



GB Electricity Market Summary

SECOND QUARTER 2017
APR TO JUN

Recorded Levels of GB Generation by Fuel (based upon Ofgem & NG Embedded Forecasts & FUELHH data):

GAS: 12.7GW (38.3%)

RENEWABLES: 9.8GW (29.5%)

NUCLEAR: 7.6GW (23.0%)

INTERCONNECTION: 2.5GW (11.8%)

COAL: 0.6GW (1.8%)

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EXECUTIVE SUMMARY

The second quarter of 2017 saw very strong levels of renewable generation as high peak levels of solar generation and as strong levels of wind generation combined to provide up to 42% of daily generation in the quarter.

This came as renewables provided the second largest share of total generation, with these levels being 23% smaller than the levels provided by the primary fuel source (gas) in the quarter and 15 times larger than levels of coal-fired generation across the three month period.

As well as providing 42% of total generation at the peak, the share of generation from renewable sources never fell below 13% across a single day in the quarter and provided on average 30% of total generation.

Combined with nuclear plants, clean electricity generators provided over half the power generated in the quarter (at 53%) with this daily share ranging from 36% and 72% across the three month period.

Whilst levels of renewable generation were very strong, levels of coal-fired generation were very low with less than 2% of power provided by coal stations, which primarily provided reserve power as required across the quarter along with some voltage control services.

Levels of wind generation in the quarter were particularly strong, with by far the highest ever levels of wind generation in GB in the second quarter of the year, whilst solar continued to see increased levels of generation in line with the progressive increase seen in the previous year.

Levels of overall electricity demand were lower across the quarter, but system prices still peaked in excess of £1,500/MWh as levels of availability were low during a reduced renewable output period that had followed a long period of strong renewable output.

The quarter saw 38% of generation come from gas-fired plants, 30% from renewables, 23% from nuclear plants, 7% from imports and 2% from coal.

Q2 2017 was the second consecutive quarter in which renewables were the second largest source of generation after gas, with Q2 2016 also having seen a similar position for renewables.

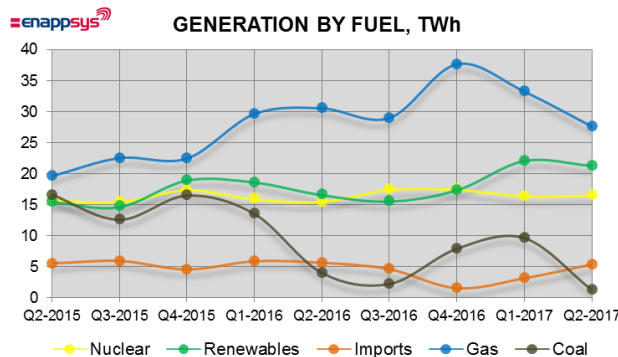
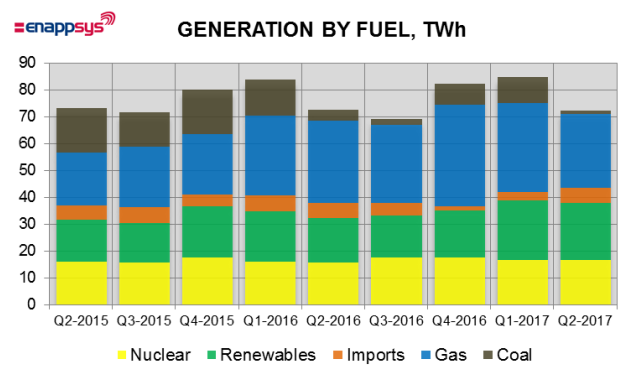
FUEL ACTIVITY

Levels of renewable generation fell marginally (down 3.5%) from Q1 2017, with levels of renewable output typically being much lower across the summer months of the year when wind speeds are significantly reduced.

However, with strong levels of wind generation and with on-going growth in levels of solar capacity, the quarter saw levels of renewable output climb 56% from the levels in the second quarter of 2016, delivering the highest ever Q2 levels of renewable output by some margin.

With demand falling for the summer period, levels of coal-fired output fell significantly to provide less than 2% of generation in the quarter.

Renewable projects (biomass, hydro, solar and wind) provided 21.3TWh of power in the quarter (an average of 9.8GW), with this amounting to 29.5% of total generation.



Gas-fired power stations provided the largest share of generation in the month, amounting to 27.7TWh in the quarter (an average of 12.7GW), with this being 38.3% of total generation over the three month period.

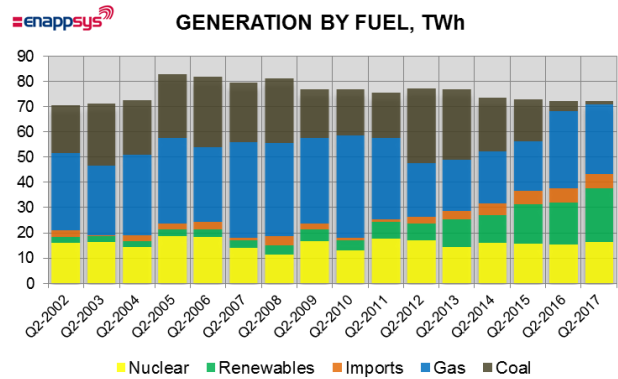
This came as gas plants continue to retain the economic advantage over coal plants in the market, but with commodity prices being such that coal could increase output levels once again if gas prices were to rise.

This shift from gas to coal has been considerably helped by the very high carbon taxes that apply to fossil fuel generators in the UK (well above the prices paid in Europe) and without these taxes, coal-fired stations would have seen considerably higher levels of generation.

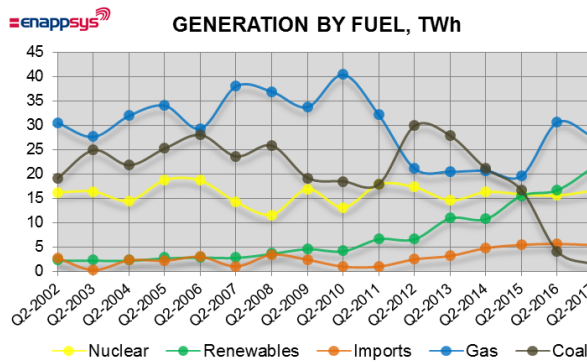
With a more even split of generation between the two fossil sources, renewables might have been the largest source of generation in the quarter, but at the cost of higher carbon emissions across the system.

The third largest source of electricity generation was nuclear plants, which generated 16.6TWh in the quarter (an average of 7.6%). These plants provided 23.0% of total generation with nuclear plants having generated less power than renewable projects for both of the completed quarters of 2017.

Levels of nuclear output have remained very stable in recent quarters and nuclear remains most unchanging source of power; this will change as these plants started to close as they reach their decommissioning dates.



Britain imported 5.4TWh of power from Ireland, Northern Ireland and from the continent with this coming at an average rate of 2.5GW. This meant that 7.5% of the electricity being consumed was being imported from other countries.



Coal-fired power stations generated 1.3TWh in the quarter (at an average rate of 0.6GW). This meant that only 1.8% of power in the quarter came from coal plants with this continuing a decline that has been progressing since Q2 2012. This meant that coal-fired power stations provided

less power than any other major fuel type.

In the quarter, 38.3% of power came from gas-fired plants, 29.5% from renewable projects, 23.0% from nuclear, 7.5% from interconnectors and 1.8% from coal plants.

Statistics

The following tables contain some of the key statistics relating to the quarter:

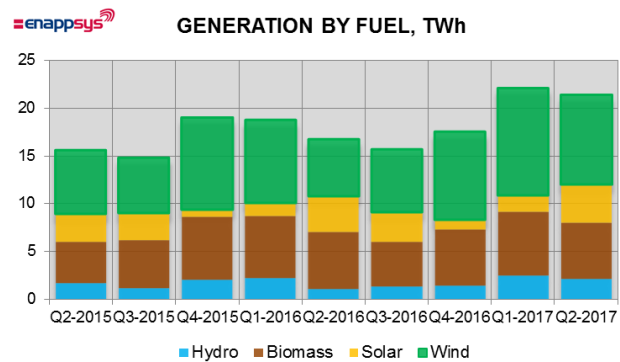
*GB Only (Excludes Northern Ireland)	Q2-2015	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017
TOTAL GENERATION BY FUEL (TWh)									
Coal	16.60	12.63	16.53	13.56	4.05	2.28	7.97	9.67	1.30
Gas	19.63	22.57	22.50	29.68	30.58	29.02	37.70	33.27	27.65
Imports	5.48	5.98	4.60	5.92	5.67	4.65	1.57	3.18	5.41
Nuclear	15.81	15.51	17.45	15.98	15.57	17.51	17.52	16.46	16.59
Renewables	15.55	14.78	19.00	18.67	16.67	15.64	17.44	22.09	21.31
FOSSIL FUELS	36.22	35.20	39.03	43.24	34.63	31.31	45.67	42.95	28.95
TOTAL	73.07	71.48	80.08	83.82	72.54	69.11	82.20	84.68	72.26
Fossil Fuel Ratio	50%	49%	49%	52%	48%	45%	56%	51%	40%
SHARE OF GENERATION (%)									
Coal	22.7%	17.7%	20.6%	16.2%	5.6%	3.3%	9.7%	11.4%	1.8%
Gas	26.9%	31.6%	28.1%	35.4%	42.2%	42.0%	45.9%	39.3%	38.3%
Imports	7.5%	8.4%	5.7%	7.1%	7.8%	6.7%	1.9%	3.8%	7.5%
Nuclear	21.6%	21.7%	21.8%	19.1%	21.5%	25.3%	21.3%	19.4%	23.0%
Renewables	21.3%	20.7%	23.7%	22.3%	23.0%	22.6%	21.2%	26.1%	29.5%
				35.34				43.41	
*GB Only (Excludes Northern Ireland)	Q2-2009	Q2-2010	Q2-2011	Q2-2012	Q2-2013	Q2-2014	Q2-2015	Q2-2016	Q2-2017
TOTAL GENERATION BY FUEL (TWh)									
Coal	19.18	18.47	17.90	29.89	27.88	21.11	16.60	4.05	1.30
Gas	33.76	40.39	32.12	21.14	20.49	20.67	19.63	30.58	27.65
Imports	2.42	1.01	1.02	2.50	3.20	4.79	5.48	5.67	5.41
Nuclear	16.88	13.06	17.90	17.31	14.55	16.30	15.81	15.57	16.59
Renewables	4.69	4.26	6.70	6.70	10.95	10.79	15.55	16.67	21.31
FOSSIL FUELS	52.93	58.85	50.01	51.02	48.38	41.78	36.22	34.63	28.95
TOTAL	76.91	77.18	75.64	77.53	77.07	73.66	73.07	72.54	72.26
Fossil Fuel Ratio	69%	76%	66%	66%	63%	57%	50%	48%	40%
SHARE OF GENERATION (%)									
Coal	26.2%	25.8%	22.3%	35.7%	38.4%	30.6%	20.2%	4.8%	1.8%
Gas	46.2%	56.5%	40.1%	25.2%	28.3%	29.9%	23.9%	36.1%	38.3%
Imports	3.3%	1.4%	1.3%	3.0%	4.4%	6.9%	6.7%	6.7%	7.5%
Nuclear	23.1%	18.3%	22.4%	20.6%	20.1%	23.6%	19.2%	18.4%	23.0%
Renewables	6.4%	6.0%	8.4%	8.0%	15.1%	15.6%	18.9%	19.7%	29.5%
	72%	82%	62%	61%	67%	60%	44%	41%	40%
Fossil	52.9	58.9	50.0	51.0	48.4	41.8	36.2	34.6	29.0

RENEWABLES

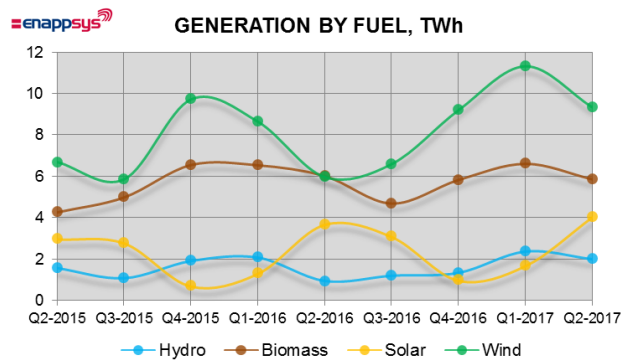
Levels of renewable generation fell 3.5% from Q1 2017 and although levels of output fell quarter-to-quarter the summer months typically see lower output due to lower wind output levels. As a result this small drop resulted in by far the highest renewable output in the second quarter of the year on record, with generation levels being 56% higher than those in Q2 2016.

Wind farms generated the largest share of renewable output in the quarter, having provided marginally less power than biomass in Q2 2016. This rise was

a key factor in the very high levels of renewable generation, but increases in hydro and



solar generation also pushed the total up.

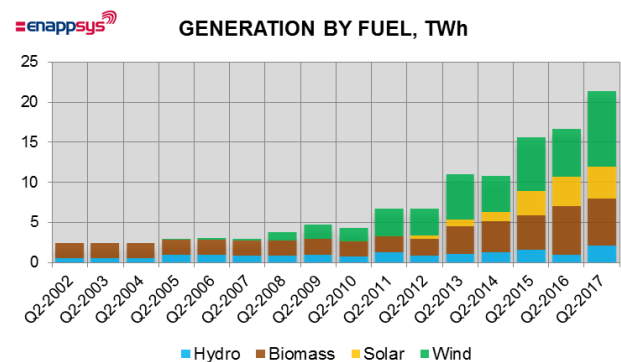


Generation from wind farms amounted to 9.4TWh (an average of 4.3GW) which amounted to 43.9% of all renewable generation. This was up from 6.0TWh in Q2 2016.

Biomass provided the second largest share of generation, amounting to 5.9TWh (an average of 2.7GW), with this amounting to 27.6% of all renewable generation. Levels of biomass generation now seem to have stabilised and remain static year to year.

Solar farms generated the third highest levels of generation, having seen output see a similar increase to the previous year, providing 4.1TWh (an average of 1.9GW). This amounts to a 19.0% share of total renewable generation.

The smallest share of renewable generation came from hydro plants



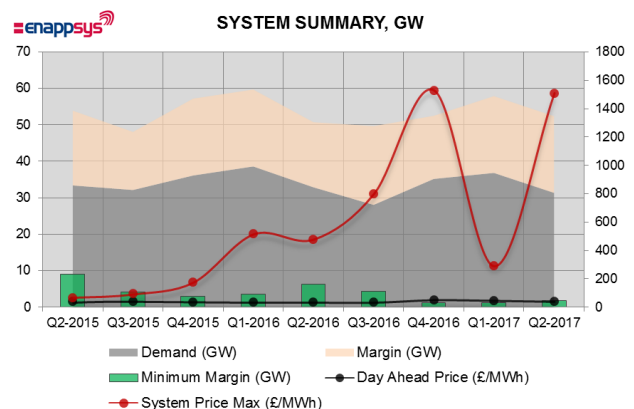
DEMAND, MARGIN AND PRICES

Levels of demand were relatively low in the second quarter of 2017, with overall demand amounting to 68.5TWh (an average of 31.4GW), with these levels being down 14% from the previous quarter and down 5% from Q2 2016.

This combined with high levels of renewable generation led to occasions where the system was very well oversupplied with this resulting in frequent negative system prices (the prices any parties can sell any excess power for – a negative price means parties are penalised rather than paid for this generation).

Being a summer quarter, the margin was sufficient throughout the three month period, but with a low renewable period following a number of days of high renewable output resulting in a high system price that exceeded £1,500/MWh. Any plants under delivering against their traded volume would have had to buy any shortfall at these prices.

The coming winter should see the introduction of the Capacity Mechanism and this might start to change the levels of margin and the frequency of high prices within the system, but otherwise the quarter was very similar to 2016, but with increased price volatility due to the strong levels of renewable generation.



Statistics

The following table contains some of the key statistics relating to the quarter:

*GB Only (Excludes Northern Ireland)	Q2-2015	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017
WHOLESALE PRICES (£/MWh)									
Day Ahead Price	41.97	41.41	37.74	34.63	35.07	34.59	52.25	47.75	41.00
Within Day Price (MDP)	40.80	41.19	37.33	34.28	34.06	33.36	50.45	47.23	41.00
WITHIN DAY PRICE BREAKDOWN (£/MWh)									
Off-Peak Hours	34.38	35.28	29.72	28.72	28.65	27.75	37.13	40.53	35.95
Peak Hours (excl Superpeak)	43.64	43.62	37.97	33.86	35.78	36.95	48.29	47.15	42.87
Superpeak Hours	45.33	46.06	52.37	48.26	40.28	33.36	87.81	62.85	45.78
SYSTEM BUY PRICE (£/MWh)									
Maximum	68.56	94.41	178.22	517.55	480.38	801.77	1528.72	292.55	1509.80
Average	45.79	47.22	42.20	36.67	34.62	35.91	51.45	46.42	40.00
Minimum	-2.61	17.54	-73.48	-63.02	-100.00	-114.99	-153.89	-14.00	-73.15
SYSTEM SELL PRICE (£/MWh)									
Maximum	68.56	94.41	178.22	517.55	480.38	801.77	1528.72	292.55	1509.80
Average	35.46	36.86	37.20	36.67	34.62	35.91	51.45	46.42	40.00
Minimum	-61.79	0.75	-73.48	-63.02	-100.00	-114.99	-153.89	-14.00	-73.15
DEMAND (MW)									
DEMAND (MW)	33,392	32,141	36,121	38,594	32,890	28,063	35,186	36,835	31,355
AVAILABILITY (MW)									
AVAILABILITY (MW)	50,122	44,769	54,271	56,430	46,968	46,133	50,859	55,672	49,281
MARGIN (MW)									
MARGIN (MW)	20,501	15,930	21,084	21,100	17,851	21,597	17,303	21,062	21,028
MIN MARGIN (MW)									
MIN MARGIN (MW)	9,125	4,217	3,007	3,482	6,259	4,439	1,213	1,287	1,867
DEMAND (TWh)									
DEMAND (TWh)	72.9	71.0	79.8	83.4	71.8	62.0	77.7	79.6	68.5
AVAILABILITY (TWh)									
AVAILABILITY (TWh)	109.5	98.8	119.8	121.9	102.6	101.9	112.3	120.3	107.6
MARGIN (TWh)									
MARGIN (TWh)	44.8	35.2	46.6	45.6	39.0	47.7	38.2	45.5	45.9
MIN MARGIN (TWh)									
MIN MARGIN (TWh)	19.9	9.3	6.6	7.5	13.7	9.8	2.7	2.8	4.1

NOTES ON THE REPORT

The figures used in the report refer to GB only, against DECC 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. FPNs at wind farms do not correlate well with metered volumes and so cannot be used reliably.

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

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

ABOUT ENAPPSYS

EnAppSys provides services to companies in the energy and power markets, specifically by providing data, information and consultancy services.

The company has a GB power market database stretching back to 2002 and an online platform that provides readily available information ranging from forwards market prices to historic generator operations.

EnAppSys is focused on providing information and analytical services covering the energy sector and is actively growing the business to provide products with enhanced analysis and forecasting capabilities and extending the geographic and sector coverage beyond the UK and the electricity market.

The company serves customers across Europe and has market monitoring platforms used by a significant number of market parties in both Britain and the Netherlands and is increasing coverage continuously.

The company's business objective is to make available timely, optimal and insightful information, analysis and systems to the energy sector to ensure all sizes of company have the best available tools and information to make informed decisions and to optimise their business strategy.

To find out more about EnAppSys contact the company at about@enappsys.com or visit the company's website at www.enappsys.com.