

GB Electricity Market Summary

Q2-2022

April to June

Issued: 05/07/2022

Generation and Contribution by Fuel Type

Renewables:	26.87TWh (-21%)	Gas:	28.70TWh (+17%)	Nuclear:	12.14TWh (+3%)
Renewables excl biomass:	21.42TWh (-21%)	Coal:	0.33TWh (-82%)	Net Imports:	-3.64TWh (-170%)

% changes stated with respect to values in the previous quarter

Contents

1	Quarterly Review of GB Electricity Market Q2 2022	3
	Demand.....	5
	Generation.....	5
	Prices	6
	Interconnectors.....	6
2	Appendix: Supporting Tables.....	8
3	Notes on the Report	10

1 Quarterly Review of GB Electricity Market Q2 2022

This quarter in the GB electricity market was very notable for interconnector flows flipping from a net import position to a net export position. GB has generally been a net importer of electricity, but this quarter the geo-political and logistical circumstances caused a change in net interconnector flow direction with exports of 3.6TWh over the quarter (corresponding to 5.7% of GB electricity generation) compared with imports of 5.2TWh in the previous quarter. This ultimately arose from a combination of the events in Ukraine; GB's position with regards to LNG imports within Europe; and reduced availability in the French nuclear fleet as a consequence of stress corrosion cracking problems.

Following Russia's military action in Ukraine, gas supplies to Europe from Russia were cut substantially and future plans for expansion, including a Nord Stream 2 pipeline from Russia to Germany, were shelved. This caused some uncertainty in European gas supplies that resulted in the gas prices increasing significantly across the continent in the immediate aftermath of the invasion. Prevailing gas prices had peaked at £208/MWh on 7th March but had fallen back to open the Q2 period at £86/MWh, declining further to close the quarter at £51/MWh.

The quarter saw increased LNG imports into GB and increased exports of gas from GB into mainland Europe and Ireland. Electricity exports to mainland Europe increased in the quarter fuelled by GB gas-fired electricity generation that increased in the quarter to meet this additional demand. During the quarter, there were a couple of intervals of excess gas supply during which GB gas prices fell to low levels. These occurred during days of low electricity demand coupled with high wind generation. Some maintenance at gas interconnectors that reduced capacity also contributed to the excess of gas. GB gas prices fell as low as £4.57/MWh on 9th June, the lowest prices seen since the summer of 2020 when demand was significantly reduced by lockdown from the COVID-19 pandemic.

As a result of lower gas prices in the GB market, wholesale electricity prices became lower than those in neighbouring countries and so electricity interconnector flows changed from predominantly importing into GB to predominantly exporting from GB. This was also driven because of some units in the French nuclear fleet exhibiting stress corrosion cracking which decreased supply and further increased the need for French imports from GB.

The GB gas market relies on LNG imports and therefore has developed LNG import and storage infrastructure. Unlike the continent GB does not have a high capacity of traditional gas storage having decommissioned some of its historical storage assets (e.g. Rough storage). Gas interconnection with our neighbours is also relatively low compared with power interconnection and hence a decline in power demand coupled with high LNG delivery can create the circumstances where gas prices in

GB can become very low versus continental gas prices. Turning this gas into power and exporting it to the continent is a way of exporting this excess gas.

The key points from the quarter are:

- Interconnectors changed from a net import position to a net export position overall for the quarter
- Demand was materially lower than previous Q2 periods
- Wind generation was the highest for any Q2 on record, though it was less than Q1 2022
- All other types of renewables saw less total generation than in Q2 2021 or in Q1 2022
- Gas prices opened the quarter at £86/MWh, down from the record highs seen following the outbreak of the Ukraine war during the previous quarter and reduced further to end the quarter at 51/MWh. There were two brief intervals of very low prices seen 10th May and 9th June with prices down to the lowest levels seen since summer 2020
- Gas-fired generation was the highest of any quarter since Q1 2021
- Nuclear output for the quarter was higher than any quarter since Q4 2020
- Less coal generation was seen than in Q2 2021 with over a month in which no coal generation was seen at all
- Wholesale prices were around double what they were in Q2 2021 but around 20-30% lower than Q1 2022

Demand

Demand was lower than in Q2 2021 and Q1 2022, indicating that the overall trend of decreasing transmission level system demand seen in the last few years is continuing. Total transmission level system demand was 52.9TWh this quarter (against 57.5TWh in Q2 2021 and 66.4TWh in Q1 2022). When embedded generation is included, this increases to 60.9TWh, the lowest overall demand seen in any quarter since Q3 2020.

Generation

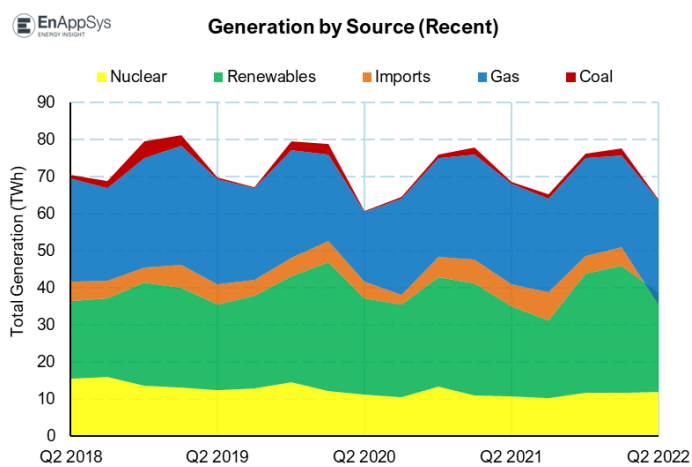


Figure 1: Stacked total quarterly generation by the main fuel groups

The gas-fired CCGT fleet remained the largest contributor to the generation mix with a total generation of 29TWh. This is the highest level of gas-fired generation seen since Q4 2019 despite wind generation being the highest of any Q2 on record and GB demand being low. This large presence of gas-fired generation in the generation mix despite relatively high renewable

generation is a consequence of high levels of exports driven by GB gas prices that are lower than in mainland Europe and concerns over storage issues.

Renewables including biomass (i.e. biomass, wind, solar and hydro) totalled 26.9TWh, making this the first quarter in which total renewables outturn was less than the total gas generation in the quarter since Q3 2021. Wind was the largest renewable source at 15.8TWh, followed by biomass at 5.4TWh and solar at 4.4TWh.

Prices

Despite low gas prices bringing wholesale prices down considerably from the extreme highs seen in the previous two quarters, prices this quarter were still very high within a wider historical context, being around double the prices from Q2 2021. Day-ahead prices averaged £155.28/MWh for the EPEX auction and £153.37/MWh for Nordpool. On Saturday 11th June, when gas prices dipped to low values, day-ahead prices dipped to their minimum for the quarter at £0.44/MWh for EPEX (SP29) and -£2.49/MWh for Nordpool (SP27). These are the lowest day-ahead prices seen since early January, before the war in Ukraine began. This highlights the effect that low demand, high wind generation and strong gas supply levels can have on the market. After being above that for coal-fired units during Q1, the breakeven range for CCGT units fell back beneath that of coal units for almost all of this quarter as can be seen in Figure 2.

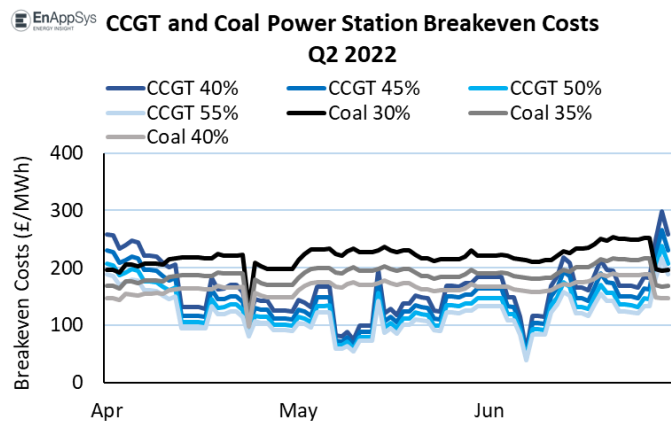


Figure 2: Breakeven costs for coal- and gas-fired units across Q2 2022.

Interconnectors

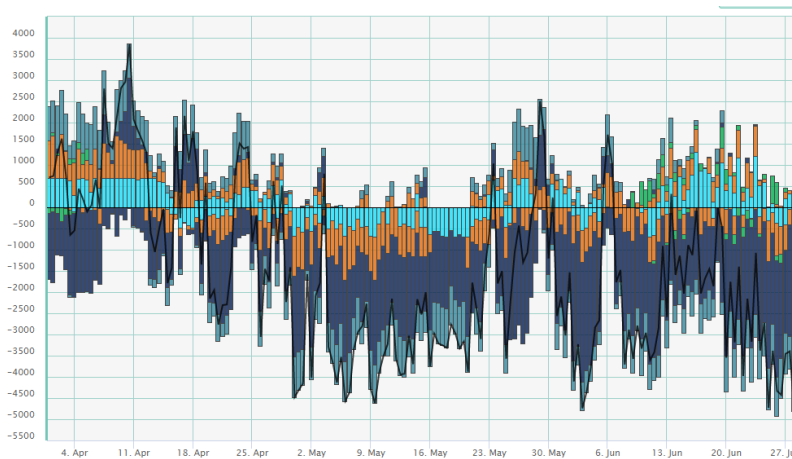


Figure 3: GB physical flows by country for Q2 2022. Orange=NL, Dark Blue=FR, Grey=BE, Green=ISEM, Light Blue=NO

The net export across the interconnectors this quarter was 3.64TWh, a change of significant magnitude from the 5.23TWh imports seen in the previous quarter. France was by far the largest consumer due to the issues in the French nuclear fleet and the large interconnection capacity. With the third interconnector between GB and France, ElecLink, going live on 25th May 2022, total interconnector capacity with France increased to 3GW, most of which was in an export position for the majority of the quarter. A net

volume of 3.3TWh was exported to France this quarter, with all three interconnectors seeing high utilisation.

The longer term context becomes apparent when seen against the trend over the last 7 years as shown in Figure 4.¹

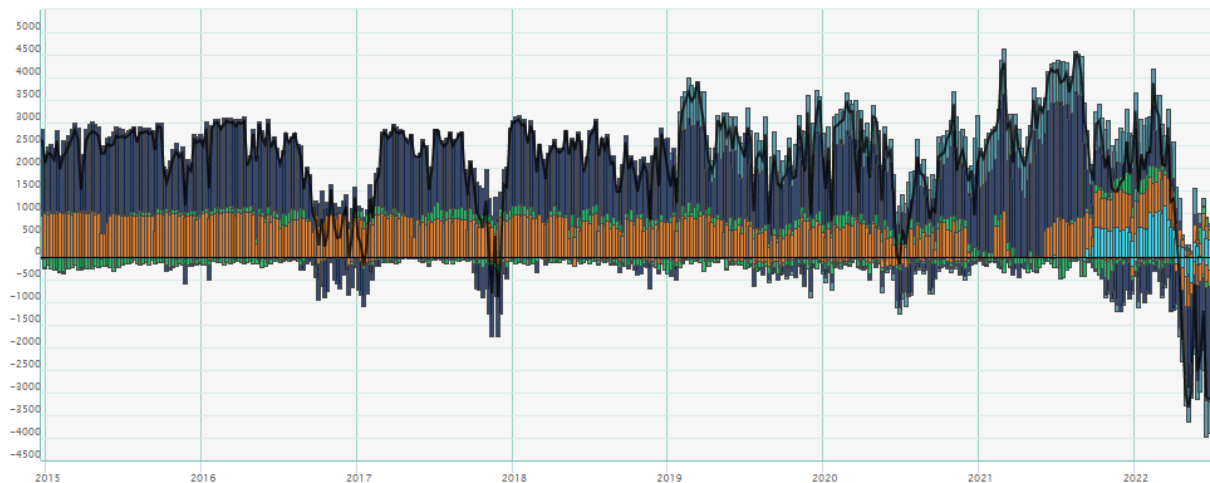


Figure 4 - GB physical flows by country for **2015-2022**. Orange=NL, Dark Blue=FR, Grey=BE, Green=ISEM, Light Blue=NO

Also notable in this context were the flows between GB and Norway. The North Sea Link between GB and Norway had commenced operation October 2021 and had primarily exported energy into the GB market, but during Q2 2022 began to receive imports from the GB market.

¹ Charts from EnAppSys platform:

<https://app.enappsys.com/#gb/elec/inter/bycountry/chart&start=202204010000&end=202207010100>

2 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 BEIS². Note that all percentages are given as a percentage of total generation including imports.

Table 1: Quarterly generation summary Q2 2022 (TWh)

*GB Only (Excludes Northern Ireland)	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022
TOTAL GENERATION BY FUEL (TWh)									
Coal	0.11	0.27	1.06	2.05	0.55	1.15	1.23	1.88	0.33
Gas	18.85	26.18	26.67	28.42	27.10	25.36	26.57	24.63	28.70
Imports	4.59	2.51	5.40	6.44	6.09	7.74	4.62	5.23	-3.64
Nuclear	11.22	10.43	13.43	10.85	10.79	10.09	11.66	11.74	12.14
Biomass	7.05	6.35	7.12	7.64	7.04	6.23	7.58	7.00	5.45
Wind	12.59	13.68	19.01	19.25	11.48	10.41	21.29	23.27	15.91
Solar	5.06	3.86	1.16	1.69	4.53	3.75	1.25	1.98	4.46
Hydro	1.19	1.21	2.24	1.71	1.09	0.61	2.10	1.87	1.05
RENEWABLES (Biomass, Wind, Solar & Hydro)	25.89	25.09	29.52	30.29	24.14	21.00	32.23	34.12	26.87
NON-DISPATCHABLE RENEWABLES (Wind, Solar & Hydro)	18.84	18.75	22.40	22.65	17.10	14.77	24.65	27.12	21.42
FOSSIL FUELS (Gas & Coal)	18.96	26.44	27.72	30.46	27.65	26.51	27.80	26.51	29.04
TOTAL GB GENERATION (excl. Imports)	56.07	61.96	70.67	71.61	62.58	57.60	71.68	72.38	68.04
TOTAL GB CONSUMPTION (incl. Imports)	60.66	64.47	76.07	78.04	68.68	65.34	76.30	77.61	64.40
Fossil Fuel Percentage	31%	41%	36%	39%	40%	41%	36%	34%	45%
Clean Percentage (Renewable & Nuclear)	61%	55%	56%	53%	51%	48%	58%	59%	61%
Renewable Share of Clean Power	70%	71%	69%	74%	69%	68%	73%	74%	69%
SHARE OF GENERATION (%)									
Coal	0.2%	0.4%	1.4%	2.6%	0.8%	1.8%	1.6%	2.4%	0.5%
Gas	31.1%	40.6%	35.1%	36.4%	39.5%	38.8%	34.8%	31.7%	44.6%
Imports	7.6%	3.9%	7.1%	8.2%	8.9%	11.8%	6.1%	6.7%	-5.7%
Nuclear	18.5%	16.2%	17.6%	13.9%	15.7%	15.4%	15.3%	15.1%	18.8%
Renewables (Biomass, Wind, Solar & Hydro)	42.7%	38.9%	38.8%	38.8%	35.2%	32.1%	42.2%	44.0%	41.7%

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

*GB Only (Excludes Northern Ireland)	Q2 2014	Q2 2015	Q2 2016	Q2 2017	Q2 2018	Q2 2019	Q2 2020	Q2 2021	Q2 2022
TOTAL GENERATION BY FUEL (TWh)									
Coal	21.11	16.60	4.05	1.30	0.92	0.36	0.11	0.55	0.33
Gas	20.67	19.63	30.58	27.65	27.99	28.27	18.85	27.10	28.70
Imports	4.78	5.48	5.67	5.40	5.06	5.67	4.59	6.09	-3.64
Nuclear	16.30	15.81	15.57	16.59	15.48	12.27	11.22	10.79	12.14
RENEWABLES (Biomass, Wind, Solar & Hydro)	9.10	13.47	12.95	17.49	21.04	23.15	25.89	24.14	26.87
FOSSIL FUELS	41.77	36.22	34.63	28.95	28.91	28.63	18.96	27.65	29.04
TOTAL GB GENERATION (excl. Imports)	67.17	65.51	63.15	63.03	65.42	64.05	56.07	62.58	68.04
TOTAL GB CONSUMPTION (incl. Imports)	71.96	70.99	68.82	68.43	70.49	69.71	60.66	68.68	64.40
Fossil Fuel Percentage	58%	51%	50%	42%	41%	41%	31%	40%	45%
Clean Percentage	35%	41%	41%	50%	52%	51%	61%	51%	61%
Renewable Share of Clean Power	13%	19%	19%	26%	30%	33%	43%	35%	42%
SHARE OF GENERATION (%)									
Coal	29.3%	23.4%	5.9%	1.9%	1.3%	0.5%	0.2%	0.8%	0.5%
Gas	28.7%	27.6%	44.4%	40.4%	39.7%	40.6%	31.1%	39.5%	44.6%
Imports	6.6%	7.7%	8.2%	7.9%	7.2%	8.1%	7.6%	8.9%	-5.7%
Nuclear	22.6%	22.3%	22.6%	24.2%	22.0%	17.6%	18.5%	15.7%	18.8%
RENEWABLES (Biomass, Wind, Solar & Hydro)	12.7%	19.0%	18.8%	25.6%	29.8%	33.2%	42.7%	35.2%	41.7%

² [https://www.gov.uk/government/statistics/energy-trends-section-6-renewables/Renewables obligation: certificates and generation \(monthly - Excel\)](https://www.gov.uk/government/statistics/energy-trends-section-6-renewables/Renewables%20obligation%3A%20certificates%20and%20generation%20(monthly%20-%20Excel))

Table 3 below shows key statistics on generation in the quarter and all previous quarters over the last two years. The wholesale and within-day prices shown are averages across the quarter in Table 4, whilst the system prices are given with minimum, average and maximum values³.

Table 3 Quarterly price summary Q2 2020 to Q2 2022

*GB Only (Excludes Northern Ireland)	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022
WHOLESALE PRICES (£/MWh)									
EPEX Day-Ahead Price	24.25	36.42	47.51	63.67	72.20	128.59	205.27	200.80	155.32
Nordpool Day-Ahead price	24.25	36.42	47.51	63.67	72.20	129.23	203.17	199.63	153.40
Within Day Price (MIDP)	23.49	35.33	45.42	59.62	71.80	125.19	191.25	194.30	149.28
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	19.59	28.82	33.49	46.19	62.71	100.21	156.55	165.99	136.51
Peak Hours (excl Superpeak)	24.66	36.77	47.55	58.89	75.06	129.48	195.78	196.87	152.53
Superpeak Hours	28.21	45.11	65.25	93.27	81.01	166.34	254.87	249.86	166.86
SYSTEM PRICE (£/MWh)									
Maximum	100.00	540.22	849.82	4000.00	1971.59	4037.80	3916.28	4035.98	494.23
Average	24.76	35.54	47.49	62.04	74.85	126.14	188.62	197.64	152.31
Minimum	-70.49	-60.00	-63.93	-61.00	-59.95	-66.73	-70.97	-90.32	-69.49
Transmission System Demand (MW average)	22,431	24,380	30,303	30,593	26,323	25,258	30,075	30,738	24,224
Demand Incl. Embedded Gen. (MW average)	26,023	27,443	32,515	33,148	29,719	28,023	32,630	33,968	27,866
Transmission System Demand (TWh total)	49.0	53.8	66.9	66.1	57.5	55.8	66.4	66.4	52.9
Demand Incl. Embedded Gen. (TWh total)	56.8	60.6	71.8	71.6	64.9	61.9	72.0	73.4	60.9

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

*GB Only (Excludes Northern Ireland)	Q2 2014	Q2 2015	Q2 2016	Q2 2017	Q2 2018	Q2 2019	Q2 2020	Q2 2021	Q2 2022
WHOLESALE PRICES (£/MWh)									
EPEX Day-Ahead Price	39.18	41.96	35.06	40.04	52.66	41.18	24.25	72.20	155.32
Nordpool Day-Ahead price	39.18	41.96	35.06	40.04	52.66	41.18	24.25	72.20	153.40
Within Day Price (MIDP)	39.65	40.77	34.01	39.95	51.61	41.00	23.49	71.80	149.28
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	33.86	34.35	28.59	33.83	46.22	36.54	19.59	62.71	136.51
Peak Hours (excl Superpeak)	42.30	43.61	35.72	41.71	53.35	42.36	24.66	75.06	152.53
Superpeak Hours	43.46	45.33	40.28	47.47	57.74	46.23	28.21	81.01	166.86
SYSTEM PRICE (£/MWh)									
Maximum	152.29	132.90	480.38	1509.80	158.00	375.00	100.00	1971.59	494.23
Average	44.28	45.79	34.58	40.43	50.53	41.23	24.76	74.85	152.31
Minimum	25.06	-2.61	-100.00	-73.15	-92.38	-71.26	-70.49	-59.95	-69.49
Transmission System Demand (MW average)	30,917	29,621	29,117	27,465	27,419	26,953	22,431	26,323	24,224
Demand Incl. Embedded Gen. (MW average)	32,092	31,853	31,790	30,751	30,677	30,132	26,023	29,719	27,866
Transmission System Demand (TWh total)	67.5	64.7	63.6	60.0	59.9	58.9	49.0	57.5	52.9
Demand Incl. Embedded Gen. (TWh total)	70.1	69.6	69.4	67.2	67.0	65.8	56.8	64.9	60.9

³ 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.

3 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 all-island I-SEM market.

Generation levels by fuel from 2009 onwards are based upon National Grid 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 databased matching of 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 APX 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*

To find out more about EnAppSys contact us via: info@enappsys.com or visit our website at: www.enappsys.com



EnAppSys Ltd.

Blenheim House, 1 Falcon Court, Stockton On-Tees, TS18 3TS, U.K.
Company Registration No.:04685938

EnAppSys B.V.

Oostelijk Bolwerk 9, 1st Floor, 4531 GP, Terneuzen, The Netherlands
Company Registration No.: 67992358

