Revenue & Charging Forum 2023

ESO

Recordings available below by following the links

1. Overview & Website Tour → Here
2. TNUoS Tariff Setting → Here
3. TNUoS Billing → Here
4. AAHEDC → Here
5. Connections Charging → Here
6. BSUoS Tariffs → Here
7. BSUoS Billing → Here
8. STAR, Q&A and Wrap Up → Here

Welcome!

Nick George

ESO Revenue Manager - Billing and Charging

Questions and Feedback

We'll be using slido throughout the day to gather your questions

Join at:

slido.com

#Revenue

Today's agenda

Arrival and morning refreshments	09:00 – 09:30
Welcome and introduction to the day	09:30 – 09:40
Walkthrough of website	09:40 – 09:50
TNUoS Tariffs	09:50 – 11:00
Refreshments break	*11:00 – 11:20*
TNUoS Billing	11:20 – 12:00
AAHEDC	12:00 – 12:10
Connection charging	12:10 – 12:30
Lunch	*12:30 – 13:20*
BSUoS Tariffs	13:20 – 13:50
BSUoS Billing	13:50 – 14:15
STAR billing system update	14:15 – 14:30
Wrap Up / Q&A / 121 Support	14:30 – 15:00

Q&A: Slido.com → #Revenue

Meet the Revenue Team

Nick George
Revenue Manager – Charging and Billing

Heather Stratford
TNUoS Billing Lead

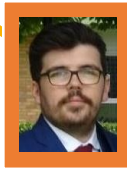
Graeme Hickman
BSUoS Billing Lead

Luke Craddock
Connections Charging Lead

Dan Hickman
TNUoS Billing Analyst

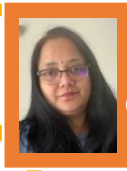
Davinder Sanghera
BSUoS Billing Analyst

John Beezley
Connections Charging Analyst



Matt Marriott
TNUoS Billing Analyst

Jheaunelle Thomas
TNUoS Billing Analyst



Rama Kodukula
Compliance Analyst

Offshore Team
(Team of 9)

Nick Everitt
Revenue Manager - Tariff Setting & Change Management

Sarah Chleboun
Revenue Tariff Lead

Vacant Position
Senior Revenue and Charging Analyst

Katie Clark
Senior Revenue and Charging Analyst

Ishtyaq Hussain
Revenue and Charging Analyst

New Position
Revenue & Tariff Analyst

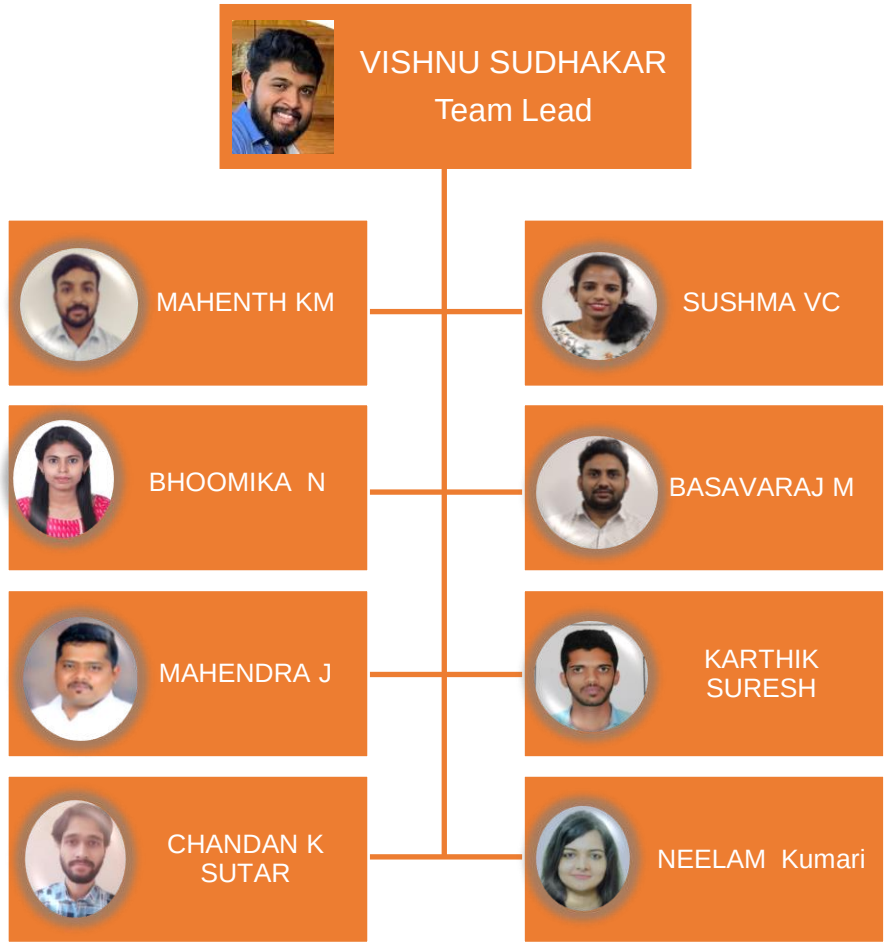
Marwah Az-zahra
Revenue & Tariff Analyst

Vacant Position
Revenue & Tariff Analyst

ESO

Meet the Revenue Team: Offshore

Q&A: Slido.com → #Revenue



BSUoS Billing	Connection Charging and Billing	TNUoS Billing	TNUoS Tariff Setting
Neelam	Basavaraj	Mahendra	Chandan
Mahenth	Sushma	Sushma	Karthik
Bhoomika	Chandan	Mahenth	Basavaraj
Sushma	Karthik	Neelam	
	Mahendra		

Our Charges

TNUoS

Transmission Network Use of System Charges
~ £4.4bn TO Revenue *

Connection Charges

Charges for connecting to the transmission network (inc one-off + cap cons)
~ £400m TO Revenue *

AAHEDC Charges

Assistance for Areas with High Electricity Distribution Costs
~ £110m SHEPD Revenue *

BSUoS

Balancing Services Use of System Charges
~ £3.8bn Revenue *

* Forecast for FY23/24, as at Sep 2023

How to Engage with Us

Transmission Charging Methodology Forum (TCMF)

A sub-group Further details can be found on the ESO website

Operational Transparency Forum (OTF)

Useful for information on operational matters, including balancing costs. Details, including a link to receive regular reminders, are available here

Subscribe to our Charging mailing list

If you're not already subscribed to our mailing list you can subscribe here

Get in touch

tnuos.queries@nationalgrideso.com – TNUoS & AAHEDC queries

bsuos.queries@nationalgrideso.com – BSUoS queries

transmissionconnectioncharging@nationalgrideso.com – Connection Charge queries

https://www.nationalgrideso.com/contact-us - contact details for other matters

Website Tour

Nick George

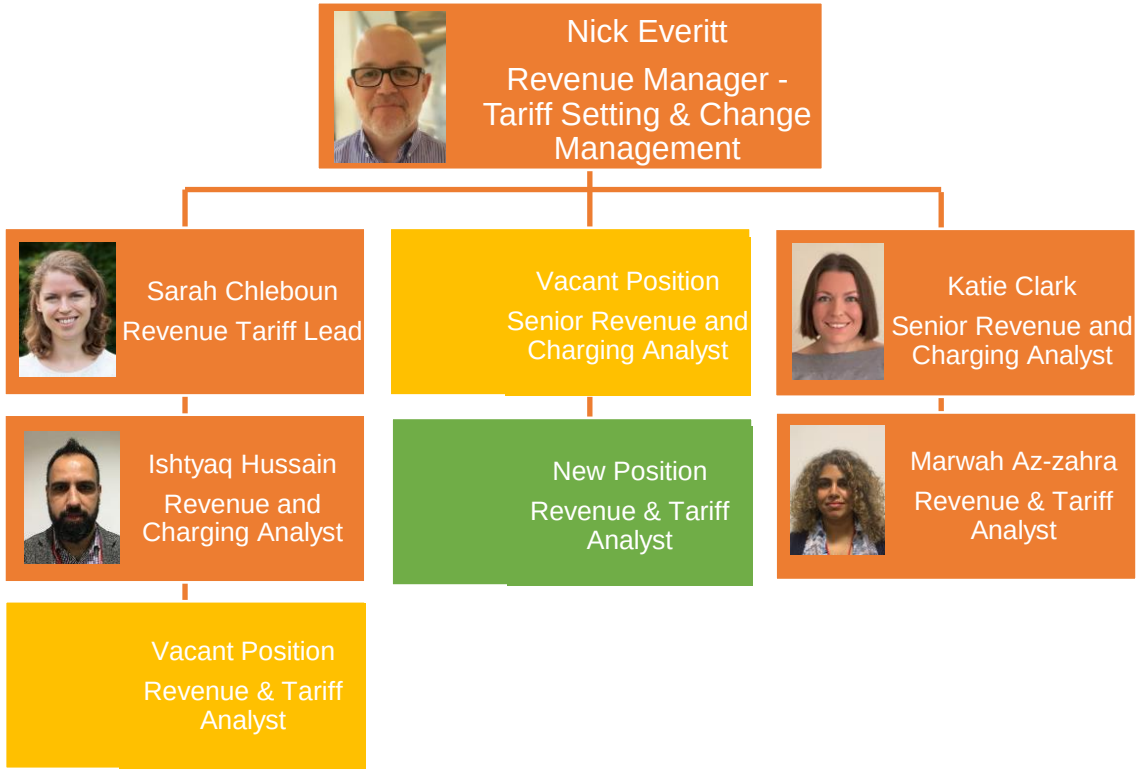
ESO Revenue Manager - Billing and Charging

https://www.nationalgrideso.com/

TNUoS Tariffs Overview

TNUoS Tariff Forecasting & Setting Team

ESO Revenue Team
TNUoS Tariff Forecasting & Setting



What is TNUoS and who pays

What is TNUoS?

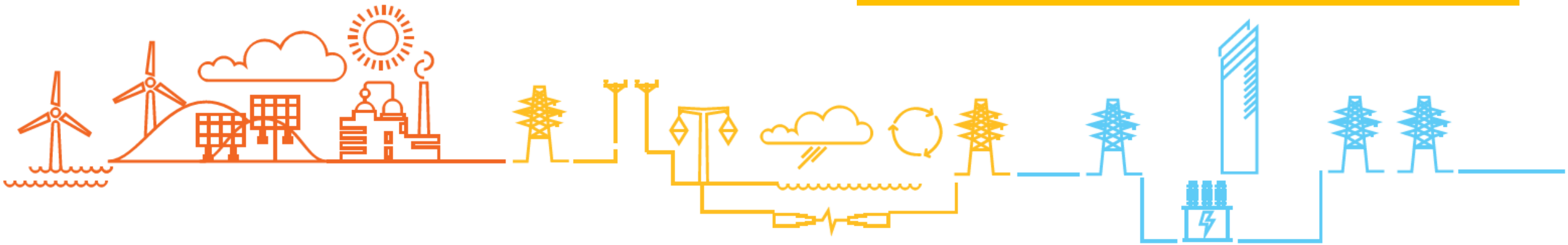
Q&A: Slido.com → #Revenue

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

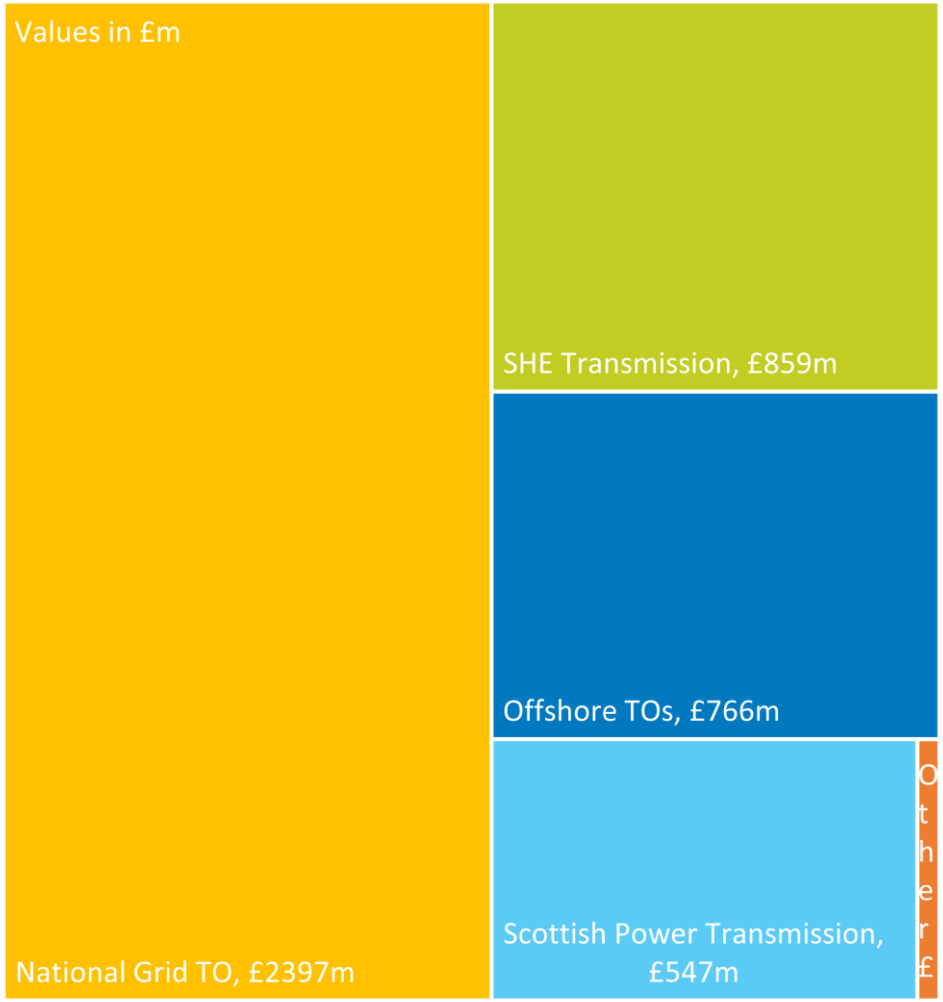
Adjustment charge: used to ensure generation tariffs are compliant with EU legislation.

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?

Q&A: Slido.com → #Revenue



Figures from [Final TNUoS Tariffs for 2023/24]
Note: figures have been rounded to the nearest £1m

Recovers revenue for:

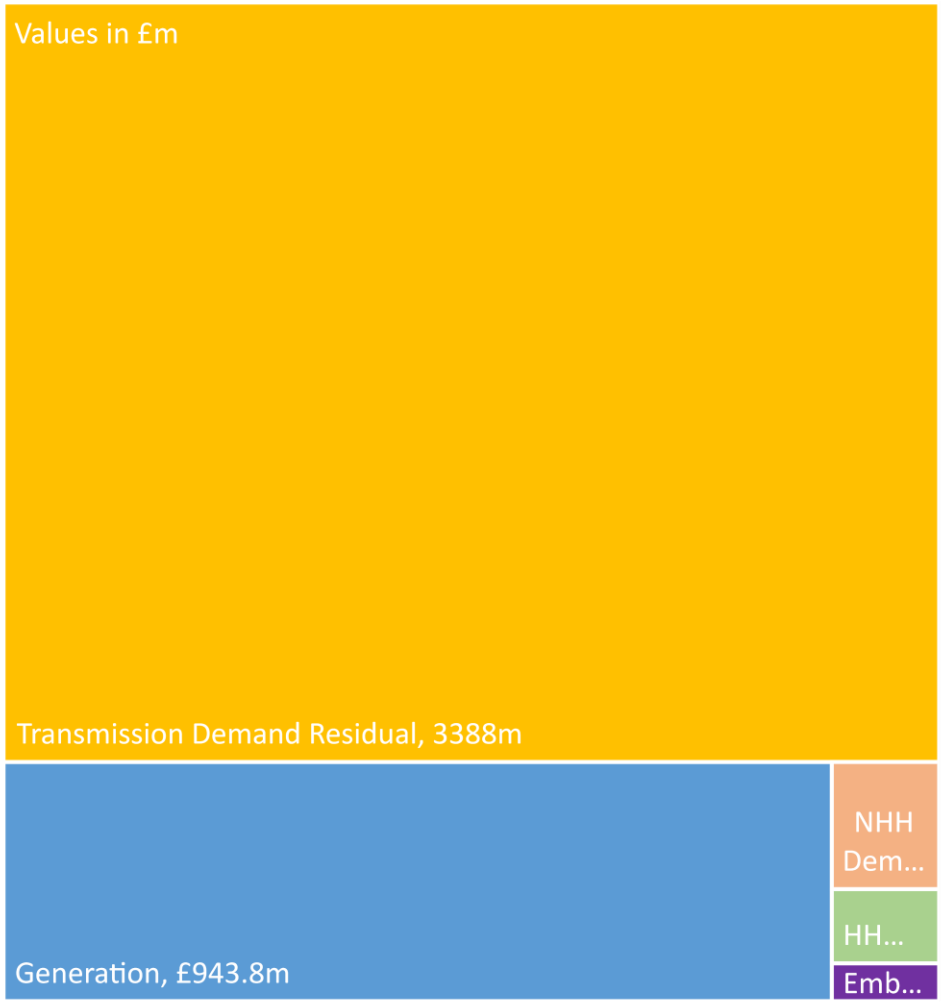
- Onshore TOs
  - National Grid Electricity Transmission
  - Scottish Power Transmission
  - Scottish Hydro Electricity Transmission
- Offshore TOs
- Other

Who pays TNUOS?

Q&A: Slido.com → #Revenue

TNUoS Revenue paid by:

- Total TNUoS Revenue for 2023/24, £4,416m
- Demand Revenue £3,473m
  - HH Demand £38m
  - NHH Demand £65m
  - Embedded Export -£19m
  - Transmission Demand Residual £3,388m
- Generation £944m



Figures from Final TNUoS Tariffs for 2023/24
Note: figures have been rounded to the nearest £1m

Who pays TNUoS? - Generators

Q&A: Slido.com → #Revenue

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 net demand during the Triad

Who pays TNUoS? - Demand

Q&A: Slido.com → #Revenue

- 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

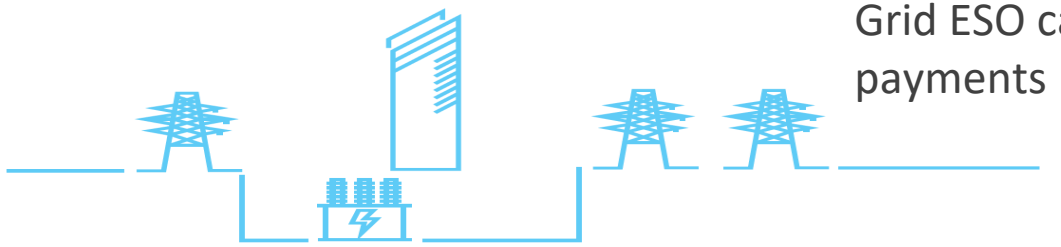
Embedded Export credited for export over Triads

Directly Connected Demand

Directly Connected Demand sites pay HH demand charges

Embedded Generation

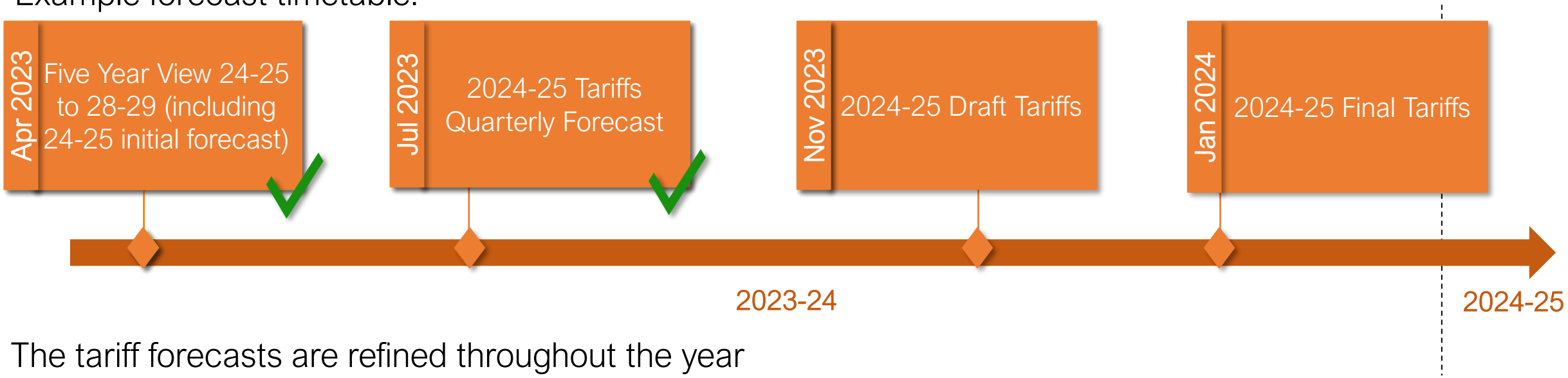
Embedded Generation (<100MW) which contracts directly with National Grid ESO can gain Embedded Export payments



Tariff Timetable

ESO has a licence and CUSC obligation to publish quarterly TNUoS forecasts and a 5 year review annually, to enable market participants to make efficient operational and investment decisions.

Example forecast timetable:



- The tariff forecasts are refined throughout the year
- The Final Tariffs are published by 31st January and take effect from the following 1st April.
- The forecast timetable for each year is published by the end of the preceding January.
- All of our tariff publications and webinar recordings can be found on our website: https://www.nationalgrideso.com/industry-information/charging/transmission-network-use-system-tnuos-charges

Generation TNUoS

Generation TNUoS

Generation TNUoS

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

Generation £944m

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

Generation TNUoS Tariffs

Q&A: Slido.com → #Revenue

Directly Connected Generators (BCAs) are liable for:

Embedded generators (BEGAs) with TEC ≥ 100MW are liable for:

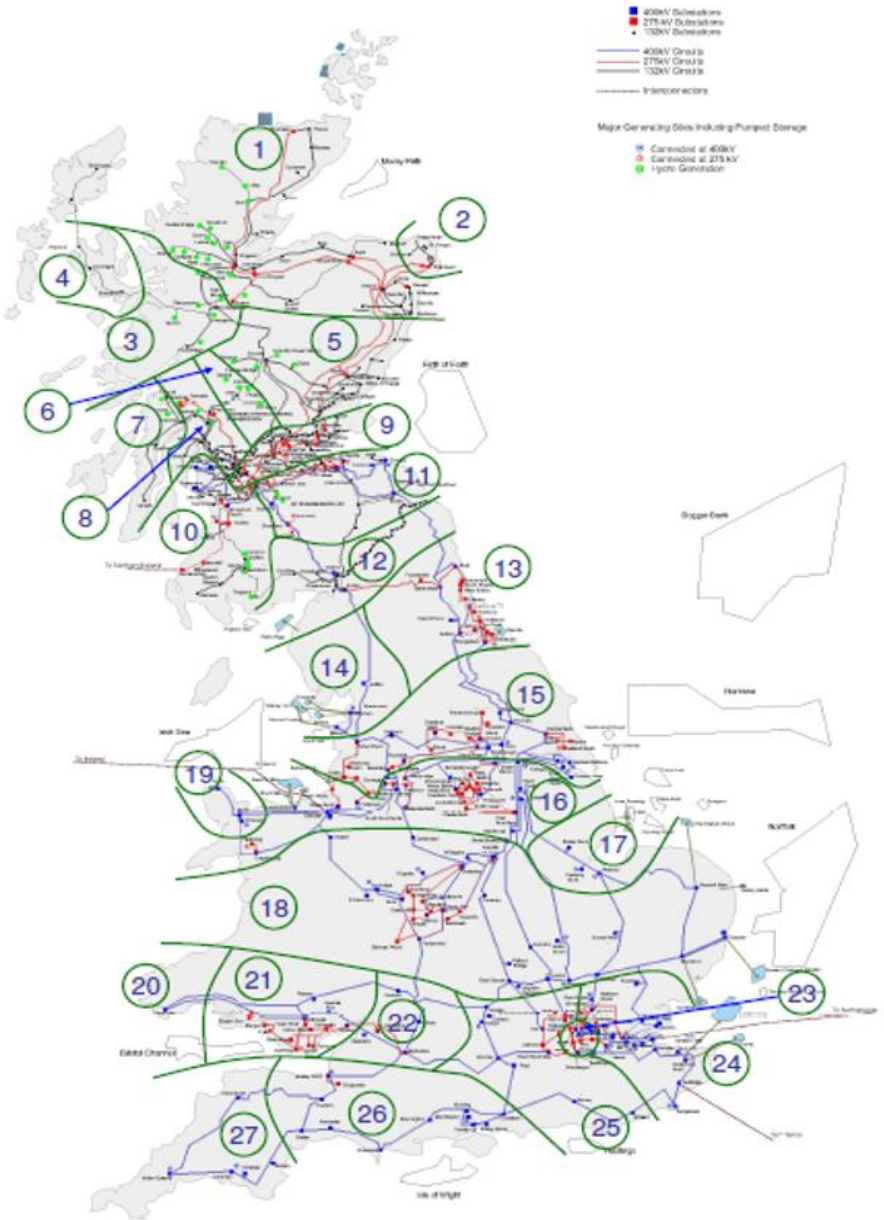
Embedded generators with TEC < 100MW are not liable for generation TNUoS charges but may be paid the Embedded Export Tariff (EET)

Always applies

May (or may not) apply

Generation Wider Tariffs

- Wider tariffs are calculated per zone
- Currently 27 generation zones
- Components apply based on fuel type



Wider Tariff components:

Peak Security	Year Round Shared
Year Round Not Shared	Adjustment

Wider Generation Charging Categories

Q&A: Slido.com → #Revenue

Intermittent e.g. Wind, Tidal, Solar

Wider Tariff = [Annual Load Factor (ALF) × Year Round Shared] + Year Round Not Shared + Adjustment

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

Wider Tariff = Peak + [ALF × Year Round Shared] + Year Round Not Shared + Adjustment

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

Wider Tariff = Peak + [ALF × Year Round Shared] + [ALF × Year Round Not Shared] + Adjustment

Annual Load Factors (ALFs)

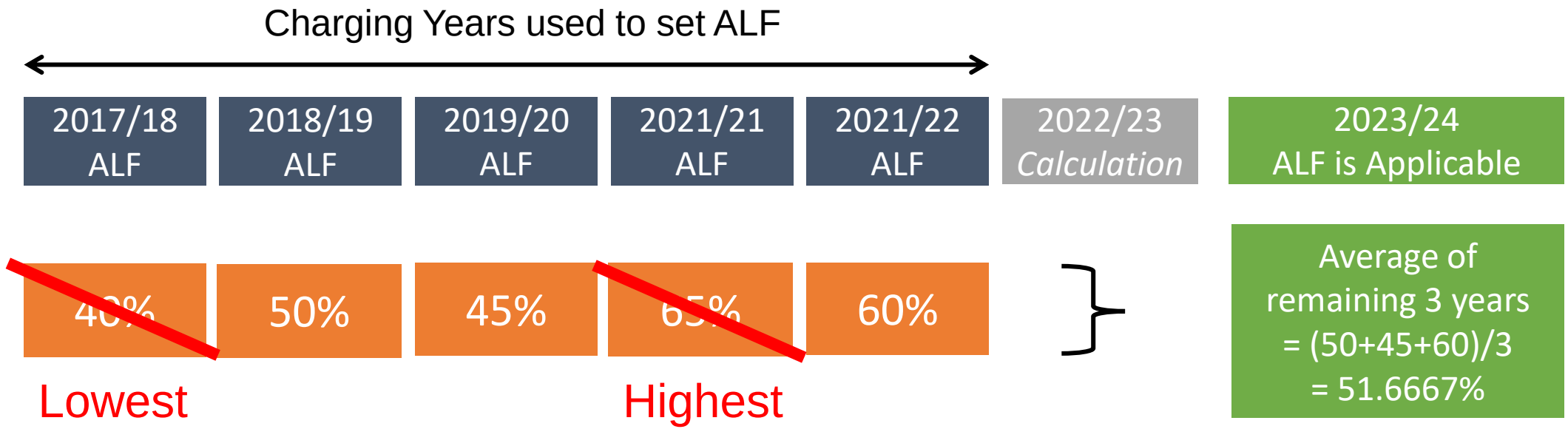
- **ALFs** give a measure (over 5 years) of a generator's output compared to its capacity, using:
  - Higher of Metered Output (MO) and Final Physical Notifications (FPN)
  - Transmission Entry Capacity (TEC)
- **ALFs are calculated at power station level**
  - For a power station with multiple Balancing Mechanism Units (BMU), the BMUs are aggregated before calculating the ALF
- **Co-location** of generating sets of different fuel types **within one power station**
  - Currently, the power station is charged according to the predominant fuel type
  - A guidance document is available on our website
- For each year in the past 5 years (where data is available):

Annual Load Factor for each of 5 years = Sum of Max (MO, FPN) for each settlement period ÷ [Sum of TEC for each settlement period × 0.5]

How to Calculate an ALF…

Q&A: Slido.com → #Revenue

- **ALFs for 2023/24** are based on data from charging years 2017/18 - 2021/22



- Where a Power Station has less than 5 years data available, then:
  - If 4 years of data – the lowest year is removed
  - If 3 years of data – all 3 years are used, none are removed
  - If < 3 full years of data – we use fuel-specific generic ALFs to complete the 3 years

Local Tariffs

What are Local TNUoS Tariffs?

Q&A: Slido.com → #Revenue

- Onshore local circuit tariffs may be charged to generators which connect directly to the transmission network if they are not directly connected to the MITS
- Onshore local substation tariffs are charged to generators which connect directly to the transmission network

Onshore Local circuit tariff

Onshore Local substation tariff

- Offshore local tariffs are specific tariffs to cover the cost the OFTO pays for the offshore transmission infrastructure. They are calculated using actual project costs.

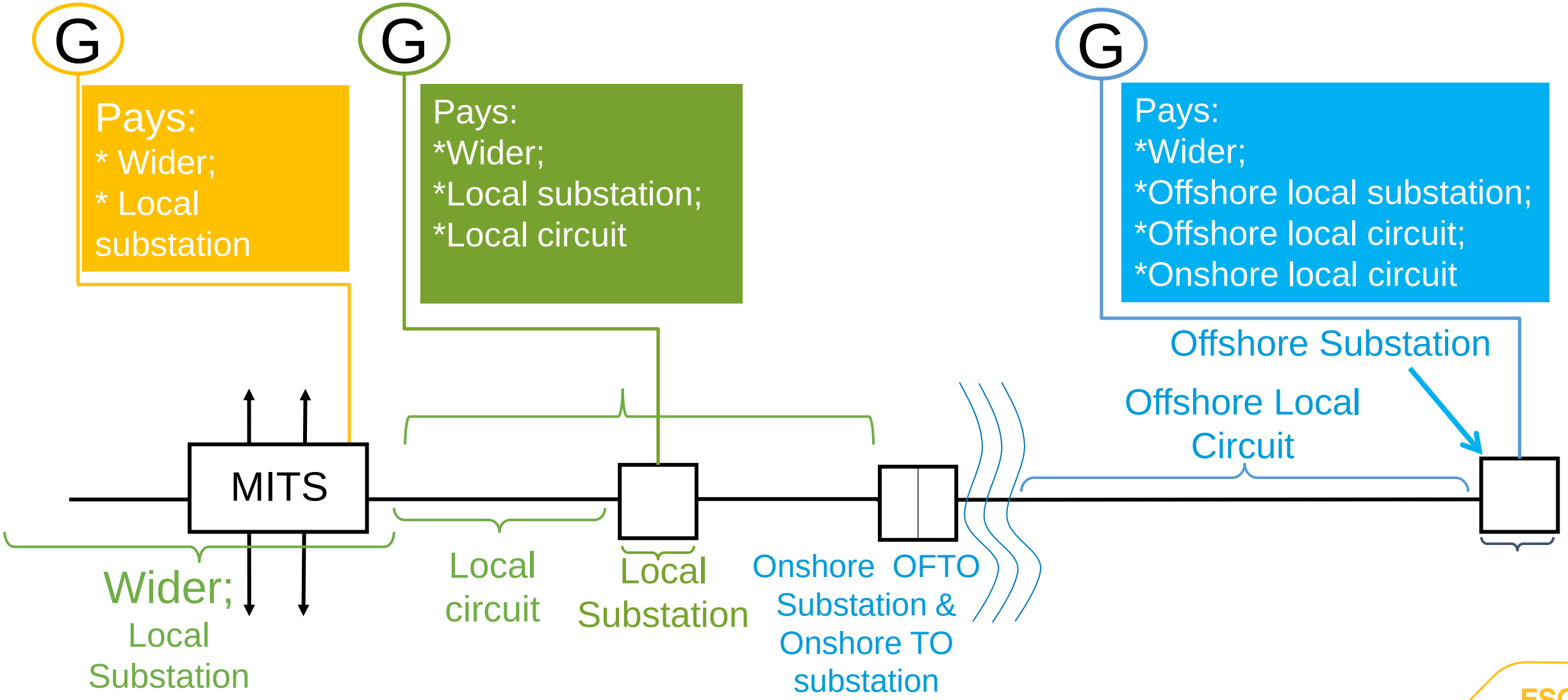
Offshore local circuit tariff

Offshore local substation tariff

ETUoS (if applicable)

Generation Tariffs: Directly connected generators

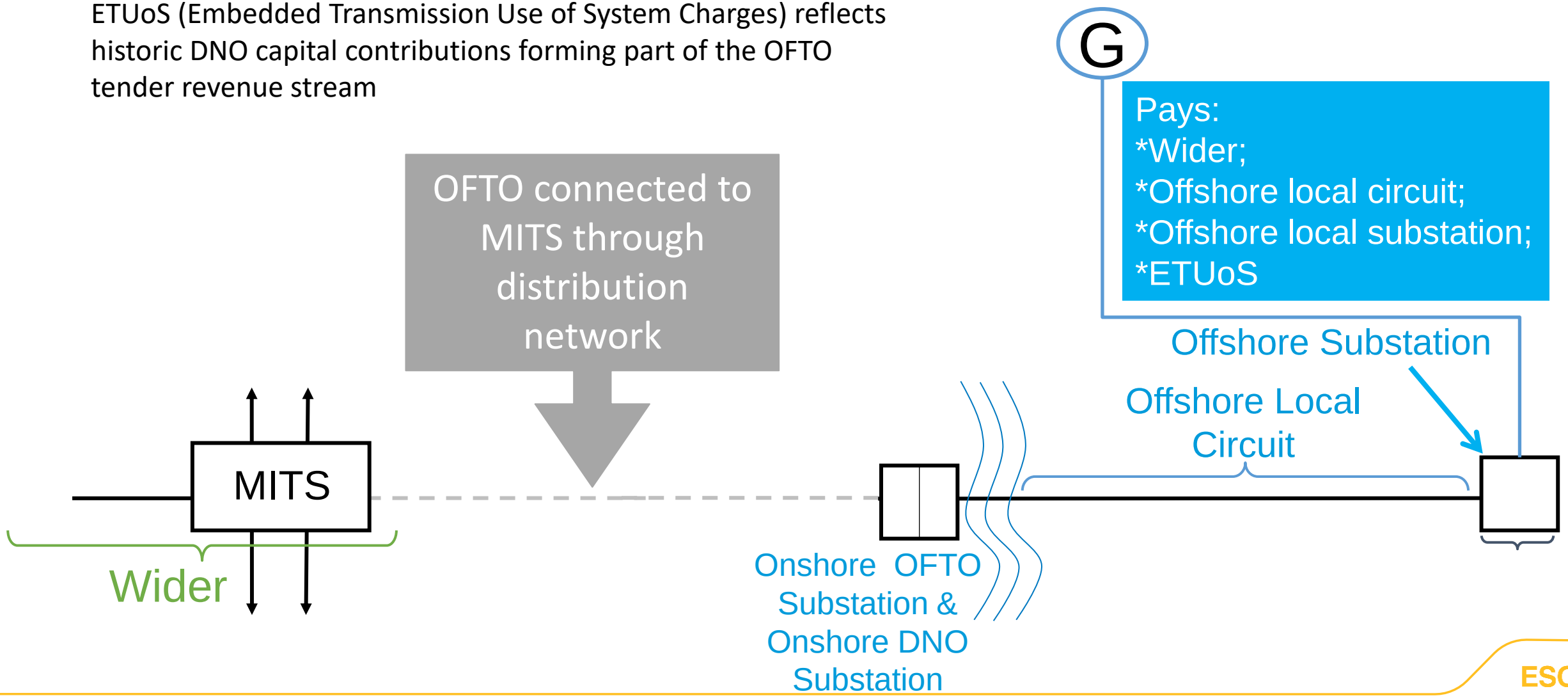
Q&A: Slido.com → #Revenue



Directly connected offshore generators via “embedded” OFTO

Q&A: Slido.com → #Revenue

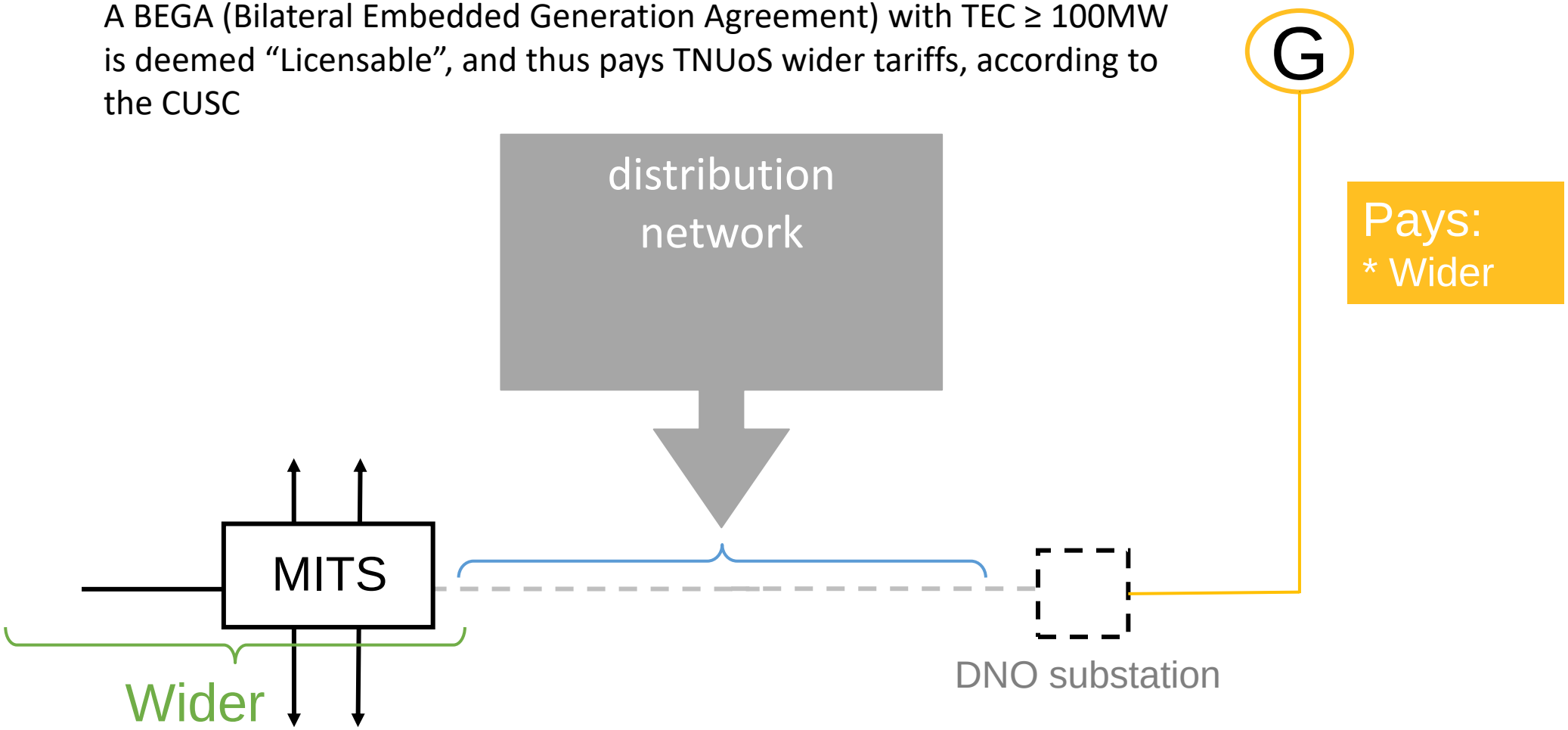
ETUoS (Embedded Transmission Use of System Charges) reflects historic DNO capital contributions forming part of the OFTO tender revenue stream



Embedded generators with TEC ≥100MW

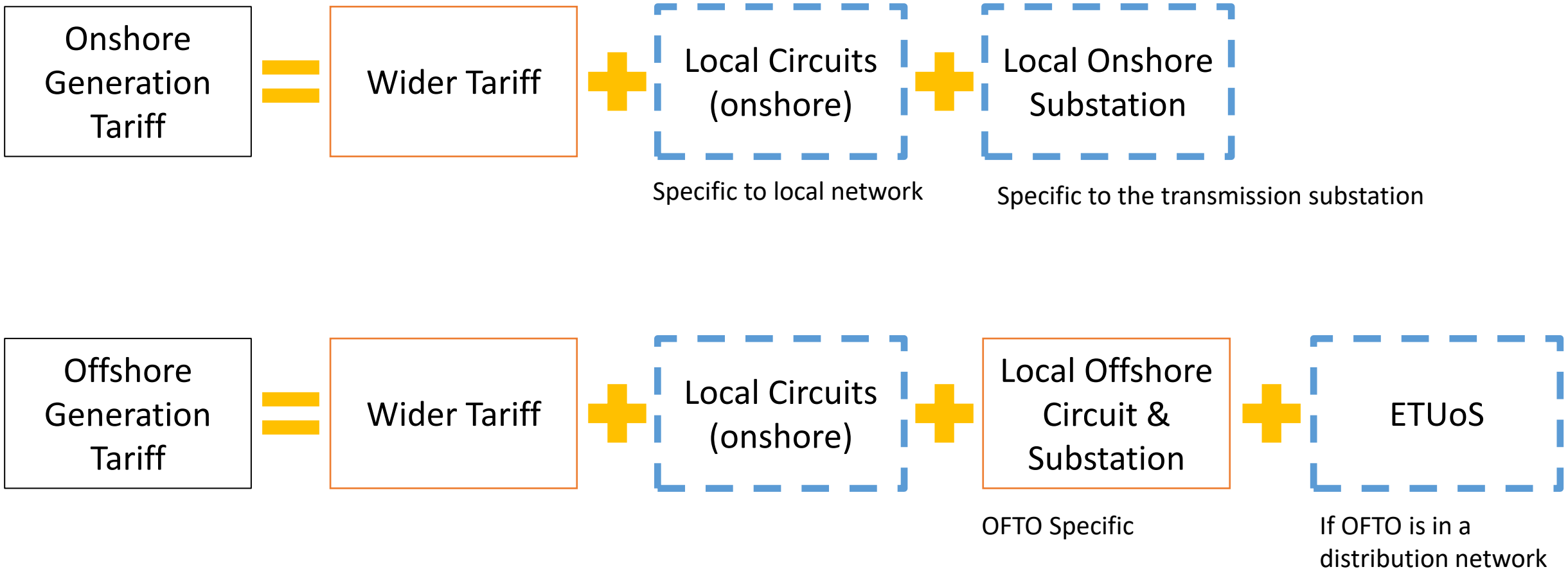
Q&A: Slido.com → #Revenue

A BEGA (Bilateral Embedded Generation Agreement) with TEC ≥ 100MW is deemed “Licensable”, and thus pays TNUoS wider tariffs, according to the CUSC



Summary: Generation Tariff Structure

Q&A: Slido.com → #Revenue



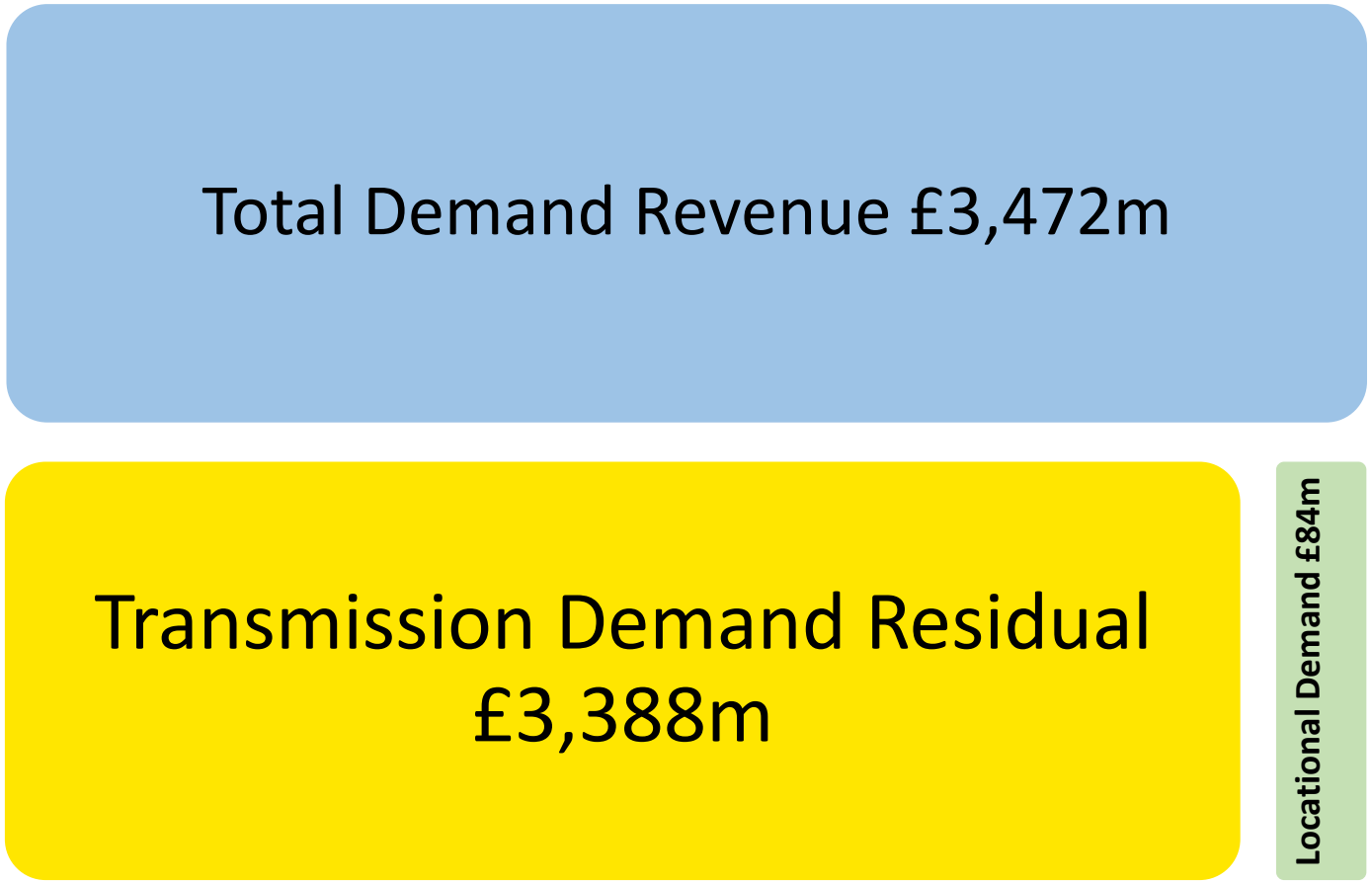
Demand TNUoS

Demand TNUoS agenda

1	Introduction
2	Transmission Demand Residual
3	Demand TNUoS Tariffs (HH & NHH)
4	What are Triads
5	Embedded Export Tariffs

Demand TNUoS Breakdown

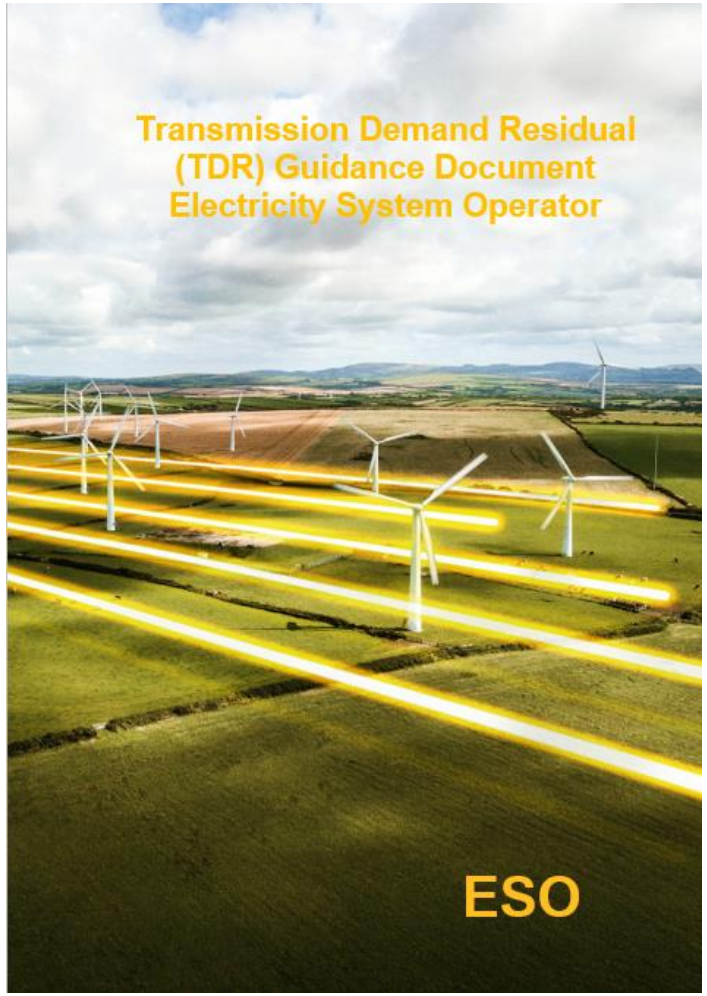
- Of the total TNUoS revenue (£4,416m) to be recovered for 2023/24 tariffs, Demand revenue accounts for £3,472m (78.6%)
- Transmission demand residual £3,388m (98%) makes majority of the demand revenue Charged at £/Site/Day.
- Locational demand £84m (2%) only a small element of overall demand revenue.



Transmission Demand Residual - Background

Q&A: Slido.com → #Revenue

- Changes were directed by Ofgem after the Targeted Charging Review (TCR) Significant Code Review (SCR).
- TCR covered a whole range of changes, Transmission Demand Residual (TDR) was only one aspect.
- ‘Banded’ methodology, which results in a £/site/day charge, directed by Ofgem for both DUoS and TNUoS.
- TDR Guidance document can be found on the Charging Guidance page of our website.



How Bands are Created

Q&A: Slido.com → #Revenue

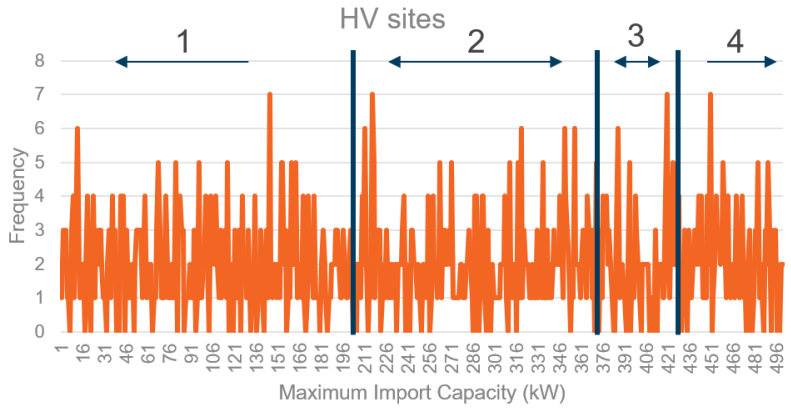
- The bands are defined in the DCUSA and CUSC by percentiles.
- At the beginning of each TO price control, ESO convert these percentiles in to ‘real’ values. This includes DNO bands too as per our obligations as the ‘Banding Agent’ in DCUSA Schedule 32.

- DNO bands based on Max Import Capacity (MIC) or Consumption (kWh) for sites with no MIC
- All Transmission bands based on Consumption (MWh)
- These bands are the same across TNUoS and DUoS charges
- DNO sites subject to DUoS and TNUoS charges
- Transmission sites only subject to TNUoS

1. How will the bands be determined?

An example banding situation with 1000 HV demand sites using randomised data between 1kW and 500kW

≥85th percentile	
70th ≤ x < 85th percentile	
40th ≤ x < 70th percentile	
<40th percentile	
HV Band 4	≥428kW
HV Band 3	357kW – <428kW
HV Band 2	206kW – <357kW
HV Band 1	<206kW



TDR – Calculation of Tariffs

Q&A: Slido.com → #Revenue

2. Work out the consumption and site count per band;

3. Smear the TDR across bands based on proportion of consumption.

4. Divide the total band recovery (from 3) by the number of sites and days to create a £/site/day tariff.

Unit Measurement	Band	Percentile	Threshold (kWh/MWh or kVA)		Consumption (GWh)	Consumption Proportion %	Site Count	Final TDR Charge (£/site/Day)
			Lower (>)	Upper (≤)				
	Domestic				103,177	37.99%	29,486,717	0.12
kWh	LV_NoMIC_1	≤ 40%	-	3,571	1,631	0.60%	912,728	0.06
	LV_NoMIC_2	40 - 70%	3,571	12,553	5,647	2.08%	694,427	0.28
	LV_NoMIC_3	70 - 85%	12,553	25,279	6,733	2.48%	347,206	0.66
	LV_NoMIC_4	> 85%	25,279	∞	20,450	7.53%	339,634	2.05
kVA	LV1	≤ 40%	-	80	7,935	2.92%	81,573	3.32
	LV2	> 40 - 70%	80	150	11,785	4.34%	65,990	6.09
	LV3	> 70 - 85%	150	231	7,305	2.69%	25,134	9.91
	LV4	> 85%	231	∞	19,707	7.26%	30,099	22.32
	HV1	≤ 40%	-	422	4,301	1.58%	8,490	17.27
	HV2	> 40 - 70%	422	1,000	12,616	4.65%	7,736	55.58
	HV3	> 70 - 85%	1,000	1,800	9,733	3.58%	3,040	109.14
	HV4	> 85%	1,800	∞	27,313	10.06%	3,361	276.99
	EHV1	≤ 40%	-	5,000	1,879	0.69%	490	130.70
	EHV2	> 40 - 70%	5,000	12,000	4,827	1.78%	256	642.65
	EHV3	> 70 - 85%	12,000	21,500	5,132	1.89%	135	1,295.79
	EHV4	> 85%	21,500	∞	14,287	5.26%	138	3,528.82
MWh	T-Demand1	<= 40%	-	33,548	342	0.13%	29	402.04
	T-Demand2	> 40 - 70%	33,548	73,936	936	0.34%	19	1,678.27
	T-Demand3	> 70 - 93%	73,936	189,873	1,736	0.64%	13	4,551.00
	T-Demand4	> 93%	189,873	∞	1,720	0.63%	5	11,722.40
Unmetered demand								
	Unmetered (p/Kwh)				2,404	0.89%		1.25
							Total TDR (£m)	3,388

1. Work out the total value of the TDR

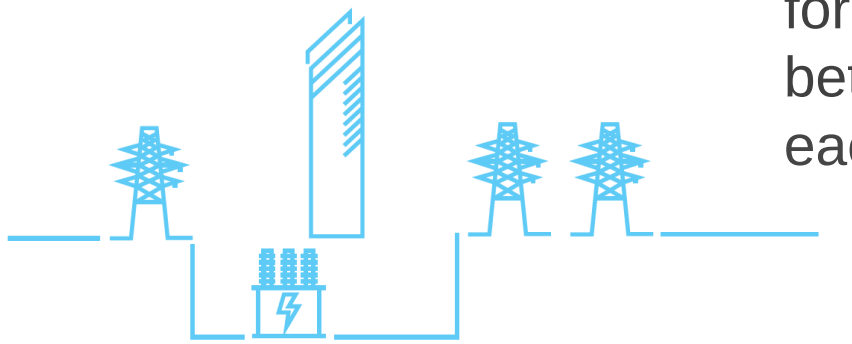
[2023/24 TB table link here]

Demand TNUoS Tariffs

- TNUoS Demand recovered £3.5bn of revenue. This accounted for 79% of total TNUoS revenue of £4.4bn in 2023/24.
- Locational demand revenue £84m (includes -£19.4m payment for Embedded generation).
- There are two demand tariffs for each of the 14 demand zones

Half-Hourly (HH) Demand (£38m)

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



Non Half-Hourly (NHH) Demand (£65m)

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

Demand TNUoS: HH & NHH Tariffs

Q&A: Slido.com → #Revenue

HH Demand Tariff = Demand Locational (£/kW) + Residual £/Site/Day

Residual charge only applicable to final demand sites

NHH Demand Tariff (p/kWh) = [Revenue Required per zone − Revenue recovered from Gross HH] ÷ NHH Volume (kWh)

Triads – what are they?

Q&A: Slido.com → #Revenue

Three half hour settlement periods of highest GB net demand

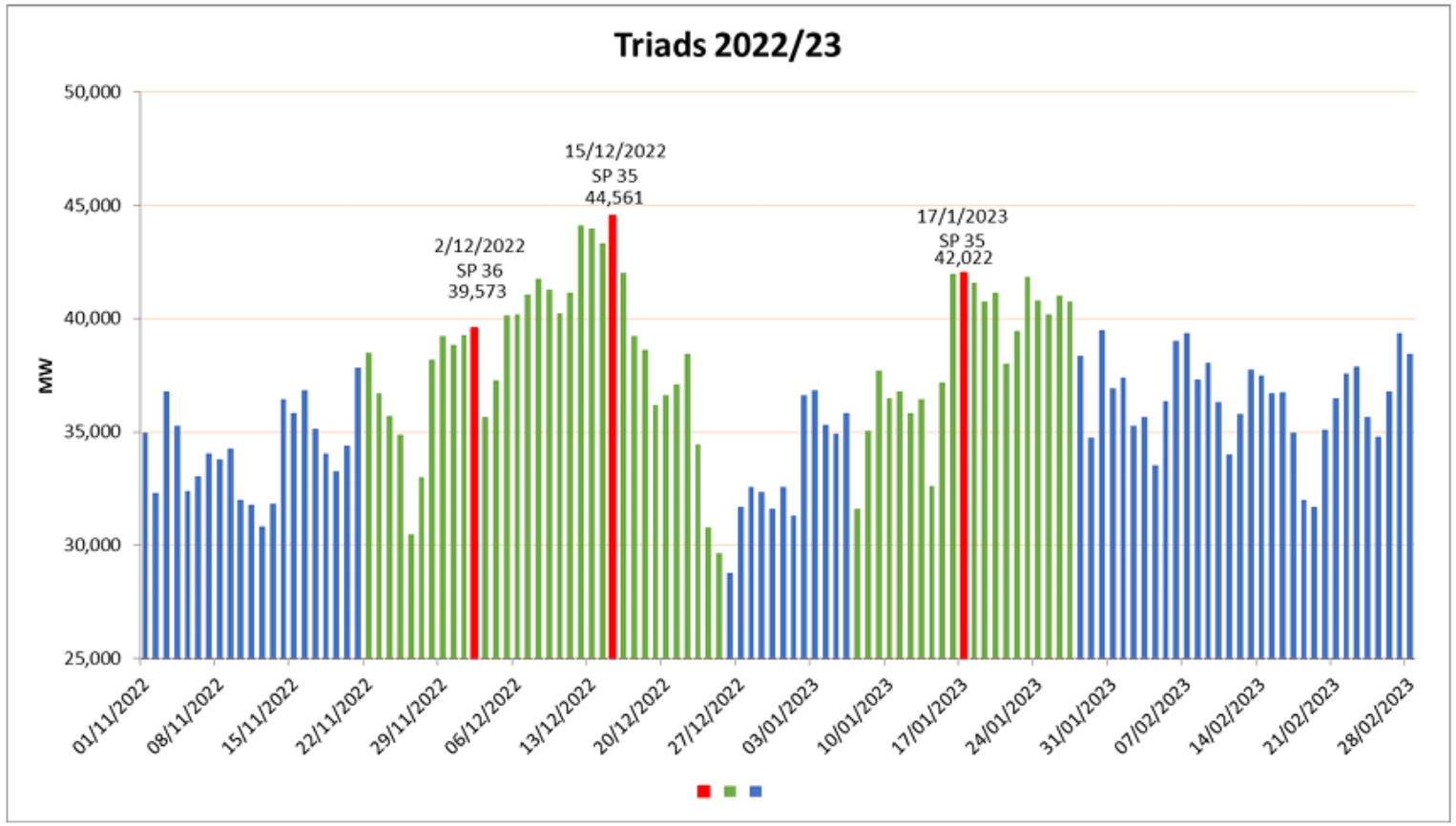
- Separated by a minimum of 10 clear days
- Determined after the event using settlement metering data reported in March
- Impact of Triads has reduced since the implementation of the transmission demand residual methodology

November

February

Triads for Winter 2022/23

Q&A: Slido.com → #Revenue



- The Triads are used to calculate charges for those who are half hourly (HH) metered. This tends to be industrial and commercial customers.
- If they don't consume electricity in the three Triad periods, they don't pay HH TNUoS charges for the entire financial year

Date	Settlement Period	Net System Demand (MW)
15/12/2022	35	44,561
17/01/2023	35	42,022
02/12/2022	36	39,573

- Triads in 2022/23 happened twice on half hourly settlement period 35 (5:30pm) and once on period 36 (6pm). Two Triad periods were reached in December and once in January.

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 (£19.4m)

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

Embedded Export Tariff

Embedded Export Tariff = **Demand Locational (£/kW)** + **AGIC* (£2.55/kW)**

- Based on the forecast of Embedded Generation output, a total of £19.4m will be paid to generators in 2023/24.
- This is added to the revenue to be recovered from the locational demand, to ensure overall revenue recovery is correct.

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

TNUoS Demand Tariffs comparison (2022/23 to 2023/24)

Zone	Zone Name	HH Demand Tariff (£/kW)	NHH Demand Tariff (p/kWh)	Embedded Export Tariff (£/kW)
1	Northern Scotland	27.446662	3.558626	-
2	Southern Scotland	35.465718	4.395158	-
3	Northern	44.681931	5.280945	-
4	North West	51.407508	6.382111	-
5	Yorkshire	51.839430	6.199445	-
6	N Wales & Mersey	53.406721	6.460609	-
7	East Midlands	55.528462	6.954272	1.011210
8	Midlands	57.193871	7.145603	2.676619
9	Eastern	57.953489	7.696135	3.436237
10	South Wales	58.461967	6.630234	3.944715
11	South East	60.199079	8.057826	5.681827
12	London	63.687789	6.457749	9.170537
13	Southern	62.263662	7.854326	7.746409
14	South Western	63.747665	8.671244	9.230413
Residual charge for demand:		56.861767		

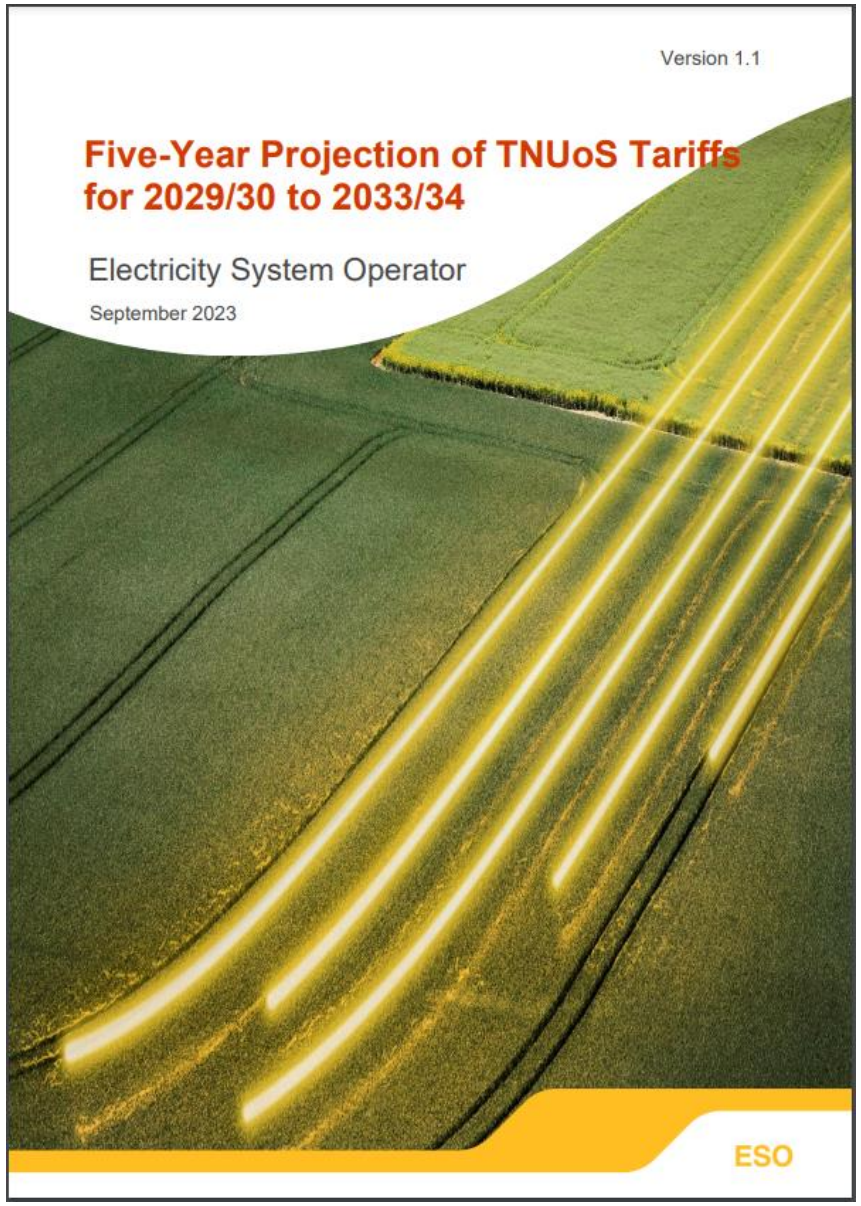
HH Demand Tariff (£/kW)	NHH Demand Tariff (p/kWh)	Embedded Export Tariff (£/kW)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	0.410283
-	-	2.051847
3.046892	0.400584	5.594200
0.272515	0.037686	2.819823
6.689801	0.794120	9.237109
2.928529	0.402166	5.475837
4.374542	0.489298	6.921850
5.290615	0.703544	7.837923
7.645707	1.079091	10.193015
Residual charge for demand		-

Band		2023/24 Final
Domestic	Tariff - £/Site/Day	0.119264
LV_NoMIC_1		0.060904
LV_NoMIC_2		0.277168
LV_NoMIC_3		0.660956
LV_NoMIC_4		2.052237
LV1		3.315495
LV2		6.087156
LV3		9.906854
LV4		22.316402
HV1		17.268078
HV2		55.583289
HV3		109.135702
HV4		276.988323
EHV1		130.702271
EHV2		642.651221
EHV3		1,295.790976
EHV4		3,528.818626
T-Demand1		402.035899
T-Demand2		1,678.272958
T-Demand3		4,550.996601
T-Demand4		11,722.399177
Unmetered demand		**p/kWh**
Unmetered		1.247484
Demand Residual (£m)		**3,388.1**

Potential Future Changes

10 Year Projection

Q&A: Slido.com → #Revenue



- 10 Year Projection Report (addendum to the 5 year forecast published in April), together they give a projection of TNUoS charges for the next 10 years.
- This projection of TNUoS tariffs is intended to inform industry on the direction of travel
- Significant uncertainties and assumptions underly all numbers within this projection.
- There is ongoing reform to change the current charging methodology which has been used for this report.

Links:-
Report
Tables
Webinar Slides
Webinar Recording

Please do send us feedback on this report to tnuos.queries@nationalgrideso.com

Potential Future Changes

Q&A: Slido.com → #Revenue

Cost Reflectiveness

- CMP315/375 (Review of the expansion constant/ expansion factors)
- CMP316 (Co-located generation sites)
- CMP331 (Site specific ALFs)
- CMP393/394 (Electricity storage)

Tariff Stability and Predictability

- CMP286/287 (Increase notice of input data)
- CMP344 (revenue adjustment)
- CMP413 Rolling 10-year wider TNUoS generation tariffs

Significant Code Review and Future Developments

- TNUoS taskforce (link)
- OTNR (Offshore Transmission Network Review
- HND (Holistic Network Design) (link)
- CSNP (Centralised Strategic Network Plan)
- Net Zero Market Reform
- Ofgem Charging Reform Letter (link)

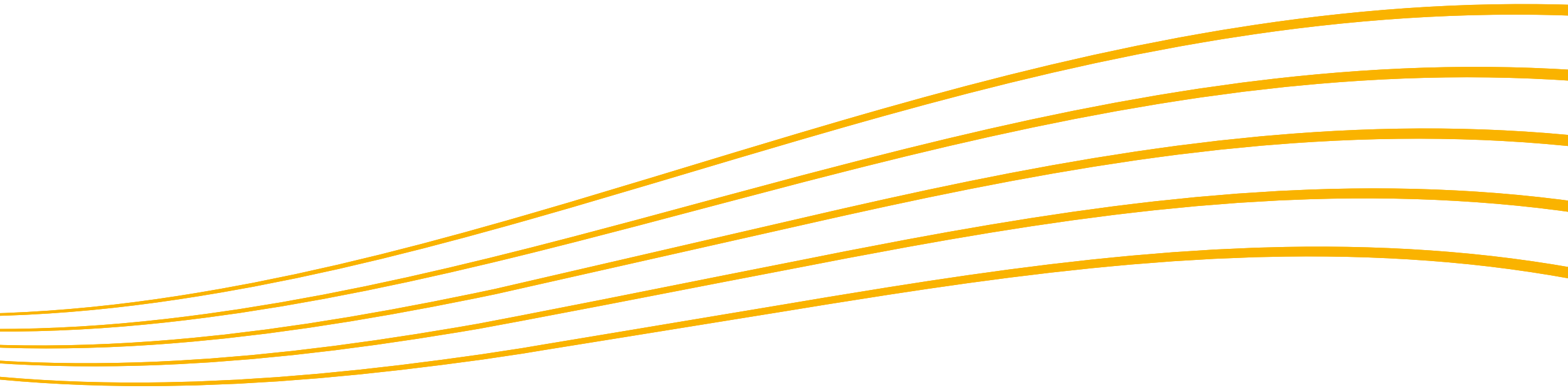
Charging Parameters

- Price Control – Including key parameters such as Expansion Constant, Expansion Factors, Security Factors, Gen Zones, TDR Threshold consumption banding data etc.

The CUSC mods listed here are non-exhaustive, and are examples of the relevant group themes, please see the following link for active and past mods :- CUSC Modifications

Q&A

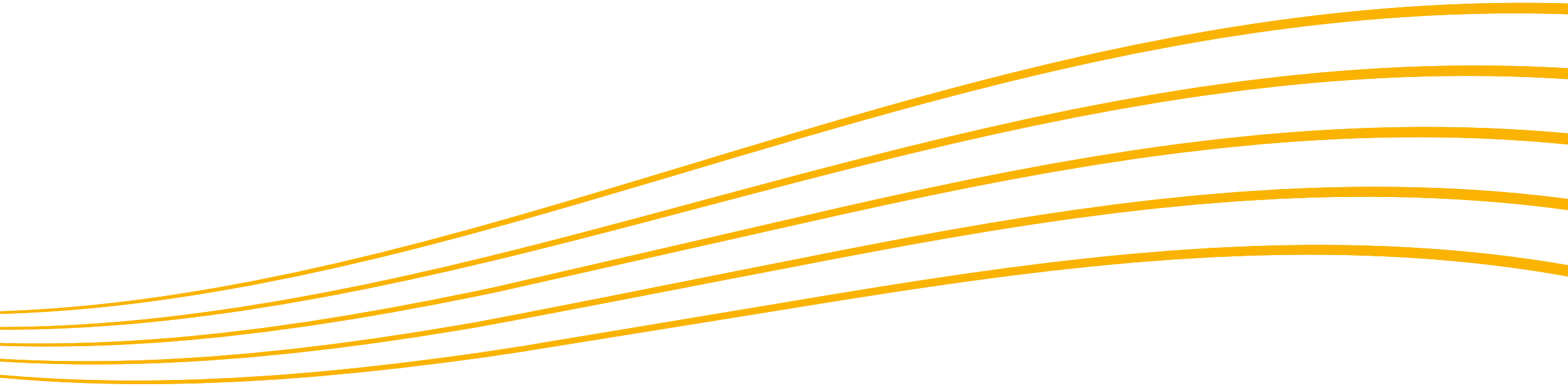
Refreshments Break



TNUoS Charging and Billing

Heather Stratford

Daniel Hickman



Agenda

1	TNUoS charges overview
2	TNUoS charges for generation
3	TNUoS charges for demand
4	Security requirements
5	Q&A

What is the TNUoS charge?

The TNUoS charge 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.

TNUoS Charges for Generation

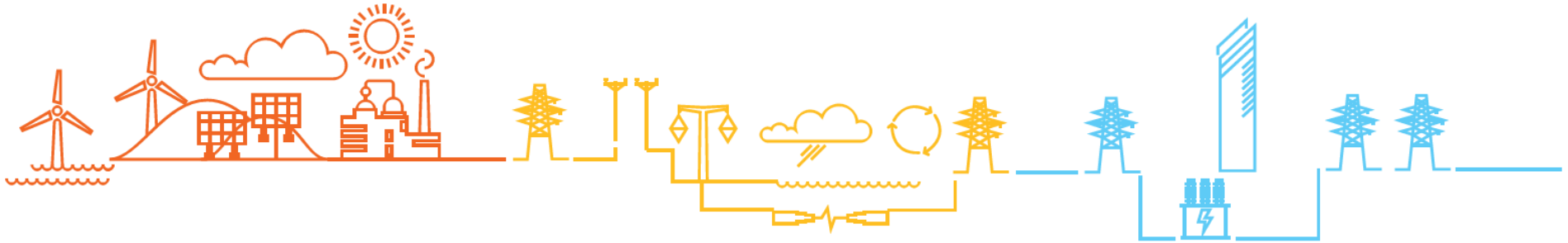
- **Transmission Connected Generation**
- **Large embedded generation (≥100MW)**

TNUoS Charges for Demand

- **Transmission Demand Residual**
- **Half-Hourly metered demand**
- **Non Half-Hourly metered demand**
- **Embedded export benefit**

TNUoS charges are calculated using the Final Tariffs published in the preceding January.

The Final Tariffs for 2023/24 are available on our website.



TNUoS Generation Charging

TNUoS Generation Billing Timeline

Monthly Invoices

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

Reconciliations

Generation charges are reconciled annually

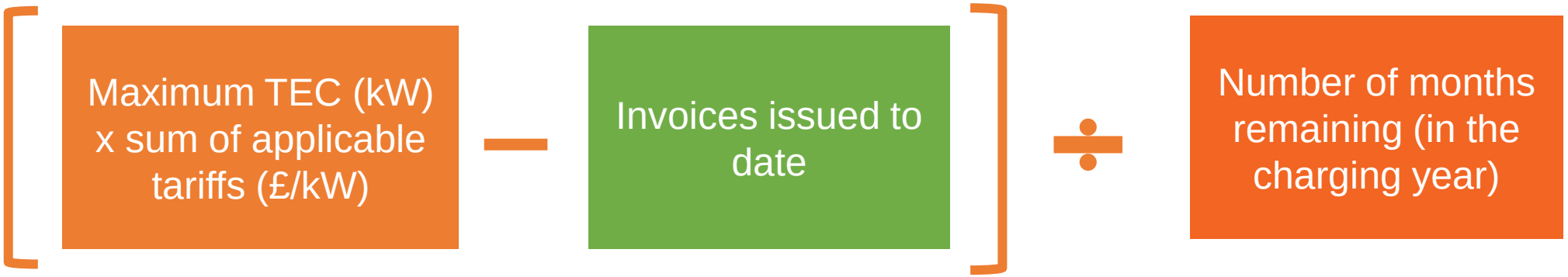
Generation Reconciliation
(April)

Charging year + 1 month

Generation Charging

TNUoS charges are applicable to transmission connected generators and embedded generators with Transmission Entry Capacity (TEC) ≥100MW

Generator monthly invoice



Generation Liabilities

- Generators with positive tariff: based on the maximum amount of TEC effective during the charging year
- Generators with negative tariff: based on the average three highest export during winter season – only corrected in reconciliation against actual metering

Generation Charges - Backing Sheet

Generators receive a backing sheet, along with the monthly invoice, which contain the following details for each station:

- Annual Load Factor
- Plant type
- Generation zone
- Wider tariff and any local circuit and substation tariffs
- Transmission Entry Capacity (TEC)
- Charge calculation
- Invoices issued to date
- Current month invoice value

We are currently seeking feedback on the Generation charge backing sheets as part of our move to a new billing system. If you have any feedback, please contact us at tnuos.queries@nationalgrideso.com

TNUoS Generation Reconciliation Overview

TNUoS generation reconciliation is issued at end of the April for the previous charging year

Recalculated Liability (1) + Compare Output vs TEC (2) + Calculate Demand (3) − Monthly invoice = Reconciliation Invoice

(1) The liability for each station is recalculated, to ensure all charges have been invoiced correctly

(2) Stations with a negative tariff: the liability is calculated where the peak station output is less than TEC

(3) Stations that take net demand over Triads are charged the half-hourly gross demand tariff

Historical Values

	2022/23	2021/22	2020/21	2019/20	2018/19	2017/18
Reconciliation (£m)	**24.6**	**9.21**	**42.94**	**22.08**	**15.09**	**13.21**

TNUoS Ex-Post Reconciliation

Q&A: Slido.com → #Revenue

TNUoS Generation charges should be within a range of €0-2.50/MWh to comply with the Limiting Regulation – “gen cap”.

If charges are outside the range, an **Ex-Post Reconciliation** will take place to ensure compliance with the range. For example:

- Out-turn = €2.75/MWh, indicating too much TNUoS Generation revenue has been recovered,
- Calculate amount, £X, that reduces TNUoS Generation revenue so that out-turn = €2.50/MWh,
- Issue total **credits** of £X to Generators and total **invoices** of £X to Suppliers.

If out-turn is below €0/MWh, the ex-post reconciliation would require an additional amount to be charged Generators, and that same amount to be credited to Suppliers.

TNUoS Demand Charging

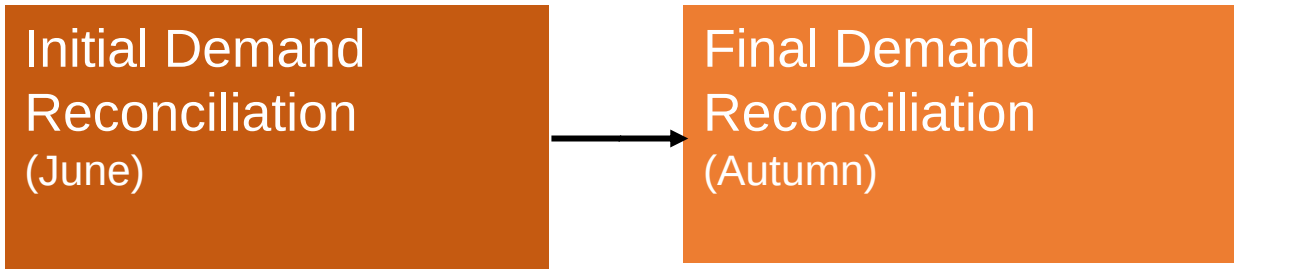
TNUoS Billing Timeline

Monthly Invoices

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

Reconciliations

Demand charges are reconciled twice (Initial / Final metering)



TNUoS Demand Charges – 2023/24

Q&A: Slido.com → #Revenue

The residual is now recovered from final demand via the TDR charge:

TDR – Sites, No. of sites

TDR – Unmetered Supplies (UMS), kWh

From 1st Apr 23, HH & NHH charging methodology has recovered **only locational** TNUoS revenue ~3% of demand revenue (embedded generation benefit is unchanged)

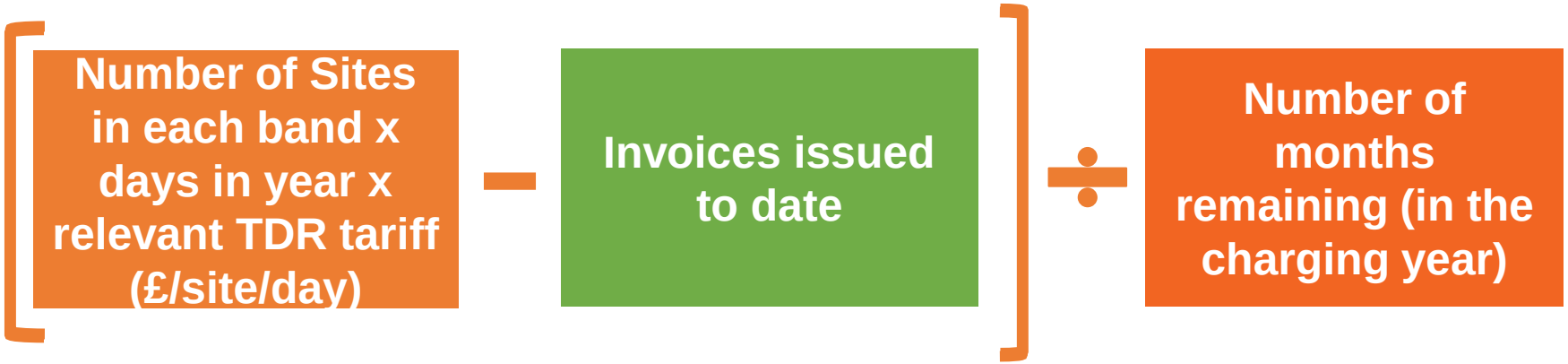
Half-hourly (HH) Gross Demand, kW

Non Half-hourly Consumption, kWh

Transmission Demand Residual - Sites

Within year, Suppliers are charged based on the latest actual site counts in each band, as provided by DNOs/iDNOs, and connection agreements

Supplier monthly invoice



Site Counts by Band

BSC Modification P402 introduced a data flow between the DNOs and ESO to provide the site counts by band and supplier that are needed to bill suppliers. This includes:

- Settlement Date
- Charging Band
- Distribution Network Operator (DNO)
- Supplier Name
- Market Participant Identifier (MPID)
- Run Type
- Grid Supply Point Group
- Site Count

It does not include MPAN level information

Example – Forecast Total Annual Site Count Days (SCD)

- April – total SCD is 34 to end April →
- Latest number of sites being supplied, based on the actual data, is **2** (based on actuals for 30th April 2023)
- Therefore, the forecast of total annual SCD is:

34 + (2 per day, for days with no actual data)

= 34 + (2 x (365-30))

= 34 + 670

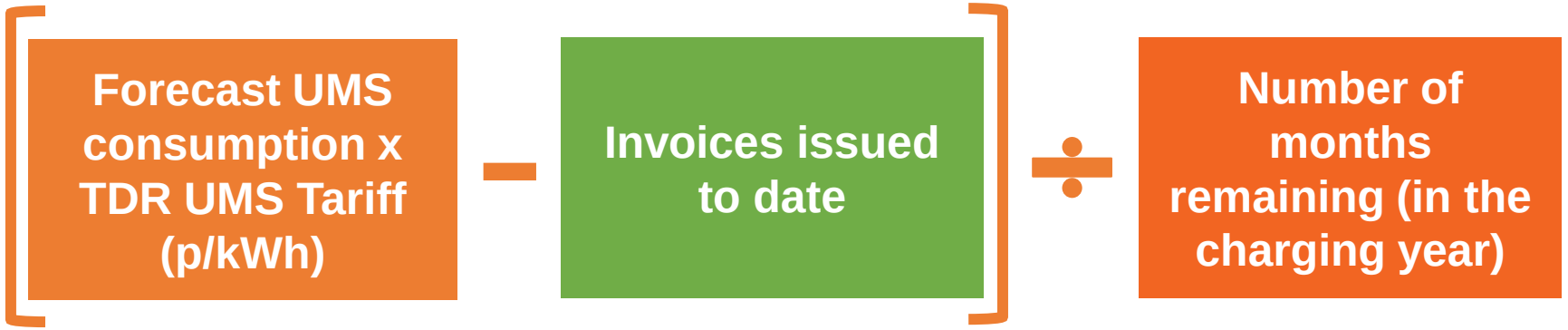
= 704

Date	Sites Supplied
01/04/2023	1
02/04/2023	1
03/04/2023	1
04/04/2023	1
05/04/2023	1
…	
…	
25/04/2023	1
26/04/2023	1
27/04/2023	2
28/04/2023	2
29/04/2023	2
30/04/2023	2
Total	34

Transmission Demand Residual - UMS

Unmetered Supplies (UMS), within year, Suppliers are charged based on the latest actual consumption (kWh) data provided by the DNO in the P402 report.

Supplier monthly invoice



Transmission Demand Residual – Backing Sheet change

Q&A: Slido.com → #Revenue

As of October 1st, in addition to a summary of annual site count days by charging band, the TNUoS Demand backing sheet now contains registrant ID and DNO level data to help customers understand what their forecast is based on

42	SCTL1	TotalForecast	TotalAnnualTDRLiability	TotalForecastAnnualDe	InvoicedTo	Remaining	RemainingI	CurrentMonthlyInvoiceAmountExclVAT£													
43	BSTL1	931.040000	24660638128.004900	24660639059.044900	1.69E+09	2.3E+10	10	2.3E+09													
44	BLANK																				
45	SCDSO	DNO	RegistrantID	DOM	EHV1	EHV2	EHV3	EHV4	HV1	HV2	HV3	HV4	LV1	LV2	LV3	LV4	LVN1	LVN2	LVN3	LVN4	UMS
46	RICBS	RRET	TTRE	147	187	0	0	0	0	0	177	0	167	0	0	0	157	0	0	0	197.3728
47	RICBS	RRET	TTRF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	RICBS	RRET	TTRG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	RICBS	RRET	TTRH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	RICBS	SHOT	REDF	148	188	0	0	0	0	0	178	0	168	0	0	0	158	0	0	0	198.3828
51	RICBS	SHOT	REDG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	RICBS	SHOT	REDH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	RICBS	SHOT	REDI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	RICBS	TTCO	ITDR	61	2796	0	0	0	0	0	8903	0	2057	0	0	0	1262	0	0	0	270.2228
55	RICBS	TTCO	STDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	RICBS	TTCO	IDRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	RICBS	TTCO	IDRB	34	76	0	0	0	0	0	54	0	20	0	0	0	33	0	0	0	5172080
58																					

Transmission Demand Residual – Inaccuracies in the site count data

If you spot something that doesn't look correct in your data, we recommend you first speak to the responsible DNO. Some issues may be:

- Inclusion of a de-energised site
- Inclusion of non-final demand sites
- Multi feeder sites counted as a site for each MPAN

If a site changes, we will receive an update when the next run type of data comes through and it will be amended in the data. A credit/invoice will then be issued for any overpayment/underpayment across the remaining months, taking account of how much liability you have already paid.

We have included a list of DNO contacts in the slide pack

Transmission Demand Residual – TDR DNO Contacts

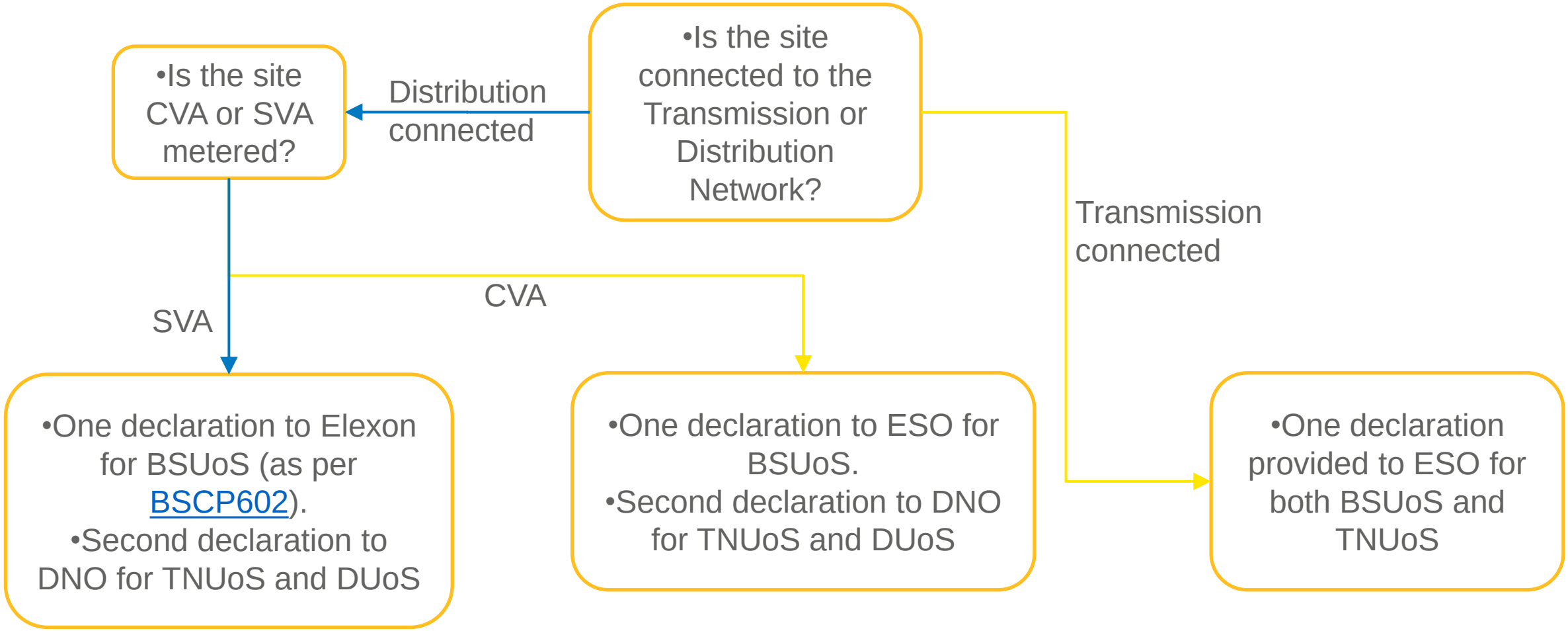
Q&A: Slido.com → #Revenue

DNO LICENSEE	MPID	MPANs Starting	CONTACT
ELECTRICITY NORTH WEST LIMITED	NORW	16	Chris.Barker@enwl.co.uk
NATIONAL GRID ELECTRICITY DISTRIBUTION (EAST MIDLANDS) PLC	EMEB	11	dwornell@nationalgrid.co.uk
NATIONAL GRID ELECTRICITY DISTRIBUTION (SOUTH WALES) PLC	SWAE	21	dwornell@nationalgrid.co.uk
NATIONAL GRID ELECTRICITY DISTRIBUTION (SOUTH WEST) PLC	SWEB	22	dwornell@nationalgrid.co.uk
NATIONAL GRID ELECTRICITY DISTRIBUTION (WEST MIDLANDS) PLC	MIDE	14	dwornell@nationalgrid.co.uk
NORTHERN POWERGRID (NORTHEAST) PLC	NEEB	15	TCR@Northernpowergrid.com
NORTHERN POWERGRID (YORKSHIRE) PLC	YELG	23	Ryan.Farrell@northernpowergrid.com
SP DISTRIBUTION PLC	SPOW	18	joe.boyle@spenergynetworks.co.uk
SP MANWEB PLC	MANW	13	joe.boyle@spenergynetworks.co.uk
SOUTHERN ELECTRIC POWER DISTRIBUTION PLC	SOUT	20	emma.clark@sse.com
SCOTTISH HYDRO ELECTRIC POWER DISTRIBUTION PLC	HYDE	17	emma.clark@sse.com
EASTERN POWER NETWORKS PLC	EELC	10	chris.ong@ukpowernetworks.co.uk
LONDON POWER NETWORKS PLC	LOND	12	chris.ong@ukpowernetworks.co.uk
SOUTH EASTERN POWER NETWORKS PLC	SEEB	19	chris.ong@ukpowernetworks.co.uk

Non-final Demand Declarations

Q&A: Slido.com → #Revenue

Non-final demand will be required to have submitted a declaration



Non-final Demand Declarations

Q&A: Slido.com → #Revenue

Pre populated forms are sent out when we see a new CVA BMU appear

Annex 1

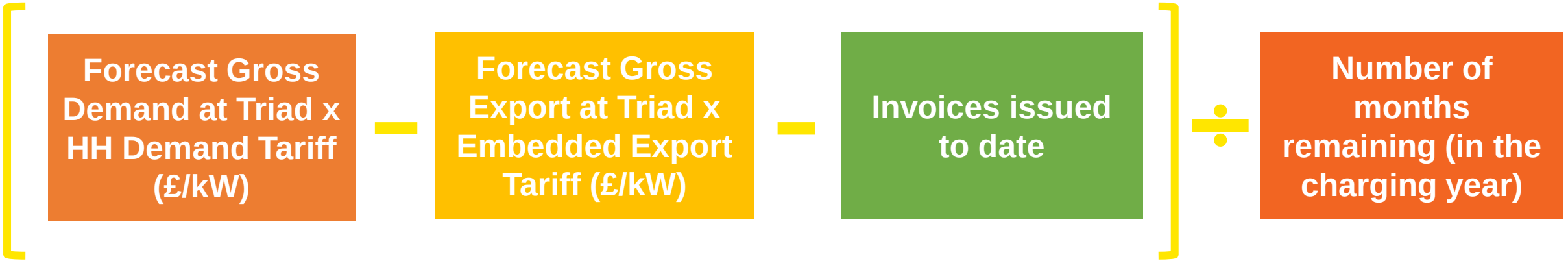
Site Number	Site Name	Site Address	BMU IDs and meters registered at address	BCA reference number	Tech Type	Transmission connected	Declaration ID (where known)	Does the BMU contain any Final Demand? If yes, please also complete Annex 2 for this site;
Unique referance number for the site if transmission connected	*Unique name for the site*	*Address that identifies the geographical location of the site, rather than its administrative address, if different)*	*The Balancing Mechanism Unit (BMU) ID(s) for the CVA site (e.g. T_XXXX)*	*Reference number associated with the Bilateral Connection Agreement made for this site.*	*Short description of the technology employed at the site*	*Is the BMU connected to the National Electricity Transmission System? Delete as appropriate*	*Unique ID determined by NGESO following the initial declaration of a facility. This field should only be filled in when updating or ceasing an existing declaration*	*Does the BMU consume any energy for purposes other than Electricity Storage, Electricity Generation or provision of an Eligible Service. Delete as appropriate. If yes, please also complete Annex 2 for this site;*
Example – simple site S0001	Oak Road Energy	4 Oak Road, Testville, O14 6BZ	T_OAKRO-1		CCGT	Yes		No
Example – mixed site S0002	Acacia Avenue Energy Park	1 Acacia Avenue, Testington, AB12 3CD	T_ACCAV-1		Factory with Wind generation and Battery Storage	Yes		No
Example – mixed site S0002	Acacia Avenue Energy Park	1 Acacia Avenue, Testington, AB12 3CD	T_ACCAV-2		Factory with Wind generation and Battery Storage	Yes		No
Example – mixed site S0002	Acacia Avenue Energy Park	1 Acacia Avenue, Testington, AB12 3CD	T_ACCAV-D		Factory with Wind generation and Battery Storage	Yes		Yes
	Poplar Energy Storage	1 Poplar Cresent, Testville, O12 5BN	E_POPLR-1		Battery Storage	No		No

Half-Hourly Demand

Q&A: Slido.com → #Revenue

Within year, Suppliers are charged based on their forecast of HH Gross Demand and Exports over the Triads

Supplier monthly invoice



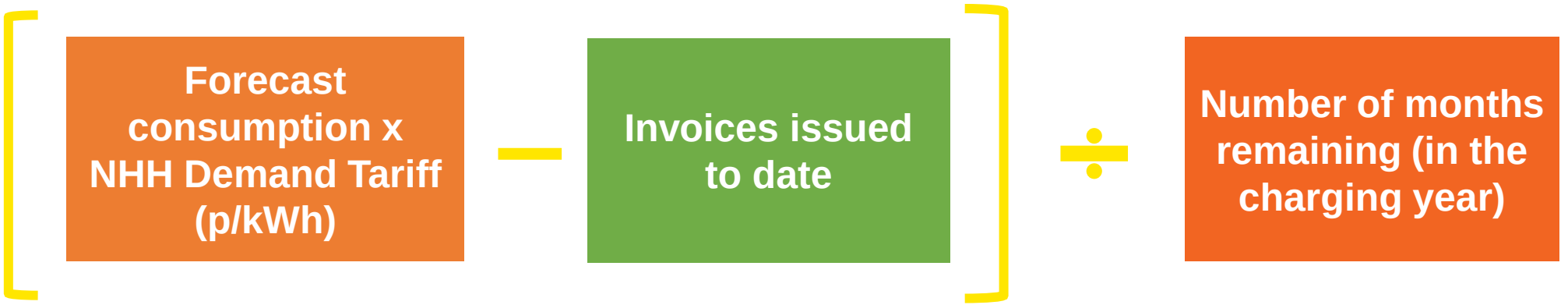
HH exports will be netted off against HH demand at BMU level, so that monthly chargeable values cannot result in a credit to the supplier

Net credits are settled at the annual reconciliation

Non Half-Hourly Consumption

Within year, Suppliers are charged based on their forecast of consumption between 16:00 – 19:00 (inclusive), every day of the charging year (kWh)

Supplier monthly invoice



Embedded Export Payments

Q&A: Slido.com → #Revenue

Payment calculation

- Based on average exports over the 3 Triads x Embedded Export tariff
- Outside of the scope of VAT and split as separate line item on the invoice

Embedded generation registered under Supplier Volume Allocation (SVA):

- Settled directly with the Supplier
- Forecast of HH exports can be provided in Supplier demand forecast
- HH exports included in monthly billing
- Further settlement at the initial and final reconciliations

Embedded generation registered under Central Volume Allocation (CVA):

- Settled directly with the Generator
- Forecast is not provided and no monthly billing
- Settlement is at this initial and final demand reconciliations
- Embedded generation is also liable for demand taken over Triads, charged using the HH gross demand tariff

TNUoS Demand Forecast

Q&A: Slido.com → #Revenue

TNUoS Locational Demand charges are based on the Supplier forecast

- Mandatory requirement in CUSC to submit a forecast by 10th March
- Forecasts should be revised by the 10th of the month if there are significant changes in demand/consumption
- It also affects the calculation of security requirement

What to include in the forecast?

HH (Triad) demand / exports

- A forecast of your contracted customers' average demand, summed by BM Unit (kW)
- A forecast of HH embedded exports average summed by BM Unit (kW)

NHH consumption

- A forecast of your contracted customers' energy consumption between 16:00 and 19:00 (inclusive) every day of the charging year, summed by BM Unit level (kWh)

DEMAND FORECAST SUBMISSION
Used for Calculating 2022/23 Monthly TNUoS Charges

Company Name: Z EXAMPLE LIMITED
Company Registered No: 10000000
Contact Name (in case of query):

BM Unit Identifier	Demand Tariff Zone	Forecast HH Triad Gross Demand (kW) *(see note 2 below)*	Forecast HH Triad Embedded Export (kW) *(see note 3 below)*	Forecast NHH Energy (kWh) *(see note 4 below)*
2__AEXAM000	Eastern	745		6,774,773
2__BEXAM000	East Midlands	914		5,513,249
2__CEXAM000	London	1,746		4,996,105
2__DEXAM000	North Wales and Mersey	912		3,206,701
2__EEXAM000	Midlands	1,228		4,686,015
2__FEXAM000	Northern	824		2,452,885
2__GEXAM000	North West	1,008		5,530,108
2__HEXAM000	Southern	1,230		5,566,630
2__JEXAM000	South East	479		4,426,747
2__KEXAM000	South Wales	334		2,195,350
2__LEXAM000	South Western	955		4,592,799
2__MEXAM000	Yorkshire	579		3,824,910
2__NEXAM000	Southern Scotland	945		1,644,185
2__PEXAM000	Northern Scotland	301		3,904,759

TNUoS Demand Reconciliation

Q&A: Slido.com → #Revenue

The initial reconciliation invoice/credit issued by 30th June, in respect of their TNUoS demand liability for the previous year. Final demand reconciliation issued in autumn the year after.

Demand reconciliation calculation

Out-turn Liability − **Monthly Invoice** + **Payment for Embedded Generation** = **Reconciliation Invoice**

Note: a customer may be liable for demand charges and/or be eligible for payments for embedded generation

Historical values

Following regulatory changes effective from 2018/19 the value of the initial demand reconciliation has reduced considerably, as shown in the table below for historical demand reconciliation values.

	2023/24	2022/23	2021/22	2020/21	2019/20	2018/19	2017/18
Initial Demand Reconciliation (£m)	**To be issued June 2023**	**-51.42**	**+6.06**	**-17.75**	**-0.77**	**-64.27**	**-146.81**
Final Demand Reconciliation (£m)	**To be issued Autumn 2025**	**To be issued Autumn 2024**	**+2.23**	**+0.78**	**+2.76**	**-0.31**	**-3.09**

Security Requirement

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

Supplier security requirement

- BSUoS: security is equal to 32 days of Supplier BSUoS charges
- TNUoS: is equivalent to a percentage of your annual demand liability

Generation security requirement

- BSUoS: security is equal to 29 days of BSUoS charges
- TNUoS: no security requirement for generators

Payment History Allowance (PHA)

- One of three forms of Users Allowed Credit (Approved credit rating or independent credit assessment)
- Accrued for each months invoice(s) paid by the due date, up to a maximum of 60 months
- Reduced by 50% for late payment, and set to zero for second late payment

Q&A

AAHEDC

Heather Stratford

AAHEDC formerly Hydro benefit

Who pays?

Electricity suppliers. The scheme amount (£111.98m) is recovered in line with conditions defined in the electricity supplier licence at a tariff of 0.042038 p/kWh.

Who receives?

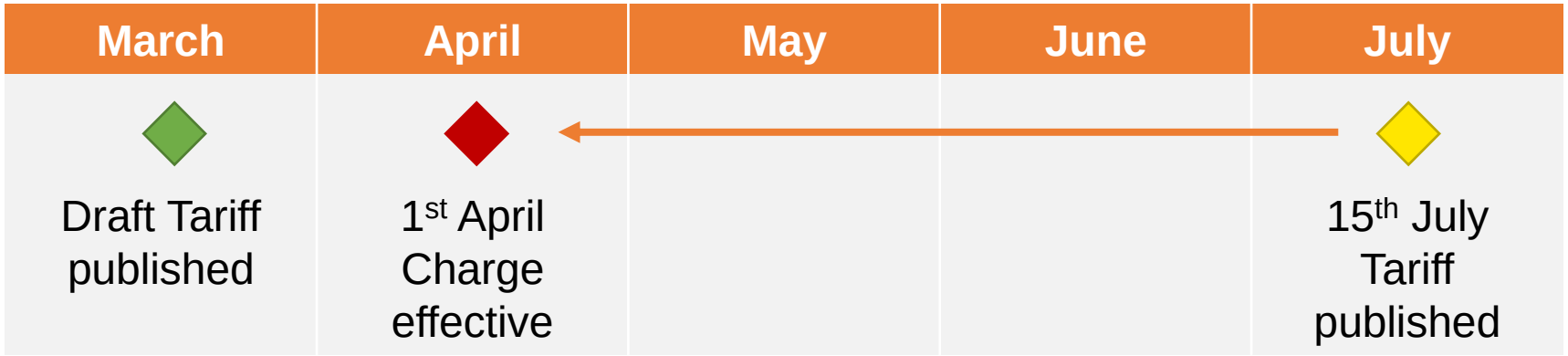
Currently there is only one Relevant Distributor, Scottish Hydro Electric Power Distribution (SHEPD), to reduce the cost of distributing electricity in the north of Scotland

How does it work?

The scheme ‘Assistance Amount’, ‘Shetland Assistance Amount’ and the ‘Administration Amount’ were introduced by the Energy Act 2004 and are inflated annually by the Consumer Prices Index including owner occupiers' housing costs (CPIH) published by the Office for National Statistics (ONS). The ESO is the appointed scheme administrator.

AAHEDC timeline

The Tariff is published annually on or before 15th July (i.e. one month before the first invoice date) and is effective retrospectively from the 1st of April that year. It is a flat rate tariff and does not vary by demand zone.

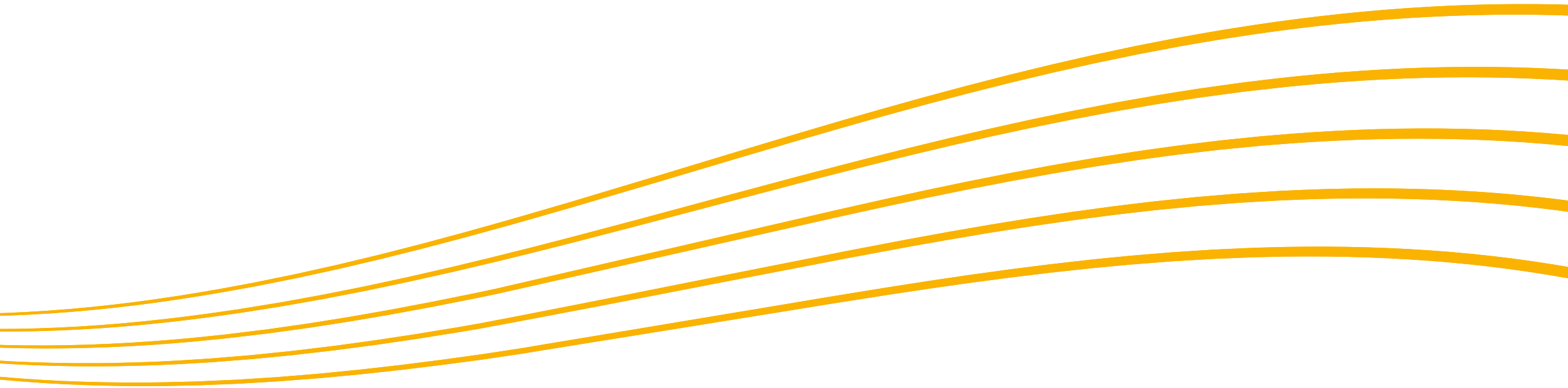


- Invoices are issued to electricity suppliers quarterly in arrears.
- The value is calculated using the sum of gross demand attributable to Licensed Suppliers across all GSP Groups in the previous quarter and includes all settlement periods across all GSP Groups.
- Suppliers are invoiced on 15th August, 15th November, 15th February and 15th May with 28-day payment terms.
- There is no reconciliation; settlement is deemed to be final at the invoice date.

Q&A

Connection Charging Overview

John Beezley

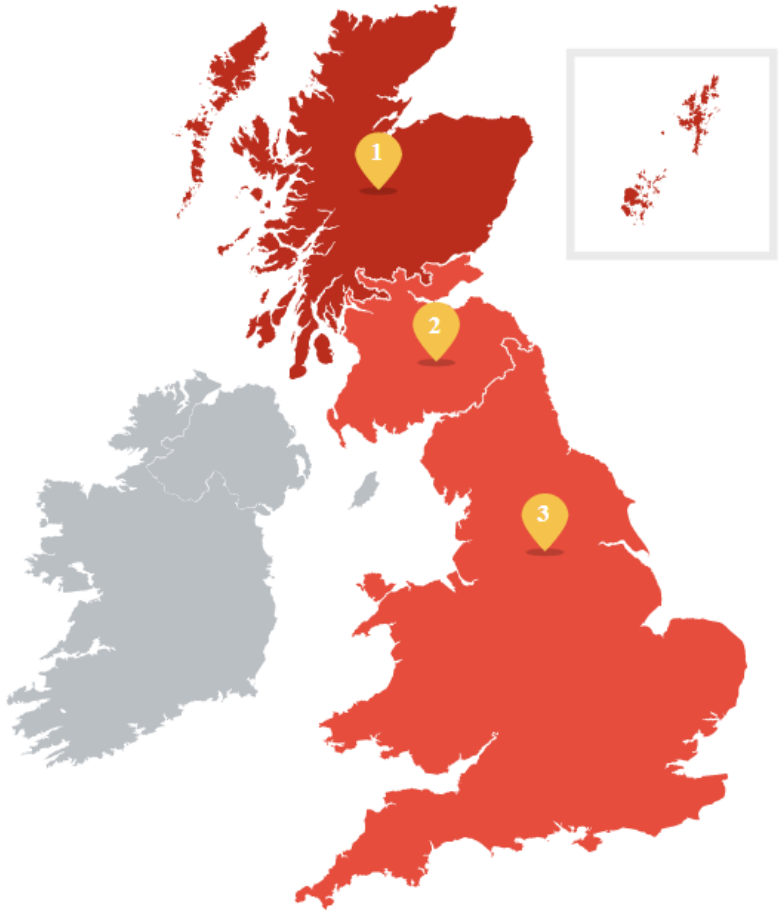


What are connection charges?

Connection charges recover the costs incurred by the Transmission Owner (TO) to design, build and maintain your connection to the transmission system. These charges are usually over a 40-year period.

We recover these charges on behalf of:

1. Scottish & Southern Electricity Networks
2. SP ENERGY NETWORKS
3. nationalgrid



Invoices are issued on the first of the month, with 15-day payment terms.

Connection Charges

Annual Connection Charge Breakdown – Year 1 - 2023

	Connection Cost	Net Asset Value	Depreciation	RoR	SSM	TRC	Annual Charge
	GAV*n*	NAV	GAV/40 or 15	NAV*RoR	GAV*SSM	GAV*TRC	
Asset 1 – 40 Year	£500,000	£493,750	£12,500	£19,750	£1,700	£5,300	£39,250
Asset 2 – 15 Year	£15,000	£14,500	£1,000	£580	£51	£159	£1,790

Acronyms

Gross Asset Value for year n (GAV*n*)

Total cost of asset including:
- Construction costs
- Engineering
- Interest during construction
- Liquidated damages premium

Net Asset Value (NAV)

Mid year depreciated GAV of the asset

Rate of Return (RoR)

Transmission Owner Rate of Return

(Example **4%**)

Site Specific Maintenance (SSM)

Recovers a proportion of the cost and overheads with the maintenance activities.

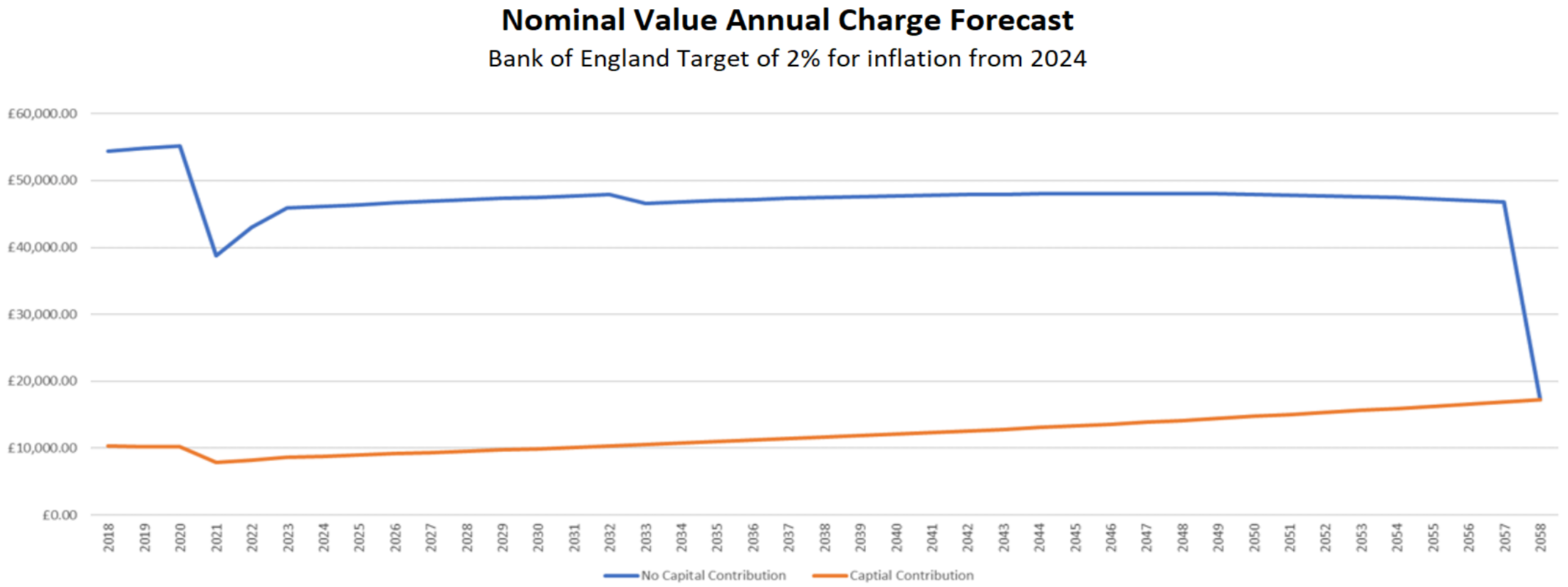
0.34%

Transmission Running Costs (TRC)

Rates, operation, indirect overheads incurred by the transmission licensees

1.06%

Example of Annual Charge over time



CMP 306 Implemented in 2021. The rate of Return element of the connection charge changed from 6% to a more cost-reflective TO-specific rate of return.

Annual Charges will change over time as we progress through price control periods and methodology changes. Each year inflation and maintenance factors are recalculated.

Capital Contribution Payments

A Capital Contribution payment can be a lump sum payment, or multiple payments per year.

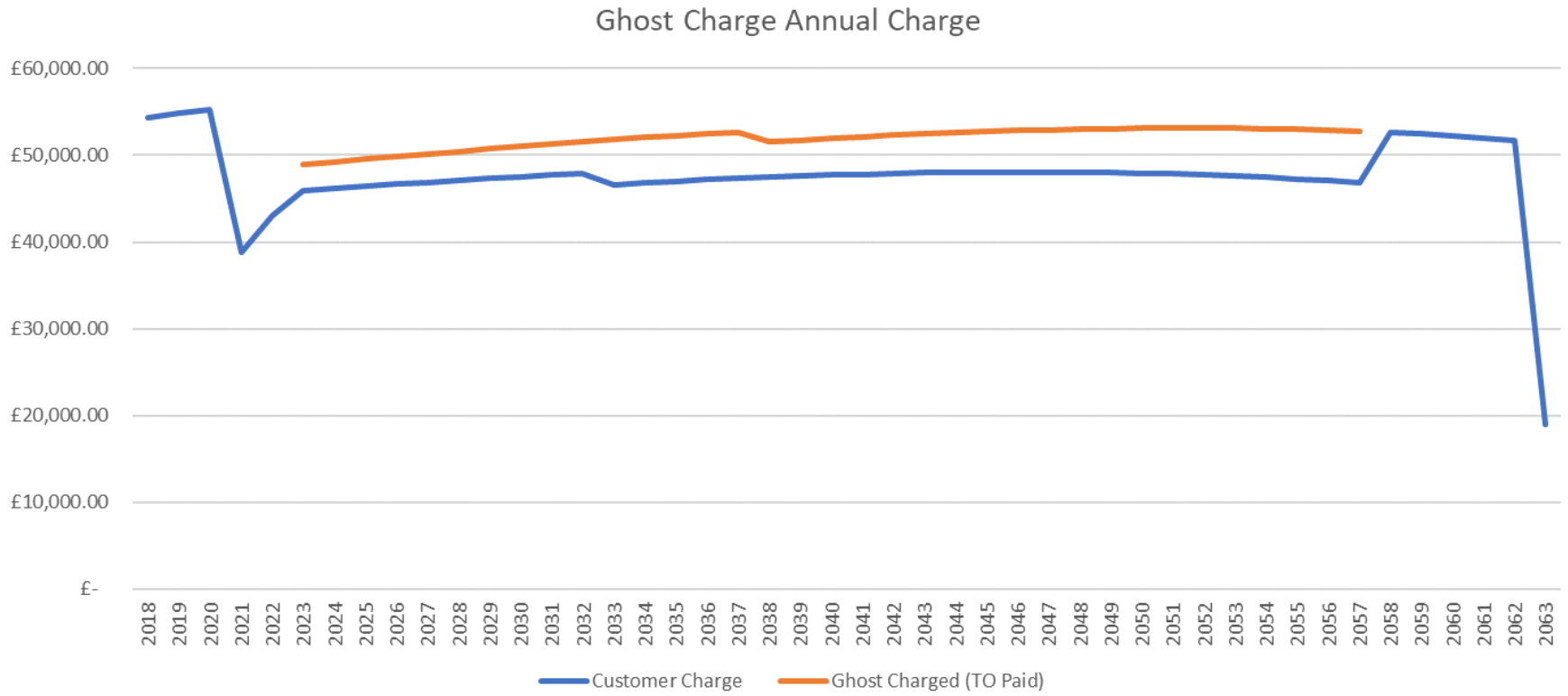
- Option 1 – Payments alongside the TO's investment to build and install your assets.
- Option 2 – Single payment upon completion of the work.
- Option 3 – Full or partial payments during the lifetime of your connection.

Annual Connection Charge = Maintenance of the Connection Assets only

You can opt into Capital Contributions via your Connection Application.

Asset Replacement: Ghost Charging

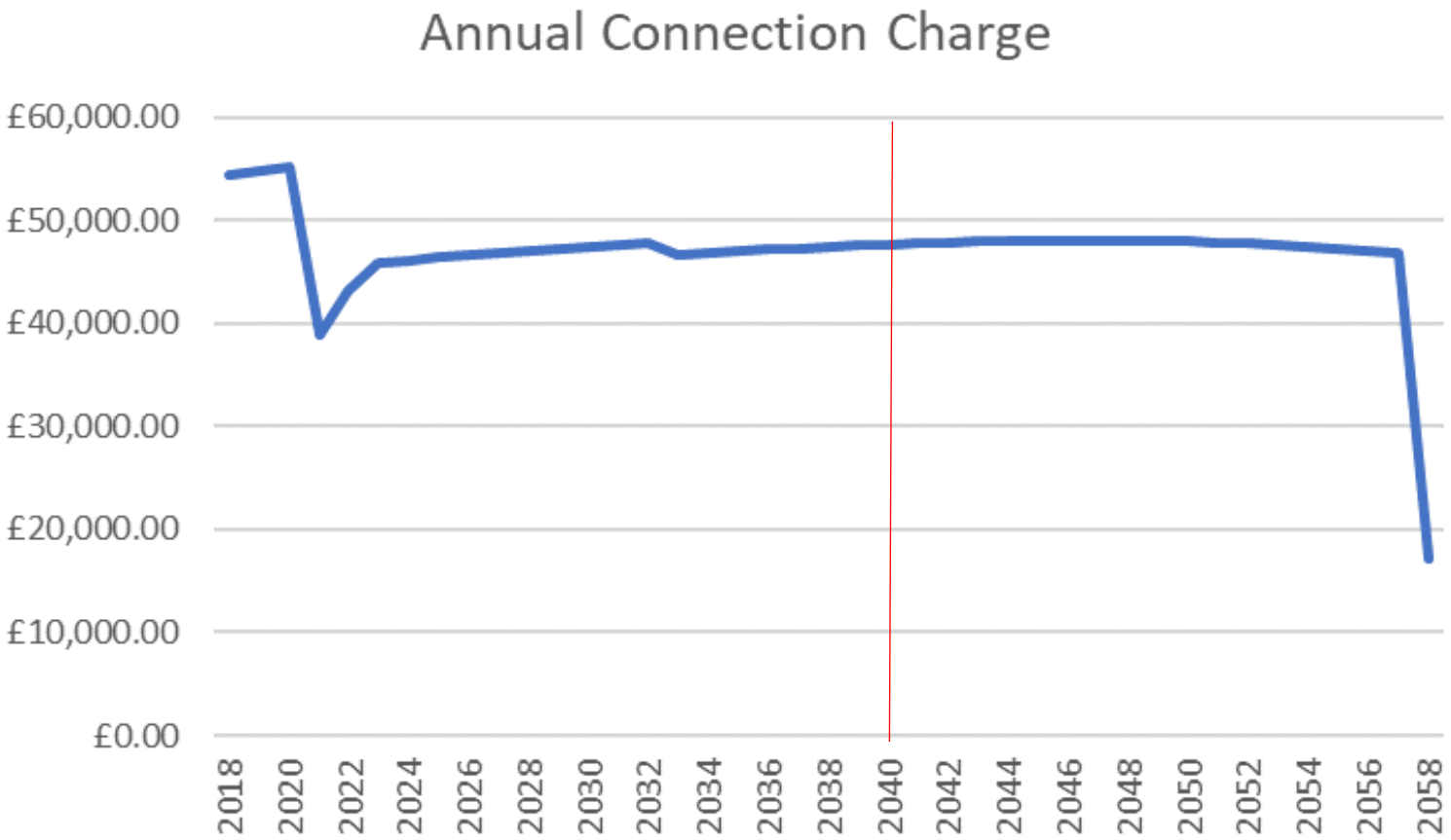
If the TO considers connection assets are required to be replaced before the end of their normal lifetime, the replacement costs will be borne by the TO. This is called 'Ghost Charging'.



You will continue to pay your existing annual charges within the remaining lifetime of your original assets. Upon the total depreciation of the original asset, your annual charge will be updated to reflect the costs of the replacement asset(s).

Asset Replacement / Termination

If the repayment method for the assets are through annualised charges, and a user requires an asset to be terminated before its economic life ends, the user will be liable for a termination charge.



The Termination Charge will recover the Net Asset Value (NAV) of the Connection Assets plus the cost of removing the Connection Assets if required. In 2040, the NAV would be £366,692

Charging Appendices Example (Appendix A)

APPENDIX A
TRANSMISSION CONNECTION ASSETS/CONNECTION SITE

User: Customer Name
Connection Site: Connecton Site Name

Part 1 - Pre-Vesting Assets

Description	Age (As at 01/04/2023)	Year
There are no Pre-Vesting Assets associated with this agreement		

Part 2a - Existing Post-Vesting Assets

Description	Age (As at 01/04/2023)	Year
There are no Existing Post-Vesting Assets associated with this agreement		

Part 2b - New Post-Vesting Assets

Description	Age (As at 01/04/2023)	Year
Asset Description 1	0	2023

Part 3a - Existing Energy Metering Systems (*)

Description	Age (As at 01/04/2023)	Year
There are no Existing Energy Metering Systems associated with this agreement		

Part 3b - New Energy Metering Systems (*)

Description	Age (As at 01/04/2023)	Year
Asset Description 2	0	2023

Key Points

- Pre-vesting assets are assets that commissioned pre 1990
- Electronic assets usually have a 10/15 year depreciation where as Non Electronic have 40

Charging Appendices Example (Appendix B)

APPENDIX B
CONNECTION CHARGES/PAYMENT

User: Customer Name
Connection Site: Connecton Site Name

(1) Connection Charges

The Connection Charges set out below may be revised in accordance with the terms of this Bilateral Connection Agreement and/or the Construction Agreement and/or the CUSC and/or the Charging Statement.

Part 1 - Pre-Vesting Assets

There are no Pre-Vesting charges for this agreement

Part 2a - Existing Post-Vesting Assets

There are no Existing Post-Vesting charges for this agreement

Part 2b - New Post-Vesting Assets

For indication only, the Connection Charge for those assets installed after 31st March 1990 and as specified in Appendix A Part 2b will be at an annual rate for the period 01/04/2023 to 31/03/2024 of £39,250.00, in April 2023 prices, where

Rate of Return 4.00%

Transmission Costs

Part A Site specific maintenance element = £1,700.00
Part B Other transmission costs element = £5,300.00

Asset Values

Asset Description	Gross Asset Value	
Asset Description 1	£	500,000.00

Part 3a - Existing Energy Metering Systems

There are no Existing Energy Metering charges for this agreement

Key Points

- If your project is due to commission in the future, the annual charge described will be different from the charges at the time of commissioning. The GAV of the assets will be recalculated to account for inflation, and the rate of return and maintenance factors for the charging year will be used.

Charging Appendices Example (Appendix B)

Depending on the work undertaken, an ad-hoc charge may be payable. When a one-off payment or capital contribution is in an offer, it will be in a price base. This will be described in Part 5 of your Appendix B. ESO will inflate the amount up to the date the payment is due from this base. Invoices of this nature usually have 30-day payment terms.

For indication only, the One-off charge for an intertip scheme as described in Appendix B1 of the Construction Agreement shall be £100,000.00 in April 2023 prices, payable as per the schedule below.

Invoice Date	Excluding VAT	
01 September, 2023	£	25,000.00
01 June, 2024	£	50,000.00
01 August, 2025	£	25,000.00
Total	**£**	**100,000.00**

All Charges in Parts 1 to 5 will be adjusted to reflect indexed asset values and charge factors applicable in the year of invoicing

Example of Invoices due

			8.65%	*2.00%*	*2.00%*
Payment Due Date	**Amount**	**Fiscal Year**	**2023**	**2024**	**2025**
01/09/2023	£25,000.00	**2023**	**£25,000.00**	**£25,500.00**	**£26,010.00**
01/06/2024	£50,000.00	**2024**	**£50,000.00**	**£51,000.00**	**£52,020.00**
01/08/2025	£25,000.00	**2025**	**£25,000.00**	**£25,500.00**	**£26,010.00**

Post Commissioning Security

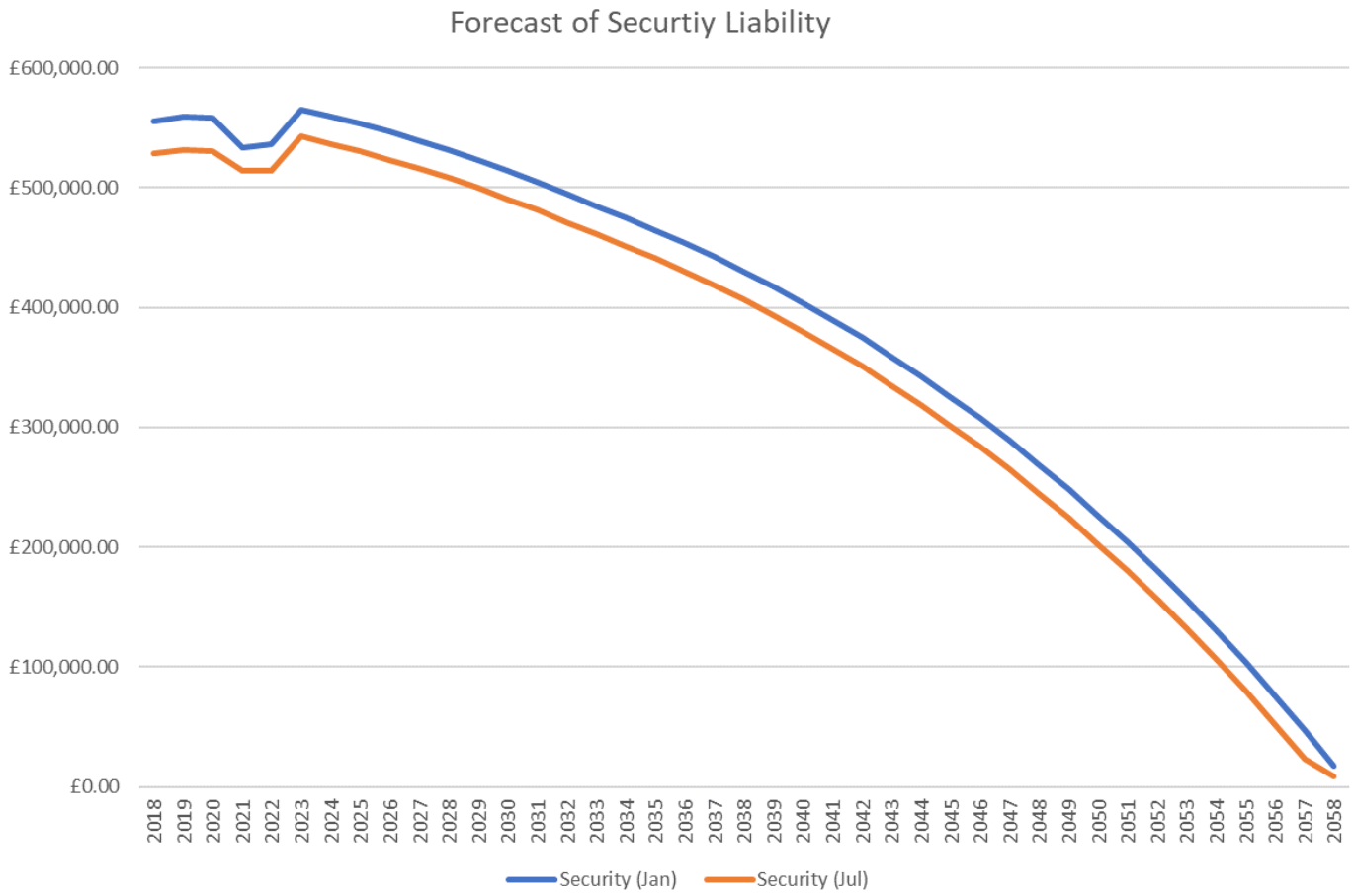
What are post-commissioning securities?

Post-commissioning securities are required to cover the owed amount if the user disconnects from the transmission system during the period that the transmission assets are chargeable to the user.

- The Transmission Owners have invested in assets which generally are charged to users over a 40-year life span. (Can be less subject to agreement from the TO)
- Should the user disconnect from the network the Transmission Owners would not be able to recover the costs of the assets which have been provided.

How are they calculated?

Securities statements are issued bi-annually. Security is calculated based on the End of Year Net Asset Value (NAV). Plus, six or twelve months of connection charges, depending on when the statements are issued.



April to March (Requested in January)

£501,500 (EOY NAV) + £54,347 (12 months connection charge) = £555,847.00

October to March (Requested in July)

£501,500 (EOY NAV) + £27,173.25 (6 months connection charge) = £528,673.00

As you pay connection charges, the security liability is reduced. Once the assets fully depreciate, you are only to secure the maintenance of the assets.

Illustration of Security

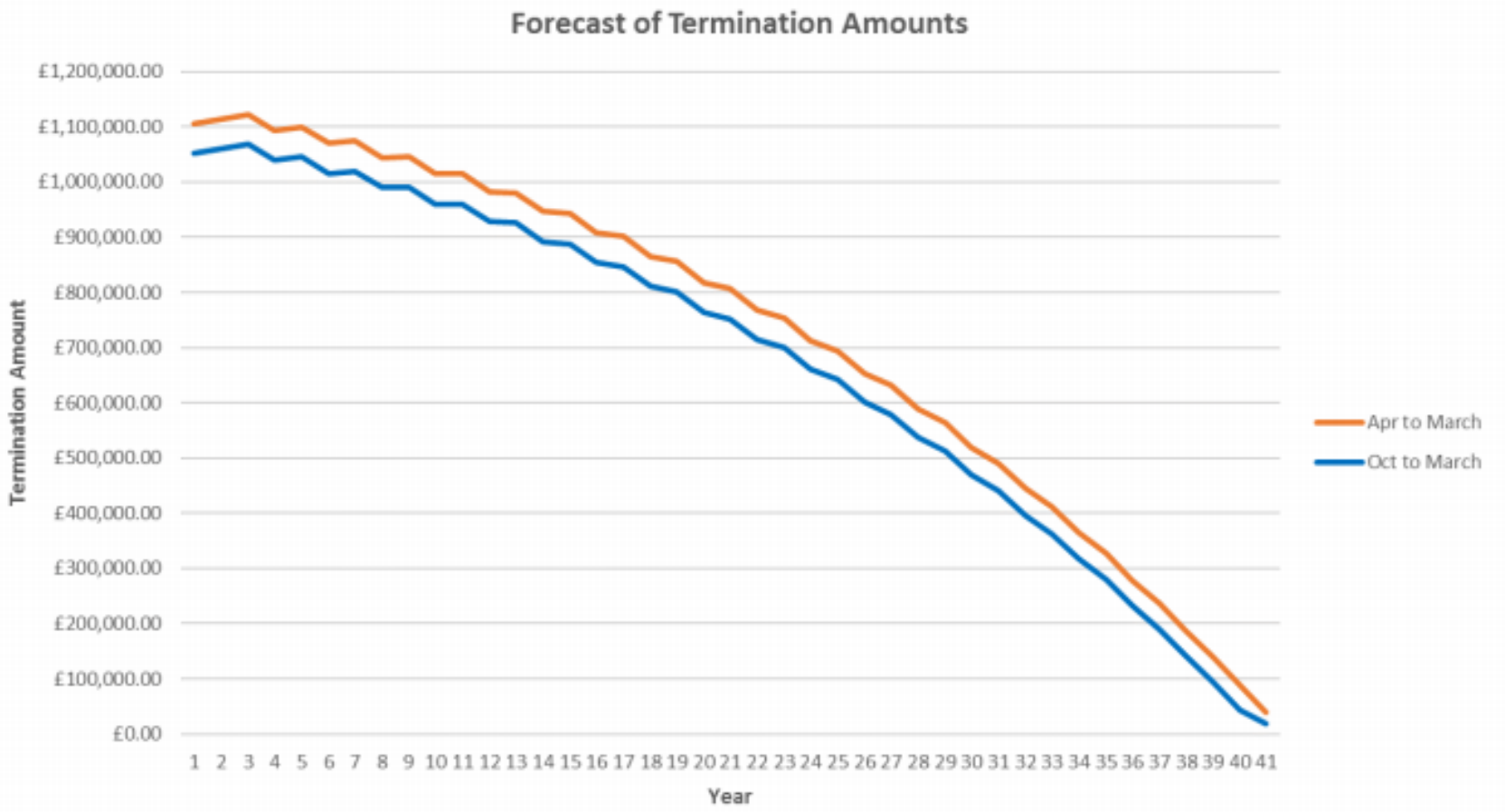
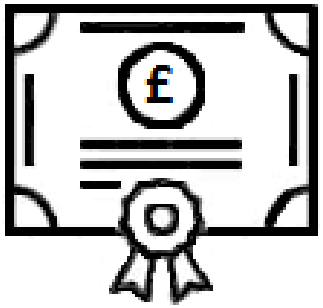


Figure 1: How the Termination Amounts vary over time assuming an initial GAV of £1,025,641.03 with constant inflation 1.33%, SSM of 0.45% and TRC of 1.47%. After the 40 year depreciation, there is no capital charge.

How do customers provide this?

Customers will generally provide security in one of the following forms:

Bank guarantee



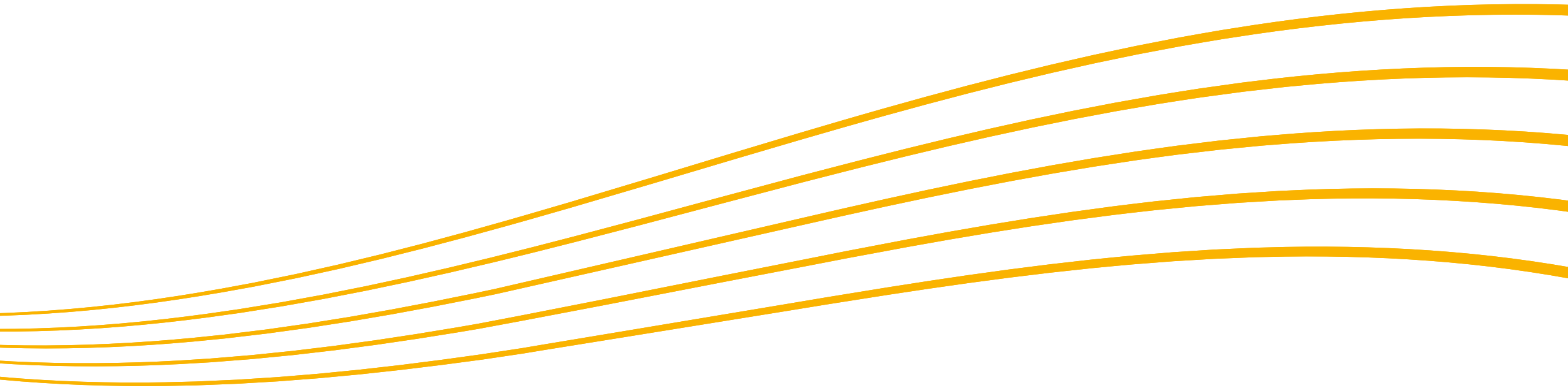
Bond

Letter of credit

Cash payment to be held in a ESO escrow account

Q&A

Lunch



BSUoS Tariffs

Katie Clark & Marwah Az-zahra

What are BSUoS charges and who pays them?

What is the charge for?

- The BSUoS charge recovers the cost of day-to-day operation including the cost of balancing the electricity transmission system.

How is it charged?

- Half hourly BSUoS Fixed Tariff £/MWh
- Information on specific charging methodologies for BSUoS are available in Section 14.31 of the CUSC

Who pays?

- **Final Demand Site (Since April 2023)**
  - Suppliers
  - Directly connected Transmission demand

Changes for BSUoS in 2023/24

Came into effect 1st April 2023

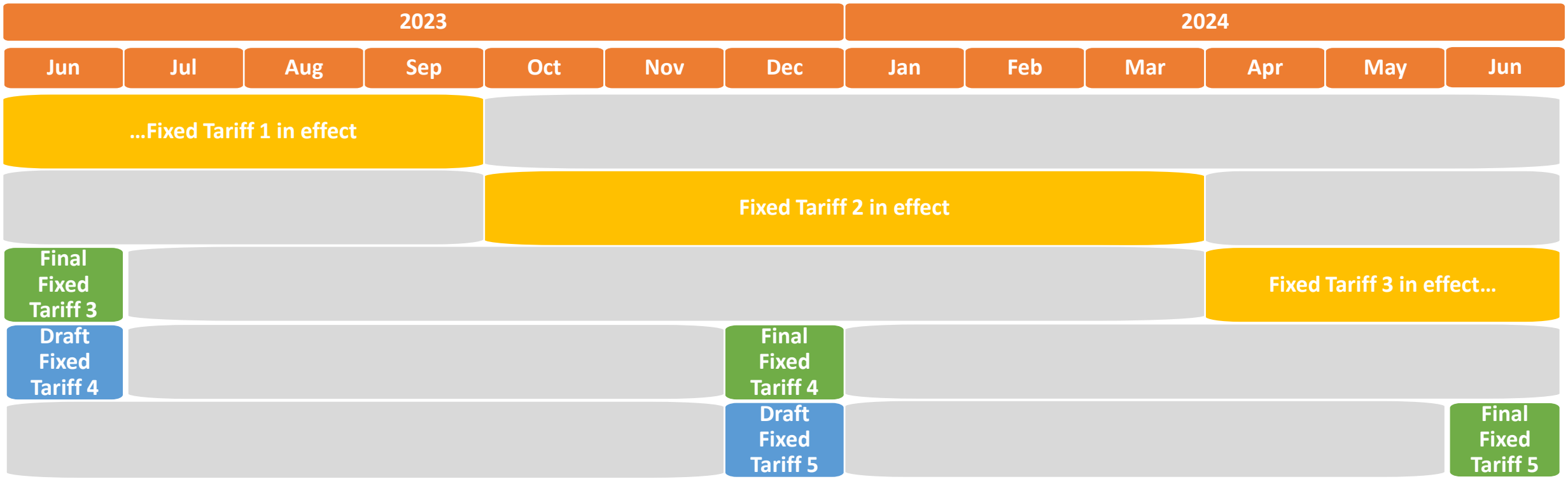
CMP308	• Removal of BSUoS charges from Generation • Charges to be levied on final demand only • Final demand declaration process, CVA v SVA
CMP361/362	• Introduction of an ex ante fixed BSUoS tariff • No current BSUoS fund, options to be discussed within BSUoS TCMF sub-group • Consequential definitions update

Included in Fixed Tariff 1/2

CMP395	• Per CMP308, generators will no longer pay BSUoS in the 2023/24 charging year but we will be running a manual monthly process to recover the portion of deferred costs they are liable for from the 2022/23 BSUoS charging year • The Supplier CMP395 deferral cost will be built into the fixed tariff price

BSUoS Tariff Setting Timetable

- Tariffs are set 9 months in advance
- Two tariffs are set each year Apr-Sep & Oct – Mar



BSUoS Fixed Tariff Inputs

Balancing Costs Forecast

- Derived from balancing cost model, based on forward curves of GB wholesale electricity as at Tariff setting.

Internal ESO Costs

- Internal costs (allowed revenue) are calculated in the Price Control Financial Model (PCFM) process as determined by the current RIIO-2 price control period.
- The costs for the 2024/25 charging year are currently based on the December 2022 PCFM.

Forecast Over/Under-Recovery

- Final over/under-recovery from previous Fixed Tariff may be included within a Future Fixed Tariff. This will be determined based on the latest available outturn date and monthly BSUoS forecast as at Final Fixed setting.

Winter Security of Supply

- ESO has received instruction to secure capacity over the past two winters, therefore there may be a future potential requirement to put additional enhanced actions in place for Winter 2023/24

Chargeable Volume Forecast

- BSUoS chargeable volume is estimated using a simple linear regression using the ESO national demand forecast as the explanatory variable.

Balancing Cost Modelling approach

Q&A: Slido.com → #Revenue

- The aim of the BSUoS forecast model is to produce a forecast with explanatory power:
  - Identify drivers for changes in balancing costs in historic data.
  - Explicit drivers capturing what we know about future changes to the system.

- Forecast is at monthly resolution with a horizon of 24 months.

- Forecast individual cost components and then combine to find total costs.

- Forecast is probabilistic to quantify the level of uncertainty.

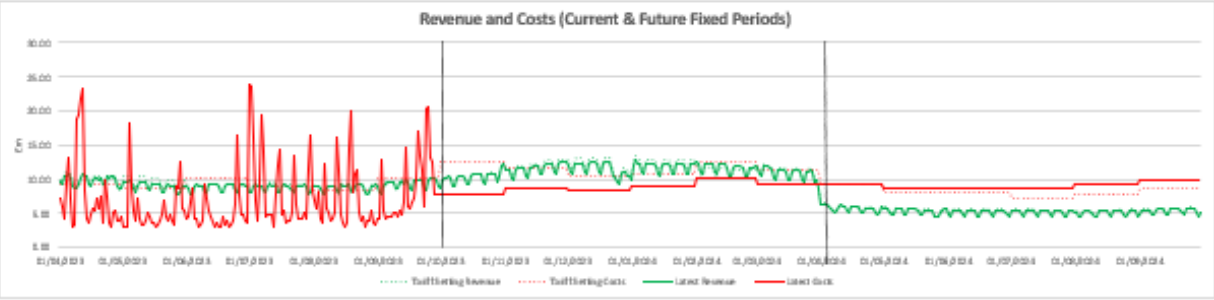
- Forecast covers a wide range of lead times therefore we use a blended approach
  - Combines the output of different models
  - Capture the variability over different time scales

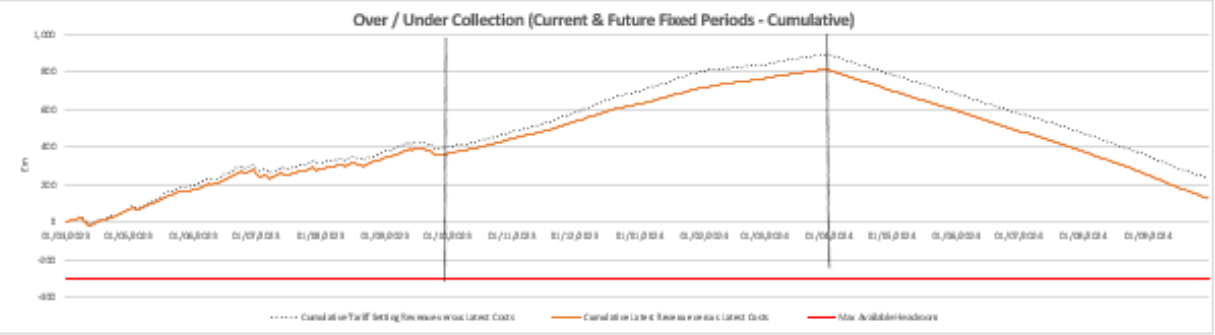
- Modelling Webinar:- Document Video Recording Slides Q&A Document

Over/Under Recovery of Charges

Report Date	28/09/2023
Latest Revenue in Fixed Per	1,638,356,346
Latest Costs in Fixed Perioc	1,279,654,276
Over / (Under) Recovery to D	358,702,070

Last date Control Room data available	27/09/2023
Last date II data entered	13/09/2023
Last date SF data entered	29/08/2023
Latest published forecast	October 23





The latest over/under-recovery of data is based on the latest of:

- Control Room Data (+1 WD)
- II Cost and Volume Data (+5 WD)
- SF Cost and Volume Data (+16 WD)
- Monthly BSUoS Forecast (15th of each month)

Data

SF Data | II Data | Control Room Data
October 23 Forecast | Tariff Setting | Calculation

Date	Balancing Mechani	Trades	Ancillary Servic	Internal Costs	Other	Total Costs	Volume	Tariff	Revenue	Over/(under) collecti
08/09/2023	327,470	1,504,344	2,000,000	1,180,055	2,936	5,014,805	702,650	13.41	9,422,538	4,407,733
09/09/2023	1,568,076	302,918	2,000,000	1,180,055	2,936	5,053,985	641,736	13.41	8,605,680	3,551,694
10/09/2023	1,098,396	211,432	2,000,000	1,180,055	2,936	4,492,820	637,985	13.41	8,555,384	4,062,564
11/09/2023	1,796,132	277,629	2,000,000	1,180,055	2,936	5,256,753	719,709	13.41	9,651,292	4,394,539
12/09/2023	943,875	598,532	2,000,000	1,180,055	2,936	4,725,397	702,456	13.41	9,419,938	4,694,541
13/09/2023	1,898,267	1,598,785	2,000,000	1,180,055	2,936	6,680,043	687,328	13.41	9,217,064	2,537,021
14/09/2023	8,800,000	2,798,222	2,000,000	1,180,055	2,936	14,781,213	728,768	13.41	9,772,780	-5,008,433
15/09/2023	2,000,000	666,542	2,000,000	1,180,055	2,936	5,849,533	718,498	13.41	9,635,057	3,785,524
16/09/2023	2,000,000	407,595	2,000,000	1,180,055	2,936	5,590,584	638,913	13.41	8,567,823	2,977,240
17/09/2023	3,000,000	439,420	2,000,000	1,180,055	2,936	6,622,411	626,617	13.41	8,402,930	1,780,518
18/09/2023	3,850,000	75,310	2,000,000	1,180,055	2,936	7,108,301	732,390	13.41	9,821,343	2,713,043
19/09/2023	5,800,000	760,000	2,000,000	1,180,055	2,936	9,742,991	741,705	13.41	9,946,261	203,270
20/09/2023	12,400,000	1,400,000	2,000,000	1,180,055	2,936	16,982,991	742,393	13.41	9,955,485	-7,027,506
21/09/2023	9,400,000	789,000	2,000,000	1,180,055	2,936	13,371,991	743,543	13.41	9,970,907	-3,401,084
22/09/2023	2,170,000	5,900,000	2,000,000	1,180,055	2,936	11,252,991	728,666	13.41	9,771,413	-1,481,578
23/09/2023	1,758,000	929,000	2,000,000	1,180,055	2,936	5,869,991	648,911	13.41	8,701,899	2,831,907
24/09/2023	14,500,000	2,700,000	2,000,000	1,180,055	2,936	20,382,991	633,489	13.41	8,495,092	-11,887,899
25/09/2023	15,490,000	1,800,000	2,000,000	1,180,055	2,936	20,472,991	741,668	13.41	9,945,766	-10,527,225
26/09/2023	9,400,000	600,000	2,000,000	1,180,055	2,936	13,182,991	752,943	13.41	10,096,965	-3,086,026
27/09/2023	8,560,000	831,000	2,000,000	1,180,055	2,936	12,573,991	754,799	13.41	10,121,855	-2,452,136
28/09/2023	6,503,333	0	0	1,180,055	2,936	7,686,324	756,252	13.41	10,141,336	2,455,011
29/09/2023	6,503,333	0	0	1,180,055	2,936	7,686,324	742,360	13.41	9,955,041	2,268,717

Published Fixed BSUoS Tariffs

Financial Year 2023/24 – Fixed Tariff 1 & 2

nationalgrideso.com/document/275721/download

	Financial Year 2023/24 - Tariff 1 - Final	
	Description	**Final Tariff**
Apr - Sep	Balancing Costs (Central) £m	1387
	Internal Costs £m	215.95
	CMP395 Recovery	Included in Balancing Costs
	Winter Security of Supply £m	87.5
	Total BSUoS £m	1690.45
	Estimated BSUoS Volume TWh	126.1
	BSUoS Tariff £/MWh	**£13.41**

	Financial Year 2023/24 - Tariff 2 - Final	
	Description	**Final Tariff**
Oct - Mar	Balancing Costs (Central) £m	1803
	Internal Costs £m	215.95
	CMP395 Recovery	Included in Balancing Costs
	Winter Security of Supply £m	87.5
	Total BSUoS £m	2106.45
	Estimated BSUoS Volume TWh	150.1
	BSUoS Tariff £/MWh	**£14.03**

Financial Year 2024/25 – Fixed Tariff 3 & Draft Tariff 4

https://www.nationalgrideso.com/document/282691/download

	Financial Year 2024/25 - Tariff 3 - Final	
	Description	**Final Tariff**
Apr - Sep	Balancing Costs (Central) £m	1,259.30
	Internal Costs £m	236.43
	Winter Security of Supply Payback from 23/24 £m	-75.00
	Over recovery from Fixed Tariff 1 (Apr 23-Sep 23) £m	-429.23
	Total BSUoS £m	991.50
	Estimated BSUoS Volume TWh	129.90
	BSUoS Tariff £/MWh	**£7.63**

	Financial Year 2024/25 - Tariff 4 - Draft	
	Description	**Draft Tariff**
Oct - Mar	Balancing Costs (Central) £m	1,407.68
	Internal Costs £m	235.14
	Winter Security of Supply Payback from 23/24 £m	-75.00
	Over recovery from Fixed Tariff 2 (Oct 23-Mar 24) £m	-435.89
	Total BSUoS £m	1,131.93
	Estimated BSUoS Volume TWh	149.00
	BSUoS Tariff £/MWh	**£7.60**

Drivers of variability

Driver	Impact
Wholesale electricity price	Cost of balancing services linked to wholesale electricity price
Network Changes	Network improvements alter constraint costs
Weather variability	Costs dependent on level of renewable generation.
Network and generator outages	Major outages of generators, interconnectors or transmission equipment leads to higher management costs
Large unexpected events	Large unexpected impacts
Policies and Government Regulation	Uncertainty in future regulatory changes or government and charging policies affecting potential future costs

BSUoS Active Mods

CMP408	• This modification looks to change the BSUoS notice period from its current 9 months to 3 months. • Should this modification be approved, the proposer's preferred option to set a new tariff by end of December 2023 for April 2024 charging, superseding this final Fixed Tariff 3, with Fixed Tariff 4 to be published in June 2024.
CMP420	• This modification will codify the treatment of 'Overrecovery' and allow the potential use of 'Over recovery' to reduce the risk of reopening prices during a future Fixed Period.
CMP396	• The modification looks to charge all interconnector lead parties BSUoS when the interconnector flows are exporting power from GB, thereby treating all Final Demand in the same manner irrelevant of where it is located

BSUoS Reporting

We have committed to providing industry with visibility of upcoming costs and the potential for tariffs to be reset. To fulfil this, we have provided the following reporting:

1. Daily web prices which include our Actual BSUoS costs
2. Weekly report on the current recovery values against fixed tariff forecasts based on:

- Actual BSUoS outturn costs (using the latest of control room data, II and SF costs)
- Actual BSUoS outturn volumes (using the latest of II and SF volumes)
- Updated projections of cost and volume, based on latest monthly forecast

3. Monthly publications of balancing service forecast cost over a 2-year time horizon (as today)

Ongoing Work

- Ongoing monitoring of current recovery vs costs – see our weekly report
- Monitoring published future tariffs vs revised forecasts
- Final Tariff 4 for Oct 2024 to Mar 2025 by end of December 2023
- Awaiting decisions regarding CMP408, raised to change tariff notification period to 3 months
- Ongoing Forecast Model Development

Q&A

BSUoS Billing

Graeme Hickman & Davinder Sanghera

What are BSUoS charges and who pays them?

What is the charge for?

- The BSUoS charge recovers the cost of day-to-day operation including the cost of balancing the electricity transmission system.

How is it charged?

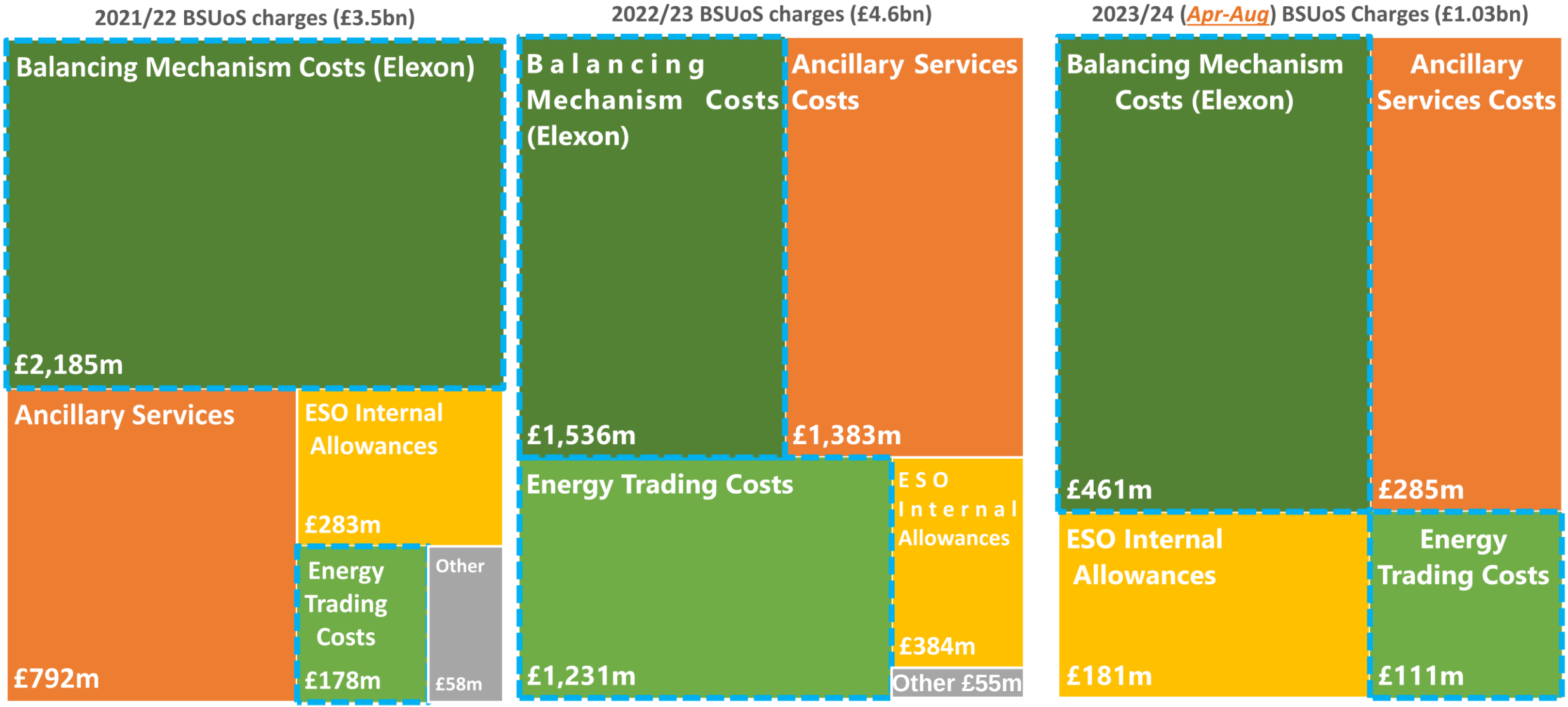
- Half hourly BSUoS Fixed Tariff £/MWh
- Information on specific charging methodologies for BSUoS are available in Section 14.31 of the CUSC

Who pays?

- **Final Demand Site (Since April 2023)**
  - Suppliers
  - Directly connected Transmission demand

What are the charges comprised of?

Q&A: Slido.com → #Revenue



*Please note that Other for the current financial year is £0.4m

Billing Process - How to calculate your BSUoS charge

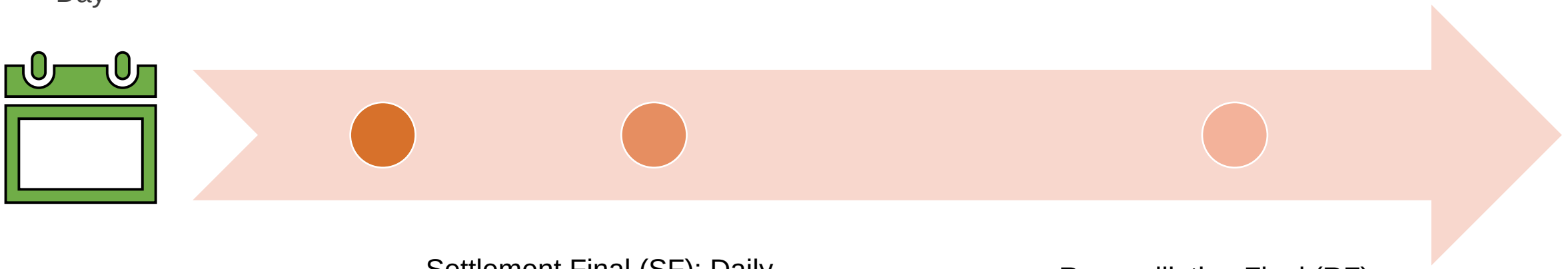
Example

Billing Process - What will you receive?

Settlement Day

Interim Initial (II): not billed Settlement Date + 5 working days

II: Notification Files, BPA and Web prices



Settlement Final (SF): Daily, Settlement Date +16 working days

- BPA, Web prices and Invoice

Reconciliation Final (RF): Daily, Settlement Date + 14 months

- BPA, Web prices, Invoice & BSUoS Charging Report (BCR - provided until settlement date 31/03/2023)

BSUoS Billing Reports

- BSC Party Charged Advice (BPA) – Breakdown of BSUoS charges at BMU level
- Current BSUoS Data (also known as Web prices) – Includes BSUoS fixed tariff, BSUoS charge, volume and daily costs at half hourly level.
- BSUoS Charging Report (BCR) – Breakdown of cost components for BSUoS (based on old methodology)

Final Demand Customer

- II, SF and RF - Daily BPA file and web prices
- RF - BCR Report (old methodology) till settlement date 31st March 23 after which no BCR report issued.

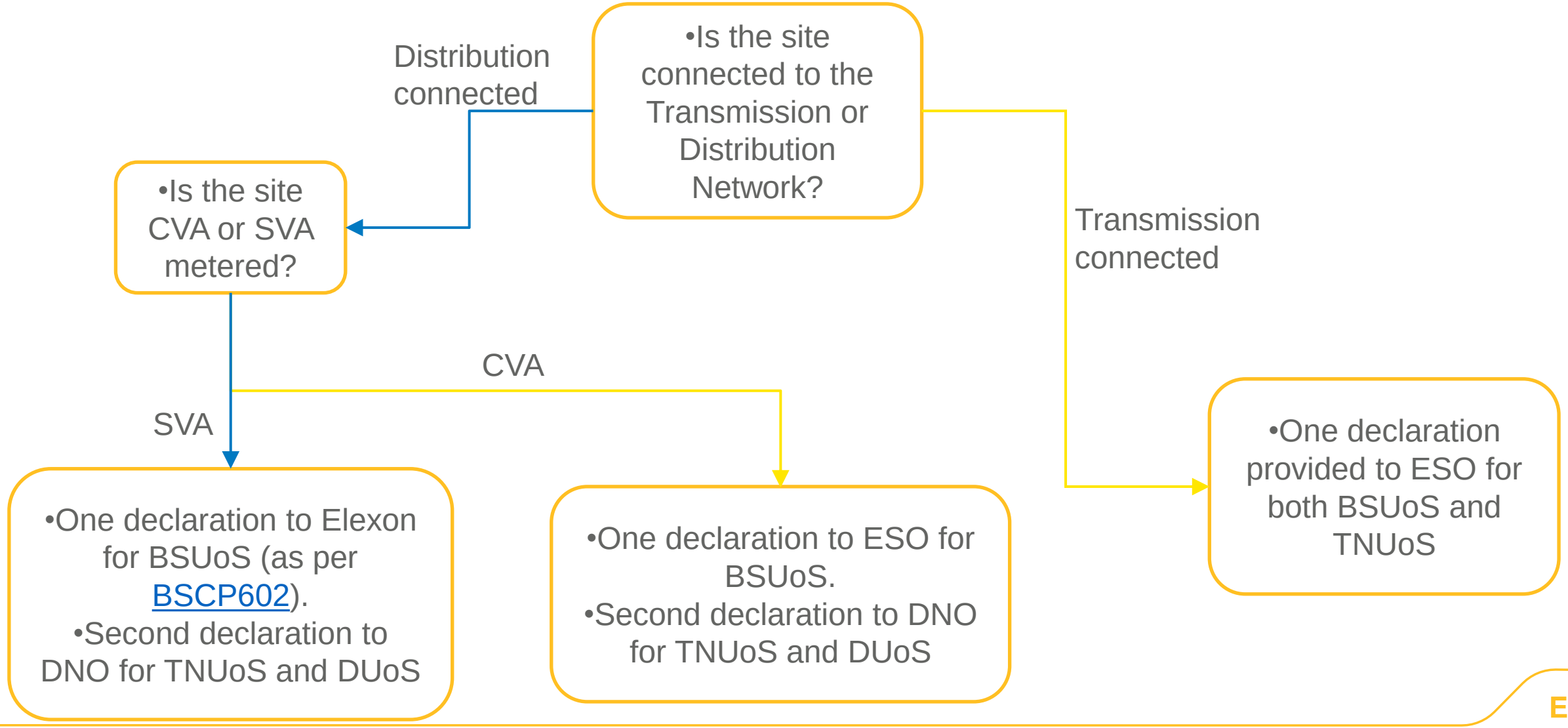
Non-Final Demand Customer

- **Must** submit a non-final demand declaration form to be exempt for BSUoS
- RF only – Daily BPA file, web prices and BCR Report (old methodology).
- After RF settlement date 31st March 23 billed no longer liable for BSUoS charges.
- CMP 395 Invoice – Cover months Apr23-Dec23, final invoice early Feb24.

Non-final Demand Declarations

Q&A: Slido.com → #Revenue

Non-final demand will be required to have submitted a declaration



Billing Process - Payment Calendar

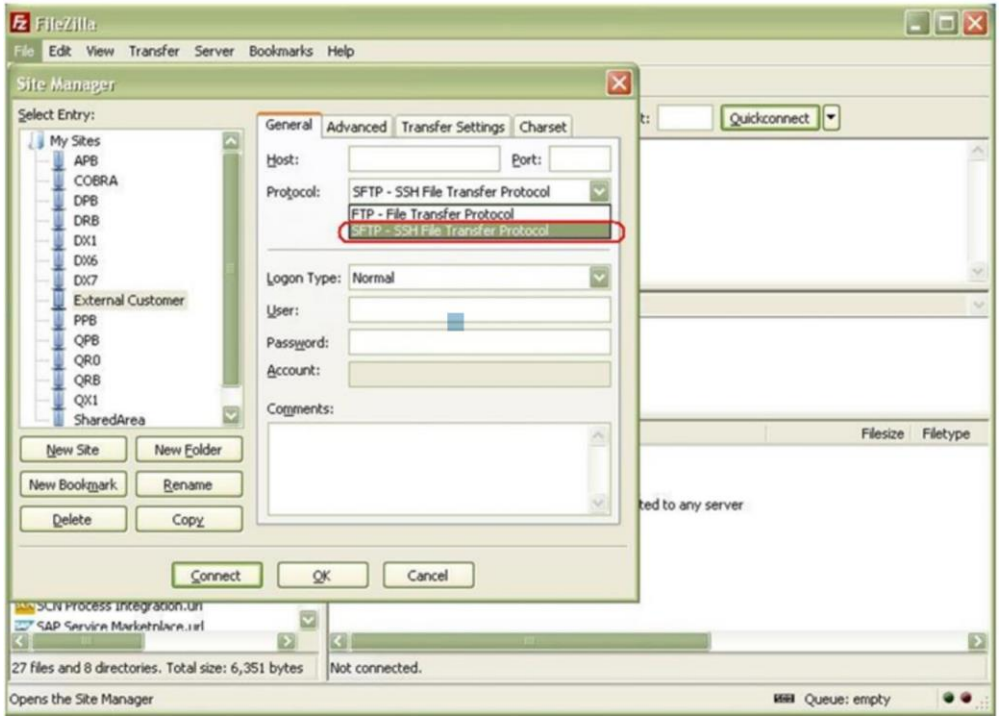
- The payment calendar is available on the BSUoS website
- It is dependent on Elexon's calendar for when the settlement metering files will be available.
- As highlighted below in orange, a customer can receive multiple SF or RF runs on a single day, reasons for this may include:
    - Catching up on Settlement dates that fall on the weekend/ bank holidays
    - Coming back from a planned system outage.
- The easiest way to pay for the charge is through a Variable Direct Debit. Payment terms are 3 business days.
- Please join our mailing circular, to be kept up to date with BSUoS information.

Sett Date	Sett Code	Notification Date (SAA released +1WD)	Payment date (notification date +3WD)	Notification Period	Payment Period
09/02/2022	RF	03/04/2023	06/04/2023	272	275
09/03/2023	SF	03/04/2023	06/04/2023	18	21
10/02/2022	RF	04/04/2023	11/04/2023	272	275
10/03/2023	SF	04/04/2023	11/04/2023	18	21
11/03/2023	SF	04/04/2023	11/04/2023	17	20
12/03/2023	SF	04/04/2023	11/04/2023	17	20
11/02/2022	RF	05/04/2023	12/04/2023	272	275
12/02/2022	RF	05/04/2023	12/04/2023	271	274
13/02/2022	RF	05/04/2023	12/04/2023	271	274
13/03/2023	SF	05/04/2023	12/04/2023	18	21
14/02/2022	RF	06/04/2023	13/04/2023	272	275
14/03/2023	SF	06/04/2023	13/04/2023	18	21
15/02/2022	RF	11/04/2023	14/04/2023	272	275
15/03/2023	SF	11/04/2023	14/04/2023	18	21
16/02/2022	RF	12/04/2023	17/04/2023	272	275
16/03/2023	SF	12/04/2023	17/04/2023	18	21
17/02/2022	RF	13/04/2023	18/04/2023	272	275
17/03/2023	SF	13/04/2023	18/04/2023	18	21
18/03/2023	SF	13/04/2023	18/04/2023	17	20
19/03/2023	SF	13/04/2023	18/04/2023	17	20
18/02/2022	RF	14/04/2023	19/04/2023	272	275

SFTP (Secure File Transfer Protocol)

Q&A: Slido.com → #Revenue

- BPA & BCR reports are available via Secure FTP
- Instructions to access/set up access to the SFTP are on the BSUoS website in the useful information and documents section. Alternatively, you can contact the mailbox with any issues or queries relating to this (bsuos.queries@nationalgrideso.com).
- Files will automatically be sent daily to the SFTP.
- The files are available for approximately 30 days after which they will be removed. Any files you wish to keep longer please download onto local drives.
- Password to access SFTP, changes every 6 months (April and October). Next password change is due 27th October. Receive new passwords on 23rd October.
- SFTP will be potentially replaced with another application when we go live with the new billing system (STAR).



Reports available on our data portal

- **Monthly Balancing Services Summary (here)**
  Provides the costs and volumes of BSUoS by month and service

- **Daily Balancing Costs (here)**
  Insightful report detailing likely BSUoS costs

- **BSUoS monthly Forecast Report (here)**
  Monthly forecast for month-ahead and a rolling 24 month period (within BSUoS Data – BSUoS Monthly Forecast)

- **Weekly over/under recovery Report (here)**
  Report found in Current BSUoS data section labelled Fixed Tariff Revenue v Costs Report

- **Payment Calendar (here)**
  This tells you which settlement days are being billed on a particular day and the payment day. Found on website within Useful Information and Documents

Q&A

Markets Services:
IT Replacement Programme

October 2023

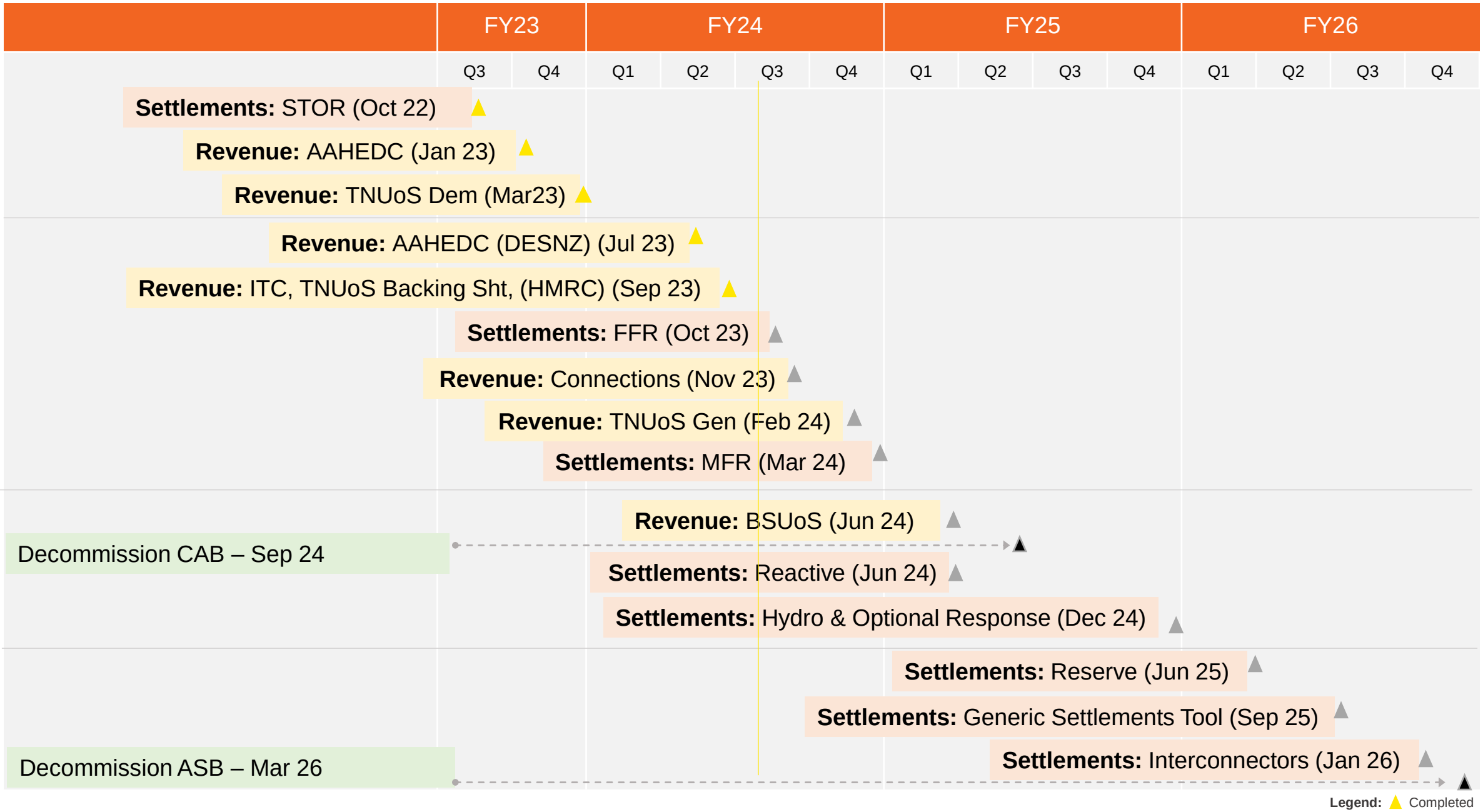
ESO

Overview

STAR delivers the ESO strategic platform for Settlement, Charging and Billing. It will be able to respond quickly to an ever evolving regulatory environment and serve a diverse and complex market.

Drivers for Change	
Markets growth	Asset Health: system scalability, flexibility to underpin growing markets and liquidity
Customer	Improved customer experience via easier access to quality data
Regulatory Compliance	Implement changes faster and more efficiently
Productivity	Process automation so teams can focus on value-add tasks

STAR Roadmap: October 2023



Changes / Improvements

Backing Sheets:

- Breakdown of site count by TDR band
- Additional table providing breakdown of site count by DNO and meter registrant (as well as band)
- Increasing the number of decimal places displayed for intermediate calculated charge values from 2dp to 6dp. The final charge will continue to be rounded to 2dp
- CSV file version of the Invoice (still be sent in PDF format)
- A Data Definition Document for the two CSV files (including example files) are available via the ESO Website

Invoices:

- A new line entry for the site daily charges on the TNUoS Invoice
- HMRC directive: The EET component of the HH charge is now split onto separate invoice line item

If you have any feedback or suggestions for further improvements, please get in touch with us at tnuos.queries@nationalgrideso.com

Summary

- Billing from STAR for **AAHEDC** and **TNUoS Demand** and working through the design and development of subsequent revenue streams
- Clear **roadmap** which sets out our vision for BP2
- Regular review our roadmap and reprioritise our backlog based on **emerging priorities and business value**
- This is supported by an agile delivery plan
- Your feedback is welcome and will **continue to inform** our design thinking

Q&A

Revenue and Charging Forum – 17th October Feedback Survey

Thank You

Please take a moment to complete feedback for the Forum

Please send any other feedback that you have via email to: Tnuos.queries@nationalgrideso.com

The teams will also be available for any specific queries or one-to-one support

Term	Description
AGIC	Avoided GSP (Grid Supply Point) Infrastructure Credit
ALF	Annual Load Factor
BCA	Bilateral Connection Agreement
BCR	Balancing Services Reporting
BEGA	Bilateral Embedded Generator Agreement
BMU	Balancing Mechanism Units
BPA	Balancing Services Charges (BSC) Party Charging Advice
BSUoS	Balancing Services Use of System
CUSC	Connection and Use of System Code
DNO	Distribution Network Operator
EET	Embedded Export Tariff
ETUoS	Embedded Transmission Use of System
FPN	Final Physical Notifications

Term	Description
FPVAR	Forecasting Performance Value at Risk
HH / NHH	Half-Hourly / Non Half-Hourly
II	Interim Initial
LDTEC	Limited Duration Transmission Entry Capacity
MITS	Main Interconnected Transmission System
NETS	National Electricity Transmission System
NIC	Network Innovation Competition
OFGEM	Office of Gas and Electricity Markets
OTNR	Offshore Transmission Network Review
PCFM	Price Control Financial Model
RF	Reconciliation Final
SCR	Significant Code Review
SF	Settlement Final

Term	Description
SQSS	Security and Quality of Supply Standard
STTEC	Short Term Transmission Entry Capacity
T&T	Model Transport and Tariff Model
TCR	Targeted Charging Review
TDR	Transmission Demand Residual
TEC	Transmission Entry Capacity
TGR	Transmission Generation Residual
TNUoS	Transmission Network Use of System
TO / OFTO	Transmission Owner / Offshore Transmission Owner
Triads	Three half-hour settlement periods with highest system demand between November and February 3 days apart
UMS	Unmetered Consumption
WACM	Workgroup Alternative CUSC Modification