

GB Electricity Market Summary

Q1-2021

January to March

Generation and Contribution by Fuel Type

Renewables:	27.1TWh (+3%)	Gas:	28.4TWh (+7%)	Nuclear:	10.9TWh (-19%)
Imports:	6.4TWh (+19%)	Coal:	2.1TWh (+94%)		

% changes stated with respect to values in the previous quarter

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1 Executive Summary

Quarter 1 2021 saw effects on the system of three key factors: low wind generation across GB and Europe in general, cold spells that were also felt in Europe and demand levels back close to pre-Covid levels.

Demand

The cold weather in the quarter meant that demand levels in Q1 2021 were close to those in previous Q1 periods, rather than seeing any significant Covid-related demand reduction. As in most Q1s, demand was higher than in the preceding Q4.

Generation

The cold weather, combined with relatively low wind levels for a Q1, meant that a greater proportion of fossil fuels were required than last Q1. Fossil fuels contributed 41% of total demand in the quarter, versus 36% from renewables. Nuclear had a 15% share. Of the fossil fuels, gas was by far the greatest contributor with 38% of total generation compared to 3% from coal. The return to high demand levels, coupled with relatively low wind generation across the quarter meant that the system was often tight. Average margin was 18% lower than that in Q1 last year and average spinning reserve was 7% lower. The CCGT fleet saw higher average utilisation at 51% compared to 38% in Q1 last year.

Prices

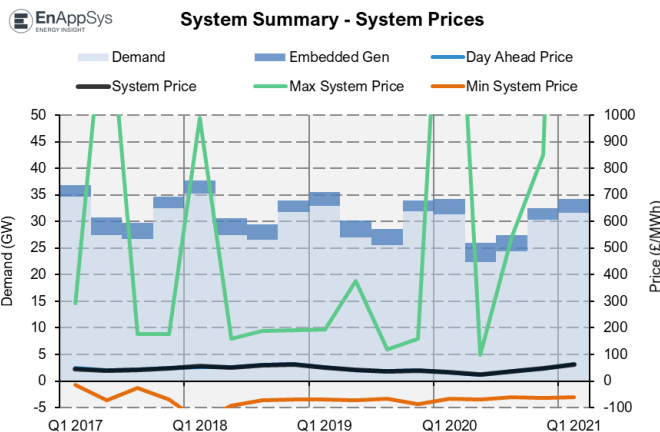
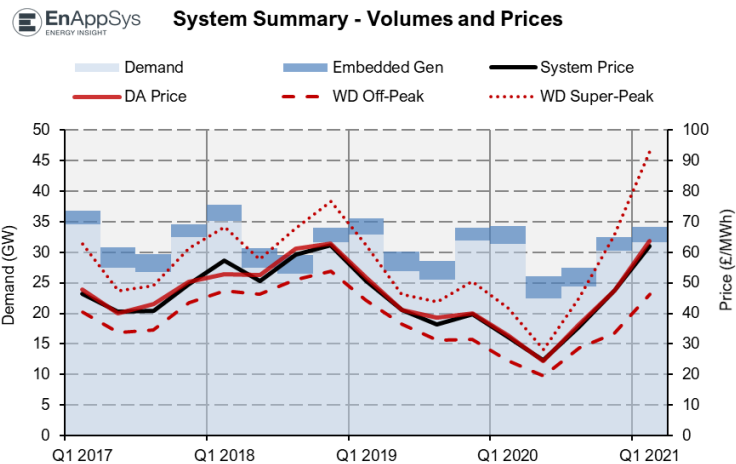
The periods of tight system resulting from the relatively high demand, combined with less renewables and more requirement for dispatchable fossil-fuel fired generation meant that there were several periods of high wholesale prices. System prices peaked at £4000/MWh during a cold spell and period of high demand in mid-January when high prices balancing actions to bring thermal units on and up to meet demand fed through into the system price. This is the highest system price seen since 2001.

2 Demand and Prices

Total demand (at the transmission system level) across Q1 2021 was 56.0TWh, close to the 55.7TWh in Q1 last year. Despite lockdown measures still being in effect across the quarter, cold spells meant that transmission system demand was still relatively high and back close to pre-Covid levels for this time of year. This situation coincided with similar conditions across Europe, with the continent as a whole seeing ~10TWh more demand this Q1 than last, as a result of colder temperatures.

This high demand combined with low wind generation to result in several tight periods in the quarter, with balancing needed to meet demand resulting in **very high system prices on occasion.**

Wholesale prices (Day-ahead and system) were notably higher this Q1 than last Q1 or Q4 2020.



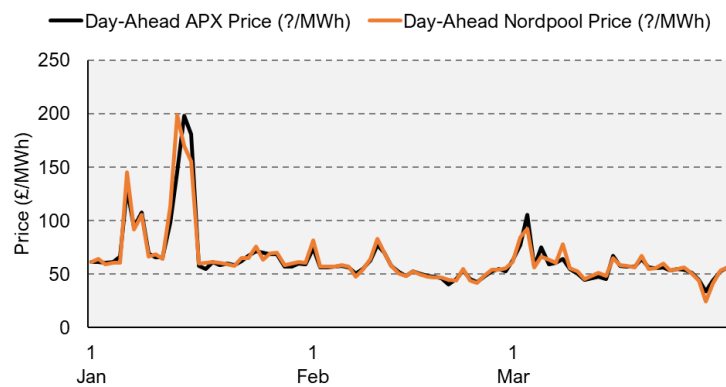
The average system price was £61.98/MWh, this is the highest in any Q1 back to 2014, with the next highest being an average of £57.41/MWh in Q1 2018.

This Q1 also saw a peak system price of £4000/MWh at 19:00 on Friday 8th January; this is the highest since the £4,993.88/MWh back in 2001, soon after NETA go-live.

With low wind and high demand, as for a lot of the month, margins of generation were very tight, and the APX Day-Ahead price had cleared at £89.00/MWh. The system had been tight through the evening, with £2,500/MWh already reached at 17:00. In this tight system, 20 offers were accepted, all of which were flagged as Energy Actions as National Grid brought several units, including coal, up and on to meet demand. **Whilst this was the peak system price event, similar conditions were seen throughout the start of the quarter, with tight system conditions resulting in the high average system prices seen.**

Following Brexit and the decoupling of GB and EU markets, **there are now two day-ahead markets, the APX and Nordpool.** As only one quarter of data exists, no comparative Q on Q analysis can be carried out, but the Nordpool average across Q1 was £64.23/MWh, compared to £63.59/MWh for the APX. On the

Daily Average Day-Ahead Prices



whole, the two markets tend to clear at similar prices, as can be seen in the chart above, of average daily clearing prices across the quarter.

Statistics

The following table sets out key statistics relating to 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, whilst the system prices are minimum, average and maximum values. MW demand values are averages, whilst TWh demand values are totals across the quarter:

*GB Only (Excludes Northern Ireland)	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021
WHOLESALE PRICES (£/MWh)									
APX Day-Ahead Price	51.83	41.18	38.49	40.09	32.70	24.25	36.42	47.51	63.59
Nordpool Day-Ahead price	51.83	41.18	38.49	40.09	32.70	24.25	36.42	47.51	64.23
Within Day Price (MIDP)	50.39	41.00	37.24	38.64	30.95	23.39	35.35	45.46	59.67
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	44.39	36.54	31.22	31.62	24.42	19.46	28.82	33.52	46.18
Peak Hours (excl Superpeak)	50.88	42.36	39.27	39.83	32.08	24.57	36.78	47.54	58.88
Superpeak Hours	62.35	46.23	43.69	50.39	41.95	28.09	45.14	65.40	93.28
SYSTEM PRICE (£/MWh)									
Maximum	195.00	375.00	120.00	160.00	2242.31	100.00	540.22	849.82	4000.00
Average	50.63	41.23	36.45	39.86	32.30	24.76	35.54	47.49	61.98
Minimum	-70.24	-71.26	-65.93	-88.00	-66.25	-70.49	-60.00	-63.93	-61.00
Transmission System Demand (MW average)	32,936	26,953	25,494	31,896	31,343	22,431	24,380	30,303	31,626
Demand Incl. Embedded Gen. (MW average)	35,493	30,132	28,584	33,989	34,280	26,023	27,443	32,515	34,176
Transmission System Demand (TWh total)	60.6	42.6	38.6	57.4	55.7	30.6	35.5	52.2	56.0
Demand Incl. Embedded Gen. (TWh total)	71.1	58.9	56.3	70.4	67.7	49.0	53.8	66.9	68.3

The following table sets out key statistics comparing the quarter with the same quarter in the previous eight years:

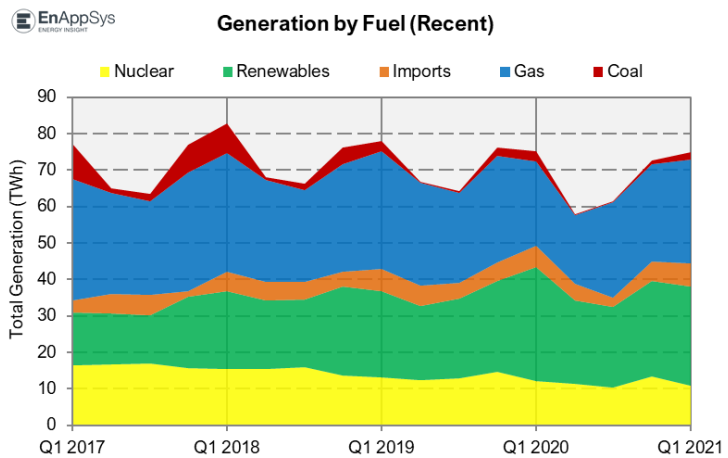
*GB Only (Excludes Northern Ireland)	Q1 2013	Q1 2014	Q1 2015	Q1 2016	Q1 2017	Q1 2018	Q1 2019	Q1 2020	Q1 2021
WHOLESALE PRICES (£/MWh)									
APX Day-Ahead Price	52.54	45.04	40.84	34.63	47.96	52.72	51.83	32.70	63.59
Nordpool Day-Ahead price	52.54	45.04	40.84	34.63	47.96	52.72	51.83	32.70	63.59
Within Day Price (MIDP)	54.02	45.45	40.47	34.25	47.23	54.16	50.39	30.95	59.67
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	43.45	36.87	33.62	28.62	40.53	47.28	44.39	24.42	46.18
Peak Hours (excl Superpeak)	55.70	46.93	41.09	33.89	47.14	54.62	50.88	32.08	58.88
Superpeak Hours	72.13	59.99	53.91	48.26	62.85	68.24	62.35	41.95	93.28
SYSTEM PRICE (£/MWh)									
Maximum	216.42	179.70	173.71	517.55	292.55	990.00	195.00	2242.31	4000.00
Average	65.16	51.96	46.46	36.66	46.34	57.41	50.63	32.30	61.98
Minimum	24.98	0.00	3.65	-63.02	-14.00	-150.00	-70.24	-66.25	-61.00
Transmission System Demand (MW average)	40,135	36,852	37,109	35,335	34,613	35,203	32,936	31,343	31,626
Demand Incl. Embedded Gen. (MW average)	42,642	38,053	38,836	37,214	36,786	37,725	35,493	34,280	34,176
Transmission System Demand (TWh total)	88.7	72.7	74.7	68.2	66.0	68.8	60.6	55.7	56.0
Demand Incl. Embedded Gen. (TWh total)	86.7	79.6	80.2	76.3	74.8	76.0	71.1	67.7	68.3

3 Fuel Activity Overview

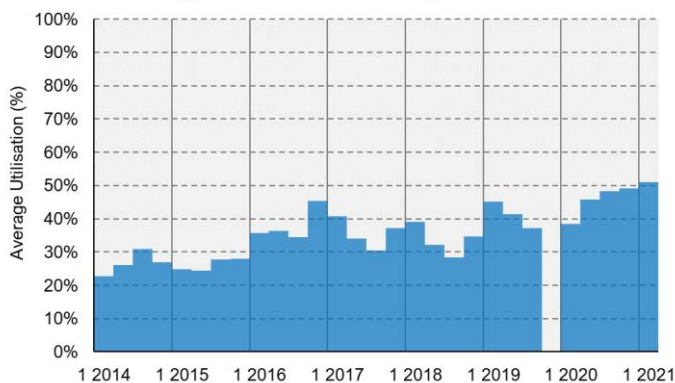
In Q1 last year, renewables (including biomass) were the greatest contributors to total generation with 41% of total output (31.2TWh). **This Q1 gas regained the top spot, but only narrowly with 38% (28.4TWh) from gas-fired generation versus 36% (27.1TWh) from renewables.**

This reduction in renewable generation stems from a

combination of high winds last Q1 and lower than usual winds this Q1. This low wind during Q1 2021 contributed to the tight periods and high prices mentioned in the previous section.



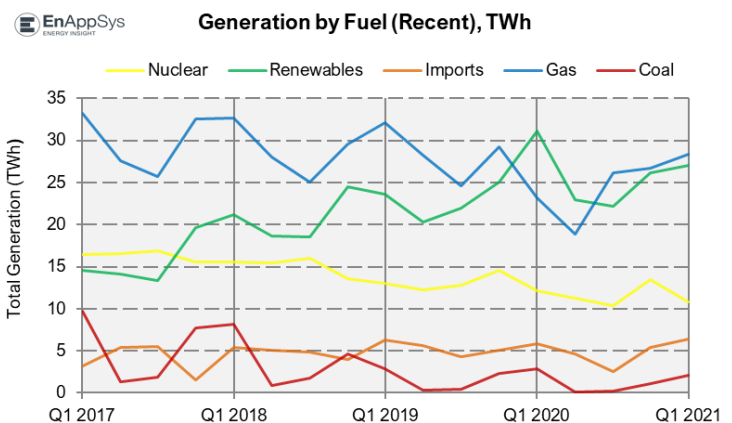
Average CCGT Utilisation per Quarter



Q1 2021 CCGT output of 28.4TWh was materially higher than the level of 23.1TWh seen in Q1 2020. Since that time Calon Energy units have withdrawn from the market and the increased output represents **materially higher utilisation levels for the CCGT fleet than for the same period last year.** The chart to the left shows average utilisation per unit for each quarter back

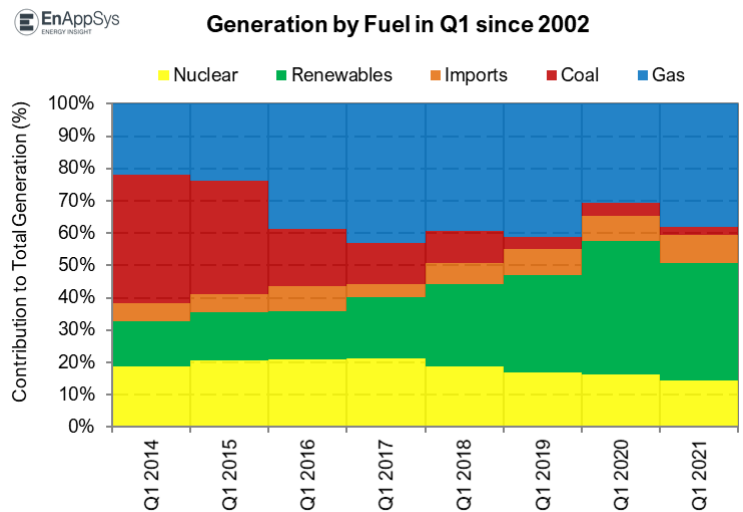
to Q1 2014; there is a trend upwards in time as coal utilisation has decreased and the remaining CCGT fleet has a higher share of the fossil fuel sector.

Coal generation has continued its Q1-on-Q1 decline, with Fiddlers Ferry having closed since Q1 last year. Despite this overall reduction in coal output, levels in Q1 were nearly double that in Q4 2020 because of the tight system at start of the year under low renewables. Most coal activity was as two-shifting, but some units saw extended runs over more than one day.



Nuclear generation has also seen a Q1-on-Q1 decline since Q1 2017. This means there has been a steady reduction in low-C power from this source. The main reason for the reduction from last Q1 is that Heysham 2-8, Hinkley Point B7 and Hinkley Point B8 were offline for some of this Q1, having been online across Q1 2020.

The tight system in the quarter meant that **imports were required more than they had been in Q1 last year**, when higher wind meant the system was less tight. Imports accounted for 8.6% of generation in the quarter, compared to 7.4% in Q1 last year.



Statistics

The following table sets out key statistics relating to generation in the quarter and all previous quarters over the last two years:

*GB Only (Excludes Northern Ireland)	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021
TOTAL GENERATION BY FUEL (TWh)									
Coal	2.84	0.36	0.41	2.32	2.92	0.11	0.27	1.06	2.05
Gas	32.18	28.27	24.66	29.26	23.15	18.85	26.18	26.67	28.42
Imports	6.24	5.67	4.33	5.02	5.80	4.59	2.51	5.40	6.44
Nuclear	13.05	12.27	12.77	14.61	12.17	11.22	10.43	13.43	10.85
Renewables (Biomass, Wind, Solar & Hydro)	23.65	20.35	22.01	25.06	31.17	23.00	22.14	26.21	27.09
FOSSIL FUELS	35.02	28.63	25.07	31.57	26.07	18.96	26.44	27.72	30.46
TOTAL	77.96	66.91	64.18	76.26	75.21	57.76	61.52	72.76	74.84
Fossil Fuel Percentage	45%	43%	39%	41%	35%	33%	43%	38%	41%
Clean Percentage (Renewable & Nuclear)	47%	49%	54%	52%	58%	59%	53%	54%	51%
Renewable Share of Clean Power	64%	62%	63%	63%	72%	67%	68%	66%	71%

SHARE OF GENERATION (%)									
Coal	3.6%	0.5%	0.6%	3.0%	3.9%	0.2%	0.4%	1.5%	2.7%
Gas	41.3%	42.3%	38.4%	38.4%	30.8%	32.6%	42.5%	36.7%	38.0%
Imports	8.0%	8.5%	6.8%	6.6%	7.7%	7.9%	4.1%	7.4%	8.6%
Nuclear	16.7%	18.3%	19.9%	19.2%	16.2%	19.4%	16.9%	18.5%	14.5%
Renewables (Biomass, Wind, Solar & Hydro)	30.3%	30.4%	34.3%	32.9%	41.4%	39.8%	36.0%	36.0%	36.2%

*GB Only (Excludes Northern Ireland)	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021
AVERAGE GENERATION BY FUEL (GW)									
Coal	1.3	0.2	0.2	1.0	1.4	0.0	0.1	0.5	0.9
Gas	14.9	12.9	11.2	13.2	10.7	8.6	11.9	12.1	13.2
Imports	2.9	2.6	2.0	2.3	2.7	2.1	1.1	2.4	3.0
Nuclear	6.0	5.6	5.8	6.6	5.6	5.1	4.7	6.1	5.0
Renewables (Biomass, Wind, Solar & Hydro)	9.1	7.4	8.1	9.1	12.3	8.4	8.3	9.7	10.1
FOSSIL FUELS	16.2	13.1	11.4	14.3	12.1	8.7	12.0	12.6	14.1
TOTAL	34.2	28.7	27.2	32.3	32.6	24.3	26.1	30.8	32.3

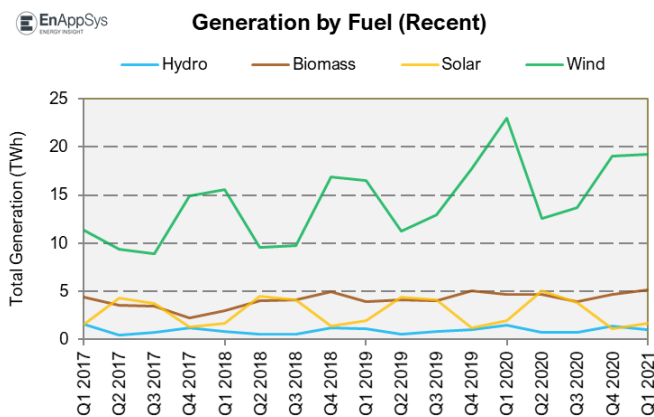
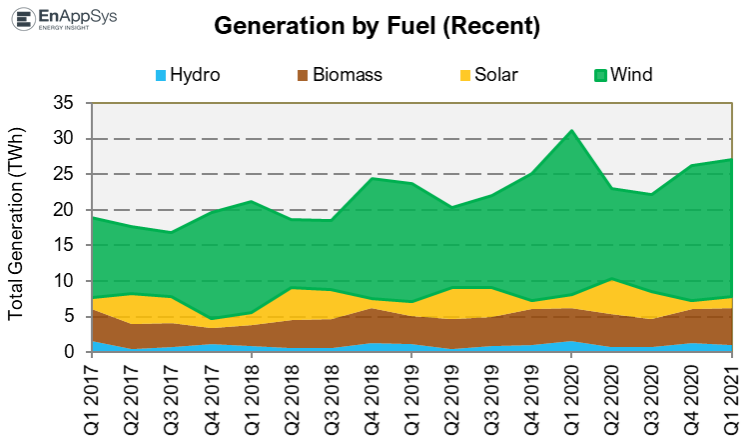
The following table sets out key statistics comparing the quarter with the same quarter in the previous eight years:

*GB Only (Excludes Northern Ireland)	Q1 2013	Q1 2014	Q1 2015	Q1 2016	Q1 2017	Q1 2018	Q1 2019	Q1 2020	Q1 2021
TOTAL GENERATION BY FUEL (TWh)									
Coal	39.26	32.61	28.70	13.55	9.67	8.12	2.84	2.92	2.05
Gas	22.75	18.06	19.66	29.63	33.27	32.65	32.18	23.15	28.42
Imports	2.37	4.56	4.69	5.92	3.18	5.36	6.24	5.80	6.44
Nuclear	17.04	15.40	16.91	15.97	16.46	15.53	13.05	12.17	10.85
Renewables (Biomass, Wind, Solar & Hydro)	12.22	13.08	14.37	15.76	18.97	21.19	23.65	31.17	27.09
FOSSIL FUELS	62.02	50.67	48.36	43.18	42.95	40.77	35.02	26.07	30.46
TOTAL	93.65	83.71	84.32	80.82	81.56	82.85	77.96	75.21	74.84
Fossil Fuel Percentage	66%	61%	57%	53%	53%	49%	45%	35%	41%
Clean Percentage	31%	34%	37%	39%	43%	44%	47%	58%	51%
Renewable Share of Clean Power	13%	16%	17%	20%	23%	26%	30%	41%	36%
SHARE OF GENERATION (%)									
Coal	41.9%	39.0%	34.0%	16.8%	11.9%	9.8%	3.6%	3.9%	2.7%
Gas	24.3%	21.6%	23.3%	36.7%	40.8%	39.4%	41.3%	30.8%	38.0%
Imports	2.5%	5.4%	5.6%	7.3%	3.9%	6.5%	8.0%	7.7%	8.6%
Nuclear	18.2%	18.4%	20.0%	19.8%	20.2%	18.7%	16.7%	16.2%	14.5%
Renewables (Biomass, Wind, Solar & Hydro)	13.1%	15.6%	17.0%	19.5%	23.3%	25.6%	30.3%	41.4%	36.2%

4 Renewables

Though the quarter saw lower wind generation than would be expected for a Q1, combined renewable generation was up 3% from Q4, due to increases in biomass and solar output. **Renewables were however lower than last Q1 due to reductions in wind, solar and hydro.** Wind was 3.8TWh less this

Q1 at 19.3TWh versus 23.0TWh in Q1 2020. The effect of this lower wind generation was seen in the tight system at start of the year.

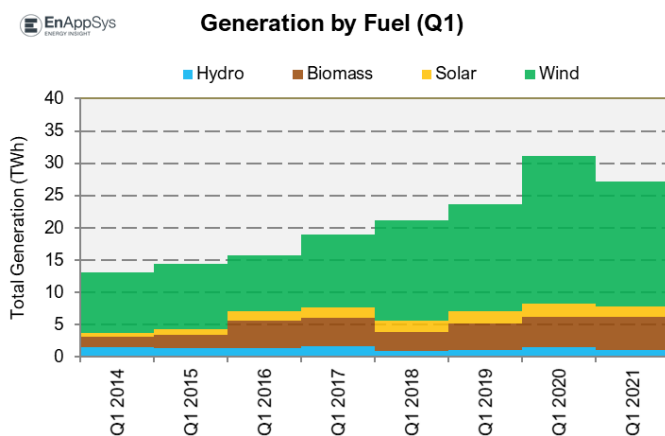


Compared to Q1 last year, all renewable sources saw lower generation, with the exception of biomass. Biomass generation increased by 10% (to total 5.2TWh), whilst wind reduced by 16% (to 19.3TWh), solar by 14% (to 1.7TWh) and hydro by 34% (to 1.0TWh). **Though wind was lower than last Q1, it was still by far the greatest contributor to**

combined renewable generation, at 71%, followed by biomass at 19%.

This lower wind, hydro and solar generation contributed to lower embedded generation than Q1 2020, which can be seen in section 2 (Demand and Prices).

Whilst renewables did not match last Q1's record levels, they were still higher than any other Q1 prior to 2020 as capacity, particularly wind, continues to be built.



Statistics

The following table sets out key statistics relating to renewable electricity output during the quarter and

*GB Only (Excludes Northern Ireland)	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021
TOTAL GENERATION BY FUEL (TWh)									
Biomass	3.98	4.17	4.02	5.03	4.71	4.65	3.89	4.69	5.16
Hydro	1.11	0.52	0.87	1.06	1.52	0.70	0.72	1.36	0.99
Solar	2.00	4.37	4.15	1.22	1.95	5.06	3.86	1.16	1.68
Wind	16.55	11.28	12.97	17.74	23.00	12.59	13.68	19.01	19.25
TOTAL RENEWABLES	23.65	20.35	22.01	25.06	31.17	23.00	22.14	26.21	27.09
SHARE OF RENEWABLE GENERATION (%)									
Biomass	16.8%	20.5%	18.3%	20.1%	15.1%	20.2%	17.6%	17.9%	19.1%
Hydro	4.7%	2.6%	4.0%	4.2%	4.9%	3.0%	3.3%	5.2%	3.7%
Solar	8.5%	21.5%	18.8%	4.9%	6.2%	22.0%	17.4%	4.4%	6.2%
Wind	70.0%	55.5%	58.9%	70.8%	73.8%	54.8%	61.8%	72.5%	71.1%
SHARE OF TOTAL GENERATION (%)									
Biomass	5.1%	6.2%	6.3%	6.6%	6.3%	8.0%	6.3%	6.4%	6.9%
Hydro	1.4%	0.8%	1.4%	1.4%	2.0%	1.2%	1.2%	1.9%	1.3%
Solar	2.6%	6.5%	6.5%	1.6%	2.6%	8.8%	6.3%	1.6%	2.2%
Wind	21.2%	16.9%	20.2%	23.3%	30.6%	21.8%	22.2%	26.1%	25.7%
LARGEST RENEWABLE SOURCE	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND

all previous quarters over the last two years:

The following table compares this Q1 with Q1 data from the last eight years:

*GB Only (Excludes Northern Ireland)	Q1 2013	Q1 2014	Q1 2015	Q1 2016	Q1 2017	Q1 2018	Q1 2019	Q1 2020	Q1 2021
TOTAL GENERATION BY FUEL (TWh)									
Biomass	4.44	1.60	2.05	4.27	4.43	3.03	3.98	4.71	5.16
Hydro	1.33	1.55	1.37	1.32	1.62	0.86	1.11	1.52	0.99
Solar	0.21	0.51	0.91	1.51	1.59	1.68	2.00	1.95	1.68
Wind	6.24	9.42	10.04	8.66	11.34	15.62	16.55	23.00	19.25
TOTAL RENEWABLES	12.22	13.08	14.37	15.76	18.97	21.19	23.65	31.17	27.09
SHARE OF RENEWABLE GENERATION (%)									
Biomass	36.3%	12.2%	14.3%	27.1%	23.3%	14.3%	16.8%	15.1%	19.1%
Hydro	10.9%	11.9%	9.5%	8.4%	8.5%	4.0%	4.7%	4.9%	3.7%
Solar	1.7%	3.9%	6.3%	9.6%	8.4%	7.9%	8.5%	6.2%	6.2%
Wind	51.1%	72.0%	69.8%	55.0%	59.8%	73.7%	70.0%	73.8%	71.1%
SHARE OF TOTAL GENERATION (%)									
Biomass	4.7%	1.9%	2.4%	5.3%	5.4%	3.7%	5.1%	6.3%	6.9%
Hydro	1.4%	1.9%	1.6%	1.6%	2.0%	1.0%	1.4%	2.0%	1.3%
Solar	0.2%	0.6%	1.1%	1.9%	1.9%	2.0%	2.6%	2.6%	2.2%
Wind	6.7%	11.3%	11.9%	10.7%	13.9%	18.9%	21.2%	30.6%	25.7%
LARGEST RENEWABLE SOURCE	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND

5 Notes on the Report

The figures used in the report refer to GB only, against BEIS figures that refer to GB and Northern Ireland. This selection has been made since Northern Ireland is separate from GB and is more closely linked to the electricity grid of the Republic of Ireland.

Generation levels by fuel from 2009 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.

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 and not distributed. 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.

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