



GB Electricity Market Summary

FULL YEAR 2015

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

GAS: 9.6GW (-3%)

COAL: 8.5GW (-23%)

NUCLEAR: 7.5GW (+10%)

RENEWABLES: 7.5GW (+22%)

INTERCONNECTIONS: 2.4GW (+6%)

Contents

EXECUTIVE SUMMARY	1
FUEL ACTIVITY	3
RENEWABLES	6
DEMAND, MARGIN AND PRICES	8
CARBON EMISSIONS	9
NOTES ON THE REPORT	10
ABOUT ENAPPSYS	11

EXECUTIVE SUMMARY

The GB electricity market has seen a notable shift over the past five years. The formerly dominant fossil fuel stations are seeing reduced levels of activity as levels of power imports from the continent have increased and renewables have generated a greater share of the overall fuel mix.

Back in 2010, fossil fuels (mostly coal and gas) were responsible for 76.4% of overall electricity generation. By 2015, this share of total generation had fallen to 51.1% with total levels of output by fossil fuel generators having fallen by 39%, from 259.8TWh to 158.8TWh.

This has seen a significant erosion of the need for older plants in the market. As 'within day' power prices are down 21% since 2013, this has contributed to much lower levels of profitability at new fossil fuel plants.

The plants that have remained active in the market have typically been the newer builds, constructed since 2010. These have reduced the oldest gas-fired plants to minimal generating hours; putting the future of these older stations in doubt as they fail to achieve sufficient running hours.

In recent years, coal-fired power stations have seen the largest reduction in levels of generation, with coal generating units as a whole seeing output decline 45.6% since 2012. Over the same period, levels of generation from gas-fired power stations have risen by 1.8%, with much of the reductions in generation resulting from the closure of coal stations.

Looking further back, however, the largest reduction in generation levels have come at gas-fired power stations which have seen a 46.2% reduction in generation levels since 2010; whilst coal-fired stations have seen a 27.7% reduction over the same period, with coal output having recently peaked in 2013.

Back in 2010, the differential between coal and gas prices was such that gas as a fuel was notably cheaper than coal. However, cheap coal has since saturated the market (driven in part by the cheap gas in America), resulting in very low coal prices. In 2014 and 2015, gas prices have similarly fallen to low levels, but this was insufficient to see a major shift from coal to gas; although levels of generation at older coal stations have been notably reduced.

In 2013, the GB electricity market saw the lowest levels of gas-fired generation since 1997. While levels of gas-fired generation have been up 5.1% since this low, levels of coal-fired generation in 2015 were at their lowest levels since 1951; when coal provided almost all electricity generated in the market, despite overall generation levels 76% lower than they were in 2015.

Coal has been a staple of the GB electricity market since its inception, generating over half of all electricity since 1948. By contrast, renewables generated only 3.6% of total electricity over the same period.

In 2015, levels of renewable generation in GB were much higher, providing 21.0% of total electricity generated and only marginally less than the 21.1% provided by nuclear power stations. In 2016, renewables are expected to exceed generation levels at nuclear plants as the renewable build out continues and the Wylfa nuclear plant closes.

Despite seeing the lowest levels of generation since 1951, coal-fired power stations provided the second highest share of generation by fuel type, at 24.0% of power generated, with gas-fired power stations providing the most power at 27.2%.

Over the course of 2015, 27.2% of generation came from gas-fired plants, 24.0% from coal stations, 21.1% from nuclear plants, 21.0% from renewables and 6.7% from interconnections.

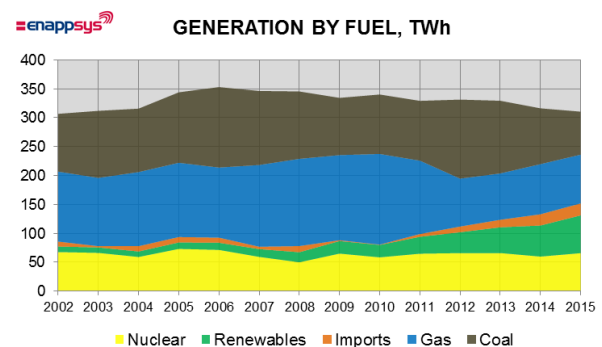
With renewable generation growing, the levels of carbon emissions not accounting for emissions on power imports was estimated at 88.7Mt for the year, down from 106.0Mt in 2014 and 125.2Mt in 2013.

FUEL ACTIVITY

Despite levels of generation dropping back 3% from their levels in 2014, gas-fired power stations provided the largest share of generation within the GB electricity market by fuel type. Total levels of generation at these stations amounted to 84.4TWh (9.6GW) and amounted to 27.2% of overall generation.

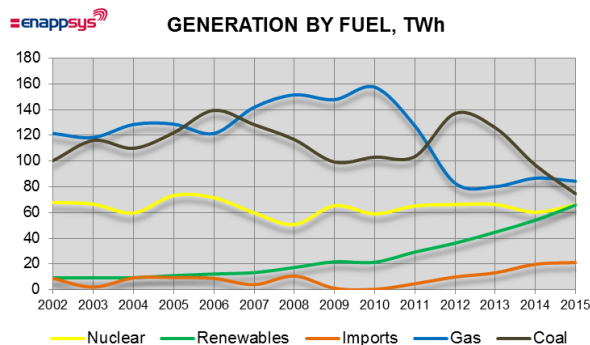
These levels of gas generation are up from recent lows in 2013 - the lowest levels of gas-fired generation since 1997 – having seen gas prices fall to low levels and with some of the newest gas-fired plants having a lower variable generation cost than the oldest coal stations for much of the year.

However, the levels of generation at gas-fired plants were down 46.2% from the recent highs in 2010, when levels of overall generation were much higher, levels of renewable generation much lower and when coal prices were significantly higher.



Coal-fired power stations provided the second largest share of total electricity generation by fuel type at 24.0% of total generation, but saw the lowest levels of generation from coal stations since 1951. Total generation levels amounted to 74.5TWh (8.5), with generation levels down 23% from 2014.

Back in 1951 electricity generation predominantly occurred via coal-fired power stations, but levels



of overall generation were 76% lower than they were in 2015. The on-going closures at coal stations mark the ending for this significant contributor to electricity generation in Britain. Since 1948, coal stations have provided over half the total electricity generation levels.

Overall levels of fossil fuel generation in 2015 amounted to 158.8TWh, down 39% from the 259.8TWh supplied in 2010.

Over the same period the share of power generated at fossil fuel stations has declined from 76.4% to 51.1%.

The drop in levels of generation from fossil fuel stations has in part come as overall generation levels have declined 8.7% since 2010, but also as levels of renewable generation and power imports have increased from the continent.

In 2015, nuclear plants generated 65.7TWh (7.5GW; up 10% from 2014), whilst renewable generators saw levels of generation total 65.4TWh (7.5GW; up 22% from 2014). In 2016, renewable generation is expected to surpass nuclear generation as the Wylfa nuclear plant in Wales closes and the construction of renewable plants continues.

Renewables now provide a large share of the electricity generation within the GB electricity market. Despite this generation coming from a diverse mix of sources, the impact upon the electricity grid has been much smaller than expected.

Wind farms continue to provide the bulk of renewable generation at 49.5% in 2015, but with biomass providing a significant 29.1% of renewable generation.

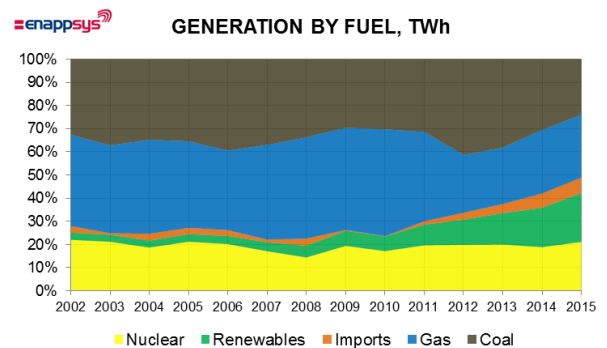
These renewable generation levels were up 204.7% from the levels in 2010, with the share of generation from renewables increasing from 6.3% to 21.0% over the same period. Since 1948, renewables have provided 3.6% of total electricity generation, which is a significant shift in the market.

Levels of imports from the continent also increased in 2015, reaching record levels with 20.8TWh (2.4GW) of net imports from Ireland and the continent; up 6% from 2014. This amounted to 6.7% of total generation.

In 2015, 27.2% of generation came from gas-fired plants, 24.0% from coal stations, 21.1% from nuclear plants, 21.0% from renewables and 6.7% from interconnections.

Statistics

The following tables contain some of the key statistics relating to the 2015 and some previous years:



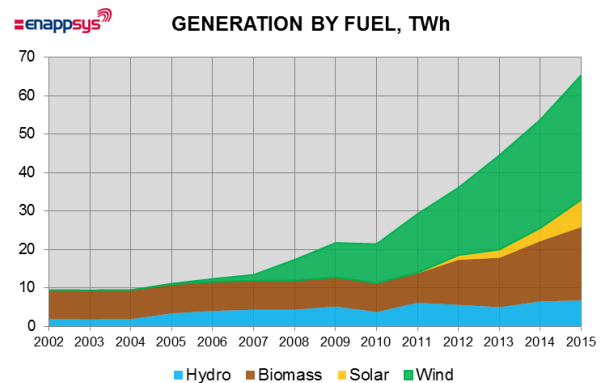
*GB Only (Excludes Northern Ireland)	2007	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL GENERATION BY FUEL (TWh)									
Coal	128.18	116.59	99.10	102.95	103.48	136.84	125.74	96.65	74.46
Gas	141.42	151.00	147.32	156.89	127.01	82.86	80.23	86.72	84.35
Imports	4.10	10.62	1.32	0.58	4.77	9.88	13.02	19.48	20.75
Nuclear	59.25	49.93	64.97	58.44	64.75	65.81	65.93	59.74	65.68
Renewables	13.47	17.38	21.75	21.45	29.24	36.09	44.51	53.75	65.35
TOTAL	346.42	345.52	334.46	340.30	329.24	331.48	329.43	316.34	310.58
SHARE OF GENERATION (%)									
Coal	37.0%	33.7%	29.6%	30.3%	31.4%	41.3%	38.2%	30.6%	24.0%
Gas	40.8%	43.7%	44.0%	46.1%	38.6%	25.0%	24.4%	27.4%	27.2%
Imports	1.2%	3.1%	0.4%	0.2%	1.4%	3.0%	4.0%	6.2%	6.7%
Nuclear	17.1%	14.5%	19.4%	17.2%	19.7%	19.9%	20.0%	18.9%	21.1%
Renewables	3.9%	5.0%	6.5%	6.3%	8.9%	10.9%	13.5%	17.0%	21.0%
INCREASE TO 2015 (%)									
Coal	-41.9%	-36.1%	-24.9%	-27.7%	-28.0%	-45.6%	-40.8%	-23.0%	0.0%
Gas	-40.4%	-44.1%	-42.7%	-46.2%	-33.6%	1.8%	5.1%	-2.7%	0.0%
Imports	405.9%	95.4%	1469.0%	3471.1%	335.4%	110.0%	59.4%	6.5%	0.0%
Nuclear	10.9%	31.5%	1.1%	12.4%	1.4%	-0.2%	-0.4%	9.9%	0.0%
Renewables	385.2%	276.0%	200.5%	204.7%	123.5%	81.1%	46.8%	21.6%	0.0%
Fossil Fuels	269.60	267.59	246.42	259.83	230.49	219.70	205.97	183.37	158.81
Fossil Fuel Share	77.8%	77.4%	73.7%	76.4%	70.0%	66.3%	62.5%	58.0%	51.1%
Renewable Share	3.9%	5.0%	6.5%	6.3%	8.9%	10.9%	13.5%	17.0%	21.0%

RENEWABLES

Growth in levels of renewable generation has been significant in recent years, with this trend continuing into 2015 as renewables generated 65.4TWh (7.5GW) or 21.0% of total electricity generation.

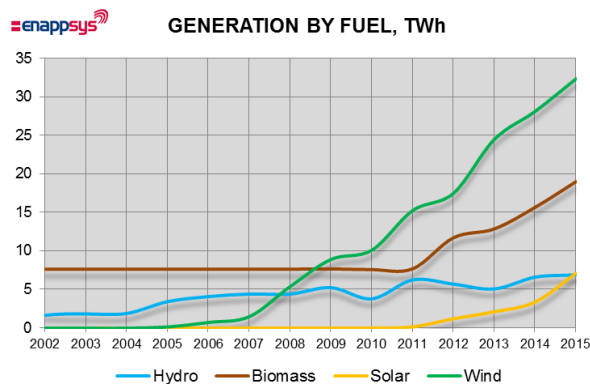
Wind farms provided the largest volume of renewable generation amounting to 32.4TWh (3.7GW), up 15% from the levels in 2014 as levels of wind farm capacity continues to grow, particularly with respect to offshore wind farms. Wind farms provided 49.5% of total renewable generation.

The largest growth in capacity and generation in recent years occurred in 2013, but levels of output have been steadily increasing since that date, with levels of output from wind farms being much higher in the winter months.



Biomass saw significant growth in 2015 as Drax units have been converting from coal to biomass with output levels increasing over time as a result of these conversions.

In 2015, biomass plants generated 19.0TWh (2.2GW), or 29.1% of all renewable generation with these generation levels being up 21.4% from 2014.

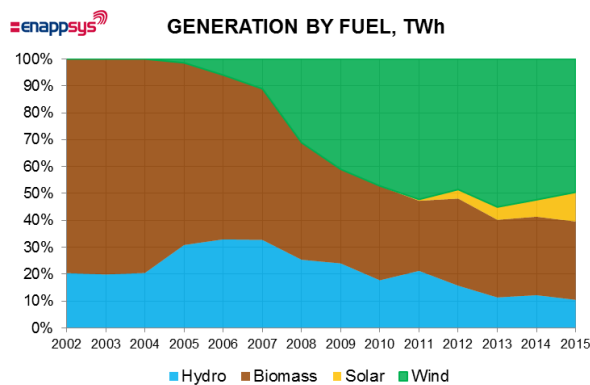


The most significant change has seen much increased levels of generation from solar plants, with this power coming mostly during the brighter summer months.

Solar farms now provide more electricity than hydro plants within GB, generating 7.1TWh (0.8GW). Solar farms generate

only low levels of power in winter, and none whatsoever overnight, so peak levels of generation from these units were much higher at peaks of ~6GW, with solar farms providing 10.9% of all renewable generation.

Solar plant construction that has occurred was much larger than expected. This came as solar developers rushed to get projects built ahead of the deadline, after which developers would be



unable to benefit from older and more lucrative subsidies. This encouraged developers to build projects much earlier than planned.

Despite hydro being the oldest source of renewable generation, providing 1.5% of overall generation as early as 1972, this source also saw the lowest levels of generation of the four largest renewable generators.

Total levels of generation from hydro plants totaled 6.8TWh (0.8GW), an increase of 4.3% since 2014. Hydro plants provided 10.5% of all renewable generation, but with this amounting to 2.2% of total generation, the share of overall generation from hydro plants has not increased significantly since 1972.

In 2015, wind farms provided 49.5% of renewable generation, biomass 29.1%, solar farms 10.9% and hydro plants 10.5%.

Statistics

The following tables contain some of the key statistics relating to the year and some previous years:

*GB Only (Excludes Northern Ireland)	2007	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL GENERATION BY FUEL (TWh)									
Biomass	7.57	7.57	7.61	7.51	7.62	11.69	12.84	15.67	19.03
Hydro	4.41	4.41	5.22	3.80	6.21	5.68	5.06	6.56	6.84
Solar	0.00	0.00	0.00	0.01	0.16	1.21	2.12	3.39	7.13
Wind	1.49	5.40	8.92	10.12	15.26	17.51	24.49	28.13	32.35
TOTAL RENEWABLES	13.47	17.38	21.75	21.45	29.24	36.09	44.51	53.75	65.35
SHARE OF RENEWABLE GENERATION (%)									
Biomass	56.2%	43.5%	35.0%	35.0%	26.1%	32.4%	28.9%	29.2%	29.1%
Hydro	32.7%	25.4%	24.0%	17.7%	21.2%	15.7%	11.4%	12.2%	10.5%
Solar	0.0%	0.0%	0.0%	0.0%	0.5%	3.4%	4.8%	6.3%	10.9%
Wind	11.1%	31.1%	41.0%	47.2%	52.2%	48.5%	55.0%	52.3%	49.5%
LARGEST RENEWABLE SOURCE	BIOMASS	BIOMASS	WIND	WIND	WIND	WIND	WIND	WIND	WIND
INCREASE TO 2015 (%)									
Biomass	151.4%	151.4%	150.2%	153.3%	149.7%	62.7%	48.1%	21.4%	0.0%
Hydro	55.2%	55.1%	31.0%	79.8%	10.2%	20.5%	35.2%	4.3%	0.0%
Solar				67695.7%	4458.6%	487.4%	236.4%	110.5%	0.0%
Wind	2066.5%	498.8%	262.8%	219.6%	112.0%	84.8%	32.1%	15.0%	0.0%

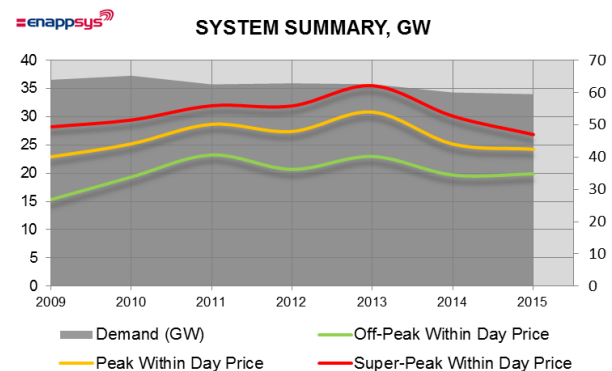
DEMAND, MARGIN AND PRICES

2015 saw levels of demand for electricity generation continue to decline with average demand at 34.0GW, down 0.9% from 2014. This level is 8.8% down from the demand peak back in 2010.

This reduction in demand has come in part due to a growth in generators connected at distribution level (i.e. at local level within towns or industrial estates). This has reduced the need to transport power through the GB network.

The reduction has also come as a result of increased levels of energy efficiency and some industries having shut down in Britain.

Gas prices peaked in 2013, resulting in higher levels of coal generation and a higher power price. However, either side of this year has seen low gas prices, resulting in low wholesale power prices and reduced margins at coal-fired plants.



Statistics

The following table contains some of the key statistics relating to the year and some previous years:

*GB Only (Excludes Northern Ireland)	2009	2010	2011	2012	2013	2014	2015
WHOLESALE PRICES (£/MWh)							
Day Ahead Price				44.54	49.69	41.55	40.51
Within Day Price (MIDP)	36.82	41.75	47.83	45.21	50.58	42.10	39.94
WITHIN DAY PRICE BREAKDOWN (£/MWh)							
Off-Peak Hours	26.87	33.85	40.70	36.23	40.23	34.47	34.82
Peak Hours (excl Superpeak)	39.95	44.09	50.17	47.95	53.97	44.04	42.44
Superpeak Hours	49.55	51.57	56.01	55.95	62.21	52.78	47.09
DEMAND (MW)	36,539	37,263	35,731	35,922	35,767	34,303	33,995

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 separated 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 gives 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 split apart 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 publically available data stream and figures cannot be 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.

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 2003 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'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.