TNUoS Tariffs Five Year Projection for 2029/30 – 2033/34 Webinar

NGESO Revenue Team

September 2023

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Agenda

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Tariff Forecasting & Setting Team



Nick Everitt

TNUoS Tariffs Five Year Projection for 2029/30 – 2033/34

Our electricity generation mix is changing to meet the 2035 target of decarbonising supply. Enabling this to happen is significant investment in transmission network development. These changes lead to changes to TNUoS tariffs.

- 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 is used

Tariff Timetable

NGESO 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.



- The 5 year projection (2029/30 2033/24) is in addition to quarterly publications as detailed above.
- The tariffs for 2024/25 will be refined throughout the year.
- Final Tariffs for 2024/25 will be published by 31st January 2024 and will take effect from 1st April 2024.

Background

The Pathway to 2030 Holistic Network Design helps to unlock the UK Government's ambition for 50 GW of offshore wind by 2030, by setting out a single, integrated approach that supports large scale delivery of electricity from offshore wind, to where it is needed across Great Britain.

This ambition raises the question of what impact this would have on TNUoS tariffs. Following requests from industry, we discussed provision of a TNUoS 10 year projection at the April TCMF meeting, to give insight on the tariff impact from significant future network development:-

- Holistic Network Design (HND single, integrated design that supports the large-scale delivery of electricity generated from offshore wind); and
- Accelerated Strategic Transmission Investments (ASTI)
- Significant network reinforcement works will be required under the HND (£32bn for offshore network infrastructure) and ASTI (£20bn) to connect up to 50GW of offshore wind by 2030

The projection of the 2029/30 – 2033/34 TNUoS Tariffs, along with our already published 5 year view, provides industry with a view of tariffs for the next 10 years.

This projection is provided on a one-off basis, and its purpose is to illustrate the future trend of TNUoS tariffs, if the methodology remains unchanged, over the next 10 years.

Modelling Approach

- We recognise the uncertainties in the next 10 years, and the constraints we face
- New price control periods
- Energy policies
- New technologies and challenges
- Charging/Modelling methodology changes
- Unavailability of some detailed network data
- Generation and demand background: scenarios instead of forecast
- We have therefore focused on the wider tariffs (locational elements) changes
- Identifying the trends
- Identify the main factors which drive tariff changes
- The modelling approach is different for the 10 year projection mainly due to unavailability of suitable data. More details on the modelling approach can be found in the report.

Sensitivities

We have also included a sensitivity analysis by replacing the FES "leading the way" generation background with an alternative one known as "Falling short".

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Key inputs and findings

Jo Zhou

Key Inputs for TNUoS Tariffs



Input changes in this tariff publication

		April 2023 Five Year View	September 2023 Five Year Projection
	DNO/DCC Demand Data	DNO/DCC forecast	ESO FES Demand Data
cional	Contracted TEC	Latest TEC Register	ESO FES Generation Data
Locat	Network Model	ETYS network data	Incremental changes under the HND and ASTI
	Inflation	Forecast	2%
	OFTO Revenue (part of allowed revenue)	Forecast	Forecast
	Allowed Revenue (non OFTO changes)	TO forecast	ESO assumption
ional	Demand Charging Bases	Monte-Carlo forecast	Extrapolation using the year-on-year trend under FES demand forecast
locat	Generation Charging Base	NGESO best view	ESO FES generation data
Non-	Generation ALFs	Unchanged	Unchanged
	Generation Revenue (G/D split)	Forecast	Unchanged
	TDR Site Count and Consumption Data	Forecast	Unchanged

Key findings

Total Revenue

The total TNUoS revenue is projected at £7.73bn for FY29/30, (an increase of £2,416m from 2028/29). This is projected to increase to £7.9bn in 2033/34.

Generation

- Generation revenue is projected to be £1.62bn for FY29/30; it is projected to grow to £2.08bn by FY33/34, mainly driven by the increase in offshore generation local charges.
- The generation charging base for FY29/30 has been projected as 117.7GW based on the FES "Leading the Way" scenario, increasing to 157.9GW in FY33/34.
- The average generation tariff for 2029/30 is projected at £17.86/kW; it is expected to grow to £26.82/kW in 2033/34.

Demand

Demand revenue to be collected through demand is projected at £6.12bn for 2029/30 (an increase of £2.1bn from 2028/29 charging year). This has been driven by the increase of total TNUoS revenue. From FY29/30 the demand revenue is projected to decrease year on year to £5.53bn in FY31/22 then increase to £5.82bn by FY33/34, in-line with the year-on-year variation in total revenue.

Consumer Bill

The total cost for the average end consumer is projected to be £79.45 per household in 2029/30 (7.45% of the average annual electricity consumer bill), an increase of £27.73 compared to the equivalent forecast figure for 2028/29. The total TNUoS charge is expected to decrease to £71.96 by 2031/32 then increase to £77.63 by 2033/34.

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Revenue

Marwah Az-zahra

ESO

TO Revenue

£m Nominal	2029/30	2030/31	2031/32	2032/33	2033/34
Total onshore TO Income from TNUoS	4,119.0	4,201.4	4,285.4	4,371.1	4,458.5
Other Income from TNUoS					
Significant Reinforcement Works and Other Pass-through from TNUoS	2,224.3	1,859.8	1,259.0	1,151.4	1,107.5
Offshore (plus interconnector contribution / allowance)	1,389.1	1,536.9	1,825.8	2,035.1	2,330.5
Total Other Income from TNUoS	3,613.4	3,396.7	3,084.9	3,186.5	3,437.9
Total to Collect from TNUoS	7,732.4	7,598.1	7,370.3	7,557.6	7,896.5

- Onshore TO statement: "Given that the RIIO framework post T2 has not been established and this taken together with Ofgem funding of investment levels to support the decarbonisation targets for 2035, we do not feel a 10-year projection could be relied on for investment decisions by industry"
- For further details on our ASTI and additional HND assumptions, please refer to the Allowed Revenue's section of the published report
- The total TNUoS revenue is projected at £7.73bn for FY29/30, (an increase of £2,416m from 2028/29). This is projected to increase to £7.9bn in 2033/34.
- OFTO revenue is projected to increase from £1.4bn in 2029/30 to £2.3bn in 2033/34, whilst onshore TOs revenues are projected to increase from £4.1bn in 2029/30 to £4.5bn in 2033/34.

Summary of revenue to be recovered

Revenue	2029/30	2030/31	2031/32	2032/33	2033/34
Total Revenue (£m)	7,732.43	7,598.12	7,370.27	7,557.58	7,896.47
Generation Output (TWh)	207.39	207.39	207.39	207.39	207.39
% of revenue from generation	20.9%	21.7%	25.0%	26.0%	26.3%
% of revenue from demand	79.1%	78.3%	75.0%	74.0%	73.7%
Revenue recovered from generation (£m)	1,616.29	1,646.64	1,839.09	1,963.17	2,075.11
Revenue recovered from demand (£m)	6,116.15	5,951.49	5,531.18	5,594.41	5,821.36

- The generation output is projected to remain the same between 2029/30 and 2033/34. The % of revenue recovered from generation is projected to increase from 20.9% in 2029/30 to 26.3% in 2033/34. The revenue recovered from generation is projected to increase from £1.6bn in 2029/30 to £2.1bn in 2033/34.
- Revenue recovered from demand is projected at £6.1bn in 2029/30, with a projected decrease to £5.5bn in 2031/32 and a small increase to £5.8bn in 2033/34.



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Generation Tariffs

Sarah Chleboun

Modelled & Chargeable Generation Capacity

- MODELLED:
 - Aligned with the "leading the way" scenario, produced by the FES team.
- CHARGEABLE:
 - Modelled TEC minus interconnector capacity



Generation Tariffs

- The Limiting Regulation requires the total TNUoS recovery from generators to be within the range of €0-2.50/MWh on average.
- All local onshore and local offshore tariffs are excluded in the Limiting Regulation €2.50/MWh cap for generator transmission charges, except for TNUoS local charges associated with pre-existing assets.
- The adjustment tariff was introduced to ensure compliance with the €2.50/MWh cap. It is projected to decrease, to become more negative, changing from -£11.64/kW in 2029/30 to -£21.80/kW in 2031/32 before increasing to -£20.10/kW by 2033/34.

Generation Tariffs (£/kW)		2029/30	2030/31	2031/32	2032/33	2033/34
Adjustment Tariff	-	11.642255	- 19.922687	- 21.798700	- 21.701678	- 20.104887
Average Generation Tariff*		17.856852	20.154059	22.016934	24.394945	26.824238

- The average generation tariff is calculated by dividing the total revenue payable by generation over the generation charging base in GW. It includes local charges
- The average generation tariff is projected to be £17.86/kW for 2029/30, increasing to £26.82/kW in 2033/34.

Generation TNUoS Tariffs – Wider tariffs

The generation TNUoS wider tariffs are made of the four elements below:



We publish examples for each generation type calculation using example ALFs:

Conventional Carbon 40%	Conventional Low Carbon 75%	Intermittent 45%
Biomass	Nuclear	Offshore wind
CCGT/CHP	Hydro	Onshore wind
Coal		Solar PV
OCGT/Oil		Tidal
Pumped storage		
Battery storage		
Reactive Compensation		

Generation Tariffs – Conventional Carbon

60.00

- In general, tariffs increase in magnitude over the 5 years.
- Increases in tariff for Scottish zones in 2033/34 due change in generation mix.

Example wider tariffs for a Conventional Carbon generator with 40% ALF



Generation Tariffs – Conventional Low Carbon

 Similar to Conventional Carbon though higher in the north due to paying full Year Round Not Shared tariff



Generation Tariffs – Intermittent

- Tariffs largely follow a similar profile to Conventional Low Carbon generators, but tariffs are slightly lower since they do not pay peak security tariffs.
- Decreases in tariff for Scottish zones in 2033/34 onwards change in generation mix.



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Demand Forecasts

Ishtyaq Hussain

System Peak, HH/NHH demand & Chargeable Export Forecast

Charging Bases	2029/30	2030/31	2031/32	2032/33	2033/34
Average System Demand at Triad (GW)	54.78	56.22	57.71	59.23	60.80
Average HH Demand at Triad (GW)	20.17	20.82	21.49	22.19	22.91
Chargeable Export Volume (GW)	117.74	125.70	134.20	138.76	157.86
NHH Demand (4pm-7pm TWh)	26.35	26.61	26.88	27.15	27.42

- Our projection of HH demand, NHH demand and embedded generation have been updated for 2029/30 through to 2033/34.
- To project chargeable HH and NHH demand and EET volumes for our projection, we have scaled our existing 5yr forecast.
- We assume that with recent historical trends and forward-looking assumptions, volumes will increase marginally year-on-year until 2033/34. We expect energy demands to be more driven by levels of economic growth, growing sources of electricity demand such as data centres and the electrification of heat and transport.

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Demand Tariffs

Ishtyaq Hussain

ESO

Demand Tariffs

- The 10yr projection shows average HH & NHH demand tariffs have seen a year-on-year increase from 2029/30 to 2033/34, the main driver being the increase in the total amount of revenue to be recovered through TNUoS locational element of demand tariffs.
- The current tariffs indicate that the HH/NHH locational tariffs will increase year on year. HH tariffs are projected to increase from £5.33kW in 2029/30 to £8.56kW in 2033/34. NHH tariffs are projected to increase from £0.25p/kWh in 2029/30 to £0.45p/kWh in 2033/34. This is due to locational HH/NHH revenue recovery increasing year on year.

Non-locational Banded Tariffs	2029/30	2030/31	2031/32	2032/33	2033/34
Average (£/site/annum)	186.729432	180.048976	166.817540	168.344670	175.194226
Unmetered (p/kWh)	2.226075	2.146435	1.988698	2.006903	2.088560
Demand Residual (£m)	6,030	5,814	5,387	5,436	5,658
HH Tariffs (Locational)	2029/30	2030/31	2031/32	2032/33	2033/34
Average Tariff (£/kW)	5.330181	7.879901	8.082499	8.559018	8.569798
Residual (£/kW)					
EET	2029/30	2030/31	2031/32	2032/33	2033/34
Average Tariff (£/kW)	2 4 4 4 2 0 0				
	2.444390	3.087549	3.401879	3.658483	3.714718
AGIC (£/kW)	2.444390	3.0875492.954496	3.4018792.954496	3.6584832.954496	3.714718 2.954496
AGIC (£/kW) Embedded Export Volume (GW)	2.444390 2.954496 8.827145	3.087549 2.954496 8.764844	3.401879 2.954496 8.740642	3.658483 2.954496 8.751112	3.714718 2.954496 8.793465
AGIC (£/kW) Embedded Export Volume (GW) Total Credit (£m)	2.954496 8.827145 21.6	3.087549 2.954496 8.764844 27.1	3.401879 2.954496 8.740642 29.7	3.658483 2.954496 8.751112 32.0	3.714718 2.954496 8.793465 32.7
AGIC (£/kW) Embedded Export Volume (GW) Total Credit (£m) NHH Tariffs (locational)	2.444390 2.954496 8.827145 21.6 2029/30	3.087549 2.954496 8.764844 27.1 2030/31	3.401879 2.954496 8.740642 29.7 2031/32	3.658483 2.954496 8.751112 32.0 2032/33	3.714718 2.954496 8.793465 32.7 2033/34

TDR Banded Charges

- Demand Residual tariffs are projected to increase year on year in line with increase in total demand residual recovery.
- Site counts and consumption data unchanged for all projected years.

Band		2029/30	2030/31	2031/32	2032/33	2033/34
Domestic		0.213404	0.205769	0.190126	0.192393	0.200221
LV_NoMIC_1		0.108979	0.105080	0.097092	0.098249	0.102247
LV_NoMIC_2		0.495949	0.478206	0.441853	0.447119	0.465311
LV_NoMIC_3		1.182676	1.140364	1.053675	1.066234	1.109616
LV_NoMIC_4		3.672153	3.540778	3.271610	3.310605	3.445306
LV1		5.932552	5.720308	5.285453	5.348452	5.566069
LV2		10.891999	10.502326	9.703945	9.819609	10.219146
LV3	≥	17.726743	17.092549	15.793183	15.981427	16.631674
LV4	/Da	39.931663	38.503062	35.576081	36.000123	37.464885
HV1	ite,	30.898487	29.793059	27.528207	27.856324	28.989734
HV2	£/3	99.457481	95.899277	88.609068	89.665226	93.313497
HV3	ff -	195.281031	188.294632	173.980580	176.054306	183.217550
HV4	<u> Tari</u>	495.626678	477.895075	441.565760	446.828914	465.009351
EHV1		233.870987	225.503989	208.361302	210.844823	219.423612
EHV2		1,149.922444	1,108.782674	1,024.493639	1,036.704884	1,078.886013
EHV3		2,318.612458	2,235.661486	2,065.707757	2,090.329545	2,175.380228
EHV4		6,314.261312	6,088.361503	5,625.527687	5,692.580032	5,924.197970
T-Demand1		602.502989	580.947766	536.784444	543.182538	565.283381
T-Demand2		2,488.451729	2,399.424566	2,217.021660	2,243.447003	2,334.727683
T-Demand3		6,935.252617	6,687.136144	6,178.783817	6,252.430587	6,506.827552
T-Demand4		18,123.813146	17,475.413320	16,146.942231	16,339.402460	17,004.215022
Unmetered demand				p/kWh		
Unmetered		2.226075	2.146435	1.988698	2.006903	2.088560
Demand Residual (£m)		6,030.21	5,814.48	5,387.18	5,436.50	5,657.70

HH Demand Tariffs

- The HH tariff (£/kW) will continue to be based on average demand taken over the triad periods but will only be reflective of the zonal locational demand tariffs. As such, the majority of the HH revenue would be collected through the demand residual banded tariffs on a fixed £ per site per day basis.
- In 2029/30 the average locational HH tariffs is projected to be at £5.33/kW and increase year-on-year to £8.56kW in 2033/34. Zones 1 to 8 are projected to be floored to £0/kW.

Zone	Zone Name	2029/30 (£/kW)	2030/31 (£/kW)	2031/32 (£/kW)	2032/33 (£/kW)	2033/34 (£/kW)
1	Northern Scotland	-	-	-	-	-
2	Southern Scotland	-	-	-	-	-
3	Northern	-	-	-	-	-
4	North West	-	-	-	-	-
5	Yorkshire	-	-	-	-	-
6	N Wales & Mersey	-	-	-	-	-
7	East Midlands	-	-	-	-	-
8	Midlands	-	-	-	-	-
9	Eastern	0.550669	2.016806	1.571060	1.820998	2.096945
10	South Wales	0.223747	0.797284	2.811985	2.292256	1.929970
11	South East	5.268477	9.811938	9.807450	9.797552	10.666818
12	London	6.378516	9.337742	9.095569	9.123995	9.756944
13	Southern	7.092326	8.343889	8.632584	9.281501	9.186253
14	South Western	3.730458	4.245336	5.569526	7.733885	5.655343



NHH Tariffs

- The average NHH tariff is projected to increase from £0.25p/kWh in 2029/30 to £0.45p/kWh in 2033/34.
- Fluctuations in zonal tariffs can be attributed to:
 - Increase in overall demand revenue
 - Changes in the HH and NHH charging bases (overall and zonal changes) and the proportion of demand revenue to be recovered across each, respectively.

Zone	Zone Name	2029/30 (p/kWh)	2030/31 (p/kWh)	2031/32 (p/kWh)	2032/33 (p/kWh)	2033/34 (p/kWh)
1	Northern Scotland	-	-	-	-	-
2	Southern Scotland	-	-	-	-	-
3	Northern	-	-	-	-	-
4	North West	-	-	-	-	-
5	Yorkshire	-	-	-	-	-
6	N Wales & Mersey	-	-	-	-	-
7	East Midlands	-	-	-	-	-
8	Midlands	-	-	-	-	-
9	Eastern	0.077043	0.286012	0.225834	0.265326	0.309691
10	South Wales	0.026850	0.096582	0.343818	0.282843	0.240289
11	South East	0.730718	1.378708	1.396129	1.412983	1.558485
12	London	0.721624	1.067380	1.050493	1.064716	1.150397
13	Southern	0.959449	1.146486	1.204781	1.315687	1.322635
14	South Western	0.534120	0.616632	0.820671	1.156072	0.857596



Embedded Export

- AGIC is projected at £2.95/kW and will remain the same until 2033/34.
- The EET tariff projection will increase year-on-year from £2.44/kW in 2029/30 to £3.71/kW in 2033/34.

Zone	Zone Name	2029/30 (£/kW)	2030/31 (£/kW)	2031/32 (£/kW)	2032/33 (£/kW)	2033/34 (£/kW)
1	Northern Scotland					
2	Southern Scotland	-				-
3	Northern					
4	North West	-				-
5	Yorkshire					
6	N Wales & Mersey	-				-
7	East Midlands	1.231029	1.120082	1.127561	0.904159	0.895403
8	Midlands	2.838314	1.867304	2.242235	2.061916	1.897935
9	Eastern	3.505165	4.971302	4.525556	4.775494	5.051441
10	South Wales	3.178243	3.751780	5.766481	5.246752	4.884466
11	South East	8.222973	12.766434	12.761946	12.752048	13.621314
12	London	9.333012	12.292238	12.050065	12.078491	12.711440
13	Southern	10.046822	11.298385	11.587080	12.235997	12.140749
14	South Western	6.684954	7.199832	8.524022	10.688381	8.609839



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Sensitivity Analysis

Jo Zhou

Sensitivity analysis

We have included a sensitivity scenario to help customers to understand the potential implications of changes to data that affect TNUoS Tariffs in this projection.

The sensitivity analysis that we undertook for 2030/31 tariffs is to illustrate the magnitude of tariff changes under a different FES scenario ("Falling Short" instead of "Leading the Way")

- Revenue from generation adjustment tariffs is -946.3m under "Falling Short", compared to -1,627.7m under the base case ("Leading the Way")
- Generation and demand tariffs also vary significantly under the alternative scenario

Impact of scenario switch ("falling short" instead of "leading the way")







demand tariffs and revenue recovery breakdown (for year 2030/31) are also included in the report

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Next Steps

Nick Everitt

Tariff Timetable



- The next publication will be the draft forecast of tariffs for 2024/25 which will be published in November 2023.
- The final tariffs for 2024/25 will be published in January 2024 and will apply from April 2024.

Getting involved

Transmission Charging Methodology Forum (TCMF)

- We will continue to engage with you on our TNUoS forecasts via the monthly TCMF meetings.
- Interested? Further details can be found on the NGESO website

Charging Future Forum

- One place to learn, contribute and shape the reform of GB's electricity network access and charging arrangements
- Interested? Further information can be found on the Charging Futures <u>Website</u> or sign up to receive more information <u>here</u>.

Ofgem open letter on Strategic Transmission Charging Reform

Ofgem outline the challenges and invite feedback to the questions in their letter <u>here</u>

Transport and Tariff Model Training

- The recordings from the last training session can be found <u>here</u>.
- We plan on running more sessions, register your interest via <u>TNUoS.queries@nationalgrideso.com</u>

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Q&A

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TNUoS Queries

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