National Electricity Transmission System Performance Report

Report to the Office of Gas and Electricity Markets (Ofgem)

2023 – 24

ESO

Contents

Section Five

Interconnectors

Section Six

Offshore Systems

Introduction

This report details the performance of the National Electricity Transmission System in Great Britain for 2023-24, as required by Transmission Licence Standard Condition C17: Transmission System Security Standard and Quality of Service.

The National Electricity Transmission System (NETS) in Great Britain is comprised of both onshore and offshore transmission networks.

The onshore transmission networks are owned by National Grid Electricity Transmission plc (NGET) in England and Wales, SP Transmission plc (SPT) in south and central Scotland and Scottish Hydro Electric Transmission plc (SHE Transmission) in the north of Scotland. There is also a 2250MW HVDC undersea link between Hunterston in Western Scotland and Flintshire Bridge in North Wales, that is jointly owned by SPT and NGET.

The offshore transmission networks are owned by Transmission Capital (TC), Blue Transmission Investments Ltd (BT), Greater Gabbard OFTO plc, Triton Knoll OFTO Ltd, Gwynt-Y-Mor OFTO plc, Thanet OFTO Ltd, Humber Gateway OFTO Ltd, West of Duddon Sands (WoDS) Transmission plc, Diamond Transmission Partners (DTP) BBE Ltd, DTP RB Ltd, DTP Galloper Ltd, DTP Walney Extension Ltd, DTP Hornsea One Ltd and DTP Hornsea Two Ltd.

Following legal separation of the Electricity System Operator from NGET on 1st April 2019, National Grid Electricity System Operator Ltd became the National Electricity Transmission System Operator (NETSO) for the onshore and offshore transmission networks.

In accordance with Standard Licence Condition C17 (Transmission System Security Standard and Quality of Service) of the Transmission Licence, the NETSO is required by the Office of Gas and Electricity Markets, to report on the annual performance of the National Electricity Transmission System in terms of availability, system security and quality of service.

The onshore and offshore transmission system broadly comprises circuits operating at 400, 275 and 132kV. The formal definition of the National Electricity Transmission System is contained in the NETS Grid Code and NETS Security and Quality of Supply Standard (NETS SQSS).

The fully interconnected transmission system provides a consistently high quality of supply and allows for the efficient bulk transfer of power from remote generation to demand centres.

Information relating to NG Electricity Transmission plc, SP Transmission plc, SHE Transmission plc, TC Robin Rigg OFTO Ltd, TC Barrow OFTO Ltd, TC Gunfleet Sands OFTO Ltd, TC Ormonde OFTO Ltd, TC Lincs OFTO Ltd, TC Westermost Rough OFTO Ltd, TC Dudgeon OFTO plc, TC Beatrice OFTO Ltd, TC Rampion OFTO Ltd, TC East Anglia One OFTO Ltd, TC Moray East OFTO Ltd, BT Walney 1 Ltd, BT Walney 2 Ltd, BT Sheringham Shoal Ltd, BT London Array Ltd, Greater Gabbard OFTO plc, Triton Knoll OFTO Ltd, Gwynt-Y-Mor OFTO plc, Thanet OFTO Ltd, Humber Gateway OFTO Ltd, WoDS Transmission plc, DTP BBE Ltd, DTP RB Ltd, DTP Galloper Ltd, DTP Walney Extension Ltd, DTP Hornsea One Ltd and DTP Hornsea Two Ltd have been provided by the Transmission Owners in accordance with Licence Condition D3 (Transmission System Security Standard and Quality of Service) of their Transmission Licences.

When considering the performance of the transmission networks, it should be recognised that this can be influenced by both the Transmission Owners and the NETSO.

The National Electricity Transmission System is connected via interconnectors to transmission systems in Northern Ireland, Republic of Ireland, France, the Netherlands, Belgium, Norway, and Denmark.

The interconnectors with Northern Ireland and the Republic of Ireland fall outside the scope of this report, as they are regulated by the Northern Ireland Authority for Utility Regulation (NIAUR) and the Commission for Regulation of Utilities (CRU) respectively. The ElecLink interconnector is also excluded as it is regulated by Commission De Régulation De L'Énergie (CRE) of France.

Information relating to interconnectors with France (Interconnexion France–Angleterre IFA1 and IFA2), the Netherlands (BritNed), Belgium (NEMO Link), Norway (North Sea Link), Denmark (Viking Link) has been provided by National Grid Ventures.

National Electricity Transmission System (GB Network)

Availability

The definitions and criteria for system availability can be found in the Glossary of terms at the end of this report.

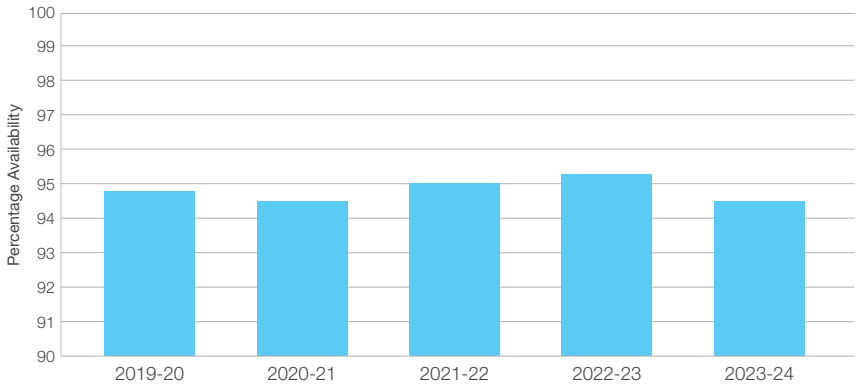
National Electricity Transmission System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability.

Annual System Availability

Annual System Availability of the National Electricity Transmission System for 2023-24 was: 94.42%

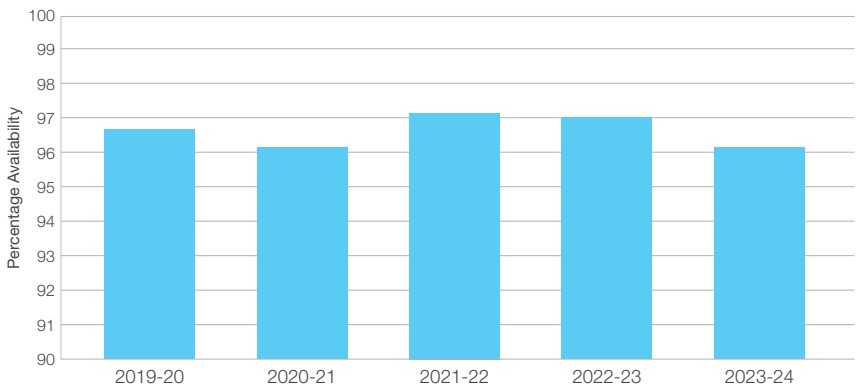
% Annual System Availability

GB % Annual System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
94.69	94.50	94.99	95.24	94.42

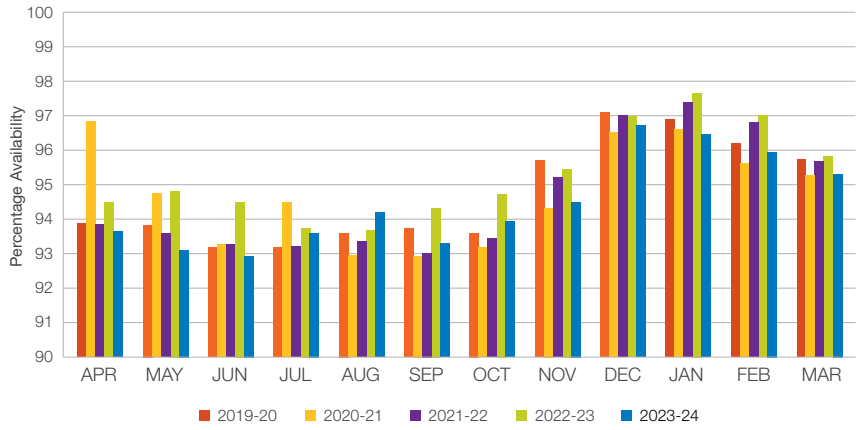


% Winter Peak System Availability

GB % Winter Peak System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
96.72	96.22	97.19	97.03	96.22



% Monthly System Availability



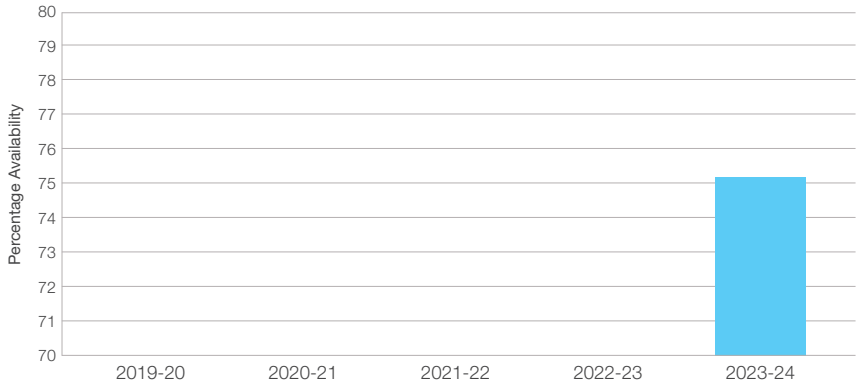
GB % Monthly System Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	93.88	96.84	93.83	94.48	93.69
May	93.77	94.68	93.55	94.73	93.15
Jun	93.16	93.24	93.22	94.47	92.97
Jul	93.11	94.43	93.16	93.70	93.64
Aug	93.51	92.92	93.31	93.60	94.25
Sep	93.71	92.90	92.96	94.28	93.34
Oct	93.52	93.10	93.40	94.72	93.96
Nov	95.70	94.32	95.21	95.38	94.54
Dec	97.05	96.45	97.01	97.01	96.75
Jan	96.89	96.58	97.39	97.63	96.50
Feb	96.17	95.57	96.78	96.99	96.00
Mar	95.80	95.30	95.73	95.86	95.36

Reactive Compensation Equipment Availability

The definitions and criteria for Reactive Compensation Equipment Availability can be found in the Glossary of terms at the end of this report.

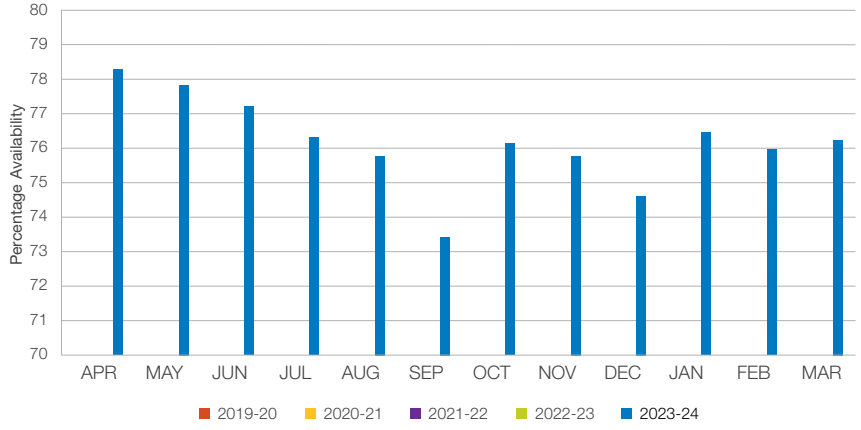
National Electricity Transmission System reactive compensation equipment performance is monitored by reporting variations in Annual and Monthly Reactive Compensation Equipment Availability.

% Annual Reactive Comp. Equipment Availability



GB % Annual Reactive Comp. Equipment Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	N/A	N/A	N/A	75.19

% Monthly Reactive Comp. Equipment Availability



GB % Monthly Reactive Comp. Equipment Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	N/A	N/A	N/A	N/A	78.24
May	N/A	N/A	N/A	N/A	77.83
Jun	N/A	N/A	N/A	N/A	77.22
Jul	N/A	N/A	N/A	N/A	76.28
Aug	N/A	N/A	N/A	N/A	75.78
Sep	N/A	N/A	N/A	N/A	73.45
Oct	N/A	N/A	N/A	N/A	76.15
Nov	N/A	N/A	N/A	N/A	75.75
Dec	N/A	N/A	N/A	N/A	74.60
Jan	N/A	N/A	N/A	N/A	76.48
Feb	N/A	N/A	N/A	N/A	76.00
Mar	N/A	N/A	N/A	N/A	76.25

Security

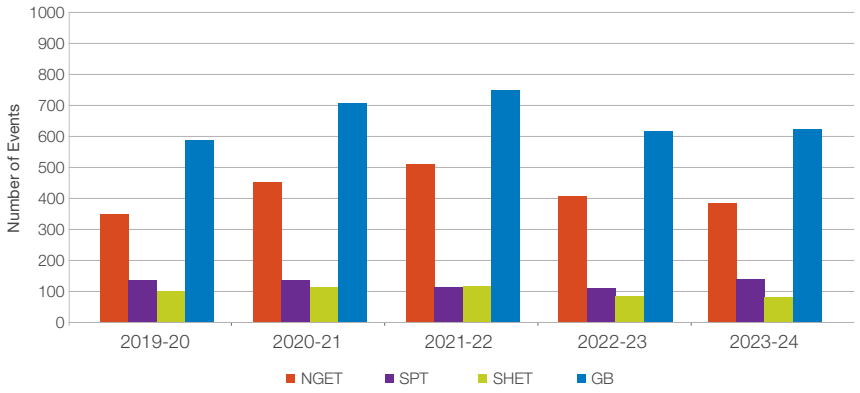
The definitions and criteria for system security can be found in the Glossary of terms at the end of this report.

System performance is monitored by the Estimated Unsupplied Energy from the National Electricity Transmission System for each incident.

During 2023-24 there were 627 NETS events where transmission circuits were disconnected either automatically or by urgent manual switching. Most of these events had no impact on electricity users with 17 resulting in loss of supplies to customers.

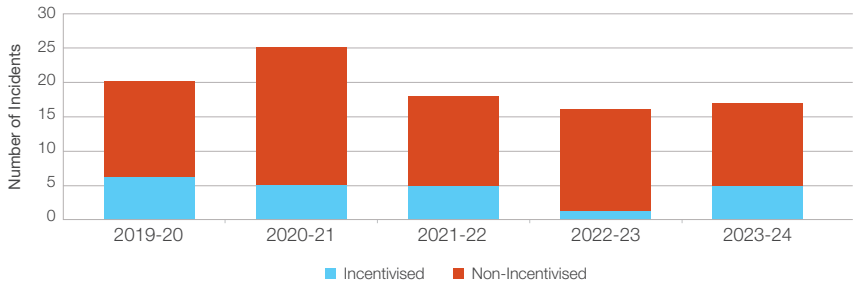
GB System Events					
	2019-20	2020-21	2021-22	2022-23	2023-24
NGET	355	455	517	412	390
SPT	131	138	115	118	148
SHET	100	113	119	89	89
GB	586	706	751	619	627

GB System Events



Number of Loss of Supply Incidents

The chart shows the annual comparison of the number of Loss of Supply Incidents that occurred within the National Electricity Transmission System.

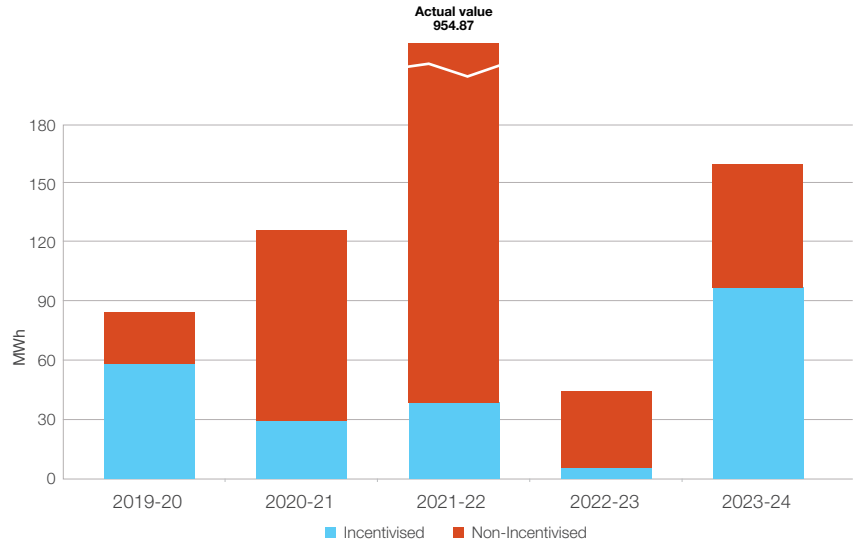


GB System – Number of Incidents					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	6	5	5	1	5
Non-Incentivised	14	20	13	15	12

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the National Electricity Transmission System during 2023-24 was: **159.78 MWh**

The chart shows the annual comparison of the Estimated Unsupplied Energy for Loss of Supply Incidents that occurred within the National Electricity Transmission System.



GB System – Estimated Unsupplied Energy (MWh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	57.59	47.98	26.84	5.20	97.08
Non-Incentivised	26.10	76.85	928.03	38.48	62.70

Reliability of Supply

The Overall Reliability of Supply for the National Electricity Transmission System during 2023-24 was: **99.999930%**

compared with 99.999981% in 2022-23 and 99.999612% in 2021-22.

Quality of Service

Quality of service is measured with reference to system Voltage and Frequency. The criteria for reportable Voltage and Frequency Excursions can be found in the Glossary of terms at the end of this report.

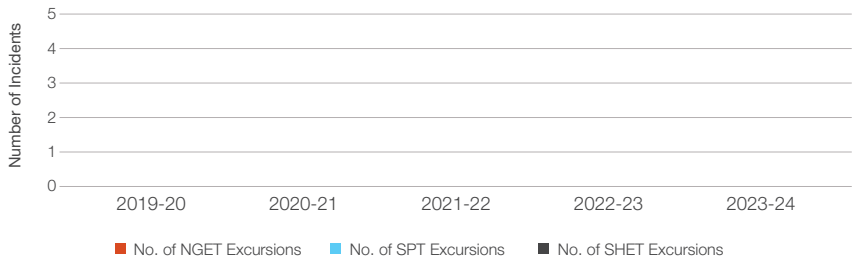
Voltage Excursions

During 2023-24 there were no reportable Voltage Excursions within the National Electricity Transmission System.

The chart below summarises the reportable Voltage Excursions that have occurred on the National Electricity Transmission System.

GB System Voltage Excursions

GB System – Voltage Excurisons					
	2019-20	2020-21	2021-22	2022-23	2023-24
Number of NGET Excursions	0	0	0	0	0
Number of SPT Excursions	0	0	0	0	0
Number of SHET Excursions	0	0	0	0	0



GB System Voltage Excursion

Incident Date, Time and Location	Nominal Voltage	Max Voltage	Duration
None			

Frequency Excursions

During 2023-24, there were no reportable Frequency Excursions within the National Electricity Transmission System. The previous Frequency Excursions were in the 2019-20 and 2008-09 reporting periods.

GB System Frequency Excursions

GB System – Frequency Excurisons					
	2019-20	2020-21	2021-22	2022-23	2023-24
Number of Excursions	1	0	0	0	0

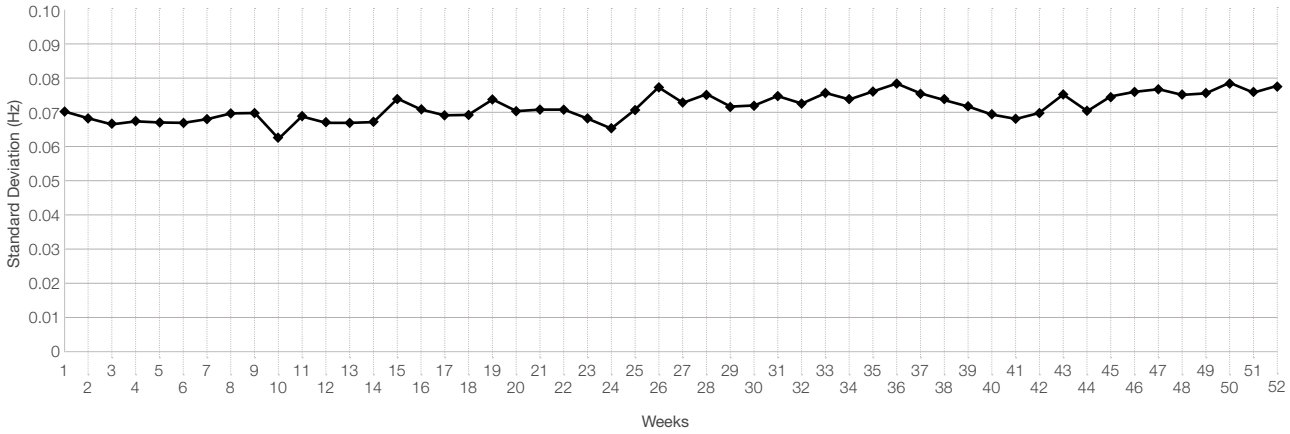
GB System Frequency Excursion

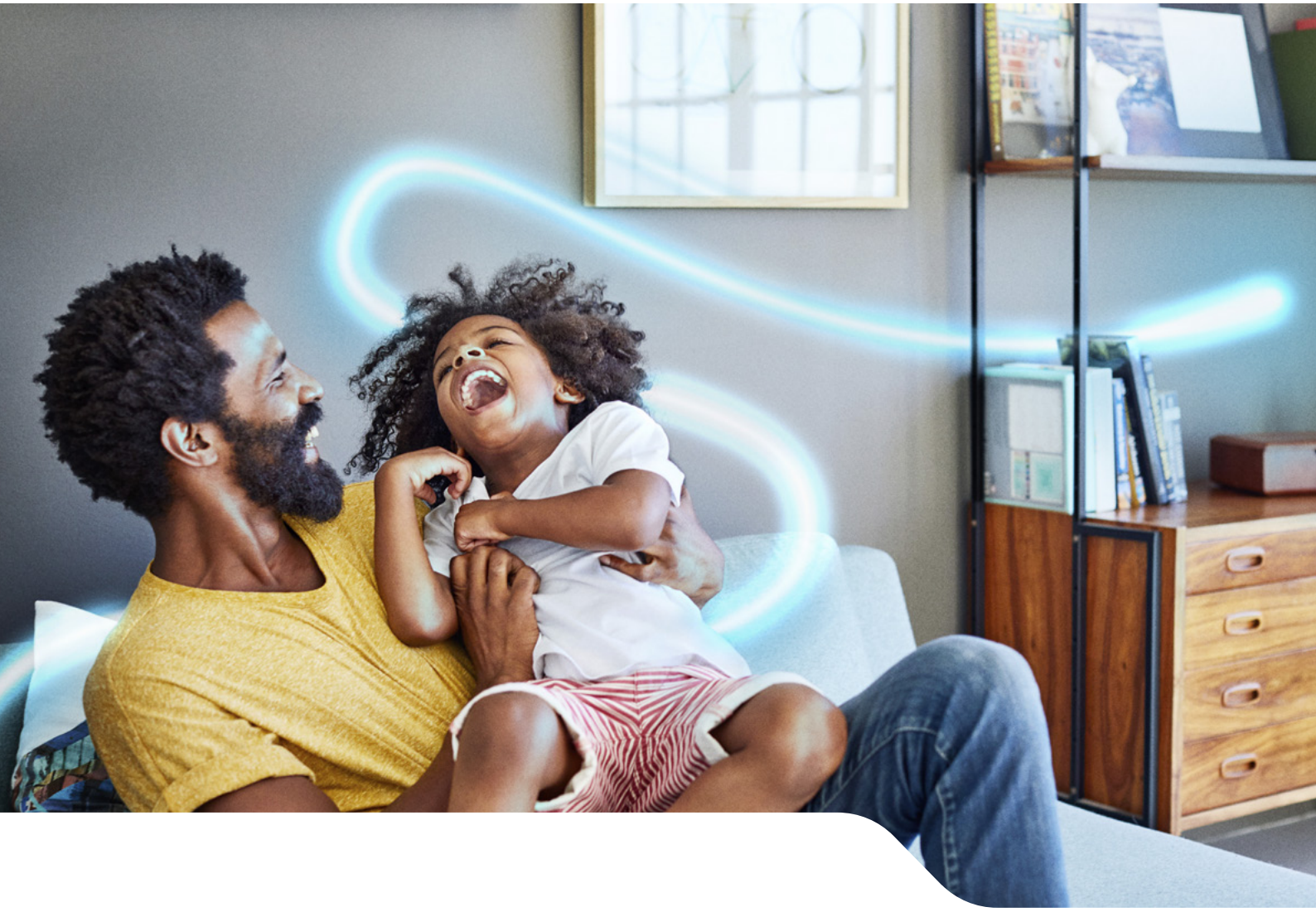
Incident Date & Time	Statutory Limits	Frequency	Duration
None	49.5 - 50.5Hz	N/A	0 seconds

Frequency Standard Deviation

The chart below displays the recorded Frequency Standard Deviation from 50Hz on a weekly basis for the year 2023-24.

GB System – Frequency Standard Deviation





National Grid Electricity Transmission System

System Description

The National Grid Electricity Transmission System operates at 400, 275 and 132kV supplying electricity to England and Wales.

The system covers an area of approximately 151,000 square kilometres and consists of over 14,000 circuit kilometres of overhead line and over 650 kilometres of underground transmission cable routes interconnecting over 300 substations.

It is connected to the SP Transmission System to the north and through six HVDC interconnectors to the Republic of Ireland, France, the Netherlands, Belgium, and Norway.

There are 68 large power stations totalling 61GW of generation capacity connected to the England and Wales transmission system. The NGET system supplies 12 distribution networks via over 132GVA of installed transformer capacity and a small number of directly connected customers such as steelworks and traction supplies.

In 2023-24 the maximum recorded demand on the network was 41.13GW.

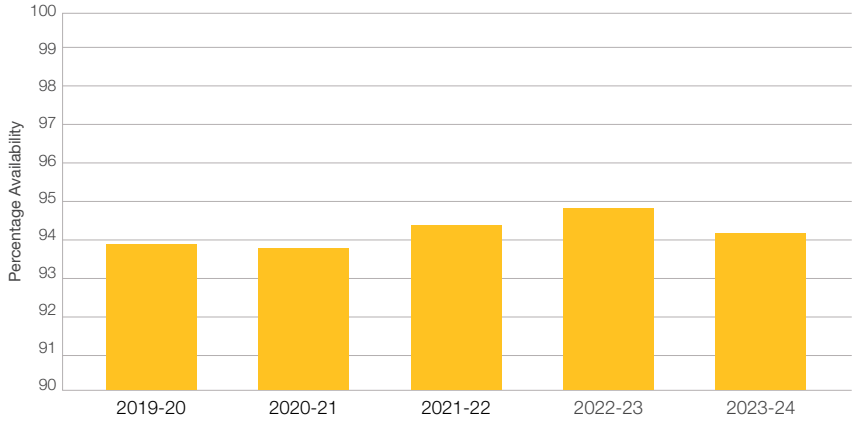
Availability

The definitions and criteria for system availability can be found in the Glossary of terms at the end of this report.

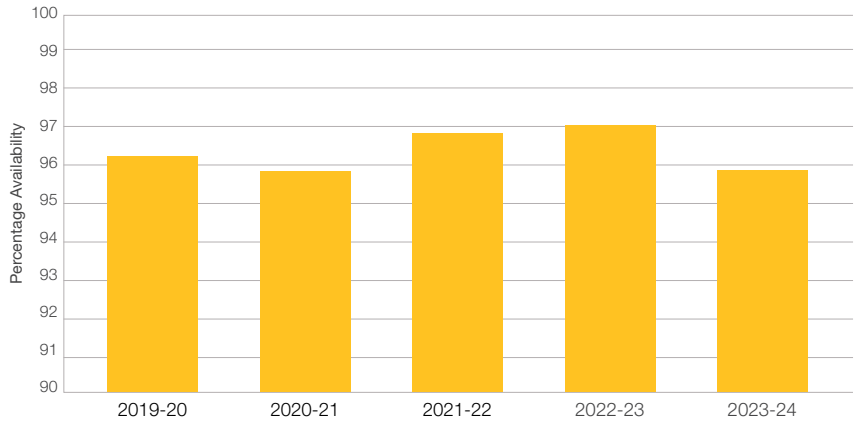
System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability.

NGET % Annual System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
93.88	93.76	94.38	94.83	94.14

% Annual System Availability

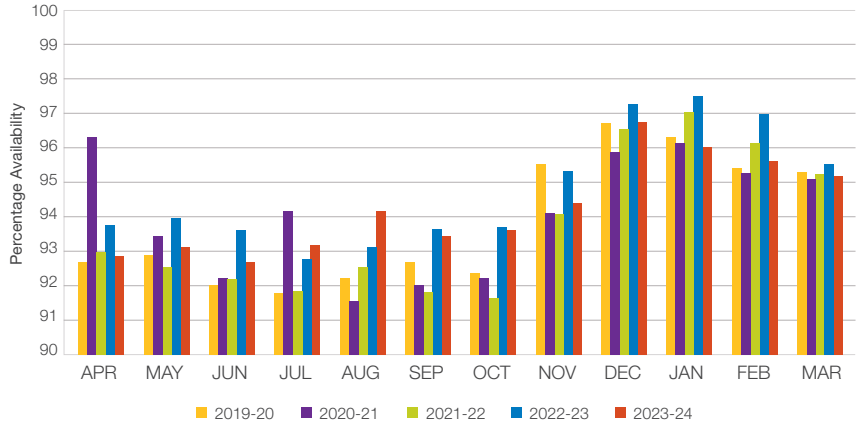


% Winter Peak System Availability



NGET % Winter Peak System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
96.26	95.84	96.86	97.04	95.84

% Monthly System Availability

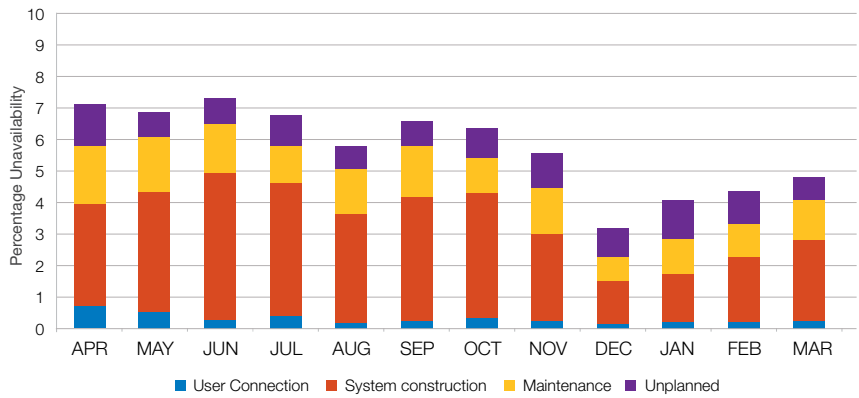


NGET % Monthly System Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	92.73	96.41	93.04	93.80	92.89
May	92.92	93.49	92.56	94.05	93.17
Jun	92.08	92.25	92.25	93.68	92.72
Jul	91.78	94.24	91.91	92.81	93.22
Aug	92.25	91.56	92.58	93.17	94.24
Sep	92.74	92.08	91.85	93.71	93.47
Oct	92.39	92.26	91.68	93.74	93.69
Nov	95.60	94.19	94.11	95.40	94.49
Dec	96.84	95.95	96.65	97.34	96.86
Jan	96.38	96.21	97.05	97.61	96.01
Feb	95.51	95.31	96.22	97.08	95.69
Mar	95.38	95.12	95.32	95.57	95.22

Monthly Planned and Unplanned System Unavailability

The table and the chart show the monthly variation in Planned and Unplanned System Unavailability.

Planned and Unplanned Unavailability (%) Transmission System



Planned and Unplanned Unavailability (%) for NGET Transmission System					
	User Connection	System Construction	Maintenance	Unplanned	Total
Apr	0.66	3.32	1.78	1.34	7.11
May	0.46	3.79	1.76	0.82	6.83
Jun	0.19	4.71	1.48	0.90	7.28
Jul	0.35	4.22	1.18	1.03	6.78
Aug	0.10	3.44	1.48	0.74	5.76
Sep	0.17	3.94	1.63	0.79	6.53
Oct	0.24	4.03	1.14	0.91	6.31
Nov	0.19	2.76	1.49	1.08	5.51
Dec	0.07	1.35	0.56	1.15	3.14
Jan	0.16	1.54	1.10	1.19	3.99
Feb	0.14	2.09	1.03	1.05	4.31
Mar	0.14	2.62	1.24	0.78	4.78

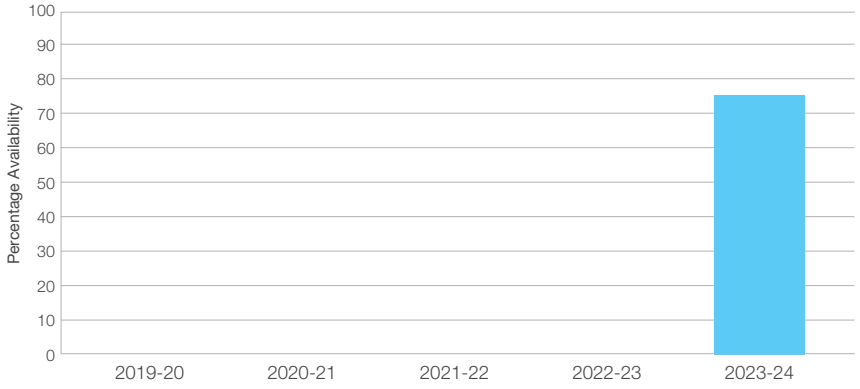
Reactive Compensation Equipment Availability

The definitions and criteria for Reactive Compensation Equipment Availability can be found in the Glossary of terms at the end of this report.

Reactive compensation equipment performance is monitored by reporting variations in Annual and Monthly Reactive Equipment Compensation Availability. There is also a breakdown of Planned and Unplanned Reactive Compensation Equipment Unavailability.

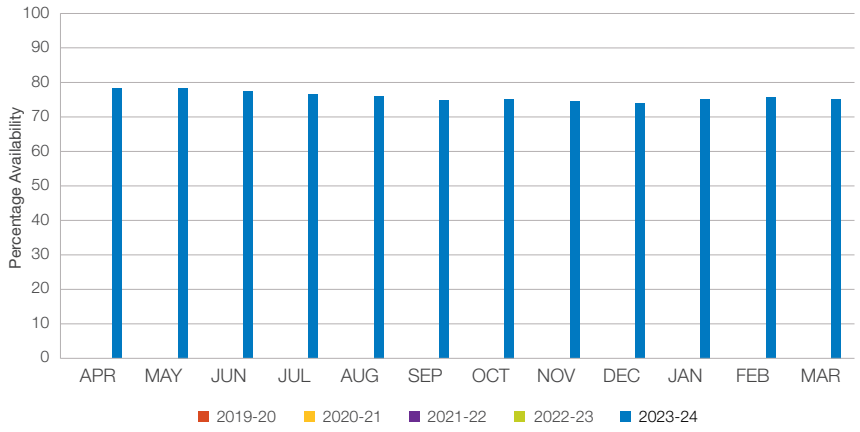
% Annual Reactive Comp. Equipment Availability

NGET % Annual Reactive Comp. Equipment Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	N/A	N/A	N/A	74.68



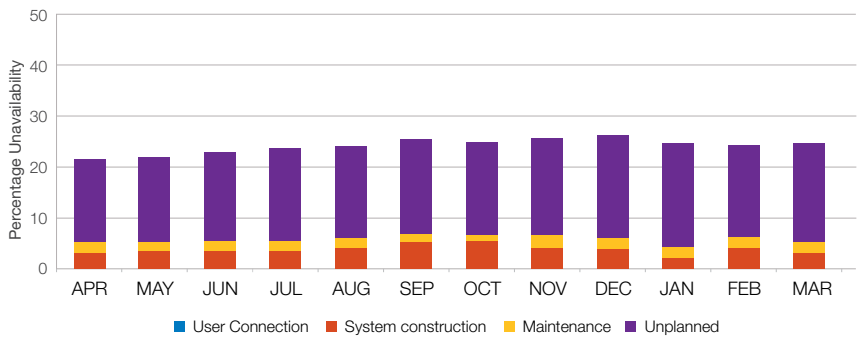
% Monthly Reactive Comp. Equipment Availability

NGET% Monthly Reactive Comp. Equipment Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	N/A	N/A	N/A	N/A	78.34
May	N/A	N/A	N/A	N/A	77.91
Jun	N/A	N/A	N/A	N/A	77.21
Jul	N/A	N/A	N/A	N/A	76.47
Aug	N/A	N/A	N/A	N/A	75.90
Sep	N/A	N/A	N/A	N/A	74.59
Oct	N/A	N/A	N/A	N/A	75.03
Nov	N/A	N/A	N/A	N/A	74.42
Dec	N/A	N/A	N/A	N/A	73.67
Jan	N/A	N/A	N/A	N/A	75.24
Feb	N/A	N/A	N/A	N/A	75.60
Mar	N/A	N/A	N/A	N/A	75.16



Planned and Unplanned Unavailability (%) Reactive Comp. Equipment

Planned and Unplanned Unavailability (%) for NGET Reactive Comp. Equipment					
	User Connection	System Construction	Maintenance	Unplanned	Total
Apr	0.00	3.10	1.90	16.66	21.66
May	0.00	3.36	1.69	17.04	22.09
Jun	0.00	3.44	2.04	17.30	22.79
Jul	0.00	3.27	1.96	18.30	23.53
Aug	0.00	3.92	2.03	18.15	24.10
Sep	0.01	5.04	1.71	18.65	25.41
Oct	0.11	5.25	1.23	18.39	24.97
Nov	0.07	4.12	2.27	19.12	25.58
Dec	0.19	3.74	2.05	20.35	26.33
Jan	0.00	2.19	1.94	20.64	24.76
Feb	0.00	4.19	2.03	18.18	24.40
Mar	0.00	3.12	2.07	19.65	24.84



Security

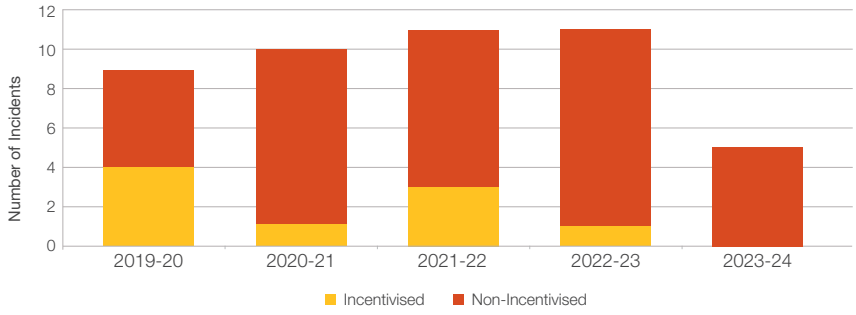
The definitions and criteria for system security can be found in the Glossary of terms at the end of this report.

System performance is monitored by the Estimated Unsupplied Energy from the NGET Transmission System for each incident.

During 2023-24 there were 390 NGET system events where transmission circuits were disconnected either automatically or by urgent manual switching. Most of these events had no impact on electricity users with 5 resulting in loss of supplies to customers.

Number of Loss of Supply Incidents

The chart shows the annual comparison of the number of Loss of Supply Incidents that occurred within the NGET Transmission System.

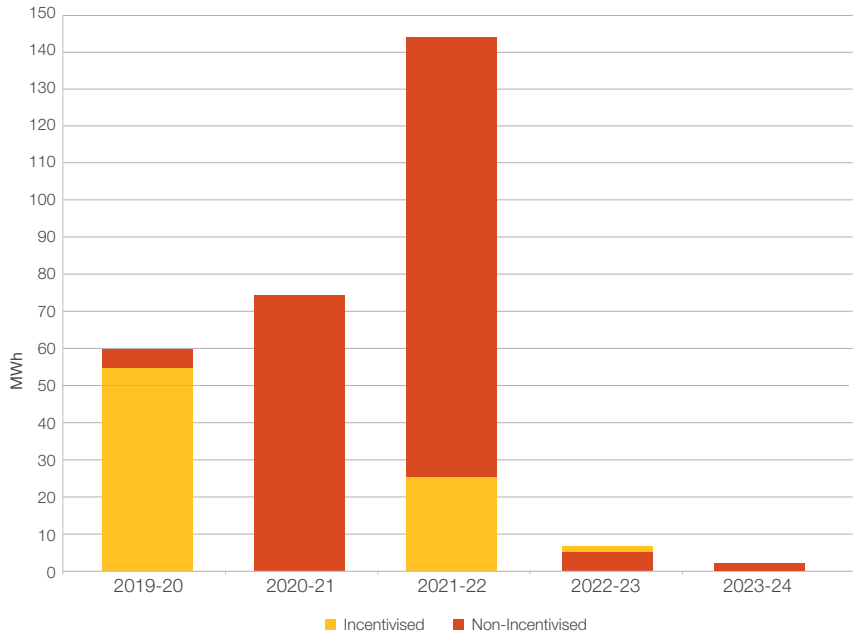


NGET System – Number of incidents					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	4	1	3	1	0
Non-Incentivised	5	9	8	10	5

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the NGET Transmission System during 2023-24 was **4.30 MWh**

The chart shows the annual comparison of the Estimated Unsupplied Energy for Loss of Supply Incidents that occurred within the NGET Transmission System.



NGET System – Estimated Unsupplied Energy (MWh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	54.45	0.00	26.70	5.20	0.00
Non-Incentivised	4.98	74.36	116.70	1.90	4.30

Reliability of Supply

The Overall Reliability of Supply for the NGET Transmission System during 2023-24 was: **99.999998%**

compared with 99.999997% in 2022-23 and 99.999936% in 2021-22.

Loss of Supply Incident Details

NGET Loss of Supply Incidents – Incentivised

Incident Date, Time and Location	MW Lost	Mins	MWh Unsupplied
Total			**0.00**

NGET Loss of Supply Incidents – Non-Incentivised

Incident Date, Time and Location	MW Lost	Mins	MWh Unsupplied
05 July 2023 14:41 at Tremorfa 275/33kV Substation At Tremorfa 275kV substation, SGT2 overall protection operated. This caused SGT1, SGT2 and both 275kV circuits to trip. The 275kV circuits were restored to service by DAR, energising SGT1 which was then available for load 2 minutes after the fault. The cause of the fault was determined to be foil tape that had blown across SGT2 circuit connections, shorting two phases. This is a customer choice connection site.	78.9	2	2.20
18 September 2023 02:24 at Ryhall 400/25kV Substation The Cottam - Eaton Socon - Ryhall circuit tripped, tripping Ryhall SGT2 and Eaton Socon SGT1. At Eaton Socon, the load was immediately picked up by SGT2. At Ryhall 400kV substation, SGT2 supplies Network Rail Essendine demand, although no demand was being taken at the time of the trip. The 400kV circuit and Eaton Socon SGT1 were returned to service by DAR, but Ryhall SGT2 is not designed to return automatically - it was returned to load by Network Rail three minutes after the fault. Ryhall SGT1 circuit was available to supply demand at all times without the need for further action to be taken by NGET, this is a customer choice connection site.	0.0	0	0.00
28 September 2023 16:14 at Dinorwig 400kV Substation Circuit breaker X120 at Dinorwig 400kV substation tripped, resulting in the loss of 400kV busbar Sections 1&2 and associated circuits. Generators 3&4 were in spin-gen mode and taking supplies (plus auxiliary system load) from the grid. Due to the supply configuration and maintenance program, First Hydro were unable to immediately supply any auxiliary load from Busbar Section 3, which remained in service. After an assessment the safety critical supplies were re-supplied by manual switching of the emergency diesel generators, 8 minutes after the fault. This is a customer choice connection site.	12.6	8	1.70
25 October 2023 07:36 at Barking 132/25kV Substation At Barking 132kV substation, Barking Grid T4B tripped on low voltage overcurrent protection, indicating it had been overloaded. This is one of two transformers which supply Network Rail at Barking, although they are not interconnected at the LV side so the load was not being shared equally. Network Rail confirmed their network had been running in an abnormal configuration which was likely to have led to the unintentional overloading. Grid T1B circuit was available to supply demand at all times without the need for further action to be taken by NGET, this is a customer choice connection site.	23.3	0	0.00
02 November 2023 08:33 at Dungeness 275kV Substation During Storm Ciaran, multiple trips occurred around Dungeness 400/275kV substation. SGT2 tripped and remained out of service, followed by SGT1 which caused the 275kV substation to be disconnected from the rest of the transmission system and the supply to Dungeness B power station was lost. Dungeness B power station started their diesel generators within 3 minutes and were able to maintain their critical services.	8.5	3	0.40
Total			**4.30**

Scottish Power Transmission System

System Description

The SP Transmission System comprises approximately 4000 circuit kilometres of overhead line and cable and 160 substations operating at 400, 275, 132 and 33kV supplying approximately 2 million customers and covering an area of 22,951 square kilometres. It is connected to the SHE Transmission System to the north, the NGET Transmission System to the south and the Northern Ireland Transmission System via an HVDC interconnector.

There are 9 major demand customers supplied directly from the SP Transmission System with the majority of the load being taken by approximately 2 million customers connected to the SP Distribution System via 14.8 GVA of installed transformer capacity. There is approximately 7.2GW of directly connected and Large Embedded generation capacity connected in the SP Transmission area, including 49 power stations directly connected to the SP Transmission System. In 2023-24 the maximum recorded demand on the network was 3.24GW.

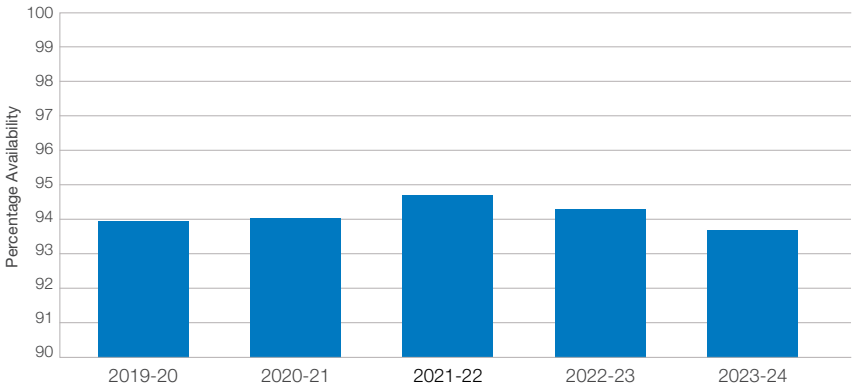
Availability

The definitions and criteria for system availability can be found in the Glossary of terms at the end of this report.

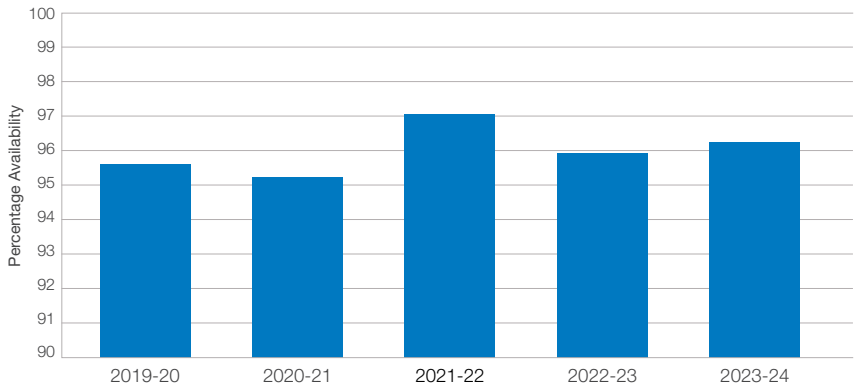
System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability.

SPT % Annual System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
93.90	94.00	94.67	94.25	93.67

% Annual System Availability

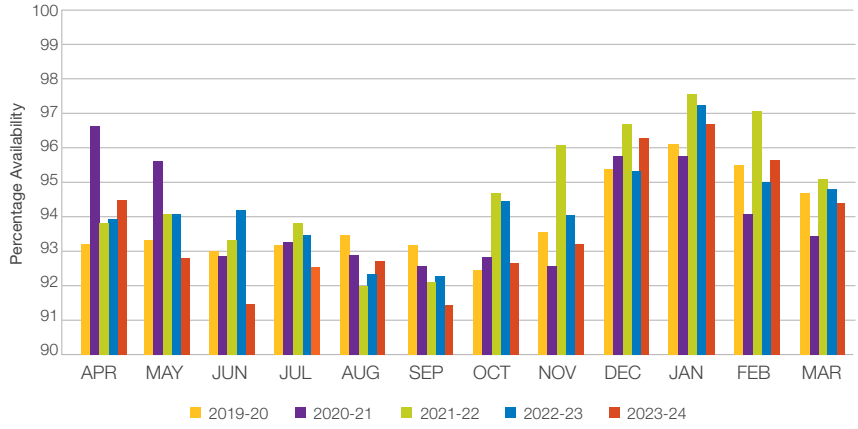


% Winter Peak System Availability



SPT % Winter Peak System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
95.64	95.24	97.11	95.88	96.22

% Monthly System Availability

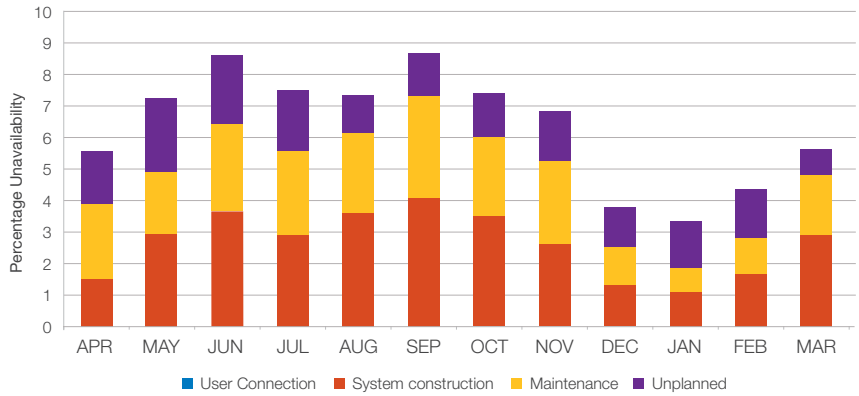


SPT % Monthly System Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	93.21	96.61	93.81	93.91	94.47
May	93.29	95.61	94.06	94.05	92.76
Jun	93.01	92.82	93.31	94.16	91.39
Jul	93.15	93.27	93.81	93.45	92.54
Aug	93.43	92.81	91.95	92.29	92.66
Sep	93.12	92.51	92.07	92.25	91.38
Oct	92.40	92.81	94.68	94.41	92.63
Nov	93.56	92.53	96.04	94.03	93.20
Dec	95.39	95.75	96.67	95.31	96.27
Jan	96.08	95.77	97.57	97.25	96.68
Feb	95.44	94.09	97.08	94.99	95.66
Mar	94.69	93.39	95.11	94.76	94.38

Monthly Planned and Unplanned System Unavailability

The table and the chart show the monthly variation in Planned and Unplanned System Unavailability.

Unavailability is defined as (100 - Availability) %



Planned and Unplanned Unavailability (%) for SP Transmission System					
	User Connection	System Construction	Maintenance	Unplanned	Total
Apr	0.00	1.48	2.39	1.67	5.53
May	0.00	2.91	1.95	2.37	7.24
Jun	0.00	3.66	2.75	2.21	8.61
Jul	0.00	2.86	2.71	1.90	7.46
Aug	0.00	3.60	2.48	1.27	7.34
Sep	0.00	4.02	3.25	1.35	8.62
Oct	0.00	3.44	2.53	1.40	7.37
Nov	0.00	2.62	2.57	1.61	6.80
Dec	0.00	1.26	1.22	1.25	3.73
Jan	0.00	1.05	0.75	1.52	3.32
Feb	0.00	1.64	1.09	1.61	4.34
Mar	0.00	2.91	1.87	0.85	5.62

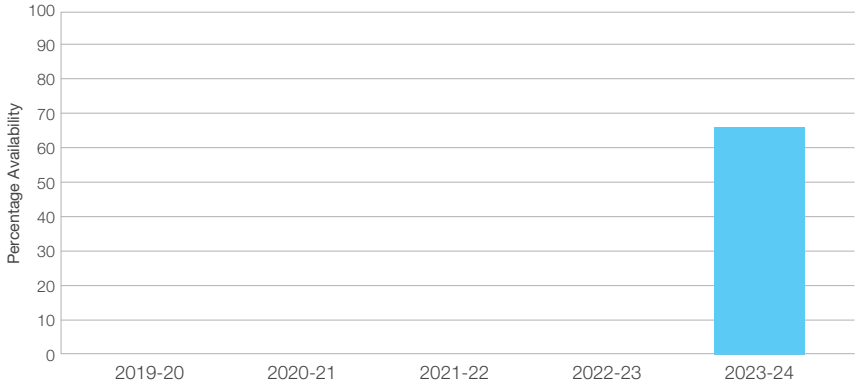
Reactive Compensation Equipment Availability

The definitions and criteria for Reactive Compensation Equipment Availability can be found in the Glossary of terms at the end of this report.

Reactive compensation equipment performance is monitored by reporting variations in Annual and Monthly Reactive Compensation Equipment Availability. There is also a breakdown of Planned and Unplanned Reactive Compensation Equipment Unavailability.

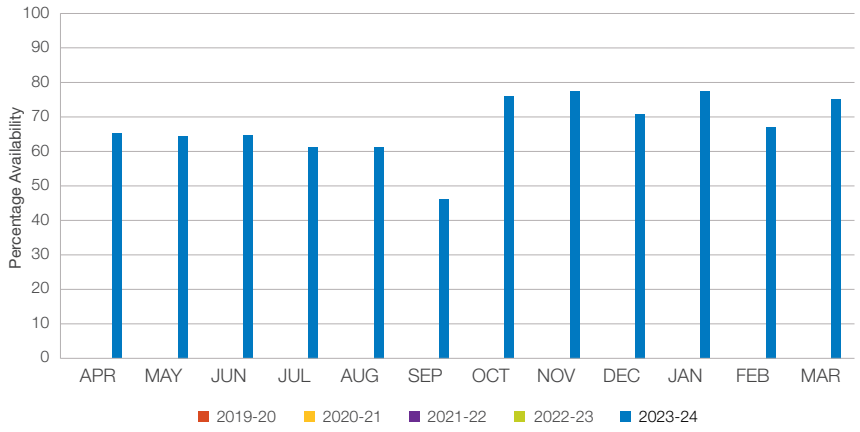
% Annual Reactive Comp. Equipment Availability

SPT % Annual Reactive Comp. Equipment Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	N/A	N/A	N/A	66.88



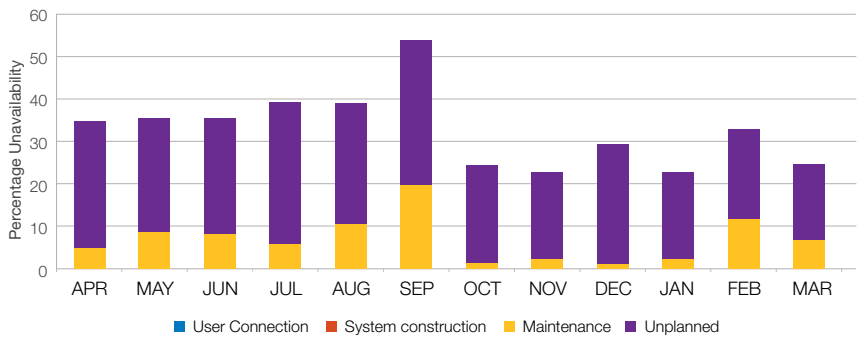
% Monthly Reactive Comp. Equipment Availability

SPT % Monthly Reactive Comp. Equipment Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	N/A	N/A	N/A	N/A	64.76
May	N/A	N/A	N/A	N/A	64.34
Jun	N/A	N/A	N/A	N/A	64.35
Jul	N/A	N/A	N/A	N/A	60.63
Aug	N/A	N/A	N/A	N/A	60.64
Sep	N/A	N/A	N/A	N/A	45.71
Oct	N/A	N/A	N/A	N/A	75.24
Nov	N/A	N/A	N/A	N/A	76.96
Dec	N/A	N/A	N/A	N/A	70.58
Jan	N/A	N/A	N/A	N/A	77.02
Feb	N/A	N/A	N/A	N/A	66.79
Mar	N/A	N/A	N/A	N/A	75.03



Monthly Planned and Unplanned Reactive Comp. Equipment Unavailability

Planned and Unplanned Unavailability (%) for SPT Reactive Comp. Equipment					
	User Connection	System Construction	Maintenance	Unplanned	Total
Apr	0.00	0.00	4.87	30.37	35.24
May	0.00	0.00	8.81	26.86	35.66
Jun	0.00	0.00	8.01	27.65	35.65
Jul	0.00	0.00	6.03	33.34	39.37
Aug	0.00	0.00	10.78	28.58	39.36
Sep	0.00	0.00	19.79	34.49	54.29
Oct	0.00	0.00	1.42	23.35	24.76
Nov	0.00	0.00	2.48	20.57	23.04
Dec	0.00	0.00	1.29	28.13	29.42
Jan	0.00	0.00	2.47	20.51	22.98
Feb	0.00	0.00	11.71	21.50	33.21
Mar	0.00	0.00	7.08	17.89	24.97



Security

The definitions and criteria for system security can be found in the Glossary of terms at the end of this report.

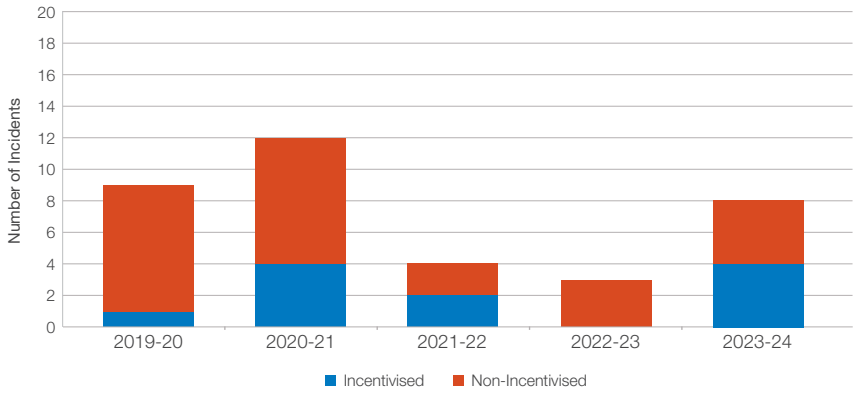
System performance is monitored by the estimated unsupplied energy from the SP Transmission System for each incident.

During 2023-24 there were 148 SPT system events where transmission circuits were disconnected either automatically or by urgent manual switching. Most of these events had no impact on electricity users with 8 resulting in loss of supply to customers.

Number of Loss of Supply Incidents

The chart shows the annual comparison of the number of Loss of Supply Incidents that occurred within the SP Transmission System.

SPT System – Number of incidents					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	1	4	2	0	4
Non-Incentivised	8	8	2	3	4

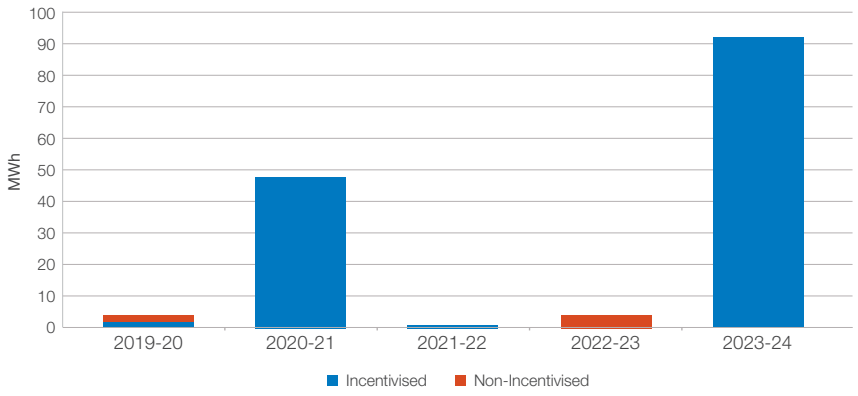


Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the SP Transmission System during 2023-24 was: **91.77 MWh**

The chart shows the annual comparison of the Estimated Unsupplied Energy for Loss of Supply Incidents that occurred within the SP Transmission System.

SPT System – Estimated Unsupplied Energy (MWh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	1.99	47.98	0.14	0.00	91.77
Non-Incentivised	1.22	0.00	0.00	3.81	0.00



Reliability of Supply

The Overall Reliability of Supply for the SP Transmission System during 2023-24 was: **99.999382%**

compared with 99.999975% in 2022-23 and 99.999999% in 2021-22.

Loss of Supply Incident Details

SPT Loss of Supply Incidents – Incentivised

Incident Date, Time and Location	MW Lost	Mins	MWh Unsupplied
15 May 2023 10:53 at Braehead Park - Erskine Main Protection Operation, No.2 circuit. Red phase fault BZ015 - BZ021. Nothing found so circuit re-energised. 9,484 customers affected and final customer restoration after 13 minutes.	12.50	13	2.71
09 July 2023 00:53 at New Cumnock - Kendoon Main Protection Operation, No.1 circuit. Partially restored via DAR. Kendoon T2 restored on load via manual switching. Lightning detected in proximity at time of fault. 230 customers affected and final customer restoration after 15 minutes.	0.10	15	0.03
02 August 2023 16:39 at Ayr - Coylton - Kilmarnock South Tape wrapped around live conductor. No.2 circuit taken out of service to allow safe removal. 23,708 customers affected and final customer restoration after 139 minutes.	18.50	139	35.05
21 November 2023 17:25 at Killermont Killermont No.1 circuit out for planned works. Grid 2 tripped on DOC due to incorrect protection settings. DOC polarity was wrong since 33kV board change in 2019. 42,117 customers affected and final customer restoration after 79 minutes.	48.20	79	53.99
Total			**91.77**

SPT Loss of Supply Incidents – Non-Incentivised

Incident Date, Time and Location	MW Lost	Mins	MWh Unsupplied
20 April 2023 20:42 at Dunoon - Sloy - Whistlefield - Windyhill Circuit tripped and reclosed during outage on No1 circuit. WHTL 205 (as per auto-reclose scheme) did not reclose delaying restoration of supplies to Whistlefield 33kV. 2 customers fed from Whistlefield, but due to planned outage they were on their own generator, 0MW demand at time of fault, not incentivised.	0.00	8	0.00
3 September 2023 23:39 at Coylton - Kilmarnock South Maybole T2 circuit tripped and auto reclosed coincident with transformer fault on Maybole T1. 10,568 customers affected, restored in under 1 minutes, not incentivised.	8.50	1	0.00
24 January 2024 05:34 at Ealston - Glenlee - Tongland During Storm Isha, circuit tripped on backup protection. Due to existing faults at New Cumnock, supplies lost. 19,399 customers affected and final customer restoration after 590 minutes. Net transfer of -84.85MW at time of fault, not incentivised.	-84.85	590	0.00
16 March 2024 05:59 at Ealston - Glenlee - Tongland Trip & Delayed Auto Reclose on No.1 circuit. Blue phase Trip and DAR (bottom phase) around 4.4km from Tongland. Line patrolled and nothing found. 28 customers affected and final customer restoration after 6 minutes. Net transfer of -7.07MW at time of fault, not incentivised.	-7.07	6	0.00
Total			**0.00**

Scottish Hydro Electric Transmission System

System Description

The SHE Transmission system comprises of over 410km of 400kV, 1732km of 275kV and 2738km of 132kV overhead line and approximately 996km of AC high voltage underground transmission cables, interconnecting 156 substations. There is also an HVDC link with 163km of cable connecting Caithness to the Moray Coast. The system covers an area of approximately 55,000 square kilometres or 24% of the Great Britain land mass. It is connected to the SP Transmission system to the South and several large Offshore Transmission Owners in the Highlands.

In 2023-24 the maximum recorded demand on the network was 1.36GW. Mostly the demand is taken by approximately 0.8 million customers connected to the Scottish Hydro Electric Power Distribution network via more than 13GVA of installed transformer capacity, with 1 other major customer also supplied directly from the SHE Transmission system. There are a growing number of large generators, with over 45 directly connected to the SHE Transmission system and many smaller units combining to produce more than 10.6GW capacity, of which 9.3GW is renewable.

The unreliability of supply figure can be distorted when compared against other systems at 275kV and 400kV due to the higher proportion of 132kV Transmission network and the consequent reduced power flows, however unreliability remains low in our network across all voltages.

The majority of these transmission assets form the main interconnected transmission system whilst the remaining radially supply the more remote areas of the territory including the outlying islands. Some connections, mainly in the more remote areas, can involve non-standard connection or running arrangements chosen by the customer and as such might experience greater risk of disruption, but on the whole reliability of the network has been very high.

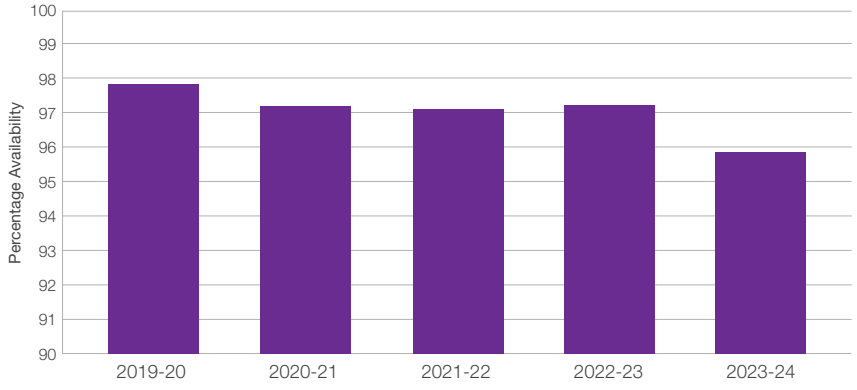
Availability

The definitions and criteria for system availability can be found in the Glossary of terms at the end of this report.

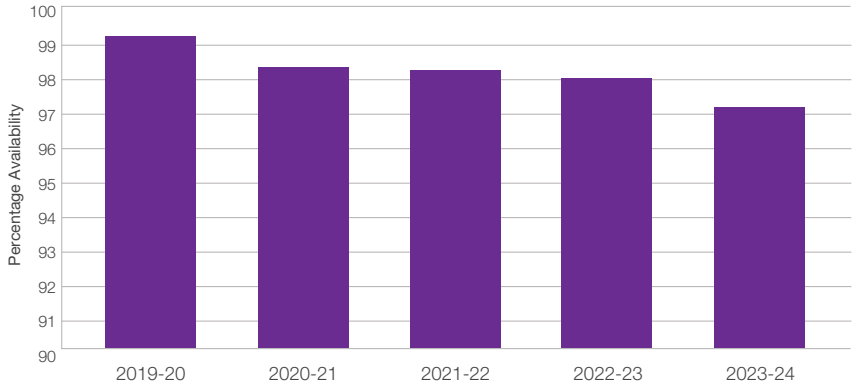
System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability.

% Annual System Availability

SHE Transmission % Annual System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
97.83	97.17	97.07	97.19	95.82

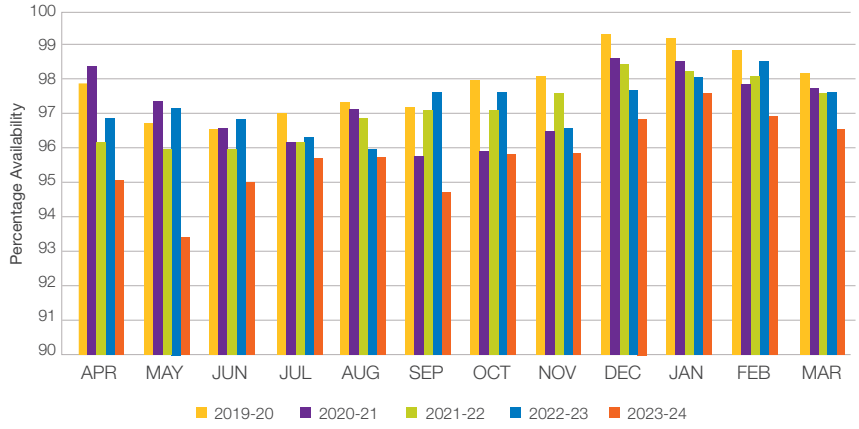


% Winter Peak System Availability



SHE Transmission % Winter Peak System Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
99.10	98.30	98.22	98.03	97.21

% Monthly System Availability

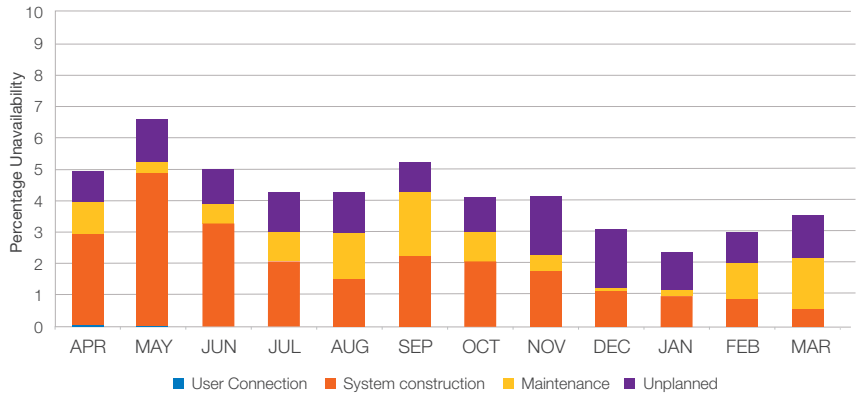


SHE Transmission % Monthly System Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	97.87	98.35	96.10	96.79	95.09
May	96.72	97.33	95.90	97.13	93.42
Jun	96.48	96.56	95.93	96.83	95.03
Jul	96.95	96.13	96.12	96.30	95.73
Aug	97.28	97.04	96.78	95.91	95.70
Sep	97.10	95.72	97.05	97.59	94.75
Oct	97.94	95.88	97.09	97.58	95.86
Nov	98.07	96.44	97.55	96.53	95.88
Dec	99.29	98.58	98.37	97.63	96.90
Jan	99.18	98.48	98.22	98.00	97.64
Feb	98.82	97.80	98.07	98.50	97.09
Mar	98.13	97.69	97.51	97.59	96.59

Monthly Planned and Unplanned System Unavailability

The table and the chart show the monthly variation in Planned and Unplanned System Unavailability.

Unavailability is defined as (100 – Availability) %



Planned and Unplanned Unavailability (%) for SHE Transmission System					
	User Connection	System Construction	Maintenance	Unplanned	Total
Apr	0.15	2.76	1.06	0.93	4.91
May	0.04	4.72	0.61	1.21	6.58
Jun	0.00	3.29	0.58	1.10	4.97
Jul	0.00	2.05	0.91	1.31	4.27
Aug	0.02	1.41	1.43	1.44	4.30
Sep	0.03	2.30	2.00	0.92	5.25
Oct	0.00	2.09	0.86	1.19	4.14
Nov	0.00	1.64	0.60	1.88	4.12
Dec	0.00	1.12	0.13	1.86	3.10
Jan	0.00	0.85	0.24	1.26	2.36
Feb	0.00	0.81	1.16	0.94	2.91
Mar	0.02	0.56	1.66	1.16	3.41

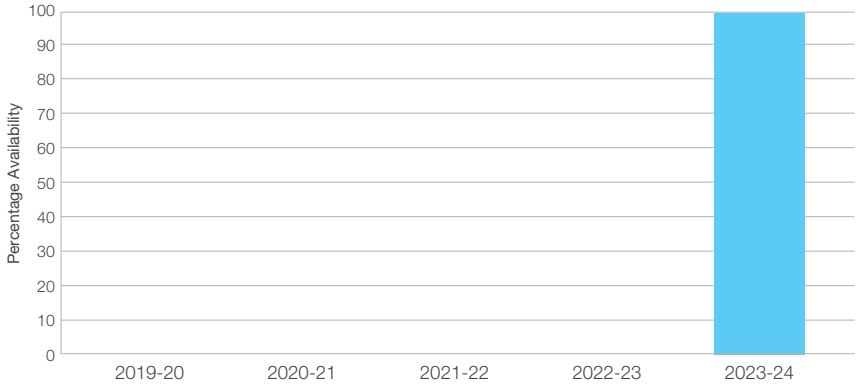
Reactive Compensation Equipment Availability

The definitions and criteria for Reactive Compensation Equipment Availability can be found in the Glossary of terms at the end of this report.

Reactive compensation equipment performance is monitored by reporting variations in Annual and Monthly Reactive Compensation Equipment Availability. There is also a breakdown of Planned and Unplanned Reactive Compensation Equipment Unavailability.

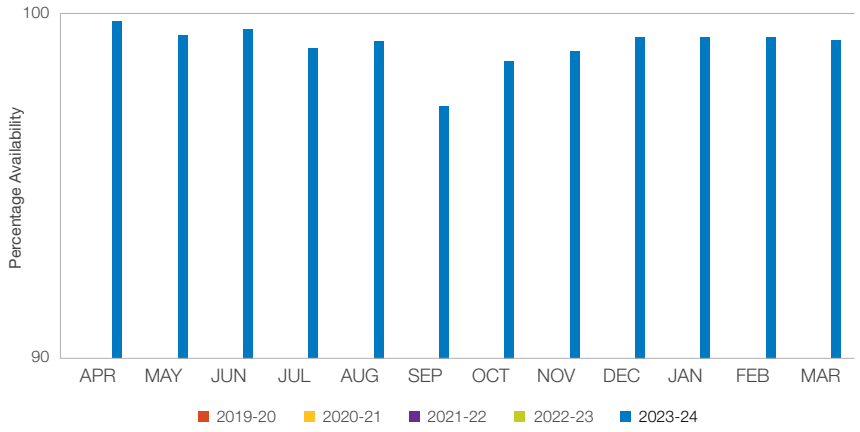
% Annual Reactive Comp. Equipment Availability

SHE Transmission % Annual Reactive Comp. Equipment Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	N/A	N/A	N/A	99.91



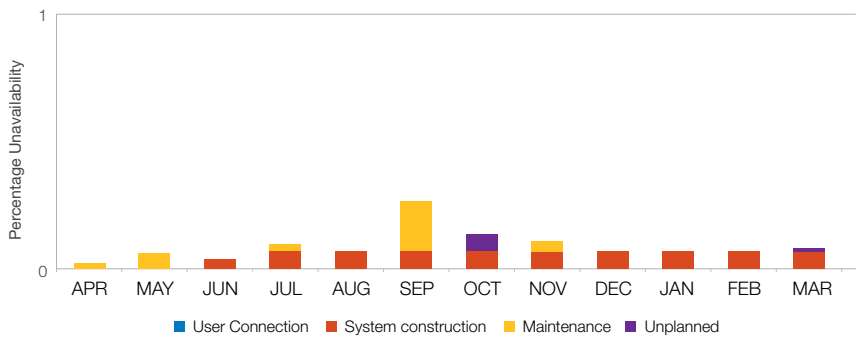
% Monthly Reactive Comp. Equipment Availability

SHE Transmission % Monthly Reactive Comp. Equipment Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
Apr	N/A	N/A	N/A	N/A	99.98
May	N/A	N/A	N/A	N/A	99.94
Jun	N/A	N/A	N/A	N/A	99.96
Jul	N/A	N/A	N/A	N/A	99.90
Aug	N/A	N/A	N/A	N/A	99.92
Sep	N/A	N/A	N/A	N/A	99.73
Oct	N/A	N/A	N/A	N/A	99.87
Nov	N/A	N/A	N/A	N/A	99.89
Dec	N/A	N/A	N/A	N/A	99.93
Jan	N/A	N/A	N/A	N/A	99.93
Feb	N/A	N/A	N/A	N/A	99.93
Mar	N/A	N/A	N/A	N/A	99.92



Monthly Planned and Unplanned Reactive Comp. Equipment Unavailability

Planned and Unplanned Unavailability (%) for SHE Reactive Comp. Equipment					
	User Connection	System Construction	Maintenance	Unplanned	Total
Apr	0.00	0.00	0.02	0.00	0.02
May	0.00	0.00	0.06	0.00	0.06
Jun	0.00	0.04	0.00	0.00	0.04
Jul	0.00	0.07	0.03	0.00	0.10
Aug	0.00	0.07	0.01	0.00	0.08
Sep	0.00	0.07	0.20	0.00	0.27
Oct	0.00	0.07	0.00	0.07	0.13
Nov	0.00	0.07	0.04	0.00	0.11
Dec	0.00	0.07	0.01	0.00	0.07
Jan	0.00	0.07	0.00	0.00	0.07
Feb	0.00	0.07	0.00	0.00	0.07
Mar	0.00	0.07	0.00	0.01	0.08



Security

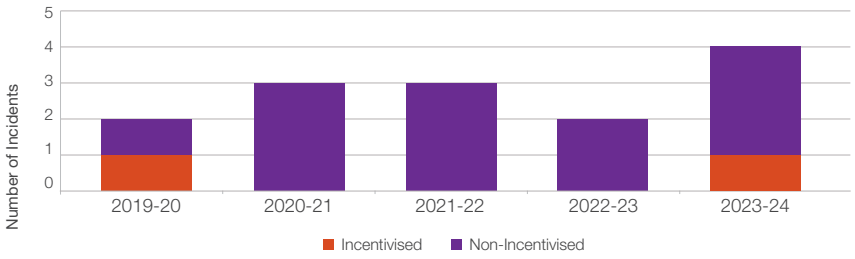
The definitions and criteria for system security can be found in the Glossary of terms at the end of this report.

System performance is monitored by the Estimated Unsupplied Energy from the SHE Transmission System for each incident.

During 2023-24 there were 89 SHE Transmission system events where transmission circuits were disconnected either automatically or by urgent manual switching. Most of these events had no impact on electricity users with 4 resulting in loss of supplies to customers.

Number of Loss of Supply Incidents

The chart shows the annual comparison of the number of Loss of Supply Incidents that occurred within the SHE Transmission System.

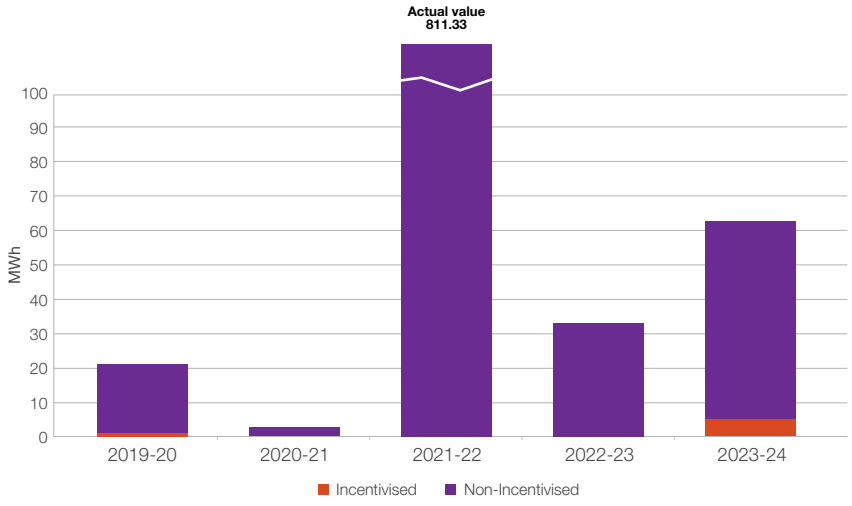


SHE Transmission System – Number of Incidents					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	1	0	0	0	1
Non-Incentivised	1	3	3	2	3

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the SHE Transmission System during 2023-24 was: **63.71 MWh**

The chart shows the annual comparison of the Estimated Unsupplied Energy for Loss of Supply Incidents that occurred within the SHE Transmission System.



SHE Transmission System – Estimated Unsupplied Energy (MWh)					
	2019-20	2020-21	2021-22	2022-23	2023-24
Incentivised	1.15	0.00	0.00	0.00	5.31
Non-Incentivised	19.90	2.49	811.33	32.77	58.40

Reliability of Supply

The Overall Reliability of Supply for the SHE Transmission System during 2023-24 was: **99.998518%**

compared with 99.999218% in 2022-23 and 99.983546% in 2021-22.

Loss of Supply Incident Details

SHE Transmission Loss of Supply Incidents - Incentivised

Incident Date, Time and Location	MW Lost	Mins	MWh Unsupplied
07 March 2024 at Arbroath 132kV Grid Transformer 2 Tripped due to a transformer failure while at single circuit risk during Grid Transformer 1 outage. Demand restored by DNO.	14.1	33	5.31
Total			**5.31**

SHE Transmission Loss of Supply Incidents – Non-Incentivised

Incident Date, Time and Location	MW Lost	Mins	MWh Unsupplied
27 July 2023 at Fort Augustus - Quich - Broadford - Edinbane - Dunvegan - Ardmore - Harris - Stornoway 132kV circuit Tripped due to failure of a voltage limiting component. Demand was restored by DNO and island generation.	22.6	262	30.2
21 December 2023 at Broadford - Edinbane 132kV circuit Tripped due to failure of an insulator. Demand was restored by DNO and island generation.	0	271	0
27 December 2023 at Fort Augustus 132kV Grid Transformer 1 Tripped due to third party fault. Demand restored by DNO.	1.5	246	28.2
Total			**58.40**

Interconnectors
IFA1

System Description

The NGET transmission system is interconnected with France between Sellindge and Les Mandarins via a 70km HVDC link owned and operated jointly by National Grid Ventures and Réseau de Transport d'Electricité (RTE), the French transmission system owner, since 1986.

The interconnector is called IFA1 and is a dual bipole design with a total capability of 2000MW.

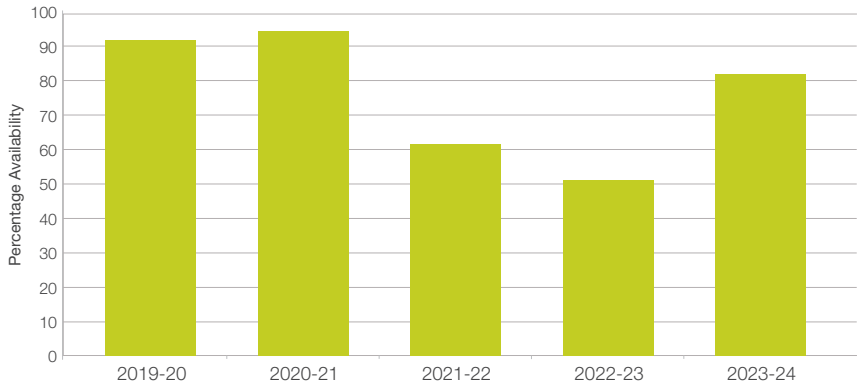
Annual Availability

Annual Availability of IFA1: **81.95%**

The chart below shows the annual comparison of availability of IFA1.

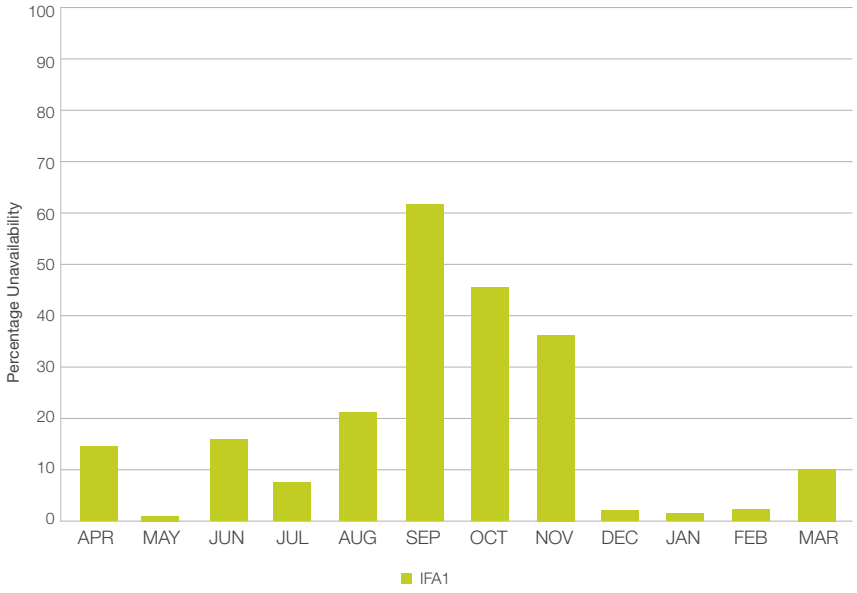
IFA1 % Annual Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
91.45	95.40	61.22	51.73	81.95

% Annual System Availability



Monthly Unavailability

% IFA1 Monthly Unavailability

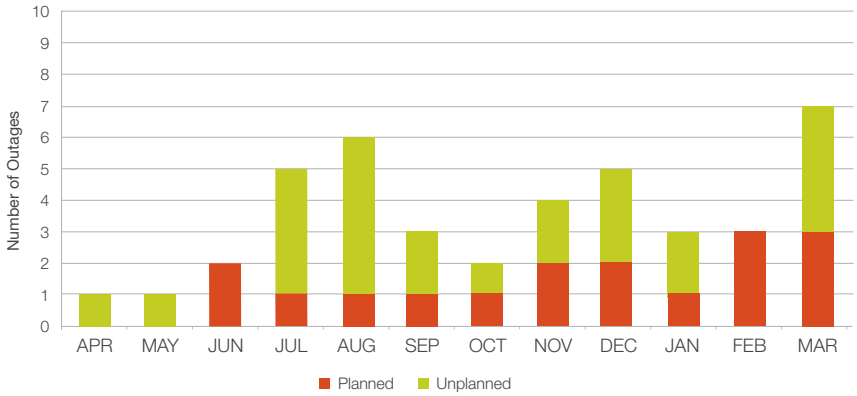


IFA1 % Monthly Unavailability	
	IFA
April	14.05
May	0.18
June	15.97
July	7.08
August	20.83
September	61.41
October	45.51
November	36.34
December	2.12
January	1.24
February	1.90
March	9.97
Average	18.05

Outages 2023-24 (April - March)

The chart refers to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead and Unplanned are notified at Day Ahead or within the Contract Day.

The chart below shows the number of Interconnector Planned and Unplanned Outages on a per month basis.



IFA1 Planned and Unplanned Outages		
	Planned	Unplanned
April	0	1
May	0	1
June	2	0
July	1	4
August	1	5
September	1	2
October	1	1
November	2	2
December	2	3
January	1	2
February	3	0
March	3	4
Total	17	25

BritNed

System Description

The NGET transmission system is interconnected with The Netherlands between Isle of Grain and Maasvlakte, via a 260km subsea cable owned and operated by BritNed Development Limited ("BritNed") since 2011.

The total capability of BritNed is 1000MW and is made up of two 'poles', 500MW each.

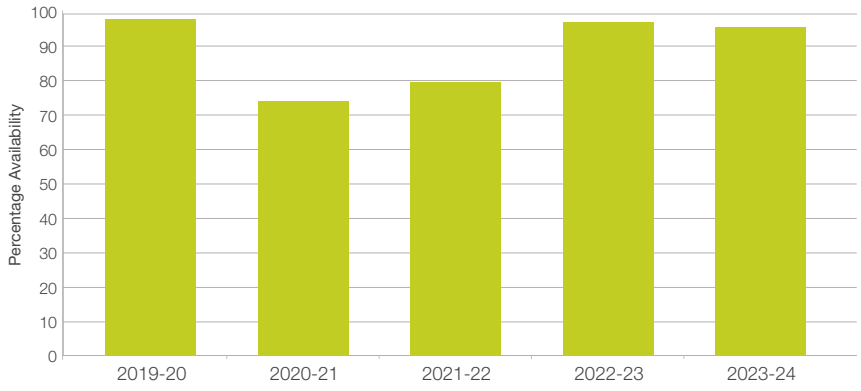
Annual Availability

Annual Availability of BritNed: **96.29%**

The chart below shows the availability of BritNed.

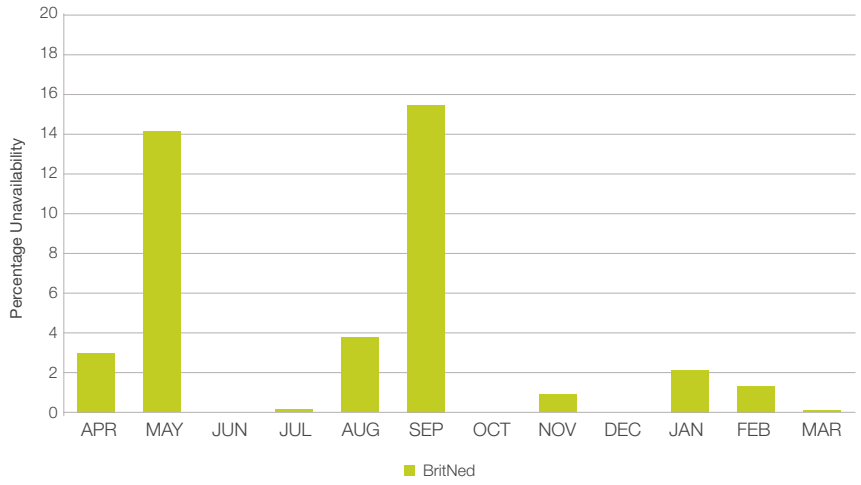
BritNed % Annual Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
98.52	74.48	79.91	97.25	96.29

% Annual System Availability



Monthly Unavailability

% BritNed Monthly Unavailability

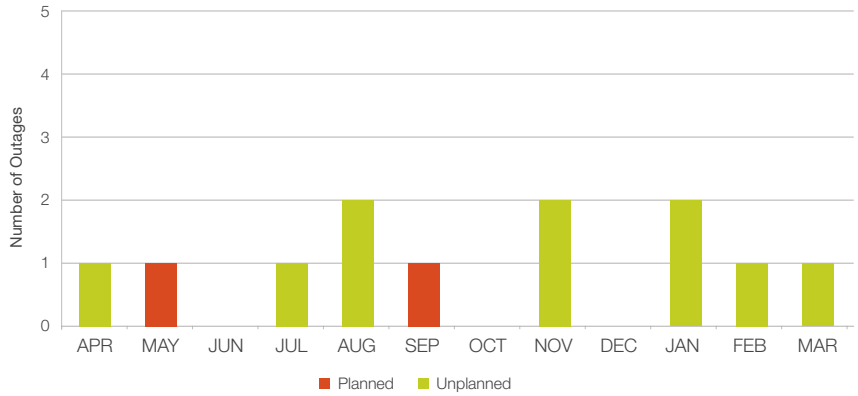


BritNed % Monthly Unavailability	
	BritNed
April	3.00
May	14.10
June	0.00
July	0.13
August	3.70
September	15.56
October	0.00
November	0.90
December	0.00
January	2.20
February	1.29
March	0.04
Average	3.71

Outages 2023-24 (April - March)

The chart refers to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead and Unplanned are notified at Day Ahead or within the Contract Day.

The chart below shows the number of Interconnector Planned and Unplanned Outages on a per month basis.



BritNed Planned and Unplanned Outages		
	Planned	Unplanned
April	0	1
May	1	0
June	0	0
July	0	1
August	0	2
September	1	0
October	0	0
November	0	2
December	0	0
January	0	2
February	0	1
March	0	1
Total	2	10

NEMO Link

System Description

The NGET transmission system is interconnected with Belgium between Richborough and Zeebrugge, via a 140km subsea cable owned and operated by Nemo Link Limited (NEMO Link) since January 2019. The total capability of the link is 1000MW and is a single 1000MW monopole design.

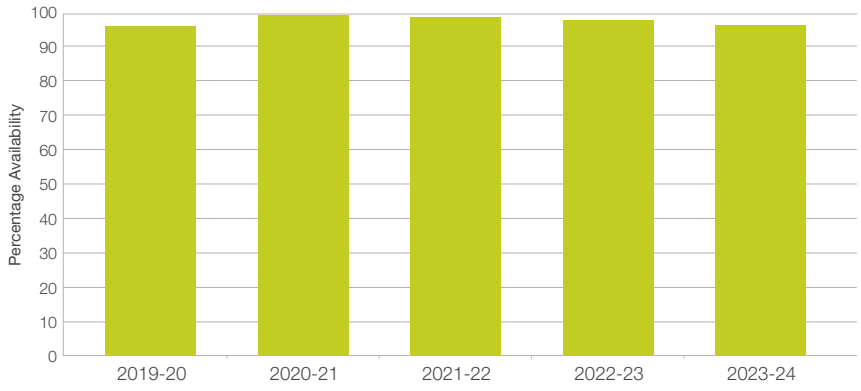
Annual Availability

Annual Availability of NEMO Link: **96.78%**

The chart below shows the availability of NEMO Link.

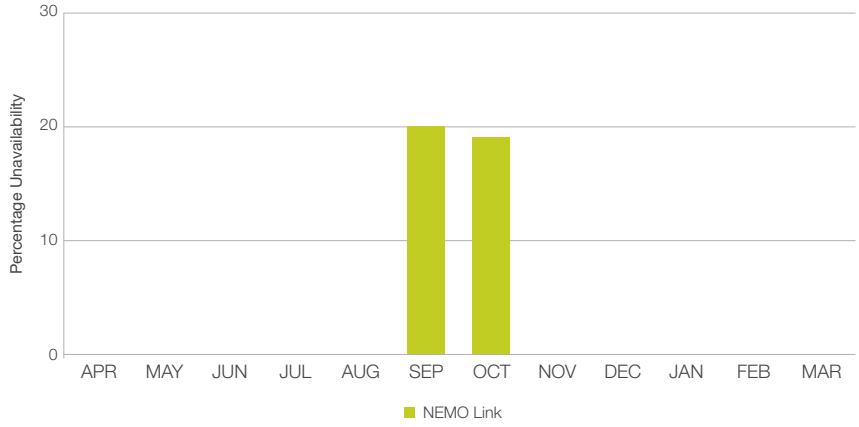
NEMO Link % Annual Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
96.14	99.22	99.00	98.09	96.78

% Annual System Availability



Monthly Unavailability

% NEMO Link Monthly Unavailability

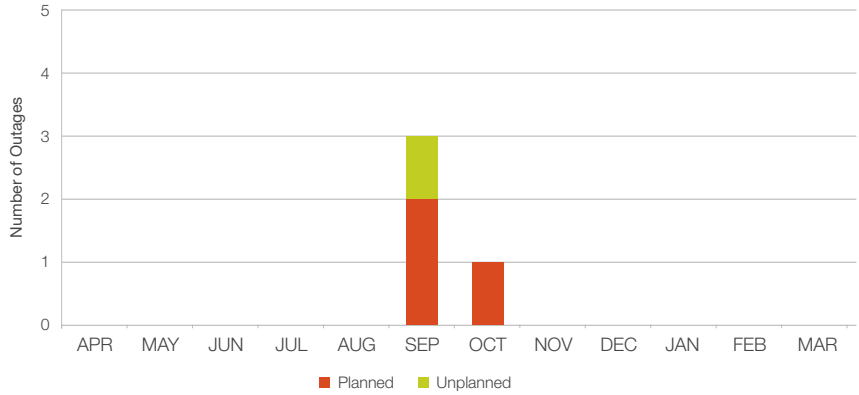


NEMO Link % Monthly Unavailability	
	Nemo Link
April	0.00
May	0.00
June	0.00
July	0.00
August	0.00
September	19.92
October	18.74
November	0.00
December	0.00
January	0.00
February	0.00
March	0.00
Average	3.22

Outages 2023-24 (April - March)

The chart refers to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead and Unplanned are notified at Day Ahead or within the Contract Day.

The chart below shows the number of Interconnector Planned and Unplanned Outages on a per month basis.



NEMO Link Planned and Unplanned Outages		
	Planned	Unplanned
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	2	1
October	1	0
November	0	0
December	0	0
January	0	0
February	0	0
March	0	0
Total	3	1

IFA2

System Description

The NGET transmission system is interconnected with France between Lee-on-the-Solent and Tourbe via a 240km HVDC link owned and operated jointly by National Grid Ventures and Réseau de Transport d'Electricité (RTE), the French transmission system owner, since January 2021.

The interconnector is called IFA2 and is a monopole design with a total capability of 1000MW.

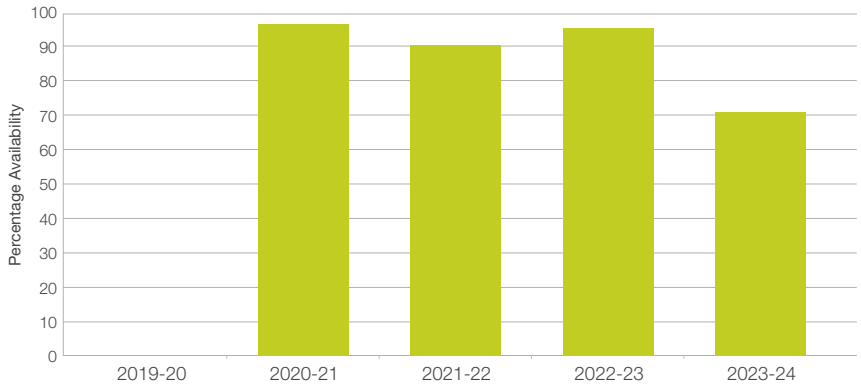
Annual Availability

Annual Availability of IFA2: **71.07%**

The chart below shows the annual comparison of availability of IFA2.

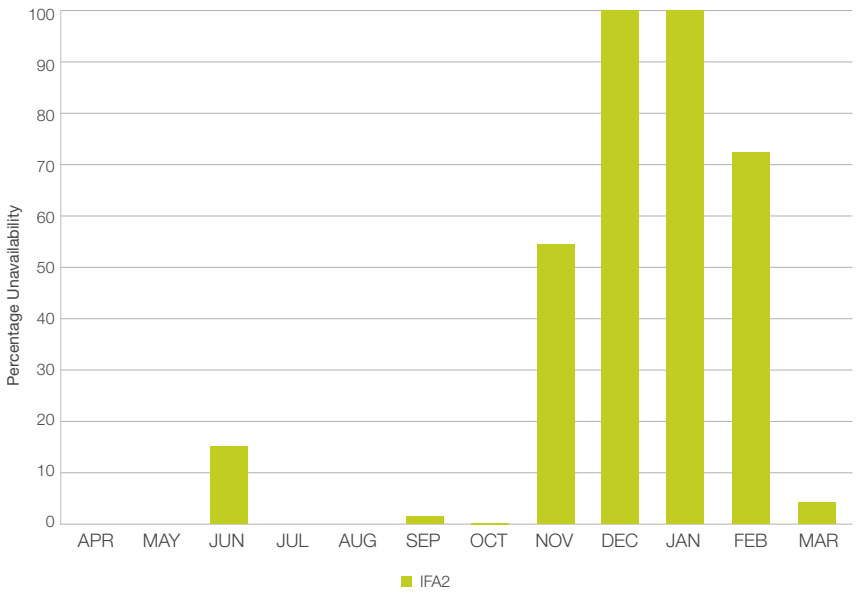
IFA2 % Annual Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	96.55	90.34	95.68	71.07

% Annual System Availability



Monthly Unavailability

% IFA2 Monthly Unavailability

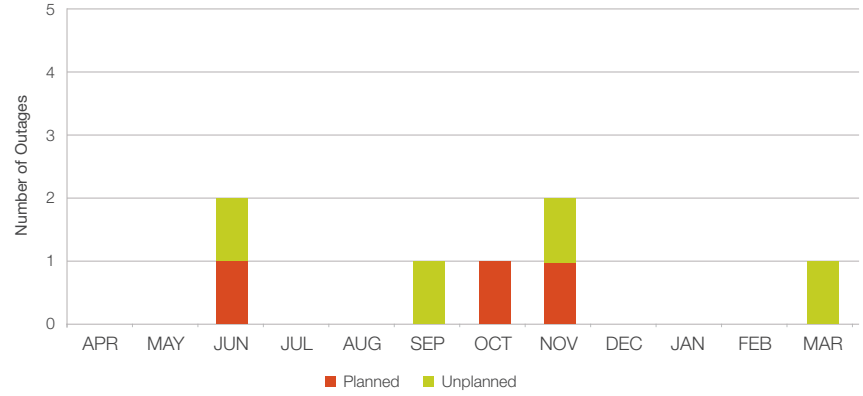


IFA2 % Monthly Unavailability	
	IFA2
April	0.00
May	0.00
June	14.91
July	0.00
August	0.00
September	1.20
October	0.09
November	54.66
December	100
January	100
February	72.27
March	4.01
Average	28.93

Outages 2023-24 (April - March)

The chart refers to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead and Unplanned are notified at Day Ahead or within the Contract Day.

The chart below shows the number of Interconnector Planned and Unplanned Outages on a per month basis.



IFA2 Planned and Unplanned Outages		
	Planned	Unplanned
April	0	0
May	0	0
June	1	1
July	0	0
August	0	0
September	0	1
October	1	0
November	1	1
December	0	0
January	0	0
February	0	0
March	0	1
Total	3	4

North Sea Link (NSL)

System Description

The NGET transmission system is interconnected with Norway between Blyth (Northumberland) and Kvilldal (Rogland) via a 720km HVDC link owned and operated jointly by National Grid Ventures and Statnett, the Norwegian transmission system owner, since October 2021.

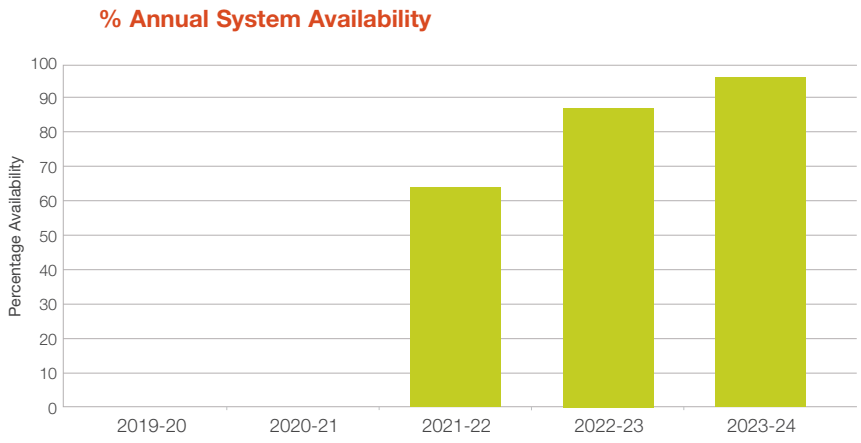
The interconnector is called North Sea Link and is a bipole design with a total capacity of 1400MW.

Annual Availability

Annual Availability of North Sea Link: **95.92%**

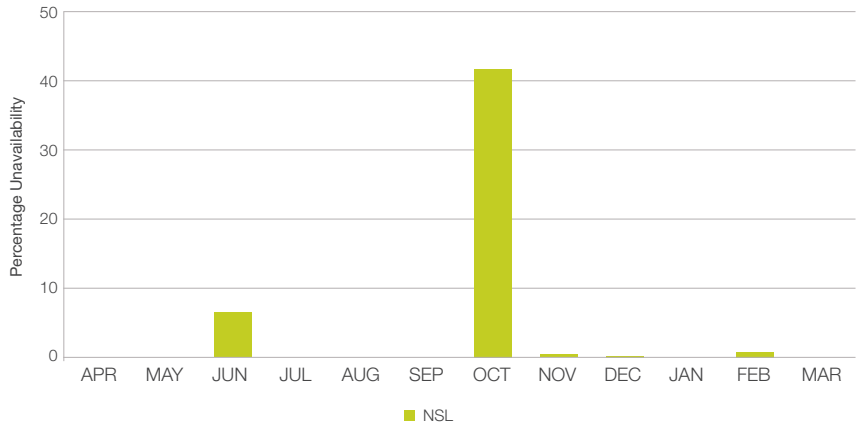
The chart below shows the annual comparison of availability of North Sea Link.

North Sea Link % Annual Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	N/A	63.61	86.67	95.92



Monthly Unavailability

% North Sea Link Monthly Unavailability

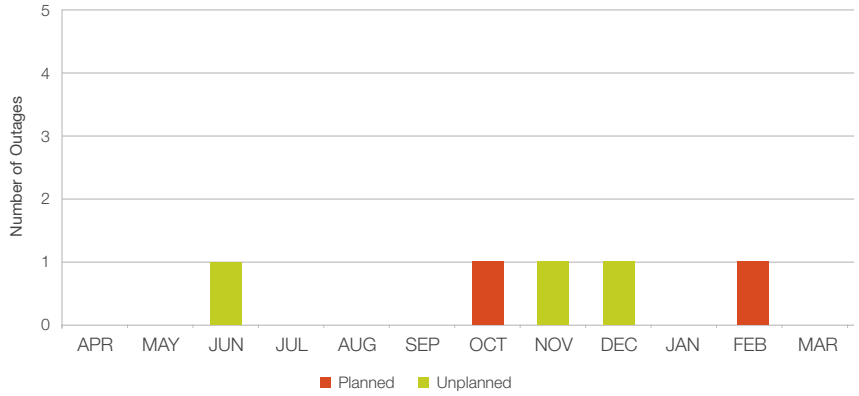


North Sea Link % Monthly Unavailability	
	NSL
April	0.00
May	0.00
June	5.93
July	0.00
August	0.00
September	0.00
October	41.57
November	0.59
December	0.17
January	0.00
February	0.72
March	0.00
Average	4.08

Outages 2023-24 (April - March)

The chart refers to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead and Unplanned are notified at Day Ahead or within the Contract Day.

The chart below shows the number of Interconnector Planned and Unplanned Outages on a per month basis.



North Sea Link Planned and Unplanned Outages		
	Planned	Unplanned
April	0	0
May	0	0
June	0	1
July	0	0
August	0	0
September	0	0
October	1	0
November	0	1
December	0	1
January	0	0
February	1	0
March	0	0
Total	2	3

Viking Link

System Description

The NGET transmission system is interconnected with Denmark between Bicker Fen (Lincolnshire) and Revsing (Jutland) via a 765km HVDC link owned and operated jointly by National Grid Ventures and Energinet, the Danish transmission system owner, since December 2023.

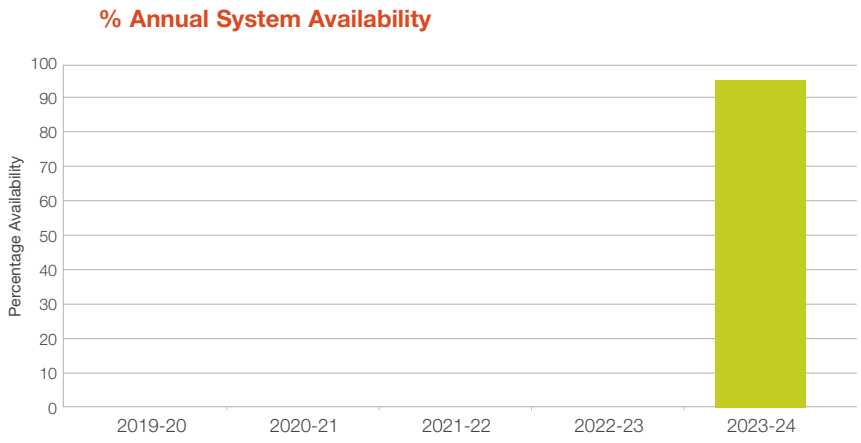
The interconnector is called Viking Link and is a bipole design with a total capacity of 1400MW.

Annual Availability

Annual Availability of Viking Link: **95.09%**

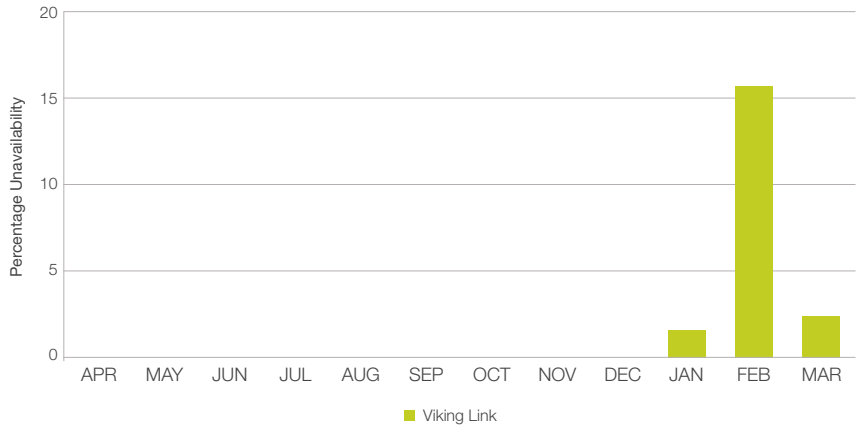
The chart below shows the annual comparison of availability of Viking Link.

Viking Link % Annual Availability				
2019-20	2020-21	2021-22	2022-23	2023-24
N/A	N/A	N/A	N/A	95.09



Monthly Unavailability

% Viking Link Monthly Unavailability

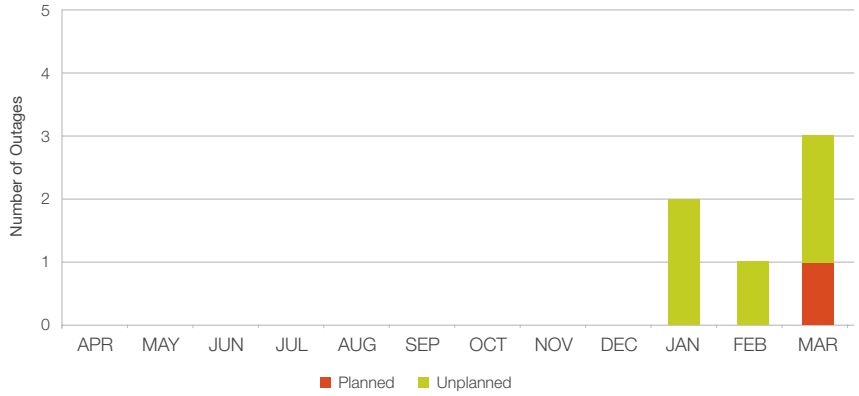


Viking Link % Monthly Unavailability	
	VKL
April	N/A
May	N/A
June	N/A
July	N/A
August	N/A
September	N/A
October	N/A
November	N/A
December	0.00
January	1.54
February	15.70
March	2.40
Average	4.91

Outages 2023-24 (April - March)

The chart refers to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead and Unplanned are notified at Day Ahead or within the Contract Day.

The chart below shows the number of Interconnector Planned and Unplanned Outages on a per month basis.



Viking Link Planned and Unplanned Outages		
	Planned	Unplanned
April	N/A	N/A
May	N/A	N/A
June	N/A	N/A
July	N/A	N/A
August	N/A	N/A
September	N/A	N/A
October	N/A	N/A
November	N/A	N/A
December	0	0
January	0	2
February	0	1
March	1	2
Total	1	5

Offshore Systems

System Description

The following section contains details of the currently connected offshore networks; Robin Rigg OFTO (TC), Gunfleet Sands OFTO (TC), Barrow OFTO (TC), Ormonde OFTO (TC), Lincs OFTO (TC), Westermost Rough OFTO (TC), Dudgeon OFTO (TC), Beatrice OFTO (TC), Rampion OFTO (TC), East Anglia 1 OFTO (TC), Moray East (TC), Walney 1 OFTO (BT), Walney 2 OFTO (BT), Sheringham Shoal OFTO (BT), London Array OFTO (BT), Greater Gabbard OFTO (EQ),Triton Knoll OFTO (EQ), Gwynt-Y-Mor OFTO (BBE), Thanet OFTO (BBE), Humber Gateway OFTO (BBE), West of Duddon Sands OFTO (WoDS), Burbo Bank Extension OFTO (DTP), Race Bank OFTO (DTP), Galloper OFTO (DTP), Walney Extension OFTO (DTP), Hornsea One OFTO (DTP) and Hornsea Two OFTO (DTP). The offshore network consists of 3,797 kilometres of circuit, connecting to 27 offshore substations totalling about 12.5GW of generating capacity.

Offshore Transmission Networks

Offshore Transmission Networks						
	Go Live	Number of Circuits	Circuit Length km	Generating Capacity MW	Connection Voltage	Interfacing Party
TC Robin Rigg	02/03/2011	2	28.8	178	132kV	DNO
TC Gunfleet Sands	19/07/2011	1	12.76	163.9	132kV	DNO
TC Barrow	27/09/2011	1	30.1	90	132kV	DNO
TC Ormonde	10/07/2012	1	44.3	150	132kV	DNO
TC Lincs	11/11/2014	2	122.6	265	400kV	Transmission
TC Westermost Rough	11/02/2016	1	26.16	206.5	275kV	Transmission
TC Dudgeon	13/11/2018	2	178	400	400kV	Transmission
TC Beatrice	04/08/2021	2	181	588	400kV	Transmission
TC Rampion	17/11/2021	2	86	400	400kV	Transmission
TC East Anglia 1	22/12/2022	2	246	680	400kV	Transmission
TC Moray East	22/02/2024	3	280	900	400kV	Transmission
BT Walney 1	31/10/2011	1	48	182	132kV	Transmission
BT Walney 2	04/10/2012	1	49	182	132kV	DNO
BT Sheringham Shoal	05/07/2013	2	88	315	132kV	DNO
BT London Array	18/09/2013	4	216	630	400kV	Transmission
EQ Greater Gabbard	29/11/2013	3	135	500	132kV	Transmission
EQ Triton Knoll	05/12/2023	2	218	824	400kV	Transmission
BBE Gwynt Y Mor	17/02/2015	4	126.8	576	400kV	Transmission
BBE Thanet	17/12/2014	2	58.8	300	132kV	DNO
BBE Humber Gateway	15/09/2016	2	78	219	275kV	Transmission
West of Duddon Sands	25/08/2015	2	84.6	382	400kV	Transmission
DTP Burbo Bank Extension	27/04/2018	1	35.3	258	400kV	Transmission
DTP Race Bank	10/11/2019	2	164.7	573	400kV	Transmission
DTP Galloper	27/02/2020	2	88.3	353	132kV	Transmission
DTP Walney Extension	04/06/2020	2	139	659	400kV	Transmission
DTP Hornsea One	12/03/2021	2	533	1134	400kV	Transmission
DTP Hornsea Two	20/07/2023	2	498.6	1320	400kV	Transmission

TC: Transmission Capital BT: Blue Transmission Investments Limited
EQ: Equitix BBE: Balfour Beatty & Equitix Consortium DTP: Diamond Transmission Partners

Availability

Offshore Transmission Systems are radial and only connect offshore generation to the wider NETS. The regulatory incentivisation of OFTO performance is different to that of onshore TOs and is based on their system availability rather than loss of supply. The OFTOs provide information for outages that originate on their system or outages that have impacted their system, for example, a generator, DNO or TO system. The system availability performance for each OFTO is then calculated after categorising the outages as either OFTO or Non-OFTO.

System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability. The Annual System Availability of Offshore Networks for 2023-24 was **97.85%**

% Annual System Availability

Offshore Transmission Networks % Annual System Availability

	2019-20	2020-21	2021-22	2022-23	2023-24
TC Robin Rigg	99.87	99.95	100	100	100
TC Gunfleet Sands	100	99.66	100	100	100
TC Barrow	100	100	100	100	100
TC Ormonde	100	100	99.93	99.38	100
TC Lincs	99.56	99.44	99.98	96.63	100
TC Westermost Rough	100	100	99.93	100	100
TC Dudgeon	99.31	99.83	99.92	99.95	98.74
TC Beatrice	N/A	N/A	99.16	99.32	96.99
TC Rampion	N/A	N/A	100	99.56	100
TC East Anglia 1	N/A	N/A	N/A	100	94.99
TC Moray East	N/A	N/A	N/A	N/A	100
BT Walney 1	99.95	100	98.90	100	99.67
BT Walney 2	100	100	100	100	100
BT Sheringham Shoal	100	100	99.69	99.61	100
BT London Array	99.95*	99.77	99.82	99.92	99.84
EQ Greater Gabbard	99.78	99.78	99.98	94.74	99.58
EQ Triton Knoll	N/A	N/A	N/A	N/A	100
BBE Gwynt Y Mor	99.95*	99.95*	99.56*	99.90	91.10
BBE Thanet	100	99.84	100	99.72	100
BBE Humber Gateway	99.83	99.76	98.73	99.72	99.34
West of Duddon Sands	100*	99.50	99.19	99.09	97.59
DTP Burbo Bank Extension	99.67	99.99	100	100	100
DTP Race Bank	100	99.26	100	99.93	94.72
DTP Galloper	100	99.95	100	99.97	100
DTP Walney Extension	N/A	99.97	100	100	100
DTP Hornsea One	N/A	100	99.93	99.57	95.30
DTP Hornsea Two	N/A	N/A	N/A	N/A	95.34

* Figure has been updated as an exceptional event with agreement from Ofgem.

% Winter Peak System Availability

Offshore Transmission Networks % Winter Peak System Availability					
	2019-20	2020-21	2021-22	2022-23	2023-24
TC Robin Rigg	100	100	100	100	100
TC Gunfleet Sands	100	100	100	100	100
TC Barrow	100	100	100	100	100
TC Ormonde	100	100	100	100	100
TC Lincs	100	100	100	100	100
TC Westermost Rough	100	100	100	100	100
TC Dudgeon	100	100	99.88	100	100
TC Beatrice	N/A	N/A	100	100	100
TC Rampion	N/A	N/A	100	100	100
TC East Anglia 1	N/A	N/A	N/A	100	99.85
TC Moray East	N/A	N/A	N/A	N/A	100
BT Walney 1	100	100	99.07	100	99.34
BT Walney 2	100	100	100	100	100
BT Sheringham Shoal	100	100	100	100	100
BT London Array	99.89	100	99.64	100	100
EQ Greater Gabbard	100	100	100	90.50	100
EQ Triton Knoll	N/A	N/A	N/A	N/A	100
BBE Gwynt Y Mor	100	72.84	99.82*	99.90	78.35
BBE Thanet	100	100	100	99.51	100
BBE Humber Gateway	99.82	100	99.17	99.41	100
West of Duddon Sands	100	100	100	100	99.80
DTP Burbo Bank Extension	100	100	100	100	100
DTP Race Bank	100	100	100	100	92.42
DTP Galloper	100	100	100	100	100
DTP Walney Extension	N/A	99.91	100	100	100
DTP Hornsea One	N/A	100	99.92	100	85.62
DTP Hornsea Two	N/A	N/A	N/A	N/A	85.62

* Figure has been updated as an exceptional event with agreement from Ofgem.

% Monthly System Availability

Offshore Transmission Networks % Monthly System Availability												
	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TC Robin Rigg	100	100	100	100	100	100	100	100	100	100	100	100
TC Gunfleet Sands	100	100	100	100	100	100	100	100	100	100	100	100
TC Barrow	100	100	100	100	100	100	100	100	100	100	100	100
TC Ormonde	100	100	100	100	100	100	100	100	100	100	100	100
TC Lincs	100	100	100	100	100	100	100	100	100	100	100	100
TC Westermost Rough	100	100	100	100	100	100	100	100	100	100	100	100
TC Dudgeon	99.36	100	100	85.70	100	100	100	100	100	100	100	100
TC Beatrice	100	100	100	92.49	82.76	100	100	100	100	100	100	89.20
TC Rampion	100	100	100	100	100	100	100	100	100	100	100	100
TC East Anglia 1	100	100	90.84	100	98.12	100	100	100	100	100	98.07	53.55
TC Moray East	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	100
BT Walney 1	100	100	100	100	100	100	100	100	96.15	100	100	100
BT Walney 2	100	100	100	100	100	100	100	100	100	100	100	100
BT Sheringham Shoal	100	100	100	100	100	100	100	100	100	100	100	100
BT London Array	100	100	100	98.15	100	100	100	100	100	100	100	100
EQ Greater Gabbard	100	100	100	100	100	95.01	100	100	100	100	100	100
EQ Triton Knoll	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	100	100	100
BBE Gwynt Y Mor	100	99.75	96.65	93.79	92.99	100	100	100	85.04	75.00	75.00	75.00
BBE Thanet	100	100	100	100	100	100	100	100	100	100	100	100
BBE Humber Gateway	100	100	100	100	100	92.10	100	100	100	100	100	100
West of Duddon Sands	100	74.70	100	100	98.17	100	100	100	100	98.81	100	100
DTP Burbo Bank Extension	100	100	100	100	100	100	100	100	100	100	100	100
DTP Race Bank	100	100	100	100	100	100	100	100	100	100	77.26	59.39
DTP Galloper	100	100	100	100	100	100	100	100	100	100	100	100
DTP Walney Extension	100	100	100	100	100	100	100	100	100	100	100	100
DTP Hornsea One	100	100	100	99.51	100	100	100	100	100	89.40	67.46	87.24
DTP Hornsea Two	N/A	N/A	N/A	100	100	100	100	100	100	89.40	67.46	87.24

% Monthly Planned and Unplanned Unavailability

The table shows the % monthly variation in Planned and Unplanned System Unavailability for the Offshore Transmission Networks. The unavailability has been classified by network responsibility i.e. OFTO or Non-OFTO (e.g. Generator).

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
TC Robin Rigg	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	3.26	0	1.05	12.11	0	0.85	2.59	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Gunfleet Sands	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Barrow	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	19.83	0	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Ormonde	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	17.63	0	0.56	3.85	0	0	0	0	0	0.55	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Lincs	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Westermost Rough	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Dudgeon	**OFTO Planned**	0.64	0	0	14.30	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Beatrice	**OFTO Planned**	0	0	0	7.51	17.20	0	0	0	0	0	0	10.80
	OFTO Unplanned	0	0	0	0	0.03	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	10.97	50.00	5.75	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Rampion	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	10.38	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC East Anglia 1	**OFTO Planned**	0	0	9.16	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	1.88	0	0	0	0	0	1.93	46.65
	Non-OFTO	0	0	0.01	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
TC Moray East	**OFTO Planned**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0
	OFTO Unplanned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0
	Non-OFTO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
BT Walney 1	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	3.85	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
BT Walney 2	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	16.62
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
BT Sheringham Shoal	**OFTO Planned**	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0.09	0.14	0	0	0	0	0	0	0

% Monthly Planned and Unplanned Unavailability

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
BT London Array	OFTO Planned	0	0	0	1.85	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
EQ Greater Gabbard	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	4.99	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
EQ Triton Knoll	OFTO Planned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
	OFTO Unplanned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
	Non-OFTO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
BBE Gwynt Y Mor	OFTO Planned	0	0	0	6.21	7.01	0	0	0	0.09	0	0	0
	OFTO Unplanned	0	0.25	3.35	0	0	0	0	0	14.87	25.00	25.00	25.00
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
BBE Thanet	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
BBE Humber Gateway	OFTO Planned	0	0	0	0	0	7.90	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
West of Duddon Sands	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	25.30	0	0	1.83	0	0	0	0	1.19	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DTP Burbo Bank Extension	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DTP Race Bank	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	22.74	40.61
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DTP Galloper	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DTP Walney Extension	OFTO Planned	0	0	0	0	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DTP Hornsea One	OFTO Planned	0	0	0	0.49	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	10.60	32.54	12.76
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DTP Hornsea Two	OFTO Planned	N/A	N/A	N/A	0.49	0	0	0	0	0	0	0	0
	OFTO Unplanned	N/A	N/A	N/A	0	0	0	0	0	0	10.60	32.54	12.76
	Non-OFTO	N/A	N/A	N/A	0	0	0	0	0	0	0	0	0

Outage Details

Offshore system outages are calculated using MW of offshore transmission capacity unavailable, not generation lost.

TC Robin Rigg

Outage Date and Time	Reason	Days, Hours and Mins	MWh
19 June 2023 07:31 Robin Rigg East Wind Farm restricted to 0MW/0MVA due to RWE outage to allow maintenance of RWE East Offshore 100MVA Transformer.	Non-OFTO	1d 11h 51m	3083
22 June 2023 07:31 Robin Rigg West Wind Farm restricted to 0MW/0MVA due to RWE outage to allow maintenance of RWE West Offshore 100MVA Transformer.	Non-OFTO	11h 51m	1090
03 August 2023 21:56 Robin Rigg West Wind Farm restricted to 0MW/0MVA due to DNO remote end protection output card fault resulting in protection depletion.	Non-OFTO	4h 53m	449
29 August 2023 08:30 Robin Rigg East Wind Farm restricted to 0MW/0MVA for DNO to break jumpers for OHL maintenance.	Non-OFTO	11h 00m	946
04 September 2023 07:56 Robin Rigg East Wind Farm restricted to 0MW/0MVA for DNO to make OHL jumpers and for RWE to complete pipework replacement on 100MVA Transformer RRE/TR/111.	Non-OFTO	3d 14h 17m	7420
06 September 2023 10:07 Robin Rigg West Wind Farm restricted to 0MW/0MVA for DNO to break OHL jumpers.	Non-OFTO	6h 50m	629
12 September 2023 07:15 Robin Rigg West Wind Farm restricted to 0MW/0MVA for DNO to break OHL jumpers and for RWE to complete pipework replacement on 100MVA Transformer RRW/TR/111.	Non-OFTO	3d 9h 16m	7477
04 November 2023 09:02 Robin Rigg East Wind Farm outage to allow investigation works for an oil leak on RWE 100MVA offshore transformer RRE/TR/111.	Non-OFTO	2h 37m	225
07 November 2023 19:10 Robin Rigg East Wind Farm outage to allow oil top up and attempt to seal oil leak on RWE 100MVA offshore transformer RRE/TR/111.	Non-OFTO	2h 42m	232
14 November 2023 08:31 Robin Rigg East Wind Farm outage to allow oil top up and attempt to seal oil leak on RWE 100MVA offshore transformer RRE/TR/111.	Non-OFTO	35m	50
21 November 2023 07:07 Robin Rigg East Wind Farm outage to repair an oil leak on RWE 100MVA offshore transformer RRE/TR/111.	Non-OFTO	6h 44m	579
24 December 2023 06:02 Robin Rigg West Wind Farm outage for the DNO (ENW) to repair a damaged insulator on the 132kV network.	Non-OFTO	1d 13h 15m	3427
Total			**25608**

TC Gunfleet Sands

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

TC Barrow

Outage Date and Time	Reason	Days, Hours and Mins	MWh
15 May 2023 11:26 ENW outage on Heysham-Trimpell No1 / BOW cct for maintenance on 104 and 304.	Non-OFTO	6d 3h 30m	13275
Total			**13275**

TC Ormonde

Outage Date and Time	Reason	Days, Hours and Mins	MWh
22 May 2023 09:59 ENW outage on Heysham – Trimpell 2 – Ormonde Windfarm 132kV circuit. Maintenance of disconnectors 204 and 404.	Non-OFTO	5d 11h 08m	19670
19 July 2023 08:51 Outage on Heysham – Trimpell 2 – Ormonde Windfarm 132kV circuit. Generator request to de-energise the offshore 33kV substation.	Non-OFTO	4h 12m	630
16 August 2023 09:08 Generator request to de-energise the offshore 33kV substation.	Non-OFTO	8h 50m	1325
17 August 2023 08:01 Generator request to de-energise the offshore 33kV substation.	Non-OFTO	5h 55m	888
29 August 2023 11:26 Generator request to de-energise the offshore 33kV substation.	Non-OFTO	5h 21m	803
31 August 2023 08:32 Generator request to de-energise the offshore 33kV substation.	Non-OFTO	8h 33m	1283
28 February 2024 10:05 Generator request to de-energise the offshore 33kV substation to complete maintenance of E/AUX Transformer and 33kV CB 1H0.	Non-OFTO	3h 51m	578
Total			**25175**

TC Lincs

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

TC Westermost Rough

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

TC Dudgeon

Outage Date and Time	Reason	Days, Hours and Mins	MWh
13 April 2023 06:40 Reinstallation of shunt reactor of circuit 2 after warranty repair.	OFTO	9h 17m	1857
06 July 2023 05:45 3 yearly shutdown maintenance and sheath testing.	OFTO	4d 14h 17m	22167
11 July 2023 06:51 3 yearly shutdown maintenance and sheath testing.	OFTO	4d 5h 28m	20395
Total			**44418**

TC Beatrice

Outage Date and Time	Reason	Days, Hours and Mins	MWh
27 July 2023 08:15 GT1 radiator replacement. Generator's snagging works.	OFTO	15d 7h 48m	108133
19 August 2023 17:43 MW restriction of CCT2 due to high transformer temperatures. Generator's snagging works.	OFTO	1h 18m	122
24 November 2023 10:05 MW restriction of CCT1 to enable SSE-N connect Moray West Windfarm.	Non-OFTO	36d 13h 54m	265159
01 January 2024 00:00 MW restriction of CCT1 to enable SSE-N GIS CB repair works.	Non-OFTO	3d 13h 36m	25166
25 March 2024 07:20 CCT2 outage works to facilitate Blackhillock Reserve Power connection at the Blackhillock onshore substation. Exceptional event request submitted to OFGEM, awaiting decision.	OFTO	6d 16h 39m	47231
Total			**445812**

TC Rampion

Outage Date and Time	Reason	Days, Hours and Mins	MWh
05 September 2023 06:36 Windfarm works on the OSP.	Non-OFTO	3d 10h 32m	15690
09 September 2023 06:36 Windfarm works on the OSP.	Non-OFTO	3d 2h 41m	14197
Total			**29887**

TC East Anglia 1

Outage Date and Time	Reason	Days, Hours and Mins	MWh
12 June 2023 08:04 Circuit 1 full outage for 220kV GIS bus bar SF6 leak. Generator's snagging works.	OFTO	4d 6h 20m	34793
21 June 2023 07:53 Circuit 2 full outage for generator's snagging works. Software update of SGT2 and GT2 and bushing sensor replacement on GT2.	OFTO	1d 5h 33m	10047
22 June 2023 17:45 GT2 outage requested by generator (CB H20 opened) due to issues to energise windfarm's 66kV boards. Extension of previous outage.	Non-OFTO	10m	57
29 August 2023 18:49 Fault traced to a protection relay analogue input failure. Exceptional event request to be submitted to OFGEM.	OFTO	1d 4h 00m	9520
28 February 2024 21:10 Fault event on export cable of circuit 1. Fault located at the onshore section of the circuit approximately 20km from Burstall onshore substation. Exceptional event request to be submitted to OFGEM.	OFTO	32d 2h 49m	245116
Total			**299533**

TC Moray East

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

BT Walney 1

Outage Date and Time	Reason	Days, Hours and Mins	MWh
06 December 2023 19:54 Disconnector 296 aux contact failure.	OFTO	28h 39m	4813
Total			**4813**

BT Walney 2

Outage Date and Time	Reason	Days, Hours and Mins	MWh
06 March 2024 08:45 xxxxx.	Non-OFTO	5d 3h 41m	20779
Total			**20779**

BT Sheringham Shoal

Outage Date and Time	Reason	Days, Hours and Mins	MWh
17 July 2023 09:22 Switching time outage to allow DNO works to be carried out.	Non-OFTO	1h 19m	207
05 August 2023 05:34 Switching time outage to allow DNO works to be carried out.	Non-OFTO	2h 01m	318
Total			**525**

BT London Array

Outage Date and Time	Reason	Days, Hours and Mins	MWh
24 July 2023 07:43 SGT1B tap changer maintenance and GT3 maintenance.	OFTO	17h 21m	2498
24 July 2023 06:43 Switching time outage on GT1.	OFTO	3h 29m	502
25 July 2023 00:05 Switching time outage on GT1.	OFTO	31m	74
26 July 2023 06:20 SGT2A tap changer maintenance and GT2 maintenance.	OFTO	14h 28m	2083
26 July 2023 06:52 Switching time outage on GT4.	OFTO	1h 47m	257
26 July 2023 19:14 Switching time outage on GT4.	OFTO	55m	132
28 July 2023 06:30 SGT2B tap changer maintenance and GT4 maintenance.	OFTO	17h 07m	2465
28 July 2023 06:56 Switching time outage on GT2.	OFTO	1h 49m	262
28 July 2023 19:23 Switching time outage on GT2.	OFTO	2h 00m	288
28 July 2023 21:49 Switching time outage on GT2.	OFTO	52m	125
Total			**8686**

Equitix Greater Gabbard

Outage Date and Time	Reason	Days, Hours and Mins	MWh
12 September 2023 08:52 IGSUB CCT3 Busduct Replacement.	OFTO	4d 12h 24m	165.60
Total			**165.60**

Equitix Triton Knoll

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

BBE Gwynt-Y-Mor

Outage Date and Time	Reason	Days, Hours and Mins	MWh
18 May 2023 14:49 SGT1 SVC related trip.	OFTO	3h 40m	736.4
10 June 2023 18:38 NG related fault.	OFTO	1d 16h 11m	9676.8
03 July 2023 06:58 SGT2 oil leak repair.	OFTO	3d 18h 41m	18218.2
07 August 2023 09:53 SGT1 air bag repair.	OFTO	4d 3h 58m	20933.5
01 December 2023 07:44 L2 400kV oil leak.	OFTO	8h 29m	2810.6
07 December 2023 09:37 GT5 fan failure, load reduced to 70%.	OFTO	8h 17m	407.1
14 December 2023 12:13 SSEC3 subsea cable fault.	OFTO	107d 11h 47m	430654.3
Total			**483436.9**

BBE Thanet

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

BBE Humber Gateway

Outage Date and Time	Reason	Days, Hours and Mins	MWh
18 September 2023 17:11 Circuit 2, AIS/GIS termination repair.	OFTO	4d 17h 38m	12499
Total			**12499**

West of Duddon Sands

Outage Date and Time	Reason	Days, Hours and Mins	MWh
07 May 2023 05:37 WoDS circuit 1 filter capacitor fault.	OFTO	11h 26m	1900
07 May 2023 21:46 WoDS circuit 1 voltage transformer fault.	OFTO	17d 15h 48m	70012
08 August 2023 05:21 REF injection testing as part of root cause analysis following July 2021 circuit 1 outage.	OFTO	1d 7h 24m	5187
18 January 2024 03:37 WoDS circuit 1 harmonic filter fault.	OFTO	13h 17m	2194
26 January 2024 15:07 WoDS circuit 2 harmonic filter fault.	OFTO	7h 13m	1192
Total			**80485**

DTP Burbo Bank Extension

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

DTP Race Bank

Outage Date and Time	Reason	Days, Hours and Mins	MWh
13 February 2024 18:13 Onshore cable fault.	OFTO	47d 5h 46m	257856
Total			**257856**

DTP Galloper

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

DTP Walney Extension

Outage Date and Time	Reason	Days, Hours and Mins	MWh
None			0
Total			**0**

DTP Hornsea One

Outage Date and Time	Reason	Days, Hours and Mins	MWh
25 July 2023 09:35 Protection Trip test CCT1.	OFTO	7h 37m	1715.51
26 July 2023 11:08 Protection Trip test CCT2.	OFTO	4h 00m	900.93
27 July 2023 09:52 Protection Trip test CCT3.	OFTO	3h 39m	822.09
19 January 2024 05:29 Deratings due to cable issue.	OFTO	72d 18h 30m	375824
Total			**379262.53**

DTP Hornsea Two

Outage Date and Time	Reason	Days, Hours and Mins	MWh
26 July 2023 11:08 Deratings due to cable issue.	OFTO	4h 00m	900.93
02 August 2023 11:49 Cable fault.	OFTO	33d 8h 31m	188752.30
Total			**189653.22**

This glossary provides explanations and definitions for common terms used throughout this report.

System Availability

System availability is reduced whenever a circuit is taken out of operation for either planned purposes or following a fault.

Planned outages are required for system construction and new user connections in addition to the maintenance necessary to retain a high level of system reliability to ensure that licence standards of security are met.

System Availability is calculated by the formula:

$$\left(\frac{\text{The sum for all circuits of hours available}}{\text{(No. of circuits) x (No. of hours in period)}}\right) \text{x } 100\%$$

A circuit is defined as equipment on the transmission system, e.g. overhead line, transformer or cable which either connects two bussing points or connects two or more circuit breakers/disconnectors, excluding busbars.

Winter Peak Availability is defined as the average System Availability over the three months of December, January and February.

Reative Compensation Equipment Availability

System reactive compensation equipment availability is calculated in terms of the summation of the availabilities of individual reactive compensation equipment on the main interconnected transmission system expressed as a percentage of the total capability of reactive compensation equipment.

Reactive compensation equipment is defined as all shunt and series reactive compensation equipment including but not limited to mechanically switched capacitors, shunt reactors, SVCs, dynamic reactive compensators, synchronous condensers.

$$\text{System availability} = \left(\frac{\text{Total MVArh* system is capable of delivering – MVArh* unavailable}}{\text{Total MVArh* system is capable of delivering}}\right)$$

*meaning absolute value

System Unavailability

System Unavailability is calculated by the formula:

(100 – Availability) %

Unavailability falls into 4 categories, 3 of which are planned and the other unplanned:

Maintenance Outages are planned outages required for maintenance;

System Construction Outages are planned outages required to construct or modify assets which are not provided for the exclusive benefit of specific users;

User Connection Outages are planned outages required to construct or modify assets which are provided to facilitate connection for the exclusive benefit of specific system users; and

Unplanned Unavailability is due to outages occurring as a result of plant or equipment failure, i.e. outages required and taken at less than 24 hours' notice.

Offshore System Availability

OFTO availability is calculated using the formula:

$$\left(\frac{\text{Total MWh system is capable of delivering – MWh unavailable}}{\text{Total MWh system is capable of delivering}}\right) \text{x } 100\%$$

NETS Grid Code and NETS Security and Quality of Supply Standard

The NETS Grid Code and NETS Security and Quality of Supply Standard (NETS SQSS) define the required security level to which the system is planned. The required security level at a substation increases with the amount of demand connected to the substation and so the planned level of demand security is normally higher for 400kV and 275kV transmission voltages than for 132kV. Additionally, the 132kV network is, in parts, less interconnected than the higher voltage systems and so losses of 132kV transmission circuits (for example due to weather related transient faults) are more likely to lead to temporary losses of supply.

Loss of Supply Incidents

A loss of supply incident is defined as any incident on the transmission system that results in an actual unsupplied energy incident to a customer or customers including pumped storage units operating in pump mode.

All transmission system incidents that resulted in a loss of supplies are reported individually giving the date, time and location of the event, duration, demand lost, an estimate of unsupplied energy and relevant factual information relating to the event.

Since 1st April 2013, loss of supply incidents is governed by the Energy Not Supplied (ENS) scheme. The scheme aims to incentivise the Transmission Licensees to minimise the impact of any loss of supply to their customers, that is, to restore supplies as soon as possible after an incident.

Loss of Supply Incidents – Incentivised

An Incentivised loss of supply event is an event on the Licensee's Transmission System that causes electricity not to be supplied to a customer, subject to the exclusions defined in the Special Conditions of the Transmission Licence.

Loss of Supply Incidents – Non-Incentivised

The Non-Incentivised category covers loss of supply incidents that are less than 3 minutes in duration, the energy not supplied is calculated and recorded but not included in the incentivised energy not supplied figure and is reported separately. The Non-Incentivised category also applies to connection arrangements that are chosen by the customer and often have a level of design and operational security below that normally required to satisfy the NETS SQSS. This may be reflected in a reduced cost of the connection. In some cases, customers have also chosen to secure their supplies using their own generation to compensate for this reduced level of transmission security. Loss of supply initiated on a DNO network are not included within this category.

Overall Reliability of Supply

The Overall Reliability of Supply for a transmission system is calculated using the formula:

$$\left[1-\left(\frac{\text{Estimated Unsupplied Energy}}{\text{Total energy that would have been supplied by the transmission system)}}\right)\right] \times 100\%$$

Voltage Excursions

The Electricity Safety, Quality and Continuity Regulations 2002 permit variations of voltage not exceeding 10% above and below the nominal at voltages of 132kV and above and not exceeding 6% at lower voltages. Any voltage excursions in excess of 15 minutes will be reported.

The NETS Grid Code reflects these limits and imposes a further constraint for the 400kV system in that voltages can only exceed +5% for a maximum of 15 minutes.

Consumers may expect the voltage to remain within these limits, except under abnormal conditions e.g. a system fault outside of the limits specified in the NETS SQSS.

Normal operational limits are agreed and monitored individually at connection points with customers to ensure that voltage limits are not exceeded following the specified credible fault events described in NETS SQSS.

Frequency Excursions

The Electricity Safety, Quality and Continuity Regulations 2002 permit variations in frequency not exceeding 1% above and below 50Hz: a range of 49.5 to 50.5Hz. Any frequency excursions outside these limits for 60 seconds or more will be reported.

The system is normally managed such that frequency is maintained within operational limits of 49.8 and 50.2Hz.

Frequency may, however, move outside these limits under fault conditions or when abnormal changes to operating conditions occur. Losses of generation between 1320 and 1800MW are considered abnormal and a maximum frequency change of 0.8Hz may occur, although operation is managed so that the frequency should return within the lower statutory limit of 49.5Hz within 60 seconds.

ESO