Five-Year View of TNUoS Tariffs for 2019/20 to 2023/24

September 2018

nationalgrid

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This information paper provides National Grid Electricity System Operator's Five-Year View of Transmission Network Use of System (TNUoS) Tariffs for 2019/20 to 2023/24

September 2018

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If you have any comments or questions on the contents or format of this report, please don't hesitate to get in touch with us. This report and associated documents can also be found on our website at www.nationalgrideso.com/tnuos

Team Email & Phone	TNUoS.Queries@nationalgrid.com	01926 654633

Disclaimer

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

Executive Summary

This document contains our view of five-year Transmission Network Use of System (TNUoS) tariffs for the years 2019/20 to 2023/24. TNUoS charges are paid by transmission connected generators and suppliers for use of the GB Transmission networks.

In June 2018, we published on open letter about our approach to this report. The feedback we received has helped to shape this report. More details can be found in the Sensitivities to Future Tariffs section.

Methodology and approach

The charging methodology used in this report is defined in Section 14 of the CUSC as approved for 1 April 2019.

There are some other methodology changes being considered as CUSC proposals, and through Ofgem's review of charging. These are summarised in Appendix B.

The general approach taken in this forecast is to use the latest view of all the data that is available, and where needed assume that users act in an economically rational way. This includes taking a best view of generation we expect to connect which drives both the locational and residual tariffs.

The final three years of this report, from 2021/22 onwards, will be in the new RIIO-T2 price control period for onshore transmission owners. There are various elements of the charging methodology that are due to be revised at the start of each price control, based on data from the new price control. Our assumptions in this forecast are listed in the report in the Modelling approach for the five-year view section at the start of the report.

Demand tariffs

Demand tariffs increase each year over the five-year forecast period. This is due to a declining charging base for HH and NHH tariffs, and increasing proportion of total revenue being recovered through demand tariffs, due to the cap on generation tariffs. In 2019/20 the average gross HH demand tariff is £50.75/kW rising to £65.27/kW in 2023/24. The average NHH demand tariff increases from 6.56p/kWh to 8.79p/kWh.

We forecast that system gross peak will fall from 51.3GW to 50.1GW in 2022/23, however, the rate of decrease is slowing. HH demand is broadly flat at 19.1GW in 2020/21 and 18.9GW in 2022/23. We expect NHH demand to fall slightly from 23.7TWh to 23.0TWh in 2023/24.

We have assumed that there is no significant shift in volumes between those demand customers charged on a half-hourly basis and those charged on a non-half-hourly basis, except for the volumes moved by CUSC modification CMP266 in 2019/20 as detailed in our April forecast of these tariffs.

The Embedded Export Tariff changes significantly in the first two years, as the value of the phased residual is reduced from £14.65/kW in 2019/20 to zero in subsequent years. We forecast the volumes of generation receiving the Embedded Export Tariff to peak in 2019/12 at 7.7GW, and then gently decline to 6.6GW by 2023/24 as the economic signal for triad benefit is no longer as strong. The total value paid out through the Embedded Export Tariff reduces from £111m in 2019/20, to £18m in 2020/21, and then is flat between £19.3m and £20.5m after then.

Generation tariffs

Generation tariffs have been set to recover a reducing amount of revenue over the five-year period in line with the methodology in the CUSC around the €2.50/MWh limit on average generation tariffs. This is due both to the decreasing forecast of transmission connected generation output (in TWh), and an increase in the generation charging base from 71.9GW in 2019/20 to 75.2GW in 2023/24. Our Best View of generation is used throughout this report, and is consistent with the Future Energy Scenarios showing increases in renewables and interconnectors, and decreases in coal and stable volumes of CCGT. The generation residual decreases from -£3.61/kW in 2019/20 to -£10.58/kW in 2023/24. The average generation tariff falls from £5.61/kW in 2019/20 to £4.32/kW in 2023/24.

We have indicated in a letter[1] that following the CMA's judgement on CMP261 (a modification concerning the €2.50/MWh cap in 2015/16), we are reviewing the options in this space and are looking to bring forward proposals in the Autumn.

Total revenues to be recovered

Total Transmission Owner (TO) allowed revenue to be recovered from TNUoS charges is forecast to be £2,879m in 2019/20 rising to £3,596m in 2023/24.

This covers allowed revenue for the onshore Transmission Owners (National Grid, Scottish Power Transmission, Scottish Hydro Electricity Transmission), the Offshore Transmission Owners, the Interconnector Cap & Floor regime, and some smaller schemes.

Our assumptions about revenue in the RIIO-T2 price control period are detailed in the report.

Key drivers of change in the tariffs

Changes to these forecast tariffs over the five-year period have predominantly been influenced by:

- Revenue to be recovered increases by £800m over the five-years, which increases the amount to be collected from demand due to the generation cap.
- A steady decrease in forecasted generation output reduces generation tariffs due to €0 -€2.50/MWh range on generation tariffs.
- There are increases in generation volumes particularly in Scotland, including new circuits and generation

[1] *https://www.nationalgrideso.com/sites/default/files/documents/Open%20letter_Compliance%20with%20838_2010.pdf*

on the Western Isles, Orkney and Shetland, which increase some generation tariffs.

Sensitivities

In addition to the best view, we have also provided details of how tariffs might vary under some sensitives. These are designed to illustrate how tariffs might change from the best view given various changes to the market. These include factors affecting locational and residual tariffs, a discussion about aprameters to be updated at the start of RIIO-T2, and discussion around larger transmission investment for remote island wind in Scotland.

Next forecast

Our next forecast of 2019/20 TNUoS tariffs will be our Draft tariffs in November 2018, followed by Final tariffs in January 2019. These tariffs will reflect the latest methodology of the CUSC at the time.

During 2019, we will produce quarterly updates of 2020/21 TNUoS tariffs; the precise timetable will be published in early 2019. This timetable will include when we next expect to prepare a five-year view of tariffs.

Feedback

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.

Modelling approach for the five-year view

This report contains TNUoS forecasts for charging years 2019/20 until 2023/24.

Tariffs for 2019/20 are the same as those published in our June 2019 update. They will next be updated in the November Draft Tariffs.

Tariffs for 2020/21 onwards have been updated using the latest view of all the data that is available, and we have assumed that users act in an economically rational way.

This report is published without prejudice and whilst every effort is made to ensure the accuracy of the information, it is subject to several estimations and forecast and may not bear relation to either the indicative or future tariffs National Grid will publish at a later date.

Charging methodology

There have been no approved changes to the charging methodology since the last five-year forecast, and the last update of 2019/20 tariffs.

There are a number of 'in-flight' proposals to change the charging methodologies. These are summarised in Appendix B.

Assumptions about RIIO-T2

At the start of the next onshore price control in April 2021, the charging methodology requires various aspects of the TNUoS methodology to be revised and updated based on new data for the price-control. The key components which need to be addressed at the price control and how they are treated in this forecast are outlined in the following table.

Table 1 – RIIO T-2 Assumptions

Component	Description	Assumptions for 2021/22 onwards
Maximum Allowed Revenue	The MAR for onshore TOs in the new price control period will be determined during the negotiations up to the start of the price control period.	**Our assumption in these tariffs is based on onshore TOs' MAR forecast under relevant STC procedures. .**
Generation zones	There are currently 27 generation zones. At the start of the next price control, there is a requirement to rezone to ensure the spread of nodal prices within a zone is +/- £1/kW. Preliminary analysis[2] in 2016 suggests that more than forty zones may be required to achieve this spread by the next price control.	**Our assumption in these tariffs is that the number of generation zones remains at 27.** We are also considering whether a change needs to be made to the charging methodology to provide greater stability in the number of charging zones.

[2] *May 2016 TCMF (page 16 of slide pack):* https://www.nationalgrid.com/sites/default/files/documents/8589935152-TCMF%20and%20CISG%20slidepack%2015th%20May%202016%20v1.0.pdf

Component	Description	Assumptions for 2021/22 onwards
Expansion Factor and Constants	The expansion factor and expansion constants need to be recalculated at the start of RIIO-T2 based on updated business plans and costs of investments. The expansion constant represents the cost of moving 1MW, 1km using 400kV OHL line. The expansion factors represent how many times more expensive moving 1MW, 1km is using different voltages and types of circuit.	**Our assumption in these tariffs is that the expansion constant continues to increase by RPI, and that the expansion factors are unchanged.**
Security Factor	The security factor is currently 1.8. This will be recalculated at start of the price-control period.	**Our assumption in these tariffs is the security factor remains as 1.8.**
Offshore tariffs	The elements for the Offshore tariffs will be recalculated at start of the price control, based on updated forecasts of OFTO revenue, and adjusting for differences in actual OFTO revenue to forecast revenue in RIIO-T1.	**Our assumption in these tariffs is that Offshore tariffs increase by RPI.**
Avoided GSP Infrastructure Credit	The AGIC is a component of the Embedded Export Tariff, paid to ‘exporting demand’ at the time of Triad. It will be recalculated based on up to 20 schemes from the RIIO-T2 price-control period.	**Our assumption in these tariffs is that the AGIC increases by RPI.**

Best View: Demand tariffs

The tables in this section show demand tariffs for Half-Hourly, Embedded Export and Non-Half-Hour metered demand.

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

None of these tariffs include the charge for the small generator discount. For details on how any extension of the small generator discount may affect future demand tariffs, please see Appendix D.

Table 2 – Summary of average demand tariffs

HH Tariffs	2019/20	2020/21	2021/22	2022/23	2023/24
Average Tariff (£/kW)	50.75	52.33	56.88	61.78	65.27
Residual (£/kW)	51.70	53.45	58.20	63.21	66.79
EET	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Average Tariff (£/kW)	14.31	2.50	2.87	2.93	3.11
Phased residual (£/kW)	14.65	-	-	-	-
AGIC (£/kW)	3.33	3.43	3.53	3.64	3.74
Total Credit (£m)	110.92	17.77	19.60	19.32	20.50
NHH Tariffs	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Average (p/kWh)	6.56	6.89	7.55	8.25	8.79

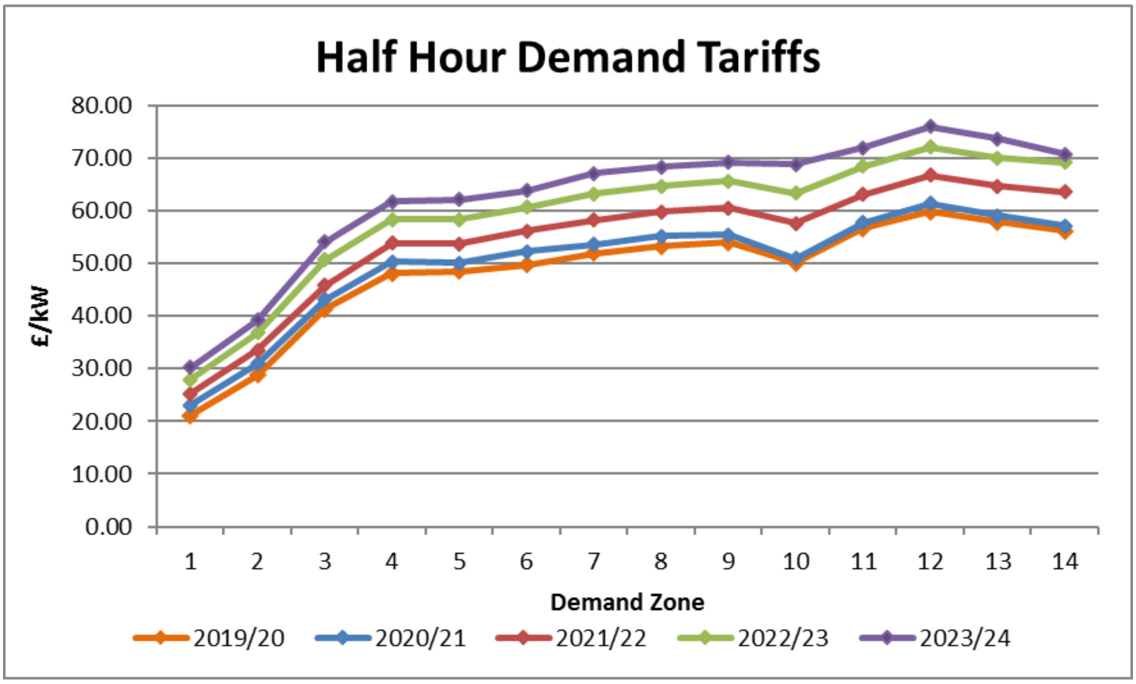
Gross Half-Hourly demand tariffs

Table 3 - Gross Half-Hourly demand tariffs by demand zone

Zone	Zone Name	2019/20 (£/kW)	2020/21 (£/kW)	2021/22 (£/kW)	2022/23 (£/kW)	2023/24 (£/kW)
1	Northern Scotland	21.117249	23.033448	25.192519	27.893080	30.223594
2	Southern Scotland	28.797132	30.974803	33.496578	36.806998	39.242013
3	Northern	41.292129	43.081997	45.846719	50.652858	54.042842
4	North West	48.128953	50.320340	53.810342	58.292956	61.693591
5	Yorkshire	48.421349	50.022220	53.649629	58.313952	62.083027
6	N Wales & Mersey	49.711398	52.246053	56.129761	60.630010	63.760366
7	East Midlands	51.861094	53.573335	58.171070	63.209102	67.015564
8	Midlands	53.158467	55.089521	59.730111	64.626820	68.248081
9	Eastern	53.903967	55.349686	60.454655	65.658489	69.138779
10	South Wales	50.052639	50.891739	57.531554	63.338230	68.801063
11	South East	56.648128	57.737310	63.039923	68.352047	71.928321
12	London	59.762093	61.323957	66.651145	72.037689	75.877593
13	Southern	57.828962	59.010698	64.645306	69.929295	73.569220
14	South Western	56.141034	57.098964	63.587135	69.115055	70.736458

The breakdown of the locational and residual components of these tariffs is shown in Appendix C.

Figure 1 - Gross Half-Hourly demand tariffs by demand zone



Since the implementation of CMP264/265 into the TNUoS methodology from the 2018/19 tariffs, the way in which HH demand is charged has changed. HH tariffs are now charged on a gross basis rather than net. A separate Embedded Export Tariff payment is made to embedded generators which generate over triad periods. Embedded exports, and small embedded generators do not pay generation TNUoS.

All zones follow the same pattern over the 5-year period, where the yearly increase in the tariffs and the residual can be attributed to an increase in revenue and offset by the reduction in credit for the Embedded Export Tariff. There are two factors that has caused the increase in revenue recovered from demand – the increasing total revenue, and an increase percentage of this to be recovered from demand due to the €2.50/MWh limit on average generation tariffs.

Embedded export tariff

The EET is a specific tariff which from 2018/19 replaces the "Triad benefit" which is paid to embedded generators for their exports over the triad periods. It is paid to embedded generators who are not eligible to be charged generation TNUoS tariffs (e.g. embedded generators with TEC lower than 100MW).

Generators are paid either directly by National Grid Electricity System Operator or through their supplier when the initial demand reconciliation has been completed in accordance with CUSC (see 14.17.19 onwards).

This table and chart show the forecasted embedded export tariffs in the years 2019/20 to 2023/24.

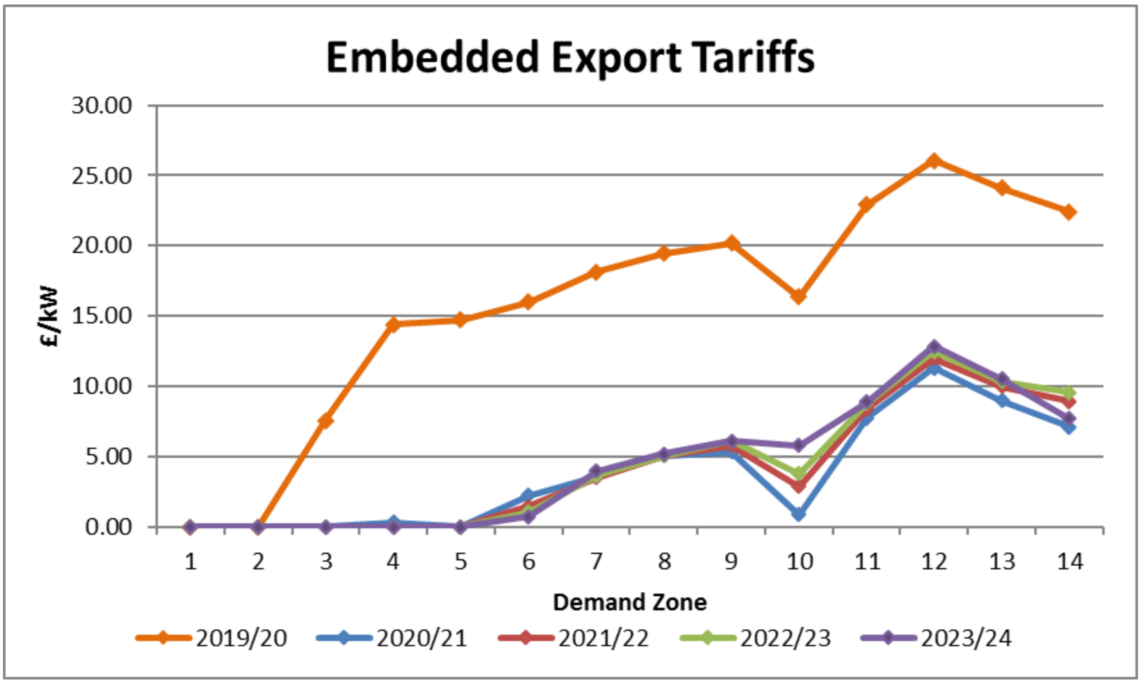
Table 4 – Embedded export tariffs

Zone	Zone Name	2019/20 (£/kW)	2020/21 (£/kW)	2021/22 (£/kW)	2022/23 (£/kW)	2023/24 (£/kW)
1	Northern Scotland	0.000000	0.000000	0.000000	0.000000	0.000000
2	Southern Scotland	0.000000	0.000000	0.000000	0.000000	0.000000
3	Northern	7.572331	0.000000	0.000000	0.000000	0.000000
4	North West	14.409155	0.297814	0.000000	0.000000	0.000000
5	Yorkshire	14.701551	0.000000	0.000000	0.000000	0.000000
6	N Wales & Mersey	15.991600	2.223527	1.460449	1.056278	0.718783
7	East Midlands	18.141296	3.550809	3.501757	3.635370	3.973981
8	Midlands	19.438669	5.066995	5.060799	5.053088	5.206499
9	Eastern	20.184169	5.327160	5.785343	6.084757	6.097196
10	South Wales	16.332841	0.869213	2.862241	3.764498	5.759480
11	South East	22.928330	7.714784	8.370611	8.778315	8.886739
12	London	26.042296	11.301432	11.981833	12.463957	12.836011
13	Southern	24.109165	8.988172	9.975994	10.355563	10.527638
14	South Western	22.421236	7.076438	8.917822	9.541323	7.694876

These tariffs include:

Phased residual (£/kW)	14.650000	-	-	-	-
AGIC (£/kW)	3.327268	3.427490	3.530315	3.636343	3.744337

Figure 2 – Embedded Export Tariff



The value of the tariff will reduce from 2019/20 to 2020/21 as the phased residual is reduced to £0/kW, whereas the AGIC will increase each year in line with RPI until the next price control.

From 2019/20 the EET will be £0/kW in zones 1 and 2, due to the negative locational tariff which is not sufficiently offset by the AGIC and the phased residual. From 2021/22 onwards it is expected that the EET for zones 1 to 5 will be zero.

The total revenue credited for embedded exports is forecast to be £110.9m in 2019/20, falling to £17.8m in 2020/21 and then staying broadly flat between £19.3m and £20.5m between 2021/22 and 2023/24.

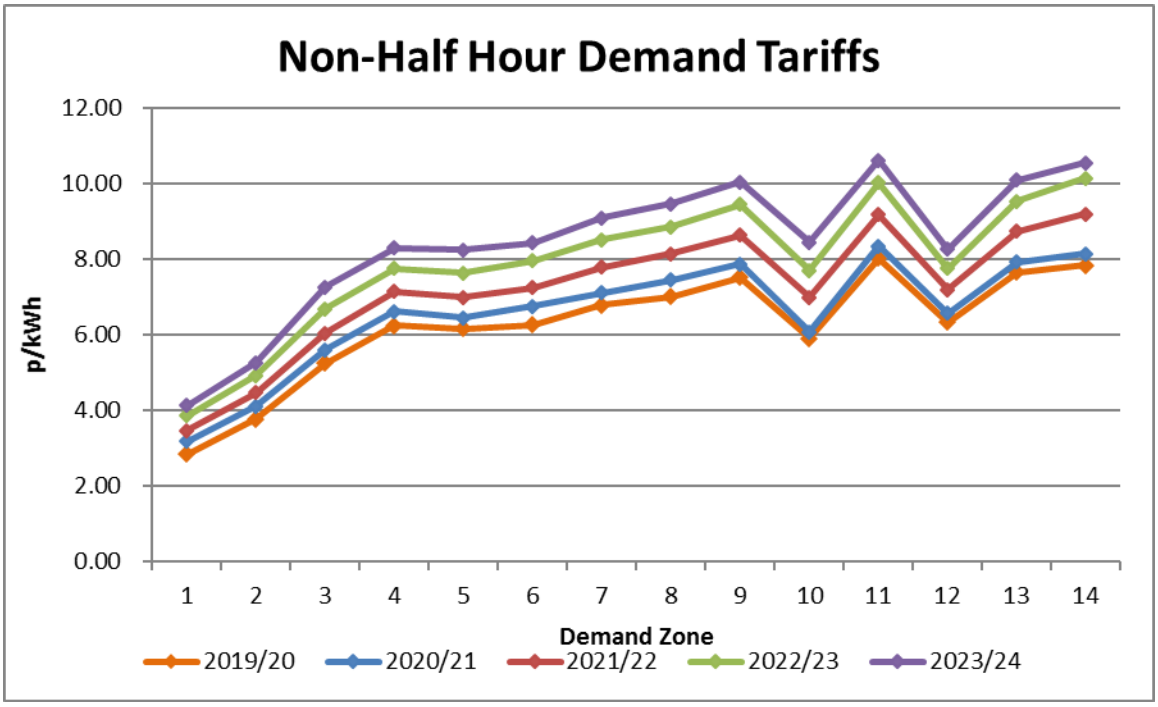
NHH demand tariffs

This table and chart show the forecast of NHH demand tariffs forecast from 2019/20 to 2023/24.

Table 5 - NHH demand tariff changes

Zone	Zone Name	2019/20 (p/kWh)	2020/21 (p/kWh)	2021/22 (p/kWh)	2022/23 (p/kWh)	2023/24 (p/kWh)
1	Northern Scotland	2.842582	3.186404	3.472882	3.864846	4.130280
2	Southern Scotland	3.769871	4.113738	4.472709	4.922319	5.266307
3	Northern	5.245346	5.603052	6.047965	6.693330	7.266772
4	North West	6.240251	6.617867	7.139860	7.750948	8.298213
5	Yorkshire	6.162897	6.449838	6.995823	7.643700	8.242317
6	N Wales & Mersey	6.267104	6.764482	7.254698	7.951098	8.441912
7	East Midlands	6.794004	7.116684	7.787229	8.516018	9.099924
8	Midlands	7.008581	7.458571	8.141238	8.860338	9.467269
9	Eastern	7.518310	7.875047	8.645451	9.455825	10.049882
10	South Wales	5.904038	6.077219	6.988462	7.705250	8.447166
11	South East	8.028688	8.350924	9.174453	10.027668	10.623586
12	London	6.338400	6.573391	7.189609	7.749939	8.270557
13	Southern	7.651950	7.926957	8.734146	9.541821	10.101376
14	South Western	7.836469	8.142467	9.193867	10.137546	10.560415

Figure 3 - NHH demand tariff changes



From 2018/19 the methodology for NHH demand tariffs remains the same following the demand TNUoS changes under CMP264/265, except the revenue to be recovered per Zone is calculated after calculating the amounts to be recovered from gross HH tariffs and paid out through the EET.

The NHH tariffs have gradually increased by between 0.2 – 1.0p/kWh for each Zone following the same pattern over the 5 year period, this trend aligns with the steady decline in chargeable zonal Non-Half-Hourly volumes where the smaller proportion of volume (overall reduction of 2.5TWh for the 5 year period) would result in higher tariffs.

The impact of the small generator discount on demand tariffs

The licence condition for the small generator discount expires on 31 March 2019, so no charge for the discount has been included in these tariffs.

Please see Appendix D for indicative values for 2019/20 onwards if the small generator discount was to be extended.

Best View: Generation tariffs

This section summarises the forecast of generation tariffs from 2019/20 to 2023/24 and how these tariffs were calculated.

Generation wider tariffs

The following section provides a summary of the forecast of wider generation tariffs from 2019/20 to 2023/24. The comparison uses example tariffs for Conventional Carbon generators with an Annual Load Factor (ALF) of 80%, Conventional Low Carbon generators with an ALF of 80%, and Intermittent generators with an ALF of 40%.

Under the current methodology each generator has its own load factor as listed in Appendix E. These will be updated for the calculation of 2019/20 tariffs before the Draft Tariffs are published in November 2018.

The classifications for different technology types are below:

Table 6 – Classifications of generation technologies

Conventional Carbon	Conventional Low Carbon	Intermittent
Biomass CCGT/CHP Coal OCGT/Oil Pumped storage *(including battery storage)*	Nuclear Hydro	Offshore wind Onshore wind Tidal

The 80% and 40% load factors used in the tables below are for illustration only. Tariffs for individual generators are calculated using their own ALF; see Appendix E for specific ALFs.

Table 7 - Generation wider tariffs in 2019/20

Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round (£/kW)	Residual Tariff (£/kW)	Conventional Carbon 80% Load Factor (£/kW)	Conventional Low Carbon 80% Load Factor (£/kW)	Intermittent 40% Load Factor (£/kW)
1	North Scotland	2.633478	17.866048	16.290564	-3.613060	26.345708	29.603820	19.823923
2	East Aberdeenshire	4.856420	10.389876	16.290564	-3.613060	22.587712	25.845825	16.833454
3	Western Highlands	2.066205	18.018719	16.300922	-3.613060	25.908858	29.169042	19.895350
4	Skye and Lochalsh	-4.050899	18.018719	16.185831	-3.613060	19.699681	22.936847	19.780259
5	Eastern Grampian and Tayside	3.028972	15.552842	15.695182	-3.613060	24.414331	27.553368	18.303259
6	Central Grampian	3.703503	14.842849	15.388225	-3.613060	24.275302	27.352947	17.712305
7	Argyll	3.318511	11.768130	25.125685	-3.613060	29.220503	34.245640	26.219877
8	The Trossachs	3.605887	11.768130	13.992947	-3.613060	20.601689	23.400278	15.087139
9	Stirlingshire and Fife	2.379372	8.968928	13.155213	-3.613060	16.465625	19.096667	13.129724
10	South West Scotland	2.432017	9.529142	13.296532	-3.613060	17.079496	19.738803	13.495129
11	Lothian and Borders	3.649624	9.529142	7.437838	-3.613060	13.610148	15.097716	7.636435
12	Solway and Cheviot	1.965527	5.394191	7.505010	-3.613060	8.671828	10.172830	6.049626
13	North East England	3.885956	3.015150	3.943079	-3.613060	5.839479	6.628095	1.536079
14	North Lancashire and The Lakes	1.590933	3.015150	2.657327	-3.613060	2.515855	3.047320	0.250327
15	South Lancashire, Yorkshire and Humber	4.476969	0.783197	0.117564	-3.613060	1.584518	1.608031	-3.182217
16	North Midlands and North Wales	3.942682	-0.830490		-3.613060	-0.334770	-0.334770	-3.945256
17	South Lincolnshire and North Norfolk	2.119470	-0.474296		-3.613060	-1.873027	-1.873027	-3.802778
18	Mid Wales and The Midlands	1.208746	-0.242530		-3.613060	-2.598338	-2.598338	-3.710072
19	Anglesey and Snowdon	4.440111	-0.650476		-3.613060	0.306670	0.306670	-3.873250
20	Pembrokeshire	9.187142	-4.517101		-3.613060	1.960401	1.960401	-5.419900
21	South Wales & Gloucester	6.185924	-4.490373		-3.613060	-1.019434	-1.019434	-5.409209
22	Cotswold	3.040964	2.258661	-6.725791	-3.613060	-4.145800	-5.490958	-9.435387
23	Central London	-5.765060	2.258661	-6.613056	-3.613060	-12.861636	-14.184247	-9.322652
24	Essex and Kent	-4.089630	2.258661		-3.613060	-5.895761	-5.895761	-2.709596
25	Oxfordshire, Surrey and Sussex	-1.567781	-2.951120		-3.613060	-7.541737	-7.541737	-4.793508
26	Somerset and Wessex	-1.407731	-4.113898		-3.613060	-8.311909	-8.311909	-5.258619
27	West Devon and Cornwall	0.103405	-5.677704		-3.613060	-8.051818	-8.051818	-5.884142

Table 8 – Generation wider tariffs in 2020/21

Zone	Zone Name	System Peak Tariff (£/kW)	Shared Year Round Tariff (£/kW)	Not Shared Year Round (£/kW)	Residual Tariff (£/kW)	Conventional Carbon 80% Load Factor (£/kW)	Conventional Low Carbon 80% Load Factor (£/kW)	Intermittent 40% Load Factor (£/kW)
1	North Scotland	2.412171	17.996620	17.631393	-4.373578	26.541003	30.067282	20.456463
2	East Aberdeenshire	4.590176	9.207316	17.631393	-4.373578	21.687565	25.213844	16.940741
3	Western Highlands	1.834263	16.946996	17.490498	-4.373578	25.010680	28.508780	19.895718
4	Skye and Lochalsh	-4.468245	16.946996	17.378385	-4.373578	18.618482	22.094159	19.783605
5	Eastern Grampian and Tayside	2.772454	14.602821	16.759021	-4.373578	23.488350	26.840154	18.226571
6	Central Grampian	3.487242	13.938372	16.427640	-4.373578	23.406474	26.692002	17.629411
7	Argyll	2.959268	10.870287	26.220782	-4.373578	28.258545	33.502702	26.195319
8	The Trossachs	3.352616	10.870287	14.831676	-4.373578	19.540608	22.506944	14.806213
9	Stirlingshire and Fife	2.096015	8.182367	13.889680	-4.373578	15.380075	18.158011	12.789049
10	South West Scotland	2.082564	8.599393	14.014966	-4.373578	15.800473	18.603466	13.081145
11	Lothian and Borders	3.598774	8.599393	8.434545	-4.373578	12.852346	14.539255	7.500724
12	Solway and Cheviot	1.811682	4.858557	7.987959	-4.373578	7.715317	9.312909	5.557804
13	North East England	3.979833	2.679607	4.266913	-4.373578	5.163471	6.016854	0.965178
14	North Lancashire and The Lakes	1.209259	2.679607	2.942075	-4.373578	1.333027	1.921442	-0.359660
15	South Lancashire, Yorkshire and Humber	5.013260	0.517067	0.247912	-4.373578	1.251665	1.301248	-3.918839
16	North Midlands and North Wales	4.158734	-0.600716		-4.373578	-0.695417	-0.695417	-4.613864
17	South Lincolnshire and North Norfolk	2.336726	-0.343158		-4.373578	-2.311378	-2.311378	-4.510841
18	Mid Wales and The Midlands	1.165833	0.004716		-4.373578	-3.203972	-3.203972	-4.371692
19	Anglesey and Snowdon	5.263738	-0.097129		-4.373578	0.812457	0.812457	-4.412430
20	Pembrokeshire	9.800834	-4.007418		-4.373578	2.221322	2.221322	-5.976545
21	South Wales & Gloucester	6.599804	-4.067612		-4.373578	-1.027864	-1.027864	-6.000623
22	Cotswold	3.299267	2.850097	-6.965935	-4.373578	-4.366981	-5.760168	-10.199474
23	Central London	-5.769604	2.850097	-7.119014	-4.373578	-13.558316	-14.982118	-10.352553
24	Essex and Kent	-4.140062	2.850097		-4.373578	-6.233562	-6.233562	-3.233539
25	Oxfordshire, Surrey and Sussex	-1.359353	-2.601556		-4.373578	-7.814176	-7.814176	-5.414200
26	Somerset and Wessex	-1.352176	-2.331719		-4.373578	-7.591129	-7.591129	-5.306266
27	West Devon and Cornwall	0.284242	-4.895245		-4.373578	-8.005532	-8.005532	-6.331676

Table 9 – Generation wider tariffs in 2021/22

Generation Tariffs		System Peak Tariff	Shared Year Round Tariff	Not Shared Year Round	Residual Tariff	Conventional Carbon 80%	Conventional Low Carbon 80%	Intermittent 40%
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	Load Factor (£/kW)	Load Factor (£/kW)	Load Factor (£/kW)
1	North Scotland	3.553810	20.642880	18.893803	-5.596682	29.586474	33.365235	21.554273
2	East Aberdeenshire	5.586813	9.566045	18.893803	-5.596682	22.758009	26.536770	17.123539
3	Western Highlands	2.955723	17.657143	18.124210	-5.596682	25.984123	29.608965	19.590385
4	Skye and Lochalsh	-3.108237	17.657143	18.449728	-5.596682	20.180578	23.870523	19.915903
5	Eastern Grampian and Tayside	4.910113	15.342743	17.096593	-5.596682	25.264900	28.684218	17.637008
6	Central Grampian	5.088823	14.674404	16.675071	-5.596682	24.571721	27.906735	16.948151
7	Argyll	4.429403	11.891910	26.457057	-5.596682	29.511895	34.803306	25.617139
8	The Trossachs	4.722703	11.891910	14.860462	-5.596682	20.527919	23.500011	14.020544
9	Stirlingshire and Fife	3.031531	9.604227	13.826013	-5.596682	16.179041	18.944244	12.071022
10	South West Scotland	3.813781	9.807425	13.906514	-5.596682	17.188250	19.969553	12.232802
11	Lothian and Borders	4.331298	9.807425	8.585038	-5.596682	13.448586	15.165594	6.911326
12	Solway and Cheviot	2.578052	6.276720	7.704446	-5.596682	8.166303	9.707192	4.618452
13	North East England	4.849414	4.753392	4.881422	-5.596682	6.960583	7.936868	1.186097
14	North Lancashire and The Lakes	2.152751	4.753392	1.324890	-5.596682	1.418695	1.683673	-2.370435
15	South Lancashire, Yorkshire and Humber	5.521266	0.735370	0.113225	-5.596682	0.603460	0.626105	-5.189309
16	North Midlands and North Wales	4.222659	-0.540623		-5.596682	-1.806521	-1.806521	-5.812931
17	South Lincolnshire and North Norfolk	2.189834	-0.265442		-5.596682	-3.619202	-3.619202	-5.702859
18	Mid Wales and The Midlands	1.072746	0.252704		-5.596682	-4.321773	-4.321773	-5.495600
19	Anglesey and Snowdon	6.558223	-0.585366		-5.596682	0.493248	0.493248	-5.830828
20	Pembrokeshire	9.124066	-4.995656		-5.596682	-0.469141	-0.469141	-7.594944
21	South Wales & Gloucester	5.292029	-5.124224		-5.596682	-4.404032	-4.404032	-7.646372
22	Cotswold	2.327615	2.921122	-8.051337	-5.596682	-7.373239	-8.983506	-12.479570
23	Central London	-6.223796	2.921122	-7.318694	-5.596682	-15.338536	-16.802274	-11.746927
24	Essex and Kent	-4.577352	2.921122		-5.596682	-7.837136	-7.837136	-4.428233
25	Oxfordshire, Surrey and Sussex	-1.618557	-2.689236		-5.596682	-9.366628	-9.366628	-6.672376
26	Somerset and Wessex	-2.086761	-2.832404		-5.596682	-9.949366	-9.949366	-6.729644
27	West Devon and Cornwall	-0.533643	-5.661355		-5.596682	-10.659409	-10.659409	-7.861224

Table 10 – Generation wider tariffs in 2022/23

Generation Tariffs		System Peak Tariff	Shared Year Round Tariff	Not Shared Year Round	Residual Tariff	Conventional Carbon 80%	Conventional Low Carbon 80%	Intermittent 40%
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	Load Factor (£/kW)	Load Factor (£/kW)	Load Factor (£/kW)
1	North Scotland	3.399382	18.345311	24.709580	-8.097064	29.746231	34.688147	23.950640
2	East Aberdeenshire	3.858739	7.538646	24.709580	-8.097064	21.560256	26.502172	19.627974
3	Western Highlands	2.893765	15.889709	22.946142	-8.097064	25.865382	30.454610	21.204962
4	Skye and Lochalsh	2.907070	15.889709	28.551513	-8.097064	30.362984	36.073286	26.810333
5	Eastern Grampian and Tayside	5.134688	13.841816	21.065014	-8.097064	24.963088	29.176091	18.504676
6	Central Grampian	5.241736	13.115702	20.221260	-8.097064	23.814242	27.858494	17.370477
7	Argyll	4.374351	10.898872	29.199738	-8.097064	28.356175	34.196123	25.462223
8	The Trossachs	4.924693	10.898872	17.597716	-8.097064	19.624899	23.144443	13.860201
9	Stirlingshire and Fife	3.066518	9.027280	15.984896	-8.097064	14.979195	18.176174	11.498744
10	South West Scotland	4.262460	9.216981	16.133173	-8.097064	16.445519	19.672154	11.722901
11	Lothian and Borders	3.235913	9.216981	9.934564	-8.097064	10.460085	12.446998	5.524292
12	Solway and Cheviot	2.679765	6.119531	8.814579	-8.097064	6.529989	8.292905	3.165327
13	North East England	4.275052	4.791089	5.532543	-8.097064	4.436894	5.543402	-0.648085
14	North Lancashire and The Lakes	2.296098	4.791089	1.931153	-8.097064	-0.423172	-0.036942	-4.249475
15	South Lancashire, Yorkshire and Humber	5.015752	1.217576	0.252854	-8.097064	-1.904968	-1.854397	-7.357180
16	North Midlands and North Wales	3.892414	-0.177591		-8.097064	-4.346723	-4.346723	-8.168100
17	South Lincolnshire and North Norfolk	2.063008	-0.181061		-8.097064	-6.178905	-6.178905	-8.169488
18	Mid Wales and The Midlands	0.960475	0.260245		-8.097064	-6.928393	-6.928393	-7.992966
19	Anglesey and Snowdon	6.935351	-0.404134		-8.097064	-1.485020	-1.485020	-8.258718
20	Pembrokeshire	9.539717	-5.558302		-8.097064	-3.003989	-3.003989	-10.320385
21	South Wales & Gloucester	5.510356	-5.958291		-8.097064	-7.353341	-7.353341	-10.480380
22	Cotswold	2.510796	2.922157	-8.598306	-8.097064	-10.127187	-11.846848	-15.526507
23	Central London	-6.399627	2.922157	-7.578387	-8.097064	-18.221675	-19.737352	-14.506588
24	Essex and Kent	-4.691482	2.922157		-8.097064	-10.450820	-10.450820	-6.928201
25	Oxfordshire, Surrey and Sussex	-1.561198	-2.948474		-8.097064	-12.017041	-12.017041	-9.276454
26	Somerset and Wessex	-1.994691	-3.129812		-8.097064	-12.595605	-12.595605	-9.348989
27	West Devon and Cornwall	-0.368025	-6.052926		-8.097064	-13.307430	-13.307430	-10.518234

Table 11 – Generation wider tariffs in 2023/24

Generation Tariffs		System Peak Tariff	Shared Year Round Tariff	Not Shared Year Round	Residual Tariff	Conventional Carbon 80%	Conventional Low Carbon 80%	Intermittent 40%
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	Load Factor (£/kW)	Load Factor (£/kW)	Load Factor (£/kW)
1	North Scotland	4.004833	15.797300	27.616029	-10.584025	28.151471	33.674677	23.350924
2	East Aberdeenshire	4.399045	5.629136	27.616029	-10.584025	20.411152	25.934358	19.283658
3	Western Highlands	3.461208	13.941672	25.695229	-10.584025	24.586704	29.725750	20.687873
4	Skye and Lochalsh	3.471866	13.941672	31.450634	-10.584025	29.201686	35.491813	26.443278
5	Eastern Grampian and Tayside	5.994532	11.880570	23.148611	-10.584025	23.433852	28.063574	17.316814
6	Central Grampian	6.154785	11.300925	22.291313	-10.584025	22.444550	26.902813	16.227658
7	Argyll	6.192388	9.799802	30.919189	-10.584025	28.183556	34.367394	24.255085
8	The Trossachs	5.023160	9.799802	20.038938	-10.584025	18.310127	22.317915	13.374834
9	Stirlingshire and Fife	3.744772	9.436995	19.633393	-10.584025	16.417057	20.343736	12.824166
10	South West Scotland	4.464018	7.859136	17.439719	-10.584025	14.119077	17.607021	9.999348
11	Lothian and Borders	3.862312	7.859136	11.289300	-10.584025	8.597036	10.854896	3.848929
12	Solway and Cheviot	3.300711	5.272531	10.451942	-10.584025	5.296264	7.386653	1.976929
13	North East England	4.900105	3.814352	6.203053	-10.584025	2.330004	3.570615	-2.855231
14	North Lancashire and The Lakes	2.969534	3.814352	2.520799	-10.584025	-2.546370	-2.042210	-6.537485
15	South Lancashire, Yorkshire and Humber	5.628564	0.444815	0.338509	-10.584025	-4.328802	-4.261100	-10.067590
16	North Midlands and North Wales	4.212636	-0.565636		-10.584025	-6.823898	-6.823898	-10.810279
17	South Lincolnshire and North Norfolk	3.000017	-0.687399		-10.584025	-8.133927	-8.133927	-10.858985
18	Mid Wales and The Midlands	1.692115	0.056678		-10.584025	-8.846568	-8.846568	-10.561354
19	Anglesey and Snowdon	7.614633	-0.841666		-10.584025	-3.642725	-3.642725	-10.920691
20	Pembrokeshire	7.660027	-5.363456		-10.584025	-7.214763	-7.214763	-12.729407
21	South Wales & Gloucester	3.238576	-5.498798		-10.584025	-11.744487	-11.744487	-12.783544
22	Cotswold	0.137528	2.939398	-7.941431	-10.584025	-14.448123	-16.036410	-17.349697
23	Central London	-6.478166	2.939398	-7.857659	-10.584025	-20.996800	-22.568332	-17.265925
24	Essex and Kent	-4.524986	2.939398		-10.584025	-12.757493	-12.757493	-9.408266
25	Oxfordshire, Surrey and Sussex	-1.510678	-2.884621		-10.584025	-14.402400	-14.402400	-11.737873
26	Somerset and Wessex	-2.418598	-1.047898		-10.584025	-13.840941	-13.840941	-11.003184
27	West Devon and Cornwall	-2.314057	1.459105	0.545783	-10.584025	-11.294172	-11.185015	-9.454600

Changes to tariffs over the five-year period

The following section provides details of the forecast of wider and local generation tariffs for 2019/20 to 2023/24 and how these change over the period. We have compared the example tariffs for Conventional Carbon generators with an ALF of 80%, Conventional Low Carbon generators with an ALF of 80%, and Intermittent generators with an ALF of 40%.

Table 12 – Comparison of Conventional Carbon (80%) tariffs

Wider Tariffs for a Conventional Carbon 80% Generator		2019/20	2020/21	2021/22	2022/23	2023/24
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	(£/kW)
1	North Scotland	26.35	26.54	29.59	29.75	28.15
2	East Aberdeenshire	22.59	21.69	22.76	21.56	20.41
3	Western Highlands	25.91	25.01	25.98	25.87	24.59
4	Skye and Lochalsh	19.70	18.62	20.18	30.36	29.20
5	Eastern Grampian and Tayside	24.41	23.49	25.26	24.96	23.43
6	Central Grampian	24.28	23.41	24.57	23.81	22.44
7	Argyll	29.22	28.26	29.51	28.36	28.18
8	The Trossachs	20.60	19.54	20.53	19.62	18.31
9	Stirlingshire and Fife	16.47	15.38	16.18	14.98	16.42
10	South West Scotland	17.08	15.80	17.19	16.45	14.12
11	Lothian and Borders	13.61	12.85	13.45	10.46	8.60
12	Solway and Cheviot	8.67	7.72	8.17	6.53	5.30
13	North East England	5.84	5.16	6.96	4.44	2.33
14	North Lancashire and The Lakes	2.52	1.33	1.42	-0.42	-2.55
15	South Lancashire, Yorkshire and Humber	1.58	1.25	0.60	-1.90	-4.33
16	North Midlands and North Wales	-0.33	-0.70	-1.81	-4.35	-6.82
17	South Lincolnshire and North Norfolk	-1.87	-2.31	-3.62	-6.18	-8.13
18	Mid Wales and The Midlands	-2.60	-3.20	-4.32	-6.93	-8.85
19	Anglesey and Snowdon	0.31	0.81	0.49	-1.49	-3.64
20	Pembrokeshire	1.96	2.22	-0.47	-3.00	-7.21
21	South Wales & Gloucester	-1.02	-1.03	-4.40	-7.35	-11.74
22	Cotswold	-4.15	-4.37	-7.37	-10.13	-14.45
23	Central London	-12.86	-13.56	-15.34	-18.22	-21.00
24	Essex and Kent	-5.90	-6.23	-7.84	-10.45	-12.76
25	Oxfordshire, Surrey and Sussex	-7.54	-7.81	-9.37	-12.02	-14.40
26	Somerset and Wessex	-8.31	-7.59	-9.95	-12.60	-13.84
27	West Devon and Cornwall	-8.05	-8.01	-10.66	-13.31	-11.29

Figure 4 - Wider tariffs for a Conventional Carbon 80% generator

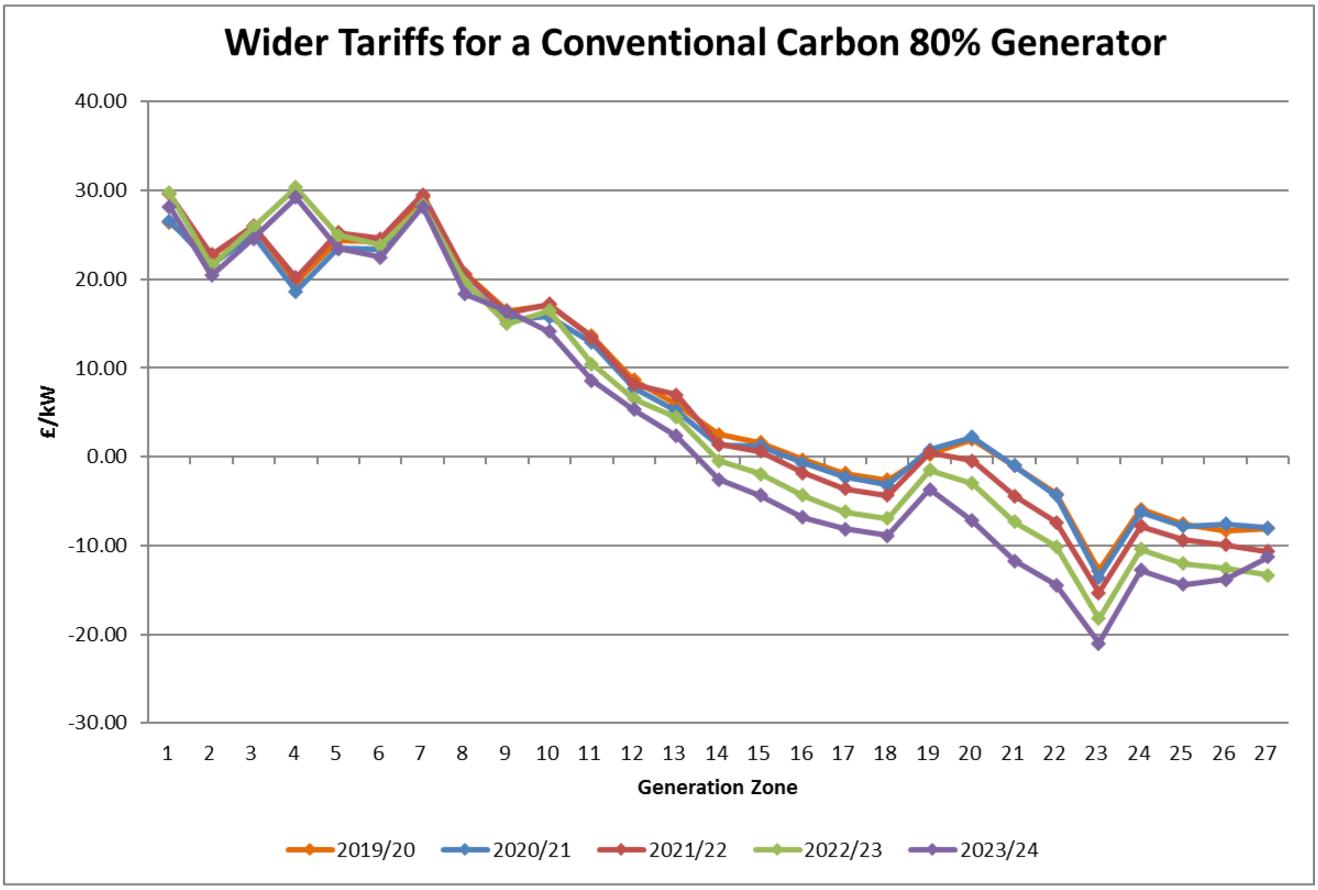


Table 13 – Comparison of Conventional Low Carbon (80%) tariffs

Wider Tariffs for a Conventional Low Carbon 80% Generator		2019/20	2020/21	2021/22	2022/23	2023/24
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	(£/kW)
1	North Scotland	29.60	30.07	33.37	34.69	33.67
2	East Aberdeenshire	25.85	25.21	26.54	26.50	25.93
3	Western Highlands	29.17	28.51	29.61	30.45	29.73
4	Skye and Lochalsh	22.94	22.09	23.87	36.07	35.49
5	Eastern Grampian and Tayside	27.55	26.84	28.68	29.18	28.06
6	Central Grampian	27.35	26.69	27.91	27.86	26.90
7	Argyll	34.25	33.50	34.80	34.20	34.37
8	The Trossachs	23.40	22.51	23.50	23.14	22.32
9	Stirlingshire and Fife	19.10	18.16	18.94	18.18	20.34
10	South West Scotland	19.74	18.60	19.97	19.67	17.61
11	Lothian and Borders	15.10	14.54	15.17	12.45	10.85
12	Solway and Cheviot	10.17	9.31	9.71	8.29	7.39
13	North East England	6.63	6.02	7.94	5.54	3.57
14	North Lancashire and The Lakes	3.05	1.92	1.68	-0.04	-2.04
15	South Lancashire, Yorkshire and Humber	1.61	1.30	0.63	-1.85	-4.26
16	North Midlands and North Wales	-0.33	-0.70	-1.81	-4.35	-6.82
17	South Lincolnshire and North Norfolk	-1.87	-2.31	-3.62	-6.18	-8.13
18	Mid Wales and The Midlands	-2.60	-3.20	-4.32	-6.93	-8.85
19	Anglesey and Snowdon	0.31	0.81	0.49	-1.49	-3.64
20	Pembrokeshire	1.96	2.22	-0.47	-3.00	-7.21
21	South Wales & Gloucester	-1.02	-1.03	-4.40	-7.35	-11.74
22	Cotswold	-5.49	-5.76	-8.98	-11.85	-16.04
23	Central London	-14.18	-14.98	-16.80	-19.74	-22.57
24	Essex and Kent	-5.90	-6.23	-7.84	-10.45	-12.76
25	Oxfordshire, Surrey and Sussex	-7.54	-7.81	-9.37	-12.02	-14.40
26	Somerset and Wessex	-8.31	-7.59	-9.95	-12.60	-13.84
27	West Devon and Cornwall	-8.05	-8.01	-10.66	-13.31	-11.19

Figure 5 – Wider tariffs for a Conventional Low Carbon 80% generator

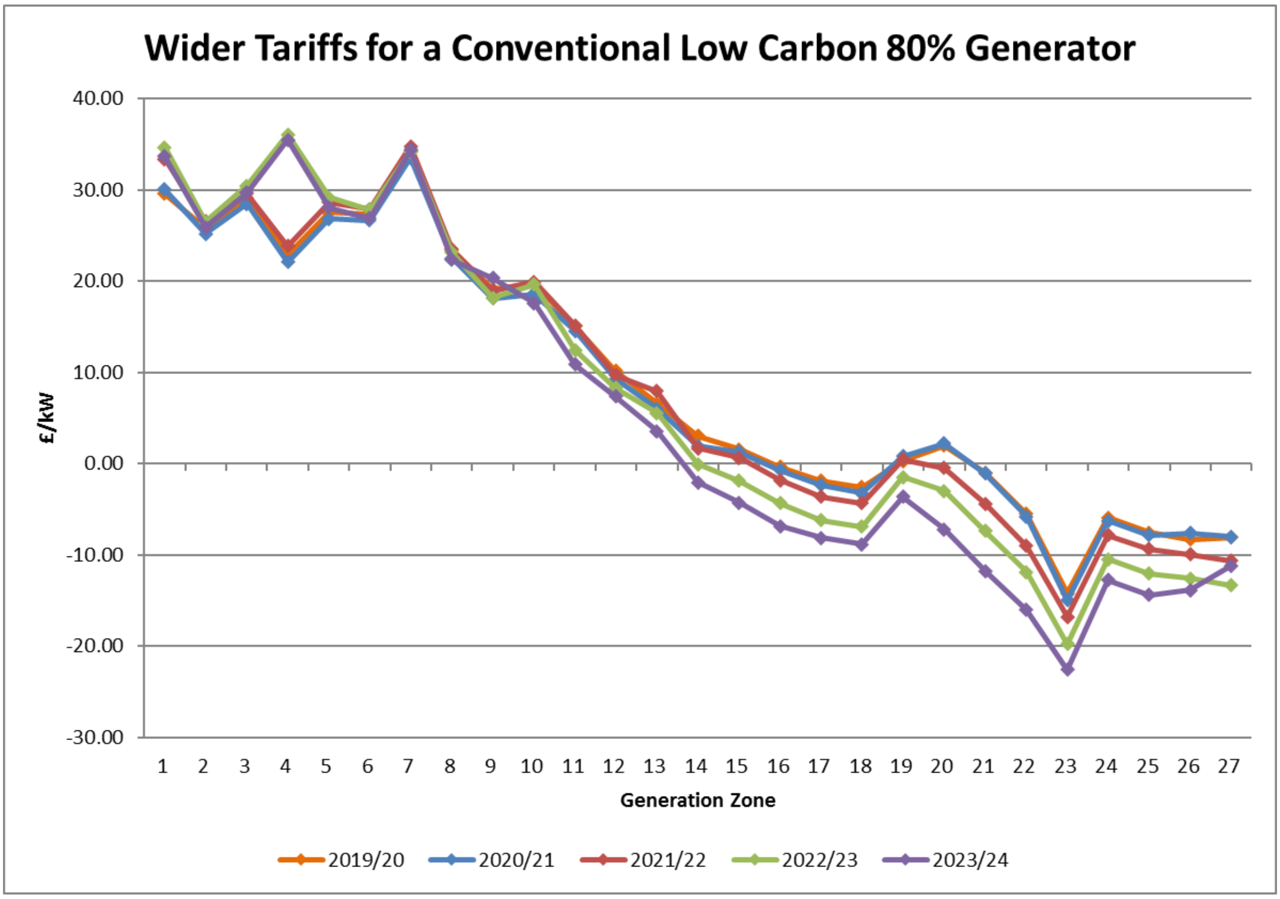
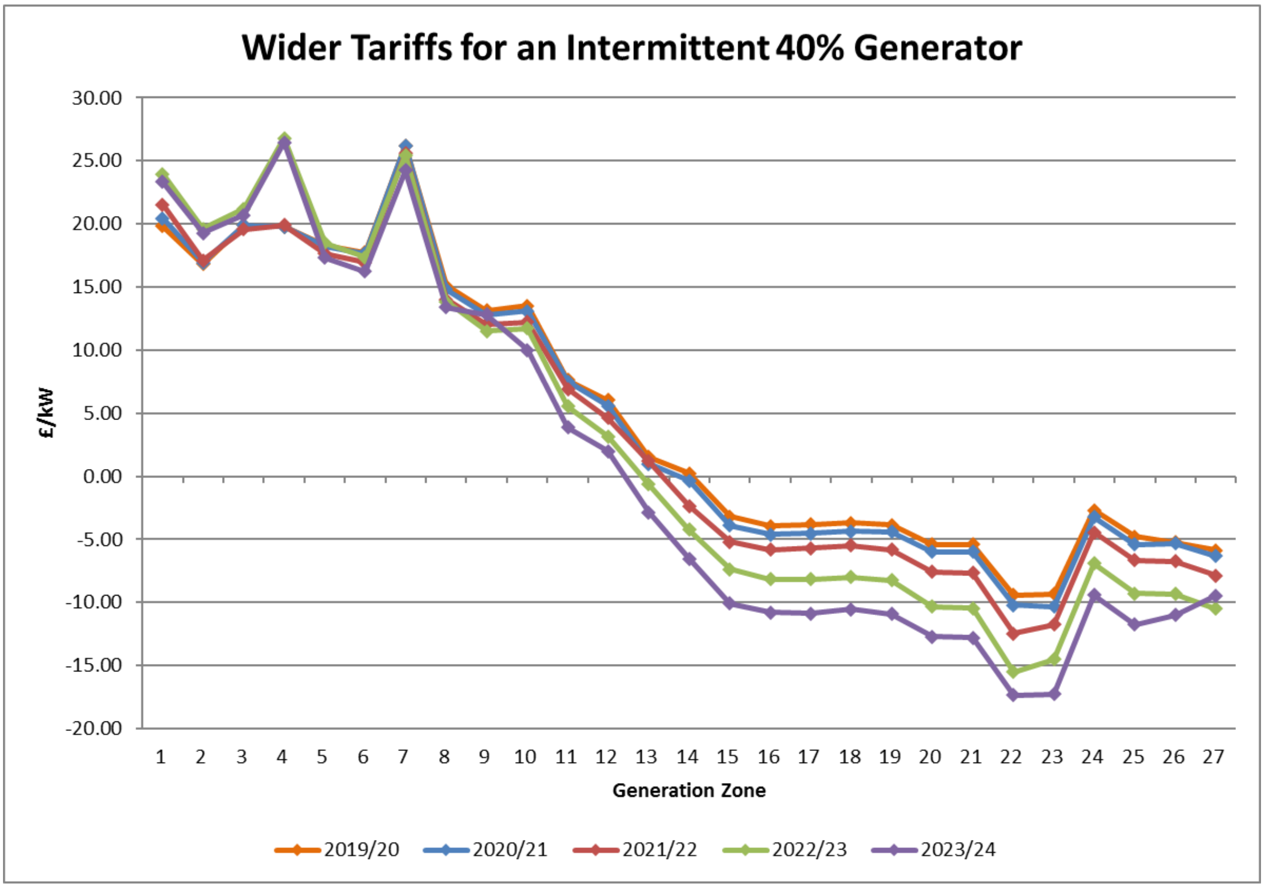


Table 14 – Comparison of Intermittent (40%) tariffs

Wider Tariffs for an Intermittent 40% Generator		2019/20	2020/21	2021/22	2022/23	2023/24
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	(£/kW)
1	North Scotland	19.82	20.46	21.55	23.95	23.35
2	East Aberdeenshire	16.83	16.94	17.12	19.63	19.28
3	Western Highlands	19.90	19.90	19.59	21.20	20.69
4	Skye and Lochalsh	19.78	19.78	19.92	26.81	26.44
5	Eastern Grampian and Tayside	18.30	18.23	17.64	18.50	17.32
6	Central Grampian	17.71	17.63	16.95	17.37	16.23
7	Argyll	26.22	26.20	25.62	25.46	24.26
8	The Trossachs	15.09	14.81	14.02	13.86	13.37
9	Stirlingshire and Fife	13.13	12.79	12.07	11.50	12.82
10	South West Scotland	13.50	13.08	12.23	11.72	10.00
11	Lothian and Borders	7.64	7.50	6.91	5.52	3.85
12	Solway and Cheviot	6.05	5.56	4.62	3.17	1.98
13	North East England	1.54	0.97	1.19	-0.65	-2.86
14	North Lancashire and The Lakes	0.25	-0.36	-2.37	-4.25	-6.54
15	South Lancashire, Yorkshire and Humber	-3.18	-3.92	-5.19	-7.36	-10.07
16	North Midlands and North Wales	-3.95	-4.61	-5.81	-8.17	-10.81
17	South Lincolnshire and North Norfolk	-3.80	-4.51	-5.70	-8.17	-10.86
18	Mid Wales and The Midlands	-3.71	-4.37	-5.50	-7.99	-10.56
19	Anglesey and Snowdon	-3.87	-4.41	-5.83	-8.26	-10.92
20	Pembrokeshire	-5.42	-5.98	-7.59	-10.32	-12.73
21	South Wales & Gloucester	-5.41	-6.00	-7.65	-10.48	-12.78
22	Cotswold	-9.44	-10.20	-12.48	-15.53	-17.35
23	Central London	-9.32	-10.35	-11.75	-14.51	-17.27
24	Essex and Kent	-2.71	-3.23	-4.43	-6.93	-9.41
25	Oxfordshire, Surrey and Sussex	-4.79	-5.41	-6.67	-9.28	-11.74
26	Somerset and Wessex	-5.26	-5.31	-6.73	-9.35	-11.00
27	West Devon and Cornwall	-5.88	-6.33	-7.86	-10.52	-9.45

Figure 6 – Wider tariffs for an Intermittent 40% generator



Changes to generation tariffs from 2019/20 to 2023/24

Generation tariffs generally remain steady throughout the five-year period. The decrease in overall tariffs is caused by the reduction in revenue that can be collected from generation customers. The Future Energy Scenarios (FES) forecast of transmission-connected generation output over the five-years predicts a gradual reduction in output, which reduces the amount of revenue that can be collected per MWh of generation. In addition, the £:€ exchange rate forecast has been updated to reflect a weaker pound, which has the effect of slightly offsetting the reduction in revenue.

The increases to the peak and year round elements of the tariffs in Scotland are roughly matched by the steady reduction in the negativity of the generation residual. This causes Scottish generation tariffs to remain broadly stable across the five-years by reducing the amount they increase by, but from zone 10 southwards tariffs gradually reduce over the course of the forecast period. The trend remains that as the amount of generation in Scotland increases, generation TNUoS tariffs in Scotland continue to rise.

The impact of the small generator discount on demand tariffs

The licence condition for the small generator discount expires on 31 March 2019, so no calculation of the discount has been included in these tariffs.

Please see Appendix D for indicative values for 2019/20 onwards if the small generator discount was to be extended.

Best View: Onshore local tariffs for generation

Onshore local substation tariffs

Local substation tariffs reflect the cost of the first transmission substation that each transmission connected generator connects to. They are increased each year by Average May to October RPI, and have been updated from the June forecast to reflect revised RPI forecast for the period May 2018 to October 2018.

Table 15 - Local substation tariffs for 2019/20

Substation Rating	Connection Type	Local Substation Tariff (£/kW)		
		132kV	275kV	400kV
<1320 MW	No redundancy	0.197964	0.113248	0.081598
<1320 MW	Redundancy	0.436098	0.269817	0.196232
>=1320 MW	No redundancy	0.000000	0.355083	0.256797
>=1320 MW	Redundancy	0.000000	0.582955	0.425509

Local substation tariffs for future years can be derived by multiplying these figures by your forecasted value of RPI.

Onshore local circuit tariffs

A forecast of onshore local circuit tariffs from 2019/20 to 2023/24 is shown below.

Where a transmission-connected generator is not directly connected to the Main Interconnected Transmission System (MITS), the onshore local circuit tariffs reflect the cost and flows on circuits between its connection and the MITS. Local circuit tariffs can change as a result of system flows and RPI.

Local circuit tariffs are dependent on the particular flows modelled on a system in a given year, and can therefore change between years. If you require further insight in to any particular local circuit tariff, please contact us using the details in this report.

Table 16 - Onshore local circuit tariffs

Connection Point	2019/20 (£/kW)	2020/21 (£/kW)	2021/22 (£/kW)	2022/23 (£/kW)	2023/24 (£/kW)
Aberarder		2.389075	2.460747	2.534652	2.609927
Aberdeen Bay	2.570844	2.648282	2.727730	2.809654	2.893096
Achruach	4.232856	4.360718	4.491458	-2.751123	-2.745798
Aigas	0.644872	0.664297	0.684226	0.704776	0.725706
An Suidhe	-0.941070	-0.971254	-0.999978	-1.029633	-0.962820
Arecleoch	2.047871	2.109556	2.172842	2.238101	2.304569
Aultmore			1.754680	1.807380	1.861056
Baglan Bay	0.750115	0.772702	-0.152582	-0.157151	0.844127
Bay of Skaill			67.115117	69.130826	71.183900
Beaw Field					131.435176
Beinneun Wind Farm	1.480947	1.525557	1.571321	1.618512	1.666577
Bhlaraidh Wind Farm	0.648822	0.668365	0.688416	0.709092	0.730151
Black Hill	1.531255	1.577378	1.624700	1.899632	2.752127
Black Law	1.722917	1.774813	1.828058	1.882961	1.938882
BlackCraig Wind Farm	6.206946	6.393908	6.585726	6.783519	6.680442
BlackLaw Extension	3.653668	3.763721	3.876633	3.993062	4.111650
Chimorie				2.562008	2.638095
Clyde (North)	0.108132	0.111389	0.114731	0.118176	0.121686
Clyde (South)	0.125049	0.128816	0.132681	0.136665	0.140724
Corriegarth	3.108511	3.202143	3.298208	3.397265	3.498158
Corriemoillie	1.640460	1.689873	1.740569	1.792845	1.846090
Coryton	0.051513	0.053124	0.055191	0.056843	0.052477
Costa Head				70.938206	73.044956
Cruachan	1.865376	1.921790	1.979443	2.038884	2.077628
Culligran	1.708927	1.760402	1.813214	1.867672	1.923139
Deanie	2.807523	2.892089	2.978852	3.068318	3.159442
Dersalloch	2.375095	2.446636	2.520036	2.595721	2.672810
Didcot	0.515265	0.531350	0.548893	0.564572	0.568859
Dinorwig	2.365700	1.476443	1.520736	1.566399	1.612987
Dorenell	2.069263	4.526749	4.662551	4.802584	4.945213
Druim Leathann			89.818529	92.516103	95.263682
Dumnaglass	1.830606	1.885746	1.942319	2.000653	2.060070
Dunhill	1.412272	1.454812	1.498456	1.769597	2.618230
Dunlaw Extension	1.479750	1.519225	1.564255	1.619061	1.671014
Edinbane	6.748067	6.952298	7.160814	7.375024	7.593959
Elchies				1.720066	1.771149
Enoch Hill					2.420482
Ewe Hill	1.354956	1.395769	1.437642	1.480820	1.524798
Fallago	0.199323	0.211927	0.216823	-0.223277	-0.230159
Farr	3.515507	3.621399	3.730041	3.842068	3.956171

Connection Point	2019/20 (£/kW)	2020/21 (£/kW)	2021/22 (£/kW)	2022/23 (£/kW)	2023/24 (£/kW)
Fernoch	4.337104	4.467743	4.601774	4.739979	4.880746
Ffestiniogg	0.249457	0.256971	0.264680	0.272630	0.280726
Finlarig	0.315718	0.325228	0.334984	0.345045	0.355292
Foyers	0.742448	0.764811	0.787756	0.811415	0.835513
Galawhistle	1.458315	1.502242	1.547309	1.593780	1.641113
Gills Bay	2.483116	2.557910	2.634648	2.713776	2.794371
Glendoe	1.813672	1.868302	1.924352	1.982147	2.041013
Glenglass	2.938353	3.026861	3.117667	3.437439	4.335603
Glenmuckloch					4.293740
Gordonbush	0.196905	0.210925	0.227808	0.237887	0.252807
Griffin Wind	9.566769	9.855375	10.150086	10.454866	10.784994
Hadyard Hill	2.729153	2.811359	2.895699	2.982668	3.071248
Harestanes	2.474147	2.551525	2.627116	2.706162	2.787470
Hartlepool	0.592021	0.545881	0.562252	0.193436	0.021552
Hedon	0.178419	0.183793	0.189308	0.194994	0.200786
Hesta Head				80.326083	82.711638
Invergarry	1.399007	1.440962	1.484208	1.528609	1.574028
Kendoon North				-4.938435	-5.083952
Kergord					127.818179
Kilgallioch	1.037718	1.068975	1.101045	1.134113	1.167794
Killingholme	0.700742	0.722485	0.745095	0.810935	0.989095
Kilmorack	0.194729	0.200594	0.206612	0.212817	0.219138
Knottingley		-0.062470	0.160181	0.164991	0.169889
Kyllachy			0.478549	0.492922	0.507561
Kype Muir	1.462492	1.506544	1.551741	1.598345	1.645813
Langage	0.648563	0.668097	0.688173	0.708864	0.729941
Lochay	0.360820	0.371689	0.382839	0.394337	0.406049
Luichart	0.565474	0.582507	0.599982	0.618002	0.636356
Marchwood	0.376314	0.387650	0.399282	0.411274	-0.256116
Mark Hill	0.863311	0.889316	0.915995	0.943506	0.971526
Middle Muir	1.954443	2.013314	2.073713	2.135994	2.199430
Middleton	0.109785	0.114110	0.151937	0.156515	0.163981
Millennium South	0.928492	0.956696	0.985381	1.014958	1.045083
Millennium Wind	1.800785	1.855028	1.910676	1.968060	2.026506
Moffat	0.169407	0.177364	0.181729	0.187332	0.193835
Moray Firth		0.764811	0.787756	0.811415	0.835513
Mossford	0.441921	0.455233	0.468890	0.482973	0.497317
Muaithebheal			91.892242	94.652097	97.463112
Nant	-1.211288	-1.247772	-1.285200	-1.323790	-1.363097
Necton	-0.362164	-0.372705	-0.254099	-0.261340	-0.309764
Rhigos	0.100370	0.103395	0.106508	0.109693	0.112935
Rocksavage	0.017456	-0.017982	-0.018521	-0.019078	-0.019644
Saltend	0.336210	0.346335	0.356728	0.367443	0.378357

Connection Point	2019/20 (£/kW)	2020/21 (£/kW)	2021/22 (£/kW)	2022/23 (£/kW)	2023/24 (£/kW)
South Humber Bank	0.934230	0.963006	0.992832	1.056806	0.424040
Spalding	0.277642	0.286286	0.294153	0.303261	0.331262
Stornaway			86.787717	89.394266	92.049131
Strathbrora	0.069949	0.079569	0.091737	0.097492	0.107594
Strathy Wind	2.028917	1.878204	1.942700	2.003546	2.069306
Stronelairg	1.417537	1.462061	1.503153	1.548818	1.579641
Wester Dod	0.368855	0.383391	0.394130	0.104793	0.107748
Whitelee	0.104644	0.107796	0.111030	0.114364	0.117761
Whitelee Extension	0.290910	0.299672	0.308663	0.317933	0.327375
Willow			1.595164	1.643072	1.691869

Table 17 - CMP203: Circuits subject to one-off charges

As part of their connection offer, generators can agree to undertake one-off payments for certain infrastructure cable assets, which affect the way that they are modelled in the Transport and Tariff model. This table shows the lines which have been amended in the model to account for the one-off charges that have already been made to the generators. For more information please see CUSC 2.14.4, 14.4, and 14.15.15 onwards.

Node 1	Node 2	Actual Parameters	Amendment in Transport Model	Generator
Dyce 132kV	Aberdeen Bay 132kV	9.5km of Cable	9.5km of OHL	Aberdeen Bay
Crystal Rig 132kV	Wester Dod 132kV	3.9km of Cable	3.9km of OHL	Aikengall II
Wishaw 132kV	Blacklaw 132kV	11.46km of Cable	11.46km of OHL	Blacklaw
Farigaig 132kV	Corriegarth 132kV	4km Cable	4km OHL	Corriegarth
Elvanfoot 275kV	Clyde North 275kV	6.2km of Cable	6.2km of OHL	Clyde North
Elvanfoot 275kV	Clyde South 275kV	7.17km of Cable	7.17km of OHL	Clyde South
Farigaig 132kV	Dunmaglass 132kV	4km Cable	4km OHL	Dunmaglass
Coalburn 132kV	Galawhistle 132kV	9.7km cable	9.7km OHL	Galawhistle II
Moffat 132kV	Harestanes 132kV	15.33km cable	15.33km OHL	Harestanes
Coalburn 132kV	Kype Muir 132kV	17km cable	17km OHL	Kype Muir
Coalburn 132kV	Middle Muir 132kV	13km cable	13km OHL	Middle Muir
Melgarve 132kV	Stronelairg 132kV	10km cable	10km OHL	Stronelairg
East Kilbride South 275kV	Whitelee 275kV	6km of Cable	6km of OHL	Whitelee
East Kilbride South 275kV	Whitelee Extension 275kV	16.68km of Cable	16.68km of OHL	Whitelee Extension

Best View: Offshore local tariffs for generation

Offshore local generation tariffs

The local offshore tariffs (substation, circuit and ETUoS) reflect the cost of offshore networks connecting offshore generation. They are calculated at the beginning of price review or on transfer to the offshore transmission owner (OFTO). The tariffs are subsequently indexed by average May to October RPI each year.

Offshore local generation tariffs associated with OFTOs yet to be appointed will be confirmed once asset transfer has taken place.

Table 18 - Offshore local tariffs 2019/20

Offshore Generator	Tariff Component (£/kW)		
	Substation	Circuit	ETUoS
Barrow	7.981091	41.757060	1.036885
Burbo Bank	10.340572	19.798431	0.000000
Greater Gabbard	14.963607	34.384896	0.000000
Gunfleet	17.272806	15.857789	2.963912
Gwynt Y Mor	18.223279	17.952181	0.000000
Humber Gateway	14.501564	32.720361	0.000000
Lincs	14.915336	58.396950	0.000000
London Array	10.153261	34.581441	0.000000
Ormonde	24.673247	45.963948	0.366294
Robin Rigg East	-0.456422	30.234037	9.370920
Robin Rigg West	-0.456422	30.234037	9.370920
Sheringham Shoal	23.838633	27.957132	0.607705
Thanet	18.153985	33.827363	0.814344
Walney 1	21.294182	42.407308	0.000000
Walney 2	21.139315	42.780918	0.000000
West of Duddon Sands	8.216843	40.545029	0.000000
Westermost Rough	17.301910	29.267428	0.000000

Offshore local tariffs for future years can be derived by multiplying these figures by your forecasted value of RPI.

Best: View: Updates to revenue & the charging model since the last forecast

Since the last five-year view was published, we have updated allowed revenue for some Transmission Owners, the local circuits model, the generation background and demand charging bases and RPI.

There have been no changes to the error margin that is used to calculate the proportion of revenue to be recovered from generation and demand (G/D split).

Allowed revenues

National Grid recovers revenue on behalf of all onshore and offshore Transmission Owners (TOs & OFTOs) in Great Britain. The allowed revenue forecast for year 2019/20 has not been updated from the June forecast. For year 2020/21, tariffs have now been calculated to recover £3,014.5m of revenue. This is a decrease of £150m from the previous five-year view of £3,164.5m, mainly due to the revised offshore projects forecast and a revised NGET revenue forecast.

Years 2021/22 to 2023/24 are beyond RIIO-T1, and the onshore TOs have assumed similar regulatory arrangements when making the revenue forecast.

Under the relevant STC procedure, TOs will update us with their forecasts on allowed revenues by early October. These figures will be reflected in November draft tariffs for year 2019/20.

Table 19 – Allowed revenues

£m Nominal	2019/20	2020/21	2021/22	2022/23	2023/24
National Grid					
Price controlled revenue	*1,770.6*	*1,899.9*	*1,954.6*	*2,047.6*	*2,104.5*
Less income from connections	*44.0*	*44.0*	*44.0*	*44.0*	*44.0*
Income from TNUoS	**1,726.6**	**1,855.9**	**1,910.6**	**2,003.6**	**2,060.5**
Scottish Power Transmission					
Price controlled revenue	*404.5*	*375.3*	*439.3*	*435.7*	*448.5*
Less income from connections	*14.5*	*14.9*	*15.4*	*15.8*	*15.8*
Income from TNUoS	***390.0***	**360.4**	**423.9**	**419.9**	**432.7**
SHE Transmission					
Price controlled revenue	*352.9*	*366.4*	*421.5*	*434.8*	*447.9*
Less income from connections	*3.5*	*2.9*	*2.9*	*3.0*	*3.0*
Income from TNUoS	***349.4***	**363.5**	**418.6**	**431.8**	**444.9**
Offshore (+ Interconnector from y2019/20)	**380.6**	**402.1**	**427.7**	**543.3**	**624.8**
Network Innovation Competition + EDR	**32.7**	**32.7**	**32.7**	**32.7**	**32.7**
Total to Collect from TNUoS	**2,879.3**	**3,014.5**	**3,213.4**	**3,431.3**	**3,595.6**

Changes affecting the locational element of tariffs

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

- Week 24 demand data and embedded generation
- Contracted generation as of June 2018;
- Local circuits; and
- RPI (which increases the expansion constant).
- volumes

Transport Model demand (Week 24 data)

The contracted demand at Grid Supply Points (GSPs) is used in the transport model to provide locational signals for future energy consumption. This data is based on demand forecasts from DNOs and directly connected users (the week 24 data).

Demand levels at individual GSPs are made specifically for the purposes of the week 24 "snapshot" of national peak demand.

Table 20 – Week 24 DNO zonal demand forecast

Demand Zone	2019/20 MW	2020/21 MW	2021/22 MW	2022/23 MW	2023/24 MW
1	499.4	364.2	348.6	335.8	331.6
2	2695.3	2629.2	2610.4	2611.1	2596.0
3	2702.3	2702.3	2715.2	2728.1	2739.6
4	3067.5	3067.5	2940.0	2852.4	2767.9
5	4384.1	4384.1	4421.0	4425.8	4423.2
6	2557.7	2557.7	2641.9	2690.5	2743.5
7	5375.8	5375.8	5428.3	5506.1	5593.0
8	4424.7	4424.7	4446.3	4487.4	4536.0
9	6238.2	6238.2	6407.5	6529.7	6648.1
10	1673.9	1673.9	1685.5	1702.3	1711.0
11	3870.8	3870.8	3861.5	3765.0	3800.7
12	5599.2	5599.2	5736.3	5823.6	5956.7
13	6565.9	6565.9	6833.2	6942.2	7023.0
14	2210.1	2210.1	2178.2	2156.1	2136.6
Total	**51865.0**	**51663.7**	**52253.8**	**52556.0**	**53006.9**

Table 21 – Contracted TEC, modelled TEC and the generation charging base

Contracted TEC is the volume of TEC with connection agreements for the 2019/20 period, which can be found on the TEC register.‡ Modelled TEC is the amount of TEC we have entered into the Transport model to calculate system flows, which includes interconnector TEC.

Chargeable TEC is our best view of the likely volume of generation that will be connected to the system during 2019/20 and liable to pay generation TNUoS charges. Chargeable

‡ *See the Registers, Reports and Updates section at* *https://www.nationalgrideso.com/uk/electricity/connections/after-you-have-connected*

TEC volumes are always based on National Grid's best view of the likely volume of generation TEC connected to the system in the relevant charging year.

Best View	2019/20	2020/21	2021/22	2022/23	2023/24
Contracted TEC (GW)	83.9	100.8	110.3	121.7	132.2
Modelled TEC (GW)	77.7	80.2	81.9	83.4	93.5
Chargeable TEC (GW)	71.9	73.3	73.6	75.2	83.8

The specific contracted TEC numbers can be found in Appendix F.

Adjustments for interconnectors

When modelling flows on the transmission system, interconnector flows are not included in the Peak model but are included in the Year Round model. Since interconnectors are not liable for generation or demand TNUoS charges, they are not included in the calculations of chargeable TEC for either the generation or demand charging bases.

Table 22 – Interconnectors

The table below reflects the contracted position of interconnectors in the interconnector register as of June 2018.

Interconnector	Node	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Aquind Interconnector	LOVE40	26	0	0	2000	2000	2000
Auchencrosh (interconnector CCT)	AUCH20	10	80	80	80	80	80
Belgium Interconnector (Nemo)	CANT40	24	1000	1000	1000	1000	1000
Britned	GRAI40	24	1200	1200	1200	1200	1200
East West Interconnector	CONQ40	16	505	505	505	505	505
ElecLink	SELL40	24	1000	1000	1000	1000	1000
FAB Link Interconnector	EXET40	26	0	1400	1400	1400	1400
Greenage Power Interconnector	GRAI40	24	0	0	0	1400	1400
Greenlink	PEMB40	20	0	0	0	500	500
Gridlink Interconnector	KINO40	24	0	0	0	1500	1500
IFA Interconnector	SELL40	24	2000	2000	2000	2000	2000
IFA2 Interconnector	FAWL40	26	1100	1100	1100	1100	1100
Norway Interconnector	PEHE40	2	0	0	1400	1400	1400
NS Link	BLYT4A	13	0	1400	1400	1400	1400
Viking Link Denmark Interconnector	BICF4A	17	0	0	0	1500	1500

RPI

The RPI index for the components detailed below is calculated based on the forecasted average May to October RPI for 2019/20.

Expansion constant

The expansion constant has been forecast to 14.552251. This reflects our latest view of the RPI. To be consistent with tariffs, we have begun to round this to six decimal places.

Table 23 – Expansion constant and inflation indices

£/MWkm		2019/20	2020/21	2021/22	2022/23	2023/24
Expansion Constant		14.083100	14.552251	14.990585	15.440303	15.904031
	2009/10	2019/20	2020/21	2021/22	2022/23	2023/24
Inflation indices	1	1.356000	1.397000	1.439000	1.481000	1.526000

Local substation and offshore substation tariffs

Local onshore substation tariffs are indexed by May to October RPI as are offshore local circuit tariffs, so have been updated from the June forecast to reflect actual RPI for the period May 2018 to October 2018.

Generation / Demand (G/D) split

The G/D split has been updated for the next five-years.

Section 14.14.5 (v) in the Connection and Use of System Code (CUSC) currently limits average annual generation use of system charges in Great Britain to €2.5/MWh. The net revenue that can be recovered from generation is therefore determined by: 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.

Exchange rate

As prescribed by the Use of System charging methodology, the exchange rate forecast is taken from the Economic and Fiscal Outlook published by the Office of Budgetary Responsibility in March 2018. The values published run up until 2022/23, so we have used this figure for 2023/24 as well.

Generation output

The forecast output of generation has been updated using the latest Future Energy Scenario data from July 2018. We have used the average of all four scenarios using April to March data.

Error margin

The error margin remains at 21%. The parameters used to calculate the proportions of revenue collected from generation and demand are shown below.

Table 24 – Generation and demand revenue proportions

		2019/20	2020/21	2021/22	2022/23	2023/24
CAPEC	Limit on generation tariff (€/MWh)	2.50	2.50	2.50	2.50	2.50
y	Error Margin	21.0%	21.0%	21.0%	21.0%	21.0%
ER	Exchange Rate (€/£)	1.12	1.11	1.10	1.10	1.10
MAR	Total Revenue (£m)	2,879.3	3,014.5	3,213.4	3431.30	3,595.6
GO	Generation Output (TWh)	229.8	221.2	213.6	207.0	201.3
G	% of revenue from generation	14.0%	13.0%	11.9%	10.9%	10.1%
D	% of revenue from demand	86.0%	87.0%	88.1%	89.1%	89.9%
G.MAR	Revenue recovered from generation (£m)	403.5	392.5	382.2	372.4	362.1
D.MAR	Revenue recovered from demand (£m)	2475.7	2622.0	2831.2	3058.9	3233.4

Compliance with EU Regulation 838/2010

The G/D split methodology defined in the CUSC is there for provide compliance to the range of €0- €2.50/MWh for average generation charges for GB.

Under the CMA decision[§] about CUSC modification CMP261, to consider ex-post compliance with the regulation, we do not include revenue recovered from “offshore local circuits” in the total revenue paid by generators in determining the average.

In advance, we can look at the quantities derived from tariff setting, to look at the effective €/MWh which is being forecast. The following table shows these values.

Table 25 – Equivalent €/MWh generation tariffs in each year

		19/20	20/21	21/22	22/23	23/24
Ex post forecast	€/MWh	0.526	0.409	0.233	- 0.289	- 0.729

The **ex post forecast** results in 0.52 €/MWh in 19/20 falling below zero in 2022/23. This fall below zero is an issue as it is outside the range specified in the regulation. We have indicated in a letter[**] that following the CMA’s judgement on CMP261 (a modification concerned the cap in 2015/16), we are reviewing the options in this space and are looking to bring forward proposals in the Autumn.

For 19/20, the exchange rate used in the tariff calculation is now set. We are however aware that the BREXIT process may have a significant effect on the exchange rate for 2019/20 which cannot be reflected in tariffs owing to the methodology.

Under the ex post compliance methodology we calculate the exchange rate would need to increase to €5.34 to £1 for us to breach the €2.50/MWh cap (compared to €1.12 used in the forecast). Similarly, volume from transmission generation would need to decrease to just 48TWh (compared to around 229TWh used in the forecast). Both situations seem highly improbable.

[§] *https://www.gov.uk/cma-cases/edf-sse-code-modification-appeal*
[**] *https://www.nationalgrid.com/sites/default/files/documents/Open%20letter_Compliance%20with%20838_2010.pdf*

Charging bases

Generation

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

We are unable to breakdown our best view of generation as some of the information used to derive it could be commercially sensitive. The contracted TEC as published in the TEC register is shown in the appendices.

The charging bases for each year can be seen above in the contracted, modelled and chargeable TEC volumes table at the beginning of this section of the report.

Demand

Our forecasts of demand and embedded generation have been updated for the years 2020/21 to 2023/24. The forecast has not been updated for the 2019/20 tariffs. We currently do not intend to update the forecasts for 2019/20 again, but we reserve the right to do so before the publication of Final 2019/20 tariffs if we believe it necessary to ensure more accurate revenue recovery.

To forecast chargeable HH and NHH demand and EET volumes we use a Monte Carlo modelling approach. This incorporates our latest data including:

- Historical gross metered demand and embedded export volumes (August 2014-March 2018)
- Weather patterns
- Future demand shifts
- Expected levels of renewable generation.

We have also adjusted our forecast based on P339 for 2019/20 only, which factors in the expected HH/NHH demand shift we are seeing during settlement.

We forecast that the system gross peak will fall from 51.3GW in 2019/20 to 50.1GW in 2023/24. We expect HH demand to increase from 18.0GW in 2019/20 to 19.18GW in 2020/21 and NHH demand to decrease from 25.5TWh to 23.8TWh. The switch from HH to NHH demand is due to the effect of P339. The HH demand is then expected to fall each year to 18.91GW in 2023/24 and the NHH demand is forecast to decrease each year to 23.0TWh by 2023/24.

Table 26 – Demand charging base and system peak

	2019/20	2020/21	2021/22	2022/23	2023/24
Average System Demand at Triad (GW)	51.33	50.75	50.39	50.09	50.13
Average HH Metered Demand at Triad (GW)	18.01	19.18	19.04	18.93	18.91
NHH Annual Energy between 4pm and 7pm (TWh)	25.51	23.75	23.41	23.13	22.97

Annual Load Factors

The Annual Load Factors (ALFs) of each power station are required to calculate tariffs. For the purposes of this forecast we have used the final version of the 2018/19 ALFs, based upon data from 2012/13 to 2016/17 available from the National Grid website.[††] The ALFs for 2019/20 will be calculated later in this year.

Generation and demand residuals

Table 27 - Residual calculation

	Component	2019/20	2020/21	2021/22	2022/23	2023/24
G	Proportion of revenue recovered from generation (%)	14.0%	13.0%	11.9%	10.9%	10.1%
D	Proportion of revenue recovered from demand (%)	86.0%	87.0%	88.1%	89.1%	89.9%
R	Total TNUoS revenue (£m)	2,879.3	3,014.5	3,213.4	3,431.3	3,595.6
Generation Residual						
R_G	Generator residual tariff (£/kW)	-3.61	-4.37	-5.60	-8.10	-10.58
Z_G	Revenue recovered from the locational element of generator tariffs (£m)	329.1	362.7	391.4	477.7	597.6
O	Revenue recovered from offshore local tariffs (£m)	296.0	311.2	337.0	426.9	495.8
L_G	Revenue recovered from onshore local substation tariffs (£m)	19.2	19.8	20.2	20.4	24.2
S_G	Revenue recovered from onshore local circuit tariffs (£m)	19.0	19.4	45.7	55.9	131.2
B_G	Generator charging base (GW)	71.9	73.3	73.6	75.2	83.8
Gross Demand Residual						
R_D	Demand residual tariff (£/kW)	51.70	53.45	58.20	63.21	66.79
Z_D	Revenue recovered from the locational element of demand tariffs (£m)	-66.7	-72.9	-81.8	-87.9	-94.3
EE	Amount to be paid to Embedded Export Tariffs (£m)	110.9	17.8	19.6	19.3	20.5
B_D	Demand Gross charging base (GW)	51.3	50.8	50.4	50.1	50.1

The residual element of tariffs can be calculated using the formulas below. This can be used to assess the effect of changing the assumptions in our tariff forecasts without the need to run the transport and tariff model.

Generation Residual = (Total Money collected from generators as determined by G/D split less money recovered through location tariffs, onshore local substation & circuit tariffs and offshore local circuit & substation tariffs) divided by the total chargeable TEC

$$R_G = \frac{G.R - Z_G - O - L_c - L_S}{B_G}$$

Where

- R_G is the generation residual tariff (£/kW)
- G is the proportion of TNUoS revenue recovered from generation
- R is the total TNUoS revenue to be recovered (£m)
- Z_G is the TNUoS revenue recovered from generation locational zonal tariffs (£m)
- O is the TNUoS revenue recovered from offshore local tariffs (£m)
- L_C is the TNUoS revenue recovered from onshore local circuit tariffs (£m)
- L_S is the TNUoS revenue recovered from onshore local substation tariffs (£m)

[††] https://www.nationalgrid.com/sites/default/files/documents/Final%202018-19%20ALFs.pdf

- B_G is the generator charging base (GW)

The **Demand Residual** = (Total demand revenue less revenue recovered from locational demand tariffs, plus revenue paid to embedded exports) divided by total system gross triad demand

$$R_D = \frac{D.R - Z_D + EE}{B_D}$$

Where:

- R_D is the gross demand residual tariff (£/kW)
- D is the proportion of TNUoS revenue recovered from demand
- R is the total TNUoS revenue to be recovered (£m)
- Z_D is the TNUoS revenue recovered from demand locational zonal tariffs (£m)
- EE is the amount to be paid to embedded export volumes through the embedded export tariff (£m)
- B_D is the demand charging base (Half-Hour equivalent GW)

Z_G, Z_D, L_C, and EE are determined by the locational elements of tariffs, and for EE the value of the AGIC and phased residual.

Sensitives to Future Tariffs

Our Open Letter

In June 2018 we published an open letter on our proposed approach to the five-year view of TNUoS tariffs[‡‡].

We received 9 responses to our letter for which we are extremely gratefully. The responses have helped us design this report and shape our future thinking.

The summary of the feedback we received is as follows:

There was broad support for our approach to the sensitives we were proposing, however, there were a number of areas where further guidance could be provided:

- Further sensitives around the locational tariffs including varying the generation mix, or a greater move to decentralised generation
- Effect of changes to project driving large investments and with large local circuits – such as generation of Scottish Islands (Western Isles, Orkney and Shetland) and offshore.
- Ensure we make it clear what assumptions we have used in particular situations; with this in mind we will publish as much data as we can.

We have included these areas in this report.

Other feedback requested that we undertook further modelling around the potential methodology changes arising from the Ofgem Targeted Charging Review, Charging Futures Forum or other current and potential CUSC modifications. Given where they are in the development cycle this is not something we can do within our five-year view now. This is driven for many reasons:

1. The changes are not yet defined; there is no concluded change to the methodology;
2. We have not developed the model to reflect any changes (it is not efficient to prepare multiple variations which are not yet defined), and
3. In the case of some proposals we do not have data to allow us to forecast in the manner proposed.

We are aware that Ofgem's TCR is dealing with how the demand residual is recovered. The total quantity of the demand residual is summarised below for your information.

In this report, we have so far provided a best view of the tariffs for 2019/20 until 2023/24. The future is however uncertain, and changes in input parameters are certain between now and the publication of the final tariffs for each year.

Caveats

Our Best View tariffs so far in this report represent our best view of how tariffs may evolve. This report is published without prejudice and whilst every effort is made to ensure the accuracy of the information, it is subject to several estimations and forecast and may not bear relation to neither the indicative nor future tariffs National Grid will publish at a later date.

‡‡ *https://www.nationalgrid.com/sites/default/files/documents/TNUoS%20FYV%20June%202018.pdf*

All tariffs illustrated in this section are to illustrate how mathematically tariffs may evolve. In presenting certain sensitivities nothing is inferred about our view of the future, likelihoods of certain scenarios or changes to policy.

All changes to the model in terms of network, demand, generation, and revenue are indicative. They should not be interpreted as our view of how things may change in future.

Effect of RIIO-T2 parameters

Throughout this section, we have maintained the assumptions about RIIO-T2 and have maintained the current charging methodology (as detailed in the Modelling approach for the five-year view section above at the start of the report).

Table 28 – Effect of changing parameters on tariffs for RIIO-T2

Component	Assumption for this five-year view	Qualitative discussion of impact of changing this parameter
Expansion Constant	The expansion constant continues to increase by RPI	The expansion constant has the effect of "stretching" the network. Increasing the Expansion Constants make positive tariffs more positive, and negative tariffs more negative. The effect is the same for all locations.
Expansion Factors	The expansion factors are unchanged	The expansion Factors are the relative cost of different types of circuits. If some are to increase by more than others this will affect tariffs dominated by those particular types of circuits. Significant data is required from TOs to recalculate these.
Security Factor	The security factor remains 1.8	As the security factor is applied to zonal tariffs, and local tariffs with redundancy; if it is increased, locational and local tariffs will increase. If it is decreased, locational and local tariffs will reduce.
Offshore tariffs	Offshore tariffs increase by RPI	Offshore tariffs will be recalculated based on latest OFTO revenue forecasts for RIIO-T2, and adjustments for any income adjusting events in RIIO-T1 (see [1]). The total revenue from generators will not change, but the proportion that is recovered from Offshore generators may change. If offshore generators pay more, then the generator residual will become more negative, and vice-versa.
Avoid GSP Infrastructure Credit	The AGIC increases by RPI	It will be recalculated based on up to 20 schemes from the RIIO-T2 price-control period. If it increases, this increases the payment to embedded generators, and therefore the total

Component	Assumption for this five-year view	Qualitative discussion of impact of changing this parameter
		cost of the embedded export. This leads to an increase in the demand residual and the average HH and NHH tariff.
Generation Zones	The number of zones remains 27	This is a significant piece of work to undertake. It was last discussed in depth at TCMF in May 2016.[§§] The analysis suggested at that time there might be over 40 generation zones in the future under the current methodology.

Factors affecting the locational tariffs

In this section we have made adjustments to the locational inputs to demonstrate how sensitive the model is to change.

A shift from less Conventional generation to more Intermittent generation

In this scenario we have changed the balance of existing generation in favour of Intermittent generation. To achieve this, we scaled back the existing TEC held by Conventional generators by 10GW, and increased the existing Intermittent generation by 10GW.

The tables below show the volumes of TEC we used in each of the scenarios , and comparing the tariffs generated using these new TEC volumes to the tariffs in the Base Case for each year. We have modelled only years 2021/22 and 2023/24 in this scenario.

2021/22 with 10GW extra Intermittent generation and 10GW less Conventional generation

Table 29 – Volumes of Transport model TEC for the 2021/22 scenario with 10GW of extra Intermittent generation/Conventional generation reduced by 10GW

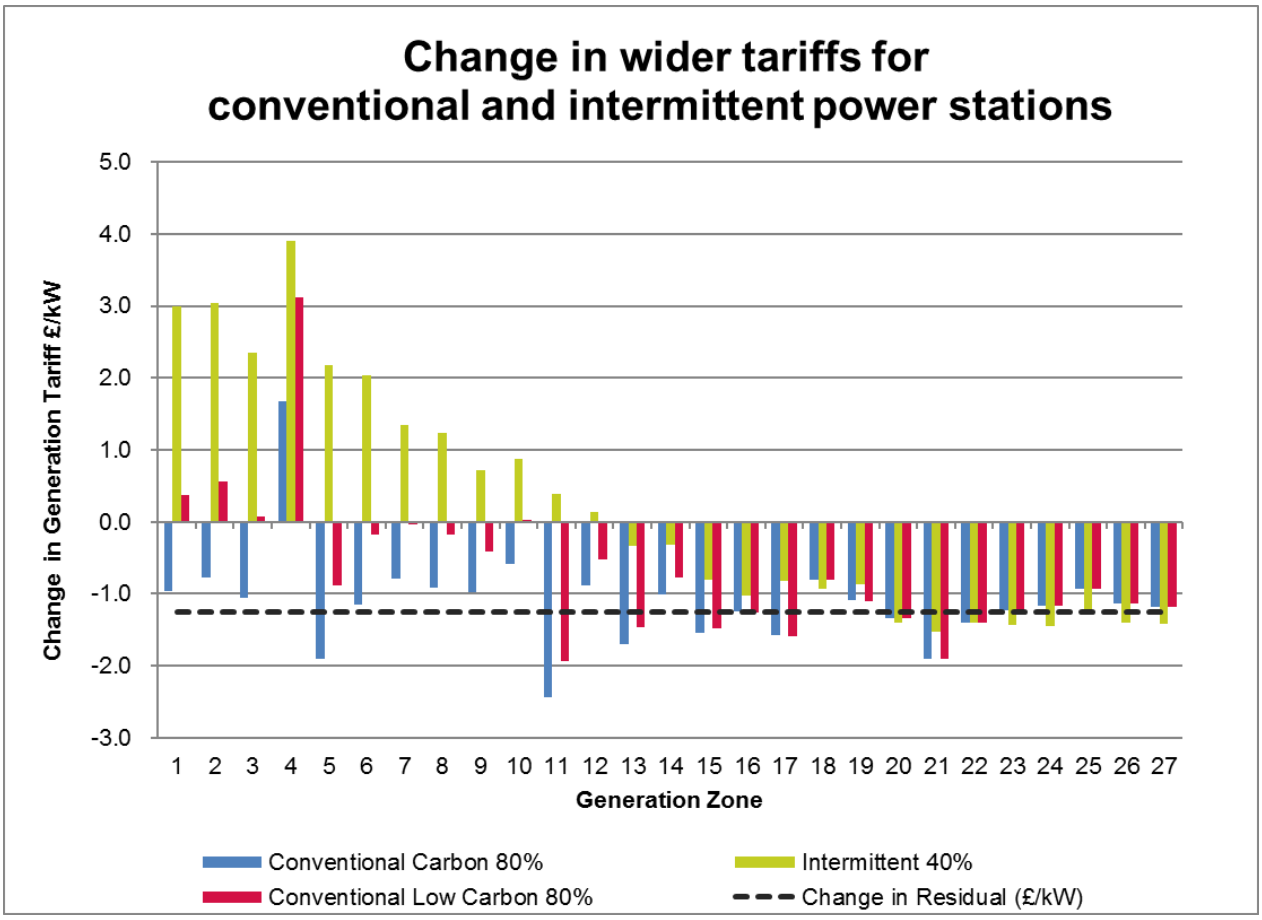
2021/22		
Total TEC (GW)	74.0	
TEC per scenario (GW)	Base Case	Increased Intermittent
Conventional TEC	57.2	47.2
Intermittent TEC	16.9	26.9

[§§] https://www.nationalgrid.com/sites/default/files/documents/8589935152-TCMF%20and%20CISG%20slidepack%2015th%20May%202016%20v1.0.pdf

Table 30 – Changes to Conventional and Intermittent Tariffs in the 2021/22 scenario with 10GW of extra Intermittent generation/Conventional generation reduced by 10GW

		Wider Generation Tariffs (£/kW)									
		Conventional Carbon 80%			Conventional Low Carbon 80%			Intermittent 40%			Change in Residual (£/kW)
Zone	Zone Name	2021/22 Base Case (£/kW)	2021/22 Intermittent (£/kW)	Change (£/kW)	2021/22 Base Case (£/kW)	2021/22 Intermittent (£/kW)	Change (£/kW)	2021/22 Base Case (£/kW)	2021/22 Intermittent (£/kW)	Change (£/kW)	
1	North Scotland	29.586474	28.622658	-0.963816	33.365235	33.737408	0.372173	21.554273	24.551667	2.997394	-1.252551
2	East Aberdeenshire	22.758009	21.981156	-0.776854	26.536770	27.095906	0.559136	17.123539	20.156603	3.033064	-1.252551
3	Western Highlands	25.984123	24.924744	-1.059380	29.608965	29.677124	0.068159	19.590385	21.943829	2.353444	-1.252551
4	Skye and Lochalsh	20.180578	21.859627	1.679050	23.870523	26.986307	3.115784	19.915903	23.815326	3.899423	-1.252551
5	Eastern Grampian and Tayside	25.264900	23.361635	-1.903265	28.684218	27.795031	-0.889187	17.637008	19.820056	2.183048	-1.252551
6	Central Grampian	24.571721	23.428416	-1.143305	27.906735	27.728289	-0.178446	16.948151	18.977208	2.029058	-1.252551
7	Argyll	29.511895	28.716490	-0.795405	34.803306	34.765059	-0.038247	25.617139	26.954895	1.337756	-1.252551
8	The Trossachs	20.527919	19.620246	-0.907673	23.500011	23.328372	-0.171639	14.020544	15.252679	1.232135	-1.252551
9	Stirlingshire and Fife	16.179041	15.196713	-0.982328	18.944244	18.537985	-0.406258	12.071022	12.795242	0.724220	-1.252551
10	South West Scotlands	17.188250	16.603011	-0.585239	19.969553	19.990006	0.020453	12.232802	13.108626	0.875824	-1.252551
11	Lothian and Borders	13.448586	11.007214	-2.441372	15.165594	13.230845	-1.934749	6.911326	7.291805	0.380479	-1.252551
12	Solway and Cheviot	8.166303	7.279399	-0.886904	9.707192	9.182693	-0.524499	4.618452	4.756246	0.137794	-1.252551
13	North East England	6.960583	5.268474	-1.692110	7.936868	6.473302	-1.463565	1.186097	0.848484	-0.337613	-1.252551
14	North Lancashire and The Lakes	1.418695	0.407678	-1.011016	1.683673	0.905367	-0.778305	-2.370435	-2.687215	-0.316780	-1.252551
15	South Lancashire, Yorkshire and Humber	0.603460	-0.931709	-1.535169	0.626105	-0.859035	-1.485140	-5.189309	-5.995411	-0.806102	-1.252551
16	North Midlands and North Wales	-1.806521	-3.050580	-1.244059	-1.806521	-3.062306	-1.255785	-5.812931	-6.835523	-1.022592	-1.252551
17	South Lincolnshire and North Norfolk	-3.619202	-5.192253	-1.573052	-3.619202	-5.202465	-1.583263	-5.702859	-6.523591	-0.820733	-1.252551
18	Mid Wales and The Midlands	-4.321773	-5.119422	-0.797649	-4.321773	-5.128466	-0.806693	-5.495600	-6.429141	-0.933540	-1.252551
19	Anglesey and Snowdon	0.493248	-0.597256	-1.090504	0.493248	-0.608982	-1.102230	-5.830828	-6.705110	-0.874282	-1.252551
20	Pembrokeshire	-0.469141	-1.808062	-1.338922	-0.469141	-1.808062	-1.338922	-7.594944	-8.993120	-1.398176	-1.252551
21	South Wales & Gloucester	-4.404032	-6.311478	-1.907446	-4.404032	-6.311478	-1.907446	-7.646372	-9.168543	-1.522171	-1.252551
22	Cotswold	-7.373239	-8.780559	-1.407320	-8.983506	-10.380204	-1.396698	-12.479570	-13.878075	-1.398504	-1.252551
23	Central London	-15.338536	-16.562973	-1.224437	-16.802274	-18.022479	-1.220205	-11.746927	-13.177383	-1.430455	-1.252551
24	Essex and Kent	-7.837136	-8.995310	-1.158174	-7.837136	-8.995310	-1.158174	-4.428233	-5.879851	-1.451617	-1.252551
25	Oxfordshire, Surrey and Sussex	-9.366628	-10.298257	-0.931629	-9.366628	-10.298257	-0.931629	-6.672376	-7.955859	-1.283483	-1.252551
26	Somerset and Wessex	-9.949366	-11.084915	-1.135548	-9.949366	-11.084915	-1.135548	-6.729644	-8.130334	-1.400690	-1.252551
27	West Devon and Cornwall	-10.659409	-11.839566	-1.180157	-10.659409	-11.839566	-1.180157	-7.861224	-9.273484	-1.412260	-1.252551

Figure 7 - Changes to Conventional and Intermittent Tariffs in the 2021/22 scenario with 10GW of extra Intermittent generation/Conventional generation reduced by 10GW



In general, Intermittent tariffs increase in zones 1-11, and decrease elsewhere. Conventional Carbon (and for the most part Conventional Low Carbon) tariffs reduce nationally.

This causes the residual to become even more negative becoming -£6.85 (compared to -£5.60 in the Base Case for 2021/22). Due to the increase in Intermittent tariffs, an extra £115m is recovered from the Year Round Not Shared element of tariffs (countered by a smaller reduction in revenue from Peak tariffs), which means that more money needs to be returned to generators through the residual to ensure the €2.50 cap is not exceeded.

Local circuit tariffs change no more than a penny per kW, except for Hartlepool (-50p), Killingholme (+19p) and South Humber Bank (-60p).

HH demand tariffs in this scenario vary on average no more than £0.07/kW, though zone 1 (-£0.77/kW) and zone 10 (+£0.67/kW) were affected more significantly than other zones. Embedded export tariffs changed no more than +/- £0.20/kW except for zones 6 (-£0.41/kW), zone 10 (+£0.64/kW) and zone 14 (+£0.36/kW).

2023/24 with 10GW extra Intermittent generation and 10GW less Conventional generation

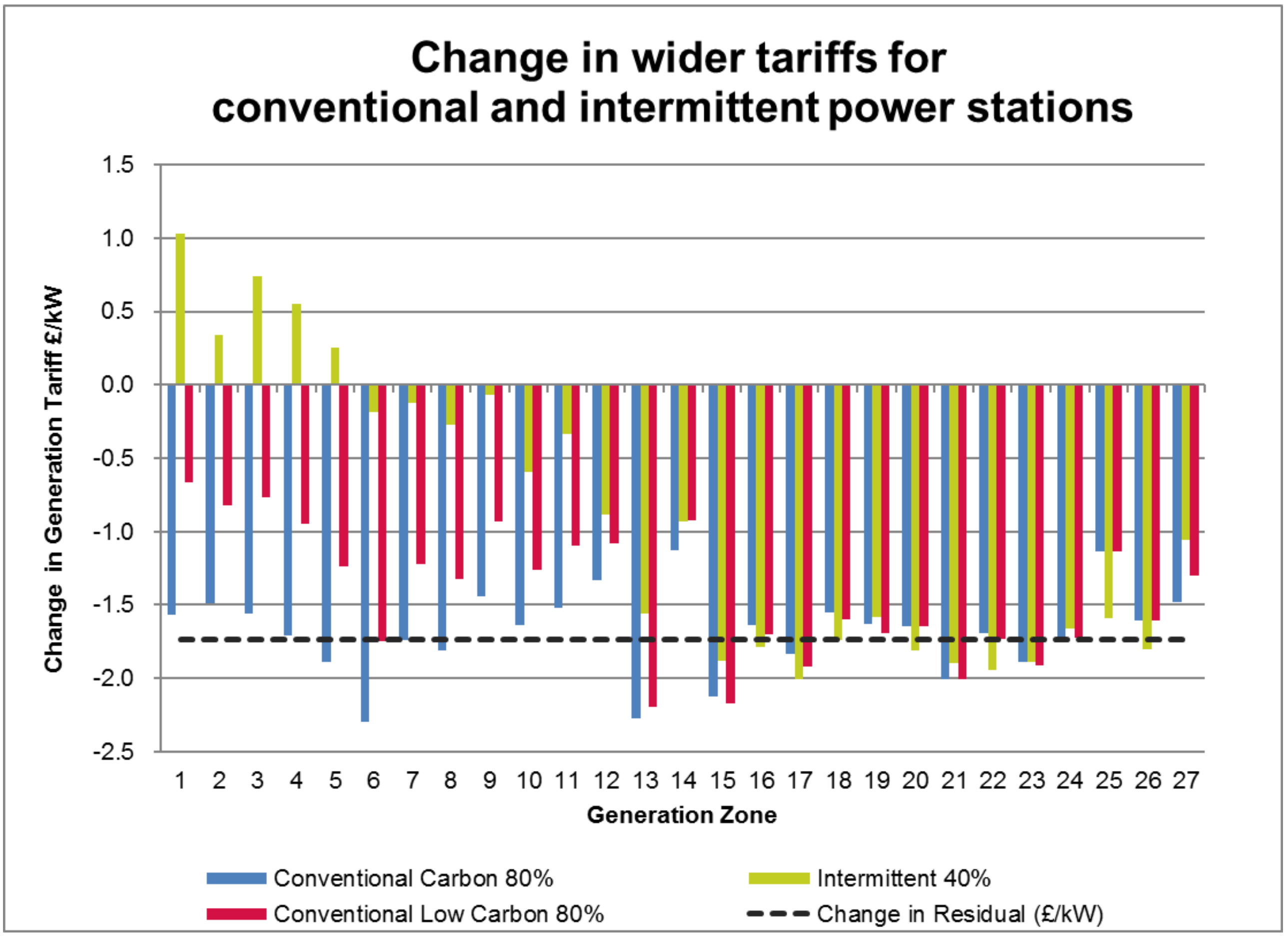
Table 31 – Volumes of Transport model TEC for the 2023/24 scenario with 10GW of extra Intermittent generation/Conventional generation reduced by 10GW

2023/24		
Total TEC (GW)	84.1	
TEC per scenario (GW)	Base Case	Increased Intermittent
Conventional TEC	57.0	47.0
Intermittent TEC	27.2	37.2

Table 32 – Changes to Conventional and Intermittent Tariffs in the 2023/24 scenario with 10GW of extra Intermittent generation/Conventional generation reduced by 10GW

Wider Generation Tariffs (£/kW)											
		Conventional Carbon 80%			Conventional Low Carbon 80%			Intermittent 40%			Change in Residual (£/kW)
Zone	Zone Name	2023/24 Base Case (£/kW)	2023/24 Intermittent (£/kW)	Change (£/kW)	2023/24 Base Case (£/kW)	2023/24 Intermittent (£/kW)	Change (£/kW)	2023/24 Base Case (£/kW)	2023/24 Intermittent (£/kW)	Change (£/kW)	
1	North Scotland	28.247481	26.680739	-1.566742	33.775013	33.110804	-0.664209	23.410843	24.443157	1.032314	-1.737957
2	East Aberdeenshire	20.509314	19.022131	-1.487183	26.036847	25.215069	-0.821777	19.344627	19.685818	0.341191	-1.737957
3	Western Highlands	24.684869	23.128185	-1.556684	29.828510	29.065065	-0.763445	20.749648	21.486459	0.736810	-1.737957
4	Skye and Lochalsh	29.298484	27.594183	-1.704300	35.592862	34.644825	-0.948037	26.503337	27.055268	0.551930	-1.737957
5	Eastern Grampian and Tayside	23.532586	21.646798	-1.885788	28.166943	26.926659	-1.240285	17.378860	17.629360	0.250500	-1.737957
6	Central Grampian	22.543589	20.247097	-2.296492	27.006437	25.260893	-1.745544	16.289382	16.099798	-0.189584	-1.737957
7	Argyll	28.287455	26.545867	-1.741588	34.476973	33.255001	-1.221972	24.321995	24.196162	-0.125833	-1.737957
8	The Trossachs	18.407741	16.593686	-1.814055	22.419895	21.095504	-1.324391	13.435174	13.159584	-0.275590	-1.737957
9	Stirlingshire and Fife	16.515001	15.071412	-1.443589	20.446325	19.515855	-0.930470	12.886401	12.817278	-0.069123	-1.737957
10	South West Scotlands	14.227751	12.591333	-1.636418	17.720716	16.458326	-1.262390	10.063999	9.473368	-0.590630	-1.737957
11	Lothian and Borders	8.686823	7.164790	-1.522033	10.948426	9.851032	-1.097394	3.907191	3.569613	-0.337577	-1.737957
12	Solway and Cheviot	5.406973	4.078607	-1.328366	7.502966	6.422926	-1.080039	2.044929	1.161099	-0.883830	-1.737957
13	North East England	2.374953	0.100753	-2.274200	3.616167	1.425220	-2.190946	-2.815669	-4.371487	-1.555818	-1.737957
14	North Lancashire and The Lakes	-2.385561	-3.515007	-1.129446	-1.868472	-2.789906	-0.921433	-6.436294	-7.368315	-0.932021	-1.737957
15	South Lancashire, Yorkshire and Humber	-4.335146	-6.456481	-2.121335	-4.271079	-6.439556	-2.168477	-10.054087	-11.931887	-1.877801	-1.737957
16	North Midlands and North Wales	-6.724787	-8.365954	-1.641167	-6.724787	-8.427106	-1.702319	-10.756902	-12.539910	-1.783008	-1.737957
17	South Lincolnshire and North Norfolk	-8.187438	-10.023561	-1.836122	-8.187438	-10.103589	-1.916150	-10.844147	-12.849858	-2.005711	-1.737957
18	Mid Wales and The Midlands	-8.896272	-10.447047	-1.550776	-8.896272	-10.497704	-1.601432	-10.591967	-12.327849	-1.735882	-1.737957
19	Anglesey and Snowdon	-3.413504	-5.044075	-1.630572	-3.413504	-5.105228	-1.691724	-10.842734	-12.424973	-1.582238	-1.737957
20	Pembrokeshire	-7.157515	-8.802842	-1.645328	-7.157515	-8.802842	-1.645328	-12.689905	-14.496766	-1.806861	-1.737957
21	South Wales & Gloucester	-11.694849	-13.699108	-2.004260	-11.694849	-13.699108	-2.004260	-12.745780	-14.644796	-1.899016	-1.737957
22	Cotswold	-14.404774	-16.093477	-1.688703	-15.984390	-17.714961	-1.730571	-17.287275	-19.233006	-1.945731	-1.737957
23	Central London	-21.041111	-22.926928	-1.885817	-22.613723	-24.529778	-1.916055	-17.252256	-19.139839	-1.887583	-1.737957
24	Essex and Kent	-12.795990	-14.533677	-1.737687	-12.795990	-14.518828	-1.722838	-9.389196	-11.051345	-1.662149	-1.737957
25	Oxfordshire, Surrey and Sussex	-14.413967	-15.547740	-1.133773	-14.413967	-15.547740	-1.133773	-11.712302	-13.301755	-1.589453	-1.737957
26	Somerset and Wessex	-13.832662	-15.437145	-1.604483	-13.832662	-15.437145	-1.604483	-10.974139	-12.775518	-1.801379	-1.737957
27	West Devon and Cornwall	-11.273441	-12.753673	-1.480232	-11.163977	-12.462856	-1.298879	-9.421191	-10.479559	-1.058368	-1.737957

Figure 8 - Changes to Conventional and Intermittent Tariffs in the 2023/24 scenario with 10GW of extra Intermittent generation/Conventional generation reduced by 10GW



In this scenario, Intermittent tariffs increase only in zones 1-5, and all tariffs decrease elsewhere. This is primarily due to the reduced amount of revenue to be collected from generation in 2023/24. This causes payments back to generators in the form of the residual increases to £1.03b, compared to £887m in the Base Case. The main cause of this is a £140m increase in this scenario in revenue received through the Year Round Not Shared element of tariffs.

HH demand tariffs don't change in general more than +/-£0.20, except for zone 1 (-£0.76/kW), zone 4 (-£0.42/kw) and zone 6 (-£0.49/kW). Embedded export tariffs in this scenario are zero from zones 1-6, and increase by £0.22/kW in zone 9 and £0.16 in zone 12. NHH tariffs dropped by 0.10p/kWh in zone 1, by 0.6p/kWh in zones 4 and 6, and increased by 0.5p/kWh in zone 3.

DNO demand data

The contracted demand at Grid Supply Points (GSPs) is used in the transport model to provide locational signals for future energy consumption. This data is based on the demand forecasts (week 24 data) from DNOs and directly connected users (DCC). In this scenario, we look at the impact of increasing and decreasing the forecasted demand.

a. **Increasing demand by 20% across all nodes** has minimal impact on the tariffs in both 20221/22 and 2023/24. The HH demand and EET average tariffs are decreased by £0.01/kW or less with no impact on NHH tariffs.

Table 33 – The effect of increasing demand by 20% on TNUoS tariffs

HH Tariffs		2021/22	2023/24
Additional Demand	GW	10.451	10.601
Effect on Tariffs			
HH Tariffs		**2021/22**	**2023/24**
Average Tariff	£/kW	56.875	65.265
	Change from base case	-0.002	-130.533
EET		**2021/22**	**2023/24**
Average Tariff	£/kW	2.865	3.110
	Change from base case	-0.004	0.001
NHH Tariffs		**2021/22**	**2023/24**
Average Tariff	p/kWh	7.551	8.794
	Change from base case	0.000	0.000
Generation Tarifs		**2021/22**	**2023/24**
Average Tariff	p/kWh	5.190	4.323
	Change from base case	0.000	0.000

b. **Decreasing demand by 20% across all nodes** increases the HH and EET demand tariff by an amount between £0.01 and £0.03/kW for both years considered. The result of decreasing demand is less revenue is collected from NHH and more is collected from HH.

Table 34 – The effect of decreasing demand by 20% on TNUoS tariffs

HH Tariffs		2021/22	2023/24
Reduction in Demand	GW	-10.451	-10.601
Effect on Tariffs			
HH Tariffs		**2021/22**	**2023/24**
Average Tariff	£/kW	56.908	65.285
	Change from base case	0.031	0.017
EET		**2021/22**	**2023/24**
Average Tariff	£/kW	2.886	3.141
	Change from base case	0.017	0.032
NHH Tariffs		**2021/22**	**2023/24**
Average Tariff	p/kWh	7.549	8.793
	Change from base case	-0.002	0.000
Generation Tarifs		**2021/22**	**2023/24**
Average Tariff	p/kWh	5.190	4.323
	Change from base case	0.000	0.000

Greater move towards decentralised generation

This scenario considers the impact of a greater move to decentralised generation by changing the following in the transport and tariff models:

- Doubling Chargeable Export at peak
- Remove a total 7GW of demand from all nodes (pro-rated to original demand)
- Decrease total annual generation output by 24.53TWh in the G/D split calculation

As shown in the table below, this scenario would have an impact on the HH tariff by increasing the tariffs by £1.30/kW for both 2021/22 and 2023/24 compared to the base case. The NHH tariff would also be increased by 0.17p/kWh for both years, whereas the generation tariffs would be decreased by 0.5 – 0.6p/kWh.

The impact of moving towards a more decentralised generation results in more revenue being collected from demand and less from generation due to the moving generation charging base if there was a greater move towards decentralised generation.

Table 35 – Impact of a greater move towards decentralised generation on TNUoS tariffs

HH Tariffs		2021/22	2023/24
Increase Chargeable Export at Peak	GW	6.830	6.593
Decrease Demand	GW	-7.000	-7.000
Decrease total annual generation output	TWh	-24.528	-24.528
Effect on Tariffs			
HH Tariffs		**2021/22**	**2023/24**
Average Tariff	£/kW	58.168	66.563
	Change	1.291	1.294
EET		**2021/22**	**2023/24**
Average Tariff	£/kW	2.892	3.094
	Change	0.022	-0.015
NHH Tariffs		**2021/22**	**2023/24**
Average	p/kWh	7.719	8.967
	Change	0.167	0.174
Generation Tarifs		**2021/22**	**2023/24**
Average	p/kWh	4.571	3.779
	Change	-0.619	-0.544

Factors affecting the residual tariffs

Total revenue

The total revenue to be collected from TNUoS affects the demand residual. Due to the upper limit on generation charges additional revenue has no effect on generation charges.

Table 36 – The effect of additional revenue on TNUoS tariffs

		19/20	20/21	21/22	22/23	23/24
Additional Revenue	£m	100.00	100.00	100.00	100.00	100.00
Effect on Tariffs						
Generation Residual	£/kW	No changes due to €2.50/MWh cap				
Demand Residual	£/kW	53.65	55.42	60.18	65.21	68.78
	Change	*1.95*	*1.97*	*1.98*	*2.00*	*1.99*
Change to NHH	*p/kWh*	*0.27*	*0.27*	*0.28*	*0.28*	*0.28*

In summary, consistently over the next 5 years – an additional £100m of allowed revenue results in an increase of around £2/kW for HH demand, and 0.3 p/kWh for NHH demand. Average generation tariffs are unchanged.

The G/D split calculation

The total revenue recovered from generation is determined by the formula in 14.14.5(v) of the CUSC. All the remaining revenue is recovered from demand tariffs.

This section looks at the effect of changing the three parameters in the G/D split calculation: The error margin, the £/€ exchange rate and the volume of chargeable generation.

a. **Reducing the error margin from 21% to 10%** results in additional revenue being recovered from generation. The result is between an additional £56m and £50m can be recovered from generator tariffs reducing demand tariffs. The generation residual increases between £0.78/kW and £0.60/kW, and decreases the demand residual of just over £1/kW and average NHH tariff decreases by 0.15p/kWh.

Table 37 – The effect of reducing the G/D split error margin to 10%

		19/20	20/21	21/22	22/23	23/24
Change to Generator Revenue	**£m**	**56.19**	**54.66**	**53.22**	**51.85**	**50.42**
Effect on Tariffs						
Generation Residual	£/kW	- 2.83	- 3.63	- 4.87	- 7.41	- 9.98
	Change	*0.78*	*0.75*	*0.72*	*0.69*	*0.60*
Demand Residual	£/kW	50.60	52.37	57.14	62.17	65.78
	Change	- *1.09*	- *1.08*	- *1.06*	- *1.04*	- *1.01*
Change to NHH	*p/kWh*	- *0.15*	- *0.15*	- *0.15*	- *0.15*	- *0.14*

b. **Increasing the exchange rate by + 0.2 €/£** results in less revenue being recovered from generation, due to the strength of the pound to the euro. The result is that between £60m and £55m less revenue can be collected from generators and is recovered from demand. This decreases generation tariffs by between £0.85/kW and £0.67/kW. The demand residual increases by around £1.15/kW, and the average NHH tariff increases by 0.16 p/kWh.

Table 38 – The effect of increasing the G/D split £:€ exchange rate

b. Exchange Rate		19/20	20/21	21/22	22/23	23/24
Change to Generator Revenue	**£m**	**- 60.91**	**- 59.79**	**- 58.62**	**- 57.39**	**- 55.81**
Effect on Tariffs						
Generation Residual	£/kW	- 4.46	- 5.19	- 6.39	- 8.86	- 11.25
	Change	*- 0.85*	*- 0.82*	*- 0.80*	*- 0.76*	*- 0.67*
Demand Residual	£/kW	52.88	54.63	59.36	64.36	67.90
	Change	*1.19*	*1.18*	*1.16*	*1.15*	*1.11*
Change to NHH	*p/kWh*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*

c. **Reducing the volume of chargeable generation by 10%.** This results in less revenue being recovered from generation. The result is between £40m and £35m less revenue can be collected from generators and is recovered from demand. This decreases generation tariffs by between £0.56/kW and £0.43/kW. The demand residual increases by around £0.75/kW, and the average NHH tariff increase by 11p/kWh.

Table 39 – The effect on the G/D split of reducing the chargeable generation volume

		19/20	20/21	21/22	22/23	23/24
Change to Generator Revenue	**£m**	**- 40.35**	**- 39.25**	**- 38.22**	**- 37.24**	**- 36.21**
Effect on Tariffs						
Generation Residual	£/kW	- 4.17	- 4.91	- 6.12	- 8.59	- 11.02
	Change	*- 0.56*	*- 0.54*	*- 0.52*	*- 0.50*	*- 0.43*
Demand Residual	£/kW	52.48	54.22	58.96	63.95	67.51
	Change	*0.79*	*0.77*	*0.76*	*0.74*	*0.72*
Change to NHH	*p/kWh*	*0.11*	*0.11*	*0.11*	*0.10*	*0.10*

Changes to Chargeable Demand Volumes

Demand tariffs makes up the largest part of the TNUoS cost recovery, responsible for £2.6bn in 19/20 rising to £3.3bn by 23/24. This section illustrates how thing may evolve if the charging bases changes:

1. **A decrease of 1GW System Peak and HH at Triad.** As decrease of 1GW at Triad reduces the charging base used to set HH tariffs, and the revenue recovered from HH tariffs. The result is a £1/kW to £1.36/kW increase in the Gross HH Demand Tariff for a 1GW decrease in charging base. NHH tariffs also increase from between 0.14p/kWh 0.19p/kWh.

Table 40 – The effect of reducing chargeable demand volumes by 1GW

		19/20	20/21	21/22	22/23	23/24
System Gross Triad Demand (-1GW)	GW	50.33	49.75	49.39	49.09	49.13
HH Gross Triad Demand (-1GW)	GW	6.75	6.12	5.83	5.60	5.59
Embedded Export Volume	GW	7.75	7.12	6.83	6.60	6.59
NHH Demand	TWh	25.51	23.75	23.41	23.13	22.97
Demand Residual	£/kW	52.72	54.52	59.38	64.50	68.15
	Change	*1.03*	*1.07*	*1.18*	*1.29*	*1.36*
Change to NHH	*p/kWh*	*0.18*	*0.20*	*0.22*	*0.24*	*0.26*

2. **An increase of 2GW of Embedded Export.** This increase the volume of Embedded Export for between 9.7GW and 8.6GW. The result is that more revenue is paid out using the Embedded Export Tariff. In 19/20 (where a change is now considered unlikely), due to the higher tariff the effect is an additional £28m, of cost through the EET. From 20/21 it is an extra £5m - £6m.
The effect on tariffs from 2020/21 onwards would be a ~10p/kW increase in HH Demand tariffs and a 0.02 p/kWh increase in NHH Demand Tariffs.

Table 41 – The effect of increasing embedded export volumes by 2GW

		19/20	20/21	21/22	22/23	23/24
System Gross Triad Demand	GW	51.33	50.75	50.39	50.09	50.13
HH Gross Triad Demand (+2GW)	GW	9.75	9.12	8.83	8.60	8.59
Embedded Export Volume	GW	16.51	17.68	17.54	17.43	17.41
NHH Demand	TWh	25.51	23.75	23.41	23.13	22.97
Embedded Export Revenue	£m	139.53	22.77	25.34	25.17	26.71
	Change	*28.61*	*5.00*	*5.74*	*5.85*	*6.22*
Demand Residual	£/kW	52.25	53.55	58.31	63.33	66.91
	Change	*0.56*	*0.10*	*0.11*	*0.12*	*0.12*
Change to NHH	*p/kWh*	*0.09*	*0.02*	*0.02*	*0.02*	*0.02*

3. **An increase of £2.00/kW (2019/20 prices) to AGIC.** Similarly to increasing the volume liable for generation, a £2.00/kW increase in the AGIC increases the revenue paid out to Embedded Export, and so increases the other demand tariffs. An additional £12m would be paid out in 19/20, and around £9m in each future year. The result in a around £0.20/kW increase in HH demand tariff and 0.03p/kWh change to NHH tariffs.
Note: due to the floor in the setting of the EET tariff, this effect does not scale linearly. Increasing the AGIC more significantly has a more significant increase

Table 42 – The effect on revenues of increasing the value of the AGIC by £2/kW

		19/20	20/21	21/22	22/23	23/24
System Gross Triad Demand	GW	51.33	50.75	50.39	50.09	50.13
HH Gross Triad Demand	GW	7.75	7.12	6.83	6.60	6.59
Embedded Export Volume	GW	16.51	17.68	17.54	17.43	17.41
NHH Demand	TWh	25.51	23.75	23.41	23.13	22.97
Embedded Export Revenue	£m	123.15	27.25	28.15	27.43	29.30
	Change	*12.23*	*9.48*	*8.55*	*8.11*	*8.80*
Demand Residual	£/kW	51.94	53.64	58.37	63.37	66.96
	Change	*0.24*	*0.19*	*0.17*	*0.16*	*0.18*
Change to NHH	*p/kWh*	*0.04*	*0.03*	*0.03*	*0.03*	*0.03*

The updated EET values with the additional £2/kW AGIC are in the following table:

Table 43– The effect on tariffs of increasing the value of the AGIC by £2/kW

	19/20	20/21	21/22	22/23	23/24
1 Northern Scotland	0.000	0.000	0.000	0.000	0.000
2 Southern Scotland	0.000	0.000	0.000	0.000	0.000
3 Northern	9.572	0.000	0.000	0.000	0.000
4 North West	16.409	2.358	1.263	0.905	0.903
5 Yorkshire	16.702	2.060	1.102	0.926	1.292
6 N Wales & Mersey	17.992	4.284	3.582	3.242	2.970
7 East Midlands	20.141	5.611	5.624	5.821	6.225
8 Midlands	21.439	7.127	7.183	7.239	7.458
9 Eastern	22.184	7.387	7.907	8.270	8.348
10 South Wales	18.333	2.929	4.984	5.950	8.010
11 South East	24.928	9.775	10.492	10.964	11.138
12 London	28.042	13.361	14.104	14.649	15.087
13 Southern	26.109	11.048	12.098	12.541	12.779
14 South Western	24.421	9.136	11.040	11.727	9.946

4. **Reducing NHH Demand by 10%.** This changes the charging base for the NHH, but does not change any other tariffs. The result of a 10% reduction in the NHH charging base see is reach 20.6TWh by 23/24. The result is an increase in NHH tariffs of between 0.71p/kWh and 1p/kWh.

Table 44 – The effect of reducing NHH demand by 10%

		19/20	20/21	21/22	22/23	23/24
System Gross Triad Demand	GW	51.33	50.75	50.39	50.09	50.13
HH Gross Triad Demand	GW	7.75	7.12	6.83	6.60	6.59
Embedded Export Volume	GW	16.51	17.68	17.54	17.43	17.41
NHH Demand	TWh	22.96	21.37	21.07	20.82	20.67
Demand Residual	£/kW *Change*	HH tariffs and demand residual are unchanged				
Change to NHH	*p/kWh*	*0.71*	*0.79*	*0.87*	*0.95*	*1.01*

Residual Quantities

For the purposes of modelling for the Ofgem Targeted Charging Review, the total Demand Residual – and how much is recovered from HH and NHH customers is shown below. The step from 19/20 to 20/21 is due to measurements classes F and G being treated as NHH in 19/20 under arrangement introduced by BSC Modification P339 and CUSC Modification CMP266.

Table 45 – The split of revenue recovered through the demand residual from the HH and NHH charging bases

		19/20	20/21	21/22	22/23	23/24
Total Generation Residual	£m	- 259.82	- 320.61	- 412.12	- 608.53	- 886.60
Total Demand Residual	£m	2,653.38	2,712.59	2,932.63	3,166.17	3,348.21
Demand Residual from HH Tariffs	%	32.2%	34.8%	34.8%	34.8%	34.7%
Demand Residual from NHH Tariffs	%	67.8%	65.2%	65.2%	65.2%	65.3%

Large transmission investment

Some large onshore transmission investments will incur high local circuit tariffs for the relevant generator projects, for example Scottish island links (Western Isles, Orkney and Shetland).

These links will be delivered under the Strategic Wider Works (SWW) mechanism. We have thus undertaken a sensitivity analysis, to align those island generators' connection years with SWW timescales.

Removing the Western Isles link and Orkney link from the 2021/22 network model

This reduces the revenue that is recovered from onshore local circuit tariffs by £21m, so the generation residual tariff will become less negative by around 47p/kW. The HH demand residual tariff is also reduced by around 48p/kW, as we assume the TOs' maximum allowed revenue is reduced by £21m as well.

Locational tariffs also change, as a result of less renewable generation connecting in North Scotland compared to the base case. In general, this makes the wider zonal tariffs slightly "flatter", as not shared year round tariffs reduce in some zones.

Table 46 – Changes to the 2021/22 generation tariffs as the effect of removing the Western Isles link and Orkney link

2021/22 Generation Tariffs Change		System Peak Tariff Change	Shared Year Round Tariff Change	Not Shared Year Round Tariff Change	Residual Tariff Change	Conventional Carbon Tariff Change 80%	Conventional Low Carbon Tariff Change 80%	Intermittent Tariff Change 40%
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	Load Factor (£/kW)	Load Factor (£/kW)	Load Factor (£/kW)
1	North Scotland	-0.063066	-0.313867	-1.235437	0.504965	-0.797544	-1.044632	-0.856019
2	East Aberdeenshire	-0.063193	1.257455	-1.235437	0.504965	0.459387	0.212299	-0.227490
3	Western Highlands	-0.062951	0.956563	-0.728558	0.504965	0.624418	0.478707	0.159032
4	Skye and Lochalsh	-0.062941	0.956563	-0.729940	0.504965	0.623322	0.477335	0.157650
5	Eastern Grampian and Tayside	-0.062466	0.726650	-0.564512	0.504965	0.572209	0.459307	0.231113
6	Central Grampian	-0.061036	0.653118	-0.533289	0.504965	0.539792	0.433135	0.232923
7	Argyll	-0.059746	0.463248	-0.346779	0.504965	0.538394	0.469038	0.343485
8	The Trossachs	-0.060475	0.463248	-0.346210	0.504965	0.538120	0.468878	0.344054
9	Stirlingshire and Fife	-0.064639	0.318736	-0.215454	0.504965	0.522952	0.479860	0.417005
10	South West Scotland	-0.054976	0.335736	-0.225429	0.504965	0.538235	0.493149	0.413830
11	Lothian and Borders	-0.073219	0.335736	-0.233723	0.504965	0.513357	0.466612	0.405536
12	Solway and Cheviot	-0.057095	0.228725	-0.150012	0.504965	0.510840	0.480838	0.446443
13	North East England	-0.108063	0.202960	-0.085594	0.504965	0.490795	0.473676	0.500555
14	North Lancashire and The Lakes	-0.021381	0.202960	-0.177466	0.504965	0.503979	0.468486	0.408683
15	South Lancashire, Yorkshire and Humber	-0.139061	0.151606	-0.007779	0.504965	0.480966	0.479410	0.557828
16	North Midlands and North Wales	-0.100817	0.075285		0.504965	0.464376	0.464376	0.535079
17	South Lincolnshire and North Norfolk	-0.120712	0.120079		0.504965	0.480317	0.480317	0.552997
18	Mid Wales and The Midlands	0.153646	-0.149050		0.504965	0.539371	0.539371	0.445345
19	Anglesey and Snowdon	0.038803	-0.052359		0.504965	0.501881	0.501881	0.484021
20	Pembrokeshire	0.061416	-0.064205		0.504965	0.515017	0.515017	0.479283
21	South Wales & Gloucester	0.057618	-0.060312		0.504965	0.514333	0.514333	0.480841
22	Cotswold	0.054976	0.005511	-0.063101	0.504965	0.513869	0.501248	0.444068
23	Central London	-0.000114	0.005511	-0.006762	0.504965	0.503851	0.502497	0.500407
24	Essex and Kent	-0.011347	0.005511		0.504965	0.498026	0.498026	0.507169
25	Oxfordshire, Surrey and Sussex	0.030637	-0.029704		0.504965	0.511839	0.511839	0.493083
26	Somerset and Wessex	0.035342	-0.035103		0.504965	0.512224	0.512224	0.490924
27	West Devon and Cornwall	0.040894	-0.043076		0.504965	0.511398	0.511398	0.487735

Removing the Western Isles link, Orkney link and Shetland link from the 2023/24 network model

This reduces the revenue that is recovered from onshore local circuit tariffs by £104m, so the generation residual tariff will become less negative by around £1.56/kW. The HH demand residual tariff is also reduced by around £2/kW, as we assume the TOs' maximum allowed revenue is reduced by £104m.

Locational tariffs also change as a result of less renewable generation connecting in North Scotland (compared to the base case). Unlike 2021/22, there is a general increase to wider zonal tariffs across all generation zones, mainly driven by increases to the residual tariffs.

Table 47 – Changes to the 2023/24 generation tariffs as the effect of removing the Western Isles link, Orkney link and Shetland link

2023/24 Generation Tariffs Change		System Peak Tariff Change	Shared Year Round Tariff Change	Not Shared Year Round Tariff Change	Residual Tariff Change	Conventional Carbon Tariff Change 80% Load Factor	Conventional Low Carbon Tariff Change 80% Load Factor	Intermittent Tariff Change 40% Load Factor
Zone	Zone Name	(£/kW)	(£/kW)	(£/kW)	(£/kW)	(£/kW)	(£/kW)	(£/kW)
1	North Scotland	0.037021	2.396951	-1.051952	1.590146	2.703166	2.492776	1.496974
2	East Aberdeenshire	0.037072	1.127386	-1.051952	1.590146	1.687565	1.477175	0.989149
3	Western Highlands	0.037070	1.338043	-1.189681	1.590146	1.745905	1.507969	0.935682
4	Skye and Lochalsh	0.037076	1.338043	-1.183034	1.590146	1.751229	1.514622	0.942329
5	Eastern Grampian and Tayside	0.037345	0.972975	-0.842960	1.590146	1.731503	1.562911	1.136376
6	Central Grampian	0.037996	0.878393	-0.761146	1.590146	1.721940	1.569710	1.180357
7	Argyll	0.039064	0.653970	-0.534132	1.590146	1.725080	1.618254	1.317602
8	The Trossachs	0.038026	0.653970	-0.530482	1.590146	1.726962	1.620866	1.321252
9	Stirlingshire and Fife	0.036228	0.586419	-0.496910	1.590146	1.697982	1.598599	1.327804
10	South West Scotland	0.044444	0.429861	-0.300807	1.590146	1.737833	1.677672	1.461284
11	Lothian and Borders	0.030570	0.429861	-0.338217	1.590146	1.694031	1.626388	1.423874
12	Solway and Cheviot	0.043201	0.265317	-0.175109	1.590146	1.705514	1.670491	1.521164
13	North East England	0.004171	0.167253	-0.138298	1.590146	1.617481	1.589821	1.518749
14	North Lancashire and The Lakes	0.070898	0.167253	-0.090006	1.590146	1.722841	1.704840	1.567041
15	South Lancashire, Yorkshire and Humber	-0.020520	0.017799	-0.037878	1.590146	1.553563	1.545987	1.559388
16	North Midlands and North Wales	0.027163	0.036224		1.590146	1.646288	1.646288	1.604635
17	South Lincolnshire and North Norfolk	-0.048927	-0.050798		1.590146	1.500580	1.500580	1.569827
18	Mid Wales and The Midlands	0.046014	-0.213161		1.590146	1.465632	1.465632	1.504882
19	Anglesey and Snowdon	0.108817	0.079990		1.590146	1.762955	1.762955	1.622142
20	Pembrokeshire	0.010350	0.008280		1.590146	1.607120	1.607120	1.593458
21	South Wales & Gloucester	0.006336	0.005353		1.590146	1.600764	1.600764	1.592287
22	Cotswold	0.002855	-0.050067	0.050719	1.590146	1.593522	1.603667	1.620838
23	Central London	-0.044373	-0.050067	0.002799	1.590146	1.507959	1.508519	1.572918
24	Essex and Kent	-0.042890	-0.050067		1.590146	1.507203	1.507203	1.570119
25	Oxfordshire, Surrey and Sussex	-0.029461	-0.058302		1.590146	1.514044	1.514044	1.566825
26	Somerset and Wessex	-0.016898	-0.023690		1.590146	1.554296	1.554296	1.580670
27	West Devon and Cornwall	-0.011489	-0.028169	-0.000975	1.590146	1.555342	1.555147	1.577903

Tools and Supporting Information

Further information

We are keen to ensure that customers understand the current charging arrangements and the reason why tariffs change. If you have specific queries on this forecast please contact us using the details below. Feedback on the content and format of this forecast 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 forums

We will hold a webinar for the Five-year view tariffs on Thursday 20 September 2018 from 10:00 to 11:00. If you wish to join the webinar, please use this registration link **(Register).**[***]

We always welcome questions and are happy to discuss specific aspects of the material contained in the June tariffs report should you wish to do so.

We will hosting a two-day charging forum in October 2018. On Tuesday 16 October 2018, we will be hosting a generation charging forum, and a demand charging forum will follow on Wednesday 17 October. We will cover both BSUoS and TNUoS charging on these days. To register your place at one or both of the days, please contact TNUoS.Queries@nationalgrid.com.

Charging models

We can provide a copy of our charging model. If you would like a copy of the model to be emailed to you, together with a user guide, please contact us using the details below. Please note that, while the model is available free of charge, it is provided under licence to restrict, among other things, its distribution and commercial use.

Numerical data

All tables in this document can be downloaded as an Excel spreadsheet from our website under ”Five-year forecasts”:

https://www.nationalgrideso.com/tnuos

Team Email & Phone	TNUoS.queries@nationalgrid.com	01926 654633

*** *https://uknationalgrid.webex.com/uknationalgrid/j.php?MTID=ma6f7a2a516fa5570367a9fb70caaa58c*

List of appendices

Appendix A: Background to TNUoS Charging

National Grid sets Transmission Network Use of System (TNUoS) tariffs for generators and suppliers. These tariffs serve two purposes: to reflect the transmission cost of connecting at different locations and to recover the total allowed revenues of the onshore and offshore transmission owners.

To reflect the cost of connecting in different parts of the network, National Grid determines a locational component of TNUoS tariffs using two models of power flows on the transmission system: peak demand and year round. Where a change in demand or generation increases power flows, tariffs increase to reflect the need to invest. Similarly, if a change reduces flows on the network, tariffs are reduced. To calculate flows on the network, information about the generation and demand connected to the network is required in conjunction with the electrical characteristics of the circuits that link these.

The charging model includes information about the cost of investing in transmission circuits based on different types of generic construction, e.g. voltage and cable / overhead line, and the costs incurred in different TO regions. Onshore, these costs are based on 'standard' conditions, which means that they reflect the cost of replacing assets at current rather than historical cost, so they do not necessarily reflect the actual cost of investment to connect a specific generator or demand site.

The locational component of TNUoS tariffs does not recover the full revenue that onshore and offshore transmission owners have been allowed in their price controls. Therefore, to ensure the correct revenue recovery, separate non-locational "residual" tariff elements are included in the generation and demand tariffs. The residual is also used to ensure the correct proportion of revenue is collected from generation and demand. The locational and residual tariff elements are combined into a zonal tariff, referred to as the wider zonal generation tariff or demand tariff, as appropriate.

For generation customers, local tariffs are also calculated. These reflect the cost associated with the transmission substation they connect to and, where a generator is not connected to the main interconnected transmission system (MITS), the cost of local circuits that the generator uses to export onto the MITS. This allows the charges to reflect the cost and design of local connections and vary from project to project. For offshore generators, these local charges reflect revenue allowances.

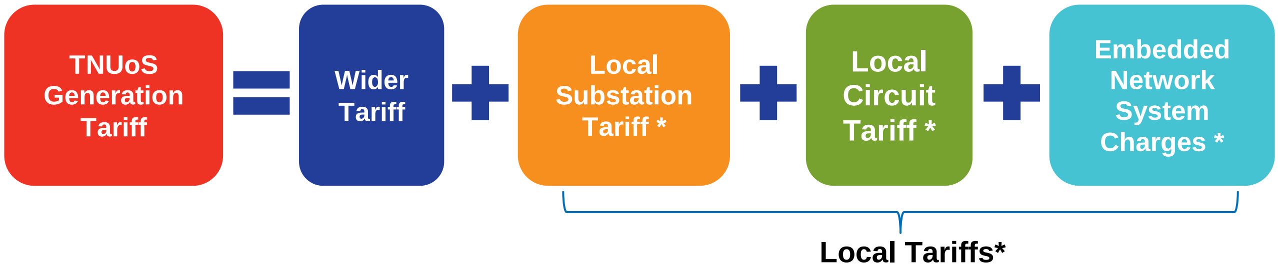
Generation charging principles

Generators pay TNUoS (Transmission Network Use of System) tariffs to allow National Grid as System Operator to recover the capital costs of building and maintaining the transmission network on behalf of the transmission asset owners (TOs).

The TNUoS tariff specific to each generator depends on many factors, including the location, type of connection, connection voltage, plant type and volume of TEC (Transmission Entry Capacity) held by the generator. The TEC figure is equal to the maximum volume of MW the generator is allowed to output onto the transmission network.

Under the current methodology there are 27 generation zones, and each zone has four tariffs. Liability for each tariff component is shown below:

TNUoS tariffs are made up of two general components, the **Wider tariff**, and **local tariffs**.



** Additional Local Tariffs may be applicable to Offshore generators*

The Wider tariff is set to recover the costs incurred by the generator for the use of the whole system, whereas the local tariffs are for the use of assets in the immediate vicinity of the connection site.

*Embedded network system charges are only payable by generators that are not directly connected to the transmission network and are not applicable to all generators.

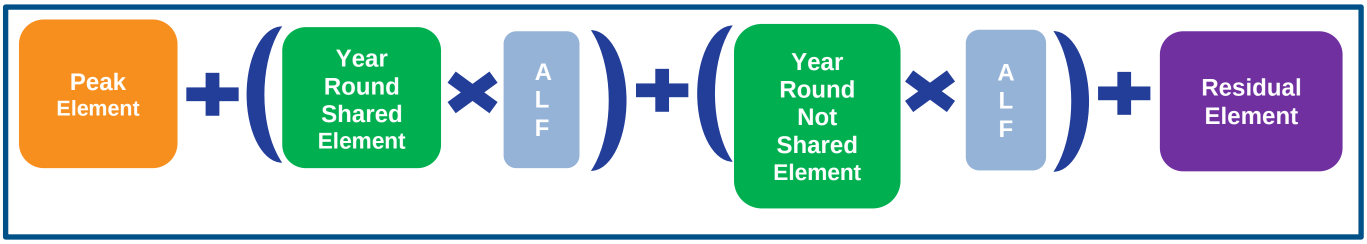
The Wider tariff

The Wider tariff is made up of four components, two of which may be multiplied by the generator's specific Annual Load Factor (ALF), depending on the generator type.

As CUSC Modification CMP268 has added an extra variation to the calculation formula, generators classed as Conventional Carbon now pay the Year Round Not Shared element in proportion to their ALF.

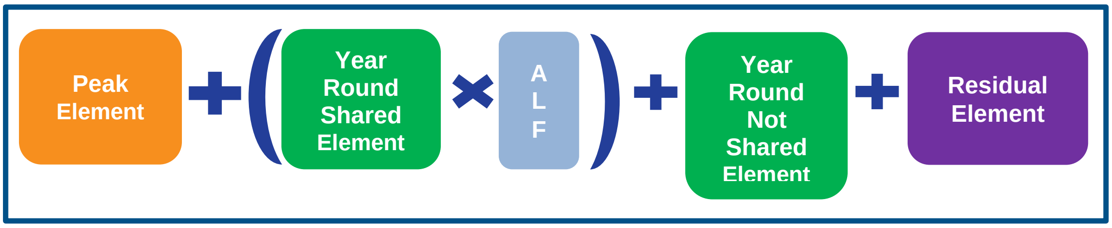
Conventional Carbon Generators

(Biomass, CHP, Coal, Gas, Pump Storage)



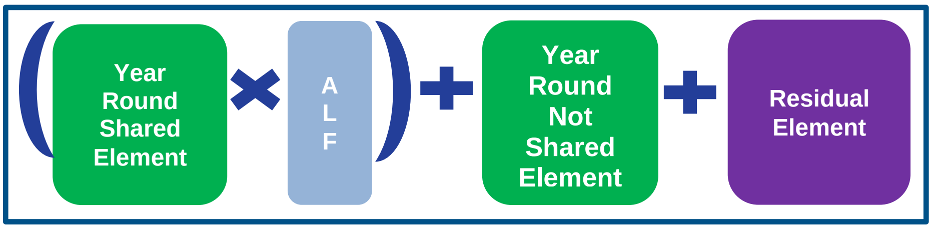
Conventional Low Carbon Generators

(Hydro, Nuclear)



Intermittent Generators

(Wind, Wave, Tidal)



The **Peak** element reflects the cost of using the system at peak times. This is only paid by conventional and peaking generators; intermittent generators do not pay this element.

The **Year Round Shared** and **Year Round Not Shared** elements represent the proportion of transmission network costs shared with other zones, and those specific to each particular zone respectively.

ALFs are calculated annually using data available from the most recent charging year. Any generator with fewer than three years of historical generation data will have any gaps derived from the generic ALF calculated for that generator type.

The **Residual** element is a flat rate for all generation zones which adds a non-locational charge (which may be positive or negative) to the Wider TNUoS tariff, to ensure that the correct amount of aggregate revenue is collected from generators as a whole.

The Annual Load Factors used in the April tariffs are listed in Appendix D.

Local substation tariffs

A generator will have a charge depending on the first onshore substation on the transmission system to which it connects. The cost is based on the voltage of the substation, whether there is a single or double (‘redundancy’) busbar, and the volume of generation TEC connected at that substation.

Local onshore substation tariffs are set at the start of each TO financial regulatory period, and are increased by RPI each year.

Onshore local circuit tariffs

If the first onshore substation which the generator connects to is categorised as a MITS (Main Interconnected Transmission System) in accordance with CUSC 14.15.33, then there is no onshore local circuit charge. Where the first onshore substation is not classified as MITS, there will be a specific circuit charge for generators connected at that location.

Embedded network system charges

If a generator is not connected directly to the transmission network, they need to have a BEGA[†††] if they want to export power onto the transmission system from the distribution network. Generators will incur local DUoS charges to be paid directly to the DNO (Distribution Network Owner) in that region, which do not form part of TNUoS.

Embedded-connected offshore generators will need to pay an estimated DUoS charge to NGET through TNUoS tariffs to cover DNO charges, called ETUoS (Embedded Transportation Use of System).

Click here to find out more about DNO regions.

Offshore local tariffs

Where an offshore generator's connection assets have been transferred to the ownership of an OFTO (Offshore Transmission Owner), there will be additional **Offshore substation** and **Offshore circuit** tariffs specific to that OFTO.[‡‡‡]

Billing

TNUoS is charged annually and costs are calculated on the highest level of TEC held by the generator during the year. (A TNUoS charging year runs from 1 April to 31 March). This means that if a generator holds 100MW in TEC from 1 April to 31 January, then 350MW from 1 February to 31 March, the generator will be charged for 350MW of TEC for that charging year.

The calculation for TNUoS generator liability is as follows:

$$\frac{(\text{TEC} * \text{TNUoS Tariff}) - \text{TNUoS charges already paid}}{\text{Number of months remaining in the charging year}}$$

All tariffs are in £/kW of TEC held by the generator.

TNUoS charges are billed each month, for the month ahead.

Generators with negative TNUoS tariffs

Where a generator's specific tariff is negative, the generator will be paid during the year based on their highest TEC for that year. After the end of the year, there is reconciliation, when the true amount to be paid to the generator is recalculated.

The value used for this reconciliation is the average output of the generator over the three settlement periods of highest output between 1 November and the end of February of the relevant charging year. Each settlement period must be separated by at least ten clear days. Each peak is capped at the amount of TEC held by the generator, so this number cannot be exceeded.

For more details, please see CUSC 14.18.13–17.

[†††] *For more information about connections, please visit our website:* https://www.nationalgrideso.com/uk/electricity/connections/applying-connection
[‡‡‡] *These specific charges include any onshore local circuit and substation charges.*

Demand charging principles

Demand is charged in different ways depending on how the consumption is settled. HH demand customers now have two specific tariffs following the implementation of CMP264/265, which are for gross HH demand and embedded export volumes; NHH customers have another specific tariff.

HH gross demand tariffs

HH gross demand tariffs are charged to customers on their metered output during the triads. Triads are the three half hour settlement periods of highest net system demand between November and February inclusive each year. They can occur on any day at any time, but each peak must be separated by at least ten full days. The final triads are usually confirmed at the end of March once final Elexon data is available, via the NGET website.[§§§] The tariff is charged on a £/kW basis. On triads, HH customers are charged the HH gross demand tariff against their gross demand volumes.

HH metered customers tend to be large industrial users, however as the rollout of smart meters progresses, more domestic demand will become HH metered as we have forecasted in the 2019/20 charging base under P339

Embedded export tariffs

The EET is a new tariff under CMP 264/265 and is paid to customers based on the HH metered export volume during the triads (the same triad periods as explained in detail above). This tariff is payable to exporting HH demand customers and embedded generators (<100MW CVA registered).

This tariff contains the locational demand elements, a phased residual over 3 years (reaching £0/kW in 2020/21) and an Avoided GSP Infrastructure Credit. The final zonal EET is floored at £0/kW for the avoidance of negative tariffs and is applied to the metered triad volumes of embedded exports for each demand zone. The money to be paid out through the EET will be recovered through demand tariffs.

Customers must now submit forecasts for both HH gross demand and embedded export volumes as to what their expected demand volumes will be. Customers are billed against these forecast volumes, and a reconciliation of the amounts paid against their actual metered output is performed once the final metering data is available from Elexon up to 16 months after the financial year in question.

Please note that if a supplier's forecast of embedded export volumes across their whole portfolio exceed the volume of HH gross demand in that zone, then they will be billed zero (instead of being paid on a monthly basis for their embedded export volumes).

Embedded generators (<100MW CVA registered) will receive payment following the final reconciliation process for the amount of embedded export during triads. SVA registered generators are not paid directly by National Grid. Payments for embedded exports from SVA registered embedded generators will be paid to their registered supplier.

[§§§] https://www.nationalgrideso.com/charging/charging-policy-and-guidance

Note: HH demand and embedded export is charged at the GSP, where the transmission network connects to the distribution network, or directly to the customer in question.

NHH demand tariffs

NHH metered customers are charged based on their demand usage between 16:00 – 19:00 on every day of the year. Suppliers must submit forecasts throughout the year as to what their expected demand volumes will be in each demand zone. The tariff is charged on a p/kWh basis. The NHH methodology remains the same under CMP264/265.

Suppliers are billed against these forecast volumes, and a reconciliation of the amounts paid against their actual metered output is performed once the final metering data is available from Elexon up to 16 months after the financial year in question.

Appendix B: In flight CUSC modification proposals to change the charging methodology

This section focuses on specific CUSC modifications and other changes which may impact on the TNUoS tariff calculation methodology in future. All these modifications are subject to whether they are approved by Ofgem and which Work Group Alternative CUSC Modification (WACM) is 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

Table 48 – Summary of in flight CUSC modification proposals

Name / Link	Title	Effect on Proposed Change	Implementation (see note)
CMP280	'Creation of a New Generator TNUoS Demand Tariff which Removes Liability for TNUoS Demand Residual Charges from Generation and Storage Users'	Change the structure of Demand TNUoS charges applied to Storage and, potential other, genreators.	April 2020
CMP286	Improving TNUoS Predictability through Increased Notice of the Target Revenue used in the TNUoS Tariff Setting Process v1	Fixes target revenue to be recovered from the TNUoS setting process earlier, to provide more stability to future tariffs.	April 2020
CMP287	Improving TNUoS Predictability Through Increased Notice of Inputs Used in the TNUoS Tariff Setting Process.	Fixes parameters associated with the TNUoS setting process earlier, to provide more stability to future tariffs.	April 2020
CMP292	Introducing a Section 8 cut-off date for changes to the Charging Methodologies	Introduces a cut off for changes to the charging methodologies to bring more stability and predictability to following year's charges	April 2020
CMP301	Clarification on the treatment of project costs associated with HVDC and subsea circuits	Clarification of the legal text to ensure that it is clear that AC substation costs are not included in the circuit expansion factor calculation for HVDC and subsea circuits. We already calculate in this manner.	April 2019, but has no immediate impact on charges

Name / Link	Title	Effect on Proposed Change	Implementation (see note)
CMP302	Extend the small generator discount until an enduring solution acknowledging the discrepancy between England & Wales and Scotland is implemented.	Maintain a discount for 132kV connected generation, paid for by a charge on HH and NHH Demand	April 2019 – see Appendix D
CMP303	Improving local circuit charge cost-reflectivity	Remove some of the cost of the HVDC and Subsea circuits from the calculation of the local circuit, reducing the local circuit tariffs for these circuits.	April 2019

Appendix C: Demand locational tariffs

The following tables show the components of the Gross HH Demand charge. The locational elements (peak security and year round) and residual.

For the Embedded Export Tariffs, the demand locational elements (peak security and year round) is added to the phased residual (in 2019/20) and the AGIC, and the resulting tariff floored at zero to avoid negative tariffs.

Table 49 – Elements of the demand location tariff for 2019/20

Zone	Zone Name	Gross Half-Hourly Demand Tariff		
		Peak Security Transport (£/kW)	Year Round Transport (£/kW)	Residual (£/kW)
1	Northern Scotland	-2.041245	-28.538572	51.697066
2	Southern Scotland	-2.244736	-20.655199	51.697066
3	Northern	-3.578833	-6.826104	51.697066
4	North West	-1.124121	-2.443992	51.697066
5	Yorkshire	-2.839206	-0.436511	51.697066
6	N Wales & Mersey	-2.259558	0.273890	51.697066
7	East Midlands	-2.158902	2.322930	51.697066
8	Midlands	-1.436307	2.897707	51.697066
9	Eastern	1.359903	0.846998	51.697066
10	South Wales	-6.144324	4.499897	51.697066
11	South East	4.213772	0.737291	51.697066
12	London	5.656190	2.408838	51.697066
13	Southern	1.816925	4.314972	51.697066
14	South Western	-0.955920	5.399888	51.697066

Table 50 – Elements of the demand location tariff for 2020/21

Zone	Zone Name	Gross Half-Hourly Demand Tariff		
		Peak Security Transport (£/kW)	Year Round Transport (£/kW)	Residual (£/kW)
1	Northern Scotland	-1.863239	-28.553329	53.450016
2	Southern Scotland	-1.973228	-20.501985	53.450016
3	Northern	-3.598473	-6.769546	53.450016
4	North West	-0.956406	-2.173270	53.450016
5	Yorkshire	-3.045796	-0.382000	53.450016
6	N Wales & Mersey	-1.115302	-0.088661	53.450016
7	East Midlands	-2.215165	2.338484	53.450016
8	Midlands	-1.272317	2.911822	53.450016
9	Eastern	1.226325	0.673345	53.450016
10	South Wales	-6.605508	4.047231	53.450016
11	South East	3.940235	0.347059	53.450016
12	London	5.628029	2.245913	53.450016
13	Southern	1.683919	3.876763	53.450016
14	South Western	-1.149779	4.798727	53.450016

Table 51 – Elements of the demand location tariff for 2021/22

Zone	Zone Name	Gross Half-Hourly Demand Tariff		
		Peak Security Transport (£/kW)	Year Round Transport (£/kW)	Residual (£/kW)
1	Northern Scotland	-2.763103	-30.244006	58.199628
2	Southern Scotland	-2.972313	-21.730737	58.199628
3	Northern	-4.540938	-7.811971	58.199628
4	North West	-1.801158	-2.588127	58.199628
5	Yorkshire	-3.911515	-0.638483	58.199628
6	N Wales & Mersey	-1.855812	-0.214054	58.199628
7	East Midlands	-2.345593	2.317036	58.199628
8	Midlands	-1.438089	2.968573	58.199628
9	Eastern	1.583920	0.671108	58.199628
10	South Wales	-5.752804	5.084731	58.199628
11	South East	4.410999	0.429297	58.199628
12	London	6.139683	2.311834	58.199628
13	Southern	2.200865	4.244814	58.199628
14	South Western	-0.274518	5.662025	58.199628

Table 52 – Elements of the demand location tariff for 2022/23

Zone	Zone Name	Gross Half-Hourly Demand Tariff		
		Peak Security Transport (£/kW)	Year Round Transport (£/kW)	Residual (£/kW)
1	Northern Scotland	-2.944705	-32.372291	63.210075
2	Southern Scotland	-3.115378	-23.287699	63.210075
3	Northern	-4.018479	-8.538737	63.210075
4	North West	-1.861155	-3.055964	63.210075
5	Yorkshire	-3.808889	-1.087234	63.210075
6	N Wales & Mersey	-2.082382	-0.497682	63.210075
7	East Midlands	-2.406003	2.405030	63.210075
8	Midlands	-1.949976	3.366721	63.210075
9	Eastern	1.708689	0.739725	63.210075
10	South Wales	-5.786453	5.914608	63.210075
11	South East	4.509495	0.632477	63.210075
12	London	6.339142	2.488472	63.210075
13	Southern	2.151204	4.568016	63.210075
14	South Western	-0.326146	6.231126	63.210075

Table 53 – Elements of the demand location tariff for 2023/24

Zone	Zone Name	Gross Half-Hourly Demand Tariff		
		Peak Security Transport (£/kW)	Year Round Transport (£/kW)	Residual (£/kW)
1	Northern Scotland	-3.499261	-33.063065	66.785919
2	Southern Scotland	-3.652873	-23.891034	66.785919
3	Northern	-4.636210	-8.106868	66.785919
4	North West	-2.535061	-2.557267	66.785919
5	Yorkshire	-4.301152	-0.401741	66.785919
6	N Wales & Mersey	-2.869393	-0.156160	66.785919
7	East Midlands	-2.657455	2.887099	66.785919
8	Midlands	-1.848632	3.310794	66.785919
9	Eastern	1.242934	1.109925	66.785919
10	South Wales	-3.510221	5.525364	66.785919
11	South East	4.417620	0.724781	66.785919
12	London	6.382092	2.709582	66.785919
13	Southern	2.674441	4.108860	66.785919
14	South Western	1.895973	2.054566	66.785919

Appendix D: Small generator discount

The CUSC modification CMP302 has been submitted to propose the extension of the small generator discount.

The small generator discount is defined in National Grid's Licence Condition C13. At present, this licence condition expires from 31 March 2019. Therefore, no small generator discount tariffs have been applied to the tariffs contained in this report.

CUSC Modification CMP302 raised in August 2019, seeks to replicate the small generation discount in to the charging methodology to apply from 2019/20 onwards. The following table shows the indicative charges that would arise from applying the small generation discount from 2019/20 onwards.

The value of the small generator discount is one-quarter of the sum of the generation and demand residuals. This may change as part of any approval of CMP302. The recovery is done across demand tariffs applying a standardised value for all demand zones in £/kW for HH tariffs and p/kWh for NHH tariffs.

Table 54 – Small generator discount from 2019/20 to 2023/24 under the Base Case

		2019/20	2020/21	2021/22	2022/23	2023/24
Generation residual	£/kW	-3.613060	-4.373578	-5.596682	-8.097064	-10.584025
Demand residual	£/kW	51.697066	53.450016	58.199628	63.210075	66.785919
Value of small generator discount	**£/kW**	**12.021001**	**12.269110**	**13.150736**	**13.778253**	**14.050474**
Volume of small generators eligible	MW	2755.46	3131.96	3432.96	4257.56	4706.41
Total cost of scheme	**£m**	**33.1**	**38.4**	**45.1**	**58.7**	**66.1**
System gross Triad demand	GW	51.3	50.8	50.4	50.1	50.1
System gross HH demand	GW	18.0	19.2	19.0	18.9	18.9
NHH demand	TWh	25.5	23.7	23.4	23.1	23.0
HH recovery charge	**£/kW**	**0.645358**	**0.757168**	**0.895946**	**1.171136**	**1.319024**
NHH recovery charge	**p/kWh**	**0.084282**	**0.100672**	**0.119970**	**0.157749**	**0.179313**

Appendix E: Annual Load Factors

Table 55 - Specific Annual Load Factors

ALFs are used to scale the shared year round element of tariffs for each generator, and the year round not shared for Conventional Carbon generators, so that each has a tariff appropriate to its historical load factor.

ALFs have been calculated using Transmission Entry Capacity, metered output and Final Physical Notifications from charging years 2012/13 to 2016/17. Generators which commissioned after 1 April 2014 will have fewer than three complete years of data so the Generic ALF listed below are added to create three complete years from which the ALF can be calculated. Generators expected to commission during 2019/20 also use the Generic ALF.

The ALFs will be recalculated in time for the November Draft tariffs using data from 2013/14 to 2017/18.

Power Station	Technology	Yearly Load Factor Source					Yearly Load Factor Value					Specific ALF
		2012/13	2013/14	2014/15	2015/16	2016/17	2012/13	2013/14	2014/15	2015/16	2016/17	
ABERTHAW	Coal	Actual	Actual	Actual	Actual	Actual	74.0137%	65.5413%	59.0043%	54.2611%	50.8335%	59.6022%
ACHRUACH	Onshore_Wind	Generic	Generic	Generic	Partial	Actual	0.0000%	0.0000%	0.0000%	33.6464%	36.7140%	34.8994%
AN SUIDHE WIND FARM	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	31.6380%	41.5843%	36.9422%	35.4900%	34.0938%	35.5087%
ARECLEOCH	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	32.4826%	33.8296%	29.7298%	36.8612%	19.7246%	32.0140%
BAGLAN BAY	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	27.5756%	16.4106%	37.9194%	29.1228%	55.2030%	31.5393%
BARKING	CCGT_CHP	Actual	Actual	Partial	Generic	Generic	2.3383%	1.8802%	14.1930%	0.0000%	0.0000%	6.1371%
BARROW OFFSHORE WIND LTD	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	42.8840%	54.1080%	47.0231%	47.1791%	44.2584%	46.1536%
BARRY	CCGT_CHP	Actual	Actual	Actual	Actual	Partial	0.6999%	1.2989%	0.4003%	2.1727%	25.4300%	1.3905%
BEAULY CASCADE	Hydro	Actual	Actual	Actual	Actual	Actual	25.4532%	35.6683%	37.1167%	35.0094%	30.4872%	33.7216%
BEINNEUN	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	30.9622%	33.2125%
BHLARAIDH	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	33.4338%	34.0364%
BLACK LAW	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	22.0683%	31.9648%	26.7881%	26.9035%	23.4623%	25.7180%
BLACKLAW EXTENSION	Onshore_Wind	Generic	Generic	Generic	Partial	Actual	0.0000%	0.0000%	0.0000%	33.4635%	13.1095%	26.9702%
BRIMSDOWN	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	21.8759%	18.7645%	11.1229%	16.4463%	45.0615%	19.0289%
BURBO BANK	Offshore_Wind	Generic	Generic	Generic	Actual	Actual	0.0000%	0.0000%	0.0000%	16.7781%	25.0233%	30.4355%
CARRAIG GHEAL	Onshore_Wind	Partial	Actual	Actual	Actual	Actual	29.8118%	45.2760%	48.9277%	45.6254%	40.4211%	46.6097%
CARRINGTON	CCGT_CHP	Generic	Generic	Generic	Partial	Actual	0.0000%	0.0000%	0.0000%	38.7318%	58.0115%	46.6520%
CLUNIE SCHEME	Hydro	Actual	Actual	Actual	Actual	Actual	33.4563%	45.3256%	43.2488%	47.9711%	32.8297%	40.6769%
CLYDE (NORTH)	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	28.5345%	42.6598%	36.8882%	41.4120%	26.8858%	35.6116%
CLYDE (SOUTH)	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	31.6084%	39.8941%	29.4115%	39.9615%	34.8751%	35.4592%
CONNAHS QUAY	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	18.5104%	12.8233%	18.3739%	28.2713%	37.4588%	21.7185%
CONON CASCADE	Hydro	Actual	Actual	Actual	Actual	Actual	47.5286%	54.2820%	55.5287%	58.9860%	48.6782%	52.8296%
CORRIEGARTH	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	22.5644%	30.4133%
CORRIEMOILLIE	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	32.2315%	33.6356%
CORYTON	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	15.6869%	9.7852%	17.5123%	26.4000%	63.0383%	19.8664%
COTTAM	Coal	Actual	Actual	Actual	Actual	Actual	65.0700%	67.3951%	51.4426%	34.4157%	14.9387%	50.3095%
COTTAM DEVELOPMENT CENTRE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	13.7361%	16.0249%	31.3132%	28.2382%	67.2482%	25.1921%
COUR	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	38.3246%	35.6667%
COWES	Gas_Oil	Actual	Actual	Actual	Actual	Actual	0.1743%	0.0956%	0.3135%	0.4912%	0.5319%	0.3264%
CRUACHAN	Pumped_Storage	Actual	Actual	Actual	Actual	Actual	8.4281%	9.6969%	9.0516%	8.8673%	7.1914%	8.7823%
CRYSTAL RIG II	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	40.6845%	50.2549%	47.5958%	48.3836%	40.2679%	45.5546%
CRYSTAL RIG III	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	39.9503%	36.2086%
DAMHEAD CREEK	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	45.0617%	77.1783%	67.4641%	64.8983%	68.1119%	66.8248%
DEESIDE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	19.7551%	17.3035%	13.9018%	17.4579%	27.1090%	18.1722%
DERSALLOCH	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	33.7728%	34.1494%
DIDCOT B	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	49.0134%	18.6624%	25.5345%	41.1389%	50.1358%	38.5623%

Power Station	Technology	Yearly Load Factor Source					Yearly Load Factor Value					Specific ALF
		2012/13	2013/14	2014/15	2015/16	2016/17	2012/13	2013/14	2014/15	2015/16	2016/17	
DIDCOT GTS	Gas_Oil	Actual	Actual	Actual	Actual	Actual	0.0720%	0.0902%	0.2843%	0.4861%	0.0452%	0.1488%
DINORWIG	Pumped_Storage	Actual	Actual	Actual	Actual	Actual	15.0990%	15.0898%	15.0650%	14.6353%	15.9596%	15.0846%
DRAX	Coal	Actual	Actual	Actual	Actual	Actual	82.4774%	80.5151%	82.2149%	76.2030%	62.2705%	79.6443%
DUDGEON	Offshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	42.4791%	47.1631%
DUNGENESS B	Nuclear	Actual	Actual	Actual	Actual	Actual	59.8295%	61.0068%	54.6917%	70.7617%	79.3403%	63.8660%
DUNLAW EXTENSION	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	32.3771%	34.8226%	30.0797%	29.1203%	26.5549%	30.5257%
DUNMAGLASS	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	38.9713%	35.8822%
EDINBANE WIND	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	29.3933%	39.4785%	31.2458%	35.5937%	32.5009%	33.1135%
EGGBOROUGH	Coal	Actual	Actual	Actual	Actual	Partial	72.6884%	72.1843%	45.7421%	27.0157%	39.7693%	63.5383%
ERROCHTY	Hydro	Actual	Actual	Actual	Actual	Actual	14.5869%	28.2628%	25.3585%	28.1507%	16.1775%	23.2289%
EWE HILL	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	33.3314%	34.0023%
FALLAGO	Onshore_Wind	Partial	Actual	Actual	Actual	Actual	32.9869%	54.8683%	44.7267%	55.7992%	43.2176%	51.7981%
FARR WINDFARM TOMATIN	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	34.0149%	44.7212%	38.5712%	40.9963%	34.1766%	37.9147%
FASNAKYLE G1 & G3	Hydro	Actual	Actual	Actual	Actual	Actual	22.1176%	35.3695%	57.4834%	53.1573%	30.9768%	39.8345%
FAWLEY CHP	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	61.1362%	63.3619%	72.8484%	57.6978%	63.2006%	62.5662%
FFESTINIOGG	Pumped_Storage	Actual	Actual	Actual	Actual	Actual	2.9286%	5.4631%	4.3251%	3.4113%	5.6749%	4.3999%
FIDDLERS FERRY	Coal	Actual	Actual	Actual	Actual	Actual	61.6386%	49.0374%	45.2435%	27.4591%	8.2478%	40.5800%
FINLARIG	Hydro	Actual	Actual	Actual	Actual	Actual	40.2952%	59.9142%	59.4092%	65.1349%	49.6402%	56.3212%
FOYERS	Pumped_Storage	Actual	Actual	Actual	Actual	Actual	13.4800%	14.7097%	12.3048%	15.4323%	11.3046%	13.4982%
FREASDAIL	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	32.5600%	33.7451%
GALAWHISTLE	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	34.9764%	34.5506%
GARRY CASCADE	Hydro	Actual	Actual	Actual	Actual	Actual	48.5993%	55.9308%	64.3828%	60.2772%	61.0498%	59.0859%
GLANDFORD BRIGG	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	0.3336%	1.5673%	0.5401%	1.8191%	2.7682%	1.3088%
GLEN APP	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	25.1373%	31.2709%
GLENDOE	Hydro	Actual	Actual	Actual	Actual	Actual	17.3350%	36.3802%	32.3494%	34.8532%	23.8605%	30.3544%
GLENMORISTON	Hydro	Actual	Actual	Actual	Actual	Actual	36.3045%	44.4594%	48.7487%	50.6921%	34.6709%	43.1709%
GORDONBUSH	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	37.8930%	46.5594%	47.7981%	47.7161%	50.4126%	47.3579%
GRAIN	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	25.4580%	41.3833%	44.0031%	39.7895%	53.8227%	41.7253%
GRANGEMOUTH	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	52.8594%	55.9047%	62.6168%	59.8274%	51.4558%	56.1972%
GREAT YARMOUTH	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	19.0270%	20.7409%	18.6633%	59.8957%	63.5120%	33.2212%
GREATER GABBARD OFFSHORE WIND FARM	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	40.1778%	48.3038%	42.1327%	50.2468%	43.1132%	44.5166%
GRIFFIN WIND	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	17.9885%	31.9566%	31.3152%	31.0284%	25.8228%	29.3888%
GUNFLEET SANDS I	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	50.1496%	56.6472%	47.0132%	50.4650%	45.7940%	49.2093%
GUNFLEET SANDS II	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	45.0132%	52.2361%	44.7211%	49.0521%	43.9893%	46.2622%
GWYNT Y MOR	Offshore_Wind	Partial	Actual	Actual	Actual	Actual	18.8535%	8.0036%	61.6185%	63.1276%	44.8323%	56.5262%

Power Station	Technology	Yearly Load Factor Source					Yearly Load Factor Value					Specific ALF
		2012/13	2013/14	2014/15	2015/16	2016/17	2012/13	2013/14	2014/15	2015/16	2016/17	
HADYARD HILL	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	27.6927%	31.9488%	27.7635%	36.6527%	31.4364%	30.3829%
HARESTANES	Onshore_Wind	Generic	Partial	Actual	Actual	Actual	0.0000%	22.2448%	28.6355%	27.8093%	22.5464%	26.3304%
HARTLEPOOL	Nuclear	Actual	Actual	Actual	Actual	Actual	80.2632%	73.7557%	56.2803%	53.8666%	78.0390%	69.3583%
HEYSHAM	Nuclear	Actual	Actual	Actual	Actual	Actual	83.3828%	73.3628%	68.8252%	72.7344%	79.6169%	75.2380%
HINKLEY POINT B	Nuclear	Actual	Actual	Actual	Actual	Actual	61.7582%	68.8664%	70.1411%	67.6412%	71.2265%	68.8829%
HUMBER GATEWAY OFFSHORE WIND FARM	Offshore_Wind	Generic	Generic	Generic	Actual	Actual	0.0000%	0.0000%	0.0000%	62.9631%	59.7195%	57.3959%
HUNTERSTON	Nuclear	Actual	Actual	Actual	Actual	Actual	73.5984%	84.7953%	79.1368%	82.1786%	83.2939%	81.5365%
IMMINGHAM	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	50.1793%	37.8219%	56.8316%	69.4686%	71.9550%	58.8265%
INDIAN QUEENS	Gas_Oil	Actual	Actual	Actual	Actual	Actual	0.3423%	0.2321%	0.0876%	0.0723%	0.0847%	0.1348%
KEADBY	CCGT_CHP	Actual	Actual	Generic	Partial	Actual	4.6125%	0.0001%	0.0000%	35.1858%	28.6076%	11.0734%
KILBRAUR	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	45.2306%	51.3777%	54.3550%	50.3807%	46.5342%	49.4309%
KILGALLIOCH	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	25.2739%	31.3164%
KILLIN CASCADE	Hydro	Actual	Actual	Actual	Actual	Actual	32.3429%	45.5356%	44.8205%	53.2348%	27.4962%	40.8997%
KILLINGHOLME (NP)	CCGT_CHP	Actual	Actual	Actual	Generic	Generic	10.6552%	7.4217%	11.6191%	0.0000%	0.0000%	9.8987%
KILLINGHOLME (POWERGEN)	Gas_Oil	Generic	Generic	Generic	Generic	Generic	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
KINGS LYNN A	CCGT_CHP	Actual	Actual	Actual	Generic	Generic	0.0003%	0.0000%	0.0000%	0.0000%	0.0000%	0.0001%
LANGAGE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	41.9115%	40.8749%	34.8629%	16.5310%	44.5413%	39.2164%
LINCS WIND FARM	Offshore_Wind	Partial	Actual	Actual	Actual	Actual	20.3244%	46.5987%	43.8178%	49.1306%	44.5192%	46.7495%
LITTLE BARFORD	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	16.3807%	33.6286%	49.6644%	39.9829%	64.8597%	41.0920%
LOCHLUICHART	Onshore_Wind	Generic	Partial	Actual	Actual	Actual	0.0000%	24.9397%	20.2103%	29.2663%	31.6897%	27.0554%
LONDON ARRAY	Offshore_Wind	Partial	Actual	Actual	Actual	Actual	38.9520%	51.2703%	64.0880%	66.8682%	53.6245%	61.5269%
LYNEMOUTH	Coal	Generic	Generic	Generic	Partial	Generic	0.0000%	0.0000%	0.0000%	68.0196%	0.0000%	58.6875%
MARCHWOOD	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	43.3537%	48.6845%	66.4021%	55.0879%	75.4248%	56.7248%
MARK HILL	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	30.1675%	30.2863%	26.7942%	34.0227%	21.9653%	29.0827%
MEDWAY	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	1.0718%	14.5545%	28.0962%	34.1799%	35.1505%	25.6102%
MILLENNIUM	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	42.1318%	52.6618%	53.2636%	48.4038%	44.9764%	48.6806%
NANT	Hydro	Actual	Actual	Actual	Actual	Actual	20.8965%	35.5883%	36.4040%	37.3788%	30.6350%	34.2091%
ORMONDE	Offshore_Wind	Partial	Actual	Actual	Actual	Actual	48.8406%	49.6561%	42.8711%	47.1986%	41.2188%	46.5753%
PEMBROKE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	61.5434%	60.3928%	67.5346%	64.5596%	77.6478%	64.5459%
PEN Y CYMOEDD	Onshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	26.9446%	31.8733%
PETERBOROUGH	CCGT_CHP	Actual	Actual	Actual	Partial	Actual	0.9506%	1.8311%	1.0929%	4.1032%	1.7914%	1.5718%
PETERHEAD	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	31.3766%	41.8811%	0.4858%	23.3813%	42.2292%	32.2130%
RACE BANK	Offshore_Wind	Generic	Generic	Generic	Generic	Partial	0.0000%	0.0000%	0.0000%	0.0000%	45.3062%	48.1055%
RATCLIFFE-ON-SOAR	Coal	Actual	Actual	Actual	Actual	Actual	66.7461%	71.7403%	56.1767%	19.6814%	15.4657%	47.5347%
ROBIN RIGG EAST	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	37.4157%	46.7562%	55.3209%	51.9700%	50.5096%	49.7453%

Power Station	Technology	Yearly Load Factor Source					Yearly Load Factor Value					Specific ALF
		2012/13	2013/14	2014/15	2015/16	2016/17	2012/13	2013/14	2014/15	2015/16	2016/17	
ROBIN RIGG WEST	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	38.2254%	48.0629%	53.4150%	56.0881%	51.5383%	51.0054%
ROCKSAVAGE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	41.4820%	2.6155%	4.4252%	19.8061%	58.6806%	21.9044%
RYE HOUSE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	10.7188%	7.4695%	5.3701%	7.7906%	15.6538%	8.6596%
SALTEND	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	81.5834%	69.0062%	67.9518%	55.6228%	77.4019%	71.4533%
SEABANK	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	15.2311%	18.2781%	25.6956%	27.2136%	41.6815%	23.7291%
SELLAFIELD	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	14.0549%	25.0221%	18.9719%	28.6790%	19.8588%	21.2842%
SEVERN POWER	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	27.7976%	32.4163%	24.6354%	18.3226%	64.4246%	28.2831%
SHERINGHAM SHOAL	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	36.6431%	49.3517%	46.2286%	53.6184%	46.9715%	47.5173%
SHOREHAM	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	0.0000%	20.7501%	10.2239%	48.9514%	68.9863%	26.6418%
SIZEWELL B	Nuclear	Actual	Actual	Actual	Actual	Actual	96.7260%	82.5051%	84.7924%	98.7826%	81.6359%	88.0078%
SLOY G2 & G3	Hydro	Actual	Actual	Actual	Actual	Actual	9.1252%	14.3471%	15.5941%	13.9439%	8.1782%	12.4721%
SOUTH HUMBER BANK	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	27.9763%	24.3373%	34.4673%	48.6753%	55.3419%	37.0396%
SPALDING	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	34.6976%	33.4800%	39.3092%	47.9407%	60.9748%	40.6492%
STAYTHORPE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	54.4117%	37.6216%	56.6148%	69.4422%	65.7791%	58.9352%
STRATHY NORTH & SOUTH	Onshore_Wind	Generic	Generic	Generic	Partial	Actual	0.0000%	0.0000%	0.0000%	49.6340%	36.1987%	40.0568%
SUTTON BRIDGE	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	20.1652%	9.4124%	17.2025%	13.1999%	38.0184%	16.8559%
TAYLORS LANE	Gas_Oil	Actual	Actual	Actual	Actual	Actual	0.2037%	0.0483%	0.0640%	0.1708%	0.8047%	0.1462%
THANET OFFSHORE WIND FARM	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	41.1093%	39.7489%	35.5935%	41.3434%	33.7132%	38.8172%
TODDLEBURN	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	32.7175%	39.5374%	33.7211%	35.0823%	31.3435%	33.8403%
TORNESS	Nuclear	Actual	Actual	Actual	Actual	Actual	84.8669%	86.4669%	91.4945%	85.7725%	97.9942%	87.9113%
USKMOUTH	Coal	Actual	Actual	Partial	Actual	Actual	45.1938%	38.9899%	46.9428%	25.5184%	24.3304%	36.5674%
WALNEY I	Offshore_Wind	Actual	Actual	Actual	Actual	Actual	44.2799%	57.7046%	52.0555%	50.7535%	47.4617%	50.0902%
WALNEY II	Offshore_Wind	Partial	Actual	Actual	Actual	Actual	54.7907%	61.9219%	58.2355%	35.7988%	54.9727%	58.3767%
WEST BURTON	Coal	Actual	Actual	Actual	Actual	Actual	70.5868%	68.9176%	61.5364%	32.7325%	10.1071%	54.3955%
WEST BURTON B	CCGT_CHP	Partial	Actual	Actual	Actual	Actual	21.3299%	30.3021%	46.8421%	59.3477%	54.2878%	53.4925%
WEST OF DUDDON SANDS OFFSHORE WIND FARM	Offshore_Wind	Generic	Partial	Actual	Actual	Actual	0.0000%	40.4447%	40.0506%	48.7540%	48.7691%	45.8579%
WESTERMOST ROUGH	Offshore_Wind	Generic	Generic	Partial	Actual	Actual	0.0000%	0.0000%	26.2900%	54.8014%	58.1061%	46.3992%
WHITELEE	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	28.2265%	35.1074%	29.8105%	31.8773%	27.2893%	29.9714%
WHITELEE EXTENSION	Onshore_Wind	Actual	Actual	Actual	Actual	Actual	12.4146%	27.0102%	27.7787%	26.7655%	23.5253%	25.7670%
WILTON	CCGT_CHP	Actual	Actual	Actual	Actual	Actual	3.4258%	4.4941%	21.5867%	16.1379%	14.4130%	11.6817%

Table 56 - Generic Annual Load Factors

Technology	Generic ALF
Gas_Oil[#]	0.1890%
Pumped_Storage	10.4412%
Tidal*	18.9000%
Biomass	26.8847%
Wave*	31.0000%
Onshore_Wind	34.3377%
CCGT_CHP	43.2127%
Hydro	41.3656%
Offshore_Wind	49.5051%
Coal	54.0215%
Nuclear	76.4001%

[#] Includes OCGTs (Open Cycle Gas Turbine generating plant).

*Note: ALF figures for Wave and Tidal technology are generic figures provided by BEIS due to no metered data being available.
These Generic ALFs are calculated in accordance with CUSC 14.15.109. The Biomass ALF for 2016/17 has been copied from the 2015/16 year due to there not being any single majority biomass-fired stations operating over that period.

Appendix F: Contracted TEC

This table is as taken from the TEC register from June 2018.

Please note that these are NOT the values that are used for generation volumes in the Best View models that we have used to derive the tariffs in this report.

Table 57 – Contracted TEC

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Aquind Interconnector	Interconnectors	LOVE40	26	0	0	2000	2000	2000
Auchencrosh (interconnector CCT)	Interconnectors	AUCH20	10	80	80	80	80	80
Belgium Interconnector (Nemo)	Interconnectors	RICH40	24	1000	1000	1000	1000	1000
Britned	Interconnectors	GRAI40	24	1200	1200	1200	1200	1200
East West Interconnector	Interconnectors	CONQ40	16	505	505	505	505	505
ElecLink	Interconnectors	SELL40	24	1000	1000	1000	1000	1000
FAB Link Interconnector	Interconnectors	EXET40	26	0	1400	1400	1400	1400
Greenage Power Interconnector	Interconnectors	GRAI40	24	0	0	0	1400	1400
Greenlink	Interconnectors	PEMB40	20	0	0	0	500	500
Gridlink Interconnector	Interconnectors	KINO40	24	0	0	0	1500	1500
IFA Interconnector	Interconnectors	SELL40	24	2000	2000	2000	2000	2000
IFA2 Interconnector	Interconnectors	FAWL40	26	1100	1100	1100	1100	1100
Norway Interconnector	Interconnectors	PEHE40	2	0	0	1400	1400	1400
NS Link	Interconnectors	BLYT4A	13	0	1400	1400	1400	1400
Viking Link Denmark Interconnector	Interconnectors	BICF4A	17	0	0	0	1500	1500
Aberarder Wind Farm	Wind Onshore	ABED10	1	0	43	43	43	43
Aberdeen Offshore Wind Farm	Wind Offshore	ABBA10	10	99	99	99	99	99
Abergelli Power Limited	OCGT	SWAN20_SPM	21	0	0	0	299	299
Aberthaw	Coal	ABTH20	21	1610	1610	1610	1610	1610
A'Chruach Wind Farm	Wind Onshore	ACHR1R	7	43	43	43	43	43
Afton	Wind Onshore	BLAC10	10	50	50	50	50	50
Aigas (part of the Beauly Cascade)	Hydro	AIGA1Q	1	20	20	20	20	20
Aikengall II Windfarm	Wind Onshore	WDOD10	11	140	140	140	140	140
An Suidhe Wind Farm, Argyll (SRO)	Wind Onshore	ANSU10	7	19.3	19.3	19.3	19.3	19.3
Arecleoch	Wind Onshore	AREC10	10	114	114	114	114	114

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Aultmore Wind Farm	Wind Onshore	AULW10	1	0	29.5	29.5	29.5	29.5
Bad a Cheo Wind Farm	Wind Onshore	MYBS11	1	29.9	29.9	29.9	29.9	29.9
Baglan Bay	CCGT	BAGB20	21	552	552	552	552	552
Barrow Offshore Wind Farm	Wind Offshore	HEYS40	14	90	90	90	90	90
Barry Power Station	CCGT	ABTH20	21	235	235	235	235	235
Beatrice Wind Farm	Wind Offshore	BLHI40	1	588	588	588	588	588
Beaw Field Wind Farm	Wind Onshore	BEWF10	1	0	0	0	0	72
Beinneun Wind Farm	Wind Onshore	BEIN10	3	109	109	109	109	109
Benbrack Wind Farm	Wind Onshore	KEON10	1	0	0	0	0	72
Bhlaraidh Wind Farm	Wind Onshore	BHLA10	3	108	108	108	108	108
Blackcraig Wind Farm	Wind Onshore	BLCW10	10	52.9	52.9	52.9	52.9	52.9
Blacklaw	Wind Onshore	BLKL10	11	118	118	118	118	118
Blacklaw Extension	Wind Onshore	BLKX10	11	60	60	60	60	60
BP Grangemouth	CHP	GRMO20	9	120	120	120	120	120
Burbo Bank Extension Offshore Wind Farm	Wind Offshore	BODE40	16	254	254	254	254	254
C.Gen Killingholme North Power Station	CCGT	KILL40	15	0	0	540	540	540
Cantick Head	Tidal	BASK10	1	0	0	30	95	160
Carnedd Wen Wind Farm	Wind Onshore	TRAW40	18	150	150	150	150	150
Carraig Gheal Wind Farm	Wind Onshore	FERO10	7	46	46	46	46	46
Carrington Power Station	CCGT	CARR40	16	910	910	910	910	910
CDCL	CCGT	COTT40	16	395	395	395	395	395
Chirmorie Wind Farm	Wind Onshore	MAHI10	10	0	0	0	80	80
Clunie (part of the Clunie Cascade)	Hydro	CLUN1S	5	61.2	61.2	61.2	61.2	61.2
Clyde North	Wind Onshore	CLYN2Q	11	374.5	374.5	374.5	374.5	374.5
Clyde South	Wind Onshore	CLYS2R	11	128.8	128.8	128.8	128.8	128.8
Codling Park Wind Farm	Wind Offshore	PENT40	19	0	0	1000	1000	1000
Connahs Quay	CCGT	CONQ40	16	1380	1380	1380	1380	1380
Corby	CCGT	GREN40_EME	18	401	401	401	401	401
Corriegarth	Wind Onshore	COGA10	1	69	69	69	69	69
Corriemoillie Wind Farm	Wind Onshore	CORI10	1	47.5	47.5	47.5	47.5	47.5
Coryton	CCGT	COSO40	24	800	800	704	704	704
Costa Head Wind Farm	Wind Onshore	COST10	1	0	0	0	20.4	20.4
Cottam	Coal	BASK20	16	2000	2000	2000	2000	2000
Cour Wind Farm	Wind Onshore	CRSS10	7	20.5	20.5	20.5	20.5	20.5

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Cowes	CCGT	FAWL40	26	140	140	140	140	140
Creag Riabhach Wind Farm	Wind Onshore	CASS1Q	1	0	0	72.6	72.6	72.6
Crookedstane Windfarm	Wind Onshore	CLYS2R	11	26.8	26.8	26.8	26.8	26.8
Crossdykes	Wind Onshore	EWEH1Q	12	46	46	46	46	46
Cruachan	Pump Storage	CRUA20	8	440	440	440	440	440
Crystal Rig 2 Wind Farm	Wind Onshore	CRYR40	11	138	138	138	138	138
Crystal Rig 3 Wind Farm	Wind Onshore	CRYR40	11	13.8	62	62	62	62
Culligran (part of the Beauly Cascade)	Hydro	CULL1Q	1	19.1	19.1	19.1	19.1	19.1
Cumberhead	Wind Onshore	GAWH10	11	0	50	50	50	50
Dalquhandy Wind Farm	Wind Onshore	COAL10	11	0	0	45	45	45
Damhead Creek	CCGT	KINO40	24	805	805	805	805	805
Damhead Creek II	CCGT	KINO40	24	0	1800	1800	1800	1800
Deanie (part of the Beauly Cascade)	Hydro	DEAN1Q	1	38	38	38	38	38
Deeside	CCGT	CONQ40	16	1	1	1	1	1
Dersalloch Wind Farm	Wind Onshore	DERS1Q	10	69	69	69	69	69
Didcot B	CCGT	DIDC40	25	1450	1450	1450	1450	1450
Dinorwig	Pump Storage	DINO40	19	1644	1644	1644	1644	1644
Dogger Bank Platform 1	Wind Offshore	CREB40	15	0	0	0	1200	1200
Dogger Bank Platform 2	Wind Offshore	CREB40	15	0	0	0	0	500
Dogger Bank Platform 3	Wind Offshore	LACK40	15	0	0	0	0	500
Dogger Bank Platform 4	Wind Offshore	CREB40	15	0	0	0	1200	1200
Dorenell Windfarm	Wind Onshore	DORE11	1	220	220	220	220	220
Douglas West	Wind Onshore	COAL10	11	0	0	45	45	45
Drax (Biomass)	Biomass	DRAX40	15	1905	1905	1905	1905	1905
Drax (Coal)	Coal	DRAX40	15	2001	2001	2001	2001	2001
Druim Leathann	Wind Onshore	DRUL10	1	0	0	46.2	46.2	46.2
Dudgeon Offshore Wind Farm	Wind Offshore	NECT40	17	400	400	400	400	400
Dungeness B	Nuclear	DUNG40	24	1091	1091	1091	1091	1091
Dunlaw Extension	Wind Onshore	DUNE10	11	29.75	29.75	29.75	29.75	29.75
Dunmaglass Wind Farm	Wind Onshore	DUNM10	1	94	94	94	94	94
East Anglia 3	Wind Offshore	BRFO40	18	0	0	0	0	1200
East Anglia One	Wind Offshore	BRFO40	18	680	680	680	680	680
Edinbane Wind, Skye	Wind Onshore	EDIN10	4	41.4	41.4	41.4	41.4	41.4
Eggborough	Coal	EGGB40	15	1870	1870	1870	1870	1870

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Elchies Wind Farm	Wind Onshore	ELCH10	1	0	0	0	0	99
Enfield	CCGT	BRIM2A_LPN	24	408	408	408	408	408
Enoch Hill	Wind Onshore	ENHI10	10	0	0	0	0	69
Errochty	Hydro	ERRO10	5	75	75	75	75	75
Ewe Hill	Wind Onshore	EWEH1Q	12	39	39	39	39	39
Fallago Rig 2	Wind Onshore	FALL40	11	0	0	41.4	41.4	41.4
Fallago Rig Wind Farm	Wind Onshore	FALL40	11	144	144	144	144	144
Farr Wind Farm, Tomatin	Wind Onshore	FAAR1Q	1	92	92	92	92	92
Fasnakyle G1 & G2	Hydro	FASN20	3	46	46	46	46	46
Fawley CHP	CHP	FAWL40	26	158	158	158	158	158
Ferrybridge D	CCGT	FERR20	15	0	0	0	0	1820
Ffestiniog	Pump Storage	FFES20	16	360	360	360	360	360
Fiddlers Ferry	Coal	FIDF20_ENW	15	1455	1987	1987	1987	1987
Finlarig	Hydro	FINL1Q	6	16.5	16.5	16.5	16.5	16.5
Firth of Forth Offshore Wind Farm 1A	Wind Offshore	TEAL20	9	0	0	0	545	545
Firth of Forth Offshore Wind Farm 1B	Wind Offshore	TEAL20	9	0	0	0	530	530
Firth of Forth Offshore Wind Farm 2A East & 2A West	Wind Offshore	BRNX40	11	0	0	0	0	700
Foyers	Pump Storage	FOYE20	1	300	300	300	300	300
Freasdail	Wind Onshore	CRSS10	7	22.2	22.2	22.2	22.2	22.2
Galawhistle Wind Farm	Wind Onshore	GAWH10	11	55.2	55.2	55.2	55.2	55.2
Galloper Wind Farm	Wind Offshore	LEIS10	18	348	348	348	348	348
Gateway Energy Centre Power Station	CCGT	COSO40	24	0	0	1096	1096	1096
Gilston Hill Wind Farm	Wind Onshore	DUNE10	11	0	21	21	21	21
Glen App Windfarm	Wind Onshore	AREC10	10	32.2	32.2	32.2	32.2	32.2
Glen Kyllachy Wind Farm	Wind Onshore	GLKY10	1	0	48.5	48.5	48.5	48.5
Glen Ullinish Wind Farm	Wind Onshore	GLNU10	4	0	0	42	42	42
Glendoe	Hydro	GLDO1G	3	99.9	99.9	99.9	99.9	99.9
Glenmoriston (part of the Moriston Cascade)	Hydro	GLEN1Q	3	37	37	37	37	37
Glenmuckloch Pumped Storage	Pump Storage	GLMU10	10	0	0	0	0	210
Glenmuckloch Wind Farm	Wind Onshore	GLGL1Q	10	0	0	0	33.6	33.6
Glenouther Wind Farm	Wind Onshore	NEIL10	11	0	24	24	24	24
Glenshero	Wind Onshore	MELG10	3	0	0	0	168	168
Golticlay Wind Farm	Wind Onshore	SPIT10	1	0	0	0	64.6	64.6

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Gordonbush Wind	Wind Onshore	GORW20	1	70	70	70	108	108
Grain	CCGT	GRAI40	24	1517	1517	1517	1517	1517
Great Yarmouth	CCGT	NORM40	18	405	405	405	405	405
Greater Gabbard Offshore Wind Farm	Wind Offshore	LEIS10	18	500	500	500	500	500
Greenwire - Alverdiscott	Wind Onshore	ALVE4A	27	0	0	0	0	1500
Griffin Wind Farm	Wind Onshore	GRIF1S	5	188.6	188.6	188.6	188.6	188.6
Gunfleet Sands II Offshore Wind Farm	Wind Offshore	BRFO40	18	64	64	64	64	64
Gunfleet Sands Offshore Wind Farm	Wind Offshore	BRFO40	18	99.9	99.9	99.9	99.9	99.9
Gwynt Y Mor Offshore Wind Farm	Wind Offshore	BODE40	16	574	574	574	574	574
Hadyard Hill	Wind Onshore	HADH10	10	99.9	99.9	99.9	99.9	99.9
Halsary Wind Farm	Wind Onshore	SPIT10	1	0	0	0	28.5	28.5
Harestanes	Wind Onshore	BASK20	12	125	125	125	125	125
Harryburn Wind Farm	Wind Onshore	ELVA2Q	11	0	0	0	68	68
Harting Rig Wind Farm	Wind Onshore	KYPE10	11	0	0	0	61.2	61.2
Hartlepool	Nuclear	HATL20	13	1207	1207	1207	1207	1207
Hatfield Power Station	CCGT	THOM41	16	0	0	0	800	800
Hesta Head Wind Farm	Wind Onshore	HEST10	1	0	0	0	20.4	20.4
Heysham Power Station	Nuclear	HEYS40	14	2400	2400	2400	2400	2400
Hinkley Point B	Nuclear	HINP40	26	1061	1061	1061	1061	1061
Hirwaun Power Station	OCGT	RHIG40	21	0	299	299	299	299
Holyhead	Biomass	WYLF40	19	210	210	210	210	210
Hopsrig Wind Farm	Wind Onshore	EWEH1Q	12	0	0	0	48	48
Hornsea Power Station 1A	Wind Offshore	KILL40	15	400	400	400	400	400
Hornsea Power Station 1B	Wind Offshore	KILL40	15	400	400	400	400	400
Hornsea Power Station 1C	Wind Offshore	KILL40	15	400	400	400	400	400
Hornsea Power Station 2A	Wind Offshore	KILL40	15	0	440	440	440	440
Hornsea Power Station 2B	Wind Offshore	KILL40	15	0	0	440	440	440
Hornsea Power Station 2C	Wind Offshore	KILL40	15	0	0	440	440	440
Hornsea Power Station 3A	Wind Offshore	NORM40	15	0	0	0	0	500
Hornsea Power Station 3B	Wind Offshore	NORM40	15	0	0	0	0	500
Humber Gateway Offshore Wind Farm	Wind Offshore	HEDO20	15	220	220	220	220	220
Hunterston	Nuclear	HUER40	10	1020	1020	1020	1020	1020
Immingham	CHP	HUMR40	15	1218	1218	1218	1218	1218
Inch Cape Offshore Wind Farm Platform 1	Wind Offshore	COCK20	11	0	0	0	0	330

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Inch Cape Offshore Wind Farm Platform 2	Wind Offshore	COCK20	11	0	0	0	0	370
Indian Queens	OCGT	INDQ40	27	140	140	140	140	140
Invergarry (part of the Garry Cascade)	Hydro	INGA1Q	3	20	20	20	20	20
J G Pears	CHP	HIGM20	16	30	30	30	30	30
Keadby	CCGT	KEAD40	16	755	755	755	755	755
Keadby II	CCGT	KEAD40	16	0	852	852	852	852
Keith Hill Wind Farm	Wind Onshore	DUNE10	11	4.5	4.5	4.5	4.5	4.5
Kennoxhead Wind Farm	Wind Onshore	COAL10	11	0	0	0	0	59.8
Kilbraur Wind Farm	Wind Onshore	STRB20	1	67	67	67	67	67
Kilgallioch	Wind Onshore	KILG20	10	228	228	228	502	502
Killingholme	OCGT	KILL40	15	600	600	600	600	600
Kilmorack (part of the Beauly Cascade)	Hydro	KIOR1Q	1	20	20	20	20	20
Kings Lynn A	CCGT	WALP40_EME	17	380	380	380	380	380
Kings Lynn B	CCGT	KINL40	17	0	0	0	0	0
Knottingley Power Station	CCGT	KNOT40	15	0	1658	1658	1658	1658
Kype Muir	Wind Onshore	KYPE10	11	88.4	88.4	88.4	88.4	88.4
Langage	CCGT	LAGA40	27	905	905	905	905	905
Liberty Steel Dalzell	OCGT	WISH10	11	18	18	18	18	18
Limekilns	Wind Onshore	DOUN10	1	0	90	90	90	90
Lincs Offshore Wind Farm	Wind Offshore	WALP40_EME	17	256	256	256	256	256
Little Barford	CCGT	EASO40	18	740	740	740	740	740
Lochay (Part of Killin Cascade Hydro Scheme)	Hydro	LOCH10	6	47	47	47	47	47
Lochluichart	Wind Onshore	CORI10	1	69	69	69	69	69
Loganhead Windfarm	Wind Onshore	EWEH1Q	12	0	0	0	0	36
London Array Offshore Wind Farm	Wind Offshore	CLEH40	24	630	630	630	630	630
Long Burn Wind Farm	Wind Onshore	NECU10	10	0	0	0	60	60
Lorg Wind Farm	Wind Onshore	KEON10	10	0	0	0	49.5	49.5
Luichart (part of the Conon Cascade)	Hydro	LUIC1Q	1	34	34	34	34	34
Lynemouth Power Station	Coal	BLYT20	13	396	396	396	396	396
Marchwood	CCGT	MAWO40	26	920	920	920	920	920
Marex	Pump Storage	CONQ40	16	1500	1500	1500	1500	1500
Margree	Wind Onshore	MARG10	10	0	43	43	43	43
Mark Hill Wind Farm	Wind Onshore	MAHI20	10	53	53	53	53	53
Medway Power Station	CCGT	GRAI40	24	735	735	735	735	735

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
MeyGen Tidal	Tidal	GILB10	1	0	15	71	154	237
Middle Muir Wind Farm	Wind Onshore	MIDM10	11	51	51	51	51	51
Millbrook Power	OCGT	SUND40	18	0	0	0	299	299
Millennium South	Wind Onshore	MILS1Q	3	25	25	25	25	25
Millennium Wind (Stage 3), Ceannacroc	Wind Onshore	MILW1Q	3	65	65	65	65	65
Minnygap	Wind Onshore	MOFF10	12	25	25	25	25	25
Monquhill Wind Farm	Wind Onshore	ENHI10	10	0	0	0	0	10
Moray Firth Offshore Wind Farm	Wind Offshore	NEDE20	2	0	20	1000	1000	1000
Moray Offshore West Windfarm	Wind Offshore	BLHI40	1	0	0	0	0	400
Morlais	Tidal	WYLF40	19	120	120	120	120	120
Mossford (part of the Conon Cascade)	Hydro	MOSS1S	1	18.66	18.66	18.66	18.66	18.66
Muaitheabhal Wind Farm	Wind Onshore	MUAI10	4	0	0	150	150	150
Nant	Hydro	NANT1Q	7	15	15	15	15	15
Neart Na Gaoithe Offshore Wind Farm	Wind Offshore	CRYR40	11	0	450	450	450	450
North Lowther Energy Initiative	Wind Onshore	ELVA2Q	11	0	0	0	0	151.2
Ormonde Offshore Wind Farm	Wind Offshore	HEYS40	14	150	150	150	150	150
Orrin (part of the Conon Cascade)	Hydro	ORRI10	1	18	18	18	18	18
Pembroke Power Station	CCGT	PEMB40	20	2199	2199	2199	2199	2199
Pen Y Cymoedd Wind Farm	Wind Onshore	RHIG40	21	228	228	228	228	228
Pencloe Windfarm	Wind Onshore	BLAC10	10	0	63	63	96	96
Peterborough	CCGT	WALP40_EME	17	245	245	245	245	245
Peterhead	CCGT	PEHE20	2	1180	1180	1180	1180	1180
Pogbie Wind Farm	Wind Onshore	DUNE10	11	11.8	11.8	11.8	11.8	11.8
Powersite @ Drakelow	CCGT	DRAK40	18	380	380	380	380	380
Progress Power Station	OCGT	BRFO40	18	0	299	299	299	299
Race Bank Wind Farm	Wind Offshore	WALP40_EME	17	565	565	565	565	565
Rampion Offshore Wind Farm	Wind Offshore	BOLN40	25	400	400	400	400	400
Ratcliffe on Soar	Coal	RATS40	18	2021	2021	2021	2021	2021
Robin Rigg East Offshore Wind Farm	Wind Offshore	HARK40	12	86	86	86	86	86
Robin Rigg West Offshore Wind Farm	Wind Offshore	HARK40	12	92	92	92	92	92
Rocksavage	CCGT	ROCK40	16	810	810	810	810	810
Rye House	CCGT	RYEH40	24	715	715	715	715	715
Sallachy Wind Farm	Wind Onshore	CASS1Q	1	0	0	0	50	50
Saltend	CCGT	SAES20	15	1100	1100	1100	1100	1100

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Sandy Knowe Wind Farm	Wind Onshore	GLGL1Q	10	0	0	51	90	90
Sanquhar II Wind Farm	Wind Onshore	GLGL1Q	10	0	0	0	99	99
Sanquhar IIa Community Wind Farm	Wind Onshore	NECU10	10	0	0	0	0	99
Sanquhar Wind Farm	Wind Onshore	GLGL1Q	10	30	30	30	30	30
Scoop Hill Wind Farm	Wind Onshore	MOFF10	12	0	0	0	0	500
Seabank	CCGT	SEAB40	22	1234	1234	1234	1234	1234
Sellafield	CHP	HUTT40	14	155	155	155	155	155
Severn Power	CCGT	USKM20	21	850	850	850	850	850
Sheringham Shoal Offshore Wind Farm	Wind Offshore	NORM40	18	315	315	315	315	315
Shoreham	CCGT	BOLN40	25	420	420	420	420	420
Sizewell B	Nuclear	SIZE40	18	1216	1216	1216	1216	1216
Sloy G2 and G3	Hydro	SLOY10	8	80	80	80	80	80
South Humber Bank	CCGT	SHBA40	15	1365	1365	1365	1365	1365
South Kyle	Wind Onshore	NECU10	10	0	165	165	165	165
Spalding	CCGT	SPLN40	17	880	880	880	880	880
Spalding Energy Expansion	CCGT	SPLN40	17	300	300	920	920	920
Staythorpe C	CCGT	STAY40	16	1752	1752	1752	1752	1752
Stella North EFR Submission	Pump Storage	STEW40	13	0	0	25	25	25
Stornoway Wind Farm	Wind Onshore	STWN10	1	0	0	129.6	129.6	129.6
Stranoch Wind Farm	Wind Onshore	MAHI10	10	0	0	0	102	102
Strathy North and South Wind	Wind Onshore	STRW10	1	67.65	67.65	67.65	67.65	225.25
Strathy Wood	Wind Onshore	GORW20	1	0	0	0	54.4	54.4
Stronelairg	Wind Onshore	STRL10	3	227.8	227.8	227.8	227.8	227.8
Sutton Bridge	CCGT	WALP40_EME	17	850	850	850	850	850
Swansea Bay	Tidal	BAGB20	21	0	320	320	320	320
Taylors Lane	CCGT	WISD20_LPN	23	144	144	144	144	144
Tees Renewable Energy Plant	Biomass	GRSA20	13	285	285	285	285	285
Thanet Extension Offshore Wind Farm	Wind Offshore	RICH40	24	0	0	272	272	272
Thanet Offshore Wind Farm	Wind Offshore	CANT40	24	300	300	300	300	300
Thorpe Marsh	CCGT	THOM41	16	0	1600	1600	1600	1600
Thurrock	OCGT	TILB20	24	0	600	600	600	600
Toddleburn Wind Farm	Wind Onshore	DUNE10	11	27.6	27.6	27.6	27.6	27.6
Torness	Nuclear	TORN40	11	1250	1250	1250	1250	1250

Generator	Technology	Nodes	Zone	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
Trafford Power	CCGT	CARR40	16	0	2050	2050	2050	2050
Tralorg Wind Farm	Wind Onshore	MAHI20	10	20	20	20	20	20
Triton Knoll Offshore Wind Farm	Wind Offshore	BICF4A	17	0	900	900	900	900
Twentyshilling Hill Wind Farm	Wind Onshore	GLGL1Q	10	0	0	0	0	34
Uskmouth	Coal	USKM20	21	230	230	230	230	230
Viking Wind Farm	Wind Onshore	KERG20	1	0	0	0	0	412
Walney 3 Offshore Wind Farm	Wind Offshore	MIDL40	14	330	330	330	330	330
Walney 4 Offshore Wind Farm	Wind Offshore	MIDL40	14	330	330	330	330	330
Walney I Offshore Wind Farm	Wind Offshore	HEYS40	14	182	182	182	182	182
Walney II Offshore Wind Farm	Wind Offshore	STAH4A	14	182	182	182	182	182
West Burton A	Coal	WBUR40	16	1987	1987	1987	1987	1987
West Burton B	CCGT	WBUR40	16	1333	1333	1333	1333	1333
West of Duddon Sands Offshore Wind Farm	Wind Offshore	HEYS40	14	382	382	382	382	382
Westermost Rough Offshore Wind Farm	Wind Offshore	HEDO20	15	205	205	205	205	205
Westray South	Tidal	DOUN20	1	0	0	60	60	100
Whitelaw Brae Windfarm	Wind Onshore	CLYS2R	11	0	54.4	54.4	54.4	54.4
Whitelee	Wind Onshore	WLEE20	10	305	305	305	305	305
Whitelee Extension	Wind Onshore	WLEX20	10	206	206	206	206	206
Whiteside Hill Wind Farm	Wind Onshore	GLGL1Q	10	27	27	27	27	27
Willington	CCGT	WILE40	18	0	1530	1530	1530	1530
Willow Wind Farm	Wind Onshore	WILW10	10	0	45	45	45	45
Wilton	CCGT	GRSA20	13	141	141	141	141	141
Windy Standard II (Brockloch Rig 1) Wind Farm	Wind Onshore	DUNH1R	10	61.5	61.5	61.5	75	75
Windy Standard III Wind Farm	Wind Onshore	DUNH1Q	10	0	0	0	43.5	43.5

Appendix G: Contracted TEC by generation zone

Table 58 – Contracted TEC by generation zone

Zone	Zone Name	2019/20 (MW)	2020/21 (MW)	2021/22 (MW)	2022/23 (MW)	2023/24 (MW)
1	North Scotland	1,881.8	2,107.8	2,502.2	2,926.5	4,327.1
2	East Aberdeenshire	1,180.0	1,200.0	3,580.0	3,580.0	3,580.0
3	Western Highlands	737.7	737.7	737.7	905.7	905.7
4	Skye and Lochalsh	41.4	41.4	233.4	233.4	233.4
5	Eastern Grampian and Tayside	324.8	324.8	324.8	324.8	324.8
6	Central Grampian	63.5	63.5	63.5	63.5	63.5
7	Argyll	166.0	166.0	166.0	166.0	166.0
8	The Trossachs	520.0	520.0	520.0	520.0	520.0
9	Stirlingshire and Fife	120.0	120.0	120.0	1,195.0	1,195.0
10	South West Scotland	2,547.5	2,863.5	2,914.5	3,741.6	4,163.6
11	Lothian and Borders	2,680.2	3,327.8	3,459.2	3,588.4	5,199.4
12	Solway and Cheviot	413.0	413.0	413.0	461.0	997.0
13	North East England	2,029.0	3,429.0	3,454.0	3,454.0	3,454.0
14	North Lancashire and The Lakes	4,201.0	4,201.0	4,201.0	4,201.0	4,201.0
15	South Lancashire, Yorkshire and Humber	13,139.0	15,769.0	17,189.0	19,589.0	23,409.0
16	North Midlands and North Wales	14,546.0	19,048.0	19,048.0	19,848.0	19,848.0
17	South Lincolnshire and North Norfolk	3,876.0	4,776.0	5,396.0	6,896.0	6,896.0
18	Mid Wales and The Midlands	7,319.9	9,148.9	9,148.9	9,447.9	10,647.9
19	Anglesey and Snowdon	1,974.0	1,974.0	2,974.0	2,974.0	2,974.0
20	Pembrokeshire	2,199.0	2,199.0	2,199.0	2,699.0	2,699.0
21	South Wales & Gloucester	3,705.0	4,324.0	4,324.0	4,623.0	4,623.0
22	Cotswold	1,234.0	1,234.0	1,234.0	1,234.0	1,234.0
23	Central London	144.0	144.0	144.0	144.0	144.0
24	Essex and Kent	12,201.0	14,601.0	15,873.0	18,773.0	18,773.0
25	Oxfordshire, Surrey and Sussex	2,270.0	2,270.0	2,270.0	2,270.0	2,270.0
26	Somerset and Wessex	3,379.0	4,779.0	6,779.0	6,779.0	6,779.0
27	West Devon and Cornwall	1,045.0	1,045.0	1,045.0	1,045.0	2,545.0

Appendix H: Transmission company revenues

National Grid revenue forecast

We seek to provide the detail behind price control revenue forecasts for National Grid, Scottish Power Transmission and SHE Transmission.

Revenue for offshore networks is included with forecasts by National Grid where the Offshore Transmission Owner has yet to be appointed.

Notes:
All monies are quoted in millions of pounds, accurate to one decimal place and are in nominal 'money of the day' prices unless stated otherwise.

Network Innovation Competition (NIC) funding is included in the National Grid price control, but is additional to the price controls of onshore and offshore Transmission Owners who receive funding. NIC funding is therefore only shown in the National Grid table, as a pass-through item.

All reasonable care has been taken in the preparation of these illustrative tables and the data therein. National Grid and other Transmission Owners offer this data without prejudice and cannot be held responsible for any loss that might be attributed to the use of this data. Neither National Grid nor other Transmission Owners accept or assume responsibility for the use of this information by any person or any person to whom this information is shown or any person to whom this information otherwise becomes available.

The revenue forecasts reflect the indicative figures that may be authorised by Ofgem in the RIIO-T1 or offshore price controls.

Table 59 – Indicative National Grid revenue forecast

National Grid Revenue Forecast			Aug-18					
Regulatory Year			2019/20	2020/21	2021/22	2022/23	2023/24	Notes
Actual RPI								
RPI Actual		RPIAt		-	-	-	-	
Assumed Interest Rate		It	1.16%	1.58%	1.83%	2.05%	2.05%	Bank of England Base Rate
Opening Base Revenue Allowance (2009/10 prices)	A1	PUt	1,585.2	1,571.6	1,571.6	1,571.6	1,571.6	
Price Control Financial Model Iteration Adjustment	A2	MODt	-334.0	-234.0	-234.0	-234.0	-234.0	Determined by Ofgem; NGET forecast
RPI True Up	A3	TRUt	3.3	2.1	0.0	-0.9	-0.9	Licensee Actual/Forecast
Prior Calendar Year RPI Forecast		GRPIFc-1	3.5%	3.0%	3.0%	3.0%	3.0%	HM Treasury Forecast
Current Calendar Year RPI Forecast		GRPIFc	3.0%	3.0%	3.0%	3.0%	3.0%	HM Treasury Forecast
Next Calendar Year RPI forecast		GRPIFc+1	3.0%	3.2%	3.0%	3.0%	3.0%	HM Treasury Forecast
RPI Forecast	A4	RPIFt	1.3570	1.3970	1.4390	1.4810	1.5260	Using HM Treasury Forecast
Base Revenue [A=(A1+A2+A3)*A4]	**A**	**BRt**	**1702.3**	**1871.5**	**1924.8**	**1979.6**	**2039.8**	
Pass-Through Business Rates	B1	RBt	0.0	-0.2	0.5	37.5	34.4	Licensee Actual/Forecast
Temporary Physical Disconnection	B2	TPDt	0.0	0.0	0.0	0.0	0.0	Licensee Actual/Forecast
Licence Fee	B3	LFt	0.0	-0.0	0.1	1.0	0.4	Licensee Actual/Forecast
Inter TSO Compensation	B4	ITCt	0.0	-0.0	0.1	-0.3	-0.7	Licensee Actual/Forecast
Termination of Bilateral Connection Agreements	B5	TERMt	0.0	0.0	0.0	0.0	0.0	Does not affect TNUoS
SP Transmission Pass-Through	B6	TSPt	390.0	360.4	423.9	419.9	432.7	
SHE Transmission Pass-Through	B7	TSHt	349.4	363.5	418.6	431.8	444.9	
Offshore Transmission and Interconnector Pass-Through	B8	TOFTOt	380.6	402.1	427.7	543.3	624.8	
Embedded Offshore Pass-Through	B9	OFETt	0.6	0.6	0.6	0.6	0.6	Licensee Actual/Forecast
Pass-Through Items [B=B1+B2+B3+B4+B5+B6+B7+B8+B9]	**B**	**PTt**	**1120.6**	**1126.4**	**1271.4**	**1433.9**	**1537.1**	
Reliability Incentive Adjustment	C1	RIt	4.2	4.3	4.5	4.6	4.7	Licensee Actual/Forecast
Stakeholder Satisfaction Adjustment	C2	SSOt	8.6	8.6	8.6	8.7	8.9	Licensee Actual/Forecast
Sulphur Hexafluoride (SF6) Gas Emissions Adjustment	C3	SFIt	1.6	3.3	3.3	3.4	3.5	Licensee Actual/Forecast
Awarded Environmental Discretionary Rewards	C4	EDRt	0.0	0.0	0.0	0.0	0.0	
Outputs Incentive Revenue [C=C1+C2+C3+C4]	**C**	**OIPt**	**14.5**	**16.2**	**16.4**	**16.7**	**17.1**	
Network Innovation Allowance	D	NIAt	10.7	11.8	12.1	12.5	12.9	Licensee Actual/Forecast
Network Innovation Competition	E	NICFt	32.7	32.7	32.7	32.7	32.7	Sum of NICF awards determined by Ofgem/Forecast by National Grid
Future Environmental Discretionary Rewards	F							
Transmission Investment for Renewable Generation	G	TIRGt	0.0	0.0	0.0	0.0	0.0	Licensee Actual/Forecast
Scottish Site Specific Adjustment	H	DISt	0.0	0.0	0.0	0.0	0.0	Licensee Actual/Forecast
Scottish Terminations Adjustment	I	TSt	0.0	0.0	0.0	0.0	0.0	Licensee Actual/Forecast
Correction Factor	K	-Kt	42.5	0.0	0.0	0.0	0.0	Calculated by Licensee
Maximum Revenue [M= A+B+C+D+E+F+G+H+I+K]	**M**	**TOt**	**2923.3**	**3058.5**	**3257.4**	**3475.3**	**3639.6**	
Termination Charges	B5							
Pre-vesting connection charges	P		44.0	44.0	44.0	44.0	44.0	Licensee Actual/Forecast
TNUoS Collected Revenue [T=M-B5-P]	**T**		**2879.3**	**3014.5**	**3213.4**	**3431.3**	**3595.6**	

Scottish Power Transmission revenue forecast

The Scottish Power Transmission revenue forecast will be updated in November for the 2019/20 Draft tariffs, and will be finalised by 25 January 2019. The indicative SPT Transmission revenue to be collected via TNUoS for the next five years are given in table 19.

SHE Transmission revenue forecast

The Scottish Hydro Electric Transmission (SHE Transmission) revenue forecast will be updated in November for the 2019/20 Draft tariffs, and will be finalised by 25 January 2019. The indicative SHET Transmission revenue to be collected via TNUoS for the next five years are given in table 19.

Offshore Transmission Owner & Interconnector revenues

The Offshore Transmission Owner revenue forecast will be updated in November for the 2019/20 Draft tariffs, and will be finalised by 25 January 2019. Revenues have been adjusted to take into account an updated RPI forecast.

TNUoS charges are also adjusted by an amount determined by Ofgem to enable recovery and/or redistribution of interconnector revenue in accordance with the Cap and Floor regime. The interconnector revenue forecast will be updated in November for the 2019/20 draft tariffs, and confirmed by 25 January 2019.

Table 60 - Offshore Transmission Owner revenues (indicative)

Offshore Transmission Revenue Forecast	12/09/2018					
Regulatory Year	2019/20	2020/21	2021/22	2022/23	2023/24	Notes
Barrow	6.2	6.4	6.2	6.6	6.8	Current revenues plus indexation
Gunfleet	7.7	8.0	7.8	8.0	8.2	Current revenues plus indexation
Walney 1	14.1	14.5	13.8	14.2	14.7	Current revenues plus indexation
Robin Rigg	8.7	9.0	8.8	8.4	8.6	Current revenues plus indexation
Walney 2	14.6	15.0	15.0	15.7	16.1	Current revenues plus indexation
Sheringham Shoal	21.4	22.1	22.2	22.2	22.8	Current revenues plus indexation
Ormonde	13.0	13.4	13.4	13.7	14.2	Current revenues plus indexation
Greater Gabbard	29.3	30.2	31.2	31.5	32.5	Current revenues plus indexation
London Array	41.4	42.6	42.6	42.6	43.9	Current revenues plus indexation
Thanet	19.2	19.8	20.5	20.9	21.5	Current revenues plus indexation
Lincs	27.7	28.6	28.6	28.8	29.7	Current revenues plus indexation
Gwynt y mor	29.0	29.9	29.9	29.8	30.7	Current revenues plus indexation
West of Duddon Sands	23.3	24.0	24.0	24.1	24.9	Current revenues plus indexation
Humber Gateway	12.0	12.4	12.4	12.4	12.8	Current revenues plus indexation
Westermost Rough	13.5	13.9	13.9	13.9	14.3	Current revenues plus indexation
Burbo Bank	106.4	13.8	14.2	14.6	15.0	National Grid Forecast
Forecast to asset transfer to OFTO by 2019/20		92.5	95.3	98.1	101.1	National Grid Forecast
Forecast to asset transfer to OFTO in 2020/21		12.9	21.6	22.2	22.9	National Grid Forecast
Forecast to asset transfer to OFTO in 2021/22			12.9	21.6	22.2	National Grid Forecast
Forecast to asset transfer to OFTO in 2022/23				94.0	102.1	National Grid Forecast
Forecast to asset transfer to OFTO in 2023/24					66.6	National Grid Forecast
Offshore Transmission Pass-Through (B7)	**387.4**	**408.9**	**434.5**	**543.3**	**631.6**	

Notes:

All monies are nominal 'money of the day' prices unless stated otherwise

Licensee forecasts and budgets are subject to change especially where they are influenced by external stakeholders

Greyed out cells are either calculated or not applicable in the year concerned due to the way the licence formula are constructed

NIC payments are not included as they do not form part of OFTO Maximum Revenue

Note: Figures for historic years represent National Grid's forecast of OFTO revenues (including prevailing asset transfer date assumptions) at the time final tariffs for each year were calculated rather than our current best view.

Appendix I: Historic & future chargeable demand data

In the tables below we have published the historic demand volumes, per demand zone, used for TNUoS for 2014/15 to 2017/18. We have also published the (net) demand data used in tariff setting for 2018/19 tariffs, and the forecast (gross) demand data used in the forecasts on 2019/20 to 2023/24 tariffs.

The historic data was provided to National Grid under BSC modifications P348/P349 which were consequential modifications following CMP264/265 to provide National Grid with gross demand data.

The tables are structured as follows:

- The first three tables are gross demand data (GW) for system peak, gross HH demand and embedded export volumes.
- The fourth table is the NHH demand data (TWh) for consumption between 4pm and 7pm. The way this data is used in tariff setting is unchanged between historic and future methodologies.
- The final two tables show, for information, the net demand data for system peak and net HH demand, the basis of charging before 2018/19. These values are not used in the calculation of tariffs in this report, but are included for information.

Table 61 – Gross system peak demand (GW)

		Actual Demand				Final Tariffs	June Forecast	Five Year Forecast			
Zone	Zone Name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1	Northern Scotland	1.594	1.675	1.423	1.418	1.477	1.483	1.482	1.459	1.454	1.443
2	Southern Scotland	4.042	4.078	3.749	3.456	3.500	3.444	3.401	3.379	3.358	3.358
3	Northern	3.401	2.751	2.475	2.650	2.664	2.576	2.547	2.540	2.519	2.528
4	North West	4.682	4.503	3.997	4.104	4.117	4.037	3.986	3.957	3.927	3.936
5	Yorkshire	4.707	4.689	4.539	3.962	3.920	3.818	3.776	3.758	3.738	3.739
6	N Wales & Mersey	3.001	3.328	3.413	2.748	2.678	2.628	2.604	2.576	2.561	2.566
7	East Midlands	5.547	5.213	5.210	4.837	4.763	4.651	4.598	4.578	4.551	4.559
8	Midlands	4.867	4.661	4.536	4.439	4.371	4.251	4.197	4.174	4.150	4.157
9	Eastern	7.266	6.818	6.605	6.653	6.605	6.447	6.363	6.321	6.294	6.288
10	South Wales	2.169	2.223	2.633	1.821	1.843	1.822	1.804	1.783	1.776	1.774
11	South East	4.323	4.054	3.919	4.008	3.999	3.906	3.859	3.822	3.806	3.804
12	London	5.332	5.009	4.692	4.891	4.323	4.187	4.145	4.111	4.077	4.090
13	Southern	6.479	6.193	6.232	5.828	5.584	5.476	5.416	5.380	5.347	5.353
14	South Western	2.919	2.711	2.629	2.596	2.621	2.597	2.572	2.551	2.531	2.538
	TOTAL	**60.330**	**57.906**	**56.053**	**53.414**	**52.463**	**51.326**	**50.750**	**50.389**	**50.090**	**50.133**

Table 62 – Gross HH demand (GW)

		Actual Demand				Final Tariffs	June Forecast	Five Year Forecast			
Zone	Zone Name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1	Northern Scotland	0.443	0.437	0.483	0.483	0.489	0.428	0.439	0.441	0.435	0.441
2	Southern Scotland	1.217	1.215	1.297	1.329	1.259	1.126	1.216	1.215	1.206	1.207
3	Northern	1.052	1.029	1.120	1.134	1.078	0.902	1.038	1.029	1.027	1.022
4	North West	1.486	1.431	1.558	1.549	1.523	1.413	1.482	1.467	1.456	1.452
5	Yorkshire	1.512	1.496	1.588	1.616	1.610	1.495	1.557	1.546	1.545	1.535
6	N Wales & Mersey	1.045	1.027	1.095	1.089	1.085	0.991	1.045	1.042	1.026	1.030
7	East Midlands	1.872	1.806	1.902	1.874	1.878	1.717	1.763	1.763	1.754	1.758
8	Midlands	1.579	1.555	1.714	1.711	1.617	1.389	1.565	1.562	1.557	1.556
9	Eastern	2.051	2.030	2.267	2.312	2.133	1.931	2.065	2.058	2.054	2.039
10	South Wales	0.743	0.797	0.765	0.754	0.839	0.779	0.821	0.798	0.803	0.797
11	South East	1.136	1.128	1.250	1.297	1.169	1.060	1.159	1.138	1.133	1.131
12	London	2.269	2.236	2.332	2.398	2.286	2.203	2.246	2.218	2.198	2.203
13	Southern	2.012	2.013	2.189	2.197	2.072	1.933	2.031	2.019	2.000	2.007
14	South Western	0.738	0.705	0.793	0.807	0.764	0.641	0.748	0.742	0.739	0.736
	TOTAL	**19.156**	**18.904**	**20.354**	**20.550**	**19.801**	**18.007**	**19.176**	**19.037**	**18.933**	**18.912**

Table 63 – Embedded export volumes (GW)

		Actual Demand				Final Tariffs	June Forecast	Five Year Forecast			
Zone	Zone Name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1	Northern Scotland	0.541	0.550	0.849	0.931	1.001	0.958	1.178	1.079	1.078	0.952
2	Southern Scotland	0.300	0.395	0.563	0.496	0.670	0.678	0.810	0.749	0.745	0.745
3	Northern	0.716	0.396	0.259	0.396	0.581	0.439	0.528	0.504	0.491	0.498
4	North West	0.202	0.281	0.315	0.424	0.343	0.410	0.381	0.356	0.346	0.346
5	Yorkshire	0.452	0.627	0.642	0.860	0.635	0.808	0.695	0.675	0.649	0.657
6	N Wales & Mersey	0.343	0.473	0.432	0.536	0.538	0.550	0.573	0.532	0.526	0.531
7	East Midlands	0.335	0.373	0.413	0.663	0.477	0.639	0.545	0.529	0.497	0.507
8	Midlands	0.213	0.237	0.311	0.408	0.211	0.335	0.219	0.236	0.220	0.228
9	Eastern	0.562	0.553	0.560	0.845	0.624	0.806	0.723	0.642	0.611	0.637
10	South Wales	0.243	0.352	0.381	0.559	0.331	0.510	0.382	0.378	0.361	0.368
11	South East	0.299	0.304	0.287	0.482	0.318	0.411	0.321	0.329	0.312	0.320
12	London	0.121	0.138	0.257	0.251	0.149	0.171	0.134	0.144	0.135	0.140
13	Southern	0.463	0.584	0.637	0.737	0.437	0.693	0.379	0.427	0.396	0.412
14	South Western	0.239	0.244	0.347	0.387	0.200	0.345	0.248	0.251	0.235	0.250
	TOTAL	**5.030**	**5.506**	**6.253**	**7.975**	**6.516**	**7.753**	**7.116**	**6.830**	**6.603**	**6.593**

Table 64 – NHH demand (TWh)

Zone	Zone Name	Actual Demand				Final Tariffs	June Forecast	Five Year Forecast			
Zone	Zone Name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1	Northern Scotland	0.876	0.811	0.819	0.749	0.741	0.784	0.754	0.738	0.735	0.733
2	Southern Scotland	1.988	1.838	1.845	1.616	1.663	1.771	1.646	1.621	1.610	1.603
3	Northern	1.468	1.355	1.362	1.156	1.200	1.318	1.160	1.146	1.129	1.120
4	North West	2.243	2.150	2.160	1.923	1.932	2.024	1.904	1.877	1.858	1.847
5	Yorkshire	2.094	1.961	1.973	1.753	1.761	1.825	1.721	1.696	1.673	1.660
6	N Wales & Mersey	1.475	1.363	1.368	1.226	1.223	1.298	1.205	1.187	1.171	1.160
7	East Midlands	2.508	2.388	2.403	2.205	2.160	2.239	2.134	2.103	2.076	2.062
8	Midlands	2.374	2.232	2.245	1.983	1.995	2.171	1.944	1.916	1.891	1.876
9	Eastern	3.617	3.427	3.444	3.117	3.086	3.238	3.021	2.981	2.944	2.924
10	South Wales	0.983	0.913	0.917	0.822	0.829	0.884	0.823	0.811	0.800	0.796
11	South East	2.250	2.132	2.141	1.913	1.910	2.008	1.867	1.844	1.822	1.810
12	London	2.180	2.038	2.046	1.814	1.836	1.871	1.772	1.755	1.747	1.731
13	Southern	3.014	2.856	2.870	2.591	2.563	2.678	2.520	2.488	2.453	2.437
14	South Western	1.530	1.426	1.434	1.297	1.273	1.402	1.279	1.251	1.222	1.207
	TOTAL	**28.600**	**26.890**	**27.025**	**24.166**	**24.172**	**25.512**	**23.748**	**23.414**	**23.131**	**22.966**

Table 65 – Net system peak demand (GW)

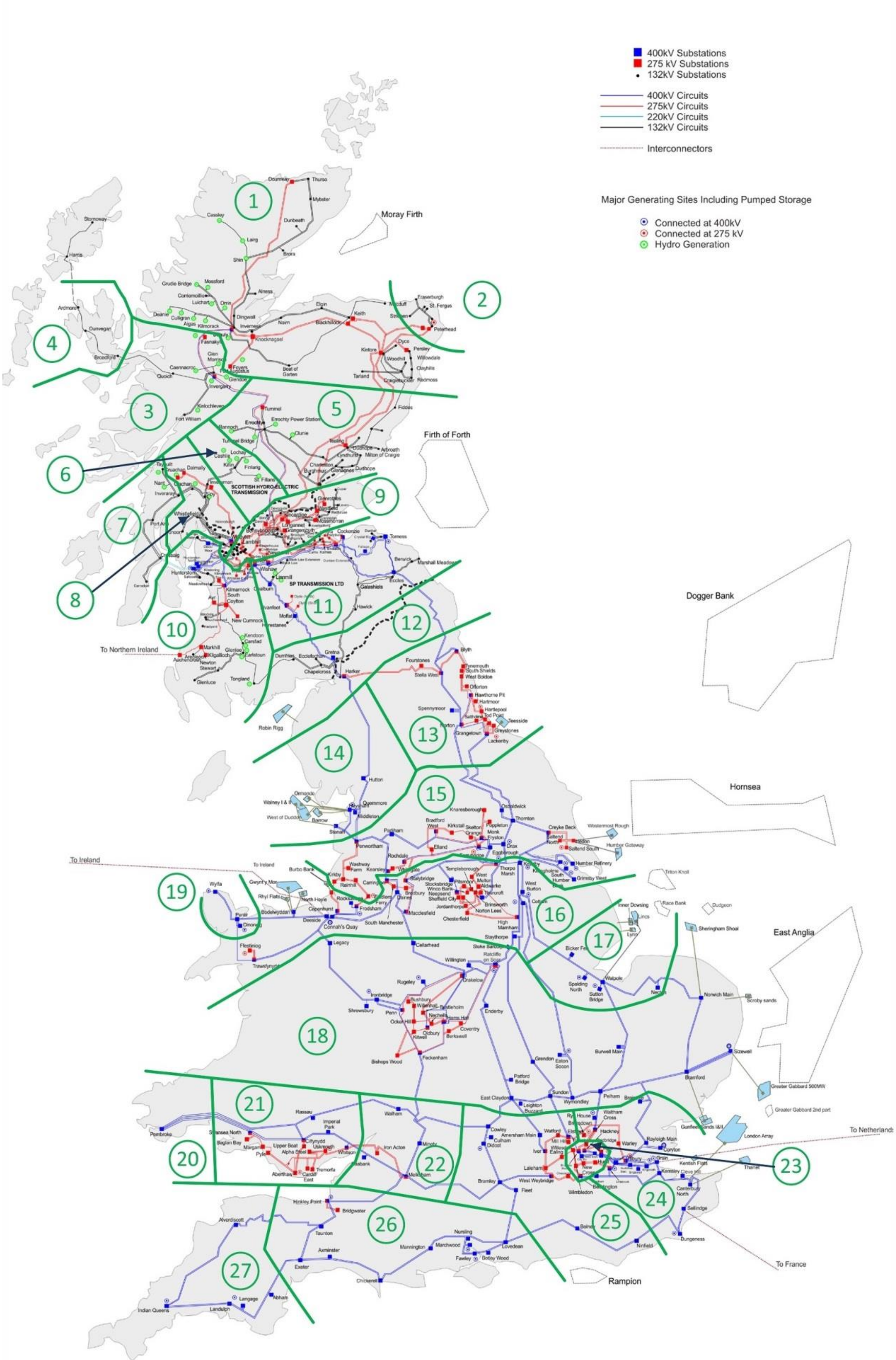
						Not required for tariffs, but included for reference					
Zone	Zone Name	Actual Demand				Final Tariffs	June Forecast	Five Year Forecast			
Zone	Zone Name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1	Northern Scotland	1.053	1.125	0.574	0.487	0.476	0.525	0.304	0.380	0.376	0.491
2	Southern Scotland	3.743	3.683	3.187	2.960	2.831	2.766	2.591	2.630	2.613	2.613
3	Northern	2.684	2.355	2.216	2.255	2.083	2.137	2.019	2.036	2.028	2.030
4	North West	4.480	4.222	3.682	3.680	3.773	3.627	3.605	3.601	3.581	3.590
5	Yorkshire	4.255	4.061	3.897	3.102	3.284	3.011	3.081	3.083	3.090	3.082
6	N Wales & Mersey	2.658	2.855	2.981	2.212	2.140	2.077	2.031	2.044	2.035	2.035
7	East Midlands	5.212	4.840	4.797	4.174	4.286	4.012	4.053	4.049	4.054	4.052
8	Midlands	4.655	4.424	4.225	4.031	4.159	3.916	3.978	3.939	3.930	3.930
9	Eastern	6.704	6.265	6.046	5.808	5.980	5.641	5.640	5.679	5.683	5.652
10	South Wales	1.926	1.871	2.252	1.262	1.511	1.312	1.423	1.406	1.415	1.406
11	South East	4.023	3.750	3.631	3.526	3.681	3.495	3.538	3.493	3.494	3.484
12	London	5.211	4.872	4.436	4.641	4.174	4.016	4.010	3.967	3.943	3.950
13	Southern	6.016	5.610	5.595	5.091	5.147	4.784	5.037	4.953	4.951	4.940
14	South Western	2.680	2.467	2.282	2.209	2.420	2.252	2.324	2.300	2.295	2.288
	TOTAL	**55.300**	**52.400**	**49.800**	**45.439**	**45.947**	**43.573**	**43.635**	**43.559**	**43.487**	**43.541**

Table 66 – Net HH demand (GW)

						Not required for tariffs, but included for reference					
		Actual Demand				Final Tariffs	June Forecast	Five Year Forecast			
Zone	Zone Name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1	Northern Scotland	- 0.098	- 0.113	- 0.366	- 0.448	- 0.512	- 0.530	- 0.739	- 0.638	- 0.642	- 0.511
2	Southern Scotland	0.918	0.821	0.735	0.832	0.589	0.447	0.406	0.465	0.461	0.462
3	Northern	0.336	0.633	0.860	0.738	0.498	0.463	0.510	0.525	0.536	0.524
4	North West	1.284	1.150	1.242	1.125	1.179	1.003	1.101	1.110	1.109	1.106
5	Yorkshire	1.060	0.869	0.946	0.756	0.974	0.688	0.863	0.871	0.896	0.878
6	N Wales & Mersey	0.701	0.555	0.663	0.553	0.547	0.441	0.471	0.510	0.500	0.499
7	East Midlands	1.536	1.433	1.488	1.211	1.401	1.078	1.218	1.234	1.257	1.251
8	Midlands	1.367	1.318	1.403	1.303	1.406	1.053	1.346	1.326	1.337	1.328
9	Eastern	1.489	1.477	1.708	1.468	1.508	1.126	1.341	1.416	1.443	1.402
10	South Wales	0.500	0.445	0.384	0.195	0.507	0.269	0.440	0.421	0.442	0.428
11	South East	0.836	0.823	0.963	0.814	0.851	0.649	0.838	0.809	0.822	0.811
12	London	2.148	2.098	2.076	2.148	2.137	2.032	2.111	2.074	2.063	2.062
13	Southern	1.548	1.429	1.552	1.460	1.636	1.241	1.652	1.592	1.604	1.594
14	South Western	0.499	0.461	0.447	0.420	0.564	0.295	0.500	0.491	0.503	0.486
	TOTAL	**14.126**	**13.398**	**14.101**	**12.575**	**13.285**	**10.255**	**12.060**	**12.207**	**12.330**	**12.320**

Appendix J: Generation zones map

Figure A2: GB Existing Transmission System



Appendix K: Demand zones map