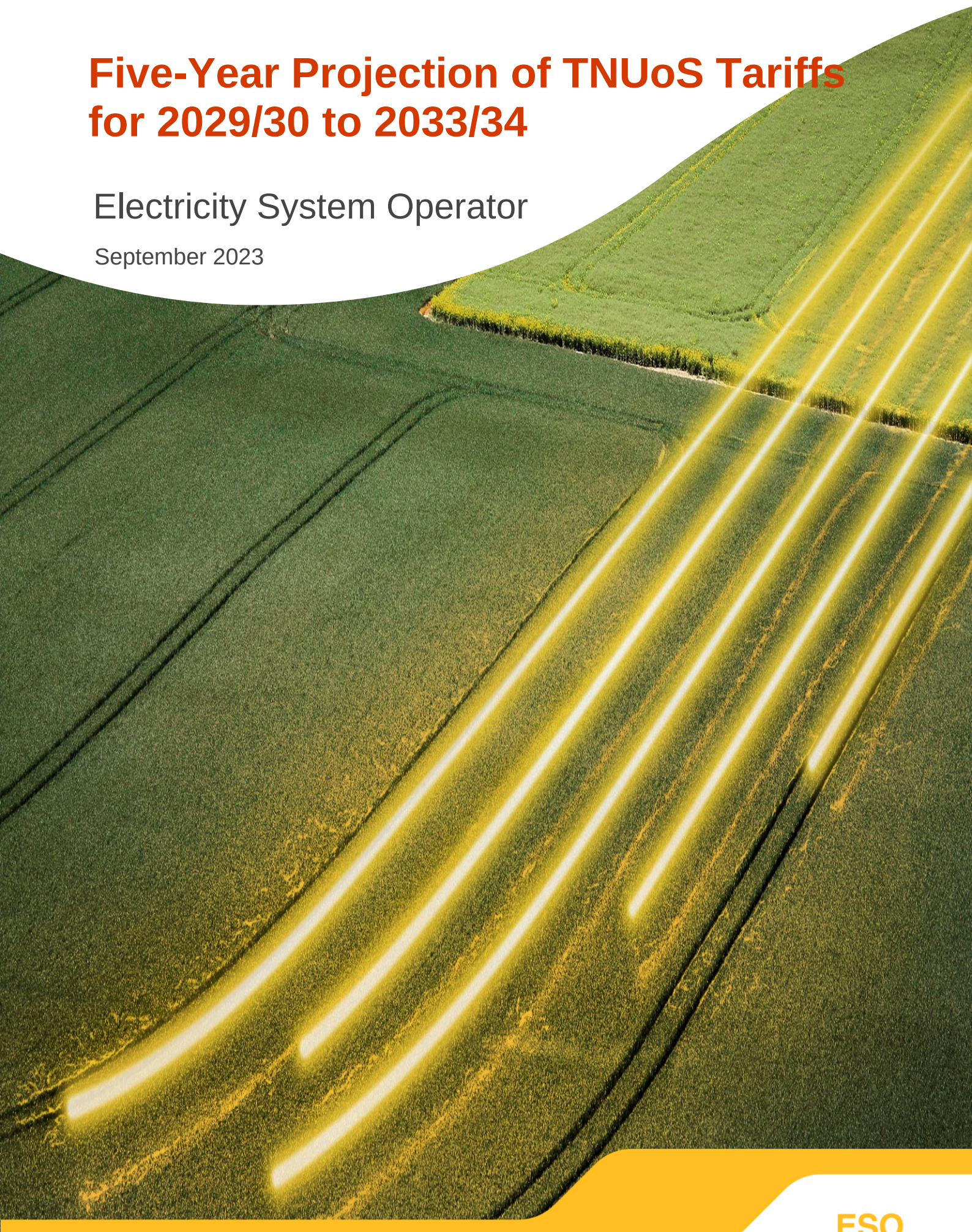
Version 1.2

Five-Year Projection of TNUoS Tariffs for 2029/30 to 2033/34



Electricity System Operator

September 2023

ESO

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TNUoS 10 Year Projection – Introduction

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Background

This report contains a projection of TNUoS tariffs for the charging years 2029/30 – 2033/34. This report 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.

There are significant plans for future network development incorporated in this projection of tariffs including Holistic Network Design (HND), Accelerated Strategic Transmission Investments (ASTI), and from future energy scenarios (FES). There are significant uncertainties in the individual and combined delivery of network development that means we have had to make a number of assumptions. In addition, this work will be delivered within regulated agreements that will be developed in the future.

We anticipate that the TNUoS and other charging methodologies will change substantially over the next 10 years. In this report, we have applied our assumptions of charging parameters and input data and have aligned our calculation with the current CUSC methodology whenever we can. We have also provided a sensitivity scenario, to help customers to understand the potential implications of changes to some of the input data. This projection can help inform ongoing changes and reform to network charging such at the TNUoS Taskforce.

This report is published without prejudice. Whilst every effort has been made to ensure the accuracy of the information, it is subject to several estimations, assumptions and forecasts and may not bear relation to either the indicative or final tariffs we will publish at later dates.

This section summarises potential changes to the methodology, data and parameters.

REMA

In July 2022 BEIS published a consultation document reviewing Electricity Market Arrangements[1]. The planned implementation will start from the mid-2020s in time to meet the 2035 decarbonisation commitment. A summary of responses was published[2] earlier this year, and a second consultation is expected to be launched later in 2023. The government also indicated in their next step the plan to work closely with Ofgem on options to sharpen locational signals, considering the role of network charging under different options for reform, and interactions with the planning and building out of the electricity network.

FES Scenarios

We have aligned the generation and demand data inputs with FES 2023[3]. The projection is based on one of the four FES scenarios called “leading the way” (LW). In the sensitivity, we applied the other scenario (“falling behind”) instead, to understand the impact on tariffs if alternative scenario is materialised.

FES data about individual generator projects are confidential, as they are ESO’s “best view”. In this report, we have provided the aggregated amount of TEC without breakdown by generation zones or technology types.

TNUoS Taskforce

In May 2022, Ofgem published an open letter[4] outlining their latest thinking on the scope of the work to be undertaken by a Task Force. In the letter, Ofgem clarified that the Task Forces will look at improvements to today’s methodology whilst keeping its core assumptions and modelling approach unchanged. They stated that this does not rule out significant changes to elements of TNUoS, for example, the transport model, changes to the ‘backgrounds’ against which charges are calculated, or the approach to the demand-weighted distributed reference node.

[1] Review of Electricity Market Arrangements (publishing.service.gov.uk)
[2] Review of Electricity Market Arrangements Summary of responses to consultation (publishing.service.gov.uk)
[3] Future Energy Scenarios | ESO (nationalgrideso.com)
[4] Transmission Network Use of System Charges – a Task Force Update (ofgem.gov.uk)

In April 2023, Ofgem published an open letter[5] providing an update on their prioritisation of activities on electricity network charging and connections. In this open letter, Ofgem confirmed that the TNUoS Taskforce will continue to focus on addressing concerns regarding the stability and predictability of TNUoS charges, while longer-term reform (late 2020s into 2030s) is led by Ofgem's Strategic Transmission Charging Reform programme, exploring the role of TNUoS in the context of different options for wholesale market design under consideration by REMA (review of electricity market arrangements). Ofgem also clarified that they believe the Taskforce itself should review priorities and agree a work programme that targets implementation of change between 2024 and 2026 (at the latest). In this report, we do not consider potential changes identified by the Taskforce.

Potential Charging Methodology Changes

Since April 2023, CUSC modification proposals have been raised in addition to the list of "in-flight" proposals that were summarised in our April 2023 Five-Year View of TNUoS Tariffs report. Table 22 gives a summary of these newly raised mod proposals.

Strategic Transmission Charging Reform

In September 2023, Ofgem published an open letter[6] on strategic transmission charging reform which set out their initial thinking on the future role and design of electricity transmission network charging and why reform may be required.

Price Control Impact on Charging Parameters

In accordance with the CUSC, at the start of each price control, various elements of the TNUoS charging methodology must be revised and updated. This projection covers the final two years of the next anticipated price control period and the first three years of the following price control, which is expected to commence in 2031-32. Input data for the recalculation of parameters is required from a number of sources, including the TO's and the Ofgem price control determinations, and are not available at this time. In this report, our assumptions are in line with the current RIIO-2 parameters, with inflation applied where applicable.

Inflation

All the tariffs in the report are based on the generic assumption of 2% for CPIH. Tariffs have been CPIH-inflated to the relevant charging year(s), as per the current CUSC methodology.

Transmission Network Revenues

One of the key variables that feeds into our annual TNUoS tariff publications is the expected revenue data, which is provided by the Onshore Transmission Network Owners (TO's). The requirement to provide this information is covered by the System Operator Transmission Owner Code (STC).

The STC procedures do not include requirements to provide data for the period that this report covers, and the transmission owners were unable to provide the information requested from them.

In the absence of any data, the statement below was provided by the Onshore TO's.

"Given that the RIIO framework post T2 has not yet 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."

[5] Open letter regarding prioritisation of electricity network charging and connections activity (ofgem.gov.uk)

[6] https://www.ofgem.gov.uk/publications/open-letter-strategic-transmission-charging-reform

Executive Summary

ESO

Executive summary

Introduction

The Electricity System Operator (ESO) is providing an indicative view of the increase to TNUoS charges for the period 2029/30 – 2033/34 to help industry with their forward planning. Significant changes to the TNUoS methodology are expected in the future, so this report should be read with appropriate caveats.

The increased TNUoS charges are recovering the significant investment the Transmission Owners are making today in projects that will deliver from 2029/30 onwards. Most of these projects arise from the Holistic Network Design and are being progressed under Ofgem's Accelerated Strategic Transmission Investment regime.

The ESO foresee a potential rise in TNUoS costs at the end of this decade, but this is significantly offset by the savings that consumers will receive from avoided constraint costs, lower carbon emissions, and lower wholesale electricity prices.

Taken solely on its own terms, the historic investment in Great Britain's transmission system, building a more secure, and cleaner electricity system comes at a cost to domestic consumers of approximately 7.6 pence per household per day.

What is TNUoS

Transmission Network Use of System (TNUoS) charges are designed to recover the cost of installing and maintaining the electricity transmission system in England, Wales, Scotland, onshore and offshore. They are applicable to transmission connected generators and suppliers for use of the transmission networks.

Following publication of the five-year view on future TNUoS Tariffs for 2024/25 - 2028/29[7], and publication of the Holistic Network Design (HND) report[8], the ESO received feedback from the industry, asking us to publish a further five-year projection of future Transmission Network Use of System (TNUoS) tariffs for years 2029/30 – 2033/34.

The ESO is providing this additional forward view of TNUoS to give industry an indicative view of how the costs of the additional network identified in the HND may impact TNUoS charges in the future. Readers should bear in mind that while we have used the existing TNUoS methodology for this report, this methodology will be changing as both the Review of Energy Market Arrangements and the TNUoS Taskforce consider fundamental changes.

Total revenues to be recovered

The total TNUoS revenue to recover in each year between 2029/30 – 2033/34 will be around £3 billion higher than the revenues to be recovered in Financial Year 2024/25. This increase in revenue is due to the significant transmission build set out in the HND. This is set out in detail on page 34.

TNUoS recovery is split between suppliers and generators. Recovery from suppliers equates to recovery from users of electricity, including domestic consumers. Under the Limiting Regulation[9] most of the TNUoS charge is recovered from suppliers.

The increase in TNUoS cost is offset by the benefits the additional transmission will bring to Great Britain. The new transmission works will reduce constraint costs compared to a network without them. These savings on constraint costs accrue directly to consumers – they are not split with generation.

Demand Tariffs

Revenue to be collected through demand is projected to increase significantly from current levels in the period 2029/30 – 2033/34, this is driven by the delivery of the ASTI projects from 2029/30 onwards. In FY 2028/29 the revenue to be collected from demand will be £4 billion, as the new infrastructure projects start to deliver in the subsequent years, this will increase to:

Year	Total Revenue to be Recovered from Demand[10]
2029/30	£6.12bn
2030/31	£5.95bn
2031/32	£5.53bn
2032/33	£5.59bn
2033/34	£5.82bn

However, these projects are not simply a cost. Delivery of these projects will lead to significant

[7] https://www2.nationalgrideso.com/document/279606/download

[8] https://www.nationalgrideso.com/future-energy/pathway-2030-holistic-network-design

[9] Commission Regulation (EU) 838/2010, as adopted in UK law, https://www.legislation.gov.uk/eur/2010/838

[10] Figures extracted from Table 17 Generation and demand revenue proportions

constraint cost savings compared to a network without them– this comes directly off consumers bills.

In addition to constraint costs, the new transmission infrastructure cuts carbon emissions by enabling more offshore wind generation. The ESO calculated the projects in the HND as saving 2 million tonnes of CO2 in the period 2030-32, in line with the Treasury Green Book methodology this would be worth in excess of £500 million to consumers.

As the projects enable significant volumes of new offshore wind to deliver greater quantities of electricity to the network wholesale prices can also be expected to come down, providing further savings to consumers.

If taken solely on its own, the total TNUoS cost for the average end consumer is projected to be £79.45 per household in 2029/30 an increase of £27.73 compared to the equivalent forecast figure for 2028/29. This equates to an increase of 2.7% on the average domestic electricity bill, or 7.6p per household per day.

Generation Tariffs

Revenue from generation is projected to be £1.62bn for FY29/30, a £0.58bn increase from FY24/25 forecast. This is projected to increase to £1.93bn by FY33/34, mainly driven by the increase in revenue from offshore generator local charges.

The Limiting Regulation has put a cap on revenue collected from generation wider charges, and any excess will be returned to generators via the so-called “adjustment revenue”. Due to the increased generation, and the higher tariffs in areas with large amount of generation, generation adjustment revenue is projected to be -£1.05bn for FY29/30 and varying each year between up to -£1.82bn (for FY31/32) and -£1.56bn (for FY33/34).

The average generation tariff is projected to be £17.86/kW for FY29/30, increased from the July forecast of FY24/25 by £5.63/kW. This figure is projected to increase to £26.82/kW by FY33/34, mainly driven by the increase in offshore local charges. Note average generation tariff figures have already been reduced by the adjustment tariff, which is projected to be -£11.6/kW for FY29/30 and dropping to -£21.8/kW (for FY31/33), before increasing slightly to -£20.1/kW by FY33/34.

Feedback

We welcome feedback on any aspect of this document and the tariff setting processes.

We are very aware that TNUoS charging is undergoing transition and there will be substantial changes to charging mechanisms over the next decade, either because of Ofgem’s charging review or through any CUSC (Connection and Use of System Code) modifications that are raised.

We strongly encourage all parties affected by the changes to the charging regime to engage with the Charging Futures Forum, or with the specific CUSC modification workgroups to flag any concerns and suggestions.

Please contact us if you have any further suggestions as to how we can better work with you to improve the tariff forecasting process.

Our contact details

Email: TNUoS.queries@nationalgrideso.com

Generation tariffs

Wider tariffs, onshore local circuit and substation tariffs, and offshore local circuit tariffs

ESO

1. Generation tariffs summary

This section summarises our view of generation tariffs from 2029/30 to 2033/34 and how these tariffs were calculated.

Table 1 Summary of average generation tariffs

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. These average tariffs include revenues from local tariffs.

The generation adjustment is used to ensure generation tariffs are compliant with Limiting Regulation, which requires total TNUoS recovery from generators to be within the range of €0-2.50/MWh on average. The adjustment tariff is currently negative to ensure Generation Tariffs are compliant with the legislation. The implementation of CMP317/327, followed by the implementation of CMP391, means that charges for the "Connection Exclusion" (i.e. assets built for generation connection) are not included in the €2.50/MWh cap. In addition, TNUoS local charges associated with pre-existing assets are included in the €2.50/MWh cap. Following the TCMF discussion in June 2023[11] , in this report, we didn't include onshore local charge calculation in the scope and continued using the 2028/29 figures instead.

Over the five-year period between 2029/30 to 2033/34, it is expected that the average generation tariff is projected to increase each year from £17.86/kW in 2029/30 to £26.82/kW in 2033/34, mainly driven by the increase in offshore local charges. The adjustment tariff is expected to decrease year-on-year up to 2031/32, increasing in magnitude, to become more negative, changing from -£11.64/kW in 2029/30 to -£21.8/kW by 2031/32. It then increases slightly to -£20.1/kW by 2029/30. This is due to the revenue which is expected to be collected from wider locational tariffs increasing in the first three years, meaning there is more of a requirement to decrease the overall generation tariff to ensure compliance with the €2.50/MWh cap and then decreasing again in the final two years.

2. Generation wider tariffs

The following section summarises the five-year view of wider generation tariffs from 2029/30 to 2033/34. A brief description of generation wider tariff structure can be found in Appendix A of the April 2023 Five-Year View of TNUoS Tariffs report.

The wider tariffs are calculated depending on the generator type and made of four components, two of the components (Year Round Shared Element and Year Round Not Shared Element) are multiplied by the generator's specific Annual Load Factor (ALF). In this report, we continued using the 2022/23 ALF figures

The classifications of generator type are listed below:

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

[11] download (nationalgrideso.com)

Each forecast, we publish example tariffs for a generator of each technology type using an example ALF. The ALFs we have used in this forecast are:

- **Conventional Carbon – 40%**
- **Conventional Low Carbon – 75%**
- **Intermittent – 45%**

The ALFs used in these examples are for illustration only. Tariffs for individual generators are calculated using their own ALFs where we have 3 or more years of data or the generic ALFs if not.

Table 2 Generation wider tariffs in 2029/30

Generation Tariffs						Example tariffs for a generator of each technology type		
Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round Tariff (£/kW)	Adjustment Tariff (£/kW)	Conventional Carbon 40% Load Factor (£/kW)	Conventional Low Carbon 75% Load Factor (£/kW)	Intermittent 45% Load Factor (£/kW)
1	North Scotland	8.293899	38.999339	35.118081	- 11.642255	26.298612	61.019229	41.025529
2	East Aberdeenshire	7.340432	24.113269	35.118081	- 11.642255	19.390717	48.901210	34.326797
3	Western Highlands	6.448817	33.935429	31.440993	- 11.642255	20.957131	51.699127	35.069681
4	Skye and Lochalsh	6.451201	33.935429	40.000939	- 11.642255	24.383493	60.261457	43.629627
5	Eastern Grampian and Tayside	7.239200	31.208968	29.095551	- 11.642255	19.718753	48.099222	31.497332
6	Central Grampian	8.063068	30.313523	28.015491	- 11.642255	19.752419	47.171446	30.014321
7	Argyll	7.874236	29.567710	37.054970	- 11.642255	22.881053	55.462734	38.718185
8	The Trossachs	8.379278	27.896629	25.073377	- 11.642255	17.925025	42.732872	25.984605
9	Stirlingshire and Fife	7.115581	28.829641	26.176131	- 11.642255	17.475635	43.271688	27.507214
10	South West Scotlands	6.380696	26.610298	24.174160	- 11.642255	15.052224	38.870325	24.506539
11	Lothian and Borders	6.537288	26.610298	15.055913	- 11.642255	11.561517	29.908670	15.388292
12	Solway and Cheviot	4.125463	18.729527	14.186324	- 11.642255	5.649548	20.716677	10.972356
13	North East England	5.331152	16.306822	10.927739	- 11.642255	4.582721	16.846753	6.623554
14	North Lancashire and The Lakes	2.744842	16.306822	- 1.066142	- 11.642255	- 2.801141	2.266562	- 5.370327
15	South Lancashire, Yorkshire and Humber	5.673682	10.252129	4.080586	- 11.642255	- 0.235487	5.801110	- 2.948211
16	North Midlands and North Wales	3.974731	2.263980	0.193536	- 11.642255	- 6.684518	- 5.776003	- 10.429928
17	South Lincolnshire and North Norfolk	- 0.355994	3.669518	0.486097	- 11.642255	- 10.336003	- 8.760014	- 9.504875
18	Mid Wales and The Midlands	- 0.901172	4.698283	0.695196	- 11.642255	- 10.386035	- 8.324519	- 8.832832
19	Anglesey and Snowdon	3.806498	0.316117	0.193536	- 11.642255	- 7.631896	- 7.405133	- 11.306466
20	Pembrokeshire	9.690402	- 4.535182	-	- 11.642255	- 3.765926	- 5.353240	- 13.683087
21	South Wales & Gloucester	4.459627	- 4.399019	-	- 11.642255	- 8.942236	- 10.481892	- 13.621814
22	Cotswold	3.276369	3.970454	- 10.815735	- 11.642255	- 11.103998	- 16.203781	- 20.671286
23	Central London	- 5.225468	3.970454	0.170154	- 11.642255	- 15.211480	- 13.719729	- 9.685397
24	Essex and Kent	- 5.024870	3.970454	0.503063	- 11.642255	- 14.877718	- 13.186222	- 9.352488
25	Oxfordshire, Surrey and Sussex	- 2.603531	- 2.557688	- 0.473087	- 11.642255	- 15.458096	- 16.637139	- 13.266302
26	Somerset and Wessex	4.677066	- 4.615146	- 0.905126	- 11.642255	- 9.173298	- 11.331675	- 14.624197
27	West Devon and Cornwall	4.461583	- 6.759913	- 0.905126	- 11.642255	- 10.246688	- 13.155733	- 15.589342

Table 3 Generation wider tariffs in 2030/31

Generation Tariffs						Example tariffs for a generator of each technology type		
Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round Tariff (£/kW)	Adjustment Tariff (£/kW)	Conventional Carbon 40% Load Factor (£/kW)	Conventional Low Carbon 75% Load Factor (£/kW)	Intermittent 45% Load Factor (£/kW)
1	North Scotland	8.913465	61.755887	70.035592	- 19.922687	41.707370	105.343285	77.903054
2	East Aberdeenshire	12.092910	52.255233	61.007031	- 19.922687	37.475129	92.368679	64.599199
3	Western Highlands	8.134787	52.182848	60.106621	- 19.922687	33.127888	87.455857	63.666216
4	Skye and Lochalsh	8.149116	52.182848	68.729901	- 19.922687	36.591529	96.093466	72.289496
5	Eastern Grampian and Tayside	8.998521	51.000816	58.713772	- 19.922687	32.961669	86.040218	61.741452
6	Central Grampian	11.968212	44.149865	48.313580	- 19.922687	29.030903	73.471504	48.258332
7	Argyll	11.587321	43.289959	54.555167	- 19.922687	30.802684	78.687270	54.112962
8	The Trossachs	10.924809	41.869034	44.825989	- 19.922687	25.680131	67.229887	43.744367
9	Stirlingshire and Fife	8.750914	43.306465	46.924565	- 19.922687	24.920639	68.232641	46.489787
10	South West Scotlands	7.528221	36.547699	39.325042	- 19.922687	17.954630	54.341350	35.848820
11	Lothian and Borders	7.520530	36.547699	28.220952	- 19.922687	13.505303	43.229569	24.744730
12	Solway and Cheviot	4.449997	25.797864	24.932221	- 19.922687	4.819344	28.807929	16.618573
13	North East England	6.732432	15.621567	10.560216	- 19.922687	- 2.717542	9.086136	- 2.332766
14	North Lancashire and The Lakes	3.379784	15.621567	6.130679	- 19.922687	- 7.842005	1.303951	- 6.762303
15	South Lancashire, Yorkshire and Humber	5.879957	9.049518	3.958647	- 19.922687	- 8.839464	- 3.296945	- 11.891757
16	North Midlands and North Wales	3.660006	3.284280	0.639575	- 19.922687	- 14.693139	- 13.159896	- 17.805186
17	South Lincolnshire and North Norfolk	0.254650	2.937344	0.523593	- 19.922687	- 18.283662	- 16.941436	- 18.077289
18	Mid Wales and The Midlands	- 1.597501	5.771653	1.416295	- 19.922687	- 18.645009	- 15.775153	- 15.909148
19	Anglesey and Snowdon	5.434718	1.601027	0.639575	- 19.922687	- 13.591728	- 12.647624	- 18.562650
20	Pembrokeshire	9.725103	- 4.926365	-	- 19.922687	- 12.168130	- 13.892358	- 22.139551
21	South Wales & Gloucester	4.490607	- 4.980586	-	- 19.922687	- 17.424314	- 19.167520	- 22.163951
22	Cotswold	3.040118	2.126545	- 9.949880	- 19.922687	- 20.011903	- 25.237540	- 28.915622
23	Central London	- 6.276267	2.126545	0.332360	- 19.922687	- 25.215392	- 24.271685	- 18.633382
24	Essex and Kent	- 5.884805	2.126545	- 1.998904	- 19.922687	- 25.756436	- 26.211487	- 20.964646
25	Oxfordshire, Surrey and Sussex	- 3.837125	- 5.125599	- 0.289883	- 19.922687	- 25.926005	- 27.893894	- 22.519090
26	Somerset and Wessex	4.424977	- 6.187061	- 0.193567	- 19.922687	- 18.049961	- 20.331573	- 22.900431
27	West Devon and Cornwall	4.335021	- 8.434453	- 0.193567	- 19.922687	- 19.038874	- 22.107073	- 23.911758

Table 4 Generation wider tariffs in 2031/32

Generation Tariffs						Example tariffs for a generator of each technology type		
Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round Tariff (£/kW)	Adjustment Tariff (£/kW)	Conventional Carbon 40% Load Factor (£/kW)	Conventional Low Carbon 75% Load Factor (£/kW)	Intermittent 45% Load Factor (£/kW)
1	North Scotland	9.379290	59.925135	73.702281	- 21.798700	41.031556	106.226722	78.869892
2	East Aberdeenshire	12.568077	51.194124	64.270423	- 21.798700	36.955196	93.435393	65.509079
3	Western Highlands	8.526779	50.182612	63.793316	- 21.798700	32.318450	88.158354	64.576791
4	Skye and Lochalsh	8.542623	50.182612	72.570783	- 21.798700	35.845281	96.951665	73.354258
5	Eastern Grampian and Tayside	8.916447	50.125088	63.726940	- 21.798700	32.658558	88.438503	64.484530
6	Central Grampian	12.267145	42.466278	51.412463	- 21.798700	28.019941	73.730617	48.723588
7	Argyll	11.888750	41.629197	57.678675	- 21.798700	29.813199	78.990623	54.613114
8	The Trossachs	11.288950	40.256488	47.836406	- 21.798700	24.727408	67.519022	44.153126
9	Stirlingshire and Fife	9.214294	41.609427	49.932194	- 21.798700	24.032242	68.554858	46.857736
10	South West Scotlands	7.510112	35.294332	42.282022	- 21.798700	16.741954	54.464183	36.365771
11	Lothian and Borders	7.139113	35.294332	31.002508	- 21.798700	11.859149	42.813670	25.086257
12	Solway and Cheviot	4.647346	24.510350	25.192807	- 21.798700	2.729909	26.424216	14.423765
13	North East England	6.113130	15.629498	12.342900	- 21.798700	- 4.496611	8.379454	- 2.422526
14	North Lancashire and The Lakes	3.411594	15.629498	6.726497	- 21.798700	- 9.444708	0.061514	- 8.038929
15	South Lancashire, Yorkshire and Humber	5.861215	8.910977	4.309903	- 21.798700	- 10.649133	- 4.944349	- 13.478857
16	North Midlands and North Wales	3.554557	3.479079	0.839459	- 21.798700	- 16.516728	- 14.795375	- 19.393655
17	South Lincolnshire and North Norfolk	1.358708	3.066016	0.671648	- 21.798700	- 18.944926	- 17.468832	- 19.747345
18	Mid Wales and The Midlands	- 0.917914	5.770752	1.682581	- 21.798700	- 19.735281	- 16.705969	- 17.519281
19	Anglesey and Snowdon	5.489138	1.759002	0.839459	- 21.798700	- 15.270178	- 14.150852	- 20.167690
20	Pembrokeshire	9.961640	- 7.048977	-	- 21.798700	- 14.656651	- 17.123793	- 24.970740
21	South Wales & Gloucester	4.406666	- 7.131888	-	- 21.798700	- 20.244789	- 22.740950	- 25.008050
22	Cotswold	1.050810	2.441327	- 11.245361	- 21.798700	- 24.269504	- 30.162256	- 31.945464
23	Central London	- 4.316769	2.441327	0.536396	- 21.798700	- 24.924380	- 23.748078	- 20.163707
24	Essex and Kent	- 5.506775	2.441327	- 2.325046	- 21.798700	- 27.258963	- 27.799526	- 23.025149
25	Oxfordshire, Surrey and Sussex	- 3.742953	- 5.191404	- 0.336332	- 21.798700	- 27.752747	- 29.771538	- 24.471164
26	Somerset and Wessex	3.993104	- 6.729345	-	- 21.798700	- 20.497334	- 22.852605	- 24.826905
27	West Devon and Cornwall	3.945994	- 9.037134	-	- 21.798700	- 21.467560	- 24.630557	- 25.865410

Table 5 Generation wider tariffs in 2032/33

Generation Tariffs						Example tariffs for a generator of each technology type		
Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round Tariff (£/kW)	Adjustment Tariff (£/kW)	Conventional Carbon 40% Load Factor (£/kW)	Conventional Low Carbon 75% Load Factor (£/kW)	Intermittent 45% Load Factor (£/kW)
1	North Scotland	12.647283	70.383154	63.090831	-21.701678	44.335199	106.823802	73.061572
2	East Aberdeenshire	9.339147	59.584599	61.213947	-21.701678	35.956887	93.539865	66.325339
3	Western Highlands	11.640233	58.988955	55.432359	-21.701678	35.707081	89.612630	60.275711
4	Skye and Lochalsh	10.759380	58.988955	63.987002	-21.701678	38.248085	97.286420	68.830354
5	Eastern Grampian and Tayside	11.722465	58.841366	55.334480	-21.701678	35.691125	89.486292	60.111417
6	Central Grampian	14.530276	48.763060	45.538858	-21.701678	30.549365	74.939751	45.780557
7	Argyll	13.323230	47.504101	52.372938	-21.701678	31.572368	79.622566	52.048105
8	The Trossachs	13.315903	46.201244	43.031505	-21.701678	27.307325	69.296663	42.120387
9	Stirlingshire and Fife	11.134110	47.631595	44.420046	-21.701678	26.253088	69.576174	44.152586
10	South West Scotlands	9.180322	39.999739	38.256459	-21.701678	18.781123	55.734907	34.554664
11	Lothian and Borders	8.550153	39.999739	27.242221	-21.701678	13.745259	44.090500	23.540426
12	Solway and Cheviot	6.634355	26.671944	22.791086	-21.701678	4.717889	27.727721	13.091783
13	North East England	6.830418	16.283767	11.506170	-21.701678	-3.755285	8.847735	-2.867813
14	North Lancashire and The Lakes	5.042339	16.283767	5.440365	-21.701678	-7.969686	0.993851	-8.933618
15	South Lancashire, Yorkshire and Humber	6.694307	8.892025	4.051452	-21.701678	-9.829980	-4.286900	-13.648815
16	North Midlands and North Wales	4.808425	2.784275	0.484407	-21.701678	-15.585780	-14.320640	-19.964347
17	South Lincolnshire and North Norfolk	-1.087767	3.405709	0.737940	-21.701678	-21.131985	-19.497223	-19.431169
18	Mid Wales and The Midlands	-1.200899	5.528977	1.596797	-21.701678	-20.052267	-17.159047	-17.616841
19	Anglesey and Snowdon	7.170743	0.750412	0.484407	-21.701678	-14.037007	-13.483719	-20.879586
20	Pembrokeshire	10.055906	-6.581213	-	-21.701678	-14.278257	-16.581682	-24.663224
21	South Wales & Gloucester	4.288931	-6.636057	-	-21.701678	-20.067170	-22.389790	-24.687904
22	Cotswold	1.482596	2.680465	-12.170869	-21.701678	-24.015244	-30.379602	-32.666338
23	Central London	-4.916648	2.680465	0.580098	-21.701678	-25.314101	-24.027879	-19.915371
24	Essex and Kent	-5.881822	2.680465	-1.919041	-21.701678	-27.278930	-27.492192	-22.414510
25	Oxfordshire, Surrey and Sussex	-4.105455	-5.203917	-0.306491	-21.701678	-28.011296	-30.016562	-24.349932
26	Somerset and Wessex	3.294740	-6.517560	-0.822353	-21.701678	-21.342903	-24.117461	-25.456933
27	West Devon and Cornwall	0.777180	-7.203532	-1.174580	-21.701678	-24.275743	-27.501727	-26.117847

Table 6 Generation wider tariffs in 2033/34

Generation Tariffs						Example tariffs for a generator of each technology type		
Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round Tariff (£/kW)	Adjustment Tariff (£/kW)	Conventional Carbon 40% Load Factor (£/kW)	Conventional Low Carbon 75% Load Factor (£/kW)	Intermittent 45% Load Factor (£/kW)
1	North Scotland	25.540512	59.342787	64.171246	- 20.104887	54.841238	114.113961	70.770613
2	East Aberdeenshire	22.449752	49.682175	61.525339	- 20.104887	46.827871	101.131835	63.777431
3	Western Highlands	23.181851	49.604516	55.965222	- 20.104887	45.304859	96.245573	58.182367
4	Skye and Lochalsh	22.558779	49.604516	64.867093	- 20.104887	48.242536	104.524372	67.084238
5	Eastern Grampian and Tayside	22.754007	53.878263	59.734002	- 20.104887	48.094026	102.791819	63.874333
6	Central Grampian	23.194698	42.461917	45.805668	- 20.104887	38.396845	80.741917	44.808644
7	Argyll	21.091737	42.284706	54.270210	- 20.104887	39.608816	86.970590	53.193441
8	The Trossachs	21.021826	40.823636	43.794388	- 20.104887	34.764149	75.329054	42.060137
9	Stirlingshire and Fife	19.034876	41.685191	44.829934	- 20.104887	33.536039	75.023816	43.483383
10	South West Scotlands	13.567652	36.362715	39.572254	- 20.104887	23.836753	60.307055	35.830589
11	Lothian and Borders	12.248521	36.362715	31.479438	- 20.104887	19.280495	50.895108	27.737773
12	Solway and Cheviot	9.384985	24.207517	23.660843	- 20.104887	8.427442	31.096579	14.449339
13	North East England	7.092240	15.165671	12.573041	- 20.104887	- 1.917162	10.934647	- 0.707294
14	North Lancashire and The Lakes	7.595157	15.165671	5.095726	- 20.104887	- 4.405171	3.960249	- 8.184609
15	South Lancashire, Yorkshire and Humber	6.437014	7.229311	3.701064	- 20.104887	- 9.295723	- 4.544826	- 13.150633
16	North Midlands and North Wales	4.952868	1.799478	0.312975	- 20.104887	- 14.307038	- 13.489436	- 18.982147
17	South Lincolnshire and North Norfolk	- 0.745040	3.242998	0.989650	- 20.104887	- 19.156868	- 17.428029	- 17.655888
18	Mid Wales and The Midlands	- 1.037757	4.989934	1.853333	- 20.104887	- 18.405337	- 15.546861	- 16.006084
19	Anglesey and Snowdon	10.187875	- 1.772016	0.312975	- 20.104887	- 10.500628	- 10.933049	- 20.589319
20	Pembrokeshire	9.355914	- 5.428997	-	- 20.104887	- 12.920572	- 14.820721	- 22.547936
21	South Wales & Gloucester	3.500172	- 5.447227	-	- 20.104887	- 18.783606	- 20.690135	- 22.556139
22	Cotswold	0.710273	2.323526	- 10.735530	- 20.104887	- 22.759416	- 28.387500	- 29.794830
23	Central London	- 4.832407	2.323526	0.675690	- 20.104887	- 23.737608	- 22.518960	- 18.383610
24	Essex and Kent	- 5.910527	2.323526	- 2.019955	- 20.104887	- 25.893986	- 26.292725	- 21.079255
25	Oxfordshire, Surrey and Sussex	- 4.677863	- 3.188030	- 1.967507	- 20.104887	- 26.844965	- 29.141280	- 23.507008
26	Somerset and Wessex	3.245195	- 3.386057	- 2.780675	- 20.104887	- 19.326385	- 22.179910	- 24.409288
27	West Devon and Cornwall	- 0.485387	- 2.973977	0.008784	- 20.104887	- 21.776351	- 22.811973	- 21.434393

3. Changes to wider tariffs over the five-year period

The following section provides details of the wider generation tariffs for 2029/30 to 2033/34 and explains how these could change over the five-year period. We have compared the example tariffs for Conventional Carbon generators with an ALF of 40%, Conventional Low Carbon generators with an ALF of 75%, and Intermittent generators with an ALF of 45% for illustration purposes only

Table 7 Comparison of Conventional Carbon (40%) tariffs

Zone	Zone Name	Example Wider Generation Tariffs (£/kW) Conventional Carbon 40%				
		2029/30	2030/31	2031/32	2032/33	2033/34
1	North Scotland	26.298612	41.707370	41.031556	44.335199	54.841238
2	East Aberdeenshire	19.390717	37.475129	36.955196	35.956887	46.827871
3	Western Highlands	20.957131	33.127888	32.318450	35.707081	45.304859
4	Skye and Lochalsh	24.383493	36.591529	35.845281	38.248085	48.242536
5	Eastern Grampian and Tayside	19.718753	32.961669	32.658558	35.691125	48.094026
6	Central Grampian	19.752419	29.030903	28.019941	30.549365	38.396845
7	Argyll	22.881053	30.802684	29.813199	31.572368	39.608816
8	The Trossachs	17.925025	25.680131	24.727408	27.307325	34.764149
9	Stirlingshire and Fife	17.475635	24.920639	24.032242	26.253088	33.536039
10	South West Scotlands	15.052224	17.954630	16.741954	18.781123	23.836753
11	Lothian and Borders	11.561517	13.505303	11.859149	13.745259	19.280495
12	Solway and Cheviot	5.649548	4.819344	2.729909	4.717889	8.427442
13	North East England	4.582721	-2.717542	-4.496611	-3.755285	-1.917162
14	North Lancashire and The Lakes	-2.801141	-7.842005	-9.444708	-7.969686	-4.405171
15	South Lancashire, Yorkshire and Humber	-0.235487	-8.839464	-10.649133	-9.829980	-9.295723
16	North Midlands and North Wales	-6.684518	-14.693139	-16.516728	-15.585780	-14.307038
17	South Lincolnshire and North Norfolk	-10.336003	-18.283662	-18.944926	-21.131985	-19.156868
18	Mid Wales and The Midlands	-10.386035	-18.645009	-19.735281	-20.052267	-18.405337
19	Anglesey and Snowdon	-7.631896	-13.591728	-15.270178	-14.037007	-10.500628
20	Pembrokeshire	-3.765926	-12.168130	-14.656651	-14.278257	-12.920572
21	South Wales & Gloucester	-8.942236	-17.424314	-20.244789	-20.067170	-18.783606
22	Cotswold	-11.103998	-20.011903	-24.269504	-24.015244	-22.759416
23	Central London	-15.211480	-25.215392	-24.924380	-25.314101	-23.737608
24	Essex and Kent	-14.877718	-25.756436	-27.258963	-27.278930	-25.893986
25	Oxfordshire, Surrey and Sussex	-15.458096	-25.926005	-27.752747	-28.011296	-26.844965
26	Somerset and Wessex	-9.173298	-18.049961	-20.497334	-21.342903	-19.326385
27	West Devon and Cornwall	-10.246688	-19.038874	-21.467560	-24.275743	-21.776351

Figure 1 Wider tariffs for a Conventional Carbon (40%) generator

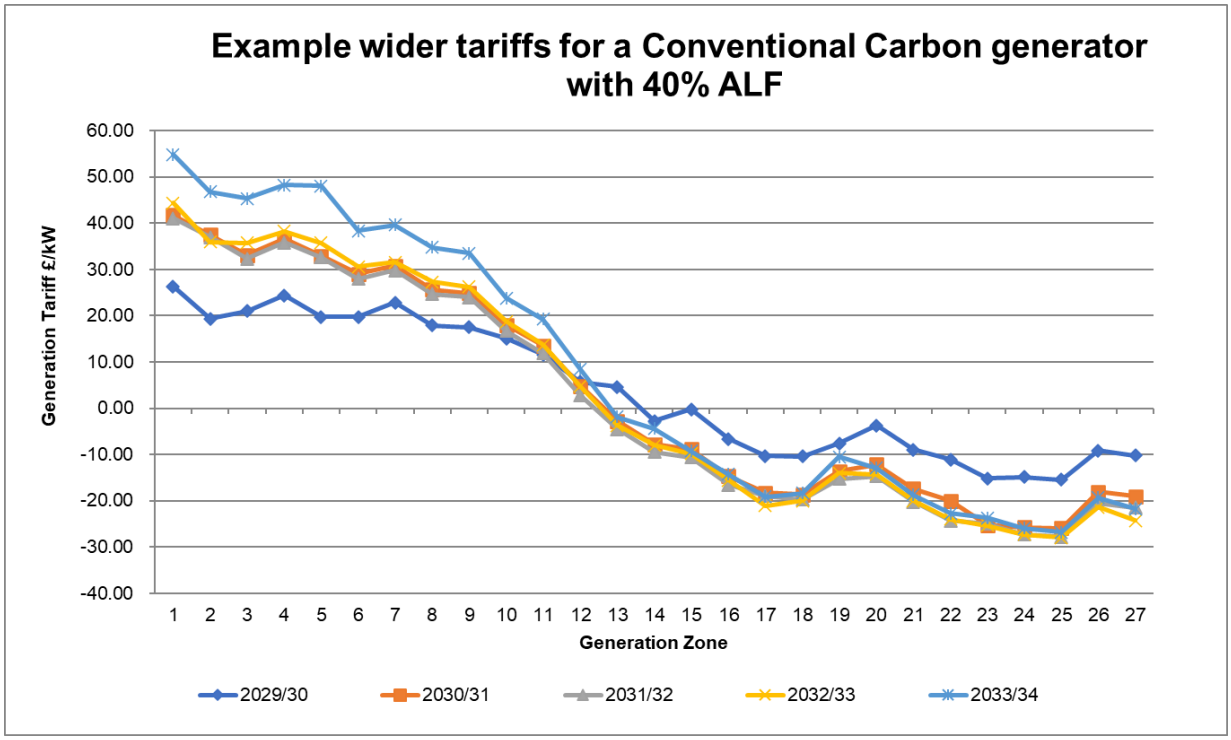

Example wider tariffs for a Conventional Carbon generator with 40% ALF
Generation Tariff £/kW
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Generation Zone
2029/30
2030/31
2031/32
2032/33
2033/34

Table 8 Comparison of Conventional Low Carbon (75%) tariffs

Zone	Zone Name	Example Wider Generation Tariffs (£/kW) Conventional Low Carbon 75%				
		2029/30	2030/31	2031/32	2032/33	2033/34
1	North Scotland	61.019229	105.343285	106.226722	106.823802	114.113961
2	East Aberdeenshire	48.901210	92.368679	93.435393	93.539865	101.131835
3	Western Highlands	51.699127	87.455857	88.158354	89.612630	96.245573
4	Skye and Lochalsh	60.261457	96.093466	96.951665	97.286420	104.524372
5	Eastern Grampian and Tayside	48.099222	86.040218	88.438503	89.486292	102.791819
6	Central Grampian	47.171446	73.471504	73.730617	74.939751	80.741917
7	Argyll	55.462734	78.687270	78.990623	79.622566	86.970590
8	The Trossachs	42.732872	67.229887	67.519022	69.296663	75.329054
9	Stirlingshire and Fife	43.271688	68.232641	68.554858	69.576174	75.023816
10	South West Scotlands	38.870325	54.341350	54.464183	55.734907	60.307055
11	Lothian and Borders	29.908670	43.229569	42.813670	44.090500	50.895108
12	Solway and Cheviot	20.716677	28.807929	26.424216	27.727721	31.096579
13	North East England	16.846753	9.086136	8.379454	8.847735	10.934647
14	North Lancashire and The Lakes	2.266562	1.303951	0.061514	0.993851	3.960249
15	South Lancashire, Yorkshire and Humber	5.801110	-3.296945	-4.944349	-4.286900	-4.544826
16	North Midlands and North Wales	-5.776003	-13.159896	-14.795375	-14.320640	-13.489436
17	South Lincolnshire and North Norfolk	-8.760014	-16.941436	-17.468832	-19.497223	-17.428029
18	Mid Wales and The Midlands	-8.324519	-15.775153	-16.705969	-17.159047	-15.546861
19	Anglesey and Snowdon	-7.405133	-12.647624	-14.150852	-13.483719	-10.933049
20	Pembrokeshire	-5.353240	-13.892358	-17.123793	-16.581682	-14.820721
21	South Wales & Gloucester	-10.481892	-19.167520	-22.740950	-22.389790	-20.690135
22	Cotswold	-16.203781	-25.237540	-30.162256	-30.379602	-28.387500
23	Central London	-13.719729	-24.271685	-23.748078	-24.027879	-22.518960
24	Essex and Kent	-13.186222	-26.211487	-27.799526	-27.492192	-26.292725
25	Oxfordshire, Surrey and Sussex	-16.637139	-27.893894	-29.771538	-30.016562	-29.141280
26	Somerset and Wessex	-11.331675	-20.331573	-22.852605	-24.117461	-22.179910
27	West Devon and Cornwall	-13.155733	-22.107073	-24.630557	-27.501727	-22.811973

Figure 2 Wider tariffs for a Conventional Low Carbon (75%) generator

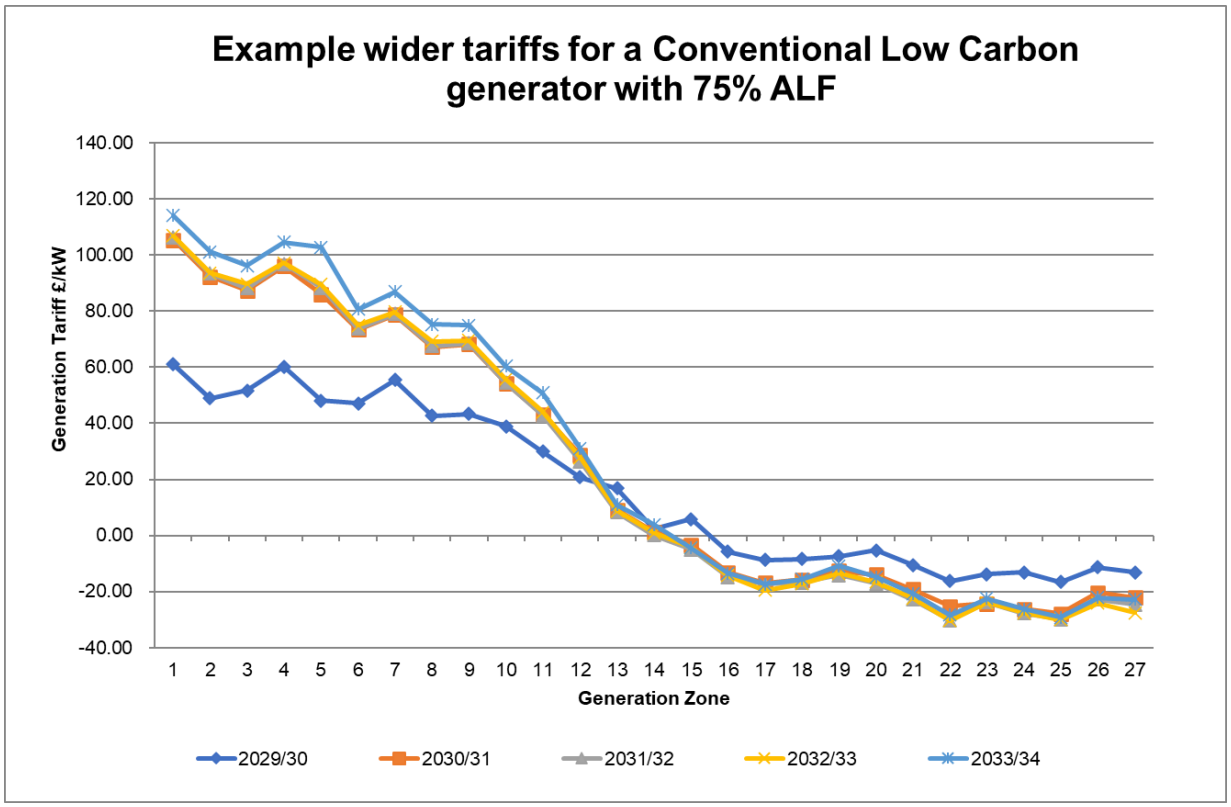
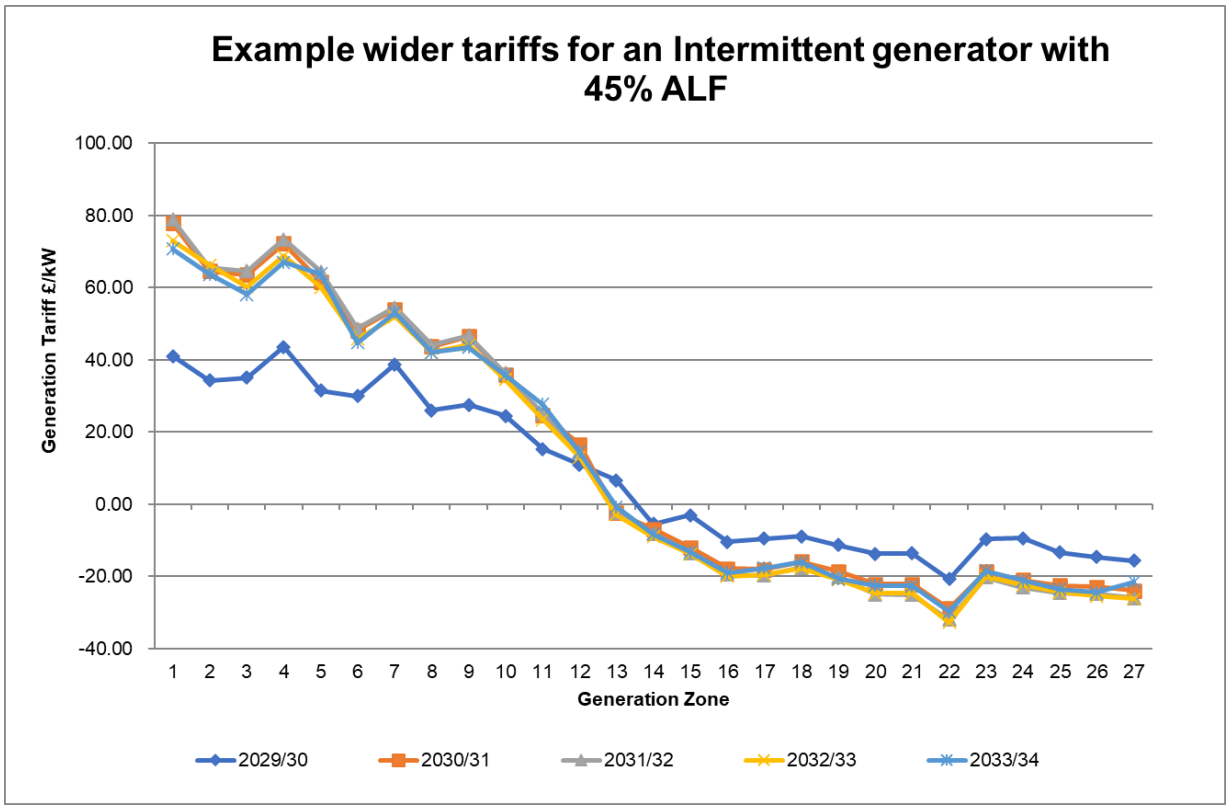


Table 9 Comparison of Intermittent (45%) tariffs

Zone	Zone Name	Example Wider Generation Tariffs (£/kW) Intermittent 45%				
		2029/30	2030/31	2031/32	2032/33	2033/34
1	North Scotland	41.025529	77.903054	78.869892	73.061572	70.770613
2	East Aberdeenshire	34.326797	64.599199	65.509079	66.325339	63.777431
3	Western Highlands	35.069681	63.666216	64.576791	60.275711	58.182367
4	Skye and Lochalsh	43.629627	72.289496	73.354258	68.830354	67.084238
5	Eastern Grampian and Tayside	31.497332	61.741452	64.484530	60.111417	63.874333
6	Central Grampian	30.014321	48.258332	48.723588	45.780557	44.808644
7	Argyll	38.718185	54.112962	54.613114	52.048105	53.193441
8	The Trossachs	25.984605	43.744367	44.153126	42.120387	42.060137
9	Stirlingshire and Fife	27.507214	46.489787	46.857736	44.152586	43.483383
10	South West Scotlands	24.506539	35.848820	36.365771	34.554664	35.830589
11	Lothian and Borders	15.388292	24.744730	25.086257	23.540426	27.737773
12	Solway and Cheviot	10.972356	16.618573	14.423765	13.091783	14.449339
13	North East England	6.623554	- 2.332766	- 2.422526	- 2.867813	- 0.707294
14	North Lancashire and The Lakes	- 5.370327	- 6.762303	- 8.038929	- 8.933618	- 8.184609
15	South Lancashire, Yorkshire and Humber	- 2.948211	- 11.891757	- 13.478857	- 13.648815	-13.150633
16	North Midlands and North Wales	- 10.429928	- 17.805186	- 19.393655	- 19.964347	-18.982147
17	South Lincolnshire and North Norfolk	- 9.504875	- 18.077289	- 19.747345	- 19.431169	-17.655888
18	Mid Wales and The Midlands	- 8.832832	- 15.909148	- 17.519281	- 17.616841	-16.006084
19	Anglesey and Snowdon	- 11.306466	- 18.562650	- 20.167690	- 20.879586	-20.589319
20	Pembrokeshire	- 13.683087	- 22.139551	- 24.970740	- 24.663224	-22.547936
21	South Wales & Gloucester	- 13.621814	- 22.163951	- 25.008050	- 24.687904	-22.556139
22	Cotswold	- 20.671286	- 28.915622	- 31.945464	- 32.666338	-29.794830
23	Central London	- 9.685397	- 18.633382	- 20.163707	- 19.915371	-18.383610
24	Essex and Kent	- 9.352488	- 20.964646	- 23.025149	- 22.414510	-21.079255
25	Oxfordshire, Surrey and Sussex	- 13.266302	- 22.519090	- 24.471164	- 24.349932	-23.507008
26	Somerset and Wessex	- 14.624197	- 22.900431	- 24.826905	- 25.456933	-24.409288
27	West Devon and Cornwall	- 15.589342	- 23.911758	- 25.865410	- 26.117847	-21.434393

Figure 3 Wider tariffs for an Intermittent (45%) generator



Locational changes

In this report, we focus on wider locational tariffs. The generation tariffs are generally expected to become more polarised over years 2029/30 – 2033/34, mainly driven by the significant network reinforcement works which will be reflected in the tariffs according to the methodology.

In 2029/30 the impact of a new HVDC link can be seen, particularly in Scottish and North England zones. From 2030/31 onwards, multiple HVDC “bootstraps” and the HND circuits were added to the TNUoS model, driving up the north-south tariff divide.

Adjustment tariff changes

The adjustment tariff has been implemented through CMP317/327, where the generation residual has been removed. However, to ensure compliance with the gen cap there is still a requirement for an adjustment tariff. The adjustment tariff is currently forecast to be negative in the next five years due to the wider tariffs causing the average generation charge to breach the cap.

In this report, we assume that the total amount to be collected from generation wider tariffs (plus local charges with pre-existing assets) are “capped” at the same amount, without inflation adjustment, across all years from 2029/30 to 2033/34. Due to the increase in wider tariffs for some generation zones with increasingly large amount of capacity, the adjustment revenue has to be increased (i.e. more negative) to keep the total eligible generation charge within the cap.

The adjustment tariff is expected to decrease year-on-year up to 2031/32, increasing in magnitude, to become more negative, changing from -£11.64/kW in 2029/30 to -£21.8/kW by 2031/32. It then increases slightly to -£20.1/kW by 2029/30. This is due to the revenue which is expected to be collected from wider locational tariffs increasing in the first three years, meaning there is more of a requirement to decrease the overall generation tariff to ensure compliance with the €2.50/MWh cap and then decreasing again in the final two years. For a full breakdown of the generation revenues, please see Table 20.

4. Onshore Local Tariffs for Generation

Following the TCMF discussion in June 2023[12] , in this report, we didn't include onshore local charge calculation in the scope and continued using the 2028/29 figures instead.

5. Offshore Local Tariffs for Generation

The local offshore tariffs (substation, circuit and Embedded Transmission Use of System) reflect the cost of offshore networks connecting offshore generation. They are calculated at the beginning of a price control or on transfer to the offshore transmission owner (OFTO). The tariffs are subsequently indexed each year, in line with the revenue of the associated Offshore Transmission Owner. Since January, the forecast has been updated with the latest inflation indices.

Please note that all offshore local tariffs will be recalculated in preparation for a new price control, to adjust for any differences in the actual OFTO revenue when compared to the forecast revenue used in RIIO-2 tariff setting and using an updated Offshore Substation Discount, which will also be calculated for the new price control. Since the data required to calculate the tariffs for a new price control is not available at this stage, offshore local tariffs have not been included in the scope of this publication, as per the onshore local generation tariffs. For this publication, we have assumed that the RIIO-2 tariffs remain and continue to be inflated in line with the revenue of the associated OFTO.

[12] download (nationalgrideso.com)

Demand tariffs

Half-Hourly (HH), Non-Half-Hourly (NHH) tariffs and the Embedded Export Tariff (EET)

ESO

6. Demand tariffs summary

There are two types of demand, Half-Hourly (HH) and Non-Half-Hourly (NHH). The section shows the tariffs for HH and NHH as well as the tariffs for Embedded Export (EET).

Table 10 Summary of demand tariffs

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)	2.444390	3.087549	3.401879	3.658483	3.714718
AGIC (£/kW)	2.954496	2.954496	2.954496	2.954496	2.954496
Embedded Export Volume (GW)	8.827145	8.764844	8.740642	8.751112	8.793465
Total Credit (£m)	21.6	27.1	29.7	32.0	32.7
NHH Tariffs (locational)	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**
Average (p/kWh)	0.255716	0.388157	0.407128	0.443498	0.451520

The above tariffs are based on the current demand CUSC methodology and do not factor future change modification like the Market wide Half Hourly Settlement implementation. Currently, generators and suppliers trade electricity in the wholesale market in half-hourly periods, but most customers are settled on a 'non-half-hourly' basis, using usage estimates that are based on profiles of average customers and meter readings. There can be considerable variances between these estimates and actual usage. Market-wide Half-Hourly Settlement (MHHS) will utilise the potential of smart meters to send accurate signals to suppliers about the cost of serving their customers throughout each day. This will place incentives on suppliers to offer new tariffs and products that encourage more flexible use of energy and help consumers to lower their bills. This will increase competition and innovation in the market and reduce costs, with numerous benefits to consumers and to wider society.

7. Demand Residual Banding Tariffs

Below in Table 11 are the forecast demand residual banded tariffs across each of the banding criteria. These tariffs will apply to HH and NHH demand as well the locational HH and NHH tariffs (where applicable).

Table 11 Non-Locational demand residual banded charges

Band		2029/30	2030/31	2031/32	2032/33	2033/34
Domestic	Tariff - £/Site/Day	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		39.931663	38.503062	35.576081	36.000123	37.464885
HV1		30.898487	29.793059	27.528207	27.856324	28.989734
HV2		99.457481	95.899277	88.609068	89.665226	93.313497
HV3		195.281031	188.294632	173.980580	176.054306	183.217550
HV4		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**

There above tariffs are calculated based on the current approved published distribution banding thresholds (LV No MIC through to EHV) for RIIO-2 and as per the decision of CMP343, there are 4 transmission connected bands. The thresholds for the T-connected bands are based on average transmission connected consumption data from 2021/22 to 2022/23 and the sites connected over that time. The consumption, consumption proportions and site counts used in the calculation of the above tariffs and are based on the out-turn data from 2021/22 provided by the DNO/IDNO's. We currently have no mechanism for forecasting future consumption and site counts across demand residual bands, therefore the only impact on the annual variance in tariffs is the change in the revenue to be recovered through demand residual, which can be seen at the bottom of the above table.

8. Half-Hourly demand tariffs

In 2029/30 the average locational HH tariffs is projected at £5.33/kW, which will then increase year-on-year to £8.57/kW in 2033/34.

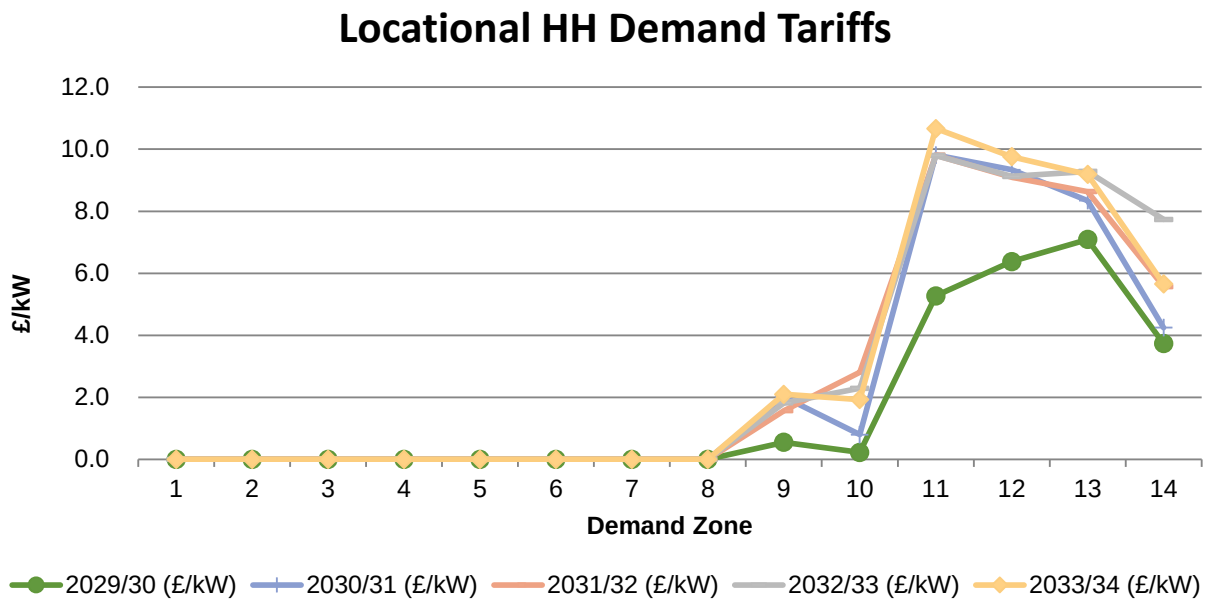
As per CMP343 decision tariffs will be floored at £0/kW from 2023/24 With locational tariffs being floored at £0/kW, demand zones 1 to 8 are set to £0/kW from 2029/30 to 2033/34. Small fluctuations can be seen in the remaining zones that have not been floored. These fluctuations are within the normal bounds, but due to the removal of the residual element these variations will be more prominent in comparison.

The table and figure below show the locational HH demand tariffs by demand zone for 2029/30 to 2033/34.

Table 12 Half-Hourly demand tariffs for 2029/30 to 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	-	-	-	-	-
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

Figure 4 Changes to gross Half-Hourly demand tariffs



The breakdown of the HH locational tariff into the peak and year-round components can be found in Appendix C.

9. Embedded Export Tariffs (EET)

The Embedded Export Tariff is designed to make credit payment to embedded generators (who are not eligible to be charged generation TNUoS tariffs with TEC lower than 100MW) for their metered exports over the triad periods.

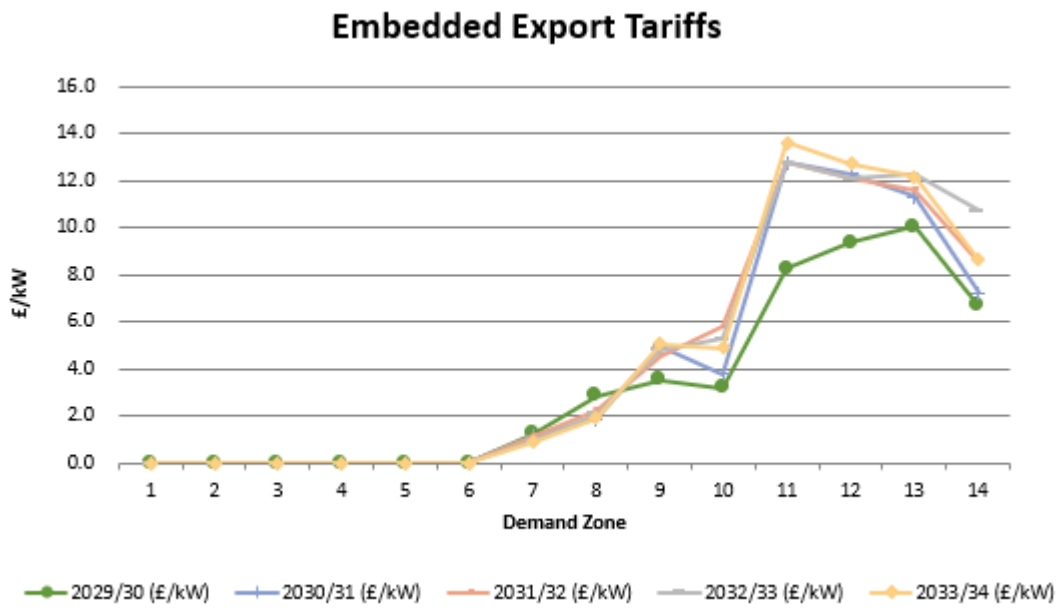
These embedded generators are paid either directly by the ESO or through their supplier when the initial demand reconciliation has been completed in accordance with CUSC (see 14.17.19 onwards). The payment to the EET is recovered through demand revenue, which will affect the price of HH and NHH demand tariffs. There is no direct impact to the EET, through the implementation of the TDR demand residual charging banding methodology.

Table 13 shows the forecasted Embedded Export Tariffs by zone in the years 2029/30 to 2033/34.

Table 13 Embedded Export Tariffs for 2029/30 to 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

Figure 5 Embedded export tariff changes



In 2029/30 the average EET is forecast at £2.44/kW, which is a slight increase in comparison to comparable 2028/29 tariffs. Over the 5 years the average EET will increase year-on-year to £3.71/kW (see Table 10).

The breakdown of the EET locational tariff into the peak and year-round components (the same values are used for HH tariff and EET, however the zones with negative tariffs are floored at £0/kW) can be found in Appendix E.

The amount of metered embedded generation produced at Triads by suppliers and embedded generators (<100MW) will determine the amount paid to them through the EET. The money to be paid out through the EET is recovered through demand tariffs, which will affect the price of HH and NHH demand tariffs.

10. Locational Non-Half-Hourly demand tariffs

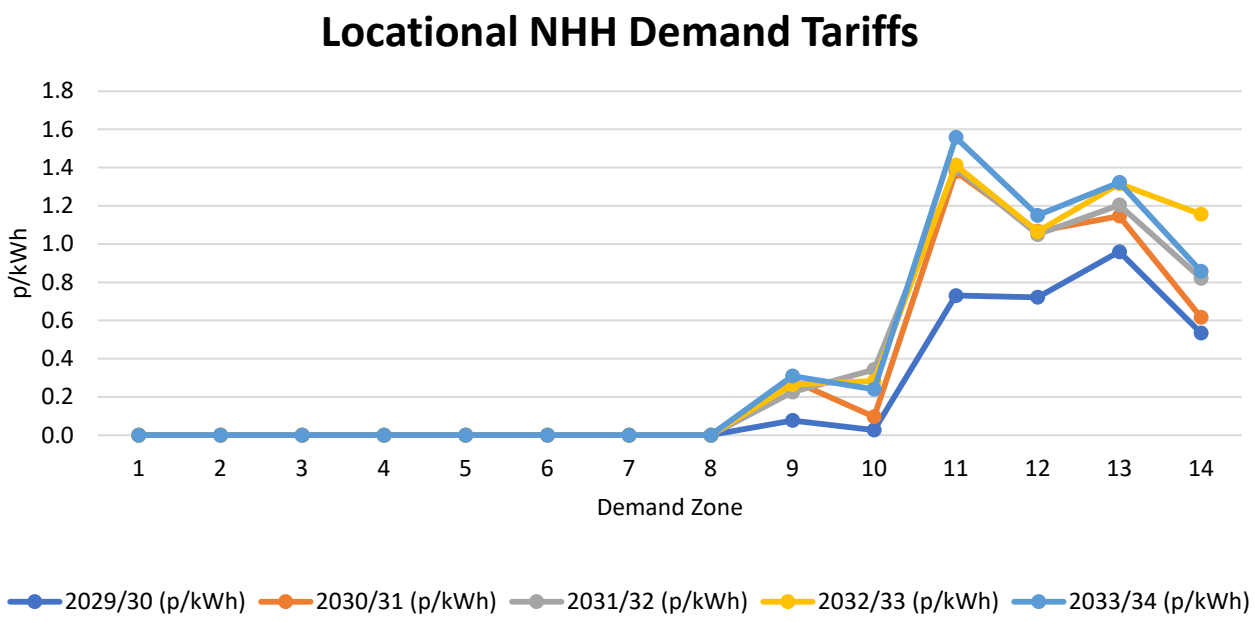
As with HH demand (now referred to as locational HH demand tariffs), the new TDR methodology significantly impacts NHH tariffs (now referred to as locational NHH demand tariffs), introducing a new set of banded tariffs for the demand residual element of demand revenue. From April 2023 (2023/24), NHH demand will continue to be subject to a p/kWh charge based on their consumption between 4pm-7pm every day of the year as they are currently. The amount paid will be significantly reduce due to the removal of the demand residual from the tariff calculation. As with locational HH demand tariffs, NHH tariffs will be floored at 0p/kWh which can be seen in Table 14. The additional £ per site per annum charge through the banded residual charges will also apply to NHH demand where applicable. For the demand residual tariffs for 2029/30 to 2033/34, please see Table 15.

Table 18 below shows the locational NHH demand tariffs for the next five years where the impact of the new banded demand residual charges can clearly be seen.

Table 14 Non-Half-Hourly demand tariffs from 2029/30 to 2033/34

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

Figure 6 Changes to Non-Half-Hourly demand tariffs



The average NHH tariff projection for 2029/30 is 0.26p/kWh, a 0.04p/kWh increase compared April 2023 Five-Year View of TNUoS Tariffs report, due to the change in demand charging methodology and the removal of the demand residual from the NHH p/kWh tariff. The locational NHH tariff projection is set to increase year-on-year through to 2033/34 which is where it will peak at 0.45p/kWh.

The changes in locational NHH tariffs will largely be the same as the locational HH tariff and EET. As the main component of these tariffs going forward, will in most part be the impact of the locational Peak and Year-Round elements of demand. The year-on-year changes in charging base for NHH as a whole and the zonal fluctuations (4-7pm consumption) will also cause changes in the NHH tariffs, as will the proportion of NHH charging base versus the HH charging base. For example, an increase in forecast HH peak demand in a zone versus a decrease in NHH 4-7pm consumption in any given year, will increase the proportion of revenue to be recovered through locational HH demand tariff for that zone and reduce the location NHH tariff. This is also true for when the scenario is reversed.

Overview of data inputs

ESO

This section explains our assumptions and approach regarding input data which are fed into this tariff projection.

11. Inputs affecting the locational element of tariffs

The locational element of generation and demand tariffs is based upon:

- Contracted position of generation;
- Nodal demand;
- Local and MITS circuits;
- Inflation;
- Locational security factor
- Expansion constant

12. Generation input data

Generation input data are important for two outputs: (1) the loadflows which in turn drives the locational tariffs, and (2) the expected revenue collected from generation, which then determine the generation/demand revenue split.

In this report, we aligned generation input data with the “leading the way” scenario, produced by the FES team. We calculated the FES generation capacity figures by each of the zones used in the ETYS report, and by each specific generation technologies, to ensure that the generation input data in our TNUoS model align with these figures. The zones are published in the ETYS report as part of the Appendix A.

13. Expansion Constant and Inflation

The Expansion Constant (EC) is the annuitised value of the cost required to transport 1 MW over 1 km. For the purposes of this projection, we assume the EC will be inflated by 2% year on year from the 2028/29 value, which was given in our April 2023 Five-Year View of TNUoS Tariffs report.

Table 15 Expansion Constant

£/MWkm	2029/30	2030/31	2031/32	2032/33	2033/34
Expansion Constant	19.875528	20.273039	20.678499	21.092069	21.513911

14. Data that are assumed to remain unchanged from the 2024/25 – 2028/29 TNUoS five year view

The following data are assumed to remain unchanged –

- Generation zone boundaries, and total number of generation zones;
- Locational onshore security factor
- Charges associated with onshore substation tariffs
- The collection of onshore local circuits
- Expansion factors
- AGIC

15. Allowed revenues

The majority of the TNUoS charges look to recover the allowed revenue for the onshore and offshore TOs in Great Britain. It also recovers some other revenue for example, the Strategic Innovation Fund. The total amount recovered is adjusted for interconnector revenue recovery or redistribution.

For Onshore TOs, their allowed revenue for the extended 2029/30 to 2033/34 projection, is made up of two parts: (1) extrapolation of the business-as-usual revenue figure (based on FY28/29 revenue forecast) inflated year on year at 2% (the assumed CPIH), and (2) revenue associated with the ASTI works.

Based on the indicative ASTI spending profile in Ofgem's decision letter[13], we derived the revenue associated with ASTI in the following approach –

- Assume that 22% of the annual spending is "fast money" and will be covered by TNUoS for the associated financial year, however will have no impact on future years' TNUoS revenue.
- Assuming the remaining 78% of the annual spending falls into the "slow money" category, and will start earning a rate of return from the financial year immediately after the year of spending. We used an annuity factor of 4.2% to convert the "slow money" into annual revenue, and the "slow money" will be recovered in 45 years.

The HND spending was split into two parts: (1) cost figure if the optimised radial connection (for offshore wind farms) is taken forward, and (2) the additional (incremental) cost for HND configuration instead. Revenue associated with part 1 is derived by using our usual OFTO revenue forecast approach. For part 2, we extracted the "incremental" cost for HND (compared to radial connection) of £7.6bn (in 21/22 price), from ESO's "Pathway to 2030" report, and assumed a generic 10%:30%:40%:20% 4-year spending profile. We then applied the same approach for ASTI costs to convert the annual spending figures into revenue.

The projection of Offshore Transmission Owner revenue to be collected via TNUoS for the 2029/30 to 2033/34 has been based on existing OFTO projects and future OFTO projects that are expected to asset transfer within this period. The expected future projects have been aligned to those that are expected to connect and subsequently asset transfer under the "leading the way" scenario produced by Future Energy Scenarios (FES).

A TNUoS revenue breakdown has not been included in the 10- year projection.

Table 16 Allowed revenues

£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**

[13] https://www.ofgem.gov.uk/sites/default/files/2022-12/ASTI%20decision%20doc%20-%20Final_Published.pdf

16. Generation / Demand (G/D) Split

The G/D split forecast is shown in Table 17.

Table 17 Generation and demand revenue proportions

Code	Revenue	2029/30	2030/31	2031/32	2032/33	2033/34
CAPEC	Limit on generation tariff (€/MWh)	2.50	2.50	2.50	2.50	2.50
y	Error Margin	23.6%	23.6%	23.6%	23.6%	23.6%
ER	Exchange Rate (€/£)	1.12	1.12	1.12	1.12	1.12
MAR	Total Revenue (£m)	7,732.43	7,598.12	7,370.27	7,557.58	7,896.47
GO	Generation Output (TWh)	207.39	207.39	207.39	207.39	207.39
G	% of revenue from generation	20.9%	21.7%	25.0%	26.0%	26.3%
D	% of revenue from demand	79.1%	78.3%	75.0%	74.0%	73.7%
G.R	Revenue recovered from generation (£m)	1,616.29	1,646.64	1,839.09	1,963.17	2,075.11
D.R	Revenue recovered from demand (£m)	6,116.15	5,951.49	5,531.18	5,594.41	5,821.36
Breakdown of generation revenue		2,160.56				
	Revenue from the Peak element	171.44	152.39	151.24	167.58	192.69
	Revenue from the Year Round Shared element	448.65	557.46	572.93	653.65	520.97
	Revenue from the Year Round Not Shared element	781.73	1,265.95	1,444.75	1,273.27	1,189.74
	Revenue from Onshore Local Circuit tariffs	46.44	41.18	42.36	42.43	39.70
	Revenue from Onshore Local Substation tariffs	17.90	17.90	17.90	17.90	17.90
	Revenue from Offshore Local tariffs	1,203.92	1,239.50	1,430.78	1,554.78	1,669.43
	Revenue from the adjustment element	-1,053.78	-1,627.73	-1,820.87	-1,746.43	-1,555.30
G.MAR	Total Revenue recovered from generation (£m)	1,616.29	1,646.64	1,839.09	1,963.17	2,075.11
	Including revenue from local charges associated with pre-existing assets (indicative) (£m)	6.45	6.45	6.45	6.45	6.45

The “gen cap”

Section 14.14.5 (v) in the CUSC currently limits average annual generation use of system charges in Great Britain to €2.5/MWh. The revenue that can be recovered from generation, is dependent on the €2.5/MWh limit, exchange rate and forecast output of chargeable generation. An error margin is also applied to reflect revenue and output forecasting accuracy. This revenue limit figure is referred to as the “gen cap”. For further detail about the exchange rate, generation TWh output, and the error margin, please refer to our April 2023 TNUoS five year view. In this report, we applied these same figures across all five years.

17. Charging bases for 2029/30 to 2033/34

Generation

In general, the forecast generation charging base is less than contracted TEC. It excludes interconnectors, which are not chargeable, and generation that we do not expect to be chargeable during the charging year due to closure, termination or delay in connection. It also includes any generators that we believe may increase their TEC.

Contracted TEC data are not used in this report, as we use data from the FES background instead of the TEC register.

We are unable to break down our best view of generation as some of the information used to derive it could be commercially sensitive.

In this report, the generation data which are used to calculate locational tariffs (known as the best view TEC), are derived from the FES generation scenario (Leading the Way). Table 18 shows the total best view TEC and chargeable TEC which are both aligned to the FES “Leading the Way” scenario.

Table 18 Contracted, Modelled & Chargeable TEC

Generation (GW)	2029/30	2030/31	2031/32	2032/33	2033/34
Contracted TEC	N/A	N/A	N/A	N/A	N/A
Modelled Best View TEC	130.19	143.15	151.66	159.02	181.82
Chargeable TEC	117.74	125.70	134.20	138.76	157.86

Demand

Our forecasts of HH demand, NHH demand and embedded generation have been updated for 2029/30 through to 2033/34.

To forecast 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.

Please refer to table TAA in the published tables spreadsheet for a detailed breakdown of the changes to the demand changing bases.

Table 19 Charging bases

Charging Bases	2029/30	2030/31	2031/32	2032/33	2033/34
Generation (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
Gross charging					
Total Average Gross Triad (GW)	54.78	56.22	57.71	59.23	60.80
HH Demand Average Gross Triad (GW)	20.17	20.82	21.49	22.19	22.91
Embedded Generation Export (GW)	8.83	8.76	8.74	8.75	8.79

18. Annual Load Factors

We have used the final version of the 2023/24 ALFs. ALFs are explained in more detail in Appendix D of the April 2023 Five-Year View of TNUoS Tariffs report, and the full list of power station ALFs are available on the National Grid ESO website.[14]

19. Adjustment tariff and demand residual

Under the existing CUSC methodology, the adjustment and residual elements of tariffs are calculated using the formulae described on page 42 of the April 2023 Five-Year View of TNUoS Tariffs report.

Table 20 shows the calculation of generation adjustment tariffs, and the breakdown of demand revenue by locational and residual.

Table 20 Residual & Adjustment Tariff calculation

[14] https://www.nationalgrideso.com/document/275686/download

Component		2029/30	2030/31	2031/32	2032/33	2033/34
G	Proportion of revenue recovered from generation (%)	20.90%	21.67%	24.95%	25.98%	26.28%
D	Proportion of revenue recovered from demand (%)	79.10%	78.33%	75.05%	74.02%	73.72%
R	Total TNUoS revenue (£m)	7,732.43	7,598.12	7,370.27	7,557.58	7,896.47
Generation revenue breakdown (without adjustment)						
ZG	Revenue recovered from the wider locational element of generator tariffs (£m)	1,401.8	1,975.8	2,168.9	2,094.5	1,903.4
O	Revenue recovered from offshore local tariffs (£m)	1,203.9	1,239.5	1,430.8	1,554.8	1,669.4
LG	Revenue recovered from onshore local substation tariffs (£m)	17.9	17.9	17.9	17.9	17.9
SG	Revenue recovered from onshore local circuit tariffs (£m)	46.4	41.2	42.4	42.4	39.7
	Revenue from local charges associated with pre-existing assets (indicative) (£m)	6.4	6.4	6.4	6.4	6.4
Generation adjustment tariff calculation						
	Limit on generation tariff (€/MWh)	2.50	2.50	2.50	2.50	2.50
	Error Margin	23.6%	23.6%	23.6%	23.6%	23.6%
	Exchange Rate (€/£)	1.12	1.12	1.12	1.12	1.12
	Total generation Output (TWh)	207.4	207.4	207.4	207.4	207.4
	Generation revenue subject to the [0,2.50]Euro/MWh range (£m)	354.48	354.48	354.48	354.48	354.48
	Adjustment Revenue (£m)	-1,053.8	-1,627.7	-1,820.9	-1,746.4	-1,555.3
BG	Generator charging base (GW)	117.74	125.70	134.20	138.76	157.86
AdjTariff	Generator adjusment tariff (£/kW)	-11.64	-19.92	-21.80	-21.70	-20.10
Gross demand residual						
RD	Demand residual (£m)	6,030.21	5,814.48	5,387.18	5,436.50	5,657.70
ZD	Revenue recovered from the locational element of demand tariffs (£m)	107.5	164.1	173.7	189.9	196.3
EE	Amount to be paid to Embedded Export Tariffs (£m)	-21.6	-27.1	-29.7	-32.0	-32.7

Tools and supporting information

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We would like to ensure that customers understand the current charging arrangements that this report is based on and the reasons why tariffs can and will change. If you have specific queries on this projection, please contact us using the details below. Feedback on the content and format of this projection is also welcome. We are particularly interested to hear how accessible you find the report and if it provides the right level of detail.

Charging webinars

We will be hosting a webinar for the 10 year projection on the 25th September 2023. You can register for this webinar at the following link :- **Register for Webinar** Please contact us if you have any issues registering for the webinar.

Charging model copies not available

We are unable to make a copy of the charging model available for the 10 year projection but we can supply copies of the models used for prior tariff publications, please contact us for this.

Numerical data

All tables in this document can be downloaded as an Excel spreadsheet from our website:

https://www.nationalgrideso.com/document/288936/download

Contact Us

We welcome feedback on any aspect of this document and the tariff setting processes.

Do let us know if you have any further suggestions as to how we can better work with you to improve the tariff forecasting process.

Our contact details

Email: TNUoS.queries@nationalgrideso.com

Appendix A: FES Scenario Sensitivity

Purpose

The TNUoS tariffs are calculated using a wide range of data. In order to understand the potential impact by generation scenario uncertainties, we undertook a sensitivity analysis by replacing the FES "leading the way" generation background with an alternative one known as "Falling short". Under the alternative scenario, the 2030/31 tariffs are given below.

Table S1 Generation Tariffs for 2030/31 under the "Falling Short" scenario

Generation Zones		System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round Tariff (£/kW)	Adjustment Tariff (£/kW)	Conventional Carbon (40%)	Conventional Low Carbon (75%)	Intermittent 45%
Zone	Zone Name							
1	North Scotland	4.819180	61.607351	68.559940	-13.989236	42.896860	105.595397	82.294012
2	East Aberdeenshire	8.575668	47.865908	68.559940	-13.989236	41.156771	99.045803	76.110363
3	Western Highlands	3.653916	54.838815	61.852244	-13.989236	36.341104	92.646035	72.540475
4	Skye and Lochalsh	3.637617	54.838815	70.329728	-13.989236	39.715798	101.107220	81.017959
5	Eastern Grampian and Tayside	3.537841	52.516446	59.044427	-13.989236	34.172954	87.980367	68.687592
6	Central Grampian	4.465282	47.184146	51.436234	-13.989236	29.924198	77.300390	58.679864
7	Argyll	6.110657	46.022316	54.782818	-13.989236	32.443475	81.420976	61.503624
8	The Trossachs	5.638447	44.317830	47.289219	-13.989236	28.292031	72.176803	53.243007
9	Stirlingshire and Fife	3.546340	45.257663	48.535096	-13.989236	27.074208	72.035447	54.911808
10	South West Scotlands	1.667146	36.392490	40.444242	-13.989236	18.412603	55.416520	42.831627
11	Lothian and Borders	1.945958	36.392490	31.482858	-13.989236	15.106861	46.733948	33.870243
12	Solway and Cheviot	0.498987	26.679066	26.021984	-13.989236	7.590171	32.541035	24.038328
13	North East England	2.744130	19.177913	14.152981	-13.989236	2.087252	17.291310	8.793806
14	North Lancashire and The Lakes	0.533998	19.177913	3.416911	-13.989236	-4.417308	4.345108	-1.942264
15	South Lancashire, Yorkshire and Humber	2.867235	8.650666	1.631074	-13.989236	-7.009305	-3.002928	-8.465362
16	North Midlands and North Wales	2.040025	5.187543	0.413945	-13.989236	-9.708616	-7.644609	-11.240897
17	South Lincolnshire and North Norfolk	-0.124264	4.568632	0.411304	-13.989236	-12.121526	-10.275722	-11.522048
18	Mid Wales and The Midlands	-0.202119	6.272084	0.419574	-13.989236	-11.514692	-9.067718	-10.747224
19	Anglesey and Snowdon	6.031012	0.961820	0.413945	-13.989236	-7.407918	-6.822914	-13.142472
20	Pembrokeshire	9.622520	-7.432895	-	-13.989236	-7.339874	-9.941387	-17.334039
21	South Wales & Gloucester	4.804472	-7.626480	-	-13.989236	-12.235356	-14.904624	-17.421152
22	Cotswold	4.372547	0.325950	-7.949770	-13.989236	-12.666217	-17.321997	-21.792329
23	Central London	-4.494929	0.325950	-2.358583	-13.989236	-19.297218	-20.598286	-16.201142
24	Essex and Kent	-3.621064	0.325950	-	-13.989236	-17.479920	-17.365838	-13.842559
25	Oxfordshire, Surrey and Sussex	-0.229380	-5.246688	-	-13.989236	-16.317291	-18.153632	-16.350246
26	Somerset and Wessex	4.100177	-7.171249	-	-13.989236	-12.757559	-15.267496	-17.216298
27	West Devon and Cornwall	5.316421	-9.281522	-	-13.989236	-12.385424	-15.633957	-18.165921

Table S2 Demand Locational Tariffs for 2030/31 under the "Falling Short" scenario

2030/31				
Zone	Zone Name	HH Gross Demand Zonal Locational Tariff (£/kW)	NHH Demand Zonal Locational Tariff (p/kWh)	Embedded Export Tariff (£/kW)
1	Northern Scotland	-	-	-
2	Southern Scotland	-	-	-
3	Northern	-	-	-
4	North West	-	-	-
5	Yorkshire	-	-	-
6	N Wales & Mersey	-	-	-
7	East Midlands	-	-	0.864741
8	Midlands	-	-	2.702707
9	Eastern	1.011648	0.143466	3.966144
10	South Wales	3.342760	0.404940	6.297256
11	South East	7.076779	0.994382	10.031275
12	London	8.013821	0.916045	10.968317
13	Southern	8.018502	1.101776	10.972998
14	South Western	4.443300	0.645386	7.397796

Table S3 TDR Tariffs for 2030/31 under the "Falling Short" scenario

2030/31	
TDR Band	TDR Tariff (£/(site day))
DOM	0.210371
LVN1	0.107430
LVN2	0.488901
LVN3	1.165871
LVN4	3.619973
LV1	5.848252
LV2	10.737227
LV3	17.474851
LV4	39.364246
HV1	30.459429
HV2	98.044219
HV3	192.506145
HV4	488.583969
EHV1	230.547749
EHV2	1,133.582386
EHV3	2,285.665659
EHV4	6,224.537524
TRN1	593.941599
TRN2	2,453.091565
TRN3	6,836.704726
TRN4	17,866.279116
Unmetered demand	p/kWh per year
UMS	2.194444

Table S4 Generation & Demand Revenue Proportions for 2030/31 under the "Falling Short" scenario

	2030/31	
Code	Revenue	
CAPEC	Limit on generation tariff (€/MWh)	2.5
y	Error Margin	0.2
ER	Exchange Rate (€/£)	1.1
MAR	Total Revenue (£m)	7,598.1
GO	Generation Output (TWh)	207.4
G	% of revenue from generation	0.2
D	% of revenue from demand	0.8
G.R	Revenue recovered from generation (£m)	1,537.1
D.R	Revenue recovered from demand (£m)	6,061.0
Breakdown of generation revenue		
	Revenue from the Peak element	88.5
	Revenue from the Year Round Shared element	386.6
	Revenue from the Year Round Not Shared element	819.4
	Revenue from Onshore Local Circuit tariffs	32.1
	Revenue from Onshore Local Substation tariffs	17.9
	Revenue from Offshore Local tariffs	1,139.0
	Revenue from the adjustment element	-946.3
G.MAR	Total Revenue recovered from generation (£m)	1,537.1
	Including revenue from local charges associated with pre-existing assets (indicative) (£m)	6.4

Appendix B: Network Assumptions

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HND circuit modelling

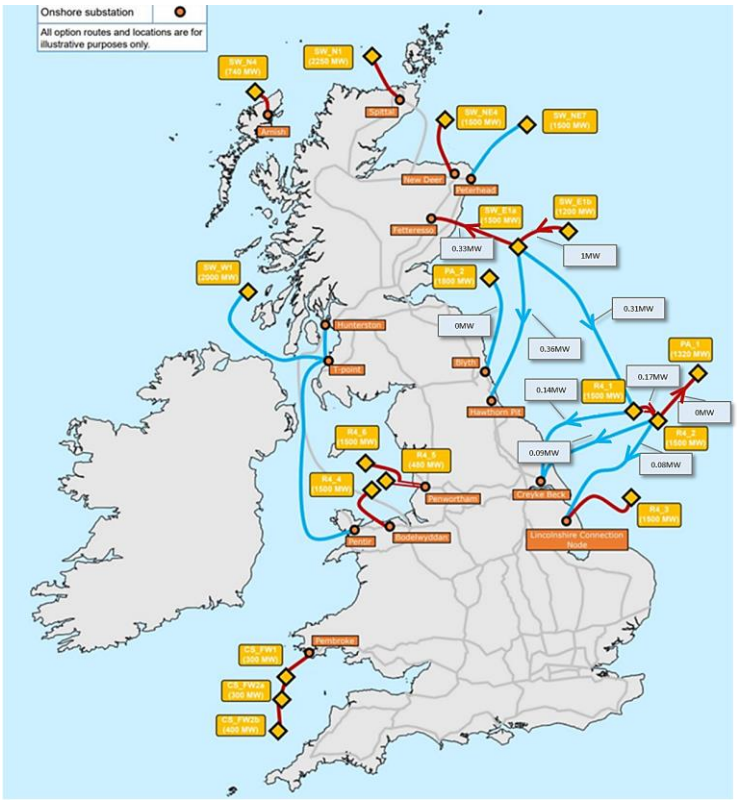
The HND circuits have combined HVAC/HVDC technologies, and will be highly flexible in terms of moving energy around the wider network. This has posed challenge to the TNUoS methodology, which relies on very limited number of scenarios (the Peak Security and Year Round scenarios) to derive the tariffs.

It has been identified that the CUSC needs to be developed to accommodate HND configuration. For this report, we made the assumption on the methodology, and treated a few HVDC circuits as if they were HVAC circuits, to enable us to calculate TNUoS tariffs. As a result, the TNUoS tariffs are highly indicative.

The list of HVDC circuits that were treated as HVAC are listed here
*SW_E1a – Hawthorn Pit
* SW_E1a – R4_1
* R4_1 – Creyke Beck
* R4_2 – Creyke Beck
* R4_2 – Lincolnshire Connection Node

The following diagram shows the distribution of incremental flows, after we "convert" the HVDC to HVAC circuits. Indicative flows assume +1MW at SW_E1b, and results change with generation, demand, network topology and parameters.

Figure 7 Incremental Flows of HVAC Circuits



"Staging" of circuit build

In this report, we assume that all HND circuits, and the HVDC "bootstraps" to be delivered under ASTI, will be completed by 2030/31.

Appendix C: Generation Scaling Factor Assumptions

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With the amount of intermittent generation and interconnectors in the system, under the “year round” setting, flexible generation will be set to negative values, to keep the total (scaled) generation equal to system demand level. Negative generation will skew the locational signal, in places where increasing generation capacity is expected to increase network cost.

To avoid skewing the locational signal, we have applied a universal “scaling factor” to reduce the TEC of each project by a fixed percentage, so that flexible generation will still be positive. Table 21 shows the scaling factors that have been applied to the total TEC in the relevant financial year.

Table 21 Generation TEC Scaling Factors

Year	Scaling Factor %
2029/30	0.78
2030/31	0.65
2031/32	0.62
2032/33	0.58
2033/34	0.49

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Appendix D: Proposed changes to the charging methodology

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Proposed changes to the charging methodology

The charging methodology can be changed through modifications to the CUSC and the licence.

This section focuses on specific CUSC modifications which may impact on the TNUoS tariff calculation methodology over the next 10 years, which have been raised since the list published in Table 27 of our April 2023 Five-Year View of TNUoS Tariffs report. Each modification is subject to an approval decision by Ofgem and if any Work Group Alternative CUSC Modifications (WACM) have been raised then Ofgem will decide which, if any, are approved.

More information about current modifications can be found at the following location:

https://www.nationalgrideso.com/uk/electricity/codes/connection-and-use-system-code?mods

A summary of the modifications which have been raised since April 2023 that could affect future TNUoS tariffs, and their status, are listed below.

Table 22 Summary of in-flight CUSC modification proposals that have been raised since April 2023

Name	Title	Effect of proposed change	Possible implementation
CMP418	Refine the allocation of Static Var Compensators (SVC) costs at OFTO transfer	To socialise SVC costs through wider TNUoS charges	Potential implementation dates will be included once the relevant modification has reached a sufficient stage of development.
CMP419	Generation Zoning Methodology Review	To review the existing generation zoning methodology to incorporate offshore assets connected as part of the Holistic Network Design (HND) and enable the wider tariff to be applied to offshore generators	

Appendix E: Breakdown of locational HH and EE tariffs

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Locational components of demand tariffs

The following tables show the locational components of the HH demand charge (Peak and Year-Round) for each year of the forecast. With the introduction of CMP343 and the removal of the demand residual (demand residual tariff) from HH tariffs, the locational elements combined which make up the HH demand tariff have been floored to £0/kW where only positive tariffs are applied

For the Embedded Export Tariffs (EET), the demand locational elements (peak security and year-round) are added together. The AGIC is then also added and the resulting tariff floored at zero to avoid negative tariffs (charges).

Table 23 Location elements of the HH demand tariff for 2029/30

Demand Zone		2029/30		
		Peak (£/kW)	Year Round (£/kW)	Floored HH Tariff (£/kW)
1	Northern Scotland	-7.043934	-62.255189	0.000000
2	Southern Scotland	-6.303851	-46.790684	0.000000
3	Northern	-5.283193	-13.564421	0.000000
4	North West	-1.948961	-8.997739	0.000000
5	Yorkshire	-3.960877	-4.178007	0.000000
6	N Wales & Mersey	-1.330083	-4.529190	0.000000
7	East Midlands	-2.124425	0.400957	0.000000
8	Midlands	-1.848675	1.732493	0.000000
9	Eastern	2.359756	-1.809087	0.550669
10	South Wales	-5.029650	5.253398	0.223747
11	South East	4.792647	0.475830	5.268477
12	London	6.509705	-0.131189	6.378516
13	Southern	2.344644	4.747682	7.092326
14	South Western	-3.823512	7.553970	3.730458

Table 24 Location elements of the HH demand tariff for 2030/31

Demand Zone		2030/31		
		Peak (£/kW)	Year Round (£/kW)	Floored HH Tariff (£/kW)
1	Northern Scotland	-7.464183	-108.750090	0.000000
2	Southern Scotland	-7.710255	-76.558348	0.000000
3	Northern	-6.315260	-22.391843	0.000000
4	North West	-2.998181	-13.476895	0.000000
5	Yorkshire	-4.376299	-5.641216	0.000000
6	N Wales & Mersey	-2.741061	-7.709239	0.000000
7	East Midlands	-1.899143	0.064729	0.000000
8	Midlands	-2.662738	1.575546	0.000000
9	Eastern	3.195021	-1.178215	2.016806
10	South Wales	-4.942461	5.739745	0.797284
11	South East	6.312394	3.499544	9.811938
12	London	7.267361	2.070380	9.337742
13	Southern	2.609822	5.734067	8.343889
14	South Western	-4.260287	8.505623	4.245336

Table 25 Location elements of the HH demand tariff for 2031/32

Demand Zone		2031/32		
		Peak (£/kW)	Year Round (£/kW)	Floored HH Tariff (£/kW)
1	Northern Scotland	-7.790121	-110.536251	0.000000
2	Southern Scotland	-7.632107	-77.905886	0.000000
3	Northern	-5.897851	-23.023876	0.000000
4	North West	-2.769207	-14.107134	0.000000
5	Yorkshire	-4.406998	-5.776068	0.000000
6	N Wales & Mersey	-2.646877	-8.043585	0.000000
7	East Midlands	-1.929586	0.102651	0.000000
8	Midlands	-2.462352	1.750091	0.000000
9	Eastern	2.752610	-1.181550	1.571060
10	South Wales	-5.111350	7.923335	2.811985
11	South East	6.208532	3.598919	9.807450
12	London	6.971968	2.123601	9.095569
13	Southern	2.690114	5.942471	8.632584
14	South Western	-3.448645	9.018171	5.569526

Table 26 Location elements of the HH demand tariff for 2032/33

Demand Zone		2032/33		
		Peak (£/kW)	Year Round (£/kW)	Floored HH Tariff (£/kW)
1	Northern Scotland	-10.825404	-109.971814	0.000000
2	Southern Scotland	-9.350826	-78.455188	0.000000
3	Northern	-6.554373	-23.233988	0.000000
4	North West	-4.078064	-13.513677	0.000000
5	Yorkshire	-5.443600	-5.333039	0.000000
6	N Wales & Mersey	-4.102163	-7.089763	0.000000
7	East Midlands	-1.966848	-0.083489	0.000000
8	Midlands	-2.381172	1.488592	0.000000
9	Eastern	3.156954	-1.335956	1.820998
10	South Wales	-5.044945	7.337201	2.292256
11	South East	6.490679	3.306873	9.797552
12	London	7.291250	1.832746	9.123995
13	Southern	3.180974	6.100527	9.281501
14	South Western	-1.348891	9.082776	7.733885

Table 27 Location elements of the HH demand tariff for 2033/34

Demand Zone		2033/34		
		Peak (£/kW)	Year Round (£/kW)	Floored HH Tariff (£/kW)
1	Northern Scotland	-23.092739	-100.779826	0.000000
2	Southern Scotland	-15.488154	-74.632415	0.000000
3	Northern	-6.436203	-23.876760	0.000000
4	North West	-6.442268	-11.535595	0.000000
5	Yorkshire	-5.343578	-5.610352	0.000000
6	N Wales & Mersey	-6.814113	-4.724844	0.000000
7	East Midlands	-2.117694	0.058601	0.000000
8	Midlands	-2.969087	1.912526	0.000000
9	Eastern	3.294011	-1.197066	2.096945
10	South Wales	-4.274815	6.204785	1.929970
11	South East	7.143101	3.523717	10.666818
12	London	7.542659	2.214285	9.756944
13	Southern	3.670633	5.515621	9.186253
14	South Western	-0.526858	6.182201	5.655343

Document Revision History

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Document Revision History

Version Number	Date of Issue	Notes
1.0	25th September 2023	Publication of Five Year Projection of TNUoS for 2029/30 to 2033/34
1.1	27th September 2023	Correction to Table 13 Embedded Export Tariffs for 2029/30 to 2033/34 Correction to Figure 5 Embedded export tariff changes. Corrected Date of Issue of Version 1.0 from 21st September to 25th September.
1.2	29th September 2023	Correction to Table 19 Charging bases for 2029/30 to 2033/34.

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