EnAppSys
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GB Electricity Market Summary

Q4-2023

October to December

Generation and Contribution by Fuel Type

Renewables:	35.3TWh (+35%)	Gas:	20.7TWh (+1%)	Nuclear:	9.6TWh (-2%)
Renewables excl. biomass:	28.6TWh (+35%)	Coal:	1.2TWh (+151%)	Net Imports:	5.2TWh (+39%)

% changes stated with respect to values in the previous quarter

1 Quarterly Review of GB Electricity Market Q4 2023

The early days of Q4 witnessed an increase in wholesale electricity prices from lower levels following the outbreak of the Israel-Hamas war and damage to the Baltic connector pipeline. Prices exhibited a considerable degree of variability throughout October, persisting until late November when a cold snap prompted another increase. However, December marked a gradual decline in wholesale electricity prices, resulting in lower prices by the end of the Q4 period compared to the beginning. Notably, during some weekends in October and December, prices occasionally dropped below the £0/MWh price mark. These declines were primarily driven by a combination of low demand and a substantial renewable output during those periods. The forward delivery contract for the summer 2024 however did consistently decline through the quarter.

Wholesale electricity prices also increased by 5% from last quarter with an average day-ahead price of £82.37/MWh in EPEX auction and £82.57/MWh in Nordpool, both of which were less than half of what they were in Q4 2022 and Q4 2021. There was a notable temporary price spike between late November and early December which was driven by cold snap with prices reaching as high as £227.60/MWh and sharply declining to lower levels through the December month given high gas storge levels.

GB demand grew in this quarter with total domestic transmission-level demand standing at 62.2TWh, marking a 1% increase from Q4 2022 demand but a 6% decrease compared to Q4 2021. It also represents an increase of 24% from Q3 2023, reflecting underlying seasonal drivers for demand.

The GB ETS (Carbon) price fluctuated through the quarter however it remained significantly lower than that of EU ETS Carbon by ~£24/te on average over the quarter. This is largely attributable to the reduction in fossil fuel generation and the increase in renewable outturn. The UK ETS carbon price closed the quarter at ~£46/te (versus EU ETS price of ~£67/te).

Renewable generation rose to 35.3TWh from 26.2TWh seen in the previous quarter, making it the highest for any quarter in the history of the GB market. Wind had the largest share of the renewable mix with the total generation standing at 25.6TWh, a record high when compared to 24.82TWh seen in Q4 2022. This is followed by biomass (6.76TWh), hydro (1.50TWh), and solar which was the lowest at 1.45TWh. Gas-fired generation increased slightly to 20.73TWh from 20.55TWh seen in Q3 2023, though this is substantially lower than the 27.4TWh seen in Q4 2022.

Nuclear power generation fell to 9.6TWh in Q4 from 9.9TWh in Q3 due to outages at the Hartlepool, Heysham, and Torness units, which lowered output from the nuclear power fleets throughout this quarter.

Imports into GB increased by 39% to 5.2TWh. France reclaimed its spot displacing Norway as the top exporter of power to GB in Q4 with 3.25TWh of power flowing from France to GB in Q4 followed by Norway with 1.45TWh of exports to GB. This was driven by the consistently low power prices France and Norway throughout the quarter compared to other GB bordering countries in Europe.

The key takeaways from this quarter are:

- Gas price opened the quarter at £32.18/MWh and plunged to £22.55/MWh in the first week of October, before increasing back to high levels of £46.59/MWh due to the Israel war and the Baltic connector pipeline damage. It remained stable with occasional drops to lower levels in the month of November. However, in December, gas price declined gradually through the month closing the quarter at £26.38/MWh.
- Wholesale electricity prices saw a 5% quarter-on-quarter increase with occasional dips into negative prices on some weekends particularly in October and December when demand was low coupled with high renewable generation.
- The interconnectors saw net power import of 5.2TWh this quarter compared to 3.7TWh seen in Q3.
- The total GB generation for this quarter (excluding imports) increased by 17% compared to the previous quarter, although it was the lowest of any Q4 since 2021.
- The total GB generation for this quarter (including imports and embedded generation) rose by 19% from the previous quarter to 72.1TWh. This was higher than last year levels but lower compared to Q4 2021.
- Wind posted higher generation this Q4 with represented a 58% increase from Q3 to 25.6TWh which a new all-time high for any quarter.
- As a result, CCGT utilisation increased only slightly to 20.7TWh from 20.5TWh seen in Q3. This is much lower than is typical of historic Q4 periods.
- The coal-fired generation rose in this quarter by 151% compared to the previous quarter reaching 1.2TWh.

Appendix: Supporting Tables

The tables below shows key statistics on generation in the quarter and all previous quarters over the last two years. Biomass and hydro values for the reporting quarter contain estimates for the embedded portion of the fleet, based on the same quarter last year as this data is published at a lag of ~3 months by DESNZ[1]. Note that all percentages are given as a percentage of total generation including imports.

Table 1: Quarterly generation summary Q4 2023 (TWh)

*GB Only (Excludes Northern Ireland)	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023
TOTAL GENERATION BY FUEL (TWh)									
Coal	1.2	1.9	0.3	1.1	0.9	0.9	0.1	0.5	1.2
Gas	26.6	24.6	28.7	30.6	27.4	23.5	22.0	20.5	20.7
Imports	4.6	5.2	-3.6	-4.6	-1.2	7.3	7.4	3.7	5.2
Nuclear	11.7	11.7	12.1	10.2	10.6	9.2	9.5	9.9	9.6
Biomass	7.7	7.0	5.4	6.4	5.5	5.9	4.6	5.0	6.8
Wind	21.3	23.3	15.9	13.5	24.8	24.0	13.4	16.2	25.6
Solar	1.2	2.0	4.5	4.2	1.4	1.7	4.9	4.1	1.4
Hydro	2.0	1.9	1.0	0.7	1.8	1.8	0.8	0.9	1.5
RENEWABLES (Biomass, Wind, Solar & Hydro)	32.3	34.2	26.8	24.8	33.6	33.4	23.7	26.2	35.3
NON-DISPATCHABLE RENEWABLES (Wind, Solar & Hydro)	24.6	27.2	21.4	18.4	28.1	27.4	19.2	21.2	28.6
FOSSIL FUELS (Gas & Coal)	27.8	26.5	29.0	31.8	28.3	24.4	22.1	21.0	22.0
TOTAL GB GENERATION (excl. Imports)	71.8	72.5	68.0	66.7	72.6	67.0	55.4	57.1	67.0
TOTAL GB CONSUMPTION (incl. Imports)	**76.4**	**77.7**	**64.3**	**62.2**	**71.4**	**74.2**	**62.7**	**60.9**	**72.1**
Fossil Fuel Percentage	36%	34%	45%	51%	40%	33%	35%	35%	30%
Clean Percentage (Renewable & Nuclear)	58%	59%	61%	56%	62%	57%	53%	59%	62%
Renewable Share of Clean Power	73%	74%	69%	71%	76%	78%	71%	73%	79%
SHARE OF GENERATION (%)									
Coal	2%	2%	1%	2%	1%	1%	0%	1%	2%
Gas	35%	32%	45%	49%	38%	32%	35%	34%	29%
Imports	6%	7%	-6%	-7%	-2%	10%	12%	6%	7%
Nuclear	15%	15%	19%	16%	15%	12%	15%	16%	13%
Renewables (Biomass, Wind, Solar & Hydro)	42%	44%	42%	40%	47%	45%	38%	43%	49%

Table 2: Year-on-year comparison of Q4 generation output (TWh and %)

*GB Only (Excludes Northern Ireland)	Q4 2015	Q4 2016	Q4 2017	Q4 2018	Q4 2019	Q4 2020	Q4 2021	Q4 2022	Q4 2023
TOTAL GENERATION BY FUEL (TWh)									
Coal	16.5	8.0	7.7	4.6	2.3	1.1	1.2	0.9	1.2
Gas	22.5	37.7	32.6	29.6	29.3	26.7	26.6	27.4	20.7
Imports	4.6	1.6	1.5	4.0	5.0	5.4	4.6	-1.2	5.2
Nuclear	17.5	17.5	15.6	13.6	14.6	13.4	11.7	10.6	9.6
RENEWABLES (Biomass, Wind, Solar & Hydro)	14.8	14.3	23.5	27.9	28.4	29.5	32.3	33.6	35.3
FOSSIL FUELS	39.0	45.6	40.3	34.2	31.6	27.7	27.8	28.3	22.0
TOTAL GB GENERATION (excl. Imports)	71.2	77.5	79.4	75.7	74.6	70.7	71.8	72.6	67.0
TOTAL GB CONSUMPTION (incl. Imports)	**75.8**	**79.0**	**80.9**	**79.7**	**79.6**	**76.1**	**76.4**	**71.4**	**72.1**
Fossil Fuel Percentage	51%	58%	50%	43%	40%	36%	36%	40%	30%
Clean Percentage	42%	40%	48%	52%	54%	56%	58%	62%	62%
Renewable Share of Clean Power	19%	18%	29%	35%	36%	39%	42%	47%	49%
SHARE OF GENERATION (%)									
Coal	22%	10%	10%	6%	3%	1%	2%	1%	2%
Gas	30%	48%	40%	37%	37%	35%	35%	38%	29%
Imports	6%	2%	2%	5%	6%	7%	6%	-2%	7%
Nuclear	23%	22%	19%	17%	18%	18%	15%	15%	13%
RENEWABLES (Biomass, Wind, Solar & Hydro)	19%	18%	29%	35%	36%	39%	42%	47%	49%

[1] https://www.gov.uk/government/statistics/energy-trends-section-6-renewables/Renewables obligation: certificates and generation (monthly - Excel)

Table 3 below shows key statistics on pricing in the quarter and all previous quarters over the last two years. The wholesale and within-day prices shown are averages across the quarter, whilst the system prices are given with minimum, average and maximum values[2]. Note that the values for domestic demand in Table 3 does not include interconnector demand.

Table 3 Quarterly price summary Q4 2021 to Q4 2023

*GB Only (Excludes Northern Ireland)	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023
WHOLESALE PRICES (£/MWh)									
EPEX Day-Ahead Price	205.27	200.80	155.32	294.75	171.15	127.62	88.66	78.08	82.37
Nordpool Day-Ahead price	205.27	200.80	155.32	294.75	171.15	127.42	89.06	78.36	82.57
Within Day Price (MIDP)	191.25	194.30	149.28	282.00	165.86	128.27	87.98	77.01	81.22
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	156.55	165.99	136.51	249.17	135.37	109.65	84.51	69.63	63.37
Peak Hours (excl Superpeak)	195.78	196.87	152.53	288.81	172.59	130.90	88.42	77.55	85.61
Superpeak Hours	254.87	249.86	166.86	332.71	211.67	161.45	94.30	91.93	106.64
SYSTEM PRICE (£/MWh)									
Maximum	3916.28	4035.98	494.23	890.00	1650.00	1950.00	370.00	239.46	310.00
Average	188.62	197.64	152.31	276.40	173.37	132.51	87.58	75.52	83.36
Minimum	-70.97	-90.32	-69.49	-68.73	-80.00	-95.71	-155.20	-185.33	-84.52
Domestic Demand (MW average)	30075.04	30737.82	24224.47	23571.40	27883.65	29695.59	23623.79	22631.16	28165.39
Domestic Demand incl. Embedded Gen (MW average)	32630.19	33967.59	27866.22	26781.58	30571.03	32532.45	27165.31	26127.64	31074.17
Domestic Demand (TWh total)	66.41	66.39	52.91	52.05	61.57	64.14	51.59	49.97	62.19
Domestic Demand Incl. Embedded Gen. (TWh total)	72.05	73.37	60.86	59.13	67.50	70.27	59.33	57.69	68.61

Table 4: Year-on-year comparison of Q4 prices

*GB Only (Excludes Northern Ireland)	Q4 2015	Q4 2016	Q4 2017	Q4 2018	Q4 2019	Q4 2020	Q4 2021	Q4 2022	Q4 2023
WHOLESALE PRICES (£/MWh)									
EPEX Day-Ahead Price	37.56	52.20	50.23	62.97	40.09	47.51	205.27	171.15	82.37
Nordpool Day-Ahead price	37.56	52.20	50.23	62.97	40.09	47.51	205.27	171.15	82.57
Within Day Price (MIDP)	37.32	50.43	49.61	61.45	38.64	45.42	191.25	165.86	81.22
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	29.72	37.24	43.42	53.89	31.62	33.49	156.55	135.37	63.37
Peak Hours (excl Superpeak)	37.97	48.23	50.27	62.08	39.83	47.55	195.78	172.59	85.61
Superpeak Hours	52.37	87.81	61.41	76.66	50.39	65.25	254.87	211.67	106.64
SYSTEM PRICE (£/MWh)									
Maximum	419.50	1528.72	178.00	191.37	160.00	849.82	3916.28	1650.00	310.00
Average	42.15	51.26	49.38	62.24	39.86	47.49	188.62	173.37	83.36
Minimum	-73.48	-153.89	-69.17	-68.40	-88.00	-63.93	-70.97	-80.00	-84.52
Domestic Demand (MW average)	33183.53	33552.21	32476.26	31702.21	31896.10	30302.98	30075.04	27883.65	28165.39
Domestic Demand incl. Embedded Gen (MW average)	34743.70	35330.19	34623.29	33955.87	33988.98	32515.27	32630.19	30571.03	31074.17
Domestic Demand (TWh total)	73.27	74.08	71.71	70.00	70.43	66.91	66.41	61.57	62.19
Domestic Demand Incl. Embedded Gen. (TWh total)	76.71	78.01	76.45	74.97	75.05	71.79	72.05	67.50	68.61

[2] Peak is 08:00 – 16:00 and 19:30 – 00:00; Super Peak is 16:00 – 19:30; Off-Peak is 00:00 – 08:00.

2 Notes on the Report

The figures used in the report refer to GB only, unlike those reported by BEIS that refer to GB and Northern Ireland. This selection has been made since the Northern Ireland electricity market is separate from the GB electricity market and is part of the Ireland all-island I-SEM market.

Generation levels by fuel from 2009 onwards are based upon National Grid fuel mix data published by Elexon as the BMRS FUELHH data, which give the operationally metered totals by fuel, down to a 5-minute resolution.

Prior to 2009, individual plant data has been aggregated from our database matching the National Grid fuel-type relationships.

To account for embedded wind and solar, the National Grid forecasts for these generators have been used as if they were output figures. Embedded hydro and biomass have been accounted for using analysis of Ofgem data on certificate awards. This embedded hydro and biomass data is published at a lag of approximately three months, so the reporting quarter will not have actual data for this section of these two fleets, instead values are estimated from the respective quarter the previous year.

Within this report, levels of offshore wind have not been separated from the wind total. This is because this can only be reliably done using metered volumes at a generating unit level. This is not a publicly available data stream and figures can only be estimated. Final Physical Notifications (FPNs) at wind farms do not correlate well with metered volumes and so cannot be used reliably.

Price and demand data primarily come from Elexon (as does the FUELHH data), with the exception of the EPEX day-ahead prices.

Availability levels are calculated by totalling levels of recorded availability at all plants in the market.

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This report has been created using our pan-European ***market data platform****, which has flexible configurable screens and automated data feeds. If you would like to gain more detailed information and insight, please contact us to arrange trial access to the platform via: sales@enappsys.com*

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