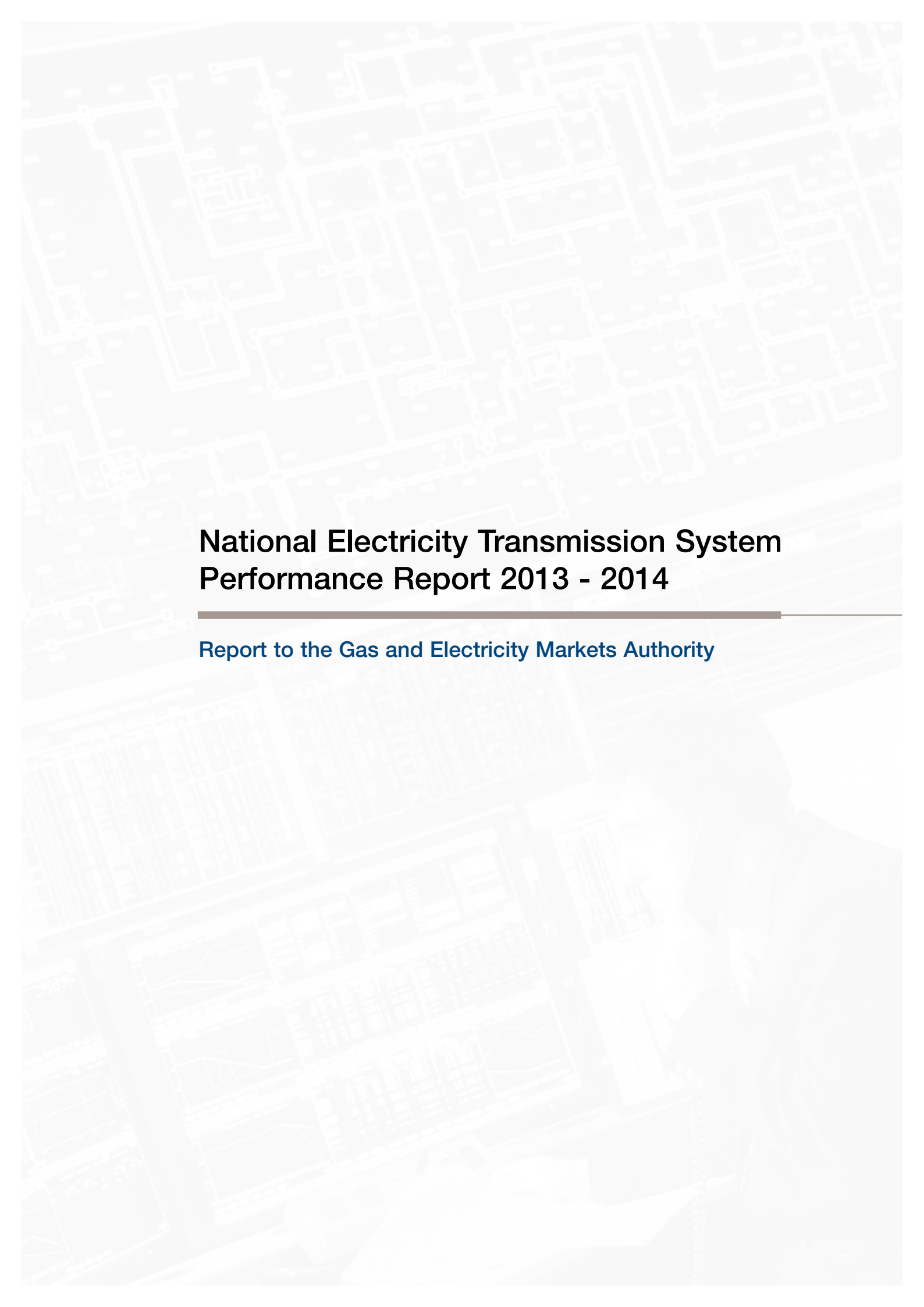


**National Electricity
Transmission System
Performance Report
2013 - 2014**

Report to the Gas and Electricity
Markets Authority





National Electricity Transmission System Performance Report 2013 - 2014

Report to the Gas and Electricity Markets Authority

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National Electricity Transmission System Performance Report

Introduction

The electricity transmission networks in Great Britain 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. These three networks form the Onshore Transmission System.

The Offshore Transmission networks are owned by Transmission Capital Partners Limited (TC), Balfour Beatty Utility Solutions (BB) and Blue Transmission Limited (BT). The National Electricity Transmission System (NETS) is comprised of the Onshore and Offshore Transmission System.

In addition to its role as the Transmission Owner in England and Wales, NGET became the Great Britain System Operator (GBSO) on 1 April 2005, and subsequently on 24th June 2009, National Electricity Transmission System Operator (NETSO) which includes the Offshore Transmission System.

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

The Onshore and Offshore Transmission System broadly comprises of 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 also allows for the efficient bulk transfer of power from remote generation to demand centres.

Information relating to SP Transmission plc, Scottish Hydro Electric Transmission plc, TC Robin Rigg OFTO Limited, TC Barrow OFTO Limited, TC Gunfleet Sands OFTO Limited, TC Ormonde OFTO Limited, Blue Transmission Limited and Balfour Beatty Utility Solutions

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 Scottish transmission networks it should be recognised that this can be influenced by both the Scottish Transmission Owners and the NETSO.

The National Electricity Transmission System is connected via interconnectors to transmission systems in France, Northern and Republic of Ireland and Netherlands. The Northern Ireland Interconnector is regulated by the Northern Ireland Regulator (NIAUR) and Republic of Ireland is regulated by the Commission for Energy Regulation (CER) which both fall outside the scope of this report.

Information relating to the Interconnexion France – Angleterre (IFA) has been provided by National Grid Interconnectors Limited (NGIC) in accordance with Licence Condition D5 (Transmission System Security Standard and Quality of Service) of the NGIC Transmission Licence.

Information relating to the Interconnector between England and the Netherlands (BritNed) has been provided by National Grid in conjunction with TenneT due to the joint ownership of the equipment.

Section One

National Electricity Transmission System (GB Network)



Reliability of Supply

The Overall Reliability of Supply for the National Electricity Transmission System during 2013-14 was:

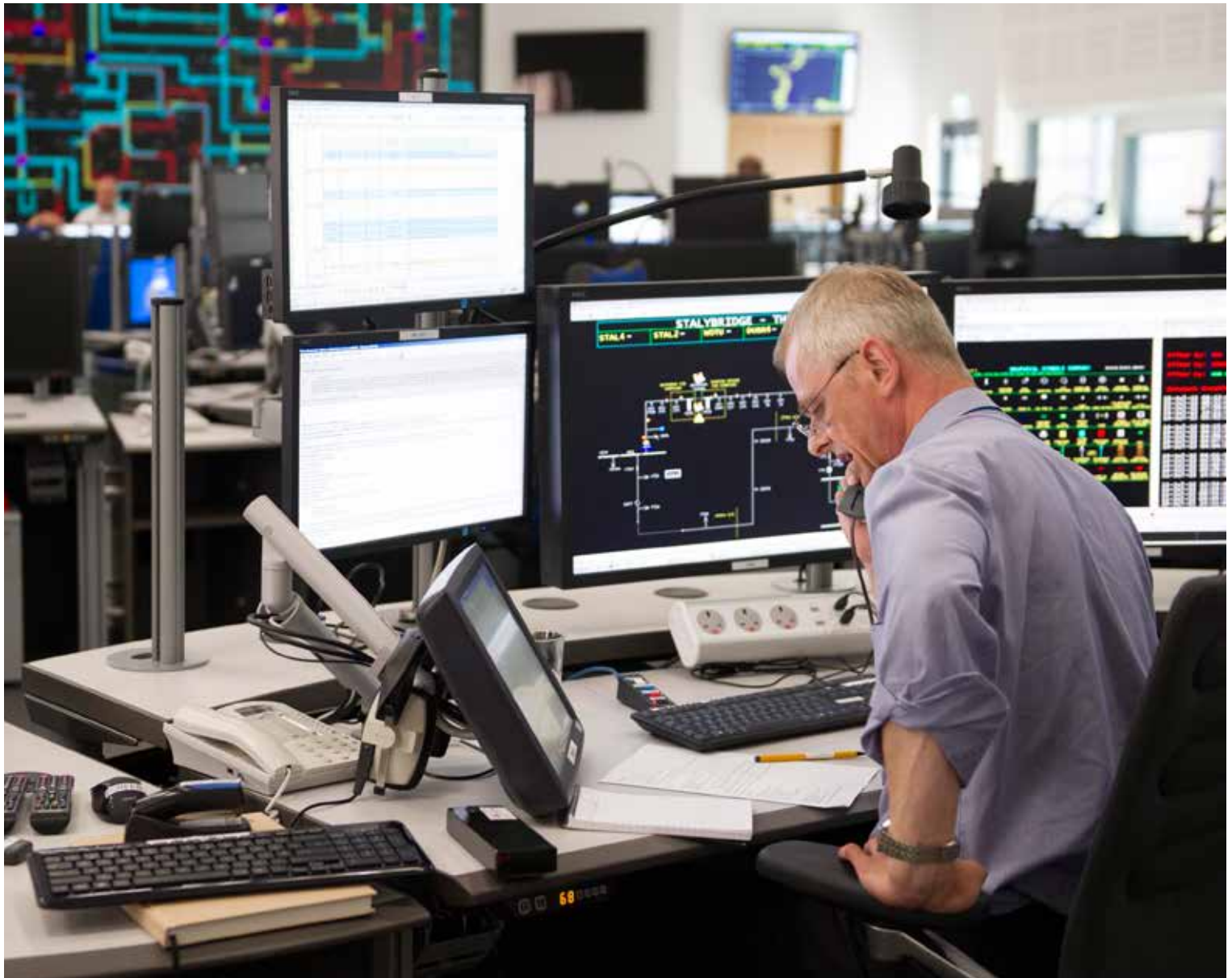
99.99991%

compared with 99.99975% in 2012-13 and 99.99954% in 2011-12.

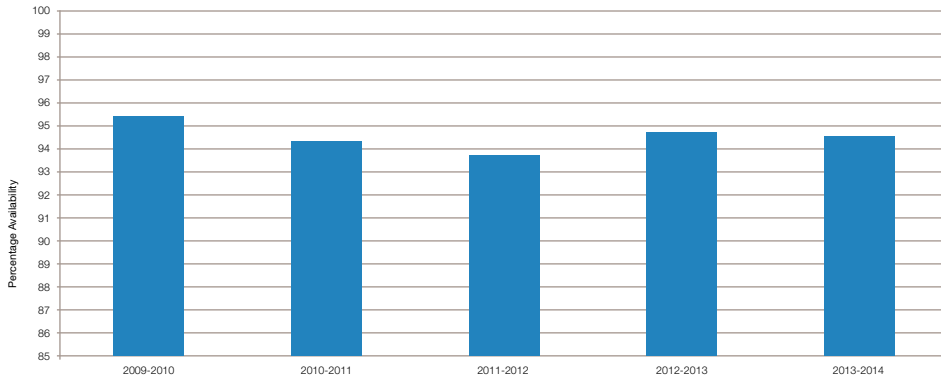
Availability

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.

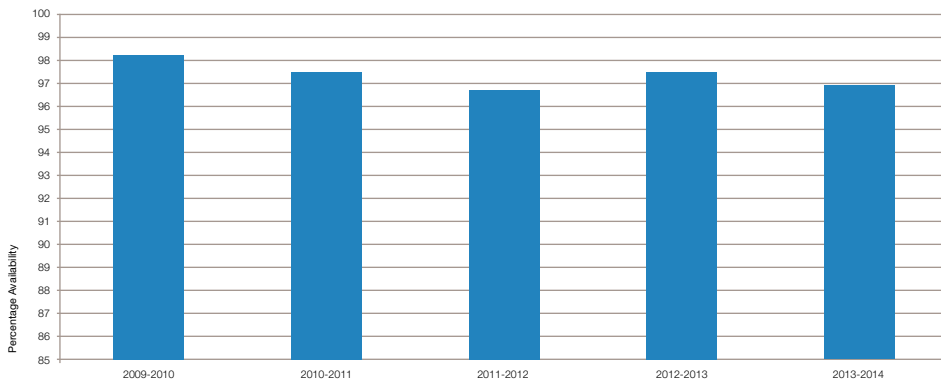


% Annual System Availability



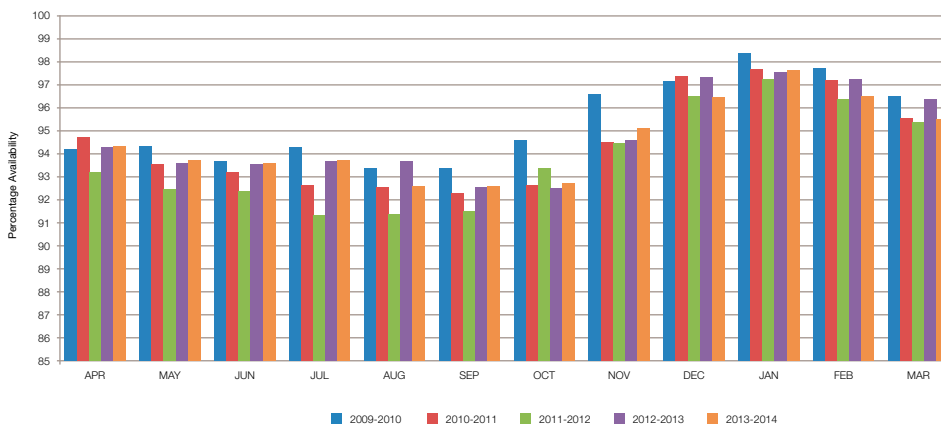
2009-10	2010-11	2011-12	2012-13	2013-14
95.44	94.47	93.78	94.75	94.50

% Winter Peak System Availability



2009-10	2010-11	2011-12	2012-13	2013-14
98.15	97.45	96.71	97.40	96.98

% Monthly System Availability



	2009-10	2010-11	2011-12	2012-13	2013-14
April	94.07	94.65	93.25	94.12	94.43
May	94.17	93.55	92.51	93.87	93.88
June	93.70	93.40	92.39	93.59	93.61
July	94.07	92.79	91.36	93.72	93.73
August	93.45	92.50	91.30	93.87	92.67
September	93.42	92.12	91.43	92.65	92.87
October	94.85	92.60	93.35	92.49	92.98
November	96.67	94.97	94.45	94.77	95.03
December	98.11	97.40	96.48	97.32	96.45
January	98.48	97.82	97.26	97.68	96.77
February	97.82	97.12	96.38	97.17	96.43
March	96.59	95.55	95.38	96.46	95.58

Annual System Availability

Annual System Availability of the National Electricity Transmission System for 2013-2014 was:

94.50%

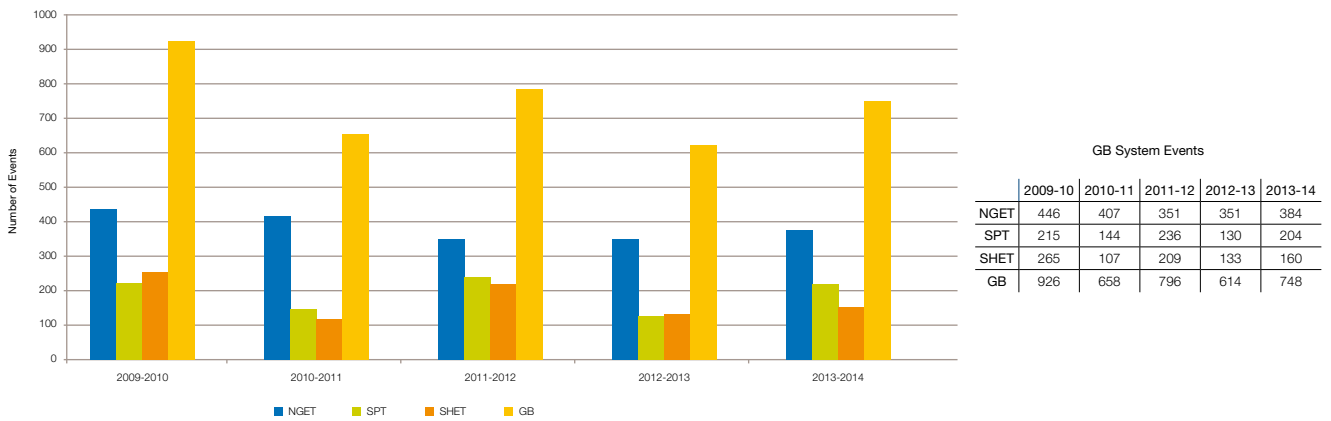
Security

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.

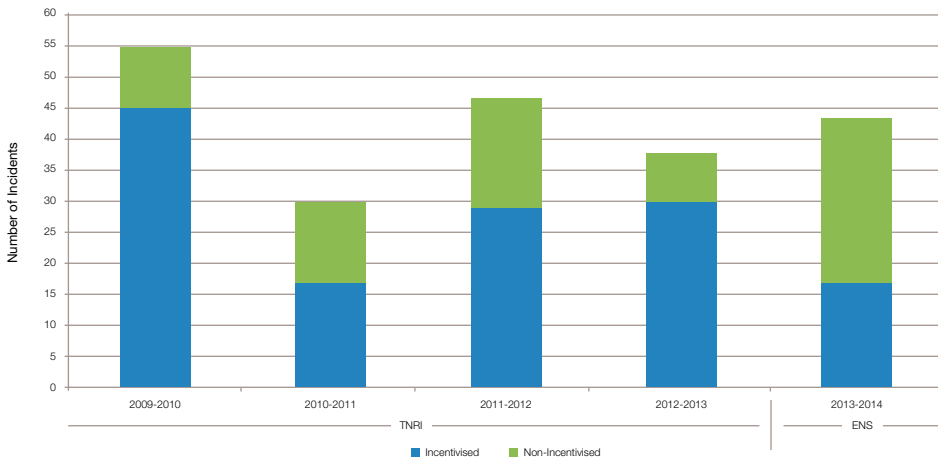
During 2013-14 there were 748 NETS events where transmission circuits were disconnected either automatically or by urgent manual switching. The vast majority of these events had no impact on electricity users with only 44 resulting in loss of supplies to customers.

The chart shows the annual comparison of the number of system events within the individual Onshore TOs and the GB network as a whole.



Number of Loss of Supply Incidents

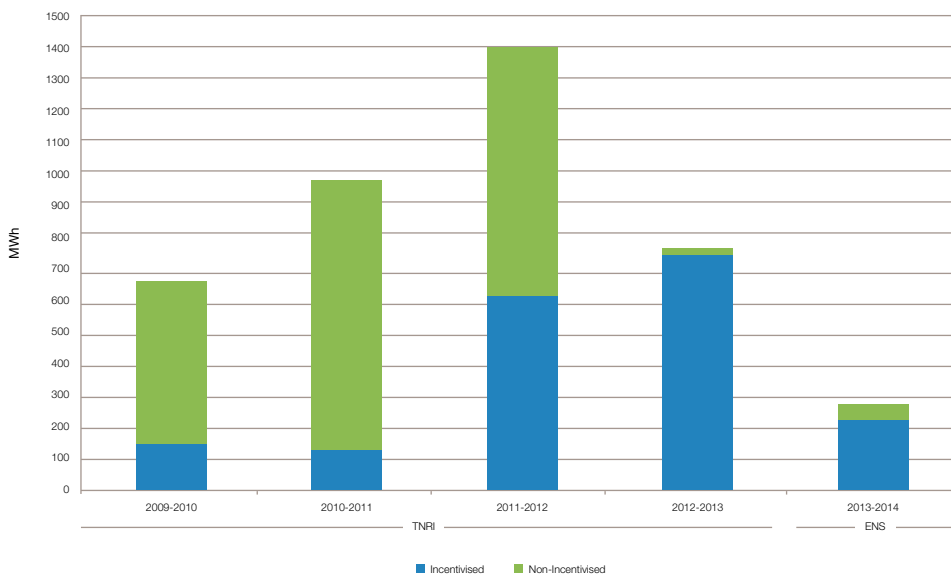
The chart shows the annual comparison of the numbers of Loss of Supply Incidents that occurred within the National Electricity Transmission System. The chart separates the TNRI (2005 – 2013) and ENS (2013 to date) schemes for clarification.



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	45	16	29	30	17
Non-Incentivised	10	14	17	8	27

Estimated Unsupplied Energy

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



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	150.55	120.54	628.88	760.53	212.93
Non-Incentivised	520.85	863.10	788.70	6.90	45.37

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the National Electricity Transmission System during 2013-14 was:

258.3 MWh

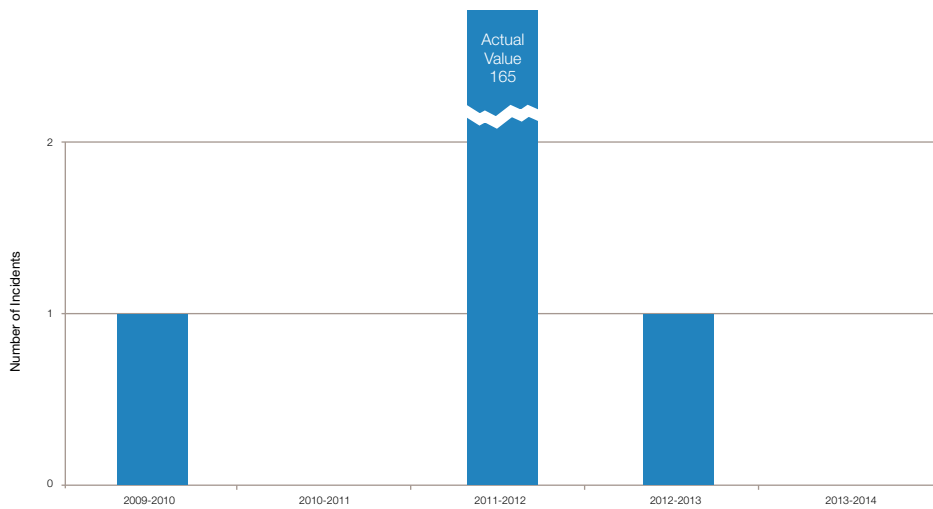
Quality of Service

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 2013-14 there were no reportable Voltage Excursion within the National Electricity Transmission System.

The chart below summarises the reportable Voltage Excursions that have occurred on the National Electricity Transmission System within England and Wales during 2013-14



	2009-10	2010-11	2011-12	2012-13	2013-14
Number of NGET Excursions	1	0	165	1	0
Number of SPT Excursions	0	0	0	0	0
Number of SHETL Excursions	0	0	0	0	0

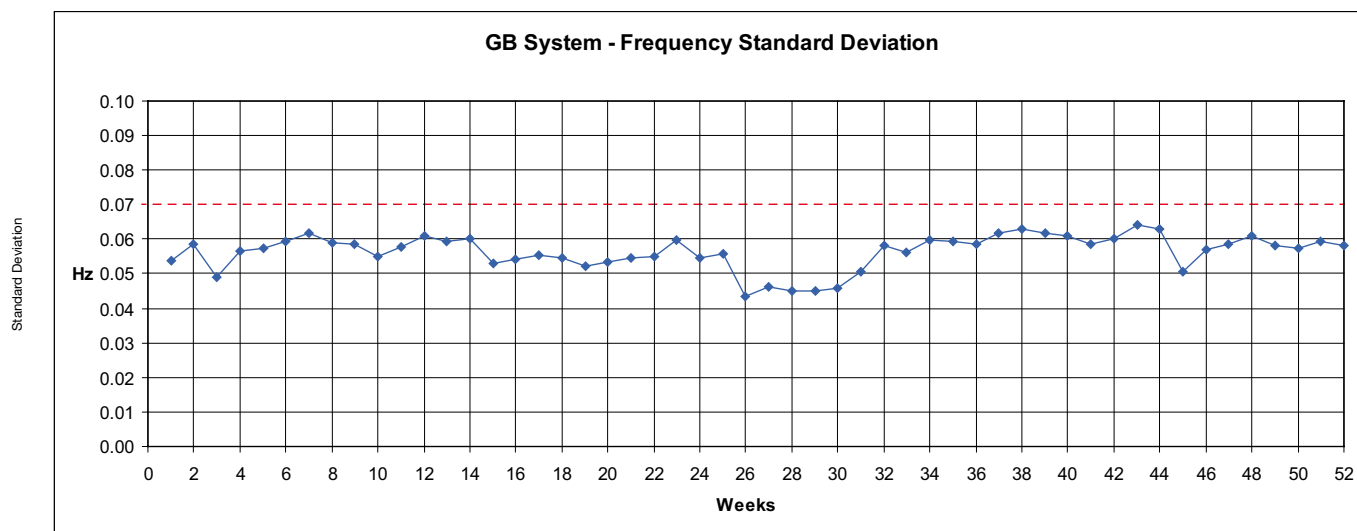
Frequency Excursions

During 2013-14 there has been no reportable Frequency Excursion within the National Electricity Transmission System.

The last reported Frequency Excursion was in 2008-09 reporting period.

Frequency Standard Deviation

The chart below displays the recorded Frequency Standard Deviation from 50Hz on a weekly basis for the year 2013-14.





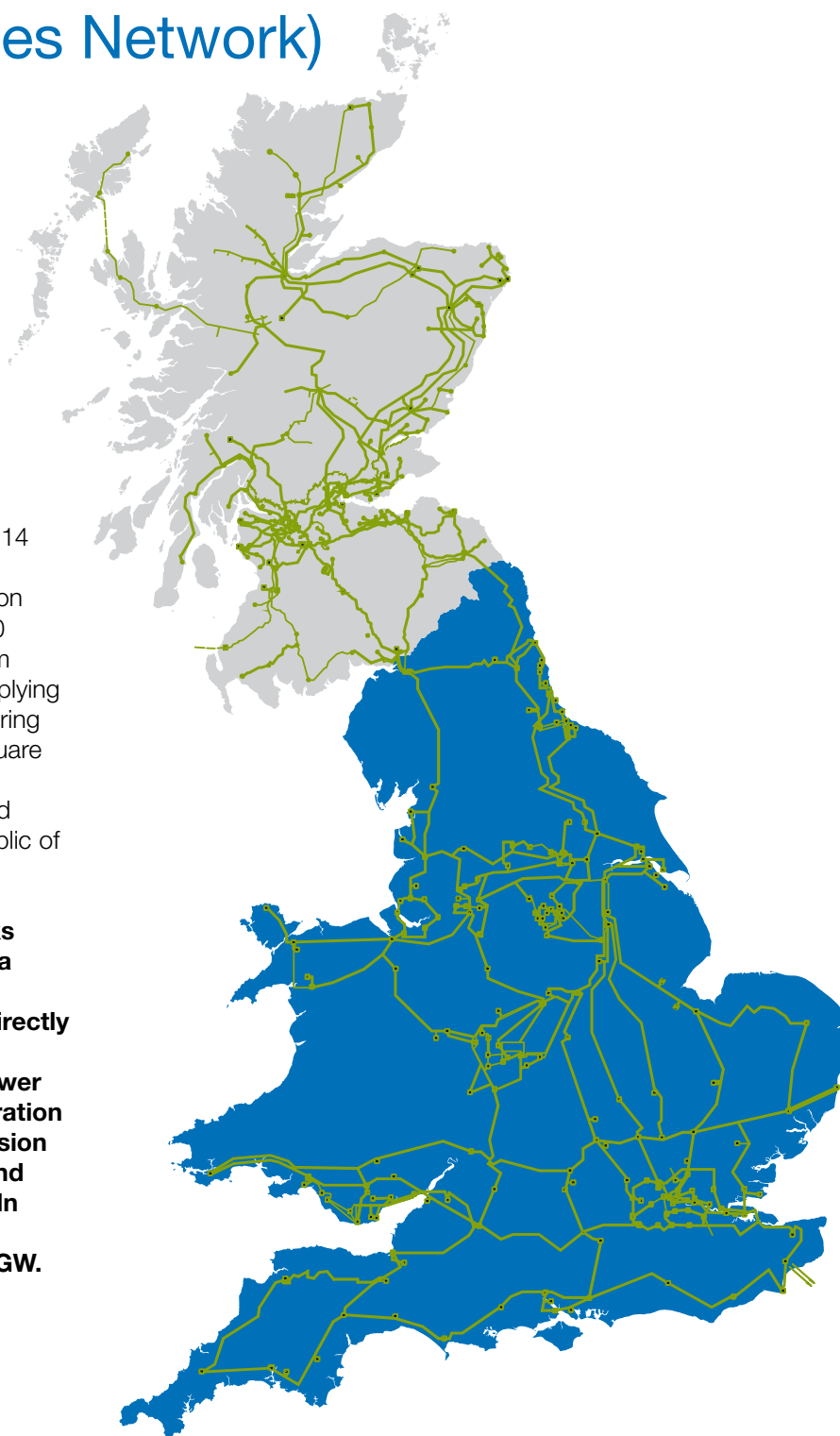
Section Two

NGET System (England & Wales Network)

System Description

The NGET System comprises of 14,114 kilometres of overhead line and 630 kilometres of underground transmission cable routes interconnecting over 300 substations. The Transmission System operates at 400, 275 and 132kV supplying electricity to England and Wales covering an area of approximately 151,000 square kilometres. It is connected to the SP Transmission System to the North and three HVDC Interconnectors to Republic of Ireland, France and Holland.

There are 12 Distribution Networks connected to the NGET system via 141GVA of installed transformer capacity and a small number of directly connected customers such as steelworks. There are 67 large power stations totalling 60.5GW of generation capacity and 9 Offshore Transmission networks connected to the England and Wales Transmission System. In 2013-14 the maximum recorded demand on the network was 46.6GW.

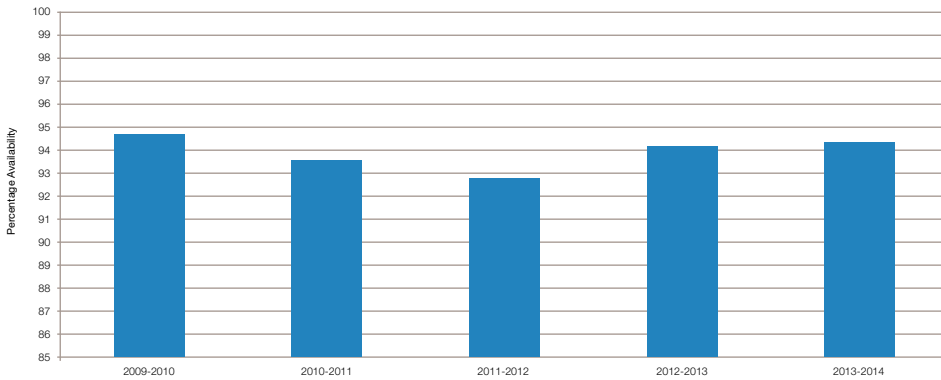


Availability

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

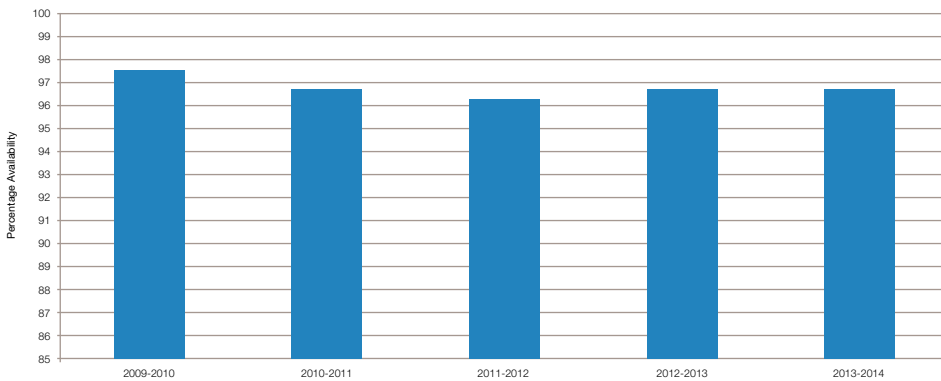
System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability.

% Annual System Availability



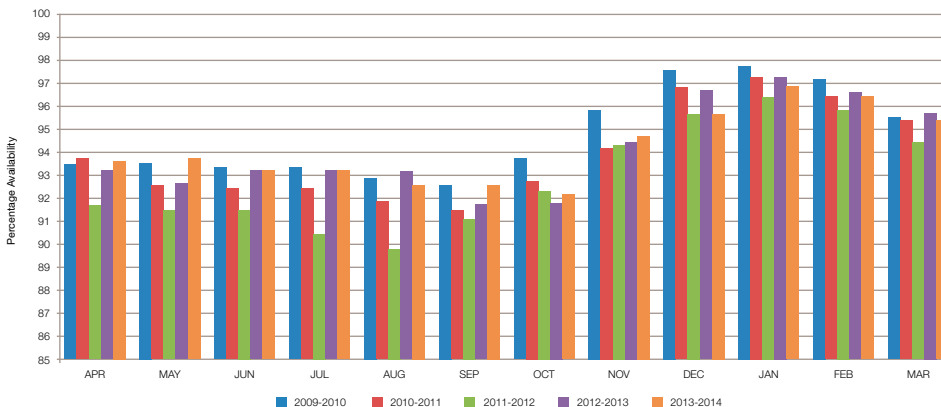
2009-10	2010-11	2011-12	2012-13	2013-14
94.76	93.60	92.71	94.03	94.16

% Winter Peak System Availability



2009-10	2010-11	2011-12	2012-13	2013-14
97.55	96.95	96.01	96.89	96.75

% Monthly System Availability

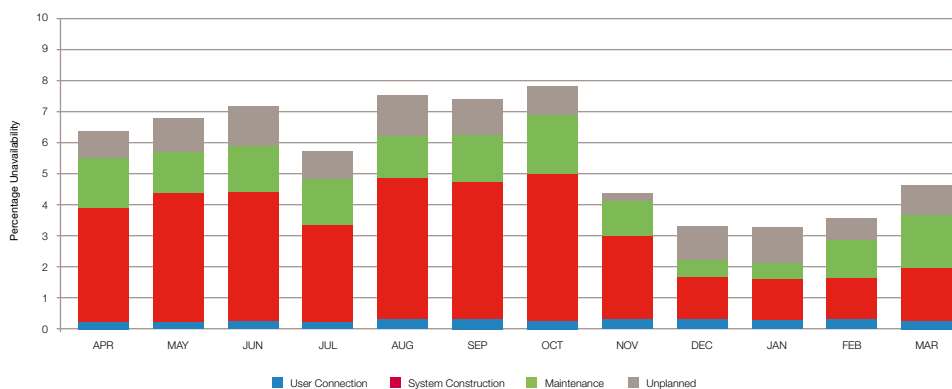


	2009-10	2010-11	2011-12	2012-13	2013-14
April	93.44	93.74	91.81	93.16	93.56
May	93.55	92.48	91.33	92.68	93.22
June	93.27	92.05	91.42	92.72	92.92
July	93.47	92.28	90.41	93.12	93.14
August	92.95	91.94	89.88	93.15	92.52
September	92.69	90.42	90.03	91.82	95.58
October	93.80	91.08	92.25	91.86	92.18
November	95.95	94.18	93.24	94.42	94.89
December	97.61	96.92	95.71	96.82	96.77
January	97.88	97.36	96.40	97.20	96.97
February	97.11	96.53	95.91	96.60	96.51
March	95.61	94.79	94.44	95.87	95.33

Planned and Unplanned System Unavailability

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

Unavailability is defined as $(100 - \text{Availability}) \%$



	User Connection	System Construction	Maintenance	Unplanned	Total
April	0.17	3.85	1.49	0.93	6.44
May	0.12	4.01	1.37	1.28	6.79
June	0.12	4.04	1.66	1.26	7.08
July	0.07	4.08	1.54	1.18	6.86
August	0.11	4.69	1.40	1.27	7.48
September	0.11	4.42	1.65	1.25	7.42
October	0.07	4.71	1.90	1.14	7.82
November	0.07	2.72	1.12	1.20	5.11
December	0.07	1.42	0.50	1.24	3.23
January	0.07	1.31	0.57	1.08	3.03
February	0.07	1.30	1.14	0.98	3.49
March	0.07	1.71	1.72	1.17	4.67



Danny Alexander, Chief Secretary to the Treasury, visiting National Grid's London Power Tunnels Project (LPT) in December 2013

Security

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

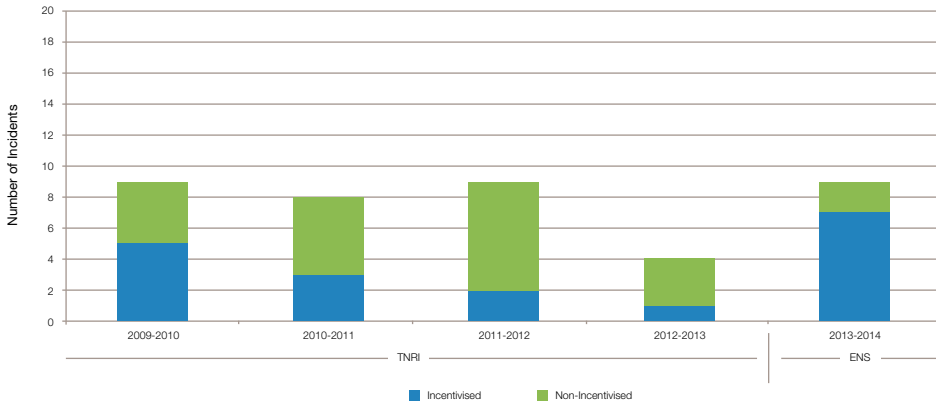
System performance is monitored by the Estimated Unsupplied Energy from the NGET Transmission System for each incident.

During 2013-14 there were 384 NGET system events where transmission circuits were disconnected either automatically or by urgent manual switching. The vast majority of these events had no impact on electricity users with only 9 resulting in loss of supplies to customers.



Number of Loss of Supply Incidents

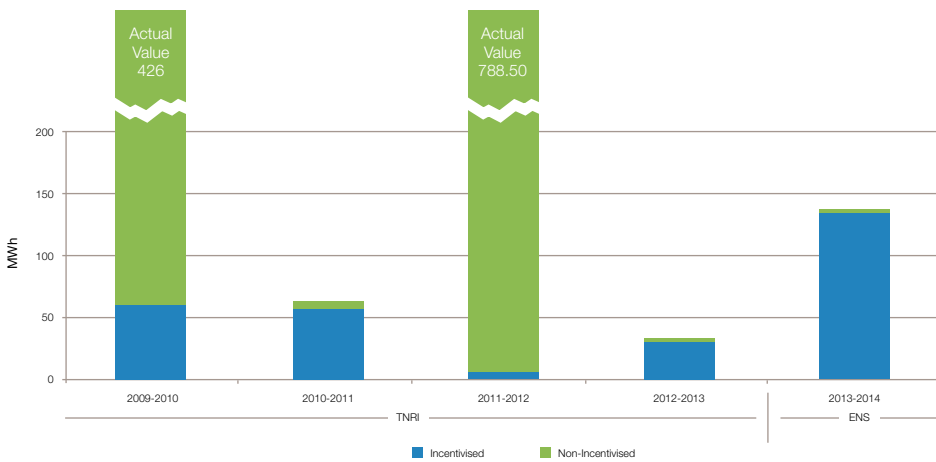
The chart shows the annual comparison of the numbers of Loss of Supply Incidents that occurred within the NGET Transmission System.



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	5	3	2	3	7
Non-Incentivised	4	5	7	1	2

Estimated Unsupplied Energy

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



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	61.00	59.50	2.50	31.50	135.03
Non-Incentivised	426.00	3.00	788.50	1.50	0.87

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the NGET Transmission System during 2013-14 was:

135.9 MWh

Reliability of Supply

The Overall Reliability of Supply for the NGET Transmission System during 2013-14 was:

99.99995%

compared with 99.99999% in 2012-13 and 99.99972% in 2011-12

Loss of Supply Incident Details

NGET Loss of Supply Incidents - Incentivised

Incident Date, Time & Location	MW Lost	Mins	MWh Unsupplied
30 June 2013, 16:57, Silverlink 11kV substation Circuit main protection operated during fault investigation, causing circuit to trip, resulting in loss of supply for 10 minutes.	3.25	10	0.5
05 July 2013, 19:47, Rugeley 400kV substation Drakelow-Rugeley circuit tripped due to protection maloperation. Stepped restoration of demand was completed within 8 minutes.	129.4	8	17.2
09 July 2013, 11:00, Hartmoor 275kV substation SGT1 and SGT2 protection operated during testing resulting in loss of supply for 12 minutes.	69.75	12	14.0
28 Oct 2013, 07:05, Dungeness 275 kV substation SGT1 and SGT2 tripped during adverse weather conditions, resulting in loss of supply for 525 minutes.	6	525	52.5
05 Nov 2013, 14:41, Barking 400kV substation SGT5B tripped during site maintenance works, resulting in loss of supply for 6 minutes.	20	6	2
05 Nov 2013, 14:49, Barking 400kV substation SGT5B tripped during site maintenance works, resulting in loss of supply for 12 minutes.	0	12	0
06 Dec 2013, 16:22, West Burton 400kV substation SGT1 tripped due to protection maloperation, resulting in loss of supply for 41 minutes.	198	41	48.8
Total			135 MWh

NGET Loss of Supply Incidents - Non-Incentivised

Incident Date, Time & Location	MW Lost	Mins	MWh Unsupplied
18 Dec 2013, 19:49, Frodsham 275kV substation SGT2 tripped due to fault and SGT3 tripped due to protection maloperation, resulting in loss of supply for 3 minutes.	18	3	0.9
14 Feb 2014, 02:28, Penrhos 132kV substation Wylfa – Penrhos 1 Circuit tripped due to unknown transient fault and auto reclosed, resulting in loss of supply for 0 minutes.	0	0	0
Total			0.9 MWh

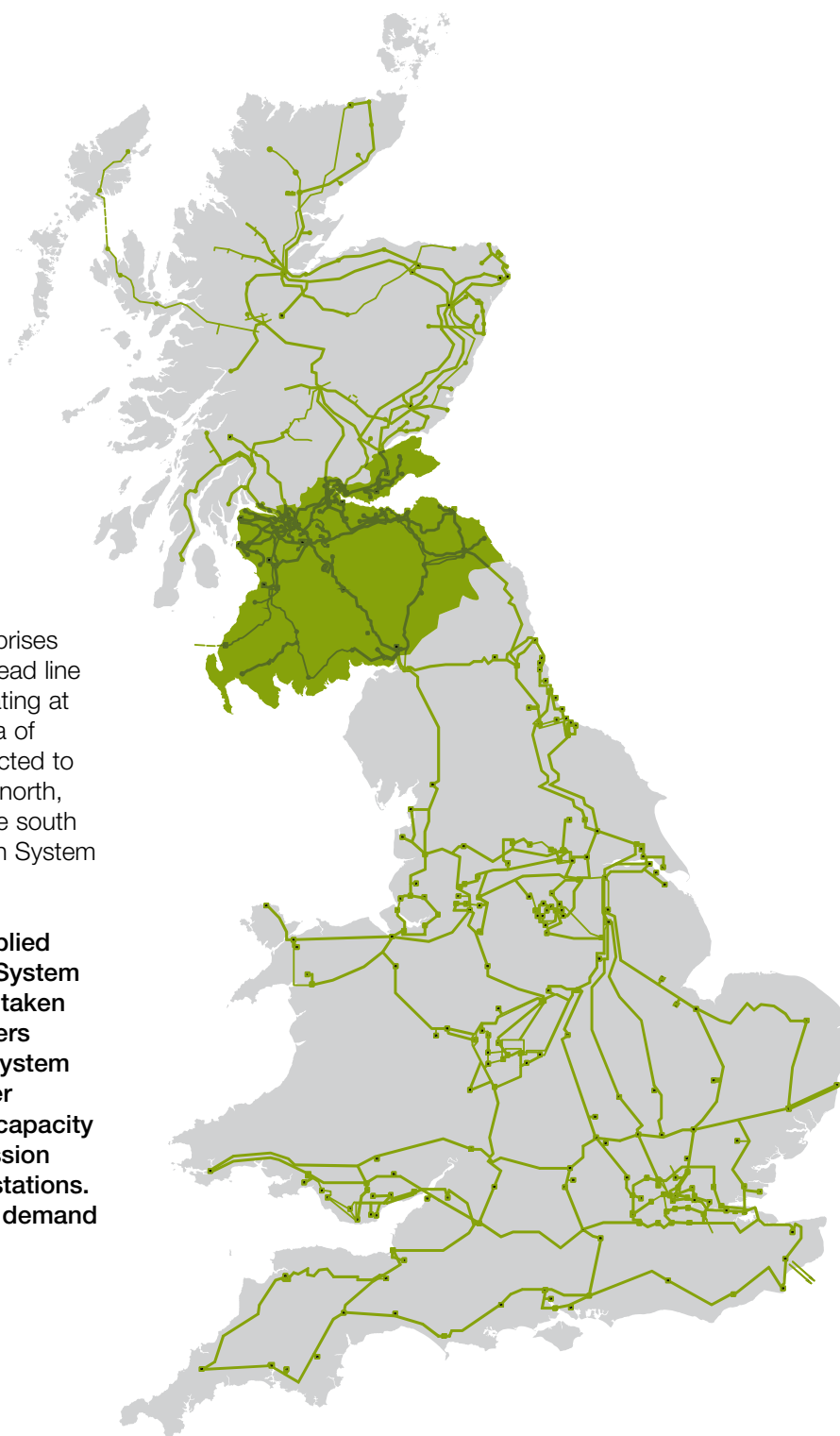
Section Three

SP Transmission System

System Description

The SPTL Transmission System comprises over 4,000 circuit kilometres of overhead line and cable and 137 substations operating at 400, 275 and 132kV covering an area of 22,950 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 17 major 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 14.9GVA of installed transformer capacity. Over 7GW of generation capacity is connected to the SPTL Transmission System, including 20 large power stations. In 2013-14 the maximum recorded demand on the network was 3.8GW.

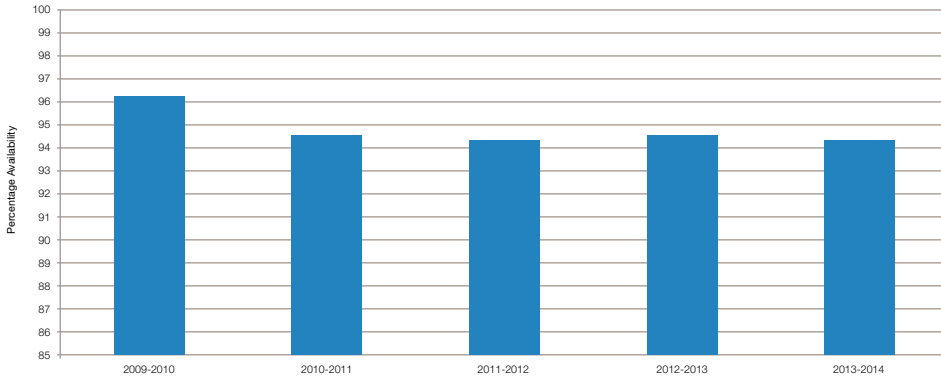


Availability

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

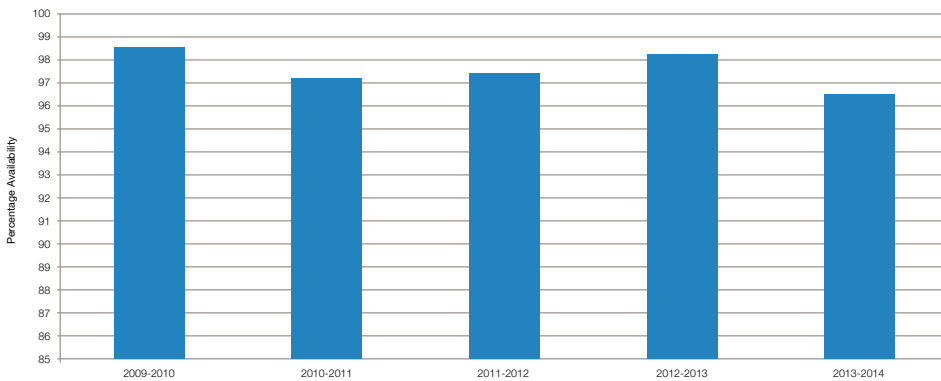
System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability.

% Annual System Availability



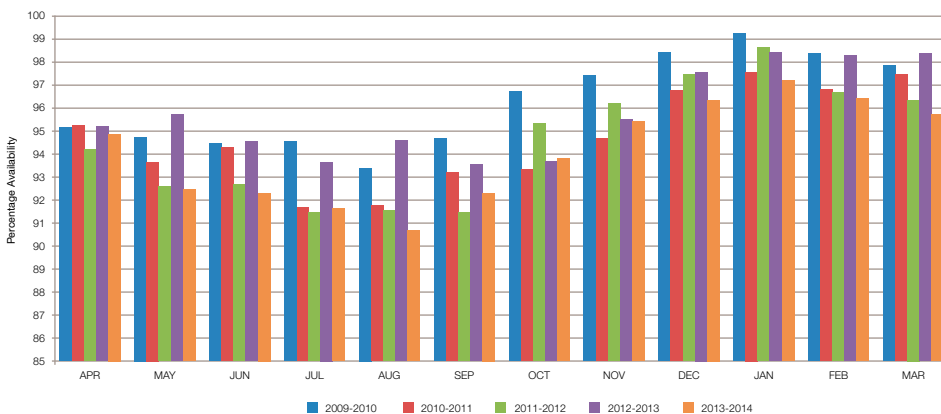
2009-10	2010-11	2011-12	2012-13	2013-14
96.09	94.62	94.41	95.72	94.14

% Winter Peak System Availability



2009-10	2010-11	2011-12	2012-13	2013-14
98.71	97.17	97.46	98.19	96.68

% Monthly System Availability



	2009-10	2010-11	2011-12	2012-13	2013-14
April	95.07	95.22	94.19	95.17	94.97
May	94.80	93.87	92.70	95.80	92.44
June	94.38	94.31	92.72	94.61	92.31
July	94.57	91.82	91.27	93.85	91.70
August	93.29	91.97	91.69	94.57	90.88
September	93.90	93.02	91.48	93.56	92.41
October	95.75	93.37	94.26	93.62	93.85
November	97.29	94.87	96.07	95.49	95.31
December	98.42	96.94	97.51	97.83	96.33
January	99.23	97.63	98.70	98.46	97.21
February	98.45	96.94	96.08	98.28	96.48
March	97.00	95.46	96.11	97.39	95.85

Planned and Unplanned System Unavailability

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

Unavailability is defined as $(100 - \text{Availability}) \%$



	User Connection	System Construction	Maintenance	Unplanned	Total
April	0.00	3.98	0.68	0.37	5.03
May	0.00	6.12	0.56	0.88	7.56
June	0.00	5.64	0.97	1.08	7.69
July	0.00	6.10	1.19	1.01	8.30
August	0.00	6.50	1.58	1.04	9.12
September	0.00	4.17	2.97	0.45	7.59
October	0.00	4.07	2.01	0.07	6.15
November	0.00	3.14	1.41	0.14	4.69
December	0.00	2.24	1.07	0.36	3.67
January	0.00	2.52	0.20	0.07	2.79
February	0.00	2.95	0.56	0.01	3.52
March	0.00	3.06	0.96	0.13	4.15



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 2013-14 there were 204 SPT system events where transmission circuits were disconnected either automatically or by urgent manual switching. The vast majority of these events had no impact on electricity users with only 17 resulting in loss of supply to customers.



Number of Loss of Supply Incidents

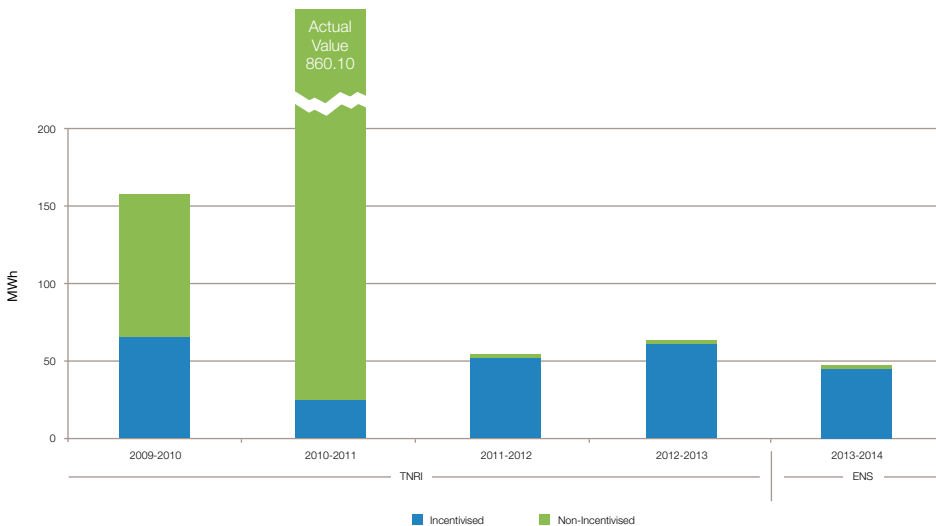
The chart shows the annual comparison of the numbers of Loss of Supply Incidents that occurred within the SP Transmission System.



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	6	1	8	4	7
Non-Incentivised	6	9	10	7	10

Estimated Unsupplied Energy

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



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	67.85	25.70	52.50	62.80	42.3
Non-Incentivised	94.85	860.10	0.20	5.40	0.10

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the SP Transmission System during 2013-14 was:

42.4 MWh

Reliability of Supply

The Overall Reliability of Supply for the SP Transmission System during 2013-14 was:

99.99979%

compared with 99.99968% in 2012-13 and 99.99975% in 2011-12

Loss of Supply Incident Details

SPT Loss of Supply Incidents - Incentivised

Incident Date, Time & Location	MW Lost	Mins	MWh Unsupplied
17 April 2013, 11:19 at Shrubhill GSP An underground cable fault caused the Smeaton-Portobello-Shrubhill 2 circuit to trip while the Portobello-Shrubhill section of the Smeaton-Portobello-Shrubhill 1 circuit and Shrubhill SGT1 were on outage. This resulted in supplies being lost to 21,261 customers for an average of 20.5 minutes.	38.5	20.5	13.2
06 June 2013, 02:06 at Whistlefield GSP A transient fault out with the ScottishPower Transmission area caused the Windyhill-Whistlefield-Dunoon-Sloy E1 circuit to trip and re-close while the Windyhill-Whistlefield-Dunoon-Sloy W2 circuit was out of service. This resulted in supplies being lost to 2 customers for an average of 18.5 minutes.	6.9	18.5	2.2
25 June 2013, 02:00 at Whistlefield GSP A transient fault out with the ScottishPower Transmission area caused the Windyhill-Whistlefield-Dunoon-Sloy W2 circuit to trip and re-close while the Windyhill-Whistlefield-Dunoon-Sloy E1 circuit was out of service for work at Sloy. This resulted in supplies being lost to 2 customers for 25 minutes.	7.5	25	3.1
19 July 2013, 11:13 at Dumfries 132/11kV GSP A 11kV cable fault on the LV side of Dumfries Grid T2A caused the Dumfries-Tongland circuit to trip while Dumfries Grid T1A was out of service due to an earlier fault. This resulted in supplies being lost to 8,516 customers for an average of 31.1 minutes.	9.1	31.1	7.3
30 Aug 2013, 14:59 at Bonnybridge, Bathgate and Drumcross GSPs and Bathgate 25kV Substation A fault in a busbar isolator, which occurred while commissioning the Bonnybridge-Stirling-Westfield circuit to the new Bonnybridge 132kV GIS substation, caused both the main and reserve busbar protections to operate. This resulted in supplies being lost to 77,067 customers for an average of 11.3 minutes.	68.3	11.3	16.3
05 Dec 2013, 07:55 at Kendoon GSP A protection issue during a fault on an adjacent circuit caused the back-up protection on the Glenlee-Kendoon-Carsfad circuit to operate. This resulted in supplies being lost to 288 customers for 24 minutes.	0.3	24	0.1
17 Jan 2014, 14:19 at Earlstoun GSP An overhead line fault caused the Glenlee-Tongland circuit and Earlstoun Grid T2 to trip. This resulted in supplies being lost to 23 customers for 4 minutes.	0.1	4	0
Total			42.3 MWh

SPT Loss of Supply Incidents - Non-Incentivised

Incident Date, Time & Location	MW Lost	Mins	MWh Unsupplied
17 Apr 2013, 11:19 at Shrubhill GSP An underground cable fault caused the Smeaton-Portobello-Shrubhill 2 circuit to trip while the Portobello-Shrubhill section of the Smeaton-Portobello-Shrubhill 1 circuit and Shrubhill SGT1 were on outage. This resulted in supplies being lost to 6,687 customers for one minute.	3.6	1	0.1
23 Apr 2013, 21:08 at Mark Hill and Arecleoch Windfarms The Coylton-Mark Hill-Auchencrosh circuit was switched out of service following the loss of both the first and second main protections due to the failure of the communications routes carrying these services. This resulted in supplies being lost to 2 customers for 98 minutes.	0	98	0
23 July 2013, 09:34 at Kendoon GSP A lightning strike cause the Coylton-Maybole-Kendoon circuit to trip, this resulted in the supplies to 222 customers being lost for 2 minutes.	0.2	2	0
02 Nov 2013, 22:12 at Hadyard Hill Windfarm The overload protection on the Kilmarnock South-Coylton-Maybole circuit operated due to generator outputs being above agreed limits, this resulted in supplies being lost to one customer for 35 minutes.	0	35	0
03 Nov 2013, 04:45 at Arecleoch Windfarm An overvoltage protection operation within the customer's network caused both feeding circuit breakers at Arecleoch 132kV substation to open. This resulted in supplies being lost to one customer for 21 minutes.	0	21	0
05 Dec 2013, 08:03 at Mark Hill and Arecleoch Windfarms High winds caused a jumper to blow into the body of a tower on the Coylton-Mark Hill-Auchencrosh circuit resulting in the circuit tripping. High speed auto-reclosers closed the circuit breakers at the Coylton and Auchencrosh ends but the Mark Hill circuit breaker remained open, as it was designed to do. This resulted in supplies being lost to Mark Hill and Arecleoch Windfarms for an average of 58 minutes.	0	58	0
05 Dec 2013, 08:33 at Mark Hill Windfarm High winds caused the Coylton-Mark Hill-Auchencrosh circuit to trip. The Coylton and Auchencrosh ends both reclosed using High Speed Auto Reclosing equipment but the Mark Hill circuit breaker required to be manually re-closed. This resulted in supplies being lost to one customer for 57 minutes.	0	57	0
26 Dec 2013, 22:47 at Mark Hill and Arecleoch Windfarms High winds caused the Coylton-Mark Hill-Auchencrosh circuit to trip. High speed auto-reclosers closed the circuit breakers at the Coylton and Auchencrosh ends but the Mark Hill circuit breaker remained open, as it was designed to do. This resulted in supplies being lost to Mark Hill and Arecleoch Windfarms for an average of 27 minutes.	0	27	0
26 Jan 2014, 07:40 at Mark Hill and Arecleoch Windfarms High winds caused the Coylton-Mark Hill-Auchencrosh circuit to trip. High speed auto-reclosers closed the circuit breakers at the Coylton and Auchencrosh ends but the Mark Hill circuit breaker remained open, as it was designed to do. This resulted in supplies being lost to Mark Hill and Arecleoch Windfarms for an average of 33 minutes.	0	33	0
15 Feb 2014, 16:19 at Hadyard Hill Windfarm The overload protection on the Kilmarnock South-Coylton-Maybole circuit operated due to generator outputs being above agreed limits, this resulted in supplies being lost to one customer for 12 minutes.	0	12	0
Total			0.1 MWh

Section Four

SHE Transmission System

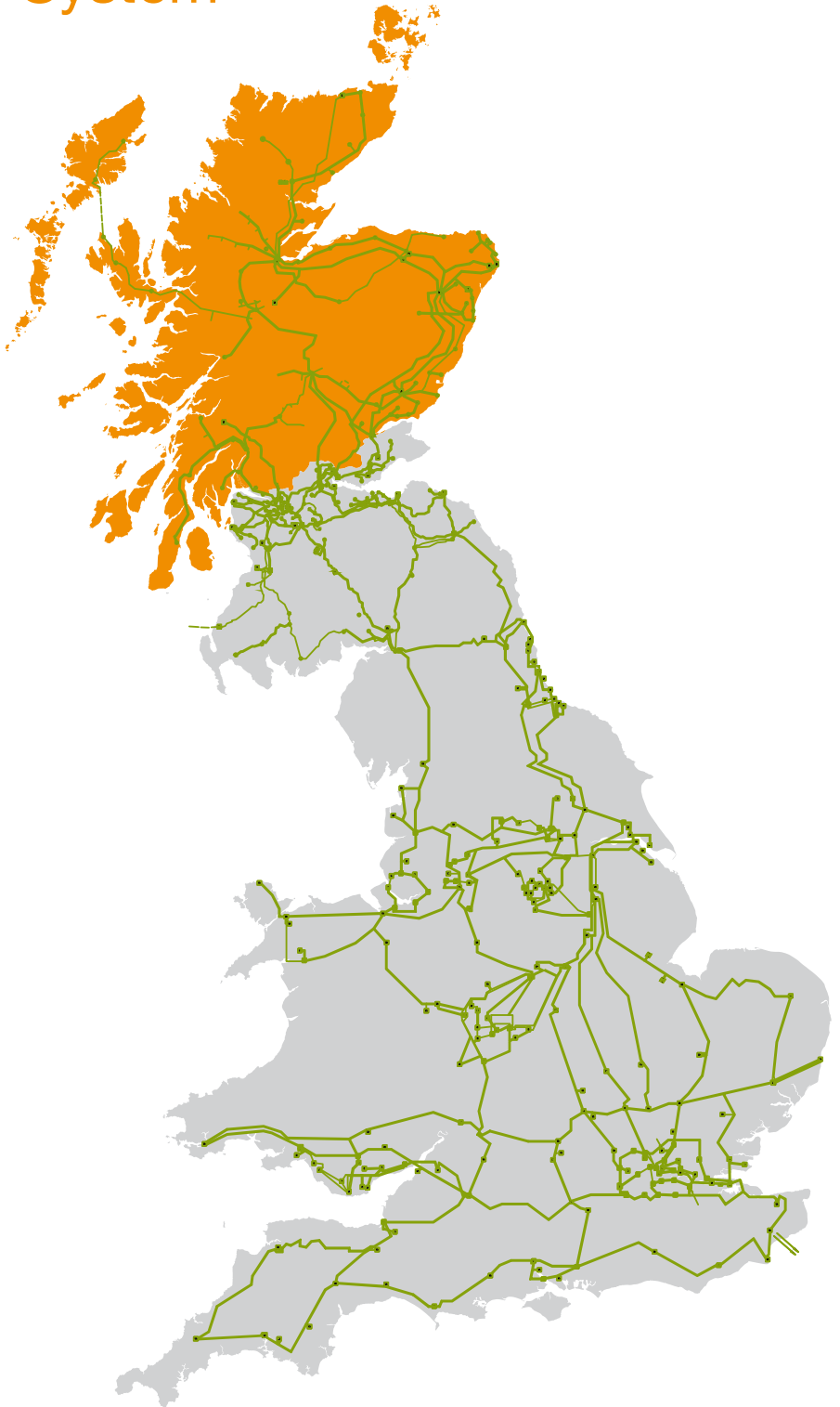
System Description

The SHE Transmission System comprises of over 5,000 circuit kilometres of overhead line and cable and 114 substations operating at 400, 275 and 132kV covering 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. In 2013-14 the maximum recorded demand on the network was 1.6GW.

There is 1 major customer supplied directly from the SHE Transmission System with the majority of the load being taken by approximately 0.75 million customers connected to the Scottish Hydro Electric Power Distribution Network via 7.2GVA of installed transformer capacity. Over 7.4GW of generation capacity is connected to the SHE Transmission System including 26 Large Power Stations.

80% of these transmission assets form the main interconnected transmission system whilst the remaining 20% 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.

When considering 132kV systems as transmission voltages it should be borne in mind that amounts of power transmitted at this voltage level are generally lower than at 275 and 400kV and as such may have lower security standards applied.

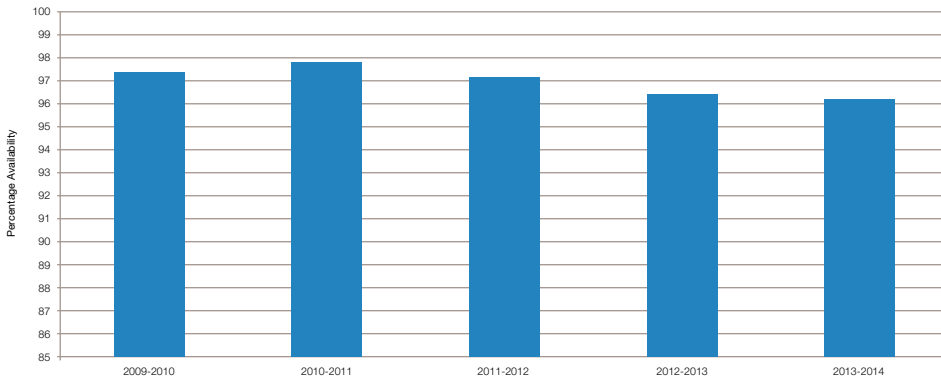


Availability

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

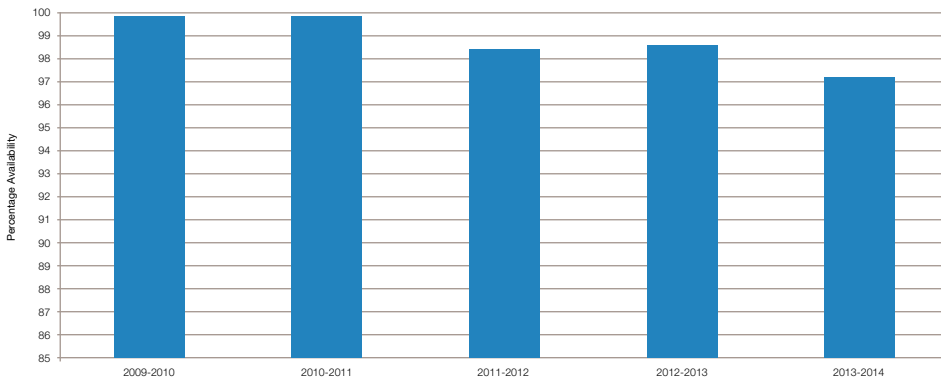
System performance is monitored by reporting variations in Annual System Availability, Winter Peak System Availability and Monthly System Availability. There is also a breakdown of Planned and Unplanned System Unavailability.

% Annual System Availability



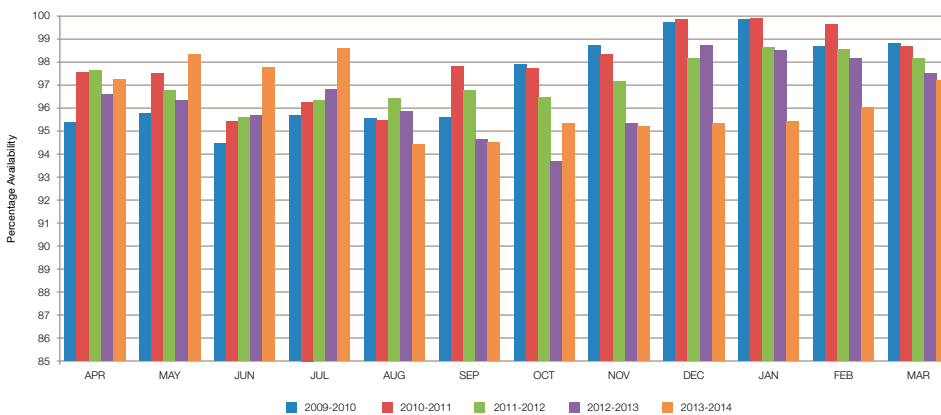
2009-10	2010-11	2011-12	2012-13	2013-14
97.37	97.89	97.14	96.48	96.29

% Winter Peak System Availability



2009-10	2010-11	2011-12	2012-13	2013-14
99.84	99.90	98.47	98.50	98.26

% Monthly System Availability

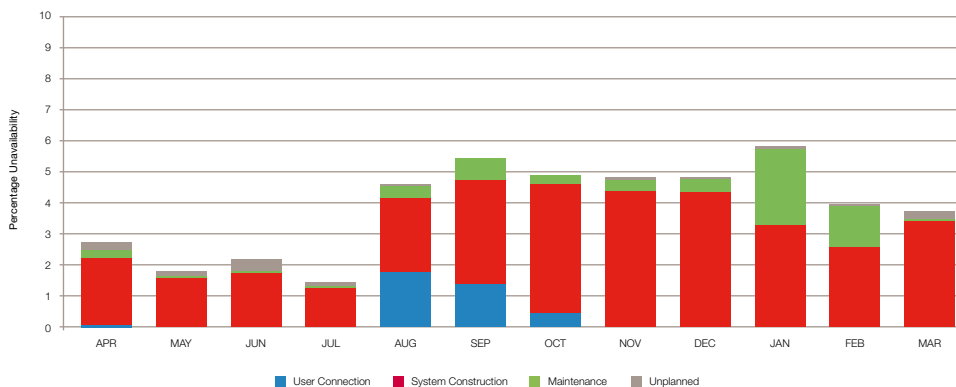


	2009-10	2010-11	2011-12	2012-13	2013-14
April	95.35	97.64	97.66	96.67	97.26
May	95.86	97.53	96.89	96.36	98.29
June	94.58	95.40	95.76	95.83	97.94
July	95.83	96.19	95.19	95.96	98.55
August	95.64	95.50	96.36	95.91	95.39
September	95.71	97.91	96.87	94.85	94.58
October	97.94	97.85	96.49	93.67	95.17
November	98.75	98.37	97.06	95.32	95.22
December	99.74	99.97	98.12	98.74	95.30
January	99.90	99.95	98.73	98.66	95.46
February	99.87	99.76	98.59	98.10	96.04
March	98.92	98.76	98.09	97.68	96.26

Planned and Unplanned System Unavailability

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

Unavailability is defined as $(100 - \text{Availability}) \%$



	User Connection	System Construction	Maintenance	Unplanned	Total
April	0.01	2.30	0.25	0.18	2.74
May	0.00	1.58	0.03	0.11	1.71
June	0.00	1.83	0.04	0.20	2.06
July	0.00	1.27	0.07	0.12	1.45
August	1.86	2.51	0.23	0.01	4.61
September	1.36	3.33	0.73	0.00	5.42
October	0.44	4.16	0.21	0.01	4.83
November	0.00	4.40	0.37	0.01	4.78
December	0.00	3.98	0.58	0.14	4.70
January	0.00	3.18	1.36	0.00	4.54
February	0.00	2.56	1.31	0.08	3.96
March	0.00	3.39	0.06	0.29	3.74



Security

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

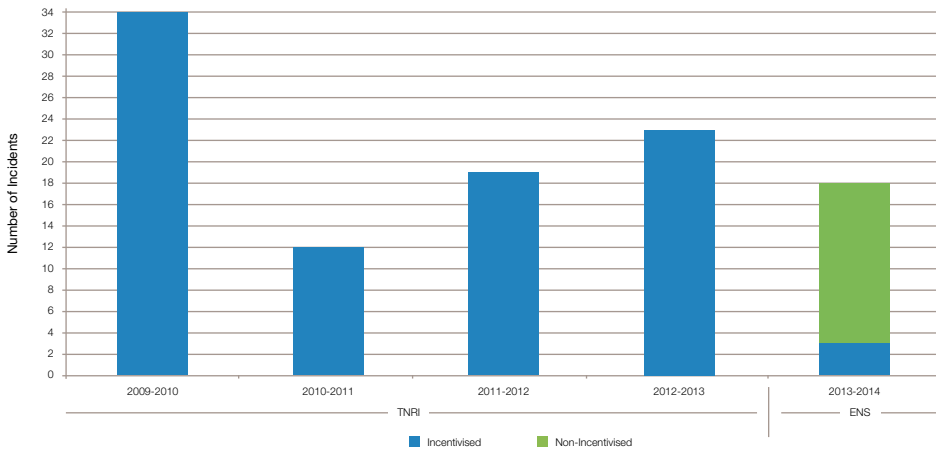
System performance is monitored by the Estimated Unsupplied Energy from the SHE Transmission System for each incident.

During 2013-14 there were 160 SHE Transmission system events where transmission circuits were disconnected either automatically or by urgent manual switching. The vast majority of these events had no impact on electricity users with only 18 resulting in loss of supply to customers.



Number of Loss of Supply Incidents

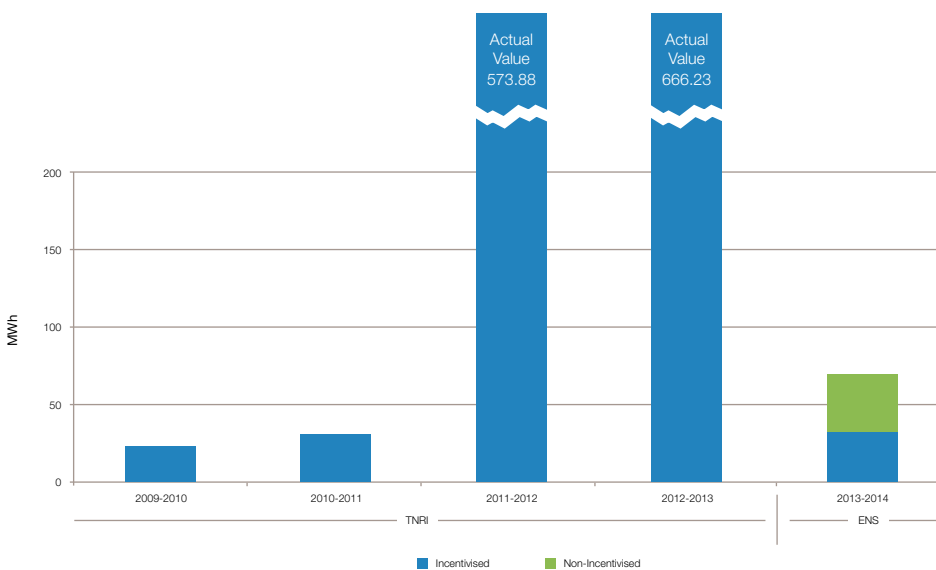
The chart shows the annual comparison of the numbers of Loss of Supply Incidents that occurred within the SHE Transmission System



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	34	12	19	23	3
Non-Incentivised	0	0	0	0	15

Estimated Unsupplied Energy

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



	2009-10	2010-11	2011-12	2012-13	2013-14
Incentivised	21.70	35.34	573.88	666.23	35.60
Non-Incentivised	0	0	0	0	44.40

Total Estimated Unsupplied Energy

The total Estimated Unsupplied Energy from the SHE Transmission System during 2013-14 was:

80 MWh

Reliability of Supply

The Overall Reliability of Supply for the SHE Transmission System during 2013-14 was:

99.99885%

compared with 99.99123% in 2012-13 and 99.99228% in 2011-12

Loss of Supply Incident Details

SHE Transmission Loss of Supply Incidents - Incentivised

Incident Date, Time & Location	MW Lost	Mins	MWh Unsupplied
07 July 2013, 23:46 at Inveraray 132kV Substation Inveraray – Port Ann – Carradale 132kV double circuit tripped due to an unknown transient fault. Demand restored in stages.	13	40	8.2
19 July 2013, 23:47 at Inveraray 132kV Substation Inveraray – Port Ann – Carradale 132kV double circuit tripped due to an unknown transient fault. Demand restored in stages.	2	18	0.7
02 August 2013, 04:38 at Sloy 132kV Substation The Sloy – Windyhill – Dunoon West 132kV circuit tripped due to an unknown transient fault. Demand restored in stages.	13	121	26.7
Total			35.6 MWh

SHE Transmission Loss of Supply Incidents - Non-Incentivised

Incident Date, Time & Location	MW Lost	Mins	MWh Unsupplied
13 April 2013, 08:31 at Thurso 132kV Substation The Shin – Brora – Dunbeath – Mybster – Thurso - Dounreay 132kV circuit tripped and auto-reclosed due to a transient fault.	15	0.4	0.1
06 June 2013, 02:06 at Sloy 132kV Substation The Sloy – Windyhill – Dunoon East 132kV circuit tripped and auto-reclosed due to an unknown transient fault. Dunoon Grid Transformer No.1 out of service.	7	0.4	0.1
25 June 2013, 02:00 at Sloy 132kV Substation The Sloy – Windyhill – Dunoon West 132kV circuit tripped and auto-reclosed due to an unknown transient fault. Dunoon Grid Transformer No.2 out of service.	7	0.4	0.1
26 July 2013, 14:40 at Harris 132kV Substation Harris – Stornoway 132kV circuit tripped and auto-reclosed due to an unknown transient fault.	10	0.7	0.1
29 July 2013, 18:00 at Killin 132kV Substation Killin – St Fillans 132kV circuit tripped and auto-reclosed due to an unknown transient fault.	0	10	0
05 August 2013, 02:51 at Sloy 132kV Substation The Sloy – Windyhill – Dunoon West 132kV circuit tripped due to an unknown transient fault. Demand restored in stages.	7	2.4	0.3
15 August 2013, 08:01 at Shin 132kV Substation The Shin – Mybster – Thurso - Dounreay 132kV circuit tripped and auto-reclosed due to an unknown transient fault.	5	0.5	0.1
31 October 2013, 04:55 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped during lightning activity. Demand restored in stages.	9	0.6	0.1
05 December 2013, 05:58 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped during high winds. Demand restored in stages.	29	0.5	0.2
05 December 2013, 06:00 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped during high winds. Demand restored in stages.	29	0.5	0.2
16 December 2013, 10:19 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped during lightning activity. Demand restored in stages.	36	0.8	13.5
21 December 2013, 13:55 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped during lightning activity. Demand restored in stages.	24	0.6	0.2
16 March 2014, 17:34 at Beaully 132kV Substation Beaully – Nairn – Elgin – Keith 132kV circuit switched out due to heath fire.	26	0.5	0.2
19 March 2014, 21:27 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped during high winds. Demand restored in stages.	18	0.6	0.2
20 March 2014, 03:38 at Fort Augustus 132kV Substation Fort Augustus - Broadford - Edinbane – Dunvegan – Ardmore 132kV circuit tripped due to falling trees. Demand restored in stages.	14	455	29
Total			44.4 MWh

Section Five

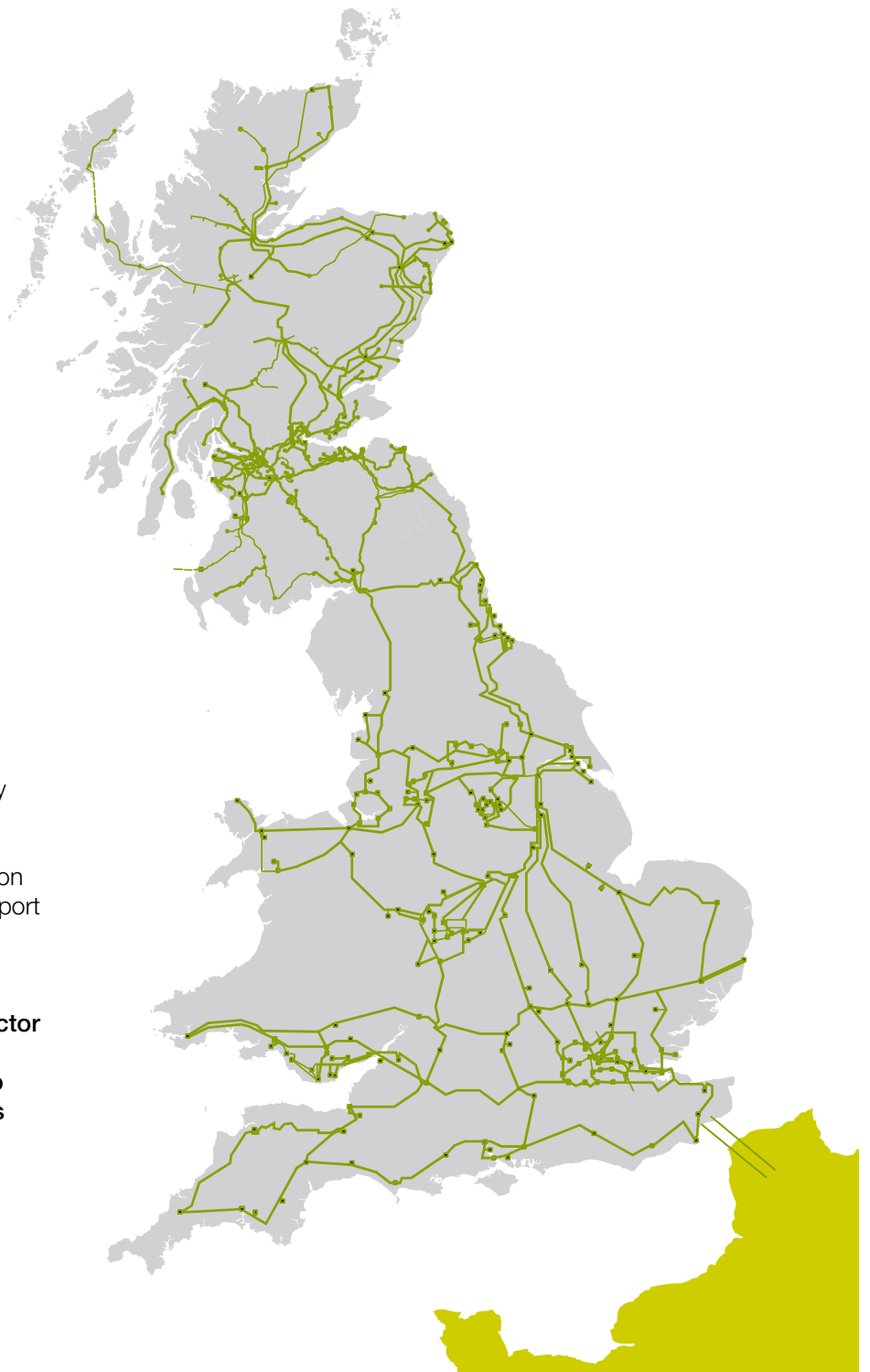
Interconnectors

England - France Interconnector

System Description

The National Grid transmission system between the English and French transmission systems is jointly owned by National Grid Interconnectors Limited (NGIC) and Réseau de Transport d'Electricité (RTE) the French transmission system owner. The information in this report has been provided by NGIC, the Interconnector Licence holder.

The total capability of the Interconnector is 2000MW. This is made up of four 'circuits', each of 500MW. There is no redundancy of the major components making up each circuit, hence all outages effect real time capability.

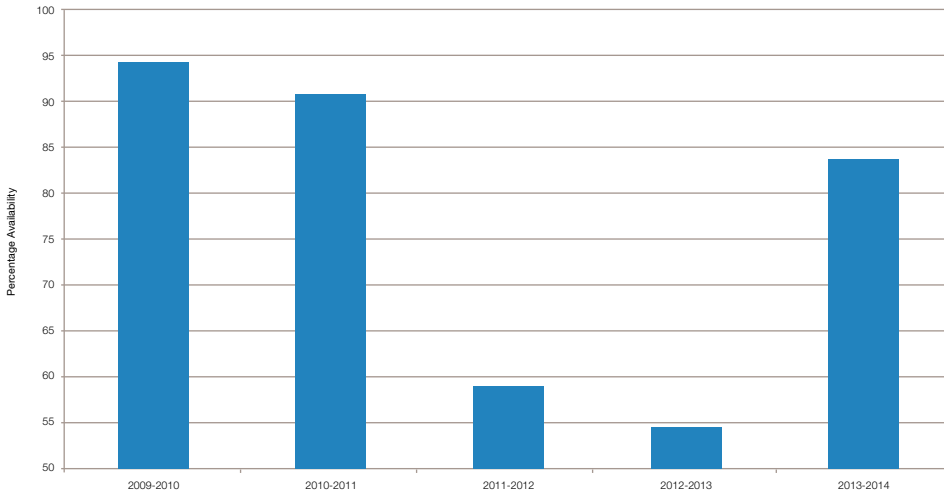


Annual Availability

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

The chart below shows the annual comparison of availability of the England – France Interconnector.

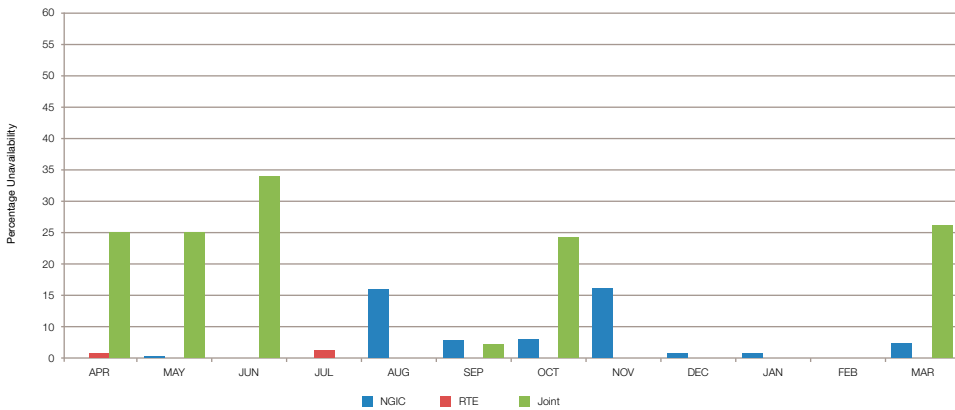
% England - France Interconnector Annual System Availability



2009-10	2010-11	2011-12	2012-13	2013-14
94.80	91.25	59.09	54.90	83.84

Monthly Unavailability

% England - France Interconnector Monthly Unavailability



	NGIC	RTE	Joint
April	0.00	0.49	25.00
May	0.47	0.00	25.00
June	0.00	0.00	34.46
July	0.00	2.05	0.00
August	15.81	0.00	0.00
September	5.92	0.00	4.59
October	6.53	0.00	24.92
November	15.80	0.00	0.00
December	0.60	0.00	0.00
January	0.52	0.00	0.00
February	0.00	0.00	0.00
March	5.00	0.00	26.73
Average	4.22	0.21	11.73

Annual System Availability

Annual Availability of
England – France Interconnector for
2013-2014 was:

83.84%

Outages 2013-14 (April - March)

Notes: The charts below refer to Planned and Unplanned Outages. In this context Planned are notified prior to Day Ahead. Unplanned are notified at Day Ahead or within Contract Day.

Chart 1 below shows the Interconnector Planned Outages on a per month basis.

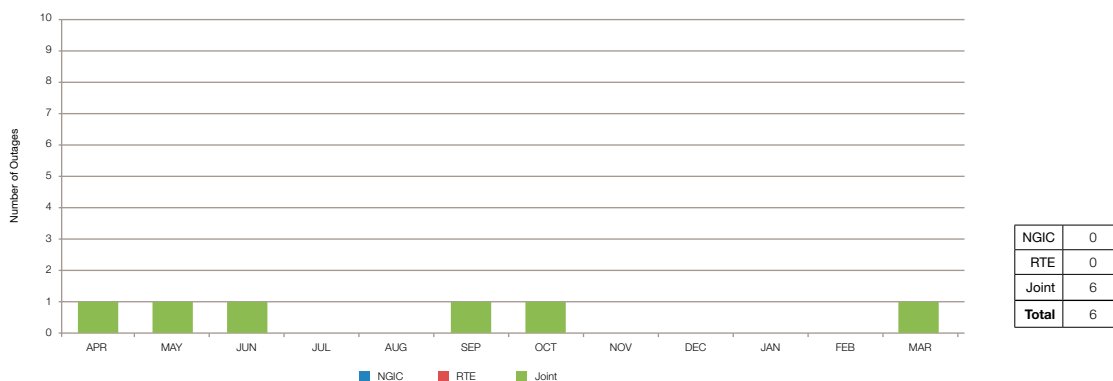


Chart 1

Chart 2 below shows the Interconnector Unplanned Outages on a per month basis.

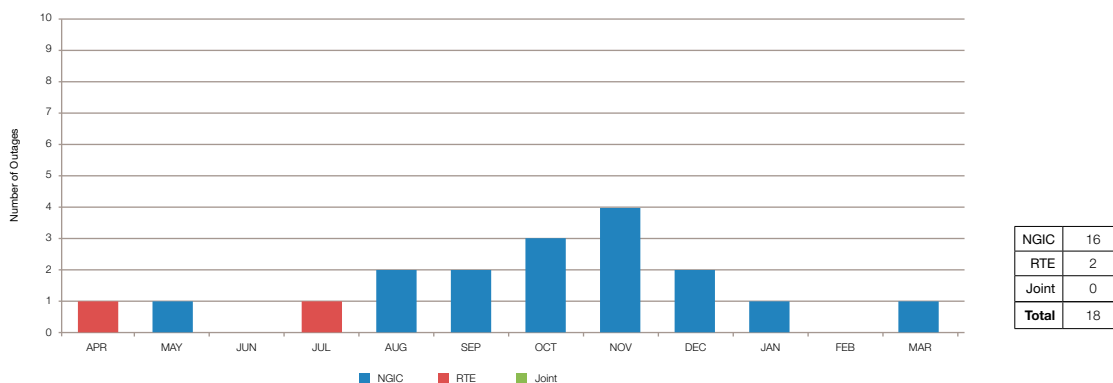


Chart 2



Section Five

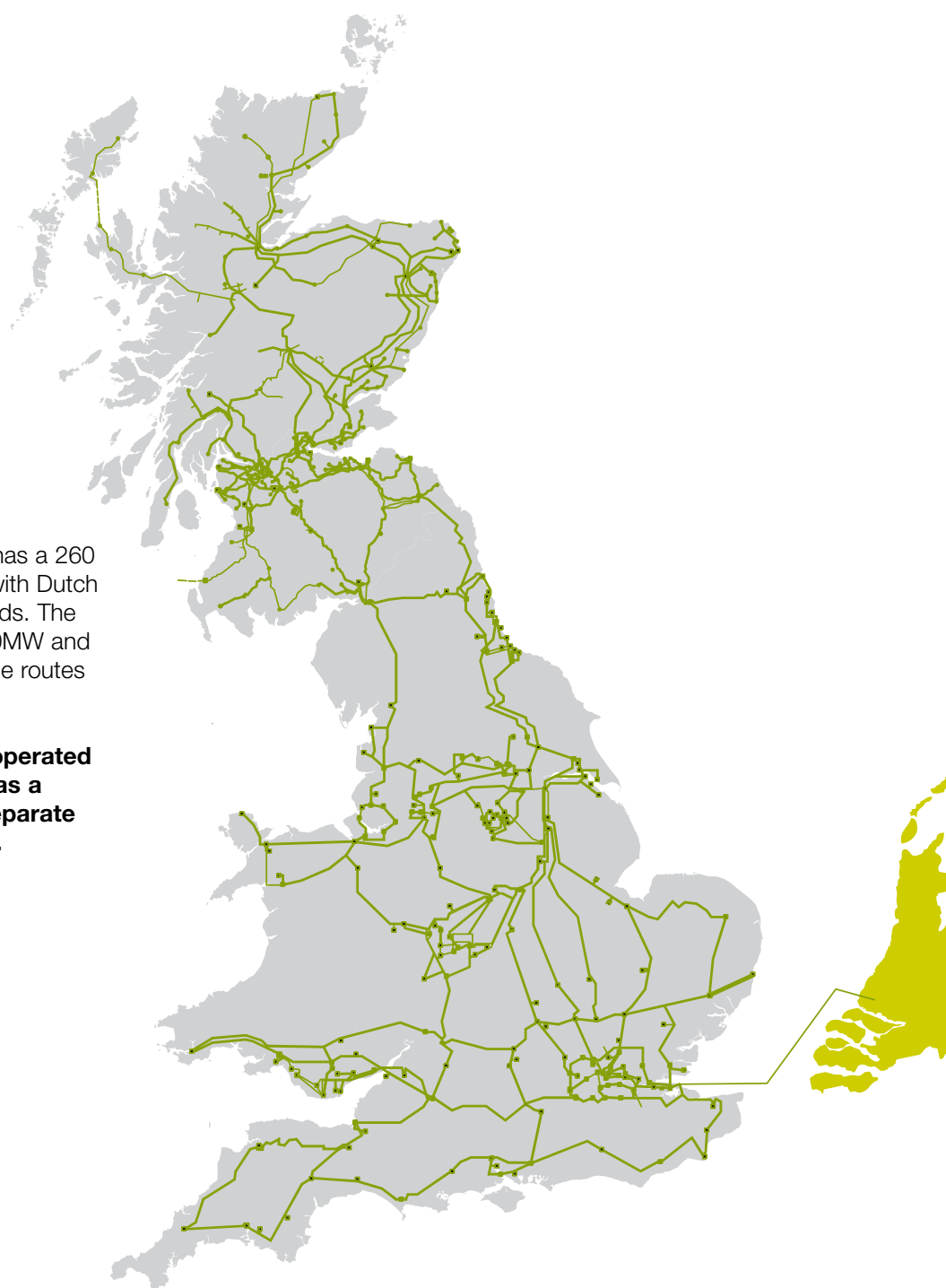
Interconnectors

England - Netherlands Interconnector

System Description

The NGET transmission system has a 260 kilometers long interconnection with Dutch operator TenneT in the Netherlands. The total capability of BritNed is 1000MW and is made up of two 'poles' or cable routes 500MW each.

BritNed is jointly owned and operated by National Grid and TenneT, as a commercial interconnector separate from their regulated activities.

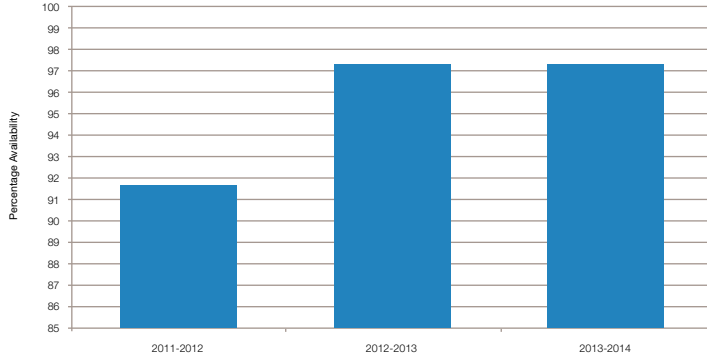


Annual Availability

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

The chart below shows the annual comparison of availability of the England – Netherlands Interconnector.

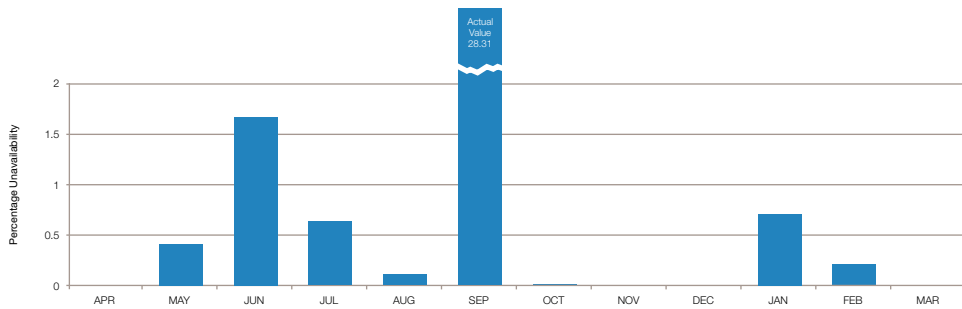
% England - Netherlands Interconnector Annual System Availability



England - Netherlands Interconnector % Annual Availability		
2011 - 2012	2012 - 2013	2013 - 2014
91.82	97.32	97.37

Monthly Unavailability

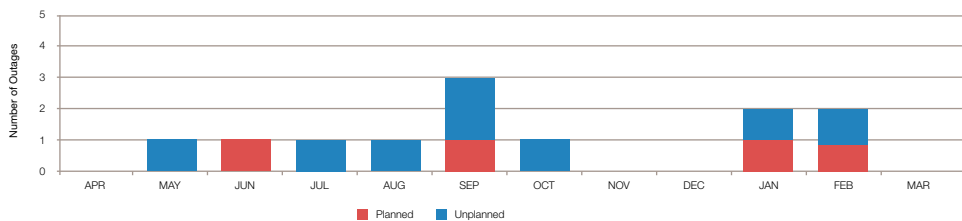
% England - Netherlands Interconnector Monthly Unavailability



England - Netherlands Interconnector % Monthly Unavailability	
	BritNed
April	0.00
May	0.45
June	1.67
July	0.60
August	0.10
September	28.31
October	0.02
November	0.00
December	0.00
January	0.66
February	0.16
March	0.00
Average	2.66

Outages 2013-14 (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.



	Planned	Unplanned
April	0	0
May	0	1
June	1	0
July	0	1
August	0	1
September	1	2
October	0	1
November	0	0
December	0	0
January	1	1
February	1	1
March	0	0
Average	4	8

Where availability is shown as less than 100% but there is no corresponding planned or unplanned outage recorded, this is as a result of reduced flow capacity rather than a full station outage.

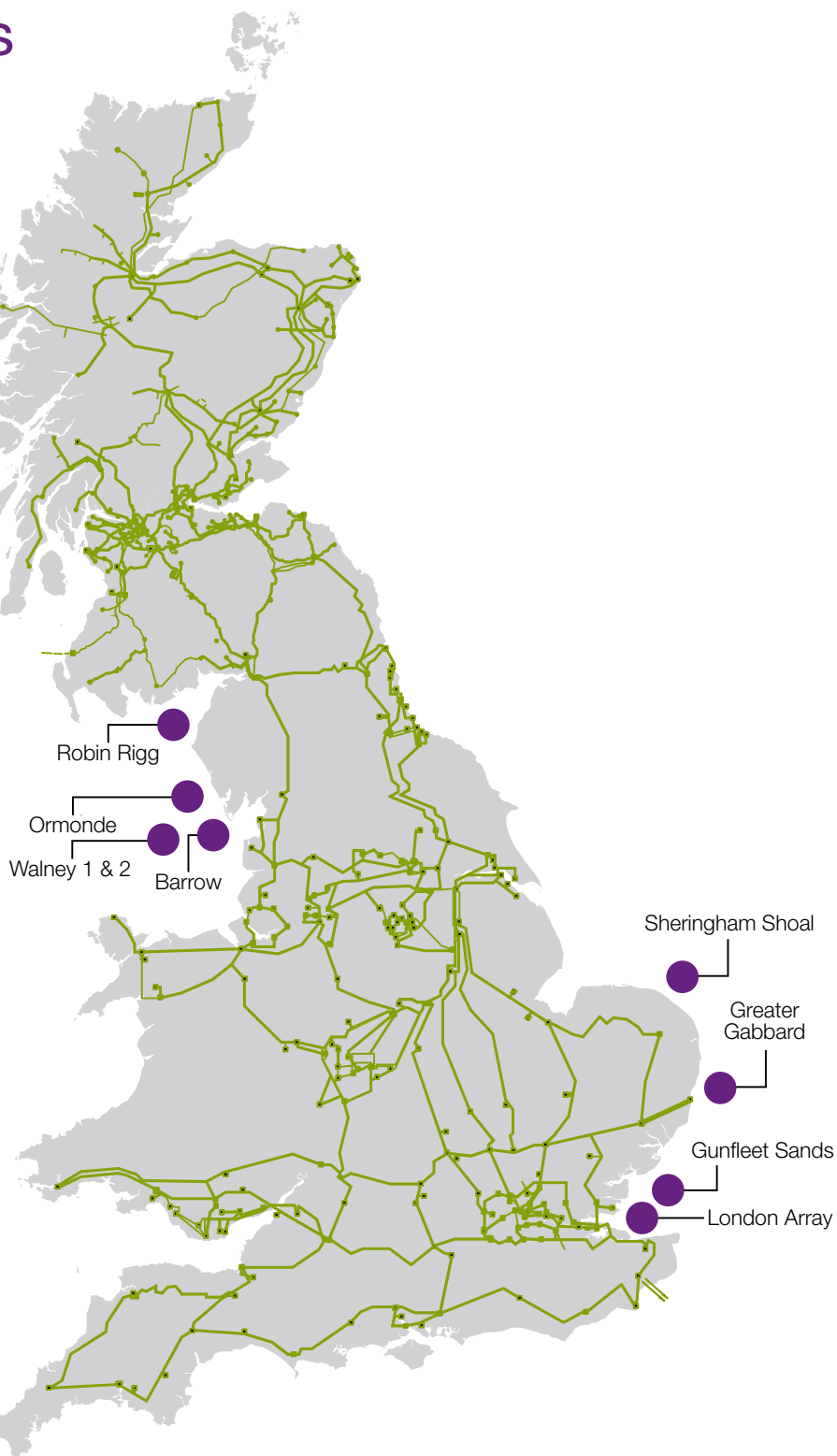
Annual System Availability
Annual Availability of
England – Netherlands Interconnector for
2013-2014 was:
97.37%

Section Six

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), Blue Transmission Walney 1 Ltd and Blue Transmission Walney 2 Ltd, Blue Transmission Sheringham Shoal Ltd, Blue Transmission London Array Ltd and Greater Gabbard (Balfour Beatty). The offshore network consists of 637 kilometres of circuit, connecting to 14 offshore substations totalling over 2.3GW of generating capacity.



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	14.4	184	132 kV	DNO
TC Gunfleet Sands	19/07/2011	1	12.76	163.9	132 kV	DNO
TC Barrow	27/09/2011	1	30.1	90	132 kV	DNO
TC Ormonde	10/07/2012	1	44.3	150	132 kV	DNO
BT Walney 1	31/10/2011	1	48.2	182	132 kV	Transmission
BT Walney 2	04/10/2012	1	49	182	132 kV	DNO
BT Sheringham Shoal	05/07/2013	2	88	315	132 kV	DNO
BT London Array	10/09/2013	4	216	630	400 kV	Transmission
BB Greater Gabbard	29/11/2013	3	135	500	132 kV	Transmission

Availability

Offshore Transmission Systems are radial and only connect offshore generation to the wider NETS. OFTO's performance to be subject to regulatory incentivisation is different from that for onshore TOs, and is based on availability rather than loss of supply. NGET have calculated availability for OFTOs including all outages originating on an OFTO's system, but excluding outages that originate elsewhere, for example on a Generator, DNO or TO's system. The OFTO availability incentive would adjust the outage data differently to calculate incentivised performance for each 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.

% Annual System Availability

Offshore Transmission Networks % Annual Availability		
	2012-13	2013-14
TC Robin Rigg	99.89	99.85
TC Gunfleet Sands	100	100.00
TC Barrow	100	99.64
TC Ormonde	100	100.00
BT Walney 1	97.47	99.99
BT Walney 2	100	94.89
BT Sheringham Shoal	N/A	99.20
BT London Array	N/A	99.97
BB Greater Gabbard	N/A	99.81

% Winter Peak System Availability

Offshore Transmission Networks % Winter Availability		
	2012-13	2013-14
TC Robin Rigg	100	100
TC Gunfleet Sands	100	100
TC Barrow	100	100
TC Ormonde	100	100
BT Walney 1	100	100
BT Walney 2	100	100
BT Sheringham Shoal	N/A	99.01
BT London Array	N/A	99.98
BB Greater Gabbard	N/A	100.00

% Monthly System Availability

	April	May	June	July	August	September	October	November	December	January	February	March
TC Robin Rigg	100	99.84	99.92	98.49	98.63	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	95.82	100	100	100	100	100	100	100	100
TC Ormonde	100	100	100	100	100	100	100	100	100	100	100	100
BT Walney 1	100	100	100	100	100	99.87	100	100	100	100	100	100
BT Walney 2	100	100	100	100	100	100	100	41.34	100	100	100	100
BT Sheringham Shoal	N/A	N/A	N/A	100	98.30	99.91	100	100	97.04	100	100	100
BT London Array	N/A	N/A	N/A	N/A	N/A	100	99.92	100	99.93	100	100	100
BB Greater Gabbard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	100	100	100	99.23

%Monthly Planned and Unplanned Unavailability

The table shows the percentage of 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 as a result of Non-OFTO.

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
TC Robin Fligg	OFTO Planned	0	0.16	0.01	1.51	0	0	0	0	00	0	0	0
	OFTO Unplanned	0	0	0.06	0	0	0	0	0	0	0	0	0
	Non-OFTO	0.05	0	0	2.76	0.25	0.08	0	0	1.08	0	1.2	0.08
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
TC Barrow	OFTO Planned	0	0	0	4.18	0	0	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0.29	0	0	0.10	0.07	0	0	0	1.67	0	0.16	0
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	32.10	28.30	0	0	0	0	0	17.60	0	0	0	0
BT Walney 1	OFTO Planned	0	0	0	0	0	0.13	0	0	0	0	0	0
	OFTO Unplanned	0	0	0	0	0	0	0	0	0	0	0	0
	Non-OFTO	0	00	0	0	0	0	0	0	0	0	0	0
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	58.66	0	0	0	0
	Non-OFTO	0	0	0	0	0	0	0	0	0	0	0	0
BT Sheringham Shoal	OFTO Planned	N/A	N/A	N/A	0	0.02	0.09	0	0	0	0	0	0
	OFTO Unplanned	N/A	N/A	N/A	0	1.68	0	0	0	2.96	0	0	0
	Non-OFTO	N/A	N/A	N/A	0	0	0	0	0	0	0	0	0
BT London Array	OFTO Planned	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0
	OFTO Unplanned	N/A	N/A	N/A	N/A	N/A	0	0.08	0	0.07	0	0	0
	Non-OFTO	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0
BB Greater Gabbard	OFTO Planned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0
	OFTO Unplanned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0.77
	Non-OFTO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0

Annual System Availability

Annual Availability of Offshore Systems
for 2013-2014 was:

99.43%

Outage Details

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

TC Robin Rigg Outages			
Outage Date & Time	Origin	Days & Hours	MWh
13 Apr 2013 , 08:49 Outage due to trip of DNO circuit breaker due to DNO network fault	Non-OFTO	1 hour	63
23 May 2013, 09:20 OFTO outage to deal with transformer oil leak	OFTO	2 hours	224
18 Jun 2013, 10:30 Contractor error during testing triggered protection	OFTO	1 hour	81
27 Jun 2013, 07:16 Planned OFTO Switching Outage	OFTO	0.25 hour	18
02 Jul 2013, 08:12 Planned OFTO Switching Outage	OFTO	0.5 hour	43
03 Jul 2013, 08:38 Planned OFTO annual maintenance (RR West)	OFTO	12 hours	1109
08 Jul 2013, 12:08 Planned OFTO Switching Outage	OFTO	0.5 hour	35
09 Jul 2013, 07:40 Outage at Request of Generator for work on offshore transformers (RR East)	Non-OFTO	2 hours	164
09 Jul 2013, 09:27 Planned OFTO annual maintenance (RR East)	OFTO	9.5 hours	879
09 Jul 2013, 19:00 Outage at Request of Generator for work on offshore transformers (RR East)	Non-OFTO	1 day 15 hours	3609
17 Aug 2013, 02:51 Generator short notice outage (RR East)	Non-OFTO	0.5 hour	51
17 Aug 2013, 02:52 Generator short notice outage (RR West)	Non-OFTO	0.5 hour	58
19 Aug 2013, 12:21 Switching time outage at request of DNO	Non-OFTO	1 hour	69
28 Aug 2013, 10:09 Switching time outage at request of DNO	Non-OFTO	1 hour	77
28 Aug 2013, 11:53 Switching time outage at request of DNO	Non-OFTO	1 hour	81
01 Sep 2013, 13:49 Switching time outage at request of DNO	Non-OFTO	1 hour	110
05 Dec 2013, 09:00 Outage caused by DNO overhead line fault	Non-OFTO	0.25 hour	11
05 Dec 2013, 09:32 Outage caused by DNO overhead line fault	Non-OFTO	0.25 hour	25
05 Dec 2013, 10:35 Outage caused by DNO overhead line fault	Non-OFTO	2 hours	186
20 Dec 2013, 20:49 Outage caused by DNO overhead line fault	Non-OFTO	0.5 hour	54
27 Dec 2013, 06:11 Outage caused by DNO overhead line fault	Non-OFTO	2.5 hours	224
27 Dec 2013, 11:41 Outage caused by DNO overhead line fault	Non-OFTO	10.5 hours	977
07 Feb 2014, 10:04 Switching time outage at request of DNO	Non-OFTO	1 hour	95
07 Feb 2014, 16:51 Switching time outage at request of DNO	Non-OFTO	0.5 hour	44
12 Feb 2014, 19:48 Outage caused by DNO overhead line fault (impacting RR East)	Non-OFTO	14 hours	1260
13 Feb 2014, 03:39 DNO protection mal-operation	Non-OFTO	3 hours	247
25 Mar 2014, 09:05 Switching time outage at request of DNO	Non-OFTO	0.5 hour	57
28 Mar 2014, 16:31 Switching time outage at request of DNO	Non-OFTO	0.5 hour	48
Total			9898 MWh

TC Gunfleet Sands Outages			
Outage Date & Time	Origin	Days & Hours	MWh
None			
Total			0 MWh

TC Barrow outages			
Outage Date & Time	Origin	Days & Hours	MWh
05 April 2013, 09:28 Outage requested by DNO for work on the DNO network	Non-OFTO	2 hours	186
05 July 2013, 09:22 Planned OFTO biennial maintenance	OFTO	1 day 7 hours	2802
29 July 2013, 09:42 Switching time outage at request of DNO	Non-OFTO	1 hour	69
02 Aug 2013, 16:01 Switching time outage at request of DNO	Non-OFTO	0.5 hour	28
03 Aug 2013, 13:39 Switching time outage at request of DNO	Non-OFTO	0.25 hour	21
05 Dec 2013, 20:11 Outage following DNO transformer issue	Non-OFTO	3.5 hours	309
06 Dec 2013, 15:07 Switching time outage at request of DNO	Non-OFTO	0.5 hour	36
12 Dec 2013, 08:50 Switching time outage at request of DNO	Non-OFTO	1.25 hours	114
14 Dec 2013, 09:59 Outage due to DNO fault	Non-OFTO	7 hours	660
20 Feb 2014, 08:48 Switching time outage at request of DNO	Non-OFTO	1 hour	72
20 Feb 2014, 19:54 Switching time outage at request of DNO	Non-OFTO	0.5 hour	27
Total			4324 MWh

TC Ormonde Outages			
Outage Date & Time	Origin	Days & Hours	MWh
06 Apr 2013, 12:31 Outage of T2 due to generator 33kV cable fault	Non-OFTO	19 days 2 hours	34346
06 Apr 2013, 16:57 Outage at Request of Generator following maloperation of their 33kV protection	Non-OFTO	4 hours	318
22 Apr 2013, 11:02 Outage at Request of DNO to perform repair work on a DNO 132kV disconnector	Non-OFTO	3 days 3 hours	5658
17 May 2013, 05:18 Outage of T1 due to generator 33kV cable fault	Non-OFTO	14 days 13 hours	31581
03 June 2013, 17:08 Outage of T2 to allow generator to commission T1 33kV cable repair	Non-OFTO	2 hours	138
01 July 2013, 11:56 Outage for DNO work	Non-OFTO	3.5 hours	510
05 Aug 2013, 09:24 Switching time outage at request of DNO	Non-OFTO	1 hour	147
11 Aug 2013, 12:36 Switching time outage at request of DNO	Non-OFTO	1 hour	130
07 Nov 2013, 01:03 Outage of T2 due to generator 33kV cable fault	Non-OFTO	10 days 13 hours	19009
17 Nov 2013, 14:13 Generator work on T1 33kV cables	Non-OFTO	5 days 9 hours	9661
18 Nov 2013, 06:23 Generator request for Harmonic Filter Works	Non-OFTO	4 days 16 hours	8394
Total			109891 MWh

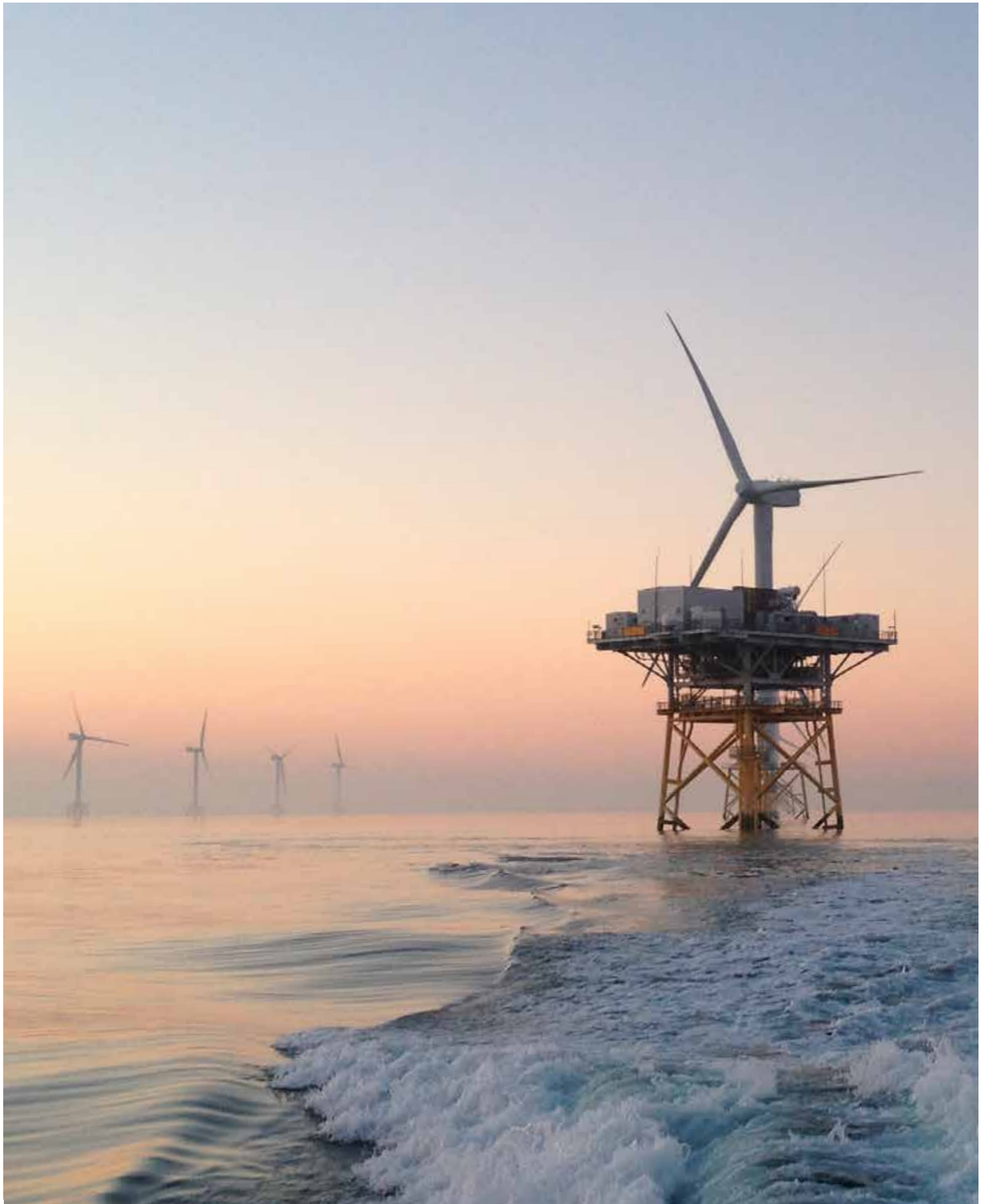
BT Walney 1 Outages			
Outage Date & Time	Origin	Days & Hours	MWh
11 Sep 2013, 13:03 Surge counter replacement – generator restriction of 120MW	OFTO	3 hours	160
Total			160 MWh

BT Walney 2 Outages			
Outage Date & Time	Origin	Days & Hours	MWh
02 Oct 2013, 23:54 ENW request for emergency switching	Non-OFTO	1.5 hours	255
04 Oct 2013, 21:44 ENW initiated request for switching	Non-OFTO	0.5 hour	104
06 Nov 2013, 05:29 132kV land cable fault	OFTO	17.7 days	70995
Total			71354 MWh

BT Sheringham Shoal Outages			
Outage Date & Time	Origin	Days & Hours	MWh
05 Aug 2013, 07:23 Salle 132kV S/S No.1 circuit GT1 & GT3	OFTO	12 hours	1853
06 Aug 2013, 07:07 Salle 132kV S/S No.2 circuit GT2 & GT4	OFTO	11.5 hours	1835
20 Aug 2013, 11:38 Off Shore Substation No.1, Grid Transformers GT1 / GT3	OFTO	2 hours	286
23 Sep 2013, 08:33 Salle 132kV S/S No.1 circuit GT1 & GT3 Inspection of radiators for leaks	OFTO	1.5 hours	207
27 Sep 2013, 11:43 Switching for DNO on Salle / Earham 1 cct	Non-OFTO	0.13 hours	0
30 Sep 2013, 08:35 Switching for DNO Salle / Earham 2 cct	Non-OFTO	0.13 hours	0
04 Oct 2013, 14:04 Switching for DNO Salle / Earham 2 cct	Non-OFTO	0.1 hours	0
05 Dec 2013, 13:27 Off Shore Substation No.1, Grid Transformers GT1 / GT3	OFTO	7 hours	538
05 Dec 2013, 20:19 Off Shore Substation No.1, Grid Transformers GT1 / GT3	OFTO	4 days	6368
09 Dec 2013, 12:46 Off Shore Substation No.1, Grid Transformers GT1 / GT3	OFTO	0.5 hour	38
04 Mar 2014, 15:28 Switching for Generator array cct	Non-OFTO	0.25 hour	0
04 Mar 2014, 17:09 Switching for Generator array cct	Non-OFTO	0.13 hour	0
07 Mar 2014, 13:18 Switching for Generator array cct	Non-OFTO	0.5 hour	0
Total			11125 MWh

BT London Array			
Outage Date & Time	Origin	Days & Hours	MWh
04 Oct 2013, 16:41 150kV Export Cable 2 & 4	OFTO	0.5 hour	160
04 Oct 2013, 17:09 150kV Export Cable 2 & 4	OFTO	0.5 hour	214
16 Dec 2013, 17:10 150kV Export Cable 2 & 4	OFTO	1 hour	302
16 Dec 2013, 18:13 150kV Export Cable 2 & 4	OFTO	0.5 hour	36
Total			721 MWh

Balfour Beatty Greater Gabbard			
Outage Date & Time	Origin	Days & Hours	MWh
None			
Total			0 MWh



Glossary of Terms

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 as a result of 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:

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

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.

System Unavailability

System Unavailability is calculated by the formula:

$$(100 - \text{Availability}) \%$$

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

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

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 400 kV and 275 kV transmission voltages than for 132 kV. Additionally, the 132 kV network is, in parts, less interconnected than the higher voltage systems and so losses of 132 kV 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 information about the cause of the incident, its location, duration and an estimate of unsupplied energy.

Loss of Supply Incidents at '3 or less customers' sites

(TNRI – 2005-2013)

The TNRI '3 or less customers' category covers locations where major industrial customers are directly connected to the transmission system. The customer could be a

steelworks, refinery or other large industrial processing site. Connection arrangements 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 system security. Distribution Network Operators and domestic customers do not come within this category.

Loss of Supply Incidents - Non-Incentivised

(ENS – 2013 to date)

The ENS 'Non-Incentivised' category covers only 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 incidents that are less than 3 minutes in duration are also part of the ENS 'Non-Incentivised' category. Distribution Network Operators and domestic customers do not come 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 132 kV 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 400 kV 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 50 Hz: a range of 49.5 to 50.5 Hz. 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 50.2 Hz.

Frequency may, however, move outside these limits if certain secured events occur or when there are abnormal changes to operating conditions. Losses of generation or import greater than 1000 MW are considered abnormal and frequency may not stay within statutory limits should such a loss occur, although operation is managed so that the frequency should return within the lower statutory limit of 49.5 Hz within 60 seconds."

Registered Office:

National Grid
1-3 Strand
London
WC2N 5EH

Registered in England & Wales no.
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