Transmission Charging Forum

Generation-focussed day

17 October 2019

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Welcome

Rebecca Yang

Revenue Manager

nationalgridESO

Housekeeping

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Today's agenda

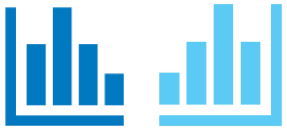
1	Welcome and introduction to the day	09:30 – 09:50
2	TNUoS - tariffs and billing (including coffee break)	09:50 – 11:30
3	BSUoS - forecasting, reporting and billing	11:30 – 12:20
4	Connection charging overview	12:20 – 12:30
	Lunch	12:30 – 13:20
5	Workshops	13:20 – 15:20
6	Q & A	15:20 – 15:40
7	Close	15:40 – 16:00

Workshops

Connection charges explained

In the session we will take you through how connection charges are calculated and explain what post-commissioning securities are.

Ways to reconcile your BSUoS charges



We will take you through how to use different data sources as a way of reconciling the BSUoS charge.

Code development updates and Q & A

We will talk through current code modifications which may have an impact on the transmission charging regime

Workshops continued

How and why we monitor your credit (TNUoS and BSUoS)

All customers receive a credit statement from us each month.

In this session, we'll explain what it's all about and why it's important.

How and why we reconcile your TNUoS charges

At the end of the charging year, you will have either underpaid or overpaid for TNUoS.

In this session we'll go take you through how we reconcile the charge.

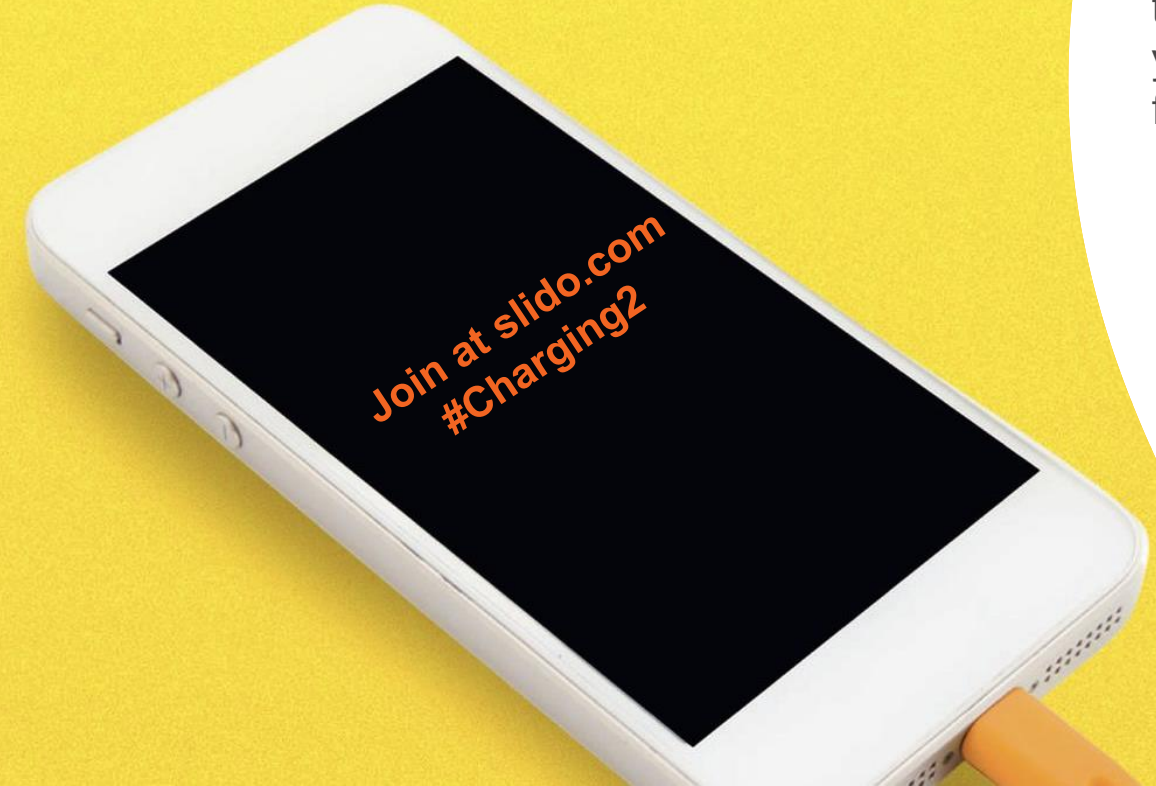
Charging Forum Workshops

13:20 – 15:20

Time	Main room	L 9	L 10	Kitchen area
13:20 – 14:00	Ways to reconcile your BSUoS charges	How and why we monitor your credit (TNUoS and BSUoS)		Networking and refreshments
14:00 - 14:40	Code development updates and Q & A	Connection charges explained		
14:40 – 15:20	Ways to reconcile your BSUoS charges	Connection charges explained	How we reconcile your TNUoS charges	

Sli.do

We'll be using sli.do throughout the day to gather your questions and feedback



Join at slido.com

#Charging2

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Revenue Team Overview

Rebecca Yang

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Revenue team

- TNUoS Billing
- BSUoS Billing
- Tariff Forecasting and Setting
- Connection Charging
- Customer & Stakeholder


Rebecca Yang, Revenue Manager


Nick Everitt, Billing


Jo Zhou, Tariff Forecasting and Setting


Alice Grayson, Connections charging and TNUoS Tariff Forecasting and Setting


Sarah Chleboun, TNUoS Tariff Forecasting and Setting


Matt Wootton, Customer & Stakeholder


Paul Hitchcock, TNUoS Billing


Anthony Tichivangana, Connections Charging


Malcom Rowe, Charging System Development


Jennifer Groome, Customer & Stakeholder and BSUoS Billing


Andrew Havvas, TNUoS Billing


Luke Craddock, Connections Charging


Karen Sawbridge, BSUoS Billing


John Beezley, Connections Charging and BSUoS Billing


Matthew Marriott, TNUoS billing and BSUoS Billing

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Our charges…

TNUoS
Transmission Network Use of System Charges
£2.8bn TO Revenue

BSUoS
Balancing Services Use of System Charges
~ £1.4bn SO Revenue

Connection Charges
~ £300m TO Revenue

TNUoS Overview

Sarah Chleboun,
Alice Grayson
& Jo Zhou

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What is TNUoS and who pays?

Sarah Chleboun

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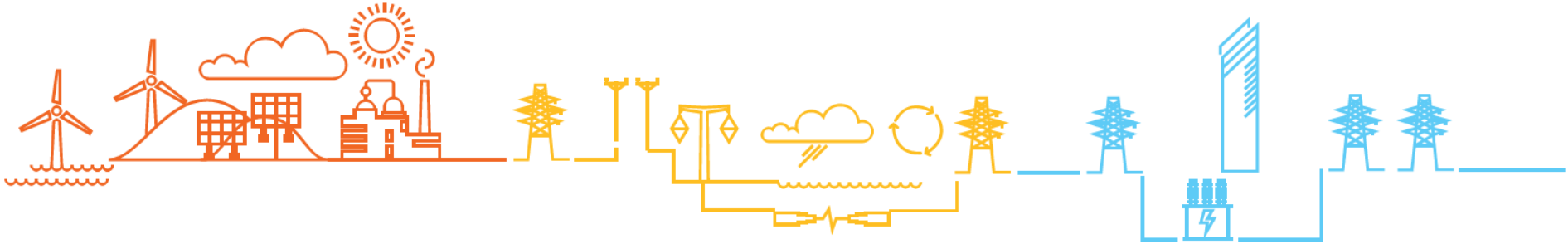
What is TNUoS?

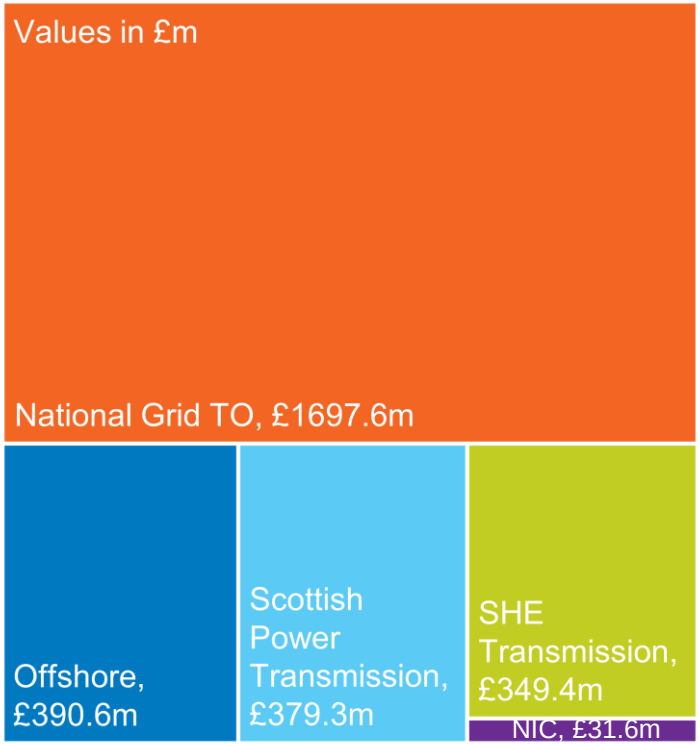
TNUoS is the Transmission Network Use of System charge, and recovers the allowed revenue for Transmission Owners for the cost of building and maintaining transmission infrastructure.

Locational charge: reflects the incremental cost of power being added to/taken off the system at different geographical points

Residual charge: what is not recovered under the Locational charge is recovered in this charge so that the TO's recover their total allowed revenue



What makes up the TNUoS charge?



Figures from Final TNUoS Tariffs for 2019/20

Recovers revenue for:

- Onshore TOs
  - National Grid TO
  - Scottish Power Transmission
  - Scottish Hydro Electricity Transmission
- Offshore TOs
- Network Innovation Competition (NIC) Fund

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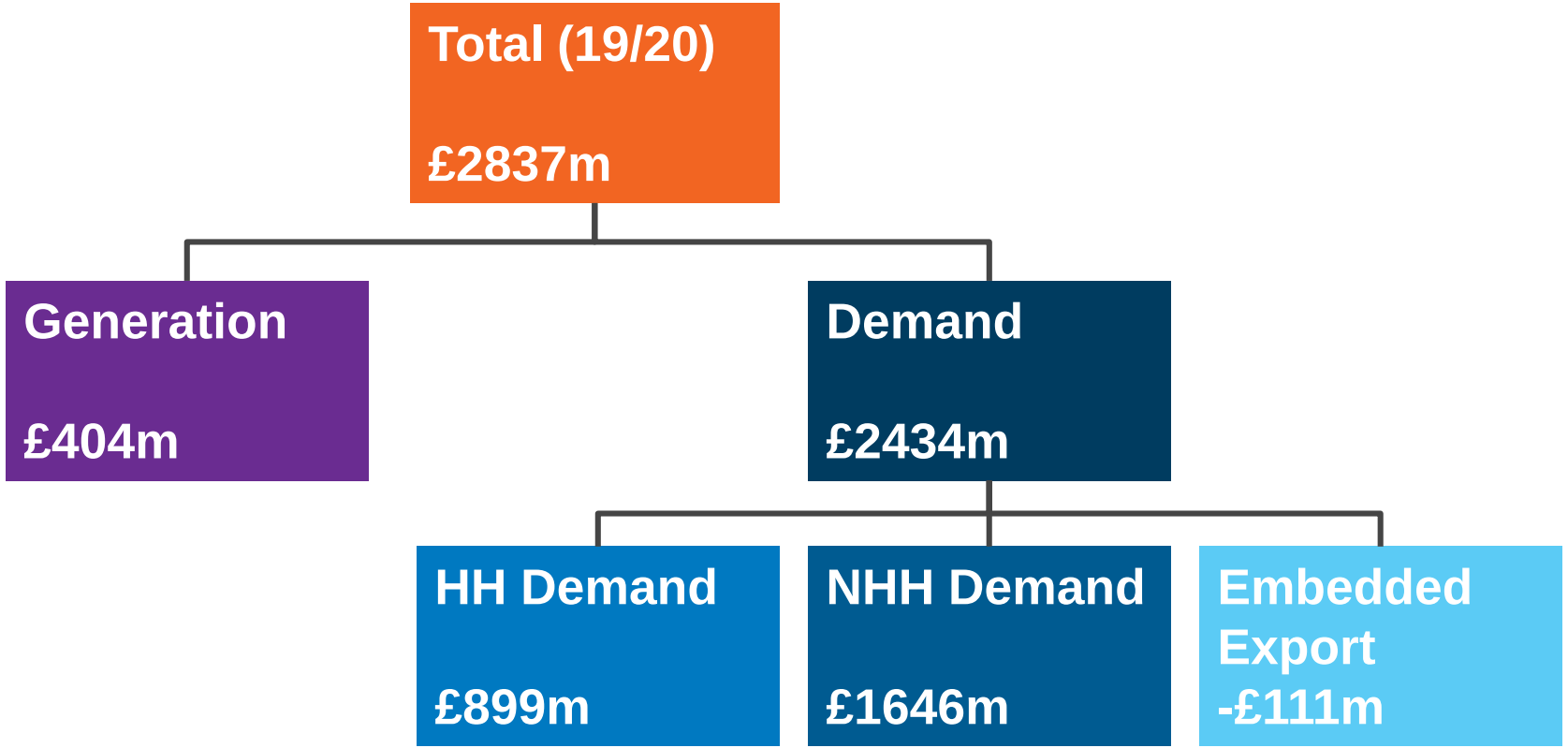
Who pays TNUoS?



Figures from Final TNUoS Tariffs for 2019/20
Note: figures have been rounded to the nearest £1m

Who pays TNUoS? - Generators

Generators that are directly connected to the transmission network & Embedded generators ≥100MW TEC are chargeable

Generation TNUoS is charged on the basis of Transmission Entry Capacity (TEC)

Generators are also liable for Demand TNUoS if they take demand during the Triad

Who pays TNUoS? - Demand

Suppliers

All licenced suppliers are liable for TNUoS charges, for their *gross demand* from the transmission network in one of the following 3 categories:

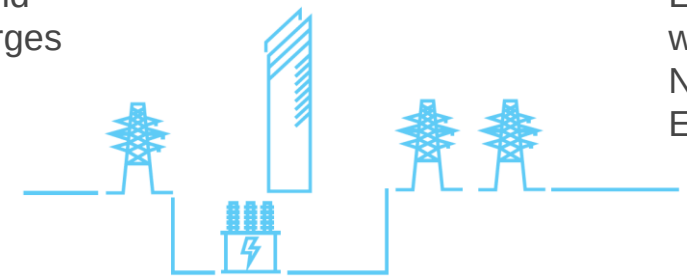
Half-Hourly metered demand on the basis of Triads

Non Half-Hourly demand, total 4pm-7pm annual consumption

Embedded Export credited for export over Triads

Directly Connected Demand

Directly Connected Demand sites pay HH demand charges



Embedded Generation

Embedded Generation (<100MW) which contracts directly with National Grid ESO can gain Embedded Export payments

Tariff Forecasting and Setting

Jo Zhou

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What is the Transport and Tariff Model & what does it do?

Calculates Transmission Network Use of System Charges (TNUoS) consistent with the methodology set out in the CUSC (Section 14, Part 2, Section 1).

It has two fundamental purposes:

1. Produce cost-reflective tariffs with locational signals, to incentivise the efficient siting of generation and demand across the transmission system
2. Ensure accurate revenue recovery for the TOs

Structure and Purpose of Transport and Tariff Model

Two elements:

Transport element

- Calculates locational signals (on nodal basis)

Tariff element

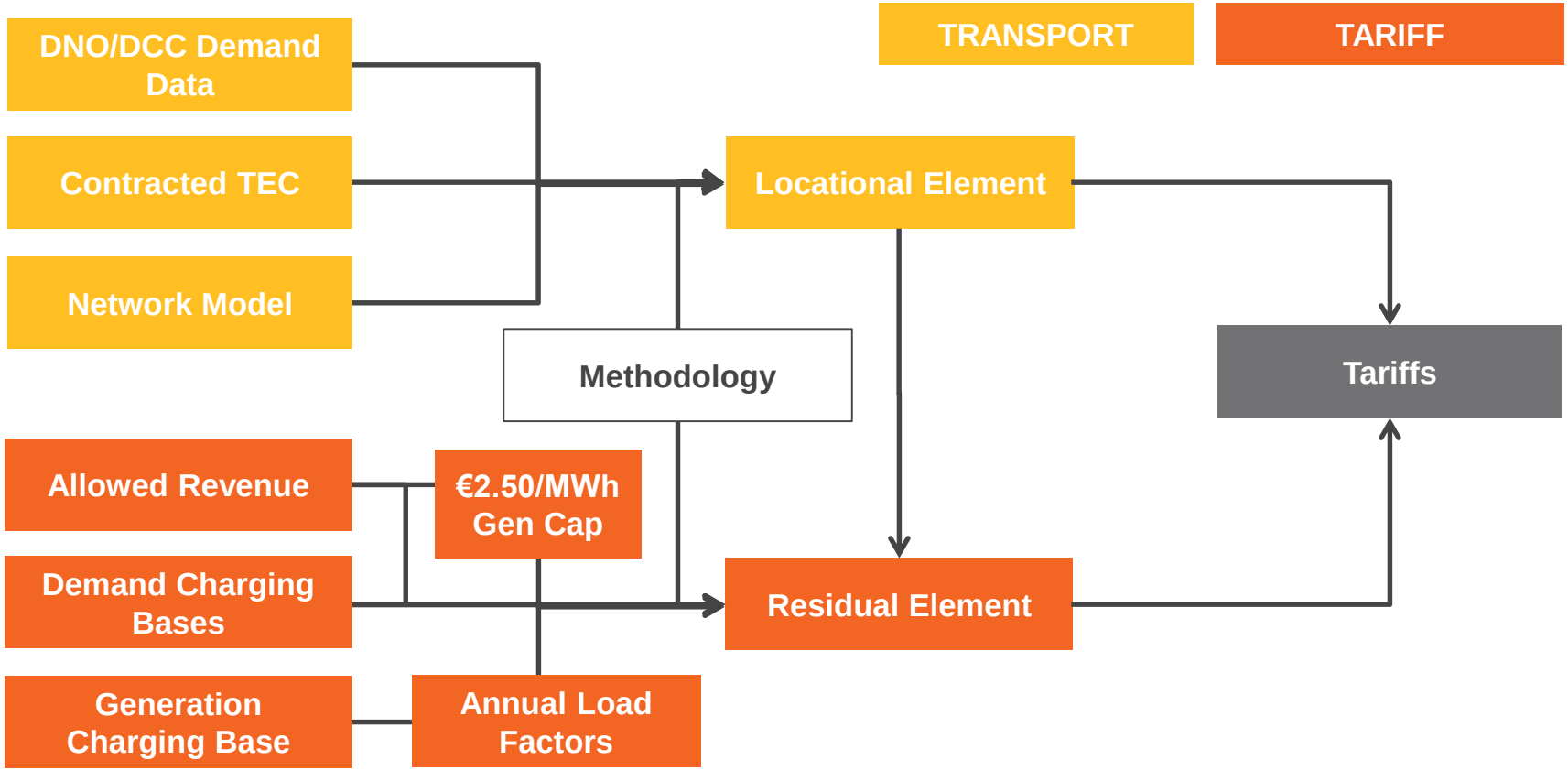
- Aggregates locational signals from nodal to zonal tariffs
- Calculates residual tariffs

Aims:

- Cost reflectivity – quantifying incremental MW*km (cost) at each node
- Transparency – “contractual” background

- Stability & predictability - zones
- Recovery of total network costs - non-locational residual tariffs
- Target revenue recovery from generators and overall

Inputs in to TNUoS Tariffs



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When do inputs change in quarterly forecasts?

		Five-year forecast	March	July	DRAFT Nov	FINAL Jan
Methodology		Open to industry governance				
Locational	DNO/DCC Demand Data	Previous year			Week 24 updated	
	Contracted TEC	Latest TEC	Latest TEC	Latest TEC	TEC Register Frozen at 31 October	
	Network Model	Previous year (except new local circuits)			Latest version based on ETYS	
Residual	Allowed Revenue	Update financial parameters	Update financial parameters	Update financial parameters	Latest TO Forecasts	From TOs
	Demand Charging Bases	Revised Forecast	Revised Forecast	Revised Forecast	*Only by exception*	*Only by exception*
	Generation Charging Base	NG Best View	NG Best View	NG Best View	NG Best View	NG Final Best View
	Generation ALFs	Previous Year			New ALFs published	
	Generation Revenue	Forecast	Forecast	Fixed Gen Rev £m		

Generation TNUoS

Jo Zhou

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Generation TNUoS

Generation TNUoS

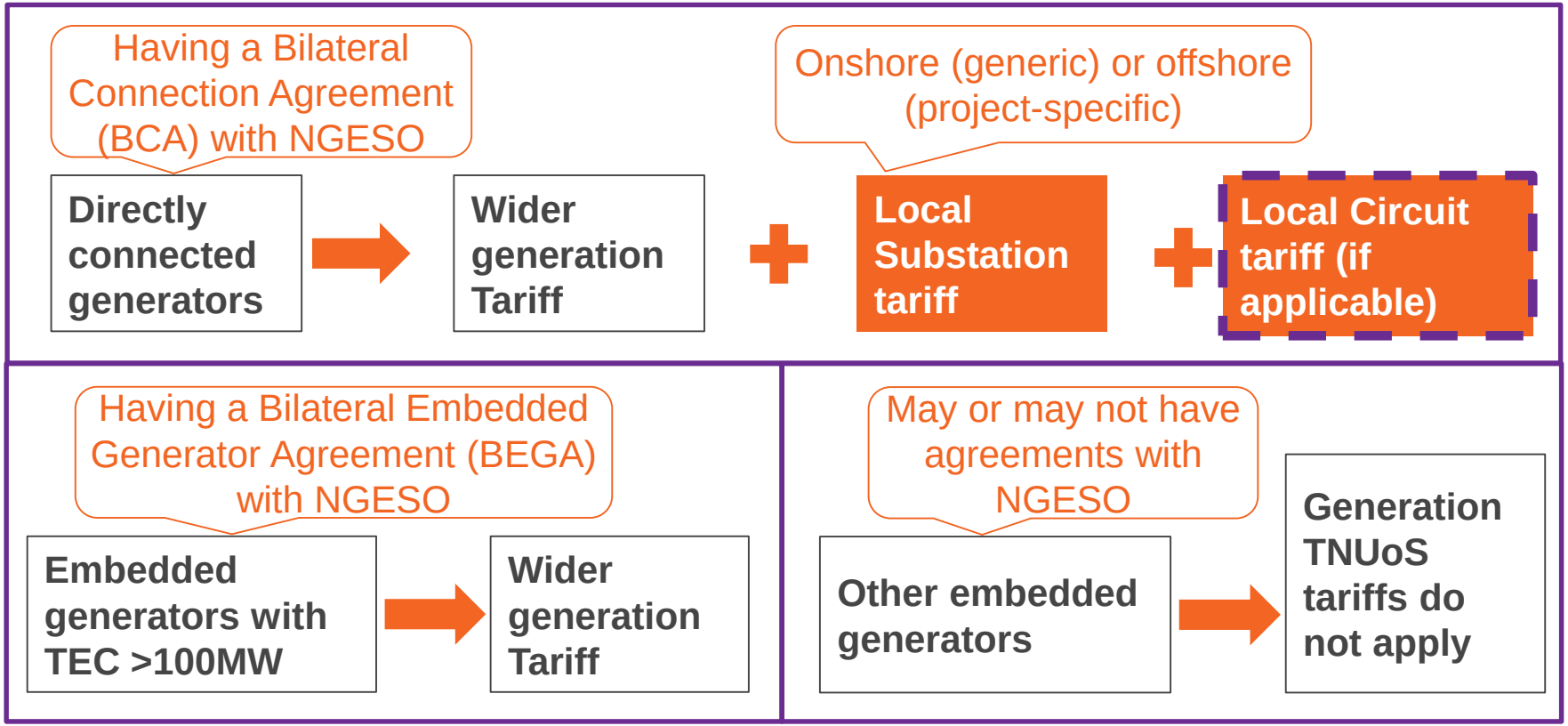
Generation TNUoS recovers charges from Transmission connected generation and licensable embedded generation

- Maximum revenue from generation set by EU Regulation
- Tariffs include wider and local elements
- Final tariffs are generator specific

Total (19/20) £2,837m

Generation £404m

Generation TNUoS Tariffs



Generation Wider Tariffs

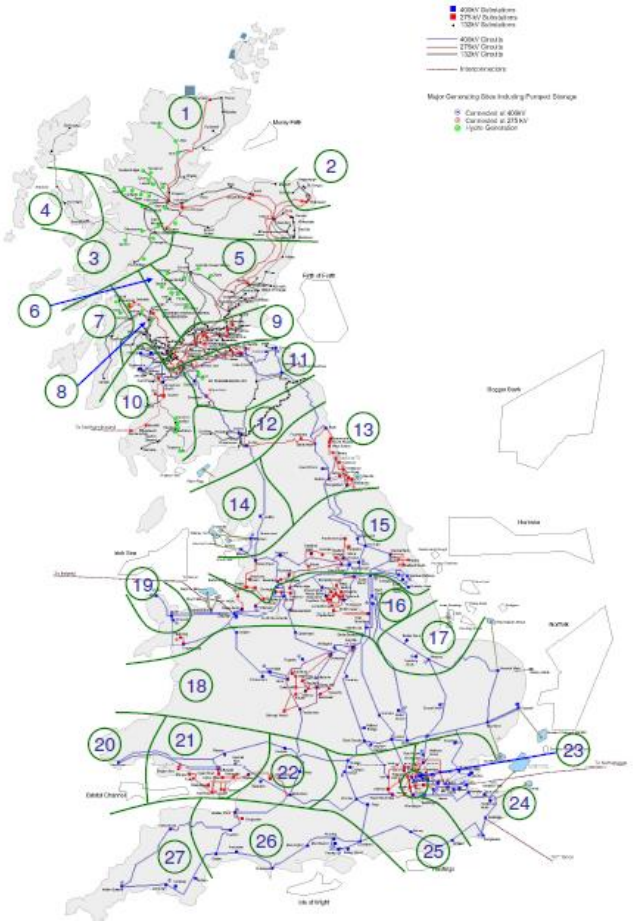
Wider tariffs are calculated per zone

27 generation zones

Components apply based on fuel type

Wider Tariff components:

Peak Security	**Year Round Shared**
Year Round Not Shared	**Generator Residual**



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Wider Generation Charging Categories

Intermittent e.g. Wind, Tidal, Solar

Conventional Low Carbon, e.g. Nuclear, Hydro (run-of-river)

Conventional Carbon, e.g. Coal, CCGT, Biomass, Pump Storage, Battery

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Annual Load Factors (ALFs)

ALFs give a measure (over five years) of a generator's output compared to its capacity, using:

- Transmission Entry Capacity (TEC)
- Metered Flows (MF)
- Final Physical Notifications (FPN)

ALFs for 2019/20 are based on data from charging years:

2013/14 2014/15 2015/16 2016/17 2017/18

Annual Load Factors (ALFs)

ALFs are calculated at power station level

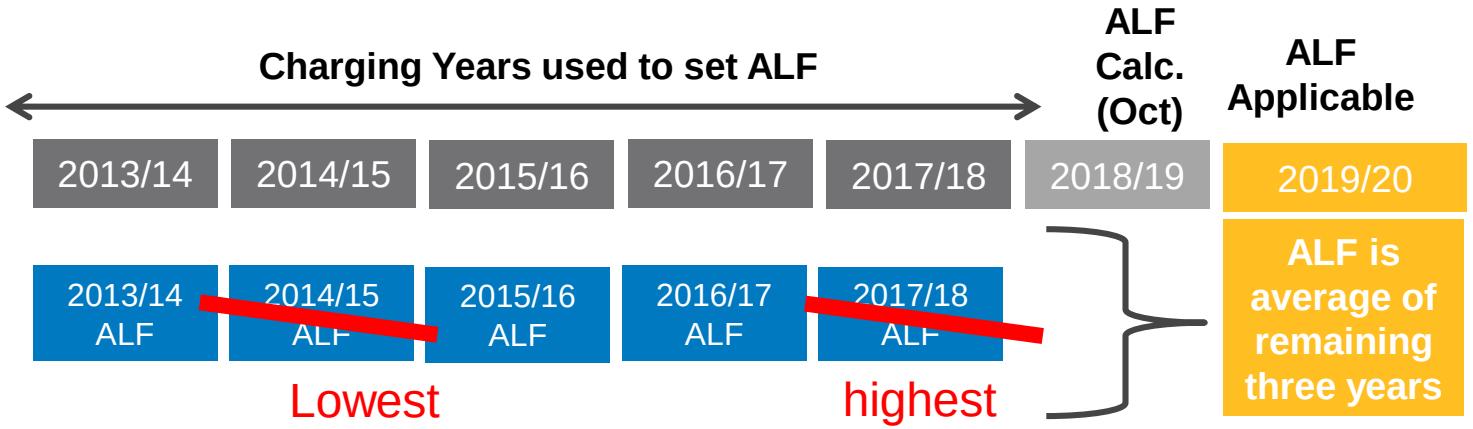
For a power station with multiple Balancing Mechanism Units (BMU) representing generating sets and/or station demand, the BMUs are aggregated before calculating the ALF

Co-location of generating sets of different fuel types within one power station

At the moment, the power station is charged according to the predominant fuel type

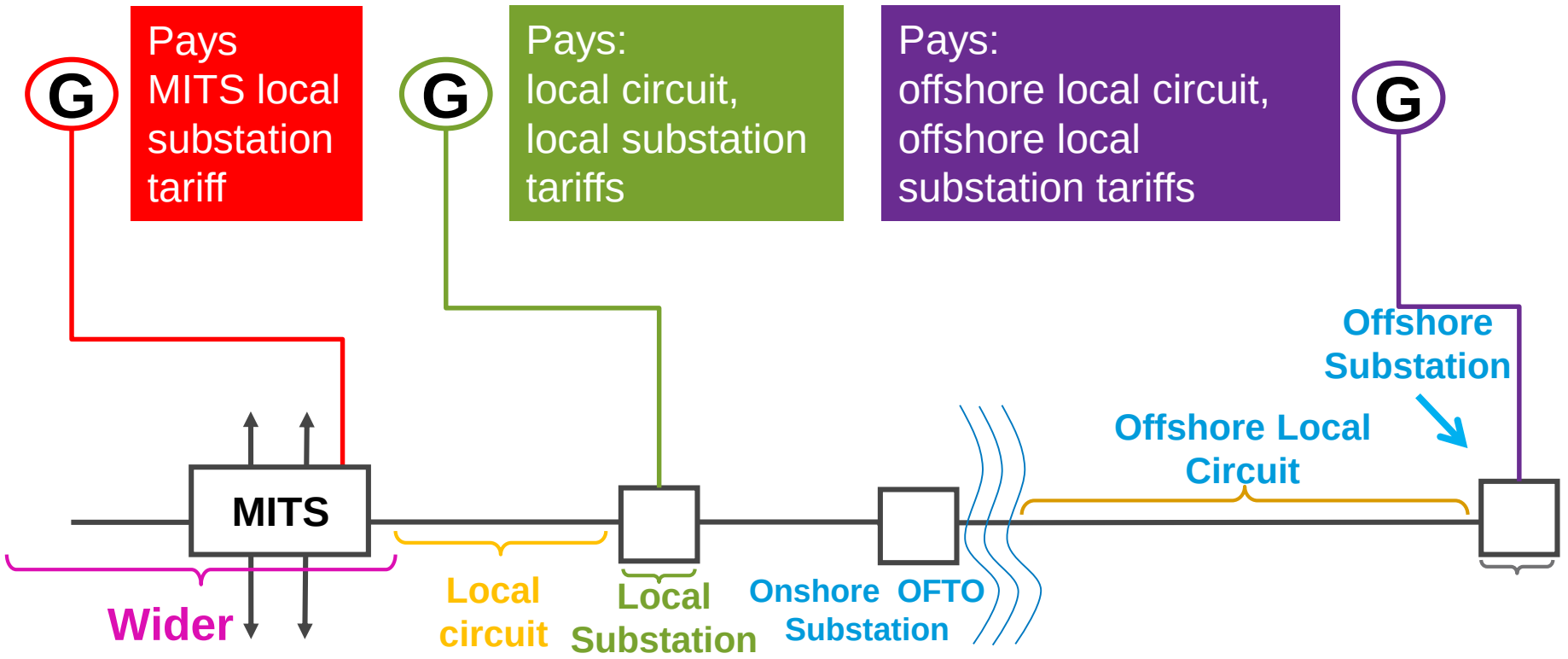
A guidance document is available on our website

How to calculate an ALF….



Power Stations with less than 3 full years' data – use fuel-specific generic ALFs

Local generation tariffs: Directly connected generators



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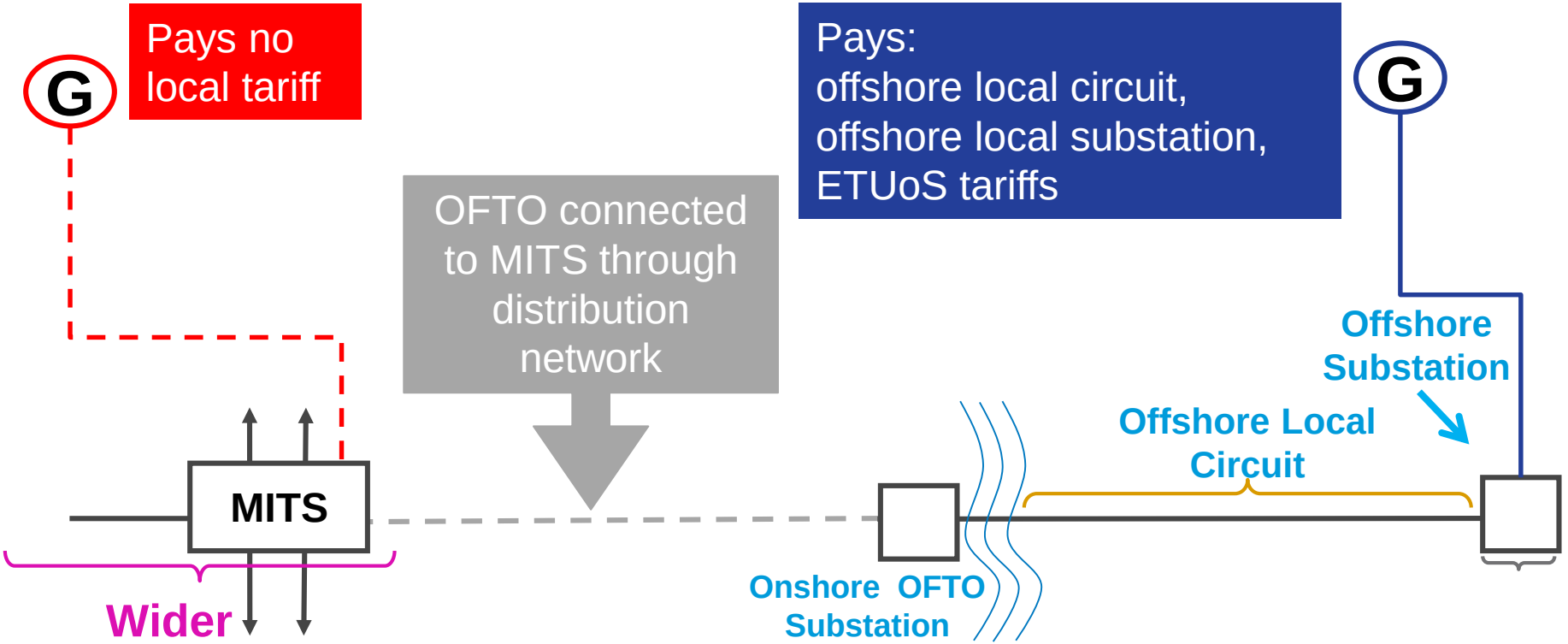
Local generation tariffs: Embedded generators

(and directly connected offshore generators via “embedded” OFTO)



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Final Generation Tariff

May (or may not) apply

Onshore

Based on voltage, capacity and redundancy

Onshore **Generation Tariff** = **Wider Tariff** + **Local Circuits (onshore)** + **Local Onshore Substation**

Specific to substations

Directly connected offshore

Offshore **Generation Tariff** = **Wider Tariff** + **Local Circuits (onshore)** + **Local Offshore Circuit & Substation** + **ETUoS**

OFTO Specific

If OFTO is in DNO's network

Demand TNUoS

Alice Grayson

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Demand TNUoS agenda

1	Demand TNUoS Tariffs (HH & NHH)
2	What are Triads
3	Embedded Export Tariffs
4	Small Generator Discount

Demand TNUoS Tariffs

Demand TNUoS recovers £2.4bn of revenue

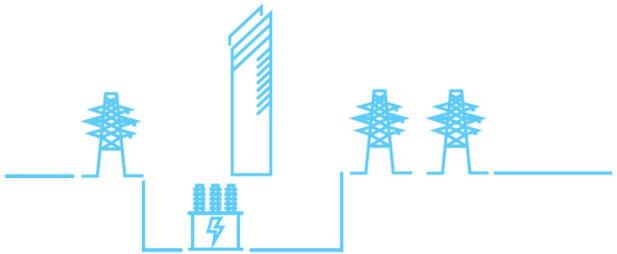
There are two demand tariffs for each of the **14 demand zones**

Half-Hourly (HH) Demand

Charged a £/kW tariff for average gross demand over the triads

Non Half-Hourly (NHH) Demand

Charged a p/kWh tariff for consumption between 4pm and 7pm



Triads – what are they?

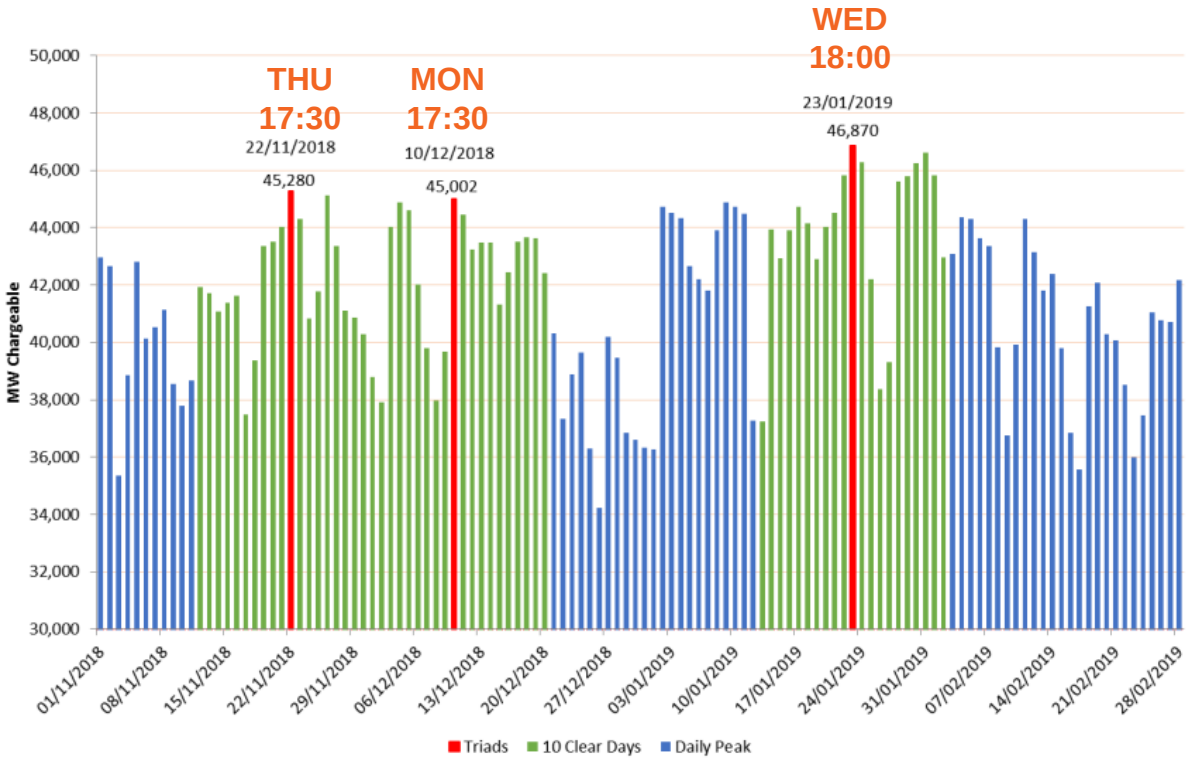
Three half hour settlement periods of highest GB net demand

- Separated by a minimum of 10 clear days
- Determined after the event using settlement metering data reported in March
- Excludes interconnector demand but includes pumping and station demand

November

February

Triads for Winter 2018/19



- Triads are usually around 17:30 on a weekday
- However, recently it has become more difficult to predict when a triad will be due to:
  - Changing behaviours to avoid triad
  - Energy efficiency
  - Embedded generation

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Embedded Export Tariff

The Embedded Export Tariff is another element of TNUoS

- The EET is paid to customers based on the HH metered export volume during the triads
- This tariff is payable to exporting HH demand customers and embedded generators (<100MW)

Embedded Export

Credited a £/kW tariff for average export over the Triads

Embedded Export Tariff

- Based on the forecast of Embedded Generation output, this will cost £111m in 2019/20
- This is added to the revenue to be recovered from the demand residual, to ensure overall revenue recovery is correct
- The phased residual will be £0/kW from 2020/21

***AGIC = Avoided GSP (Grid Supply Point) Infrastructure Credit, which is indexed by average May to October RPI each year.**

Small Generator Discount

Small generators (<100MW) connected at 132kV transmission receive a £/kW reduction in their TNUoS

For 2019/20, the small generator discount tariff is **£11.81/kW**

The small generator discount has been extended until 31st March 2021

Total amount paid out through the discount is £31.8m for 2019/20

This is recovered through demand tariffs

It increases the demand tariffs by:

HH demand	NHH demand
£0.62/kW	0.08p/kWh

Coffee Break

Any questions?

Go to: www.slido.com
Event code: #Charging2

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TNUoS Charging and Billing

Paul Hitchcock

Andrew Havvas

- Your bill
- Embedded export
- Reconciliation

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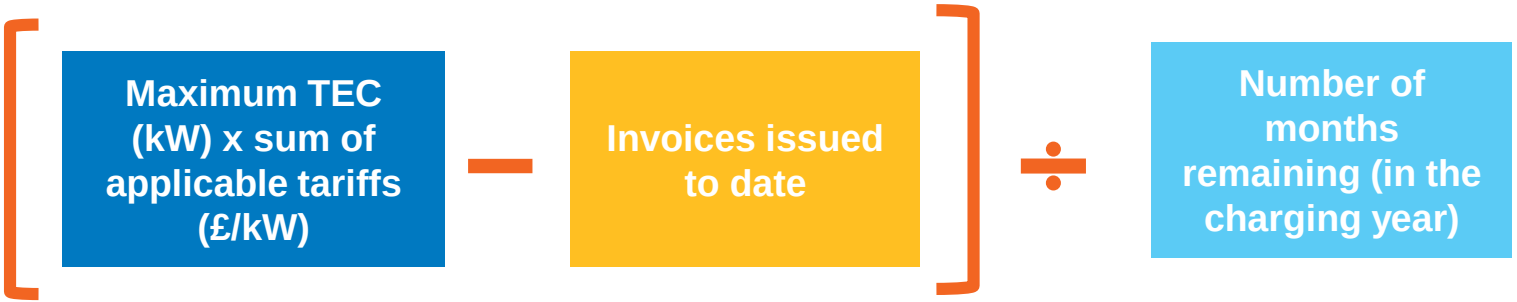
Generation Charging

Generation TNUoS is invoiced monthly on the basis of maximum Transmission Entry Capacity (TEC) within year

Generator monthly invoice:



TNUoS Charges: Generation Backing Sheet

Backing Information for Monthly
Transmission Network Use of System Generation Charges

October 2019

Natiional Grid Electricity System Operator
1-3 Strand
London
WC2N 5EH

XYZ GEN POWER LTD

Our Job Ref:		Small Generation Discount:	No
Payment Due:	15/10/2019	Annual Load Factor:	48.314000%
Power Station:	XYZ Gen	Peak Security Flag:	1
Zone ID:	15	Plant Type:	Conventional
Zone Name:	South Lancashire Yorkshire and Humber		

Wider Tariffs:

Effective From	Effective To	Months Applicable	Peak Security	Year Round Shared	Year Round Not Shared	Residual	Small Gens Discount	Tariff (£/kW)
01/04/2019	31/03/2020	12	4.792817	0.495644	0.145609	-3.527532	0.000000	-3.142458

Effective Wider Tariff: -3.142458

** Tariff = [(ALF x Year Round Shared) + (Year Round Not Shared + Residual)] - Small Gens Discount*

Local Circuit Tariff:

Effective From	Effective To	Months Applicable	Tariff (£/kW)	Tariff Type
01/04/2019	31/03/2020	12	0	Lcl_Circuit

Effective Local Circuit Tariff: 0.000000

Local Substation Tariff:

Effective From	Effective To	Months Applicable	Tariff (£/kW)	Tariff Type
01/04/2019	31/03/2020	12	0.196232	Lcl_Substation

Effective Local Substation Tariff: 0.196232

Generation Charge Calculation

Charge Category	Transmission Entry Capacity (kW)	Effective Generation Tariff (£/kW)	Forecast Annual Liability (£)	Invoiced to Date (£)	Remaining Liability (£)	Remaining Months	Current Monthly Charge (£)
Infrastructure Generation	247,000	-2.946226	-£727,717.71	£218,759.51	-£946,477.22	6	-£157,746.20

Generators receive a monthly backing sheet

Details include:

- Applicable tariffs
- Annual load factor
- Invoices issued to date
- Current invoice value

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TNUoS Billing Timeline

Monthly Invoices

Suppliers and Generators are billed on the 1st of every month and payable by the 15th

Reconciliations

Generation and Demand charges are reconciled annually but Demand charges are reconciled twice (latest / final metering)

Transmission Connected

Generation Reconciliation (April)

Charging year + 1 month

Distribution Connected (Embedded)

Initial Demand Reconciliation (June) → **Final Demand Reconciliation (Autumn)**

Charging year + 3 months

Charging year + ~18 months

Payments to Embedded Generators

Our Job Ref : CAB_TNUG_00000[redacted]
Payment Due Date : 15.06.2019
BM Units : [redacted]
Zone ID : 02
Zone Name : SOUTHERN SCOTLAND

Half Hourly Triad Gross Demand

Leg1 (kW)	Leg2 (kW)	Leg3 (kW)	Average (kW)
0.00	0.00	0.00	0.00
		Demand Tariff (£/kW)	29.070427
		Annual Gross Demand Liability (£)	0.00

Half Hourly Triad Gross Export

Leg1 (kW)	Leg2 (kW)	Leg3 (kW)	Average (kW)
-464.00	-3,654.00	-1,240.00	-1,786.00
		Export Tariff (£/kW)	14.124001
		Annual Embedded Export Liability (£)	-25,225.44

Half Hourly Gross Demand and Embedded Export

Month	Due Date	Amount Invoiced (£)	Average Demand Triad Liability (£)	Average Embedded Export Liability (£)	Difference: Metered Liability and Invoiced (£)*	Interest Rate %	Interest (£)	Total (£)
01	16.04.2018	0.00	0.00	-2,102.12	-2,102.12	0.895	-18.80	-2,120.92
02	15.05.2018	0.00	0.00	-2,102.12	-2,102.12	0.855	-17.97	-2,120.09
03	15.06.2018	0.00	0.00	-2,102.12	-2,102.12	0.812	-17.08	-2,119.20
04	16.07.2018	0.00	0.00	-2,102.12	-2,102.12	0.770	-16.18	-2,118.30
05	15.08.2018	0.00	0.00	-2,102.12	-2,102.12	0.719	-15.12	-2,117.24
06	17.09.2018	0.00	0.00	-2,102.12	-2,102.12	0.651	-13.69	-2,115.81
07	15.10.2018	0.00	0.00	-2,102.12	-2,102.12	0.594	-12.48	-2,114.60
08	15.11.2018	0.00	0.00	-2,102.12	-2,102.12	0.530	-11.14	-2,113.26
09	17.12.2018	0.00	0.00	-2,102.12	-2,102.12	0.464	-9.76	-2,111.88
10	15.01.2019	0.00	0.00	-2,102.12	-2,102.12	0.405	-8.51	-2,110.63
11	15.02.2019	0.00	0.00	-2,102.12	-2,102.12	0.341	-7.17	-2,109.29
12	15.03.2019	0.00	0.00	-2,102.12	-2,102.12	0.284	-5.96	-2,108.08
Demand HH Total		0.00	0.00	-25,225.44	-25,225.44		-153.86	-25,379.30

BEGA Contracts

- Non-licensable, distribution connected generators receive payment for exports over the Triads (sometimes referred to as 'Triad benefit') at the annual Initial Demand Reconciliation
- Average exports over the 3 Triads x Embedded Export tariff (applicable to demand zone) = £

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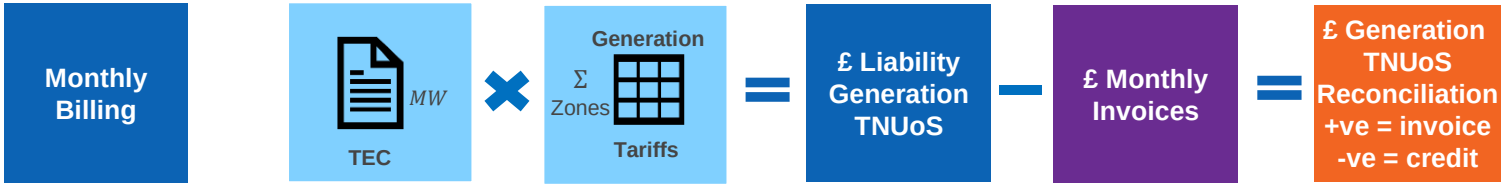
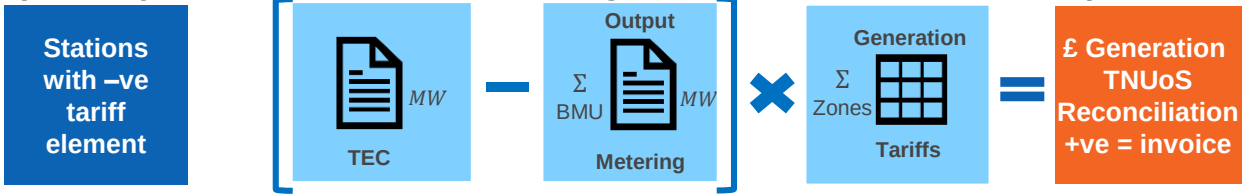
Generation TNUoS Reconciliation = (1) + (2) + (3)

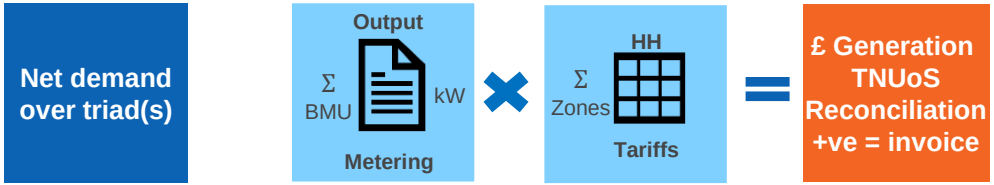
1) Recalculate annual liability based on latest information, and reconcile to sum of monthly billing



2) For any stations with one or more negative tariff elements, calculate peak station output and reconcile to TEC



3) Calculate station output at each triad, identify any net demand and charge relevant HH gross demand tariff



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Balancing Services Use of System Charging (BSUoS)

Nick Everitt

Nigel Swan

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BSUoS Agenda

1	BSUoS Overview
2	BSUoS Forecasting and Reporting
3	BSUoS Billing
4	Questions

What are BSUoS charges and who pays them?

The BSUoS charge recovers the cost of day-to-day operation of the transmission system

What is the charge for?

To recover balancing services costs

Recovers the cost of day-to-day operation of the transmission system

How is it charged?

Half hourly £/MWh applied proportionally according to your portfolio share

Charges are based on the costs of balancing actions taken on the transmission system over the 48 settlement periods each day

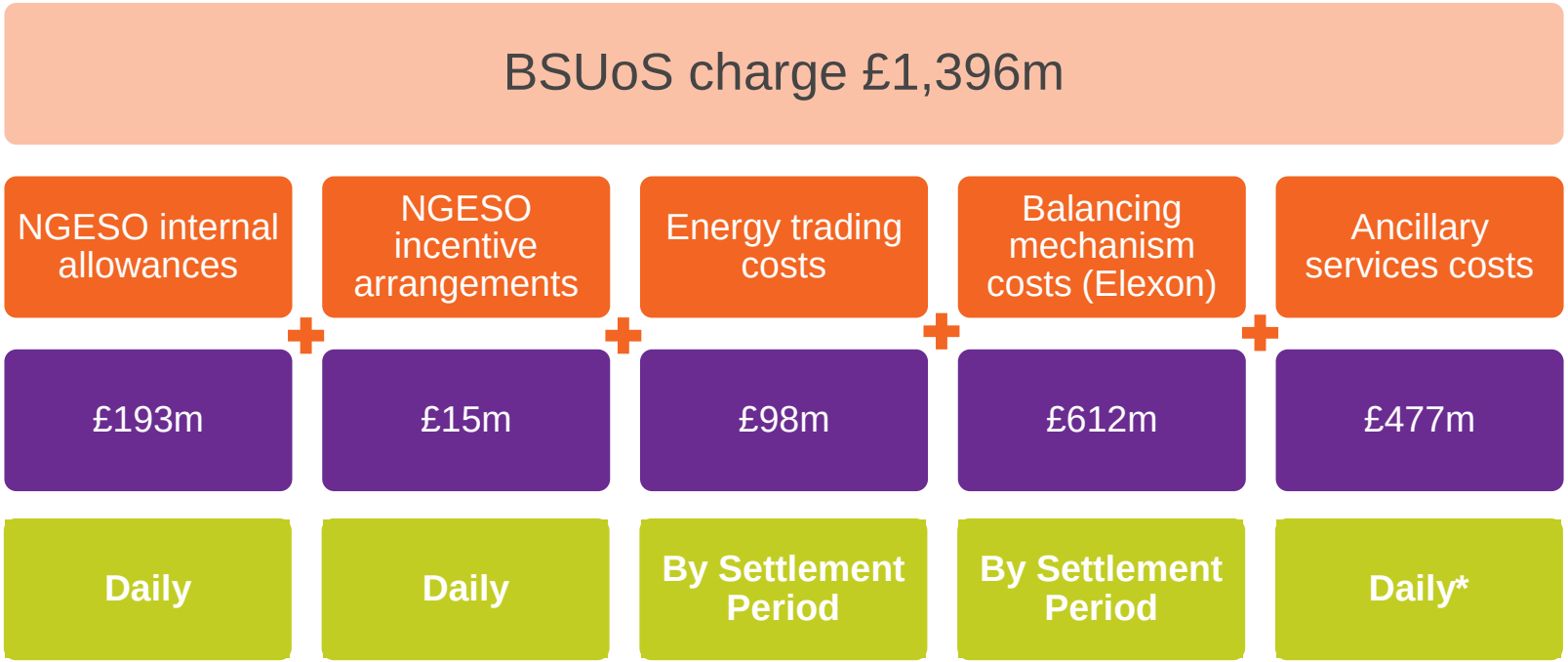
Who pays?

Generators

Suppliers

NGESO collects revenue from the customers that are using the network during each settlement period

What is the charge comprised of?



Figures rounded to nearest £m / 18/19 Scheme Year Actuals
Daily* - STOR week ahead availability costs by settlement period

BSUoS Forecasting and Reporting Agenda

1	Performance Review Team
2	Data Explorer
3	Daily Report
4	Monthly Balancing Services Summary
5	BSUoS Monthly Forecast Report
6	BSUoS Forecast Error (Jun - Aug)
7	New and Future Reports

Commercial Performance Review team

Nigel Swan

Forecast and report BSUoS costs and charges for current financial year and the next two years. Publish OPMR data and generation availability.

Nicholas Robertson

Pavinder Babra

Cristian Ebau

Anita Wong

Harry Shearer

BSUoS reporting and forecasting

OPMR publication

Feedback on each report

1. What extent the reports help to inform business decisions

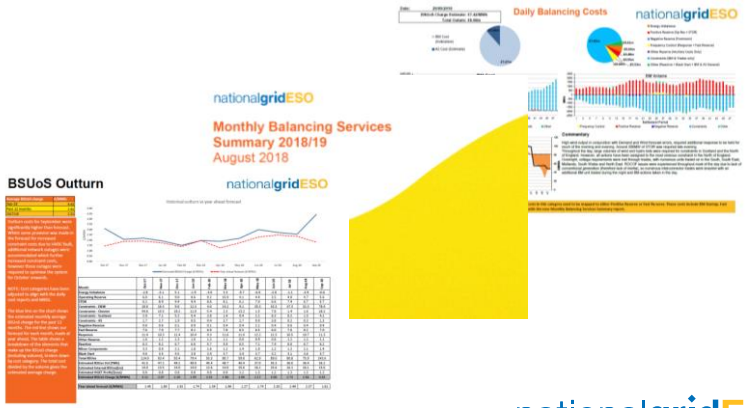
2. How understandable the content is of the reports

3. How likely you are to recommend the reports to a friend or colleague

Poll questions

Go to: www.slido.com
Event code: #Charging2

Respond to the 5 questions



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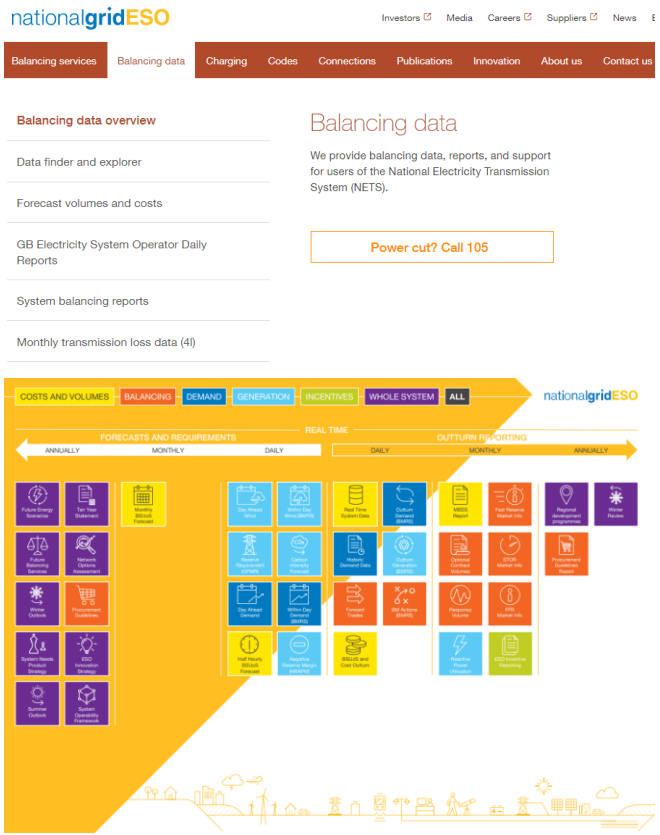
Data Explorer Page

- Launched Q1 this year
- Interactive way of navigating through information published on website
- Organised by timescale and granularity

- Feedback request
  - Informing business decisions?
  - Understand content?
  - Would recommend?



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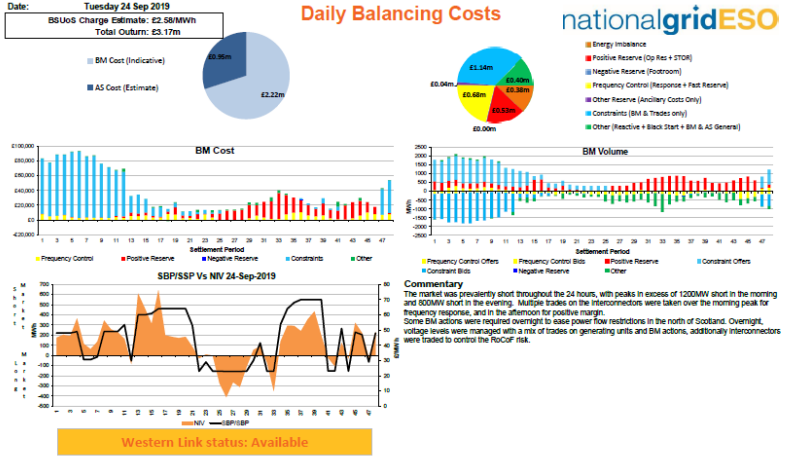
Daily Balancing Cost Report

- Launched on 5 January 2018
- It has been through several iterations
- Aim to publish within 2 working days

- Feedback request
  - Informing business decisions?
  - Understand content?
  - Would recommend?



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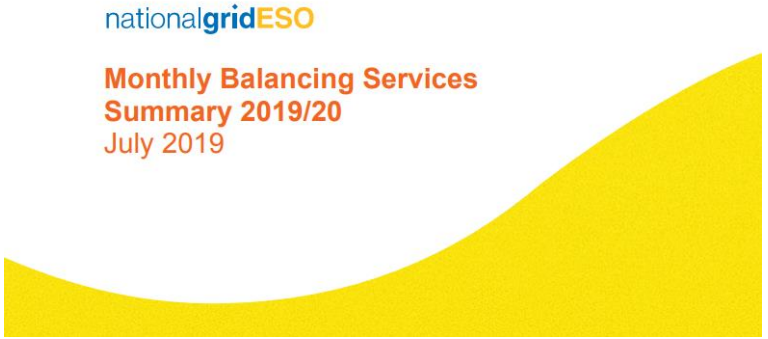
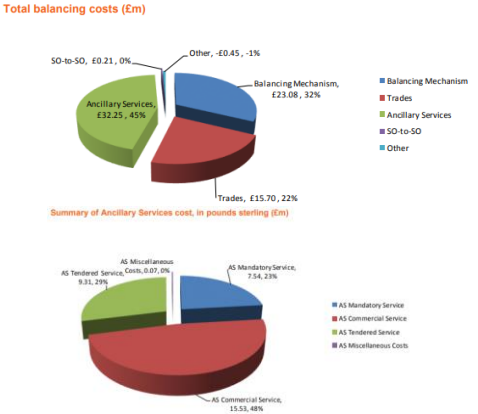
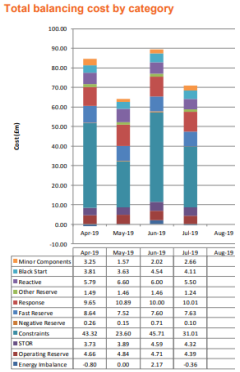
Monthly Balancing Services Summary

- Launched in May 2018 – April report
- Structure designed to flow through each service
- Increased level of cost/volume breakdown

- Feedback request
  - Informing business decisions?
  - Understand content?
  - Would recommend?







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BSUoS Monthly Forecast Report

- Launched in June 2018
- Cost breakdown changes

- Feedback request
  - Informing business decisions?
  - Understand content?
  - Would recommend?

BSUoS Outturn

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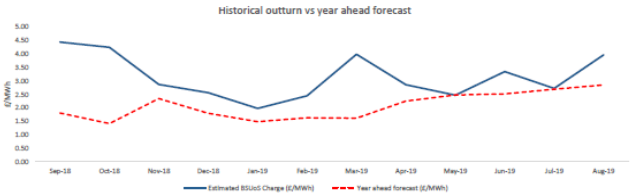
Average BSUoS charge	£/MWh
Aug-19	3.97
Past 12 months	3.11
2018/19	2.88

Outturn costs for August were higher than July due to an increase in constraint costs due to more adverse weather than July. Western Link was restricted to reduced levels at the end of the month and additional response was also held leading to an increase in costs.

The BSUoS volume down by 1.6TWh on July.

The blue line on the chart shows the estimated monthly average BSUoS charge for the past 12 months. The red line shows our forecast for each month, made at year ahead. The table shows a breakdown of the elements that make up the BSUoS charge (including volume), broken down by cost category. The total cost divided by the volume gives the estimated average charge.



Month	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19
Energy Imbalance	-0.7	0.0	2.5	-2.3	-5.5	-5.1	0.2	-0.8	0.0	2.2	-0.4	2.4
Operating Reserve	5.4	8.0	8.5	8.2	6.8	4.7	4.4	4.7	4.8	4.7	4.4	6.3
STOR	5.8	5.4	5.8	6.0	6.1	4.6	5.1	3.7	3.9	4.6	4.3	4.2
Constraints - E&W	77.7	71.0	29.8	26.5	9.3	21.2	23.3	16.8	14.8	43.4	24.0	41.7
Constraints - Cheviot	18.2	8.8	13.9	2.2	13.3	11.1	30.8	17.3	0.4	0.1	0.1	1.0
Constraints - Scotland	4.1	10.9	5.7	16.4	10.7	10.5	31.6	4.1	6.0	0.9	4.7	12.4
Constraints - AS	1.6	13.5	13.3	8.2	7.3	6.8	6.5	5.1	2.4	1.2	2.2	1.9
Negative Reserve	0.6	0.2	0.4	0.4	0.2	0.1	0.1	0.3	0.1	0.7	0.1	1.4
Fast Reserve	7.6	8.5	7.0	7.6	9.8	7.8	8.2	8.6	7.5	7.6	7.6	7.5
Response	11.4	10.5	12.1	11.8	9.7	9.1	11.5	9.6	10.9	10.0	10.0	13.7
Other Reserve	1.1	1.3	0.8	1.5	1.4	1.4	1.3	1.5	1.5	1.5	1.2	2.0
Reactive	6.1	6.8	6.9	7.9	7.5	6.1	6.0	3.8	6.6	6.0	5.5	5.4
Minor Components	1.5	0.6	1.2	1.8	1.3	2.0	12.6	3.2	1.6	2.0	2.7	4.4
Black Start	3.8	5.0	3.5	3.8	3.6	3.6	5.3	3.5	3.6	3.2	3.8	3.9
Total BSUoS	144.1	150.6	111.4	99.9	81.6	83.8	147.0	83.5	64.1	88.2	70.3	108.2
Estimated BSUoS Vol (TWh)	36.2	39.5	44.7	45.7	50.0	40.6	41.2	38.2	36.7	34.1	35.6	34.0
Estimated Internal BSUoS (£m)	15.6	16.1	15.6	16.1	16.1	14.5	16.1	24.9	25.7	24.9	25.7	25.7
ESO Incentive	1.2	1.3	1.2	1.3	1.3	1.2	1.3	1.0	1.0	1.0	1.0	1.0
ALoMCP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Estimated BSUoS Charge (£/MWh)	4.45	4.25	2.87	2.57	1.98	2.45	3.99	2.86	2.47	3.35	2.73	3.97
Year ahead forecast (£/MWh)	1.81	1.42	2.35	1.80	1.49	1.63	1.62	2.25	2.48	2.52	2.69	2.85

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BSUoS Forecast Error

June 2019

- Cost: +£24.1m
- Vol: -2.7 TWh
- Charge: +£0.88 (35%)

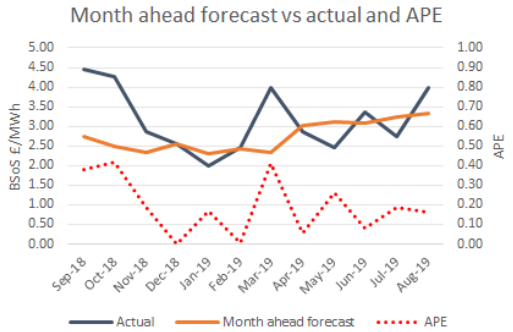
July 2019

- Cost: -£17.9m
- Vol: +1.6 TWh
- Charge: -£0.62 (19%)

August 2019

- Cost: +£37.9m
- Vol: -1.6 TWh
- Charge: +£1.25 (46%)

Month Ahead Forecast Error



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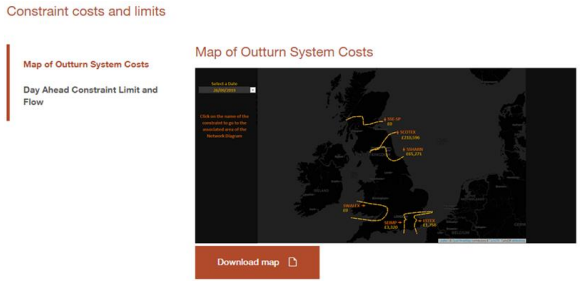
New and Future Reports

Operational Insights

- Sharing our insight on balancing actions and producing a map of outturn system costs for thermal constraint costs by region or constraint boundary.
- Publish day ahead information on constraint boundaries to share the limit and the expected flow at day ahead.



Upcoming Projects

- Sharing our insight on balancing actions and producing a map of outturn system costs for voltage constraints per region.
- New data portal:Q3 2019-20

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BSUoS Billing

Nick Everitt

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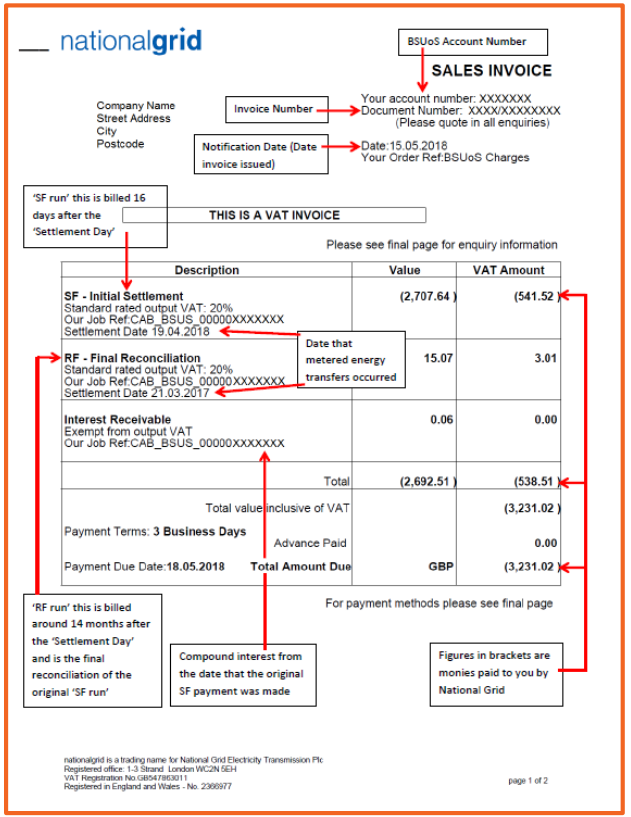
BSUoS Billing Agenda

1	Your bill
2	How to calculate your charge
3	Credit monitoring
4	BCR reporting improvement
5	BSUoS data sources

BSUoS Billing

Run type	Definition	When billed
II	Interim Initial	Settlement Day + 5 working days (no invoice sent)
SF	Settlement Final	Daily, Settlement Day + 16 working days
RF	Reconciliation Final	Daily, Settlement Day + 14 months



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The Balancing Services Charging Report (BCR)

- Cost categories updated
- Black start costs broken down to greater granularity
- Separate line for ESO incentive
- Placeholders for future costs

NGESO BALANCING SERVICES USE OF SYSTEM CHARGES — Page : 1
BALANCING SERVICES CHARGING REPORT(BCR)

Date: 08/10/2019

Settlement Day:13/09/2019

SAA Run Number:02 — Settlement Run Type:SF — NGESO Version Id:01

Internal Scheme Code:19/20 — Internal Scheme Name:2019/2020 — Internal Scheme Day: 166

BALANCING SERVICES USE OF SYSTEM CHARGE	TODAY COMPONENTS(£)	YEAR TO DATE(£)
System Operator Balancing Mechanism Costs	+1,469,476.780	+242,375,242.430
Balancing Services Contract Cost	+1,190,177.805	+147,033,856.239
Balancing Services Cost Variable	+241,600.570	+59,157,893.145
ESO Incentive Recovery Costs	+40,983.610	+6,803,279.260
Black Start Capital Costs	+.000	+.000
Black Start Testing Costs	+.000	+.000
Black Start Availability Costs	+114,936.360	+19,092,235.280
Black Start Other Costs	+.000	+.000
System Operator Internal Costs	+824,071.040	+136,795,792.640
System Innovation Costs	+.000	+.000
Prior Year Cost Recovery	+.000	+.000
EMR Incentive Revenue	+4,128.420	+685,317.720
Placeholder Column2 30 Charact	+.000	+.000
Placeholder Column3 30 Charact	+.000	+.000
Wind Forecast Incentive	+.000	+.000
Provision Of Balancing Services to Others	+.000	+.000
Total Internal Costs	+824,071.040	+136,795,792.640
Total External Costs	+3,061,303.545	+475,147,824.074
Total Adjusted Energy Volume (MWh)	+1,162,571.746	

BSC Party Charging Advice (BPA)

The rest of the BPA file will show how the BSUoS Charge was applied to each BMU

NGC BALANCING SERVICES USE OF SYSTEM CHARGES
BSC PARTY CHARGING ADVICE (BPA)

Date:	20180515						
Settlement Day:	20180419						
CAB Run Number:	2	SAA Run Number:	2	Settlement Run Type:	SF	NGC Version Id:	1
Internal Scheme Code:	18/19	Internal Scheme Name:	2018/2019	Internal Scheme Day:	19		
External Scheme Code:	18/19	External Scheme Name:	2018/2019	External Scheme Day:	19		
BSC PARTY ID:	XXXXX	BSC Party Name:	XXXXXXXXXXX				

BM UNIT SETTLEMENT PERIOD DATA:

BM UNIT ID: 2_AABCD

This table applies the BSUoS Charge to each metered volume period from BMU '2_AABCD'

Settlement Period	BM Unit Metered Energy Volume (MWh)	Transmission Loss Multiplier	Trading Unit Delivery Mode	Balancing Services Use of System Charge (£)
1	1.948	1.0172379	-1	**-13.782**
2	1.827	1.017628	-1	-12.364
3	1.155	1.0170298	-1	-7.924
4	1.819	1.0163888	-1	-13.429
5	3.859	1.0160457	-1	-23.641
6	4.735	1.0149942	-1	-31.539
7	4.467	1.0148752	-1	-24.958

Useful calculation

BSUoS Charge Calculation

BSUoS Price £/MWh x BM Unit metered Energy Volume (MWh) x Transmission Loss Multiplier x Trading Unit Delivery Mode (+ or – 1) = **BSUoS Charge for Settlement Period**

£6.9953 x 1.948 x 1.0172379 x -1
= **-£13.782**

How to calculate your BSUoS Charge

Example

Charges are calculated by individual settlement period per BMU

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Credit Monitoring

BSUoS liabilities must be secured (in line with Section 3, Part III of the CUSC)

- Generators secure 29 days of BSUoS charges
- NG ESO calculates the value based on historical billing

The value of security required is re-assessed at the start of each month and a statement is emailed to each customer.

BCR Reporting Improvement

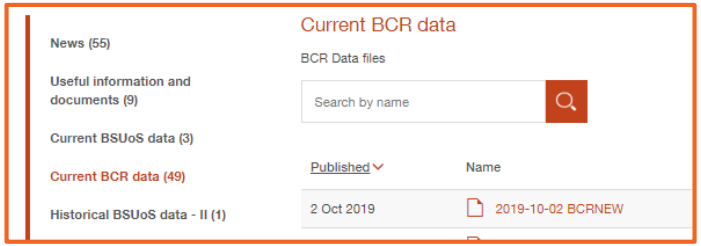
We now have a new price file which is issued alongside the existing reports via the FTP server. The price file contains II, SF and RF daily price data.

The Balancing Services Charging Report (BCR) now includes:

Section 1
Summary of costs by daily and year to date category.

Section 2
Shows the costs and price by SP (already shown on the existing BCR report).

Section 3
More granular costs by settlement period. Will enable users to see different cost components and model future prices.



We also upload the latest BCR report to our webpage daily

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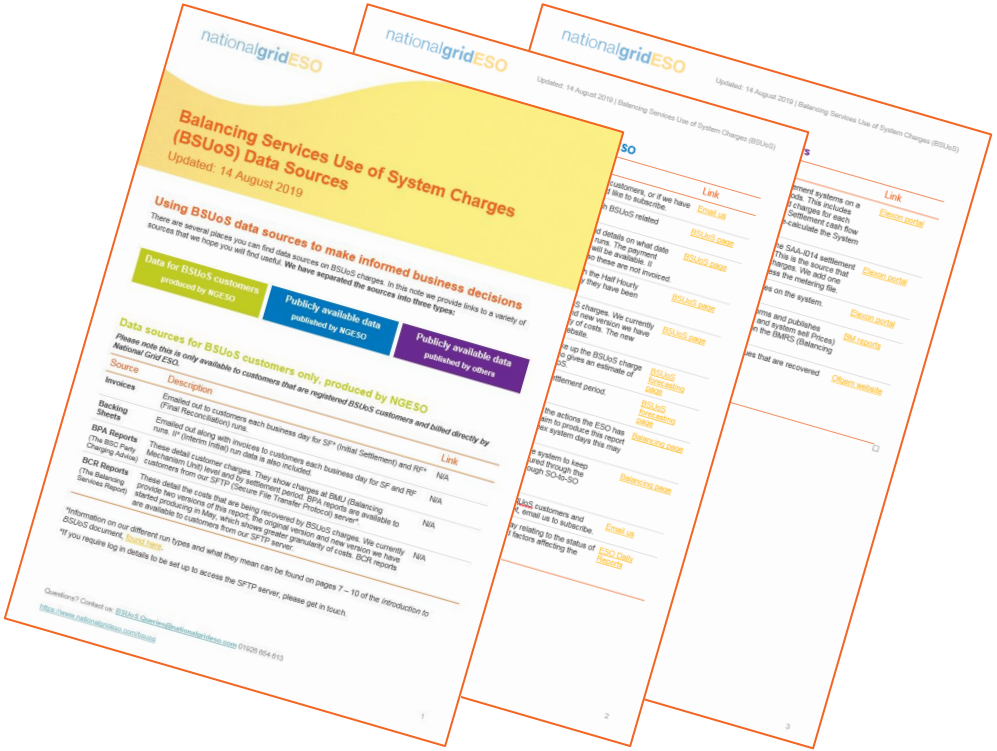
BSUoS Data Sources

- Guidance document with links to various data sources
- Will use some of the sources in the workshop later



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Connection Charges

Anthony Tichivangana

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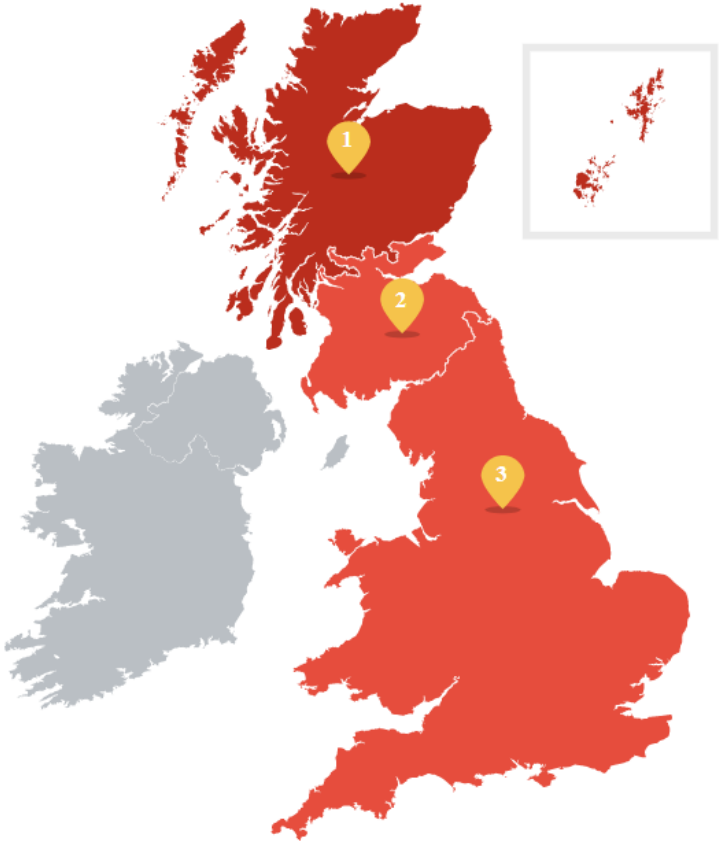
Connection charges

Connection Charging Team calculate and recover Connection Charges **on behalf of the Transmission Owner.**

Connection charges cover installing and maintaining **sole use assets** which connect users to the National Electricity Transmission System (NETS).



1 Scottish & Southern Electricity Networks

2 SP ENERGY NETWORKS

3 nationalgrid

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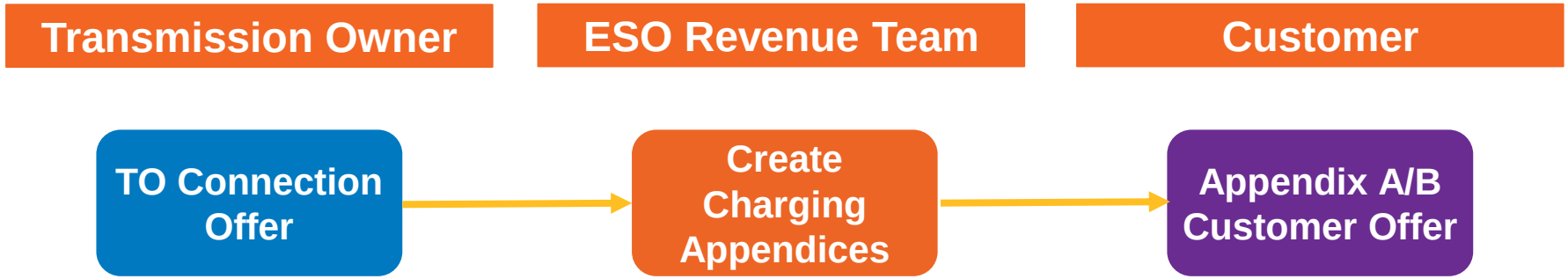
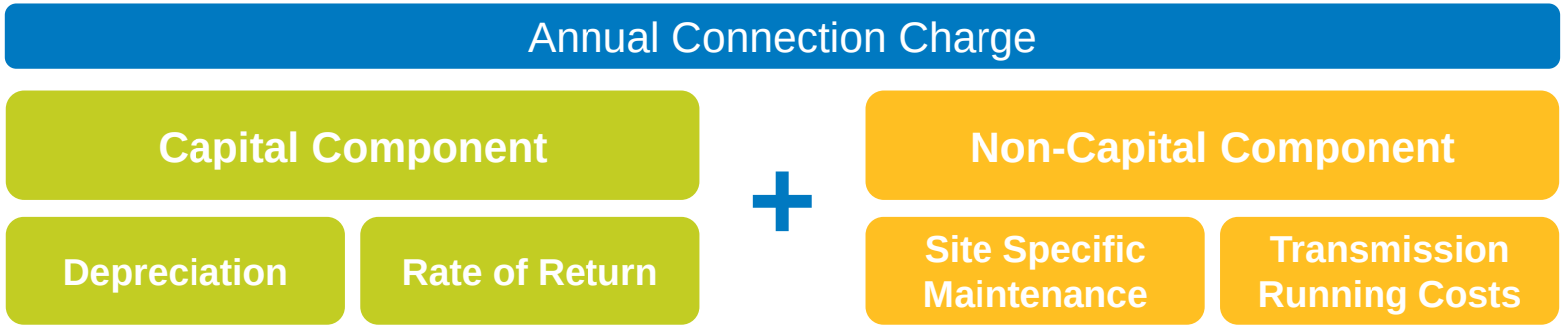
Connection Offer Process



- The Transmission Owner provide the ESO with the cost of the connection asset.
- We then apply our charging methodology to create a connection charge for customer offers.
- The ESO has contract in place with the TOs and customers for each connection

Connection charges

The connection charge is calculated annually and payable monthly. It's made up of the following elements:



- Customers can choose to pay the capital component in full to reduce the monthly connection charge. This is called a capital contribution.
- Non Capital Component is payable for as long as the site is operational, even after the capital component has been paid off.
- Customers are required to place post commissioning security for as long as the site is operational

After lunch

- Workshops
- Q&A
- Feedback

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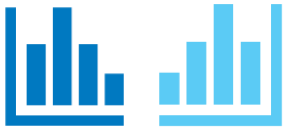
Workshops

Connection charges explained

In the session we will take you through how connection charges are calculated and explain what post-commissioning securities are.

Ways to reconcile your BSUoS charges



We will take you through how to use different data sources as a way of reconciling the BSUoS charge.

Code development updates and Q & A

We will talk through current code modifications which may have an impact on the transmission charging regime

Workshops continued

How and why we monitor your credit (TNUoS and BSUoS)

All customers receive a credit statement from us each month.

In this session, we'll explain what it's all about and why it's important.

How and why we reconcile your TNUoS charges

At the end of the charging year, you will have either underpaid or overpaid for TNUoS.

In this session we'll go take you through how we reconcile the charge.

Charging Forum Workshops

13:20 – 15:20

Time	Main room	L 9	L 10	Kitchen area
13:20 – 14:00	Ways to reconcile your BSUoS charges	How and why we monitor your credit (TNUoS and BSUoS)		Networking and refreshments
14:00 - 14:40	Code development updates and Q & A	Connection charges explained		
14:40 – 15:20	Ways to reconcile your BSUoS charges	Connection charges explained	How we reconcile your TNUoS charges	

Lunch

(Room L9)

Any questions?

Go to: **www.slido.com**
Event code: **#Charging2**

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Question and Answer session

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Your feedback on today

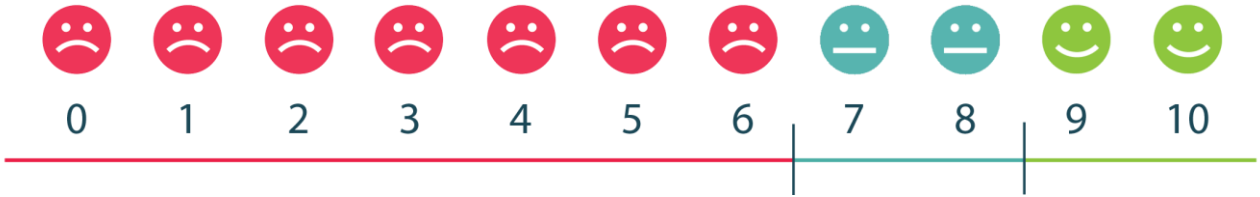
1. How likely is it that you would recommend the Transmission Charging Forum to a friend or colleague?

2. What did you like about this event?

3. How could we improve this event?

Poll questions

Go to: www.slido.com
Event code: #Charging2
Respond to 3 questions



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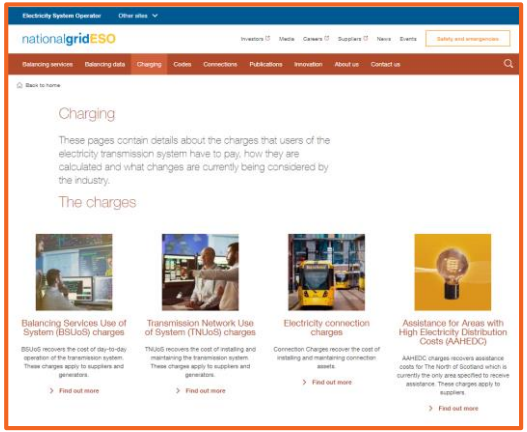
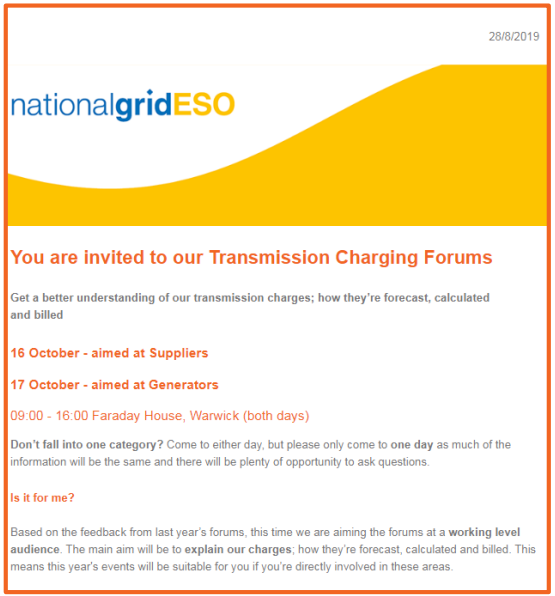
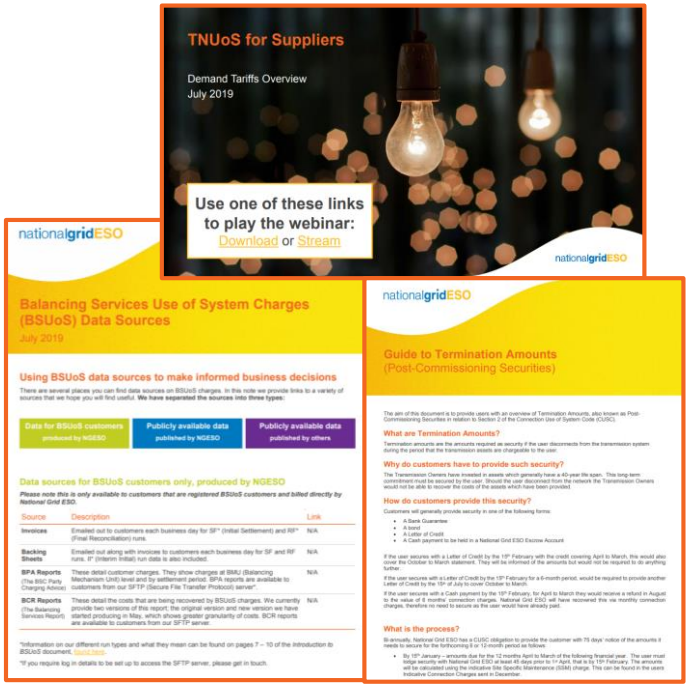
Our engagement channels



Website





Newsletter

Guidance materials

www.nationalgrideso.com/charging

Join our mailing list

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Upcoming events

- **2020/2021 Draft Tariffs Webinar** 5 December 10:30 - 11:30am
- **TNUoS Transport & Tariff Model training** 11 December 10:00am - 3:00pm

Contact us

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TransmissionConnectionCharging@nationalgrideso.com

www.nationalgrideso.com/charging

Customer Satisfaction Surveys - coming soon

We donate £10 to City Year UK for every survey response

We're asking for your feedback on:

- our overall service as a transmission charging team (covering BSUoS and TNUoS charges),
- our service as National Grid ESO as a whole.

Thank you

BMG Research

An independent research organisation

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