

Overview

This file contains Annexes 1 to 7 to the Environment Report 2021/22.

Annexes 1 to 7 and the associated commentary are an edited copy of our annual submission to the regulator*. We have made the format easier to navigate and removed confidential information with an agreement from Ofgem. The structure and content of this document reflect their specific purpose, and as a result are not suited for the reader looking for some general information. For that reader, we recommend the Environment Report.

Each Annex consists of two tabs, as they contain information for each of our two licences: Northeast and Yorkshire.
(As an example, tab 1N contains information relating to the Northeast licence and 1Y to Yorkshire.)

Date of publication: October 2022

*We did not apply to Ofgem for the relevant adjustment for the purposes of the Innovation Roll-out Mechanism (IRM), hence we have not had anything to report on this measure.

Navigation

[1N - Visual Amenity](#)

[1Y - Visual Amenity](#)

[2N - Environmental Reporting](#)

[2Y - Environmental Reporting](#)

[3N - Carbon Footprint](#)

[3Y - Carbon Footprint](#)

[4N - Losses Snapshot](#)

[4Y - Losses Snapshot](#)

[5N - Smart Metering](#)

[5Y - Smart Metering](#)

[6N - Innovative Solutions](#)

[6Y - Innovative Solutions](#)

[7N - Low carbon technologies](#)

[7Y - Low carbon technologies](#)

[Glossary](#)

Associated documents:

- Environment Report 2021/22, October 2022
- Detailed Commentary Associated with Annexes 1 to 7 to the Environment and Innovation 2021/22 report, October 2022
- Cost benefit analysis tables, October 2022
- Regulatory Instructions and Guidance (RIGs) for RIIO-ED1, Ofgem, May 2022, available from <https://www.ofgem.gov.uk/publications/direction-make-modifications-regulatory-instructions-and-guidance-rigs-riio-ed1-version-70>

1Y - Visual Amenity		Volumes/ Additions																											
NPgY				DPCR5								RIIO-ED1														Total			
2020/21		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	DPCR5	RIIO-ED1													
		#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	

Volume - Visual Amenity Inside Designated Areas

OHL Inside Designated Areas at End of Reporting Year (km)	LV	km	111	109	106	102	102	109	106	104	104	102	102	102		530	729
OHL Inside Designated Areas at End of Reporting Year (km)	HV	km	746	744	744	741	740	740	739	738	733	724	724	724		3,716	5,123
OHL Inside Designated Areas at End of Reporting Year (km)	EHV	km	131	131	131	131	131	131	131	131	131	131	131	131		657	918
OHL Inside Designated Areas at End of Reporting Year (km)	132kV	km	23	23	23	23	23	23	23	23	23	23	23	23		115	160
Total OHL Inside Designated Areas at End of Reporting Year (km)			1,011	1,008	1,004	998	996	1,003	999	995	991	981	980	980	-	5,017	6,930
OHL (km) Removed During Year	LV	km	0	1	3	4	0	2	3	2	0	1	0	-		8	9
OHL (km) Removed During Year	HV	km	-	4	-	3	1	6	1	2	4	9	1	-		9	22
OHL (km) Removed During Year	EHV	km	-	-	-	-	-	-	-	-	-	-	-	-		-	-
OHL (km) Removed During Year	132kV	km	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Total OHL (km) Removed During Year			0	5	3	7	1	8	4	4	4	10	1	-	-	17	31
UG Cables Installed During Year (km)	LV	km	0	1	3	4	0	2	3	2	0	2	1	-		8	9
UG Cables Installed During Year (km)	HV	km	-	4	-	3	1	6	1	2	5	10	1	-		9	25
UG Cables Installed During Year (km)	EHV	km														-	-
UG Cables Installed During Year (km)	132kV	km														-	-
Total UG Cables Installed During Year (km)			0	5	3	7	1	8	4	4	6	12	1	-	-	17	34

Volume - Visual Amenity Outside Designated Areas (10% Allowance)

OHL (km) Removed During Year	LV	km														-	-
OHL (km) Removed During Year	HV	km														-	-
OHL (km) Removed During Year	EHV	km														-	-
OHL (km) Removed During Year	132kV	km														-	-
Total OHL (km) Removed During Year		km	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UG Cables Installed During Year (km)	LV	km														-	-
UG Cables Installed During Year (km)	HV	km														-	-
UG Cables Installed During Year (km)	EHV	km														-	-
UG Cables Installed During Year (km)	132kV	km														-	-
Total UG Cables Installed During Year (km)		km	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

OHL Inside Designated Areas at End of Reporting Year (km)						Undergrounding Activity Under ED1 Visual Amenity Allowance																								
						Visual Amenity Inside Designated Areas: OHL (km) Removed During Year					Visual Amenity Inside Designated Areas: UG Cables Installed During Year (km)					Visual Amenity Outside Designated Areas: OHL (km) Removed During Year					Visual Amenity Outside Designated Areas: UG Cables Installed During Year (km)					Visual Amenity Outside Designated Areas: Visual Amenity Expenditure (£m) on Visual Amenity Outside Designated Areas by voltage				
						LV	HV	33kV & 66kV	132kV	Total	LV	HV	33kV & 66kV	132kV	Total	LV	HV	33kV & 66kV	132kV	Total	LV	HV	33kV & 66kV	132kV	Total	LV	HV	33kV & 66kV	132kV	Total
Peak District	DA1	24.18	141.63	34.69	-	200.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Yorkshire Dales	DA1	20.41	197.75	18.62	-	236.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nidderdale	DA1	11.72	96.34	-	-	108.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Lincolnshire Wolds	DA1	45.84	287.97	77.79	22.93	434.53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		102.16	723.69	131.09	22.93	979.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				

16 - Visual Amenity		Volumes/ Additions													RSD-4213													Total				
RPNH 2020/21		2011	2012	DPCR5 2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	DPCR5	RSD-4213																
		m	m	m	m	m	m	m	m	m	m	m	m	m	m																	
		m	m	m	m	m	m	m	m	m	m	m	m	m	m																	

Volume - Visual Amenity Inside Designated Areas																		
OHL Inside Designated Areas at End of Reporting Year (km)	LV	km	495	451	444	447	424	437	415	414	411	405	405	402		2,237	2,887	
OHL Inside Designated Areas at End of Reporting Year (km)	HV	km	2,942	2,943	2,822	2,822	2,822	2,822	2,809	2,809	2,804	2,800	2,800	2,797	2,786		14,350	19,604
OHL Inside Designated Areas at End of Reporting Year (km)	EHV	km	217	217	175	175	175	175	175	175	175	175	175	175		950	1,221	
OHL Inside Designated Areas at End of Reporting Year (km)	132kV	km															-	
Total OHL Inside Designated Areas at End of Reporting Year (km)	LV	km	3,614.20	3,611.77	3,440.76	3,418.22	3,400.69	3,411.41	3,402.20	3,392.30	3,382.37	3,372.18	3,362.78	3,352.75		17,036	23,713	
OHL (km) Removed During Year	LV	km	-3.81	-7.36	-3.57	-2.56	-7.59	-6.11	-6.31	-5.48	-2.99	-3.28	-2.60	-3.03		27	34	
OHL (km) Removed During Year	HV	km	-	-	-	-	-	-	0.83	4.52	4.34	0.01	2.78	10.96		-	23	
OHL (km) Removed During Year	EHV	km	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
OHL (km) Removed During Year	132kV	km	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
Total OHL (km) Removed During Year	LV	km	3.81	7.36	3.57	2.56	7.59	6.11	6.31	5.48	2.99	3.28	2.60	3.03		27	57	
UG Cables Installed During Year (km)	LV	km	3.63	7.39	5.39	3.58	7.65	6.07	7.68	7.08	5.72	3.86	2.88	4.63		27	38	
UG Cables Installed During Year (km)	HV	km	-	-	-	-	-	-	6.85	4.95	4.87	6.02	3.75	6.77		-	21	
UG Cables Installed During Year (km)	EHV	km	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
UG Cables Installed During Year (km)	132kV	km	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
Total UG Cables Installed During Year (km)	LV	km	3.63	7.39	5.39	3.58	7.65	6.07	8.84	12.03	7.59	3.88	6.47	11.40		27	59	

Volume - Visual Amenity Outside Designated Areas (10% Allowance)																														
OHL (km) Removed During Year	LV	km														-														-
OHL (km) Removed During Year	HV	km														-														-
OHL (km) Removed During Year	EHV	km														-														-
OHL (km) Removed During Year	132kV	km														-														-
Total OHL (km) Removed During Year																-														-
UG Cables Installed During Year (km)	LV	km														-														-
UG Cables Installed During Year (km)	HV	km														-														-
UG Cables Installed During Year (km)	EHV	km														-														-
UG Cables Installed During Year (km)	132kV	km														-														-
Total UG Cables Installed During Year (km)																-														-

		Undergrounding Activity Under E01 Visual Amenity Allowance																														
		OHL Inside Designated Areas at End of Reporting Year (km)						Visual Amenity Inside Designated Areas: OHL (km) Removed During Year					Visual Amenity Inside Designated Areas: UG Cables Installed During Year (km)					Visual Amenity Outside Designated Areas: OHL (km) Removed During Year					Visual Amenity Outside Designated Areas: UG Cables Installed During Year (km)					Visual Amenity Outside Designated Areas: Visual Amenity Expenditure (£m) on Visual Amenity Outside Designated Areas by voltage				
		LV	HV	23kV & 66kV	132kV	Total	LV	HV	23kV & 66kV	132kV	Total	LV	HV	23kV & 66kV	132kV	Total	LV	HV	23kV & 66kV	132kV	Total	LV	HV	23kV & 66kV	132kV	Total	LV	HV	23kV & 66kV	132kV	Total	
Howe/Han Mills	D01	17.85	139.18	36.19	-	255.13	1.20	-	-	-	6.13	1.00	-	0.64	-	1.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niddale	D02	89.00	344.85	13.19	-	466.94	0.62	5.48	-	-	6.10	0.99	-	-	-	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Reston	D03	88.45	340.91	30.13	-	399.39	-	1.28	-	-	1.28	-	-	-	-	4.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northumberland Coast	D04	11.61	71.59	-	-	83.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northumberland	D05	21.50	227.21	22.21	-	322.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Yorks Moors	D06	112.38	875.09	60.07	-	1,047.54	1.07	0.05	-	-	1.12	1.26	-	-	-	1.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tynemouth	D07	80.82	296.87	-	-	377.69	0.15	1.25	-	-	1.39	0.89	1.53	-	-	2.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1,000.00	1,000.00	1,000.00	-	3,000.00	10.00	10.00	-	-	14.00	9.44	9.77	-	-	14.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NPgY		2Y - Environmental Reporting																															
2020/21		Costs															Volumes/ Additions																
Unit		2011	2012	DPCR5		2014	2015	2016	2017	2018	RIIO-ED1		2021	2022	2023	DPCR5	Total	2011	2012	DPCR5		2014	2015	2016	2017	2018	RIIO-ED1		2021	2022	2023	DPCR5	Total
		£m	£m	£m	£m	£m	£m				£m	£m				£m	£m		£m	£m	£m	£m	£m				£m	#				#	#
Environmental costs and volumes																																	
Undergrounding for Visual Amenity	km removed	0.01	-	-	-	-					-	-				0	-	0.5										-	-			1	-
Non-Undergrounding Visual Amenity Schemes	# interventions										-	-				-	-											-	-			-	-
Oil Pollution Mitigation Scheme - Cables	#										-	-				-	-											-	-			-	-
Oil Pollution Mitigation Scheme - Operational Sites	#	0.11	0.09	0.06	0.23	0.18	0.34	0.31	0.06	0.17	0.07	0.12	0			0.7	1.1	11.0	6.0	2.0	27.0	22.0	112.0	86.0	4.0	25.0	33.0	-	-			68	260
Oil Pollution Mitigation Scheme - Non Operational Sites	#										-	-				-	-											-	-			-	-
Persistent Organic Pollutant asset changes	#	0.15	0.24	-	-	-					-	-																-	-				
Persistent Organic Pollutant oil changes	#										-	-																-	-				
Persistent Organic Pollutant oil testing	#										-	-																-	-				
SF6 Emitted Mitigation Schemes	#										0.01	-				-	0											-	-				
Noise Pollution	# Interventions	0.01	-	0.04	0.13	0.22	0.13	0.19	0.03	0.03	0.00	0.07	0			0.4	0.5	-										-	-			1	
Contaminated Land Clean Up	#							0.15	0.21	0.05	0.11	-	0			-	0.6											-	-			12	17
Environmental Civil Sanction	#										-	-				-	-											-	-			-	23
Total		0.3	0.3	0.1	0.4	0.4	0.5	0.6512	0.3	0.3	0.2	0.2	0.1	-		1.5	2.1														83	37	
Fluid-Filled Cables																																	
Fluid-Filled Cables in service	Circuit km															607	591	481	461	451	438	421	418	407	379	359	345						
Oil in Service in Cables	Fluid ltrs															1,576,581	1,558,529	1,425,357	1,398,926	1,362,751	1,145,692	1,089,978	1,078,596	1,042,745	974,315	914,406	870,045						
Fluid Used to Top Up Cables	Fluid ltrs															31,250	33,788	51,905	42,951	28,113	18,732	18,150	17,438	19,567	24,267	20,224	19,383			188,007	#####		
Fluid Used to Top Up Cables as a percentage of volume in service	%															2%	2%	4%	3%	2%	2%	1.67%	2%	2%	2%	2%	2%	-					
Fluid Recovered from Fluid-Filled Cables	Fluid ltrs															-			9,344	11,370	2,361	6,928	2,699	1,810	7,229	8,143	6,032			20,714	35,202		
SF6																																	
SF6 Bank	kg															9,089	12,825	16,401	17,281	17,817	18,304	18,638	19,101	19,487	19,605	19,679	20,193						
SF6 Emitted	kg															47	97	36	98	79	84	99	62	47	48	49	87			357	477		
SF6 Emitted as a percentage of SF6 Bank	%															1%	1%	0%	1%	0%	0%	0.53%	0%	0%	0%	0%	0%	-					
Noise Pollution																																	
Total complaints received	#																7	19	17	26	11	18	27	16	19	39	26			69	156		

2N - Environmental Reporting																															
NPgN		Costs													Volumes/ Additions																
2020/21		DPCR5					RIIO-ED1					Total					DPCR5					RIIO-ED1					Total				
Unit		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	DPCR5	RIIO-ED1	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	DPCR5	RIIO-ED1
		£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#

Environmental costs and volumes

Undergrounding for Visual Amenity	km removed
Non-Undergrounding Visual Amenity Schemes	# interventions
Oil Pollution Mitigation Scheme - Cables	#
Oil Pollution Mitigation Scheme - Operational Sites	#
Oil Pollution Mitigation Scheme - Non Operational Sites	#
Persistent Organic Pollutant asset changes	#
Persistent Organic Pollutant oil changes	#
Persistent Organic Pollutant oil testing	#
SF6 Emitted Mitigation Schemes	#
Noise Pollution	# Interventions
Contaminated Land Clean Up	#
Environmental Civil Sanction	#
Total	

-										-	-				-	-
										-	-				-	-
										-	-				-	-
0.10	0.06	0.13	0.09	0.19	0.16	0.26	0.05	0.10	0.06	0	0				0.6	0.7
										-	-				-	-
-	-	-	-	-						-	-					
										-	-					
										-	-					
						0.08	0.08	0.04	-						-	0.2
0.07	0.08	0.16	0.30	0.11	0.03	0.06	0.56	0.00	0.02	0	0				0.7	0.9
						-	-		-	-	0				-	0.0
									-	-	-				-	-
0.2	0.1	0.3	0.4	0.3	0.2	0.3	0.7	0.2	0.1	0.1	0.25	-			1.3	1.8

Fluid-Filled Cables

Fluid-Filled Cables in service	Circuit km
Oil in Service in Cables	Fluid ltrs
Fluid Used to Top Up Cables	Fluid ltrs
Fluid Used to Top Up Cables as a percentage of volume in service	%
Fluid Recovered from Fluid-Filled Cables	Fluid ltrs

583	575	567	554	529	522,011	520	494	479	456	444	441		
1,544,752	1,530,109	1,501,323	1,469,599	1,419,147	1,433,538	1,429,192	1,347,254	1,305,156	1,240,009	1,211,779	1,202,394		
21,995	20,461	13,214	16,837	15,890	13,021	18,641	12,124	14,747	9,543	7,831	8,979	88,397	84,886
1.4%	1.3%	0.9%	1.1%	1.1%	0.9%	1.3%	0.9%	1.1%	0.8%	0.6%	0.7%	-	-
3,985	10,512	7,088	5,572	4,205	3,235	1,846	1,350	4,203	559	1,927	2,293	31,362	15,413

SF6

SF6 Bank	kg
SF6 Emitted	kg
SF6 Emitted as a percentage of SF6 Bank	%

9,089	9,960	13,832	14,530	15,125	15,259	15,393	16,174	16,357	16,590	16,621	17,059		
47	33	36	25	16	24	15	36	18	15	24	15	157	146
0.5%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	-	-

Noise Pollution

Total complaints received	#
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	7	18	13	17	14	16	17	23	16	28	21	55	135
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										-	-				-	-
										-	-				-	-
										-	-				-	-
11.0	8.0	4.0	14.0	18.0	34.0	45.0	4.0	23.0	22.0	-	-				55	128
						-	-	-	-	-	-				-	-
										-	-					
										-	-					
										-	-					
										-	-					
6	1	4	2.0	3.0	3.0	3.0	3.0	-	3.0	-	-	1.0			16	13
										-	-	6.0			-	6
20.0	15.0	6.0	7.0	2.0	4.0	4.0	1.0	6.0	-	-	-				50	15

583	575	567	554	529	522,011	520	494	479	456	444	441		
1,544,752	1,530,109	1,501,323	1,469,599	1,419,147	1,433,538	1,429,192	1,347,254	1,305,156	1,240,009	1,211,779	1,202,394		
21,995	20,461	13,214	16,837	15,890	13,021	18,641	12,124	14,747	9,543	7,831	8,979	88,397	84,886
1.4%	1.3%	0.9%	1.1%	1.1%	0.9%	1.3%	0.9%	1.1%	0.8%	0.6%	0.7%	-	-
3,985	10,512	7,088	5,572	4,205	3,235	1,846	1,350	4,203	559	1,927	2,293	31,362	15,413

9,089	9,960	13,832	14,530	15,125	15,259	15,393	16,174	16,357	16,590	16,621	17,059		
47	33	36	25	16	24	15	36	18	15	24	15	157	146
0.5%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	-	-

	7	18	13	17	14	16	17	23	16	28	21	55	135
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[illegible][illegible][illegible]

Business Transport									
Road	Miles	4,516,278	4,445,115	4,432,277.00	4,396,390	4,480,667	3,004,182.00	3,043,882.00	28,318,791.00
Rail	Person Km	569,346	432,076	696,244.90	721,773	675,118	15,917.72	55,475.79	3,165,950.98
Sea		-	-	-	-	-	-	-	-
Air	Person Km	765,518	541,429	1,071,782.70	735,842	573,431	-	13,677.42	3,701,479.87
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
Total		-	-	-	-	-	-	-	-

Fugitive Emissions	Kg
SF6	-
Gases Other	-
Total	-

Fuel Combustion							
Diesel							-
Gas Natural							-
Fuels Other							-
Total							-

Losses									
Losses	kWh	#####	#####	1,370,343,185.60	1,233,170,610	#####	1,418,719,020.87	1,409,021,939.40	9,349,738,743.46

[illegible][illegible]

Business Transport	Road							-
	Rail							-
	Sea							-
	Air							-
								-
	Total							

[illegible]

Fuel Combustion	Litres							
Diesel	2,039,540	#####	1,473,813.36	1,461,423	1,511,942	1,674,984.15	1,778,947.39	11,749,901.60
Gas Natural								-
Fuels Other								-
Total								-

4Y - Losses Snapshot																									
NPgY																									
2020/21																									
Activity							Units	Volumes								Estimated Distribution Losses benefits over 'Baseline Scenario'								Cumulative discounted net benefits	
Category	Programme/project title	Type of Distribution Losses managed by the activity (Select from list)	Primary driver of activity (Select from list)	Please indicate where else in the RIGs the activity has been reported	Activity identified in DNO's final RIIO-ED1 Business Plan? (Yes/No)	Cross-reference to relevant paragraph(s) of current Distribution Losses Strategy	Description of unit	2015/16	2016/17	2017/18	2018/19	2020/21	2020/21	2021/22	2022/23	2015/16	2016/17	2017/18	2018/19	2020/21	2020/21	2021/22	2022/23	RIIO-ED1	45 years (if appropriate)
Text	Text	Text	Text	Text	Text	Text	Text	#	#	#	#	#	#	#	#	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	£m	£m
Cable	NPgY 300mm HV	Technical losses	Other	This information	Yes	Design policy, page	km	112.85	112.99	78.40	118.40	120	105	102		-253.43	509.72	- 689.22	- 959.90	-1235.9	-1479.3	-1716.5		-0.50	0.33
Cable	NPgY 300mm LV	Technical losses	Other	This information	Yes	Design policy, page	km	114.94	85.30	104.80	172.37	155	136	147		-405.22	- 705.96	-1,075.44	- 1,683.16	-2230.4	-2710.1	-3228.7		-0.18	2.09
Cable	h transformers replacement	Technical losses	Asset Replacement	This information	Yes	Replacement of pre	Transformer	3	1	3	7	11	7	4		-79.2	-109.0	-156.1	-317.3	-525.3	-656.3	-721.8		-0.05	0.51
Cable																									
Cable																									
Transformer																									
Transformer																									
Transformer																									
Transformer																									
Innovative Solution																									
Innovative Solution																									
Innovative Solution																									
Innovative Solution																									
Innovative Solution																									
Smart Meters																									
Smart Meters																									
Smart Meters																									
Smart Meters																									
Smart Meters																									
Relevant Theft of Electricity																									
Relevant Theft of Electricity																									
Relevant Theft of Electricity																									
Relevant Theft of Electricity																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Total																-737.9	-1,324.7	-1,920.7	- 2,960.4	-3,991.6	- 4,845.7	#####	-	-	0.7

4N - Losses Snapshot																									
NPgN																									
2020/21																									
Activity								Units	Volumes								Estimated Distribution Losses benefits over 'Baseline Scenario'								Cumulative discounted net benefits
Category	Programme/project title	Type of Distribution Losses managed by the activity (Select from list)	Primary driver of activity (Select from list)	Please indicate where else in the RIGs the activity has been reported	Activity identified in DNO's final RIIO ED1 Business Plan? (Yes/No)	Cross-reference to relevant paragraph(s) of current Distribution Losses Strategy	Description of unit	2015/16	2016/17	2017/18	2018/19	2020/21	2020/21	2021/22	2022/23	2015/16	2016/17	2017/18	2018/19	2020/21	2020/21	2021/22	2022/23	RIIO-ED1	45 years (if appropriate)
Text	Text	Text	Text	Text	Text	Text	Text	#	#	#	#	#	#	#	#	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	£m	£m
Cable	NPgN 300mm HV	Technical losses	Other	This information	Yes	Design policy, page	km	19.7	53.2	15.2	73.8	77.3	49.8	48.6		-44.3	-164.7	-199.8	-367.3	-543.5	-658.7	-771.7		-0.220	0.145
Cable	NPgN 300mm LV	Technical losses	Other	This information	Yes	Design policy, page	km	75.1	34.3	36.0	86.9	78.8	61.4	58.6		-264.9	-385.8	-512.7	-819.0	-1097.0	-1313.3	-1520.0		-0.080	0.991
Cable	h transformers replacement	Technical losses	Asset Replacement	This information	Yes	Replacement of pre	Transformer	0.0	5.0	6.0	0.0	4.0	2.0	0.0		0.0	-111.8	-251.0	-252.2	-335.3	-384.0	-385.9		-0.013	0.309
Cable																									
Transformer																									
Transformer																									
Transformer																									
Transformer																									
Transformer																									
Innovative Solution																									
Innovative Solution																									
Innovative Solution																									
Innovative Solution																									
Smart Meters																									
Smart Meters																									
Smart Meters																									
Smart Meters																									
Relevant Theft of Electricity																									
Relevant Theft of Electricity																									
Relevant Theft of Electricity																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Other (please specify)																									
Total																- 309.2	- 662.2	- 963.4	- 1,438.5	- 1,975.8	- 2,355.9	#####	-	-	0.3

5Y - Smart Metering NPgY 2020/21															
		2011	2012	DPCR5 2013	2014	2015	2016	2017	2018	RIIO-ED1 2019 2020		2021	2022	2023	Total DPCR5 RIIO-ED1
		£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Costs		Cost													
Smart Meter Communication Licensee Costs (pass through)					0.1	0.3	0.6	1.3	1.4	1.9	2.4	2.9	2.5		0.4
Smart Meter Information Technology Costs (pass through)					-	-	0.8	1.4	0.9	0.8	0.6	0.7	1.0		-
Elective Communication Services (outside price control)					-	-	-	-	-	-	-	-	-		-
Smart Meter Communication Licensee Costs (outside price control)					-	-	-	-	-	-	-	-	-		-
Total		-	-	-	0.1	0.3	1.4	2.6	2.2	2.7	2.9	3.6	3.5	-	19.1
Estimated Benefits		Estimated benefits													
Avoided losses to network operators							-	-	-	-	-	-	-		-
Reduction in CML							-	-	-	-	-	-	-		-
Reduction in operational costs to fix faults							-	-	-	-	-	-	-		-
Reduction in calls to faults and emergencies lines							-	-	-	-	-	-	-		-
Better informed investment decisions for electricity network enforcement							-	-	-	-	-	-	-		-
Avoided cost of investigation of customer complaints about voltage quality of supply							-	-	-	-	-	-	-		-
Network capacity investment savings from electricity demand shift							-	-	-	-	-	-	-		-
Total		-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-

5N - Smart Metering
NPgN
2020/21

Costs

Smart Meter Communication Licensee Costs (pass through)
Smart Meter Information Technology Costs (pass through)
Elective Communication Services (outside price control)
Smart Meter Communication Licensee Costs (outside price control)
Total

Cost

	2011 £m	2012 £m	DPCR5 2013 £m	2014 £m	2015 £m	2016 £m	2017 £m	2018 £m	RIIO-ED1 2019 £m	2020 £m	2021 £m	2022 £m	2023 £m	DPCR5 £m	Total RIIO-ED1 £m
				0.07	0.18	0.46	0.90	0.96	1.36	1.67	2.0	1.75		0.25	9.15
				-	-	0.82	1.35	0.88	0.79	0.59	0.7	1.02		-	6.19
				-	-	-	-	-	-	-	-	-		-	-
				-	-	-	-	-	-	-	-	-		-	-
	-	-	-	0.07	0.18	1.29	2.26	1.84	2.14	2.26	2.79	2.77	-	0.25	15.34

Estimated Benefits

Avoided losses to network operators
Reduction in CML
Reduction in operational costs to fix faults
Reduction in calls to faults and emergencies lines
Better informed investment decisions for electricity network enforcement
Avoided cost of investigation of customer complaints about voltage quality of supply
Network capacity investment savings from electricity demand shift
Total

Estimated benefits

						-	-	-	-	-	-			-	-
						-	-	-	-	-	-			-	-
						-	-	-	-	-	-			-	-
						-	-	-	-	-	-			-	-
						-	-	-	-	-	-			-	-
						-	-	-	-	-	-			-	-
						-	-	-	-	-	-			-	-
	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-

Innovative Solutions NPgY 2020/21				Additions		Disposals		MVA released		Estimated Gross Avoided		Estimated Losses Impacted		Estimated CI Impact		Estimated CML Impact		Other Estimated GHG Emissions		Estimated Impact on Fatalities		Estimated Impact on Significant Injuries		Estimated Impact on Oil Leakage	
Solution type	Unit	Voltage level of issue	RIIO Output	RIIO-ED1 2016	RIIO-ED1 2016	RIIO-ED1 2016	RIIO-ED1 2016	MVA 2016	MVA 2016	RIIO-ED1 2016	RIIO-ED1 2016	RIIO-ED1 2016	RIIO-ED1 2016	CI 2016	RIIO-ED1 CI	mins 2016	mins RIIO-ED1	tCO2e 2016	RIIO-ED1 2016	fatalities 2016	RIIO-ED1 2016	major injuries 2016	RIIO-ED1 2016	litres 2016	RIIO-ED1 2016
Increase Network Capacity/Optimise Utilisation																									
Load capacity release	Agreement	EHV	connections	4.00	4.00		-	26.00	26.00		-		-		-		-		-		-		-		-
Generation capacity release	Agreement	EHV	connections	1.00	3.00		-	3.00	17.00		-		-		-		-		-		-		-		-
Voltage reduction at primary	Substation primary	LV	connections	13.00	318.00		-	117.00	2,862.00		-		-		-		-		-		-		-		-
Total				18.00	325.00		-	146.00	2,905.00		-		-		-		-		-		-		-		-
Improve Asset Life Cycle Management																									
Transformer insulating oil on-line regeneration	Substation primary	EHV	reliability and availability	-	24.00		-		-		-		-		-		-		-		-		-		-
HV Circuit breaker retrofit	Retrofit	HV	reliability and availability		69.00		-		-		2.76		-		-		-		-		-		-		-
Total				-	93.00		-	-	-		2.76		-		-		-		-		-		-		-
Improve Network Performance																									
LV technology programme (Kelvatek)	units	LV	reliability and availability	643.00	643.00		-		-	- 0.26	- 1.58		-	- 25,333.00	-146,090.00	- 2,640,434.00	-15,090,280.00		-		-		-		-
Automatic Power Restoration System (APRS)	Substation primary	HV	reliability and availability	10	180.00		-		-		-		-	- 527.00	-125,831.00	- 19,707.00	- 660,519.74		-		-		-		-
Total				653.00	823.00		-	-	-	- 0.26	- 1.58		-	- 25,860.00	-271,921.00	- 2,660,141.00	-15,750,799.74		-		-		-		-
Improve Safety																									
Telematics in operational vehicles	vehicles	N/A	safety	345.00	400.00		-		-	-	0.08		-		-		-		- 165.60		-		-		-
Fire retardant workwear	employees protected	N/A	safety	960.00	1,920.00		-		-	- 0.06	- 0.12		-		-		-		-	- 7.00	- 14.00		-		-
Farm safety	shows	HV/EHV	safety	5.00	10.00		-		-	- 0.01	- 0.01		-	- 495.00	- 990.00	- 85,072.00	- 170,144.00		- 0.07	- 0.14	- 0.04	- 0.08		-	-
Total				1,310.00	2,330.00		-	-	-	- 0.07	- 0.21		-	- 495.00	- 990.00	- 85,072.00	- 170,144.00		- 0.07	- 0.14	- 7.04	- 14.08		-	-
Improve Environmental Impact																									
Fluid filled cable leak detection (pft)	circuits	EHV	environment	1.00	29.00		-		-	- 0.11	- 1.92		-		-		-		-		-		-	- 750.00	#####
Total				1.00	29.00		-	-	-	- 0.11	- 1.92		-		-		-		-		-		-	- 750.00	#####
Improve Connection Performance																									
Flexible connection agreements (constrained generators)	Connection agreement	EHV	connections	1.0	5.00		-	3.00	27.60	- 0.75	- 10.85		-		-		-		-		-		-		-
AutoDesign	Deployments	LV	connections		1,064.00		-		-		0.08		-		-		-		-		-		-		-
Total				1.00	1,069.00		-	3.00	27.60	- 0.75	- 10.93		-		-		-		-		-		-		-

Innovative Solutions NPgN 2020/21				Additions		Disposals		MVA released		Estimated Gross Avoided		Estimated Losses Impacted		Estimated CI Impact		Estimated CML Impact		Other Estimated GHG Emissions		Estimated Impact on Fatalities		Estimated Impact on Major Injuries		Estimated Impact on Oil Leaked																
Solution type	Unit	Voltage level of issue	RIIO Output	RIIO-ED1		RIIO-ED1		RIIO-ED1		RIIO-ED1		RIIO-ED1		RIIO-ED1		RIIO-ED1		RIIO-ED1	RIIO-ED1	RIIO-ED1	RIIO-ED1	RIIO-ED1	RIIO-ED1	RIIO-ED1	RIIO-ED1															
				2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1	2016	RIIO-ED1													
				#	#	#	#	MVA	RIIO-ED1	MVA	£m	£m	MWh	MWh	CI	2016	RIIO-ED1	CI	mins	2016	RIIO-ED1	mins	tCO2e	2016	RIIO-ED1	fatalities	2016	RIIO-ED1	major injuries	2016	RIIO-ED1	litres								
Increase Network Capacity/Optimise Utilisation																																								
Generation capacity release	agreement	EHV	connections	-	2.00		-	-	4.00		-	-		-		-	-		-		-		-		-		-		-		-									
Voltage reduction at primary	substation primary	LV	connections	5.00	174.00		-	45.00	#####		-	-		-		-	-		-		-		-		-		-		-		-									
Total				5.00	176.00		-	45.00	#####		-	-		-		-	-		-		-		-		-		-		-		-									
Improve Asset Life Cycle Management																																								
Transformer insulating oil on-line regeneration	Regeneration	EHV	reliability and availability		9.00		-		-		-	-		-		-	-		-		-		-		-		-		-		-									
HV Circuit breaker retrofit	Retrofit	HV	reliability and availability		54.00		-		-		-	2.16		-		-	-		-		-		-		-		-		-		-									
Total				-	63.00		-	-	-		-	2.16		-		-	-		-		-		-		-		-		-		-									
Improve Network Performance																																								
LV technology programme (Kelvatek)	unit	LV	reliability and availability	368.00	368.00		-		-		-	0.18	-	1.07		-	19,404.00	-113,020.00		-	1,902,714.00	#####		-		-		-		-		-								
Automatic Power Restoration System (APRS)	substation primary	HV	reliability and availability	17.00	131.00		-		-		-		-			-	2,522.00	-396,998.00		-	13,409.54	#####		-		-		-		-		-								
Total				385.00	499.00		-	-	-		-	0.18	-	1.07		-	#####	-510,018.00		-	1,916,123.54	#####		-		-		-		-		-								
Improve Safety																																								
Telematics in operational vehicles	vehicles	N/A	safety	345.00	400.00		-	-	-		-	0.05		-		-		-		-	110.40		-		-		-		-		-									
Fire retardant workwear	employees protective	N/A	safety	640.00	#####		-	-	-		-	0.04	-	0.08		-		-		-		-		-		-		-		-		-								
Farm safety	shows	HV/EHV	safety	2.00	4.00		-	-	-		-	0.00	-	0.01		-	1,835.00	-	3,670.00		-	149,800.00	-	299,600.00		-	0.07	-	0.13		-	0.07	-	0.13	-	6.04	-	12.07		-
Total				987.00	#####		-	-	-		-	0.04	-	0.14		-	1,835.00	-	3,670.00		-	149,800.00	-	299,600.00		-	0.07	-	0.13		-	6.04	-	12.07		-				
Improve Environmental Impact																																								
Fluid filled cable leak detection (pft)	circuits	EHV	environment	6.00	7.00		-		-		-	0.51	-	0.58		-		-		-		-		-		-		-		-		-	-	4,500.00	-	5,250.00				
Total				6.00	7.00		-	-	-		-	0.51	-	0.58		-		-		-		-		-		-		-		-	-	4,500.00	-	5,250.00						
Improve Connection Performance																																								
Flexible connection agreements (constrained generator connection agreements)	connection agreements	132kV	connections	1.00	1.00		-	30.00	30.00		-	3.00	-	3.00		-		-		-		-		-		-		-		-		-		-						
AutoDesign	deployments	LV	connections		#####		-				-		-	0.11		-		-		-		-		-		-		-		-		-		-						
Total				1.00	#####		-	30.00	30.00		-	3.00	-	3.11		-		-		-		-		-		-		-		-		-		-						

**7Y - LCTs
NPgY
2020/21**

	2016	2017	2018	2019	RIIO-ED1 2020	2021	2022	2023	RIIO-ED1
Units	#	#	#	#	#	#	#	#	#

Estimated volumes of LCTs Installed

Secondary network

Heat Pumps	Number	456	541.0	657.0	624.0	943.0	866.0	573.0	4,660.0
EV slow charge	Number	209	48	111.0	207.0	31.0	14.0	29.0	649.0
EV fast charge	Number	296	375	417.0	965.0	748.0	1,767.0	4,189.0	8,757.0
PVs (G83)	Number	13,038	2,320	1,155.0	1,333.0	469.0	868.0	1,596.0	20,779.0
Other DG (G83)	Number	1	-	-	-	20.0	-	-	21.0
DG (non G83)	Number	235	120	47.0	44.0	34.0	252.0	534.0	1,266.0
Total		14,235	3,404	2,387.0	3,173.0	2,245.0	3,767.0	6,921.0	36,132.0

Primary network

Heat Pumps	Number								-
EV slow charge	Number								-
EV fast charge	Number								-
PVs (G83)	Number								-
Other DG (G83)	Number								-
DG (non G83)	Number	7.0	10.0	4.0	-	1.0	4.0		26.0
Total		7	10.0	4.0	-	1.0	4.0	-	26.0

Estimated size of LCTs Installed

Secondary network

Heat Pumps	MW	2.9	2.3	2.8	3.6	9.4	25.0	3.6	49.6
EV slow charge	MW	0.7	0.2	0.4	0.8	0.1	0.1		2.4
EV fast charge	MW	2.2	2.8	3.1	7.8	7.4	20.2	33.0	76.5
PVs (G83)	MW	40.2	7.2	3.7	4.4	1.6	2.9	5.6	65.6
Other DG (G83)	MW	0.0	-	-	-	0.1	-	-	0.1
DG (non G83)	MW	103.5	54.2	10.7	11.4	81.0	13.0	23.5	297.3
Total		150	66.7	20.8	28.0	99.5	61.1	65.7	491.3

Primary network

Heat Pumps	MW								-
EV slow charge	MW								-
EV fast charge	MW								-
PVs (G83)	MW								-
Other DG (G83)	MW								-
DG (non G83)	MW	135.9	230.4	122.5	-	77.0	121.0		686.8
Total		136	230.4	122.5	-	77.0	121.0	-	686.8

**7N - LCTs
NPgN
2020/21**

	RIIO-ED1								
Units	2016	2017	2018	2019	2020	2021	2022	2023	RIIO-ED1
	#	#	#	#	#	#	#	#	#

Estimated volumes of LCTs Installed

Secondary network

Heat Pumps	Number	541.0	370.0	436.0	589.0	711.0	702.0	1,178.0	4,527.0
EV slow charge	Number	228.0	94.0	164.0	110.0	16.0	13.0	32.0	657.0
EV fast charge	Number	321.0	313.0	435.0	424.0	427.0	1,027.0	2,601.0	5,548.0
PVs (G83)	Number	11,890.0	1,304.0	932.0	1,231.0	445.0	460.0	1,392.0	17,654.0
Other DG (G83)	Number	-	1.0	-	-	27.0	-	-	28.0
DG (non G83)	Number	115.0	83.0	35.0	36.0	28.0	164.0	411.0	872.0
Total		13,095	2,165	2,002	2,390	1,654	2,366	5,614	29,286.0

Primary network

Heat Pumps	Number								-
EV slow charge	Number								-
EV fast charge	Number								-
PVs (G83)	Number								-
Other DG (G83)	Number								-
DG (non G83)	Number	2.0	3.0	5.0	1.0	2.0	1.0		14.0
Total		2.0	3	5.0	1.0	2.0	1.0	-	14.0

Estimated size of LCTs Installed

Secondary network

Heat Pumps		2.34	4.04	3.04	6.51	9.6	14.5	5.8	45.8
EV slow charge	MW	0.8	0.4	0.6	0.4	0.1	0.1	0.1	2.3
EV fast charge	MW	2.3	2.3	3.2	3.4	6.2	12.0	19.2	48.6
PVs (G83)	MW	35.24	3.90	2.97	3.98	1.4	1.5	4.7	53.7
Other DG (G83)	MW	-	0.0	-	-	0.1	-	-	0.1
DG (non G83)	MW	39.7	79.0	6.2	3.0	12.9	30.4	21.5	192.7
Total		80.4	89.6	16.0	17.3	30.2	58.5	51.3	343.2

Primary network

Heat Pumps	MW								-
EV slow charge	MW								-
EV fast charge	MW								-
PVs (G83)	MW								-
Other DG (G83)	MW								-
DG (non G83)	MW	9.0	85.1	225.9	0.04	33.0	99.0		452.1
Total		9.0	85.1	225.9	0.0	33.0	99.0	-	452.1

GLOSSARY

Term	Definition
BCF	Business Carbon Footprint (BCF) is the total amount of greenhouse gas emissions that is caused directly or indirectly by a business.
CI	Customer Interruption (CI) is the number of customers whose electricity supply has been interrupted, per 100 customers, where an interruption of supply lasts for three minutes or longer, and excludes re-interruptions to the supply of customers previously interrupted during the same incident.
CML	Customer Minutes Lost (CML) is the average duration of interruptions to the supply per customer, where an interruption of supply lasts for three minutes or longer.
Designated Area	Designated Area (DA) is used to refer to Areas of Outstanding Natural Beauty and National Parks
DPCR5	DPCR5 stands for Distribution Price Control Review 5. The period of five regulatory years (1 April to 31 March), from 2010 to 2015, covered by an agreement between the regulator and the distributed network operator on costs and deliverables. The generic name for such period is a 'price control period'.
G83	The term is used in this annex as a way to refer to small-scale distributed generation which falls under the Engineering Recommendation G83 (i.e. up to 16A per phase per premises, connected at low voltage). Please note, G98 standard has now replaced the G83 standard. The Table E7 still refers to G83.
MVA	Mega Volt Amp is a measure of electrical power.
Non G83	The term is used in this annex as a way to refer to all distributed generation which is greater in size than G83. Please note, G98 standard has now replaced the G83 standard. The Table E7 still refers to G83.
Primary substations	Substation connecting circuits at extra-high voltage and high voltage.
RIIO-ED1	The price control period (see DPCR5) covering 2015 to 2023.