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GB Electricity Market Summary

Q2-2023

April to June

Generation and Contribution by Fuel Type

Renewables:	23.89TWh (-29%)	Gas:	22.04TWh (-6%)	Nuclear:	9.53TWh (+3%)
Renewables excl. biomass:	19.15TWh (-30%)	Coal:	0.09TWh (-90%)	Net Imports:	7.35TWh (+1%)

% changes stated with respect to values in the previous quarter

1 Quarterly Review of GB Electricity Market Q2 2023

Electricity prices during Q2 2023 followed the downward trend of wholesale gas prices which fell through the quarter until early June as Europe emerged from the winter with record high gas stocks in storage at the end of Q1 2023. As a consequence, market expectations were that the refilling of stocks through the summer season would be easier than had been anticipated ahead of the winter and this, coupled with expectations of weak economic growth, exerted a downward influence on market gas prices which fed through into the electricity market as a result of lower generation costs. However, from early June onwards gas, and consequently electricity prices, rose due to increased competition for LNG shipments between Europe and Asia; an extension of the maintenance period at Nyhamma gas processing plant in Norway; and the announcement that the Groningen gas field in the Netherlands would close in the autumn.

As well as declining gas prices, increased French nuclear availability and low demand this quarter contributed to the GB power market continuing its recovery from the turbulent events of 2022. Wholesale power prices decreased to levels last seen in the summer of 2021 and the interconnectors returned to a position of net imports comparable to that seen before Russia's invasion of Ukraine, though it should be noted that prices in summer 2021 were still notably higher than historical averages, so prices currently remain high relative to these long-term averages.

A 20% decrease in demand from the previous quarter's level of 64.1TWh to 51.6TWh was observed, reflecting normal seasonal variations and also some underlying demand reduction. This was the lowest transmission level demand seen in GB in any quarter since the 49.0TWh in Q2 2020 during the first COVID-19 lockdown. Consequently, electricity prices this quarter were lower than those seen in recent quarters with an average day-ahead price of £88.66/MWh in the EPEX auction and £89.06/MWh in Nordpool. The highest day-ahead price of £170.00/MWh occurred in early April when gas prices were the around the highest they would be all quarter and demand had only just begun its seasonal decline.

These low prices were seen despite **renewable generation being lower than in Q2 2022**. Total wind generation for the quarter stood at 13.39TWh, lower than the 15.91TWh of Q2 2022 but higher than the 11.48TWh of Q2 2021. Solar generation, on the other hand, was high at 4.95TWh, higher than any Q2 since the 5.06TWh in Q2 2020.

Despite lower renewable generation, **the level of gas–fired generation was low compared with recent quarters**. In comparison with Q2 periods in recent years, only 2020, which was affected by the COVID-19 pandemic, and 2015, which was affected by coal plants using up coal stocks ahead of the LCPD deadline, saw lower levels of Q2 gas-fired output.

Nuclear generation output in GB for Q2 was slightly higher than in Q1 but lower than recent quarters prior to that reflecting the impact of recent closures of Hinkley B in August 2022 and Hunterston at the end of 2021.

The key takeaways from this quarter are:

- **Lowest demand since Q2 2020:** Demand is typically lower at this time of year than in winter, but this quarter saw lower demand than any quarter since 2020 with a total demand of 51.6TWh, only 5% higher than the 49.0TWh in Q2 2020 when the COVID-19 pandemic was strongly dampening European demand. This was in part due to the demand destruction seen from both industry and consumers as power users changed their habits due to the high prices seen in recent quarters.
- **Lower conventional and renewable generation:** As a consequence of lower demand this quarter, GB's domestic generation dropped with declines seen in both conventional as well as renewable generation types. Wind, biomass, and coal saw the most significant drops from the previous quarter with changes of 44%, 21% and 90%, respectively.
- **Interconnector flows in net import position:** Net power imports into GB continued this quarter with a total net import volume of 7.35TWh, a slight increase from the levels seen in the previous quarter. This quarter marks two consecutive quarters of net imports, following three consecutive quarters of net exports in 2022 which occurred as a consequence of French nuclear outages and lower generation costs prevailing in the UK for gas-fired generation. Power imports this quarter were the highest for any quarter since Q3 2021, with the largest contributions of 4.6TWh and 2.3TWh import volumes coming from France and Norway respectively.
- **Gas prices in decline:** Alongside the reduction in conventional generation this quarter, gas prices fell from April through to early June, dropping as low as £19.47/MWh. Across June, however, a sharp rise in gas prices was observed, peaking at £35.34/MWh. Carbon prices fell across the quarter with the UK ETS prices peaking at £74/te in early April and closing the quarter at a low of £50/te.
- **Negative system pricing:** System prices were generally low across the quarter and decreased on average by 34% compared to the previous quarter. The average system price of £87.58/MWh was the lowest for any quarter since Q2 2021 and was reduced due to more periods of negative pricing being observed than is typical, with system prices dropping as low as -£155.20/MWh in May. Day-ahead prices also dropped beneath £0/MWh on occasion during periods of high renewable generation. More extreme negative pricing was seen elsewhere in Europe, particularly in the Netherlands and Germany where prices dropped well beneath -€100/MWh at times.
- **Heatwave in mid-June:** High temperatures in mid-June resulted in unusually high demand. Solar output was hindered by the very high temperatures, resulting in a short system for much of the time and maintenance at several CCGT units reduced the available upward margin which caused high system prices that were frequently around double the day-ahead prices for several consecutive days. Uniper's Ratcliffe-on-Soar coal plant was brought online at this time.

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 Q2 2023 (TWh)

*GB Only (Excludes Northern Ireland)	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
TOTAL GENERATION BY FUEL (TWh)									
Coal	0.55	1.15	1.23	1.88	0.33	1.12	0.94	0.93	0.09
Gas	27.10	25.36	26.57	24.63	28.70	30.63	27.38	23.46	22.04
Imports	6.09	7.74	4.62	5.23	-3.64	-4.59	-1.20	7.25	7.35
Nuclear	10.79	10.09	11.66	11.74	12.14	10.17	10.64	9.21	9.53
Biomass	7.04	6.32	7.71	7.03	5.40	6.37	5.52	5.97	4.74
Wind	11.48	10.41	21.29	23.27	15.91	13.46	24.82	23.98	13.39
Solar	4.53	3.75	1.25	1.98	4.46	4.25	1.43	1.69	4.95
Hydro	1.10	0.63	2.05	1.93	1.03	0.74	1.84	1.81	0.81
RENEWABLES (Biomass, Wind, Solar & Hydro)	24.16	21.11	32.30	34.21	26.79	24.82	33.61	33.46	23.89
NON-DISPATCHABLE RENEWABLES (Wind, Solar & Hydro)	17.12	14.79	24.59	27.18	21.40	18.45	28.09	27.49	19.15
FOSSIL FUELS (Gas & Coal)	27.65	26.51	27.80	26.51	29.04	31.76	28.31	24.39	22.13
TOTAL GB GENERATION (excl. Imports)	62.60	57.72	71.76	72.46	67.97	66.75	72.56	67.07	55.55
TOTAL GB CONSUMPTION (incl. Imports)	**68.69**	**65.45**	**76.38**	**77.70**	**64.33**	**62.15**	**71.36**	**74.32**	**62.90**
Fossil Fuel Percentage	40%	41%	36%	34%	45%	51%	40%	33%	35%
Clean Percentage (Renewable & Nuclear)	51%	48%	58%	59%	61%	56%	62%	57%	53%
Renewable Share of Clean Power	69%	68%	73%	74%	69%	71%	76%	78%	71%
SHARE OF GENERATION (%)									
Coal	0.8%	1.8%	1.6%	2.4%	0.5%	1.8%	1.3%	1.3%	0.1%
Gas	39.5%	38.7%	34.8%	31.7%	44.6%	49.3%	38.4%	31.6%	35.0%
Imports	8.9%	11.8%	6.0%	6.7%	-5.7%	-7.4%	-1.7%	9.8%	11.7%
Nuclear	15.7%	15.4%	15.3%	15.1%	18.9%	16.4%	14.9%	12.4%	15.2%
Renewables (Biomass, Wind, Solar & Hydro)	35.2%	32.3%	42.3%	44.0%	41.7%	39.9%	47.1%	45.0%	38.0%

Table 2: Year-on-year comparison of Q2 generation output (TWh and %)

*GB Only (Excludes Northern Ireland)	Q2 2015	Q2 2016	Q2 2017	Q2 2018	Q2 2019	Q2 2020	Q2 2021	Q2 2022	Q2 2023
TOTAL GENERATION BY FUEL (TWh)									
Coal	16.60	4.05	1.30	0.92	0.36	0.11	0.55	0.33	0.09
Gas	19.63	30.58	27.65	27.99	28.27	18.85	27.10	28.70	22.04
Imports	5.48	5.67	5.40	5.06	5.67	4.59	6.09	-3.64	7.35
Nuclear	15.81	15.57	16.59	15.48	12.27	11.22	10.79	12.14	9.53
RENEWABLES (Biomass, Wind, Solar & Hydro)	13.47	12.95	17.49	21.04	23.15	25.89	24.16	26.79	23.89
FOSSIL FUELS	36.22	34.63	28.95	28.91	28.63	18.96	27.65	29.04	22.13
TOTAL GB GENERATION (excl. Imports)	65.51	63.15	63.03	65.42	64.05	56.07	62.60	67.97	55.55
TOTAL GB CONSUMPTION (incl. Imports)	**70.99**	**68.82**	**68.43**	**70.49**	**69.71**	**60.66**	**68.69**	**64.33**	**62.90**
Fossil Fuel Percentage	51%	50%	42%	41%	41%	31%	40%	45%	35%
Clean Percentage	41%	41%	50%	52%	51%	61%	51%	61%	53%
Renewable Share of Clean Power	19%	19%	26%	30%	33%	43%	35%	42%	38%
SHARE OF GENERATION (%)									
Coal	23.4%	5.9%	1.9%	1.3%	0.5%	0.2%	0.8%	0.5%	0.1%
Gas	27.6%	44.4%	40.4%	39.7%	40.6%	31.1%	39.5%	44.6%	35.0%
Imports	7.7%	8.2%	7.9%	7.2%	8.1%	7.6%	8.9%	-5.7%	11.7%
Nuclear	22.3%	22.6%	24.2%	22.0%	17.6%	18.5%	15.7%	18.9%	15.2%
RENEWABLES (Biomass, Wind, Solar & Hydro)	19.0%	18.8%	25.6%	29.8%	33.2%	42.7%	35.2%	41.7%	38.0%

[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 Q2 2021 to Q2 2023

*GB Only (Excludes Northern Ireland)	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
WHOLESALE PRICES (£/MWh)									
EPEX Day-Ahead Price	72.20	128.59	205.27	200.80	155.32	294.75	171.15	127.62	88.66
Nordpool Day-Ahead price	72.20	128.59	205.27	200.80	155.32	294.79	168.79	127.42	89.06
Within Day Price (MIDP)	71.80	125.19	191.25	194.30	149.28	282.00	165.86	128.27	87.98
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	62.71	100.21	156.55	165.99	136.51	249.17	135.37	109.65	84.51
Peak Hours (excl Superpeak)	75.06	129.48	195.78	196.87	152.53	288.81	172.59	130.90	88.42
Superpeak Hours	81.01	166.34	254.87	249.86	166.86	332.71	211.67	161.45	94.30
SYSTEM PRICE (£/MWh)									
Maximum	1971.59	4037.80	3916.28	4035.98	494.23	890.00	1650.00	1950.00	370.00
Average	74.85	126.14	188.62	197.64	152.31	276.40	173.37	132.51	87.58
Minimum	-59.95	-66.73	-70.97	-90.32	-69.49	-68.73	-80.00	-95.71	-155.20
Domestic Demand (MW average)	26,323	25,258	30,075	30,738	24,224	23,571	27,884	29,696	23,624
Domestic Demand incl. Embedded Gen (MW average)	29,719	28,023	32,630	33,968	27,866	26,782	30,571	32,532	27,165
Domestic Demand (TWh total)	57.5	55.8	66.4	66.4	52.9	52.0	61.6	64.1	51.6
Domestic Demand Incl. Embedded Gen. (TWh total)	64.9	61.9	72.0	73.4	60.9	59.1	67.5	70.3	59.3

Table 4: Year-on-year comparison of Q2 prices

*GB Only (Excludes Northern Ireland)	Q2 2015	Q2 2016	Q2 2017	Q2 2018	Q2 2019	Q2 2020	Q2 2021	Q2 2022	Q2 2023
WHOLESALE PRICES (£/MWh)									
EPEX Day-Ahead Price	41.96	35.06	40.04	52.66	41.18	24.25	72.20	155.32	88.66
Nordpool Day-Ahead price	41.96	35.06	40.04	52.66	41.18	24.25	72.20	155.32	89.06
Within Day Price (MIDP)	40.77	34.01	39.95	51.61	41.00	23.49	71.80	149.28	87.98
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	34.35	28.59	33.83	46.22	36.54	19.59	62.71	136.51	84.51
Peak Hours (excl Superpeak)	43.61	35.72	41.71	53.35	42.36	24.66	75.06	152.53	88.42
Superpeak Hours	45.33	40.28	47.47	57.74	46.23	28.21	81.01	166.86	94.30
SYSTEM PRICE (£/MWh)									
Maximum	132.90	480.38	1509.80	158.00	375.00	100.00	1971.59	494.23	370.00
Average	45.79	34.58	40.43	50.53	41.23	24.76	74.85	152.31	87.58
Minimum	-2.61	-100.00	-73.15	-92.38	-71.26	-70.49	-59.95	-69.49	-155.20
Domestic Demand (MW average)	29,621	29,117	27,465	27,419	26,953	22,431	26,323	24,224	23,624
Domestic Demand incl. Embedded Gen (MW average)	31,853	31,790	30,751	30,677	30,132	26,023	29,719	27,866	27,165
Domestic Demand (TWh total)	64.7	63.6	60.0	59.9	58.9	49.0	57.5	52.9	51.6
Domestic Demand Incl. Embedded Gen. (TWh total)	69.6	69.4	67.2	67.0	65.8	56.8	64.9	60.9	59.3

[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.

EnAppSys offers incredibly detailed market insights and consultancy services for companies in the energy industry.

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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