

<b>Report:</b>		Worst Served Customers (WSC) – 2023/24 project status					
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## Northern Powergrid – Worst Served Customers (WSC) – 2023/24 project status

### 1. Purpose

The purpose of this document is to set out the detailed of Worst Served Customer Projects and fulfilling the following regulatory requirement:

- With effect from the Regulatory Year commencing on 1 April 2024, the licensee must, by 31 October in each Regulatory Year, publish on its website information about the WSC Projects it is undertaking in respect of its WSC in such a format that stakeholders can easily understand the activities the licensee is carrying out to improve outcomes for its WSC.

This document supersedes the following documents:

Document Reference	Document Title	Version	Published Date
N/A – first publication			

### 2. Scope

This document applies to all customers that experience interruptions (of at least three minutes duration), caused by higher voltage interruptions that meet the criteria below. It reports on the work completed in line with the policy: REG/002/006: Methodology - Annual Process for Identifying Worst Served Customer (WSC) Projects.

#### ***Worst Served Customer (WSC):***

***means a Customer of the licensee who experiences 12 or more unplanned Incidents of a duration of three minutes or longer at Distribution Higher Voltage, over a three Regulatory Year period with a minimum of two such Incidents per Regulatory Year.***

Note: The above definition is the electricity distribution network regulator's (Ofgem) definition.

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### 3. Worst Served Customer

#### 3.1. General

- 3.1.1. Worst Served Customers (WSCs) became a defined group of customers during previous price control periods and continues in the RIIO-ED2 price control period (with an amended definition). This classification is aimed at supplementing the Interruption Incentive Scheme (IIS) as it was recognised that for some customers, intervention to address network performance issues wouldn't be captured by the traditional IIS mechanism as they may fail the economic test of IIS.
- 3.1.2. During the previous (RIIO-ED1) price control period the mechanism allowed Distribution Network Operators (DNOs) to invest where customers experienced 12 or more higher voltage faults (of at least three minutes duration) over a three-year period with a minimum of three faults in each of the three years. For the RIIO-ED2 price control period, Ofgem worked with DNOs to review the WSC mechanism.
- 3.1.3. As a result, the mechanism for RIIO-ED2 has been improved. The qualifying threshold has been modified by reducing the minimum number of higher voltage faults in each year to two (whilst retaining the overall number of faults within the three-year window at 12). In addition, the mechanism has been enhanced by making less prescriptive and more flexible which allows more scope to develop schemes with more significant benefits.

### 4. Worst Served Customer volumes

#### 4.1. General

- 4.1.1. As a result of the historical nature of the definition, WSC volumes will change over time and will be subject to a number of factors, for example the impacts of storm events that have impacted the network during the previous years – incidents during storm events which meet the thresholds for severe weather exceptions from the suite of normal guaranteed standards and IIS impact are also included in the definition.
- 4.1.2. Figure 1 shows this as a chart with the RIIO-ED2 regulatory definition applied back through the period of RIIO-ED1. The black dotted lines highlight the volumes at the time of our business plan submission and the current volumes of WSCs by respective licence area.

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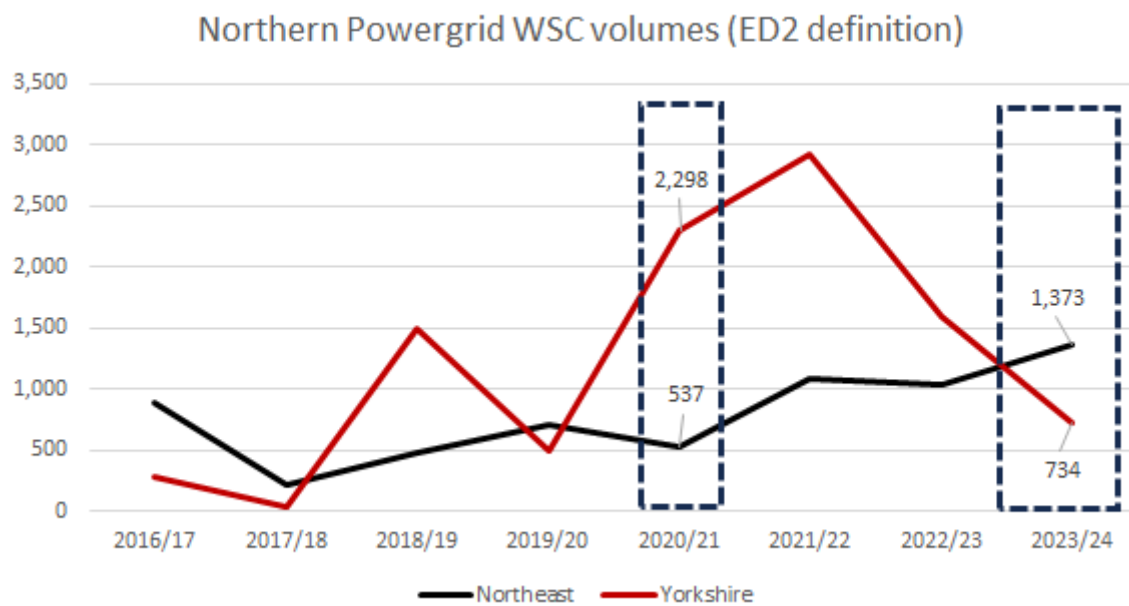


Figure 1– Historical volumes of Worst Served Customers

## 5. Worst Served Customer background information on WSC and the WSC projects

### 5.1. Locations of WSC projects

- 5.1.1. In order to give stakeholders, a clear reference point, a unique licensee chosen identification number for the WSC Project is allocated – these are used throughout this document to aid the reader.
- 5.1.2. To understand how a WSC is defined and by which historical performance window, the Regulatory Year ending where the WSC Project qualified under the WSC framework is recorded, so for 2024, this would mean WSC have been defined by the regulatory years 2020/21, 2021/22 and 2022/23.
- 5.1.3. For each scheme narrative of the work to be undertaken as part of the WSC Project is provided to define the area of the works and the associated solution. Tables 1 & 2 present details for the Northeast and Yorkshire respectively.

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#### 5.1.4. Northeast

WSC reference	Project	Name of WSC project	Year qualified	No of WSC	Description
WSC_NE_2024_01		DENWICK	2024	587	HEDGELEY MOOR CAPACITOR SW - FOLLYBURN SW TD 20KV FDR and HEDGELEY MOOR CAPACITOR SW - WOOPERTON TD 20KV FDR ccts:
WSC_NE_2024_02		EASTGATE CEMENT	2024	3	EASTGATE CEMENT - EASTGATE 20KV FDR:
WSC_NE_2024_03		FOURSTONES	2024	115	NUNWICK SOUTH SW - KEEPERSHIELD SW 20KV TD FDR:
WSC_NE_2024_04		HARTMOOR	2024	32	HART MOOR - WHANGDON SW 20KV TD FDR
WSC_NE_2024_05		MOOR MONKTON PUMPS	2024	15	MOOR MONKTON PUMPS - NEWTON COURT TD 11KV FDR
WSC_NE_2024_06		RESERVOIR	2024	452	RESERVOIR - GALLACHER PARK 20KV FDR
WSC_NE_2024_07		RIPON	2024	2	RIPON - RIPON HOLMEFIELD 11KV TD FDR:
WSC_NE_2024_08		SKERNESIDE	2024	81	SKERNESIDE - BRAFFERTON SW TEED 20KV FDR
WSC_NE_2024_09		TEAM VALLEY	2024	54	TEAM VALLEY - TRADING R175 20KV
WSC_NE_2024_10		WARKWORTH	2024	32	WSC on WHITTLE COLLIERY - DYKEHEAD QUARRY SW TD 20KV

Table 1 – Background information on the Northeast WSC projects

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#### 5.1.1. Yorkshire

WSC reference	Project	Name of WSC project	Year qualified	No of WSC	Description
WSC_Y_2024_01		CAISTOR	2024	3	CAISTOR (ASC) - BRIGG ROAD CAISTOR LSI TEED 11KV
WSC_Y_2024_02		DRIFFIELD	2024	15	DRIFFIELD (ASC) - BRIDLINGTON ROAD DRIFFIELD 11KV
WSC_Y_2024_03		GRAINTHORPE	2024	14	GRAINTHORPE (ASC) - GRAINTHORPE BUTT LANE 11KV & GRAINTHORPE (ASC) - GRAINSGATE GRAINTHORPE LSI TD 11KV
WSC_Y_2024_04		NORTH THORESBY	2024	2	NORTH THORESBY - NORTH THORESBY SCREED 11KV
WSC_Y_2024_05		SEATON	2024	39	SEATON - GOXHILL EAST TEED 11KV
WSC_Y_2024_06		SELBY	2024	3	SELBY - BAWTRY ROAD SELBY 11KV
WSC_Y_2024_07		SOUTH RESTON	2024	256	SOUTH RESTON - SOUTH RESTON MAIN ROAD 1518 11KV
WSC_Y_2024_08		SOUTHGATE	2024	6	SOUTHGATE (ASC) - PRINCESS CLOSE 11KV
WSC_Y_2024_09		WOOLLEY	2024	113	WOOLLEY - HAIGH HILL LANE LSI TEED 11KV

Table 2 – Background information on the Yorkshire WSC projects

## 6. Worst Served Customer optioneering

- 6.1.1. For each group of WSCs each proposed improvement scheme (or group of schemes) will be compared to determine the most cost-effective solution per WSC for the group.
- 6.1.2. Using historical customer interruption records an analysis is made of the root causes of the interruptions experienced by the WSCs. This analysis is required to inform engineering staff so that they can develop several alternative appropriate improvement scheme proposals for consideration to reduce the number of incidents experienced by WSCs.
- 6.1.3. Differing approaches may be required depending on the topologies of the affected parts of the electrical network, which can be a significant contributory factor, and the nature of the root causes. For example, overhead circuits in rural locations with low population densities may have limited alternative supply sources readily available, should a fault occur, due to issues including limited available interconnection to other circuits (which restricts the prompt restoration of supply). Also note that customers supplied by overhead lines, in general, have a higher probability of faults occurring during periods of adverse weather. A further factor that limits restoration of supplies in a timely manner is the availability of automation on switchgear which means that faults cannot be isolated and unaffected customers supplies restored relatively quickly by use of remote control / automatic power restoration technology.
- 6.1.4. Scheme proposals to improve the interruption performance of WSCs may therefore propose the installation of circuit interconnections or to install automatic restoration switching equipment.

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Alternative solutions may be also proposed. For example, for overhead lines in locations that are vulnerable to wildlife interference proposals may be put forward to install equipment to deter such interference.

6.1.5. Worst served customer, in general, tend to be small numbers of customers grouped together on poorer performing parts of the electrical network. In such cases this enables engineering staff to develop design scheme proposals that will benefit a group of WSCs within a particular demand group.

6.1.6. Our RII0-ED2 business plan was submitted with a supporting Engineering Justification Paper. Within this we defined the basis of optioneering for our WSC population.

- Option 1: No investment in worst served customers
- Option 2: Deliver a technology led solution utilising a mixture of automation and other supporting works;
- Option 3: Reinforce these areas of the network through increasing the capacity of existing infrastructure; and
- Option 4: Reinforcement through construction of additional circuits to develop interconnectivity.

6.1.7. WSC scheme proposals are therefore undertaken by consideration of each demand group.

6.1.8. In the majority of cases a solution based on option 2 will be pursued as this will provide most cost-efficient solution in the longer term after assessing the costs v benefits. The following paragraphs explain the logic for this approach.

6.1.9. In addition, although the scope of this WSC analysis has been to reduce the number of  $\geq 3$  minute interruptions (given that this drives Ofgem's WSC classification), option 2 will also immediately provide additional customer minutes lost benefits to WSCs through reduced restoration times for some types of faults (e.g. those where control engineers are able to utilise remote control to restore customers' supplies).

6.1.10. Given the above it has been established that option 2, automating the network which supplied these customers, was the most cost-efficient solution after assessing the costs v benefits. A limited number of switchgear units are to be changed, as retrofitting automation to some existing switchgear is not possible.

6.1.11. By selecting option 2 as our preferred option, we will:

- Deliver customer interruptions and customer minutes lost benefits for our customers
- Remove the assessed population of customers from the WSC classification
- Improve the level of customer service that those customers experience
- Deliver these works on a cost-effective basis for Northern Powergrid's customers
- Reduce the consenting and programming risk as compared to option 4

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- 6.1.12. The chosen option is consistent with our commitment to delivering significant improvements in performance for our WSCs, which was supported by our stakeholders during our RII0-ED2 stakeholder engagement process.

## **7. Worst Served Customer project details and progress**

### **7.1. General**

- 7.1.1. The following section details the costs and scheduling of investment. Tables 3 & 4 present the Northeast and Yorkshire WSC project planning details.

- 7.1.2. In terms of defining the project status, Ofgem set out three phases of the project to measure against. These are as follows:

- Planning – WSC Project is being planned, including any consents being obtained
- Delivery – WSC Project is being delivered i.e. construction has commenced
- Completed – WSC Project delivery has completed

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## 7.2. Project locations

### 7.2.1. Northeast

WSC reference	Project	Status	Proposed Solution	Expected Completion	Estimated cost (£k)
WSC_NE_2024_01		Delivery	Overhead automation for WSC located towards the network extremities in North Northumberland.	2025	91.0
WSC_NE_2024_02		Delivery	Overhead automation for WSC located in exposed location.	2025	38.5
WSC_NE_2024_03		Planning	Overhead automation for WSCs on spur at extremity of an extensive network with no interconnection.	2025	23.5
WSC_NE_2024_04		Planning	Overhead automation for WSC spread on rural mainline towards normally open point	2026	
WSC_NE_2024_05		Planning	Overhead automation for WSCs spread on rural mainline	2025	79.0
WSC_NE_2024_06		Planning	Overhead automation for WSCs spread on mixed overhead/underground mainline	2026	
WSC_NE_2024_07		Planning	Overhead automation for WSC on underground network behind extensive overhead network	2025	45.0
WSC_NE_2024_08		Planning	Overhead automation for WSCs on spurline	2026	120.0
WSC_NE_2024_09		Planning	Ground mounted automation for WSC predominantly on a mainline	2025	8.5
WSC_NE_2024_10		Planning	Overhead automation for WSC on rural mainline towards normally open point	2026	108.0

Table 3 – Northeast WSC project planning details



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### 7.2.2. Yorkshire

WSC reference	Project	Status	Proposed Solution	Expected Completion	Estimated cost (£k)
WSC_Y_2024_01		Planning	WSC spread on multiple rural mainline feeds towards multiple normally open points – technology deployment under review		
WSC_Y_2024_02		Planning	WSCs on spurline – technology deployment under review		
WSC_Y_2024_03		Planning	WSC on multiple locations along circuit (two mainline and one spur) – technology deployment under review		
WSC_Y_2024_04		Planning	WSCs on spur at extremity of an extensive network with no interconnection – technology deployment under review		
WSC_Y_2024_05		Planning	WSC on spurline – technology deployment under review, recently commissioned automation may resolve this.		
WSC_Y_2024_06		Planning	Overhead automation for WSC on spurlines	2025	39.0
WSC_Y_2024_07		Planning	WSC on rural mainline – technology deployment under review, recently commissioned automation may resolve this.		
WSC_Y_2024_08		Planning	WSC on extensive spurline – technology deployment under review		
WSC_Y_2024_09		Planning	Overhead automation for WSC at end of rural mainline towards normally open point	2025	65.0

Table 4 – Yorkshire WSC project planning details

## 8. Worst Served Customer project delivered benefits

### 8.1. General

8.1.1. This section provides an update on the number of WSC that the WSC Project that was actually delivered is expected to benefit, encompassing a short narrative. This will outline the reason for any difference between the number of WSC that the WSC Project actually delivered is intended to benefit compared to the number of WSC that the planned WSC Project was expected to benefit.

### 8.1.2. Northeast

WSC reference	Project	WSC # (to benefit)	Reason for difference between planned and delivered customer benefit (post investment appraisal)
WSC_NE_2024_01		587	Nothing to report
WSC_NE_2024_02		3	Nothing to report

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<b>WSC reference</b>	<b>Project</b>	<b>WSC # (to benefit)</b>	<b>Reason for difference between planned and delivered customer benefit (post investment appraisal)</b>
WSC_NE_2024_03		115	Nothing to report
WSC_NE_2024_04		32	Nothing to report
WSC_NE_2024_05		15	Nothing to report
WSC_NE_2024_06		452	Nothing to report
WSC_NE_2024_07		2	Nothing to report
WSC_NE_2024_08		81	Nothing to report
WSC_NE_2024_09		54	Nothing to report
WSC_NE_2024_10		32	Nothing to report

Table 5 – Northeast WSC project post investment appraisal

#### 8.1.3. Yorkshire

<b>WSC reference</b>	<b>Project</b>	<b>WSC # (to benefit)</b>	<b>Reason for difference between planned and delivered customer benefit (post investment appraisal)</b>
WSC_Y_2024_01			Pending confirmation
WSC_Y_2024_02			Pending confirmation
WSC_Y_2024_03			Pending confirmation
WSC_Y_2024_04			Pending confirmation
WSC_Y_2024_05			Pending confirmation
WSC_Y_2024_06		3	Nothing to report
WSC_Y_2024_07			Pending confirmation
WSC_Y_2024_08			Pending confirmation
WSC_Y_2024_09		113	Nothing to report

Table 6 – Yorkshire WSC project post investment appraisal

#### 8.1.4. Details of actual delivery dates and annual costs will be detailed in subsequent years.

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## 9. References

### 9.1. External Documentation

Reference	Title
Northern Powergrid (Northeast) plc Electricity Distribution Licence Special Conditions	Northern Powergrid (Northeast) plc Electricity Distribution Licence Special Conditions
Northern Powergrid (Yorkshire) plc Electricity Distribution Licence Special Conditions	Northern Powergrid (Yorkshire) plc Electricity Distribution Licence Special Conditions
Ofgem: RIIO-ED2 Regulatory Instructions and Guidance: Annex B Costs, Volumes and Revenue	Ofgem: RIIO-ED2 Regulatory Instructions and Guidance: Annex B Costs, Volumes and Revenue. Publication Date 9 May 2023
Ofgem: Worst Served Customers Guidance Document v0.4	Ofgem: Worst Served Customers Guidance Document (version 1) Publication Date : 17 February 2023

### 9.2. Internal Documentation

Reference	Title
REG/002/006	Methodology - Annual Process for Identifying Worst Served Customer (WSC) Projects

### 9.3. Amendments from Previous Version

Reference	Description
N/A	N/A

## 10. Definitions

Term	Definition
Demand Group	Groups of WSCs with a common source of supply.
Higher voltage	Any distribution voltage above 1kV, up to and including 132kV
IIS	Interruption Incentive Scheme
Interruption	A customer interruption of 3 minutes or longer.
OMS	Outage Management System
WSC Project	A project that is expected to reduce the number of Incidents at Distribution Higher Voltage experienced by WSC. This covers both capital investments and operational changes.
Demand Group	Groups of WSCs with a common source of supply.

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## 11. Authority for Issue

### 11.1. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

**Review Period** - This document should be reviewed within the following time period;

Standard review period & reason		
Period: 1 year		Reason: To reflect annual publication
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Phil Groves	Lead Reliability Engineer	31/10/2024

### 11.2. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Ian Punshon	Senior Quality of Service Officer	31/10/2024

### 11.3. Authorisation

Authorisation is granted for publication of this document.

		Date
Paul Black	Head of System Engineering	31/10/2024