EnAppSys
ENERGY INSIGHT

GB Electricity Market Summary

Q4-2020

October to December

Generation by Fuel Type

Renewables:	25.6TWh (+18%)	Gas:	26.1TWh (+2%)	Nuclear:	13.1TWh (+29%)
Imports:	5.43TWh (+115%)	Coal:	1.0TWh (+298%)		

% changes stated with respect to values in the previous quarter

Contents

1 Executive Summary

Quarter 4 2020 saw a seasonal increase in demand from Q3, rising to levels slightly lower than in Q4 of recent years; whilst the November lockdown was apparent as reduced demand levels, as the quarter progressed, demand rose again to similar levels than for the same period last year. As demand rose, the system occasionally became tight when renewable generation was low, with system prices reaching £849.86/MWh during a low wind period at the end of December.

Demand

With some Covid-related lockdown measures in place during the quarter, aggregate demand over the full quarter was slightly lower than in recent years. Total demand (including embedded generation) in Q4 2020 was 76.9TWh (average of 34.8GW), 5% lower than that in Q4 last year and Q4 2018. Transmission system demand showed less difference, with Q4 this year being just 2% lower than that in the last two years, with the main difference arising from greater embedded generation this Q4.

Generation

The combined fossil fuel fleet (CCGT, OCGT, coal and oil) contributed the greatest share of total generation in the quarter, with 27.1TWh, or 38% of generation. This meant that, in 2020, the fossil fuel fleet was the greatest contributor in Q3 and Q4, whilst the renewable fleet had been the greatest contributor in the first two quarters Of the individual fuel types, the CCGT fleet was again the highest contributor, with 26.6TWh (36% share).

This quarter, the gas-fired fleet contributed 26.1TWh (37%) whilst the coal-fired fleet contributed 1.0TWh (1%). For the gas fleet, this was a marginal decrease from the 26.2TWh in Q3, whilst the coal fleet saw a 289% increase from the 0.3TWh in Q3.

As demand rose, overall generation increased, and imports also rose. Net imports were 111% up from Q3 levels, to total 5.3TWh (7% of generation).

Nuclear generation increased 29% from the previous quarter, as the Sizewell output reduction contract[1] was over and the two Hunterston units came back online. However, compared to previous Q4s, nuclear output was its lowest for any year back to 2014.

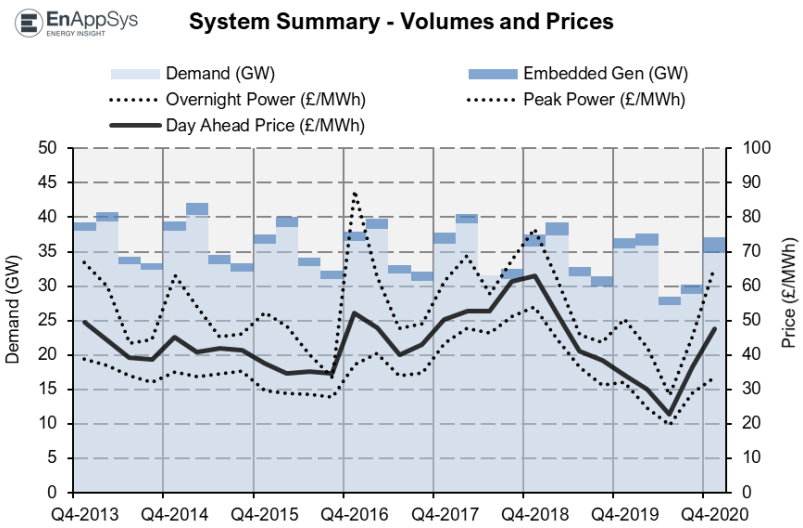
Prices

As demand and generation levels continued to rise into the winter, prices also rose. The average system price across the quarter was £47.50/MWh, up 34% from the £35.56/MWh in Q3 and up 16% from the £40.00/MWh in Q4 last year. The peak system price in the quarter was £849.86/MWh; this occurred on 28th December when an already tight system saw unit trips and the reserve scarcity pricing mechanism activated in imbalance price setting. Despite being notably high, this was not, however, the highest in the year, as Q1 saw a peak of £2,242.31/MWh.

[1] This was a contractual arrangement between National Grid and Sizewell to support management of system stability during low demand periods in the summer months.

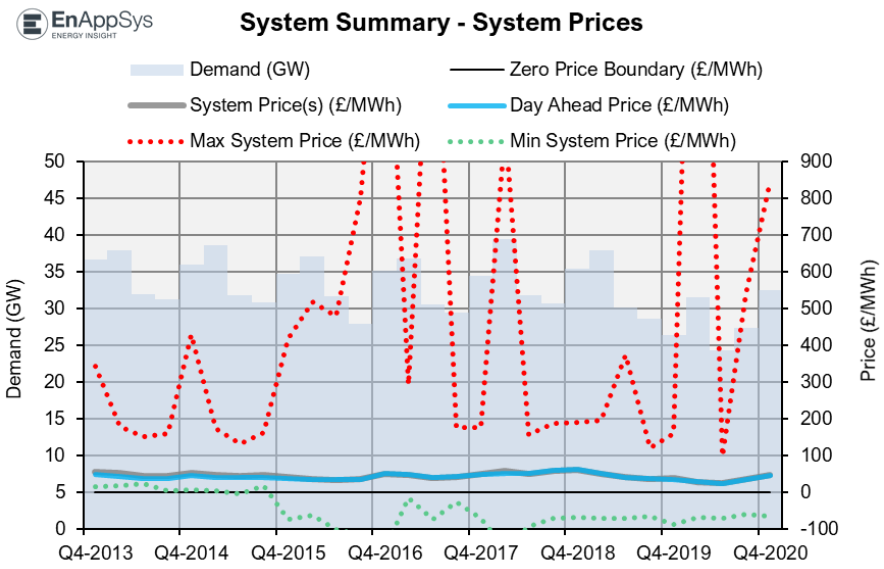
2 Demand and Prices

Q4 2020 saw the second highest quarterly demand of the year, totalling 76.9TWh, resulting in an average of 32.5GW per half hour, versus the high of 35.9GW in Q1, 27.2GW in Q2 and 28.8GW in Q3.



In contrast to the periods of low demand and oversupply seen in Q2 and Q3, **the increase in demand in Q4, combined with periods of low wind, led to several tight periods and associated high prices during the quarter.**

This was visible as an increase in average system price versus Q3. The average across Q4 was £47.50/MWh, up 34% from the £35.56/MWh in Q3 and up 16% from the £40.00/MWh in Q4 last year. The peak system price in the quarter was £849.86/MWh; this occurred on 28th December when an already tight system saw unit trips and reserve scarcity pricing was activated. Despite being notably high, this was not, however, the highest in the year, as Q1 saw a peak of £2,242.31/MWh.



Day-ahead prices were also higher, on average, than in the other quarters this year, at £47.52/MWh, up 30% from £36.42/MWh in Q3 and up 28% from the 24.00/MWh in Q4 last year. This average was the highest for the last six quarters, not exceeded since the £51.28/MWh in Q1 2019.

Statistics

The following tables set out some key statistics relating to prices and demand during the quarter. 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:

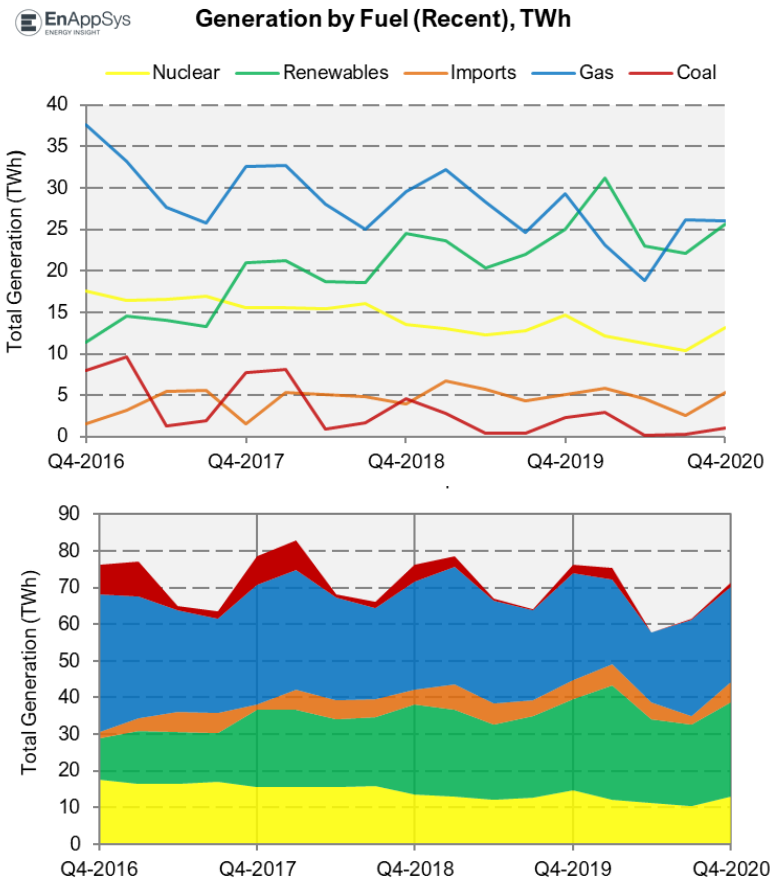
*GB Only (Excludes Northern Ireland)	Q4-2018	Q1-2019	Q2-2019	Q3-2019	Q4-2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020
WHOLESALE PRICES (£/MWh)									
Day Ahead Price	62.98	51.82	41.18	38.50	34.00	30.00	22.80	36.42	47.52
Within Day Price (MIDP)	61.67	50.83	40.99	37.25	39.00	27.00	23.13	35.34	45.47
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	54.03	44.70	36.52	31.22	32.01	24.47	19.65	28.79	33.52
Peak Hours (excl Superpeak)	62.39	51.22	42.32	39.27	39.93	32.18	24.71	36.77	47.52
Superpeak Hours	76.64	62.29	45.97	43.69	50.38	41.93	28.22	45.14	65.40
SYSTEM PRICE (£/MWh)									
Maximum	191.37	195.00	375.00	120.00	160.00	2242.31	100.00	540.22	849.82
Average	62.42	50.81	41.27	36.56	40.00	29.00	24.98	35.56	47.50
Minimum	-68.40	-70.24	-71.26	-65.93	-88.00	-66.25	-70.49	-60.00	-63.93
Demand (MW)	35,472	37,905	30,142	28,574	26,377	31,615	24,364	27,439	32,515
Availability (MW)	56,442	59,968	52,304	51,935	58,448	58,545	52,799	47,914	54,998
Demand (TWh)	78.3	81.9	65.8	63.1	58.2	68.3	53.2	60.6	71.8
Availability (TWh)	124.6	129.5	114.2	114.7	129.1	126.5	115.3	105.8	121.4

3 Fuel Activity Overview

Q4 2020 saw the greatest share of generation provided by the gas-fired fleet, with 26.1TWh (36.6%) of generation. This was closely followed by the combined renewable fleet (including biomass) collectively at 25.6TWh (35.9%) Of the combined renewable fleet, the wind component was the largest, at 18.6TWh (26.1%).

Without biomass in the renewable category, the contribution of the other three fuel types would total 21.5TWh, still higher than nuclear at 13.4TWh, keeping renewables in second place.

The high renewable contribution in Q4 meant that **this was the highest level of Q4 renewable generation to date being 0.6TWh up on the level recorded last year.**



The contribution of the renewable fleets in Q4 has increased steadily over time. Over a similar period, coal has seen a steep decline, partly resulting from the decommissioning of several stations. The CCGT fleet has seen a slight decline over the same period, but the coal decline moved CCGT units more into merit, to become the main thermal fleet.

Coal saw its lowest levels of generation in a Q4 of recent times, with a total of just 1.1TWh across the quarter (1.5% share of generation). This was an increase of 289% on Q3 generation however, as the coal fleet had only produced 0.3TWh in the previous quarter.

Nuclear generation increased 29% from the previous quarter, as the Sizewell output reduction contract was over and the two Hunterston units came back online. However, **compared to previous Q4s, nuclear output was its lowest for any year back to 2014, as eleven out of the potential 14**

units were online, versus 12 last winter. Heysham 1-1 went offline at the end of September, whilst the two Hinkley Point B units remained offline from earlier in the year.

Statistics

The following tables contain sets out key statistics relating to generation in the quarter:

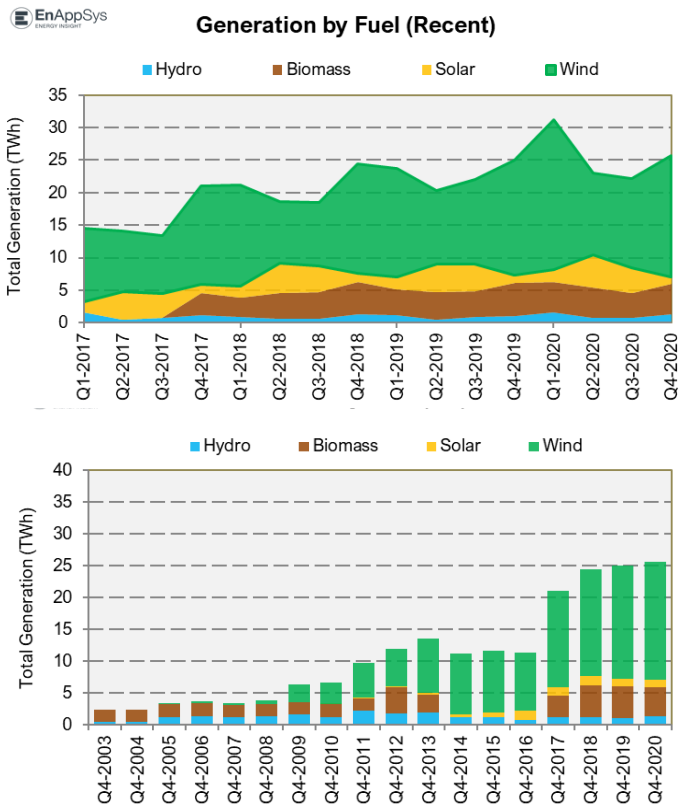
*GB Only (Excludes Northern Ireland)	Q4-2018	Q1-2019	Q2-2019	Q3-2019	Q4-2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020
TOTAL GENERATION BY FUEL (TWh)									
Coal	4.63	2.85	0.36	0.41	2.32	2.92	0.11	0.27	1.03
Gas	29.58	32.21	28.27	24.67	29.25	23.15	18.85	26.17	26.09
Imports	3.97	6.76	5.67	4.34	5.02	5.80	4.58	2.51	5.28
Nuclear	13.58	13.06	12.27	12.77	14.61	12.17	11.22	10.43	13.13
Renewables (Biomass, Wind, Solar & Hydro)	24.48	23.67	20.34	22.02	25.06	31.18	22.98	22.14	25.64
FOSSIL FUELS	34.21	35.05	28.63	25.08	31.57	26.07	18.96	26.44	27.12
TOTAL	**76.24**	**78.54**	**66.91**	**64.21**	**76.26**	**75.22**	**57.74**	**61.51**	**71.17**
Fossil Fuel Percentage	45%	45%	43%	39%	41%	35%	33%	43%	38%
Clean Percentage (Renewable & Nuclear)	50%	47%	49%	54%	52%	58%	59%	53%	54%
Renewable Share of Clean Power	64%	64%	62%	63%	63%	72%	67%	68%	66%
SHARE OF GENERATION (%)									
Coal	6.1%	3.6%	0.5%	0.6%	3.0%	3.9%	0.2%	0.4%	1.5%
Gas	38.8%	41.0%	42.3%	38.4%	38.4%	30.8%	32.7%	42.6%	36.7%
Imports	5.2%	8.6%	8.5%	6.8%	6.6%	7.7%	7.9%	4.1%	7.4%
Nuclear	17.8%	16.6%	18.3%	19.9%	19.2%	16.2%	19.4%	16.9%	18.5%
Renewables (Biomass, Wind, Solar & Hydro)	32.1%	30.1%	30.4%	34.3%	32.9%	41.4%	39.8%	36.0%	36.0%

*GB Only (Excludes Northern Ireland)	Q4-2018	Q1-2019	Q2-2019	Q3-2019	Q4-2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020
AVERAGE GENERATION BY FUEL (GW)									
Coal	2.1	1.3	0.2	0.2	1.0	1.4	0.0	0.1	0.5
Gas	13.4	14.9	12.9	11.2	13.2	10.7	8.6	11.9	12.1
Imports	1.8	3.1	2.6	2.0	2.3	2.7	2.1	1.1	2.4
Nuclear	6.2	6.0	5.6	5.8	6.6	5.6	5.1	4.7	6.1
Renewables (Biomass, Wind, Solar & Hydro)	11.1	11.0	9.3	10.0	11.3	14.4	10.5	10.0	11.9
FOSSIL FUELS	15.5	16.2	13.1	11.4	14.3	12.1	8.7	12.0	12.6
TOTAL	**34.5**	**36.4**	**30.6**	**29.1**	**34.5**	**34.8**	**26.4**	**27.9**	**32.9**

*GB Only (Excludes Northern Ireland)	Q4-2012	Q4-2013	Q4-2014	Q4-2015	Q4-2016	Q4-2017	Q4-2018	Q4-2019	Q4-2020
TOTAL GENERATION BY FUEL (TWh)									
Coal	39.18	32.31	27.06	16.53	7.97	7.73	4.63	2.32	1.03
Gas	20.38	19.23	22.17	22.50	37.69	32.61	29.58	29.25	26.09
Imports	2.22	3.01	4.86	4.60	1.57	1.53	3.97	5.02	5.28
Nuclear	15.60	16.93	13.34	17.45	17.52	15.58	13.58	14.61	13.13
Renewables (Biomass, Wind, Solar & Hydro)	11.89	13.60	11.16	11.69	11.39	21.04	24.48	25.06	25.64
FOSSIL FUELS	59.55	51.54	49.23	39.02	45.66	40.34	34.21	31.57	27.12
TOTAL	**89.27**	**85.08**	**78.59**	**72.76**	**76.13**	**78.49**	**76.24**	**76.26**	**71.17**
Fossil Fuel Percentage	67%	61%	63%	54%	60%	51%	45%	41%	38%
Clean Percentage	31%	36%	31%	40%	38%	47%	50%	52%	54%
Renewable Share of Clean Power	13%	16%	14%	16%	15%	27%	32%	33%	36%
SHARE OF GENERATION (%)									
Coal	43.9%	38.0%	34.4%	22.7%	10.5%	9.8%	6.1%	3.0%	1.5%
Gas	22.8%	22.6%	28.2%	30.9%	49.5%	41.5%	38.8%	38.4%	36.7%
Imports	2.5%	3.5%	6.2%	6.3%	2.1%	1.9%	5.2%	6.6%	7.4%
Nuclear	17.5%	19.9%	17.0%	24.0%	23.0%	19.9%	17.8%	19.2%	18.5%
Renewables (Biomass, Wind, Solar & Hydro)	13.3%	16.0%	14.2%	16.1%	15.0%	26.8%	32.1%	32.9%	36.0%

4 Renewables

Total renewable generation, from wind, solar, hydro and biomass, was 25.6TWh in Q4 2020, up 16% from the 22.1TWh in Q3. Without biomass, the total was 21.1TWh. The overall total was close to the 25.1TWh seen in Q4 last year (20.0TWh without biomass). The additional 0.58TWh in this Q4 than last means **that this was the highest Q4 level of renewable generation to date**. This reflects increased levels of installed capacity rather than higher load factors per se.



This increase from Q3 levels mainly resulted from a ~4.9TWh increase in wind generation. Hydro and biomass both increased by ~0.7TWh, whilst solar fell by ~2.7TWh. This is the general seasonal pattern seen for Q3 into Q4, with an increase in wind and often hydro, but a decrease in solar output. Biomass generation tends to remain relatively stable as many of the units receive subsidies, which incentivise high utilisation. Prior to the conversion of the coal units, Ironbridge (in 2012, decommissioned in 2015), Drax and Lynemouth, the main biomass generation was from embedded sites. The Rothes site is a transmission-connected dedicated biomass site and was opened in 2013.

The contributions of the four fuel types, in each Q4 back to 2003, is shown in the chart above. **Wind has had the largest share in each Q4 back to 2009.** Following ten years of overall increase in Q4 wind generation, resulting from large wind farm build-out between 2008 and 2018, the Q4 levels have remained relatively steady in 2019 and 2020.

Statistics

The following tables sets out key statistics relating to renewable electricity output during the quarter:

*GB Only (Excludes Northern Ireland)	Q4-2018	Q1-2019	Q2-2019	Q3-2019	Q4-2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020
TOTAL GENERATION BY FUEL (TWh)									
Biomass	4.94	3.98	4.16	4.02	5.03	4.71	4.64	3.89	4.58
Hydro	1.26	1.11	0.52	0.87	1.06	1.52	0.70	0.72	1.33
Solar	1.42	2.00	4.37	4.15	1.21	1.95	5.06	3.86	1.13
Wind	16.87	16.57	11.28	12.98	17.76	23.01	12.59	13.68	18.59
TOTAL RENEWABLES	**24.48**	**23.67**	**20.34**	**22.02**	**25.06**	**31.18**	**22.98**	**22.14**	**25.64**
SHARE OF RENEWABLE GENERATION (%)									
Biomass	20.2%	16.8%	20.5%	18.3%	20.1%	15.1%	20.2%	17.6%	17.9%
Hydro	5.1%	4.7%	2.6%	4.0%	4.2%	4.9%	3.0%	3.3%	5.2%
Solar	5.8%	8.5%	21.5%	18.8%	4.8%	6.2%	22.0%	17.4%	4.4%
Wind	68.9%	70.0%	55.5%	58.9%	70.9%	73.8%	54.8%	61.8%	72.5%
SHARE OF TOTAL GENERATION (%)									
Biomass	6.5%	5.1%	6.2%	6.3%	6.6%	6.3%	8.0%	6.3%	6.4%
Hydro	1.6%	1.4%	0.8%	1.4%	1.4%	2.0%	1.2%	1.2%	1.9%
Solar	1.9%	2.5%	6.5%	6.5%	1.6%	2.6%	8.8%	6.3%	1.6%
Wind	22.1%	21.1%	16.9%	20.2%	23.3%	30.6%	21.8%	22.2%	26.1%
LARGEST RENEWABLE SOURCE	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND

*GB Only (Excludes Northern Ireland)	Q4-2012	Q4-2013	Q4-2014	Q4-2015	Q4-2016	Q4-2017	Q4-2018	Q4-2019	Q4-2020
TOTAL GENERATION BY FUEL (TWh)									
Biomass	4.23	2.88	0.00	0.00	0.00	3.40	4.94	5.03	4.58
Hydro	1.75	1.91	1.19	1.17	0.82	1.18	1.26	1.06	1.33
Solar	0.15	0.21	0.53	0.77	1.35	1.30	1.42	1.21	1.13
Wind	5.76	8.59	9.44	9.74	9.21	15.16	16.87	17.76	18.59
TOTAL RENEWABLES	**11.89**	**13.60**	**11.16**	**11.69**	**11.39**	**21.04**	**24.48**	**25.06**	**25.64**
SHARE OF RENEWABLE GENERATION (%)									
Biomass	35.6%	21.2%	0.0%	0.0%	0.0%	16.2%	20.2%	20.1%	17.9%
Hydro	14.7%	14.0%	10.6%	10.0%	7.2%	5.6%	5.1%	4.2%	5.2%
Solar	1.2%	1.6%	4.8%	6.6%	11.9%	6.2%	5.8%	4.8%	4.4%
Wind	48.5%	63.2%	84.6%	83.3%	80.9%	72.1%	68.9%	70.9%	72.5%
SHARE OF TOTAL GENERATION (%)									
Biomass	4.7%	3.4%	0.0%	0.0%	0.0%	4.3%	6.5%	6.6%	6.4%
Hydro	2.0%	2.2%	1.5%	1.6%	1.1%	1.5%	1.6%	1.4%	1.9%
Solar	0.2%	0.3%	0.7%	1.1%	1.8%	1.7%	1.9%	1.6%	1.6%
Wind	6.5%	10.1%	12.0%	13.4%	12.1%	19.3%	22.1%	23.3%	26.1%
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.

Next to providing a pan-European energy data platform, flexible configurable screens and automated data feeds, EnAppSys offers consultancy services and incredibly detailed market insights for companies in the energy industry.

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