against NGED.

Guaranteed Standards of Performance awareness

Output (59)	Continue to send the 'Power for Life' publication to all customers and make sure it promotes the GSOPs.	

7.91 Guaranteed Standards of Performance (GSOPs) set out the minimum service standards that DNOs must meet under Ofgem's regulatory framework. Where a standard is not met then a payment is made to that customer. GSOPs cover the provision of connections, supply interruptions and response to problems such as voltage complaints.

7.92 Where NGED is aware of a failure, a payment will be made without the need for a customer to make a claim.

7.93 NGED has committed to publicising GSOPs in our customer newsletter 'Power for Life'. The newsletter was last issued in April 2021 to all customers and included information on GSOPs – directing customers to find out more on our website.

Social Obligations

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23

31 October 2023

Electricity Distribution

nationalgrid

Social obligations

Contents

8 Social obligations

8.1 In delivering electricity to 8 million customers, we provide a range of services to fulfil our social obligations.

8.2 NGED broadly defines 'social obligations' as the role we have as a Distribution Network Operator to help customers in vulnerable circumstances.

8.3 In RIIO-ED1, NGED's social obligations outputs are in four themes.

- Improve understanding of vulnerability.
- Improve the data held on the Priority Services Register.
- Improve the services provided for vulnerable customers.
- Address fuel poverty by supporting customers to access key information

8.4 During RIIO-ED1, NGED has added to these initial commitments by creating new funding streams to provide financial and expert support to community groups tackling fuel poverty and related challenges.

Regulatory framework

8.5 For RIIO-ED1 Ofgem introduced the Stakeholder Engagement and Consumer Vulnerability (SECV) incentive. The incentive aims to encourage network companies to engage proactively with stakeholders in order to anticipate their needs and deliver a consumer focused, socially responsible and sustainable energy service. Rewards are available to network companies who can demonstrate high quality activities against set criteria.

8.6 NGED's SECV submissions can be found via the following weblink.

yourpowerfuture.nationalgrid.co.uk/ofgems-secv-incentive

8.7 The submissions provide information explaining NGED's approach to social obligations as well as broader information on stakeholder engagement and consumer vulnerability and the positive outcomes that we have delivered for customers.

8.8 Our 2022/23 submission shows how we delivered 308 key outputs and positive outcomes for customers. We invested £11 million delivering these outcomes, £400,000 more than 2021/22. We have also undertaken collaborative social value measurement research to understand the wider value to customers, the environment and society of the improvements that we deliver.

Evolving strategy

8.9 Our approach to our social obligations is continuously refined; informed by feedback from our stakeholders and working with them to co-create detailed actions to ensure we respond to changes in requirements and provide effective services.

8.10 Throughout 2022/23 we have conducted extensive engagement with stakeholders on our approach to consumer vulnerability, seeking direct input and building actions with them. Their priorities are reflected in our core mission to support customers in vulnerable situations through the following three key principles:

- Increase reach of our PSR and build customer resilience to power cuts;
- Tackle fuel poverty and cold homes;
- Ensure a fair energy transition for all.

Overview of social obligations outputs

Improving understanding of vulnerability		
60	Work with expert partners to improve our understanding of the needs of customers in vulnerable situations	We worked with a wide range of expert partners and were certified to the British Standards Institute Standard BS18477, which specifies requirements for responding to customers in vulnerable situations.
61	Train staff to recognise the signs of vulnerability.	We provided specialist training to the Priority Services Register (PSR) teams and contact centre staff. Field staff are trained on registering customers to the PSR.
Improving the data held on the Priority Services Register		
62	Contact vulnerable customers at least once every two years to check the details we hold on the Priority Services Register.	We continue to maintain and develop the Priority Services Register (PSR), proactively contacting over 2 million PSR customers during 2022/23 (931,879 through our data cleanse team 1,078,662 during power cuts)
63	Improve the quality of Priority Services Register data by working with other agencies and sharing information.	We increased the number of referral partners that we work with to 180 in total. We added 31 new partners in 2022/23, with the aim of achieving a better balance in the types of agencies that we work with.
64	Co-ordinate meetings with suppliers to agree criteria for vulnerability.	29 'common needs codes' are now in use across the industry.
Improving the services provided for customers in vulnerable situations		
65	Raise awareness of the Priority Services Register.	We worked with a range of organisations, including other utilities and fire and rescue services, to raise awareness of the PSR and used advertisements on Radio, in print and social media.
66	Make 10,000 crisis packs available.*	Over the RIIO-ED1 period we have issued 10,894 crisis packs, exceeding the target by 9%
67	Contact all customers who depend on a power supply for medical reasons every three hours during power cuts.**	In 2022/23 there were 53,919 customers who depend on a power supply for medical reasons that were affected by power cuts lasting longer than 3 hours. We make concerted efforts to contact such customers throughout the outages.
68	Continue to provide practical support through the British Red Cross and other organisations as appropriate.	British Red Cross support was not required in 2022/23. However we did use the help of the National Caterers Association during 21 prolonged power cuts, supporting 205 customers in total.
69	Ask for feedback from customers in vulnerable situations about our service.	We achieved customer satisfaction ratings of 9.1 out of 10 from customers on the PSR who had received a routine call to check their personal details.
70	Develop ways of sharing information with local resilience forums.	We work with local resilience forums across our four licence areas.
Reducing fuel poverty by supporting customers to access help		
71	Build a database of regional agencies we can refer customers to for help.	There are fuel poverty projects in all our areas, working with a network of support agencies.
72	Work with partners to develop links to and from our website.	Details on our fuel poverty projects and links to partner organisations are available on our website.
73	Develop joint information and awareness campaigns, and co-ordinate with partners to provide customers with help.	Our Power Up programme helped 7,886 customers save over £2.9 million in 2022/23.
74	Provide fuel poverty training to our staff who have contact with members of the public.	We provide staff in our contact centre with customised training on fuel poverty and customers in vulnerable situations.
75	Use data analysis to help identify areas with a high concentration of vulnerable households.	We use data analysis to identify areas with a high concentration of vulnerable households.
76	Develop local outreach services.	'Affordable Warmth' schemes helped 12,243 customers to save over £12.3 million this year.

* Targets are for the full eight year RIIO-ED1 period, not for a discrete year
** Target to be achieved each year of RIIO-ED1

Improving understanding of vulnerability

Output (60)	Work with expert partners to improve our understanding of the needs of vulnerable customers.

8.11 NGED is committed to developing an effective support network for vulnerable customers by working closely with partners who are experts in supporting customers in vulnerable situations.

8.12 We use inputs from a variety of social groups, through stakeholder engagement and partnership projects, to enhance our understanding of vulnerability.

8.13 Working with a variety of third parties ensures that we:

- consider a variety of viewpoints;
- are aware of evolving issues impacting vulnerable customers;
- overcome areas where we lack core expertise; and
- improve customers' awareness of the services NGED can provide.

8.14 Some of the initiatives that support our understanding of the needs of customers in vulnerable situations are detailed in the following sections but further information can be found within our 2022/23 SECV submission.

Working with partner organisations

8.15 We work with a range of partners to identify vulnerable customers, to examine the social issues facing them and to co-deliver projects.

8.16 Working with partner organisations allows us to share knowledge and explore alternative approaches, whilst extending our reach beyond those customers who contact us directly. The approach is cost effective because we utilise the expertise of partners rather than duplicating the activity of existing organisations.

8.17 We now have a network of 180 referral partners that we work with to support customers on our Priority Services Register, an increase of 20% since 2021/22. Social indicator mapping has been used to match areas of PSR eligibility with current low uptake in order to establish new partnerships in under-represented areas.

8.18 We work with fuel poverty partners, using a 'hub' model where a lead agency uses a pool of sub-partners, each with differing core expertise, to ensure that customers receive a range of support via a single point of contact.

8.19 Partner organisations have different levels of experience and knowledge and we seek to share best practice through an annual Consumer Vulnerability Conference. We invite stakeholders from a range of consumer groups including charities, local authorities and emergency services. The 2022/23 'Annual Consumer Vulnerability Workshop', was held in September 2022 and focused on supporting customers in a fair energy transition.

The Customer Panel

8.20 The Customer Panel is hosted by our President or an NGED Director and is a key part of our engagement programme. The panel brings together expert representatives from the major stakeholder groups and entrusts them with full transparency in relation to NGED's performance and future plans. This enables them to critically evaluate our performance, make informed decisions about our activities and provide a strategic steer.

8.21 At the close of 2022/23 the panel consisted of 28 permanent members who meet quarterly. The group consists of subject matter experts, consumer representatives and wider stakeholders from key areas including businesses, utilities and vulnerable customers. The

diversity of the Customer Panel ensures that we are provided with a balanced representation of views across a range of stakeholders.

8.22 The Customer Panel continues to advise, evaluate and co-create solutions with NGED. During 2022/23 we held focused discussions on social obligations, connections, Community Energy and network investment.

Stakeholder workshops

8.23 In June 2022, NGED hosted three virtual workshops focused on Connectability, Sustainability, and Vulnerability and Affordability. Each workshop was designed to seek feedback from stakeholders on one of the specific topics.

8.24 In September 2022, we hosted six workshops across our licence areas to gain an understanding from across the communities that we serve. All of these workshops were attended in person and two of the workshops had hybrid arrangements offering stakeholders the option to participate either in person or online. These six workshops involved 198 delegates representing stakeholder groups that included local authorities, domestic customers, consumer bodies, businesses, developers, utilities and other DNOs.

8.25 Round-table discussions at these events helped us to update our view of stakeholder priorities and refine RIIO-ED2 delivery plans in consideration of the changing energy landscape.

8.26 Summary findings reports from the workshops can be found at the link below.
yourpowerfuture.nationalgrid.co.uk/workshops-and-events

Building a common view of customer capabilities

8.27 Close engagement with our expert stakeholders is crucial to ensure NGED is able to understand and identify the needs of customers in vulnerable situations. This is especially important for the energy transition to a 'smart network'. In 2019, we joined forces with Scottish and Southern Electricity Networks (SSEN) and the Centre for Sustainable Energy (CSE) to create a bespoke research programme called 'Smart and Fair?', with the specific intention of turning the aspiration of 'no one being left behind' from theory into practical delivery.

8.28 At our Consumer Vulnerability Conference, stakeholders told us to prioritise supporting customers with lower than average technological skills or limited access to digital services. Citizens Advice produced a report in 2022 called 'Access Denied', which suggests that 1-in-20 adults do not use the internet, and 1-in-5 lack some of the essential skills for life. Without intervention, these customers risk being left behind in the energy transition.

8.29 Working closely with our partners we have piloted a pioneering model of support to provide Smart Energy Action Plans (SEAPs) tailored to customer capabilities and priorities. We focus on customers who would typically need extra support (e.g. PSR customers referred via 'Power Up') and the SEAPs are tailored to individual circumstances and offer support across six key topics. The pilot supported 162 customers, trained 37 SEAP advisors and created a new tool and suite of training materials, enabling partners to provide bespoke advice around how a customer could participate and benefit from smart opportunities. We also hosted our first DNO collaboration event, focusing on a fair energy transition for all and we will continue to share learning across the industry as the initiative develops.

8.30 We made tackling digital exclusion a key requirement of our 2022 Energy Affordability Fund projects, launching innovative new ways to identify and support customers to access information and digital services. We supported six projects in 2022 to deliver a range of activities, including delivering training on digital exclusion to community organisations and establishing five 'Digital Help Hubs' in areas where people cannot access online services.

8.31 Our Social Contract Working Group identified an opportunity to help customers through National Grid's IT refresh process. Working with social change charity, the Good Things Foundation, we piloted an initiative to donate our used iPads to vulnerable customers. We donated 465 iPads to digitally excluded customers via a network of 42 trusted charity partners in our region. Every customer supported also received in-depth digital skills training and free mobile data in collaboration with Virgin Media, O2, Vodafone and Three.

External validation of our approach

8.32 External validation of our approach gives us confidence that we are doing the right things to develop our understanding of vulnerability.

Customer Service Excellence Standard

8.33 Each year NGED's customer service is assessed against the government's Customer Service Excellence standard, part of which tests our customer insight, including the services we provide for vulnerable customers.

8.34 In 2022/23, we were successfully recertified against the Customer Service Excellence Standard. In total we achieved 47 out of 57 'Compliance Plus' ratings (achieving compliance in the rest).

8.35 This year we celebrated 30 years of achieving this certification. The CSE Assessor said "Excellent customer satisfaction and performance levels continue. Partnership arrangements and wider community activities are outstanding. Schemes for PSR customers provide holistic support for those in fuel poverty."

Certification for inclusive service provision

8.36 The British Standards Institute certification (BSI) – BS18477: Inclusive Service Provision specifies requirements for identifying and responding to consumer vulnerability. It recognises that vulnerability is dynamic and multi-dimensional and may vary over time and in different settings.

8.37 NGED uses assessment against the standard to improve the ability to recognise and address the broad and complex nature of consumer vulnerability, and as a result provide flexible and inclusive services. We put forward all key, new projects developed over the previous 12 months for the auditors to assess in terms of project effectiveness and inclusivity.

8.38 In 2022/23 the assessor undertook a robust three day audit of NGED, assessing our processes against 36 elements in the standard. The audit critically evaluated whether NGED's services effectively address consumer vulnerability, which included demonstrating that:

- we meet individual vulnerability needs;
- we provide improved services and accessibility as a result of engagement;
- we undertake partnership working; and
- we provide customer satisfaction.

8.39 NGED maintained full compliance with the standard for the tenth consecutive year.

Output (61) Train staff to recognise the signs of vulnerability.

8.40 All our contact centre staff receive regular specialist training in recognising signs of vulnerability. We have engaged expert organisations to ensure that staff have awareness of specific needs including customers with sight or hearing loss, dementia, Parkinson's disease, oxygen therapy, dialysis machines and mental health issues.

8.41 During 2022/23 we provided bespoke training for Contact Centre and Field staff to identify customers with mental health issues and enhance their understanding of how to refer customers to support schemes.

8.42 General vulnerability refresher training is provided to all contact centre staff each year, which includes an update on the PSR process and the activities of the PSR team. This training is held in advance of the busy winter months to ensure that staff are prepared for taking calls from vulnerable customers during cold weather and storms.

8.43 We have provided training to field based staff and depot based customer facing teams on recognising vulnerability, how to access support for customers through the British Red Cross and how to add a customer to the PSR.

8.44 In addition to training, we have implemented an internal App that supports our field staff by providing access to advice and information to support customers, with links to the practical community support schemes we operate. The App complements our training for customer-facing staff, and ensures they are equipped to help customers they encounter in a range of vulnerable situations.

Improving the data held on the Priority Services Register

Output (62) Contact vulnerable customers at least once every two years to check the details we hold on the Priority Services Register.

8.45 Our activities to improve the data we hold on the PSR include extensive data cleansing, working with suppliers, using data models to identify vulnerable customers and working with other agencies.

8.46 We have a dedicated team who undertake calls to check the details that we hold for individuals on the PSR and our general contact centre staff are trained to assist with this activity when the volumes of other calls are low.

8.47 Our systems prompt us to contact vulnerable customers every two years. In 2022/23 we made 2,010,541 proactive contacts to PSR customers in total, successfully updating 410,462 records as a result of this contact. Of those proactive contacts 931,879 customers were contacted via NGED's data cleanse teams and 1,078,662 were contacted via proactive calls to individuals on the PSR during power cuts.

8.48 We contact customers to update their details but also take the opportunity to offer advice to assist customers to improve their resilience to a power cut should such an event occur. Priority is placed on the quality, rather than quantity, of calls. There are no time limits for a conversation. We treat calls with sensitivity and we listen.

8.49 In order to ensure we are getting it right, we carry out annual, independent satisfaction research to measure the effectiveness of our engagement and identify improvements. In 2022/23 PSR customers who undertook a survey continued to rate our service as 9.1 out of 10.

Output (63)	Improve the quality of Priority Services Register data by working with other agencies and sharing information.

Informed consent

8.50 NGED works with third parties to register vulnerable customers on the PSR and, more recently, to share the customer data with other utilities, where the customer agrees. The processes we follow are designed to ensure that customers join the PSR with informed consent for data sharing.

8.51 We work with a network of partner organisations that have access to a range of customer groups. These partner organisations are well placed to discuss the PSR with customers directly and to identify whether the customer is happy for the agency to add them to the PSR. We hold best practice events for partners and use an e-learner tool to provide guidance on the process for adding customers to the register.

Collaborating with others already working with vulnerable customers

8.52 We have successfully added 31 new PSR referral partners, each one identified to address an area of vulnerability within NGED's region. We now work with a total of 180 PSR referral network partners.

8.53 We have continued to use data mapping to identify areas of high PSR eligibility but low current take up of joining the PSR. We use this information to guide our recruitment of new agencies. We aim to achieve a good balance in the types of referral agencies we work with (across charities, local authorities and health services). These agencies tend to work with different demographics of customers, enabling us to broaden the range of customers with whom we engage.

8.54 Frequent updates of the social indicator mapping allows us to identify changing requirements and needs. In 2021/22, we incorporated data and additional filters to identify customer digital access and capabilities.

8.55 To support our partners we have published our social indicator data in a downloadable format so that groups are able to use the data to better target their own services. In 2019/20 we co-developed an online PSR Hub with our Customer Panel, providing referral partners with a one-stop-shop to learn about the PSR, and to access data maps, user guides and training videos. We have continued to improve this facility in response to feedback from partner testing.

8.56 NGED has a number of fuel poverty outreach projects in place. Whilst the primary driver of these projects is to provide support to customers struggling to afford their energy, we ensure that projects also address power cut vulnerability, provision of resilience advice and promotion of the PSR.

Data sharing

8.57 The UK Regulator's Network has called on utilities to collaborate and securely share non-financial vulnerability data. An industry working group was set up to progress data sharing between networks and all water companies.

8.58 NGED's Customer Panel encouraged us to take a lead by ensuring that we have processes in place to share and receive data, and proactively engage utilities in our region to initiate data sharing. When we register new PSR customers we also capture their informed consent to share data with other utilities.

8.59 NGED was the first DNO to implement two-way data sharing with water companies. We now have agreements in place with seven of the eight water companies in our area, and continue to offer data sharing with the remaining company.

8.60 In 2022/23, 293,140 customers have benefited from record sharing.

8.61 We also have agreements in place with the three gas networks in our region to sign-up customers to the PSR on our behalf and for this data to be automatically shared with NGED.

8.62 We continue to pursue other utilities to engage in data collaborations as it can produce widespread and mutual benefits.

Output (64) Co-ordinate meetings with suppliers to agree criteria for vulnerability. 

8.63 As members of the Energy Networks Association (the industry body for UK electricity transmission and distribution) NGED has worked with other DNOs, Suppliers, Ofgem, charities and consumer bodies to implement a common set of PSR needs codes.

8.64 The Safeguarding Customers Working Group agreed 29 common needs codes to be used consistently by all parties nationally to identify and register customers. The new codes recognise the multi-dimensional nature of vulnerability and replace categorisations which were over 15 years old.

8.65 The introduction of automated two-way data flows between DNOs and suppliers in July 2017 allows NGED to send accurate and consistent customer records to suppliers.

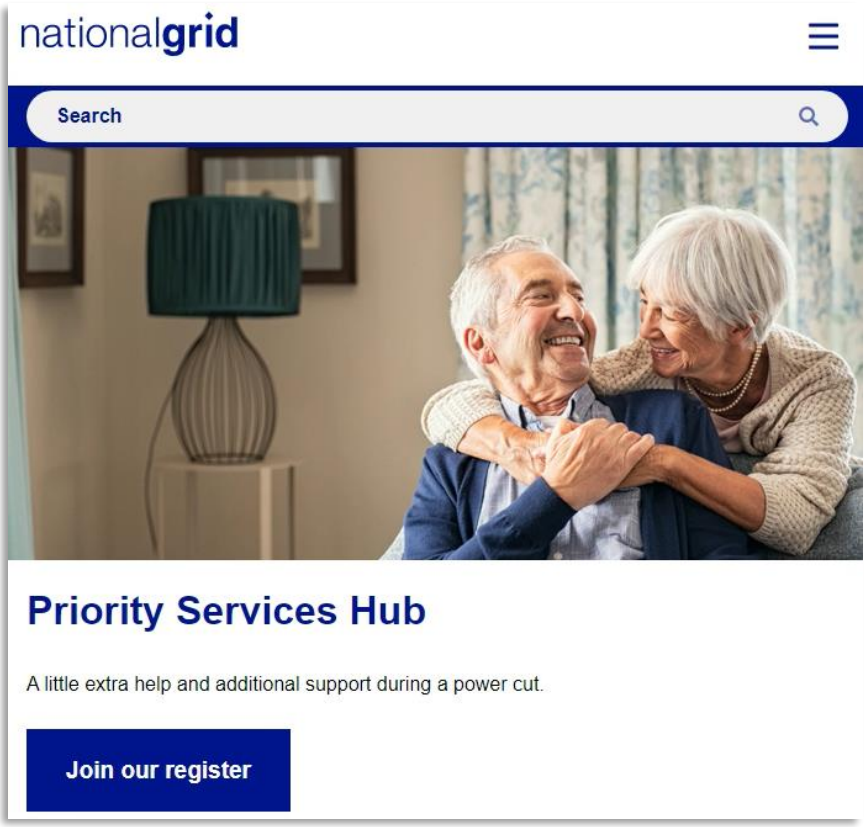
Improving the services provided for vulnerable customers

Output (65) Raise awareness of the Priority Services Register.

8.66 NGED has collaborated with other UK DNOs to identify approaches that can reach more customers who would be eligible for the PSR. Our updated methodology looks at household vulnerability - understanding how circumstances may combine or overlap. This has improved the accuracy of our PSR coverage. Our PSR Reach was 64.9% of eligible households in 2022/23 with 3.4% added in the year.

8.67 In addition to the proactive work that we undertake with partners to identify vulnerable customers we also take steps to raise general public awareness of the PSR via a variety of activities, as detailed below.

- Use of printed advertising campaigns, taking two full page adverts in more than 25 daily and weekly publications promoting PSR and winter preparedness
- Advertising on 300 buses with an estimated reach of 3.5 million
- Paid social media
- Digital advertising
- Radio advertising on Smooth and Gold radio networks reaching 717,000 listeners
- Two way data share agreements with seven water companies within our regions benefitting 293,140 customers over 2022/23.
- Partnering with a theatre group to put on a street performance on a high street in South Wales during a school holiday attracted members of the public with whom we shared information on the PSR and grid safety.



Output (66) Make 10,000 crisis packs available.

8.68 Crisis packs are intended to provide items that help during a power cut. They include items such as a flask, a torch, gloves, a hat, socks and information leaflets. NGED committed to distributing 10,000 crisis packs during RIIO-ED1. In 2022/23 we distributed 1,900 packs, making a cumulative total across the whole RIIO-ED1 period of 10,984 packs.

8.69 Crisis packs are distributed in a range of ways.

- Field staff can distribute packs as a result of a site visit and discussion with customers.
- Local depots are provided with stocks of crisis packs that can be distributed as required during a power cut.
- Partners such as the British Red Cross and Age UK are provided with stocks of crisis packs to distribute to customers where they identify a requirement.

8.70 We also provide analogue telephones to vulnerable customers who need a means of communication, because digital phones reliant upon mains power may not work during a power cut.

8.71 Staff are trained to identify signs of vulnerability in the customers they interact with and can provide crisis packs, arrange for the customer to join the PSR or activate support from the British Red Cross.

Output (67) Contact all customers who depend on a power supply for medical reasons every three hours during power cuts.

8.72 For unplanned outages, NGED committed to contacting medically dependent customers within the first three hours of a prolonged power cut to provide updates on power restoration times and to identify if additional support or further contact is required.

8.73 We provide this service around the clock and we attempt to contact all our PSR customers by text or telephone.

8.74 During 2022/23 NGED made 1,078,662 proactive contacts, via calls and texts, to PSR customers (all categories) during power cuts.

Output (68)	Continue to provide practical support through the British Red Cross and other organisations as appropriate.

8.75 During prolonged outages we request assistance from partner organisations to provide support to customers. For RIIO-ED1 we proposed to continue to work with the British Red Cross and the Royal Voluntary Service for these services, but the Royal Voluntary Service ceased to provide the support we require, we therefore established a new arrangement with the Nationwide Caterers Association.

8.76 Contact centre staff have the facility to request that the British Red Cross assist with the provision of warm meals, drinks, crisis packs and general welfare checks during an outage. Use of the British Red Cross can also be prompted by field staff who are concerned about customers, however their help was not required in 2022/23.

8.77 Our agreement with the Nationwide Caterers Association enables us to provide hot food and drinks for communities impacted by prolonged power cuts. During 2022/23 we utilised this service on 21 occasions, assisting 205 customers.

Providing assistance during system emergencies

8.78 System emergencies such as damage caused by severe weather can leave vulnerable customers without power for prolonged periods of time.

8.79 NGED has a range of vehicles suitable for operating in severe weather conditions that can be used to reach vulnerable customers to provide support. This includes use of the NGED helicopter fleet (where weather conditions permit flying), boats and amphibious vehicles.

8.80 The key capabilities of the Helicopter Unit have been extended to include:

- delivery of provisions to remote customers who are without power;
- delivery of water pumps and electricity generation; and
- customer evacuation.

8.81 Providing this assistance requires staff to be trained to prepare them for the challenges associated with severe weather. During 2022/23 the following training was delivered.

Staff training for severe weather (staff trained)

Training type	West Midlands	East Midlands	South Wales	South West	Total NGED
Off road driver training	11	18	7	10	46
Water first responder – operating safely in or near flood water	1	20	7	2	30

Output (69) Ask for feedback from vulnerable customers about our service.

8.82 Feedback from customers is invaluable in assisting us to make sure that we are supporting customers effectively and that the service we provide is appropriate.

8.83 As well as the surveys undertaken as part of Ofgem's Broad Measure of Customer Satisfaction, NGED commissions additional research which tests the satisfaction levels of a broader group of customers and identifies potential improvements to our services. Research is conducted by expert external research providers to ensure that the results are objective and robust. We survey customers to measure satisfaction after actions have been taken and to identify potential improvements.

8.84 We undertake surveys to understand the views of vulnerable customers in the following groups:

- PSR customers contacted by NGED's PSR data cleanse team to update their details and to offer power cut advice
- Customers who have been referred to a 'Power Up' partner agency for fuel poverty advice
- Customers who have been identified by one of our four Affordable Warmth fuel poverty outreach schemes

8.85 Customers are asked to rate our service out of ten and the results of these surveys are shown below.

8.86 The feedback received from the satisfaction surveys is used to ensure that we deliver the right levels of service and that customers are happy with the partners that we work with and the information that we provide.

Output (70) Develop ways of sharing information with local resilience forums.

8.87 We work with local resilience forums on an ongoing basis to ensure that we are able to provide a range of services during emergencies. During 2022/23 we worked with 15 resilience forums.

8.88 NGED continues to be committed to working with the emergency services and taking an active part with Gold Command arrangements for emergency response during severe weather conditions.

Providing information during an emergency

8.89 We have developed our website to ensure that effective updates are available during emergencies for customers, the media, local authorities and other emergency resilience partners.

8.90 During 2018/19 we launched a new 'storm mode' for our website. During a storm a simplified homepage on the website permanently displays our power cut map, a link to PSR information and live power cut storm reports e.g. the number of customers off supply. This improves access to vital information during widespread disruption.

8.91 When a storm is forecast we increase staffing and provide more communication. We also produce storm bulletins which are emailed to customers who have registered their interest. There are three categories of bulletin – one sent in advance of a predicted event, one during a storm and one post event. The thresholds for triggering a bulletin have been agreed with the Customer Panel. The bulletins inform stakeholders of the latest weather conditions, areas affected, the number of customers off supply and key steps we are taking to restore power.

8.92 In the event of a storm we open up additional 'ramp-up' contact centres to allow our main contact centres to prioritise outbound calls, particularly those made to vulnerable customers.

8.93 During severe weather, regular updates are provided to the government and industry regulator detailing contingency planning arrangements before the event, the number of customers affected during the event, advising on risks to the electricity network and information on restoration times after the event.

8.94 Once a storm is over, NGED produces an extensive closedown report for key stakeholders such as Ofgem, BEIS, local resilience forums and the media, with statistics for specific regions, actions taken and lessons learnt.

Address fuel poverty by supporting customers to access key information.

Output (71) Build a database of regional agencies we can refer customers to for help.

8.95 NGED uses the expertise of other organisations to provide support for fuel poverty. We work with partners rather than duplicating their activities which allows us to address fuel poverty in a cost-effective and strategic way. Two different approaches are used.

- NGED refers PSR customers to partners for fuel poverty support.
- Partners refer customers they have worked with to NGED for registration on the PSR.

8.96 We regularly undertake 'horizon scan' activities to identify and map existing vulnerable customer support agencies and schemes in our region and to identify partnership opportunities that help us to target hard-to-reach customers. We select organisations that we work with based on matching the services they can provide with the customer needs revealed by the social indicator mapping that we undertake. Performing this 'horizon scan' exercise regularly is vital as the types of agencies and the support provided regularly changes.

8.97 We have worked extensively with stakeholders to define NGED's role in tackling fuel poverty. They tell us projects must deliver a holistic service dealing with a range of issues that could be contributing to fuel poverty. To ensure customers obtain comprehensive support every one of our projects must be capable of delivering nine core interventions:

- Income maximisation e.g. debt management;
- Energy tariff advice e.g. switching energy providers;
- Energy efficiency measures e.g. home insulation schemes;
- Heating solutions e.g. boiler replacement schemes;
- Behavioural changes e.g. effective use of heating systems;
- Health & wellbeing e.g. mobility aids and fire safety checks;
- Managed referrals to water company social tariffs;
- Befriending services;
- Managed Fuel Poor Network Extension Scheme (FPNES) applications which support off-grid, fuel poor households to connect to the gas network, and obtain carbon monoxide (CO) monitors

8.98 To deliver this full range of criteria, we have established a framework of multiple partners. We recognise the complexity of having vulnerable customers interact with multiple agencies, so we work with one lead agency per region (responsible for coordinating the support for customers and reporting on outcomes) who then manages a network of regional expert partners.

Output (72) Work with partners to develop links to and from our website.

8.99 Further details on our fuel poverty projects, and links to our partner organisations, can be found on NGED's website together with contact details for our Social Obligations team.

nationalgrid.co.uk/customers-and-community/priority-services/addressing-fuel-poverty

Output (73) Develop joint information and awareness campaigns, and co-ordinate with partners to provide customers with help.

8.100 We have an extensive programme of support schemes, working with expert agencies including Auriga, Citizens Advice, Energy Saving Trust, Centre for Sustainable Energy and several NHS Trusts. These partnerships aim to provide practical support for customers living in fuel poverty. This includes help with switching energy tariffs and arranging funds for enduring energy efficiency measures.

8.101 We have two long-standing fuel poverty programmes that provide direct one-to-one support for customers. Power Up and Affordable Warmth operate as hub-models where a lead organisation coordinates support from trusted local partners who deliver support across nine core intervention areas.

- Customers on the PSR are referred to the Power Up scheme by our contact centre when we identify that they are struggling to heat their homes.
- Under the Affordable Warmth scheme, we fund four lead partner agencies to identify and support customers in fuel poverty, by generating their own referrals in their geographic areas.

8.102 Supplementing these programmes we have two funds.

- The Energy Affordability Fund provides funding for established organisations to develop innovative local support that can then be adopted more widely.
- The Community Matters Fund provides support to new or small locally based organisations that deliver support across a wide range of areas including fuel poverty. For example, during 2022/23, targeted funding to 759 organisations supported 395,370 customers in key areas of need such as holiday hunger and festive giving.

8.103 Performance of each scheme is reviewed monthly, which includes tracking the outcome for every referral. Quantitative financial savings (for the customers) are recorded only when the outcome is confirmed (e.g. following a tariff switch or benefit entitlement change), alongside qualitative outcomes (e.g. free stair lift installations or subsidised connections to the gas network). Details of our performance in 2022/23 can be seen in the table below:

Programme	No. of Customers	Savings
'Power Up'	7,886	£3m
'Affordable Warmth'	12,243	£12.4m
Energy Affordability Fund	999	£0.7m
Other projects	3,335	£4.5m
Total	**24,463**	**£20.6m**

*Figures may not reconcile due to rounding.

8.104 We aim to continually improve our approach and therefore we host annual Vulnerability Conferences to help to identify new opportunities. These conferences allow sharing of approaches across partner organisations and the feedback informs how we shape the services that we provide.

Output (74)	Provide fuel poverty training to our staff who have contact with members of the public.

8.105 Every member of our PSR team has received bespoke training on fuel poverty through expert agencies such as the Energy Savings Trust and Citizens Advice.

8.106 All of our field staff and contact centre staff receive regular training on recognising signs of fuel poverty and referring customers to help either through our PSR or partner organisations.

Output (75)	Use data analysis to help identify areas with a high concentration of vulnerable households.

8.107 We conduct extensive data mapping to target outreach projects to areas of the highest vulnerability or deprivation.

8.108 We have worked with the Centre for Sustainable Energy to develop social indicator maps that identify geographic areas with high concentrations of customers in vulnerable circumstances and use this data to identify partners working in those local areas. As a result we target our projects to areas of greatest need, working with the most appropriate agencies.

8.109 Since 2017/18 NGED has published the data in a downloadable format to help agencies to use the data themselves to better target the services they provide.

8.110 Stakeholders, especially those in smaller organisations, found the data we initially provided too complex to drive improvements. We therefore enhanced the accessibility of our data and launched a new interactive web based facility which presents the analysis in an easy-to-view format. During 2018/19 we ran workshops with 20 existing partner agencies to understand their requirements and to enhance the website. The website now includes:

- Maps with a zoom in feature – allowing the user to view data down to street level
- Regional view options via local authority area
- Optional overlay to show the gas connection status – showing electricity-only areas
- The ability to filter on a wide variety of criteria, including fuel poor householders and distance from key services

8.111 The tool can be found at the following link.

nationalgrid.co.uk/customers-and-community/priority-services/social-indicator-mapping

8.112 We have continued to update and improve the data we provide. The UK Government has recently changed the measure of fuel poverty using the Low Income Low Energy Efficiency indicator. As a result we are adapting our social indicator mapping. This change is predicted to identify one million households as newly fuel poor, while removing 300,000 from this classification. The revised social indicator mapping will enable us to identify new fuel poverty hotspots within our region and work with our partners to design targeted, locally specific services.

8.113 During 2019/20 we also co-developed an online PSR hub with our Customer Panel, providing referral partners with a one-stop-shop to learn about the PSR, access data maps, user guides, and training videos. In 2022/23 the PSR hub has allowed 46,984 direct sign-ups to NGED's PSR.

Output (76) Develop local outreach services.

8.114 As well as having our 'Power up' schemes which refer customers on the PSR to services, we also support fuel poverty outreach schemes through our 'Affordable Warmth' programme.

8.115 NGED's 'Affordable Warmth' projects were initiated to provide funding for fuel poverty advice to be given via existing community support schemes already working in deprived areas. This year, the four Affordable Warmth schemes supported 12,243 customers to save £12.3m.

8.116 We use our social indicator mapping tool to target outreach and as with our 'Power up' scheme we work with lead agencies who work with a network of trusted local organisations to provide one-to-one customer support. In addition to providing fuel poverty support, partners are funded to provide power cut resilience advice, to promote NGED's PSR and gain informed consent to sign up eligible customers to NGED's PSR.

8.117 While we have our established Power Up and Affordable Warmth schemes, we seek to consider new options for supporting customers. In 2022/23 we targeted an area of deprivation associated with child poverty. We partnered with a local charity and NHS community midwives to deliver vital support such as access to maternity benefits, housing support and essential baby equipment. This project also highlighted new, associated vulnerabilities acting as a barrier to accessing support such as language skills. Through this pilot scheme we helped 727 customers save over £1.3m and made translation services available to customers and caseworkers. Having achieved successful outcomes in the pilot, we have now extended and embedded this project into our core delivery programme across four NHS Trusts.

8.118 A smart energy future, built on a whole-system approach to services, will require us to take a holistic approach to vulnerability. We are building new relationships and trialing new approaches as a result. Our Energy Affordability Fund supported six projects with a particular focus on reaching often overlooked or marginalised communities, for example sending multilingual local advisors to run workshops in places of worship, showing animations in hospital to reach hospital leavers, training rural mentors and setting up mobile drop in services for advice and support as well as providing take home kits with thermal leak detectors and energy monitors.

8.119 Building on the momentum of our 'In This Together – Community Matters' Covid-19 relief fund, we ensure the grassroots initiatives that play a crucial role in our communities are sustained for the long-term, leveraging opportunities to combine them with our core PSR and fuel poverty services to support the most in-need.

8.120 As part of our Social Contract, NGED launched a shareholder-funded annual £1m support fund for local community initiatives and good causes. At our annual consumer vulnerability workshop, our stakeholders encouraged us to go further, in response, we have increased our fund to more than £3.8 million for 2023/24.

8.121 Further details can be found in our Social Contract.

Expenditure

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23
31 October 2023

Electricity Distribution

nationalgrid

Expenditure

Contents

9 Expenditure

Introduction

9.1 In the RIIO-ED1 Business Plan, NGED proposed an overall 8-year expenditure of £9.2bn (in 2012/13 prices), of which £7.0bn was covered by the price control mechanism referred to as Totex. The remaining £2.2bn covers costs that DNOs do not have control over such as rates, licence fees and transmission charges that are 'passed through' to the charges we make to electricity suppliers.

9.2 The expenditure covers all aspects of running a distribution network including the following.

- Load related Capex
- Non-load related Capex
- Network operating costs
- Non-operational Capex
- Closely associated indirects
- Business support
- Other costs within the price control
- Activity costs outside the price control – not included in Totex
- Non activity based costs (outside the price control) – not included in Totex

9.3 Each year, we report the expenditure across all these areas to Ofgem in line with Standard Licence Obligation 46, which has an extensive set of rules and definitions called Regulatory Instructions and Guidance. The data shown in this section is based upon the data reported for the period 1 April 2022 to 31 March 2023.

9.4 Within this section all expenditure is quoted in 2012/13 prices, as this is the price base used for setting allowances, within licence conditions and within Ofgem financial models. Costs incurred in 2022/23 have been deflated to this price base to be comparable to the allowances.

9.5 Allowed costs include the forecast level of above inflation cost increases known as 'real price effects'.

9.6 Costs are shown after the deduction of customer contributions and other cost recoveries.

9.7 Indirect activities have been allocated across activities within and outside the price control.

RIIO-ED1 Totex expenditure summary

9.8 NGED expenditure for the whole or RIIO-ED1 was 2% lower than allowances for total costs within the price control (Totex), with the variations by licence area shown in the table below.

ED1 expenditure vs allowance (2012/13 prices) £million

Licence area	West Midlands	East Midlands	South Wales	South West	NGED Total
Totex actual costs RIIO-ED1 (£million)	2,083.6	2,082.4	1,047.5	1,644.6	6,858.1
Totex allowance RIIO-ED1 (£million)	2,089.4	2,109.1	1,089.5	1,708.0	6,996.1
% of allowance spent	99.7%	98.7%	96.1%	96.3%	98.0%

2022/23 expenditure overview

9.9 The following table provides a breakdown across all the areas of expenditure showing the allowed values and actual values in the year 2022/23 for all four licence areas and NGED as a whole. This includes costs within the price control and costs outside the price control.

2022/23 expenditure vs allowance (2012/13 prices) £million

	West Midlands		East Midlands		South Wales		South West		NGED Total	
	Allowed	Actual 2022/23	Allowed	Actual 2022/23	Allowed	Actual 2022/23	Allowed	Actual 2022/23	Allowed	Actual 2022/23
Connections related reinforcement	2.8	7.2	2.6	13.1	1.4	5.2	1.3	5.5	8.1	31.0
General reinforcement	32.5	28.5	39.3	25.5	5.0	8.5	15.8	12.8	92.6	75.4
LOAD RELATED CAPEX	**35.2**	**35.7**	**41.9**	**38.6**	**6.5**	**13.7**	**17.1**	**18.3**	**100.7**	**106.4**
Asset replacement and refurbishment	69.9	50.2	59.6	44.6	40.4	28.2	60.8	50.4	230.7	173.4
Diversions **	8.7	8.1	6.0	7.1	-8.4	1.1	11.8	3.3	18.1	19.5
Operational IT and telecoms	3.0	5.0	3.2	5.2	3.1	3.6	3.5	5.6	12.8	19.4
Quality of supply	0.0	0.6	0.0	0.9	0.0	0.5	0.0	0.8	0.0	2.9
Worst served customers *	0.0	0.0	0.1	0.0	0.2	0.2	0.1	0.6	0.4	0.8
Safety and overhead line clearances	3.4	2.3	3.5	4.8	1.4	2.9	2.8	3.7	11.1	13.8
Flood defences	0.1	0.0	0.2	0.1	0.3	0.0	0.1	0.0	0.8	0.1
Environmental	0.6	1.8	0.6	2.3	0.3	1.0	0.3	1.7	1.8	6.8
Visual amenity *	0.4	0.0	0.1	0.1	0.8	0.3	1.0	0.3	2.3	0.7
NON-LOAD RELATED CAPEX	**86.1**	**68.1**	**73.4**	**65.1**	**38.0**	**37.8**	**80.5**	**66.4**	**278.1**	**237.3**
Faults and other unplanned repairs	29.5	31.0	34.2	31.6	13.5	13.3	24.4	24.5	101.7	100.4
Tree cutting	8.5	11.1	6.6	8.6	8.2	6.9	11.4	10.1	34.7	36.7
Inspections	3.0	2.5	3.1	2.5	2.1	1.8	3.0	2.8	11.2	9.6
Repair and maintenance	6.6	6.4	5.6	6.4	2.8	3.4	3.8	4.8	18.8	21.0
Other operating costs	4.7	4.1	4.7	4.5	2.0	2.1	3.1	3.2	14.5	13.9
NETWORK OPERATING COSTS	**52.4**	**55.0**	**54.2**	**53.6**	**28.7**	**27.5**	**45.8**	**45.4**	**181.0**	**181.5**
NON-OPERATIONAL CAPEX	10.2	19.1	10.3	31.6	5.0	12.3	9.1	12.0	34.6	75.1
CLOSELY ASSOCIATED INDIRECTS	54.9	52.1	54.5	53.3	30.6	28.2	45.4	44.1	185.4	177.7
BUSINESS SUPPORT	28.0	24.5	29.1	25.5	14.9	13.8	24.1	22.4	96.1	86.2
OTHER COSTS WITHIN THE PRICE CONTROL	0.0	4.3	0.0	4.2	0.0	2.7	0.0	4.1	0.0	15.2
PRICE CONTROL ADJUSTMENTS	-0.2	-6.6	1.2	-7.6	0.0	-3.3	0.0	-7.4	0.9	-24.9
TOTAL COSTS WITHIN PRICE CONTROL	**266.6**	**252.3**	**264.6**	**264.2**	**123.6**	**132.7**	**222.0**	**205.2**	**876.8**	**854.5**
PRICE CONTROL ADJUSTMENTS	0.2	6.6	0.0	7.6	0.0	3.3	0.0	7.4	0.3	24.9
ACTIVITY COSTS OUTSIDE PRICE CONTROL	18.7	26.0	18.2	10.2	5.7	5.0	8.9	13.4	51.5	54.6
NON ACTIVITY BASED COSTS	83.4	46.5	95.2	45.5	57.8	21.3	78.1	27.4	314.6	140.6
TOTAL COSTS	**369.0**	**331.3**	**378.0**	**327.5**	**187.2**	**162.3**	**308.9**	**253.5**	**1243.1**	**1074.7**

* The allowed levels of expenditure for worst served customers and visual amenity are subject to an ex-post (after the expenditure has been incurred) adjustment up to an overall cap for the RIIO-ED1 period.
** Diversions allowances for each DNO includes the voluntary rail electrification allowance hand back for curtailed rail electrification projects. As allowances are being returned equally in 2020/21, 2021/22 and 2022/23 associated to the full 8 year RIIO-ED1 period this may create negative allowances.

Please note:
The values shown may show small differences to the values stated in the performance snapshot provided in section one of this report. The performance snapshot is based on data submitted to Ofgem in table SI1 as part of annual reporting on 31 July 2023.
Totals may not reconcile as a result of rounding.
The values shown against descriptions in lower case sum up to the values shown in capitals.

Load related Capex

9.10 Load related Capex is expenditure incurred in providing additional capacity on the network. This reinforcement may be required to enable a new connection to be made or where the existing capacity is reaching limits as a result of growth in load or distributed generation.

9.11 In 2022/23 expenditure across the whole of NGED was £106.4m against an allowance of £100.7m. Expenditure was higher than forecast in three licence areas, the West Midlands South Wales and South West, but lower in East Midlands.

9.12 As in 2021/22, expenditure associated with the amount of network reinforcement required for new connections continued to be over four times higher with 2022/23 values of expenditure of £31.0m compared to an allowance of £8.1m. The allowance (based on forecasts in 2012/13) assumed a lower level of higher voltage demand and generation connections than have actually arisen.

9.13 Expenditure on general reinforcement was 19% lower than allowances, impacted by lower than forecast impact from low carbon technology and continued use of flexibility services offsetting the need for conventional reinforcement.

Non-load related Capex expenditure

9.14 Non-load related Capex is capital investment in the network, of which two thirds is on replacement and refurbishment of poor condition assets. Other large areas of expenditure are diversions, operational IT and network safety work including removal of overhead line clearance issues.

9.15 In 2022/23, total NGED expenditure for non-load related Capex was 15% lower than allowance; £237.3m was spent against an allowance of £278.1m with variances across a number of categories.

9.16 The biggest impact was associated with asset replacement and refurbishment where expenditure of £173.4m was 25% lower than an allowance of £230.7m. Expenditure was lower across all four licence areas.

9.17 Operational IT and telecoms costs were 50% higher than allowance for NGED as a whole. Across all areas £19.4m was spent against an allowance of £12.8m. This is due to ongoing digitalisation developments for DSO and enhanced cyber resilience requirements.

Network operating costs

9.18 Network operating costs include inspections, repair and maintenance, faults and tree cutting. Overall expenditure was broadly in line with the allowances of £181m.

9.19 Lower than forecast costs for inspections offset higher costs for repairs and maintenance

Non-operational Capex

9.20 Non-operational Capex includes the purchase of new IT systems and equipment, property, vehicles and small tools and equipment. Expenditure was more than double the allowances of £34.6m at £75.1m.

Closely associated indirects

9.21 Closely associated indirect costs relate to the costs of staff and systems that enable the work on the network to be carried out. This includes network design, planning and project management as well as the costs of wayleaves (paying private individuals for having equipment on their land) and the training of new staff and apprentices.

9.22 Expenditure of £177.7m was incurred in 2022/23, which is 4% lower than allowances. However, we are 6% over for the whole RIIO-ED1 period.

9.23 Higher costs in RIIO-ED1 mainly relate to expenditure on core labour. Efficiency initiatives have been sought to improve our systems and processes, demonstrated by improvements in the performance over the last two years.

Business support

9.24 Business support costs include a number of corporate activities that are provided by central functions including human resources, finance and regulation. Expenditure in these areas was 10% lower than allowances at £86.2m in 2022/23.

Other costs within the price control

9.25 Other costs within the price control include atypical activity costs and costs associated with innovation activity which are funded by the Totex allowance.

9.26 The nature of these activities means that minimal expenditure was included in the RIIO-ED1 Business Plan.

9.27 Costs within this area in 2022/23 include significant volumes of claims for network apparatus in gardens. A number of agents have been active in this arena, increasing the volume of claims. We have dedicated resources to this activity to ensure that claims are resolved at minimum cost.

Price control adjustments

9.28 Adjustments are made to specific costs within the price control in line with guidance provided by the regulator.

Activity costs outside the price control – not included in Totex

9.29 These costs relate to work funded directly by customers and not through the price control, for example sole use connections work.

Non-activity based costs outside of the price control – not included in Totex

9.30 There are some costs that do not form part of 'regulated' expenditure because they form costs that DNOs do not have control over, some of which are treated as 'pass through' costs. Non activity based costs were lower than forecasted with expenditure of £140.6m against an allowance of £314.6m.

Expenditure out-turn for RIIO-ED1

9.31 As this report is for the final year of RIIO-ED1 the following provides a summary for the outturn of the whole price control. This covers actual expenditure from 2015/16 to 2022/23.

2022/23 expenditure vs allowance (2012/13 prices) £million

	West Midlands		East Midlands		South Wales		South West		NGED Total	
	Allowed	Actual	Allowed	Actual	Allowed	Actual	Allowed	Actual	Allowed	Actual
Connections related reinforcement	20.0	36.3	18.8	128.5	9.5	16.0	9.4	27.6	57.7	208.4
General reinforcement	203.3	170.1	278.4	149.6	45.4	44.4	86.5	67.0	613.6	431.1
LOAD RELATED CAPEX	223.2	206.4	297.2	278.0	55.0	60.4	95.9	94.7	671.3	639.4
Asset replacement and refurbishment	547.6	469.2	459.4	421.9	311.5	257.4	474.6	413.6	1793.1	1562.1
Diversions **	75.1	61.0	80.8	71.0	32.8	28.7	75.1	67.3	263.9	227.9
Operational IT and telecoms	35.6	36.4	43.2	34.5	27.1	14.5	29.9	23.3	135.9	108.7
Quality of supply	16.5	13.8	9.2	13.7	3.1	10.2	3.1	8.7	31.9	46.4
Worst served customers *	0.5	0.5	0.5	0.5	1.7	1.7	0.7	1.1	3.4	3.8
Safety and overhead line clearances	26.9	31.1	28.1	38.4	11.6	27.3	38.6	46.0	105.3	142.8
Flood defences	1.2	0.7	5.1	3.1	7.9	2.9	1.2	1.0	15.5	7.7
Environmental	4.5	9.1	5.0	7.0	2.3	5.5	2.5	5.9	14.3	27.4
Visual amenity *	2.0	1.6	0.7	0.7	1.4	0.9	2.7	2.0	6.8	5.2
NON-LOAD RELATED CAPEX	710.0	623.3	632.2	590.8	399.4	349.0	628.3	568.8	2369.9	2131.9
Faults and other unplanned repairs	235.8	275.4	271.0	276.7	108.1	104.4	195.1	202.8	810.1	859.3
Tree cutting	66.5	102.9	51.8	75.0	64.1	60.7	89.5	89.1	271.9	327.7
Inspections	22.5	24.7	23.4	23.8	16.2	16.0	23.4	22.2	85.5	86.6
Repair and maintenance	52.8	62.5	44.5	58.4	22.6	31.6	30.3	39.6	150.2	192.2
Other operating costs	31.8	29.1	35.5	35.8	16.0	16.9	21.3	24.1	104.6	105.8
NETWORK OPERATING COSTS	409.5	494.6	426.2	469.6	227.0	229.5	359.6	377.8	1422.3	1571.6
NON-OPERATIONAL CAPEX	97.2	91.8	89.8	97.3	50.5	72.9	84.5	86.3	322.0	348.3
CLOSELY ASSOCIATED INDIRECTS	429.2	472.4	426.6	471.6	239.2	234.7	350.1	358.5	1445.0	1537.3
BUSINESS SUPPORT	221.1	193.1	229.4	196.3	118.7	106.6	190.0	169.7	759.1	665.8
OTHER COSTS WITHIN THE PRICE CONTROL	0.2	34.6	0.1	22.8	0.0	18.3	0.0	33.6	0.3	109.3
PRICE CONTROL ADJUSTMENTS	-0.9	-32.6	7.8	-44.0	-0.2	-24.1	-0.4	-44.8	6.2	-145.5
TOTAL COSTS WITHIN PRICE CONTROL	2089.4	2083.6	2109.1	2082.4	1089.5	1047.5	1708.0	1644.6	6996.1	6858.1
PRICE CONTROL ADJUSTMENTS	0.9	32.6	0.1	44.0	0.2	24.1	0.4	44.8	1.7	145.5
ACTIVITY COSTS OUTSIDE PRICE CONTROL	138.2	176.1	139.8	110.8	46.4	63.8	73.1	116.9	397.5	467.6
NON ACTIVITY BASED COSTS	608.8	507.2	677.5	526.8	448.6	326.4	597.0	433.3	2331.9	1793.7
TOTAL COSTS	2837.3	2799.4	2926.6	2764.0	1584.8	1461.7	2378.5	2239.7	9727.2	9264.9

* Allowances for Worst Served Customers and Visual Amenity are ex-post (after the expenditure has been incurred). These are the projected allowances for these activities at the end of RIIO-ED1

9.32 Spend on load related Capex (expenditure incurred in providing additional capacity on the network) is 5% lower than allowance at £639.4m. Expenditure associated with the amount of network reinforcement required for new connections was four times higher at £208.4m which offset lower expenditure on general reinforcement of £431.1m compared to allowances of £613.6m.

9.33 Non-load related expenditure has a 10% underspend with the main impacts being from 13% lower expenditure on asset replacement, 14% lower expenditure on diversions, 20% lower expenditure on operational IT offset in part by a 36% higher expenditure for safety and overhead clearances, 46% higher expenditure on quality of supply and 92% higher in environmental expenditure.

9.34 Spend on network operating costs (including inspections, repair and maintenance, faults and tree cutting) was 10% higher than allowances at £1.57bn. Fault expenditure was 6% higher than allowances at £859.3m; Tree cutting was 21% higher at £327.7m and Repairs and Maintenance was 28% higher at £192.2m. .

9.35 Non-operational Capex includes the purchase of new IT systems, property, vehicles, and small tools and equipment. Overall expenditure was 8% higher than allowances at £348.3m

9.36 Closely associated indirect costs (related to the costs of staff and systems that enable the work on the network to be carried out such as network design and planning) was 6% higher than allowances at £1.54bn.

9.37 Business support (including Human Resources, Finance and Regulation) costs have been 12% lower than allowances at £665.8m.

9.38 Across the whole of RIIO-ED1, NGED actual Totex expenditure is 2.0% lower than allowances for costs within the price control at £6.86m.

Glossary

RIIO-ED1 Business Plan Commitments Report
Year Eight – 2022/23
31 October 2023

Electricity Distribution

nationalgrid

10 Glossary

A

Accident Frequency Rate

Accident frequency rate is derived from the number of annual accidents and the number of staff, and is expressed as 'accidents per 100 members of staff'. The calculation allows a like-for-like comparison irrespective of the number of staff employed.

Automation

Computer controlled decision making linked to remotely controlled devices which allows electricity supplies to be quickly rerouted without the need to send a person to the site.

B

Behavioural Safety

An approach to safety which goes beyond setting rules and enforcing compliance. It focusses on changing attitudes so that staff take responsibility for their own safety and the safety of others by acting on training, following instructions and challenging others when they see safety rules about to be broken.

Black Start

The recovery from an event of widespread power loss. We carry out specific programmes of work to make sure that the network is able to cope in these situations.

Broad Measure of Customer Satisfaction (BMCS)

An incentive scheme made up of a customer satisfaction survey, an assessment of how complaints are dealt with and a review of stakeholder engagement. It was introduced for DPCR5 and is designed to drive improvements in the quality of the overall customer experience by capturing and measuring customers' experiences of contact with their DNO across the range of services and activities the DNOs provide.

Building Research Establishment Environmental Assessment Method (BREEAM)

A methodology used by the building industry to assess the environmental aspects of building construction and refurbishment.

Bund

A containment wall constructed around items of plant which contain large amounts of oil, designed to prevent oil from leaking into the environment.

Business Carbon Footprint (BCF)

A calculation which represents the effect our work has on the environment. BCF is measured and reported using equivalent tonnes of carbon dioxide to express the impact of energy usage in offices, emissions from vehicles and the release of greenhouse gases. BCF is used to encourage DNOs to consider the direct carbon impact of conducting their operations and to be proactive in the reduction of emissions.

C

Capacity

The amount of power that can be distributed through an asset or the network.

Capital Expenditure (Capex)

Expenditure on investment in long-lived distribution assets, such as underground cables, overhead electricity lines and substations.

Centre for Sustainable Energy (CSE)

An independent national charity that helps people and organisations from the public, private and voluntary sectors meet the twin challenges of rising energy costs and climate change.

CIRT (Crown Internet Routing & Tracking)

An online system specifically designed for ICPs and IDNOs, the system allows the online submission of connection applications and progress tracking of those applications.

Closed Circuit Television (CCTV)

A video based security monitoring system that presents images on television screens in a monitoring centre from cameras installed at remote sites allowing activities to be recorded and intruders to be identified.

Common Network Asset Indices Methodology (CNAIM)

A standard approach for the derivation of asset risk values for DNOs to report risk levels associated with network assets.

Competition in Connections

Historically, the incumbent DNO would have provided new connections. Over recent price controls, Ofgem has promoted greater involvement of third parties in both the design of connections and on-site delivery of connections work. This means that third party connection providers compete for the business of providing new connections in a competitive market.

Connections Portal

An online system designed for customers requiring a connection for small projects and service alterations. Within the Portal, customers can make an application, accept an offer, make a payment and request automatic email updates of key stages within the process.

Contestable work

Other organisations can carry out connections work in competition with the incumbent DNO. Work that can be carried out by a third party competitor is referred to as contestable.

Crisis Packs

A crisis pack can be distributed to customers impacted by power outages, often vulnerable customers who are more likely to suffer a detriment as a result of a prolonged outage. The packs contain a flask, wind-up torch, gloves, a hat, a reusable hand-warmer and information leaflets. Analogue telephones are also available to those customers who may need them.

Customer Interruptions (CIs)

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 re-interruptions to the supply of customers previously interrupted during the same incident.

Customer Minutes Lost (CMLs)

The average duration of interruptions to supply per year per customer, where an interruption of supply to customer(s) lasts for three minutes or longer.

Customer Service Excellence Standard

This is a Government scheme which recognises organisations that provide effective and excellent customer service. Similar assessments were previously awarded through the Charter Mark.

Cut-out

A piece of equipment installed at the service position to terminate incoming cables. It is positioned before the meter and contains a fuse.

D

DECC

The former Government Department of Energy and Climate Change. Replaced by the Department for Business, Energy and Industrial Strategy, which itself has been replaced by the Department for Energy Security and Net Zero.

Demand Response/Demand Side Response

A technique that can be employed to reduce load on the network when maximum demand is reaching or exceeding the capacity of the network. It relies upon commercial agreements being in place with customers who can reduce their load and have agreed to do so under the instruction of the DNO.

Distributed Energy Resources (DER)

Smaller power sources embedded in the distribution network that can be used to provide the power to meet demand.

Distributed Generation (DG)

Electricity generation connected to the distribution network. It includes wind turbines, domestic solar panels, large scale photo-voltaic farms, hydro-electric power and biomass generators. Sometimes referred to as embedded generation.

Distribution Network Operators (DNOs)

A DNO is a holder of an electricity distribution licence. There are 14 DNOs which are owned by six different ownership groups. NGED holds licences for four DNOs.

Distribution Price Control Review 5 (DPCR5)

The price control period which preceded RIIO-ED1. DPCR5 ran from 1 April 2010 until 31 March 2015.

Distribution System Operator (DSO)

It is anticipated that changes to the energy sector will require Distribution Network Operators to evolve from a traditional, passive role of network management to a Distribution System Operator with full operational responsibility for forecasting energy production and demand along with identifying which parts of the network require extra capacity and seeking the provision of that capacity through new flexibility services or traditional network reinforcement.

E

ESQCR

Electricity, Safety, Quality and Continuity Regulations 2002. The ESQCR specify safety standards, which aim to protect the general public and customers from danger.

Extra High Voltage (EHV)

Voltages from 22kV up to, but not including, 132kV.

Exceptional events

Events beyond the control of the DNO that impact on network performance, this could include instances of severe weather or significant one off events. Exceptional events can be exempted from calculations of network performance when strict criteria are met and verified by Ofgem.

F

Flexible Connections

Standard connections allow customers to import or export up to the full rated capacity noted in their connection agreement at all times of normal network operation. The customer is free to use the capacity assigned at any level they choose without further involvement from the network operator. However, where there is insufficient capacity, and costly and/or time consuming reinforcement is required, NGED has developed a range of 'flexible' connections which enable more active management of capacity to limit export and load at times of peak demand, which enables new connections to be made without the need for network reinforcement.

Fluvial flooding

Flooding related to river or coastal sites.

Fuel poverty

Fuel poverty describes circumstances where customers struggle to afford electricity and to effectively heat their properties. Whilst NGED is not directly responsible for dealing with fuel poverty we refer customers to a network of expert partners for further advice and assistance.

G

Guaranteed Standards of Performance (GSOPs)

Minimum service levels which DNOs must meet across a range of activities covering supply interruptions, appointments and connections. The Guaranteed Standards are specified in statutory legislation. Where a licence holder fails to provide the level of service required, it must make a payment to the customer affected subject to certain exemptions.

H

Health and Safety Executive (HSE)

The Government organisation responsible for enforcing health and safety legislation.

Health Index (HI)

A measure of an assets condition based upon the probability of failure and informed by a range of observations and measurements. The calculation of health indices is specified in the Common Network Asset Indices Methodology.

Heat Pump

Systems which capture heat energy from the ground, bodies of water or air. They can be used for space heating, water heating, heat recovery and cooling in a range of buildings. A supply of electricity is required to power the heat pump system.

High Voltage (HV)

Voltages from 1kV up to, but not including, 22kV.

I

Improvement Notice

Where there is a significant breach of Health and Safety legislation the Health and Safety Executive has the power to issue a formal Improvement Notice.

Incentive on Connections Engagement (ICE)

An incentive mechanism which drives DNOs to improve communication and interaction with major customers. Penalties can be imposed where DNOs fail to demonstrate sufficient engagement with major customers.

Independent Distribution Network Operator (IDNO)

A company that can construct new electricity networks, embedded within and connected to the DNOs network, retaining ownership of and being responsible for the operation of the new network.

Independent Connections Provider (ICP)

A third party company that can construct new connections and the associated electricity network on behalf of a customer, with the network being adopted by either an IDNO or the DNO.

Innovation projects

Projects that seek to find new and better ways of working. Projects can focus on network performance and efficiency, low carbon networks, smart grids and meters, reducing impact on the environment, developing customer service and helping vulnerable customers.

Inspections and Maintenance (I&M)

Inspections are activities carried out on a routine basis to establish the status and condition of network equipment. Maintenance is routine work which seeks to ensure that network equipment continues to perform as expected during its lifetime.

Interruption Incentive Scheme (IIS)

The Interruption Incentive Scheme is a financial incentive mechanism that provides annual rewards or penalties based on a DNO's performance against its targets for the number of customers interrupted per 100 customers (CI) and the number of customer minutes lost per customer (CML).

ISO 14001

This is an international standard for environmental management systems.

L

Load

The amount of power flowing through an asset or a network. This may also be referred to as demand. Maximum demand is compared to capacity to determine if the network needs to be reinforced.

Load Index (LI)

Framework, introduced as part of the DPCR5 Price Control, demonstrating the utilisation of individual substations or groups of interconnected substations. It is used as a secondary deliverable capturing the impact of load related investment.

Low Carbon Networks Fund (LCNF)

A funding mechanism introduced under DPCR5 to encourage DNOs to prepare for the move to a low carbon economy. A fund was made available for DNOs and partners to innovate and trial new technologies, commercial arrangements and ways of operating networks. The LCNF structure was replaced by the Network Innovation Competition and Network Innovation Allowance during RIIO-ED1, however some LCNF projects continued during RIIO-ED1.

Low Carbon Technology (LCT)

This is the collective term for devices that reduce the amount of carbon being used for heating, transport and generation. It includes electric vehicles, heat pumps and solar generation.

Low Voltage (LV)

This refers to voltages up to, but not including, 1kV.

LVSSA

Connections customers are categorised by Ofgem according to a range of factors. LVSSA customers are those seeking single domestic connections requiring no mains work at low voltage.

LVSSB

Connections customers are categorised by Ofgem according to a range of factors. LVSSB customers are those seeking two to four domestic connections or one-off commercial connections at low voltage requiring no network reinforcement work.

M

Medically dependent customers

Customers who rely on electricity as a result of a health condition.

N

National Grid Electricity Transmission (NGET)

The 400kV and 275kV transmission network used to transport electricity around the country from sources of large scale generation such as power stations and off-shore wind farms to substations that feed into DNO electricity networks.

National Grid Electricity Distribution (NGED)

The name of the electricity distribution network operator that holds four distribution licences for West Midlands, East Midlands, South Wales and South West. NGED is the new name for the company formally known as Western Power Distribution (WPD).

Net zero

The UK's Climate Change Act (2008) sets out how the UK tackles climate change. The act says that by 2050 the UK Government must reduce greenhouse gas emissions by at least 100% compared with 1990 levels.

Network Innovation Allowance (NIA)

An allowance agreed as part of the price control to fund smaller scale innovation projects. The purpose of the allowance is to encourage DNOs to innovate to address issues associated with the development of their networks. The NIA (and NIC) replaced the Low Carbon Networks Fund at the commencement of RIIO-ED1.

Network Innovation Competition (NIC)

An annual funding competition for larger and more complex innovation projects. The NIC (and NIA) replaced the Low Carbon Networks Fund at the commencement of RIIO-ED1.

O

Office of Gas and Electricity Markets (Ofgem)

Ofgem is responsible for regulating the gas and electricity markets and network monopolies in the UK to ensure customers' needs are protected.

P

P2

DNOs have a licence obligation to manage networks to meet the requirements of Electricity Networks Association Engineering Recommendation for Security of Supply P2. This specifies the expected capability of the network to meet demands under defined outage conditions.

Perfluorocarbon Tracer (PFT)

A chemical that is injected into fluid filled cables, used to speed up the location of leaks.

Pluvial flooding

Flooding related to excessive rainwater (flash flooding).

Power Up

Our referral service which arranges for a partner organisation to provide help for customers who are struggling to pay for energy.

Powering Improvement

An industry strategy which aims to achieve continuous improvement in safety and occupational health in the energy generation and network sectors.

Price Control

NGED is a regional monopoly – our customers are such because of where they live and work. NGED is therefore regulated by Ofgem to make sure that we provide a high level of service for the money we are allowed to charge. The money we can earn is set for a specific period of time and determined through a process that assesses proposed activities and associated costs. The process results in determining the financial mechanisms that determine what costs can be recovered from customers. The RIIO-ED1 price control covers the period from 1 April 2015 to 31 March 2023.

Priority Services Register (PSR)

A database that records details about customers in vulnerable circumstances so that we can provide additional support if needed.

Prohibition Notice

Where the Health and Safety Executive believes that an activity carries serious risk of harm it has the option to stop activities immediately using a Prohibition Notice.

Protection batteries

Most circuit breakers on the network rely upon batteries to provide the power to monitor the network and initiate tripping and reclosing actions. These batteries are separate to SCADA batteries that provide the power for communication systems between sites and central control centres.

Q

Quality of Service (unweighted)

The Interruption Incentive Scheme measures Quality of Service using two metrics: Customer Interruptions and Customer Minutes Lost. For IIS, the comparison of actual performance against targets converts different types of interruption using weighting factors (for example unplanned interruptions are weighted at 50%). Quality of Service (unweighted) relates to the raw pre-weighted measures.

R

Real Price Effects (RPE)

Increase in prices of materials, direct staff or contract labour, over and above increases in the Retail Price Index.

Reinforcement

The provision of more network capacity by installing more assets or installing higher rated assets

Resilience

The ability of the network to withstand extreme events such as storms and flooding, and having the ability to recover quickly from widespread power black outs.

Resilience Tree Cutting

This is the full removal or extensive cutting of trees that are found to be within the falling distance of overhead power lines. This ensures that they cannot cause damage to the power lines in the event of severe weather.

Revenue = Incentives + Innovation + Outputs (RIIO)

The current regulatory framework, introduced for electricity distribution in 2015/16. It places emphasis on incentives to drive the innovation needed to deliver a sustainable energy network at value for money to existing and future consumers.

RIIO Electricity Distribution 1 (RIIO-ED1)

The eight-year price control period that runs from 1 April 2015 to 31 March 2023. It is the first electricity distribution price control that uses the RIIO framework for setting allowances.

RIIO Electricity Distribution 2 (RIIO-ED2)

The five-year electricity distribution price control period that runs from 1 April 2023 to 31 March 2028. Ofgem has determined that the RIIO-ED2 price control will be five years in length.

Routine Tree Cutting

Tree cutting is undertaken on a cyclical basis to provide sufficient clearance from equipment. Tree cutting prevents faults and keeps the public safe. Clearance is carried out to standard industry specified distances from equipment.

S

SCADA batteries

Batteries which provide the power for system communication between sites and central control centres.

Self-approved designs

The proposals for new network connections that have been designed by ICPs without the need for approval of designs by NGED. Processes and procedure for authorised ICPs to carry out self-approval have been developed in line with the requirement to facilitate competition in connections.

Self-determined point of connection

The proposed point at which a new connection or extension to the network, to be developed by an ICP, connects to the existing network, which has been determined without the need for approval by NGED.

Smart Grid

A generic term for a range of measures that are used to operate electricity networks more flexibly, allowing more generation or demand (load) to be connected and managing the associated power flows.

Smart Meters

Smart meters record the energy consumed within a property and are capable of being read remotely. The government originally mandated that by 2020 every home in Great Britain will be offered a smart electricity and gas meter, but the timescales have been extended to June 2025. Smart meters have the capability to allow NGED much greater visibility of the operational state of the low voltage network.

Stakeholder Engagement and Consumer Vulnerability Strategy (SECV)

An incentive mechanism designed to encourage network companies to engage proactively with stakeholders and to deliver a consumer focused, socially responsible and sustainable energy service. Rewards are available to network companies who can demonstrate high quality activities against set criteria.

Substation

A part of the distribution network that transforms voltage and allows the re-routing of power by switching the configuration. It contains transformers, switchgear and equipment that protects the network components by interrupting supplies when there is a fault. Substations vary in size from bulk supply points that supply tens of thousands of customers to pole mounted substations that may supply a single rural property.

Sulphur Hexafluoride (SF_6)

A gas widely used as an insulating medium in transmission and distribution equipment. It has excellent insulating properties but is a potent greenhouse gas. It continues to be used because there are limited alternatives available.

Supervisory Control and Data Acquisition (SCADA)

This is the term used for the system that monitors and controls distributed assets. It comprises the remote terminal units, communication infrastructure and human interface within central control rooms.

Switches

Devices installed on the network that can be turned on or off and are used to alter the routing of electricity. Some can be operated remotely by central control engineers; others require manual operation on site by authorised staff.

T

Time to Connect Incentive

An incentive scheme which focusses on two elements – the time taken to provide a quotation for a connection and, once the offer is accepted, the time taken to complete the necessary connection works. Rewards are available to DNOs who outperform common targets set by Ofgem. Time to Connect and Time to Quote targets are expressed in days.

Third Party Connection Providers

Independent organisations that carry out elements of connections work that are contestable. Work which is non-contestable will always be undertaken by the DNO.

Totex

The licensee's total expenditure (with limited exceptions) on regulated business activities. It includes both capital and operating expenditure items that the licensee has control over.

Transformer

Converts electricity from one voltage to another.

Transmission charges

Charges made to users of the electricity transmission system. Charges cover the cost of installing and maintaining the transmission system.

Transmission system

The transmission system is the 400kV and 275kV network used to transport electricity around the country from sources of large scale generation such as power stations and off-shore wind farms to substations that feed into DNO electricity networks. The NGED network is connected to the National Grid Electricity Transmission system at a number of grid supply points.

U

Unrestricted Domestic Tariff

The estimated annual cost of electricity distribution to the typical domestic customer, calculated under the Common Distribution Charging Methodology and assuming specific consumption of 3,100kWh. The tariff charge will vary for each licence area depending on customer numbers and the nature of the network.

V

Vulnerable Customers

Vulnerable customers include those customers who are medically dependent upon electricity, have special communication requirements, have other special needs with a dependence upon electricity (e.g. stair lift), are elderly, have a transient vulnerability to a power cut (e.g. such as those who have recently left hospital) or need assistance with energy affordability.

W

Western Power Distribution (WPD)

Former name of the electricity distribution network operator that holds four distribution licences for West Midlands, East Midlands, South Wales and South West. Now called National Grid Electricity Distribution (NGED).

Whole system outcomes

Transmission system operators and distribution network operators coordinating their activities in order ensure that networks as a whole are managed efficiently and in the best interest of consumers.

Worst Served Customers

Customers who experience 12 or more higher voltage interruptions over a three year period, with a minimum of three in any one year.

National Grid Electricity Distribution (East Midlands) plc, No2366923
National Grid Electricity Distribution (West Midlands) plc, No3600574
National Grid Electricity Distribution (South West) plc, No2366894
National Grid Electricity Distribution (South Wales plc, No2366985
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