



# GB Electricity Market Summary

## Full Year 2018

Gas: 13.1GW (-3%)

Interconnectors: 2.2GW (+23%)

Renewables: 10.9GW (+15%)

Coal: 1.8GW (-25%)

Nuclear: 6.9GW (-7%)

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## Executive Summary

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2018 saw continued growth in levels of renewable generation, with overall levels of renewable generation within Britain now closing in upon levels of fossil fueled generation.

Levels of generation from coal and gas-fired power stations produced a combined 130.9TWh against a total of 95.9TWh from renewable sources. Whilst this meant that fossil power plants produced 35.0TWh more than renewable sources, renewable projects also saw levels of generation increase by 12.7TWh, with this impacting levels of conventional power generation.

With any further increases in renewable generation set to reduce levels of fossil fuel generation, this trajectory should see levels of renewable generation reach 121.3TWh by 2020, with the impact of this likely to be that fossil fuel generation falls to 105.6TWh by the same year. This would see more power come from renewable projects than from any other aggregated power source (renewables, fossil fuels, nuclear or interconnectors).

The increase in levels of renewable generation was primarily driving by a large rise in levels of wind-powered generation as a number of large offshore wind farms commissioned or entered full operation during the year.

With offshore wind farms now providing a relatively low cost source of power (against historic levels) these projects set to continue to come on-stream driving higher levels of renewable output in future years.

This means that - in the short-term at least – wind is set to continue to be the primary source of renewable generation, with wind farms producing a record high share of renewable generation at 55.4%.

In the year, levels of wind generation acted to displace conventional power stations and whilst this leaves room for baseload generation this does act to squeeze levels of generation from other generators in the market.

With these plants still needed in order to meet peak demand requirements the suspension of the Capacity Mechanism during the year is a concern in terms of ensuring plants are incentivised to remain in the market.

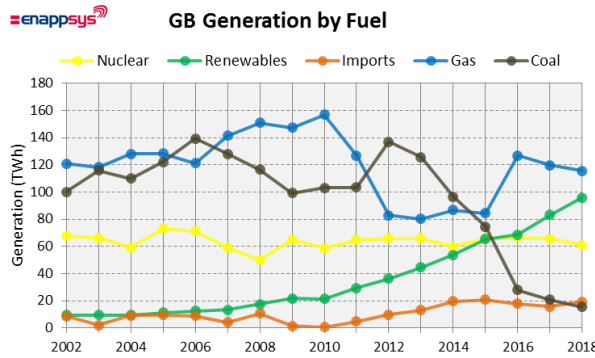
Against this backdrop, the market in 2018 saw prices fall to lower than usual levels as the impact of this growing wind and of very competitive market dynamics placed downward pressure on prices.

This dynamic should settle down over time, but with increased competition in the market driven by the growth of renewables it will become necessary to reinstate the Capacity Mechanism in order to fill the gap left by the lost income.

If that is not the case then plant closures will likely in order to push levels of market income up to required levels.

## Fuel Activity Overview

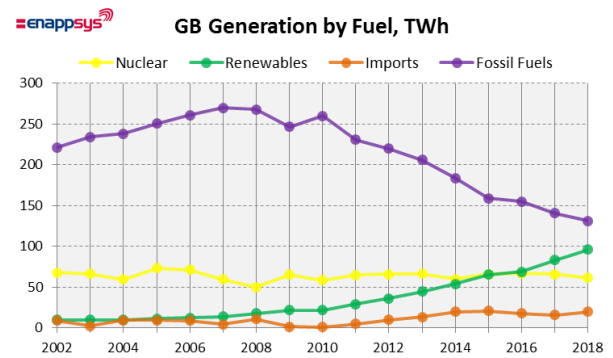
The British power market in 2018 continued to source the majority of power from gas-fired power stations, which provided 37.6% of the total power generated. This was followed by generation



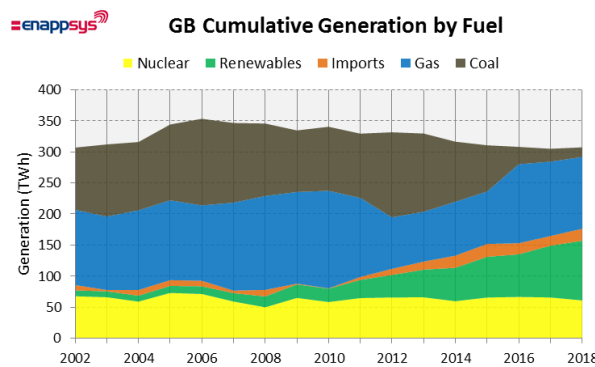
from renewable sources (at 31.2%), nuclear stations (19.9%), power generated abroad (6.3%) and from coal stations (5.0%).

The most significant activity in the year saw the on-going rise in levels of renewable generation, increasing by 15% to reach 95.9TWh. If this rate of increase at 12.7TWh continues for the next two years, then renewables should be set to overtake fossil fuels as the dominant source of power generation by 2020, as renewables continue to display conventional power stations.

This activity has been driven by the arrival of new large offshore wind farms in the market and with offshore wind farms being relatively economical (taking into account their benefits) this rise is set to continue in future years.



As levels renewable generation have climbed, levels of gas-fired generation have remained relatively static, but at the same time levels



of coal-fired generation are now down 89% from the recent high in 2012, with levels of generation totaling 15.5TWh in the period.

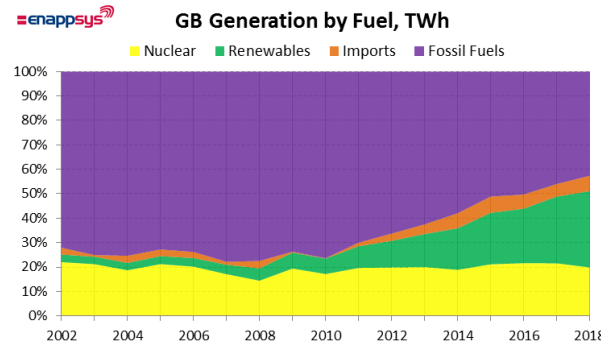
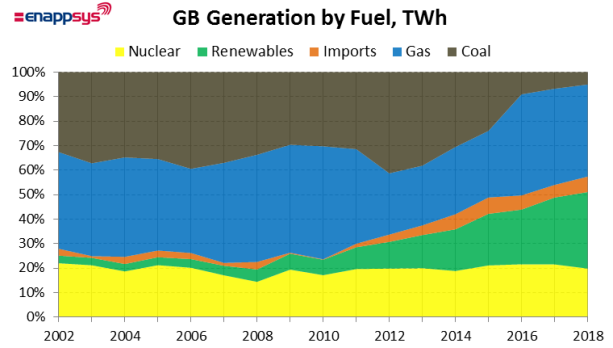
This meant that coal-fired power stations provided only 5% of the power generated in the period, with this representing a drop of 25% from the previous year.

Levels of gas-fired generation were down 3.5% from the previous year, but the high carbon prices that existing within the GB power market have so far largely insulated gas power stations from the on-going rise of renewable generation.

These power stations are still affected by periods of high wind generation, during which only the most efficient plants remain running, but do benefit from slightly high prices as they provide balancing services.

The net impact of these changes are that levels of gas-fired generation remain up 43.9% from the lows seen in 2013, but still down 26.4% from the highs noted in 2010.

Otherwise, nuclear plants generated 61.0TWh in the year; down 7.2% from the previous year as a number of plants saw extended outages during the year.



Interconnectors saw net imports into Britain equivalent to 19.4TWh of power generation, with imports retaining an advantage over domestic electricity producing due to the higher carbon taxes applicable within the GB market.

## Statistics

The following tables contain some of the key statistics relating to 2018 and some previous years:

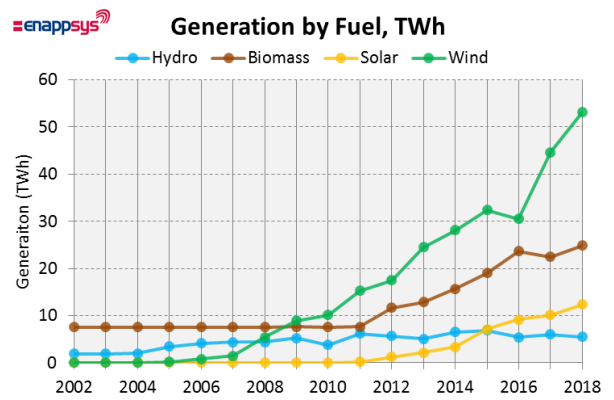
*GB Only (Excludes Northern Ireland)	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>TOTAL GENERATION BY FUEL (TWh)</b>									
Coal	102.95	103.48	136.84	125.74	96.65	74.46	27.92	20.67	15.47
Gas	156.89	127.01	82.86	80.23	86.72	84.35	126.98	119.59	115.45
Imports	0.58	4.77	9.88	13.02	19.48	20.75	17.81	15.71	19.38
Nuclear	58.44	64.75	65.81	65.93	59.74	65.68	66.58	65.72	61.01
Renewables	21.45	29.24	36.09	44.51	53.75	65.35	68.64	83.20	95.88
<b>TOTAL</b>	<b>340.30</b>	<b>329.24</b>	<b>331.48</b>	<b>329.43</b>	<b>316.34</b>	<b>310.58</b>	<b>307.93</b>	<b>304.90</b>	<b>307.19</b>
<b>SHARE OF GENERATION (%)</b>									
Coal	30.3%	31.4%	41.3%	38.2%	30.6%	24.0%	9.1%	6.8%	5.0%
Gas	46.1%	38.6%	25.0%	24.4%	27.4%	27.2%	41.2%	39.2%	37.6%
Imports	0.2%	1.4%	3.0%	4.0%	6.2%	6.7%	5.8%	5.2%	6.3%
Nuclear	17.2%	19.7%	19.9%	20.0%	18.9%	21.1%	21.6%	21.6%	19.9%
Renewables	6.3%	8.9%	10.9%	13.5%	17.0%	21.0%	22.3%	27.3%	31.2%
<b>CHANGE FROM YEAR TO 2018 (%)</b>									
Coal	-85.0%	-85.1%	-88.7%	-87.7%	-84.0%	-79.2%	-44.6%	-25.2%	
Gas	-26.4%	-9.1%	39.3%	43.9%	33.1%	36.9%	-9.1%	-3.5%	
Imports	3235.1%	306.6%	96.2%	48.8%	-0.5%	-6.6%	8.8%	23.3%	
Nuclear	4.4%	-5.8%	-7.3%	-7.5%	2.1%	-7.1%	-8.4%	-7.2%	
Renewables	347.1%	227.9%	165.7%	115.4%	78.4%	46.7%	39.7%	15.2%	
<b>Fossil Fuels</b>	<b>259.83</b>	<b>230.49</b>	<b>219.70</b>	<b>205.97</b>	<b>183.37</b>	<b>158.81</b>	<b>154.89</b>	<b>140.26</b>	<b>130.91</b>
Fossil Fuel Share	76.4%	70.0%	66.3%	62.5%	58.0%	51.1%	50.3%	46.0%	42.6%
Renewable Share	6.3%	8.9%	10.9%	13.5%	17.0%	21.0%	22.3%	27.3%	31.2%

## Renewables

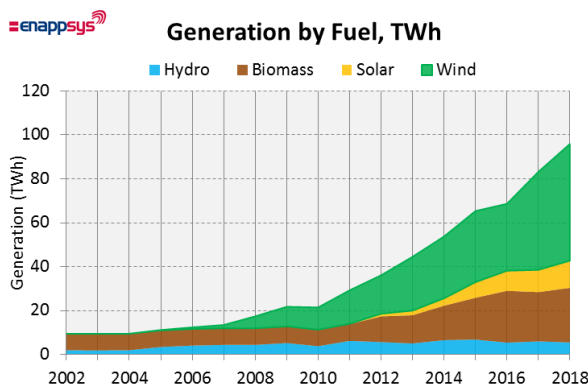
Wind farms continue to be the primary source of renewable generation in the GB power market and as levels of wind generation climb to record high levels, the share of renewable generation from wind sources also hit a new high at 55.4%.

This rise – supported by strong growth in levels of installed offshore wind capacity – saw the levels of generation from wind farms climb by 19.1% to total 53.2TWh. It is worth noting that these levels now significantly exceed levels of combined coal-fired generation and net electricity imports, whilst remaining only slightly behind levels of nuclear generation.

As a result, the impact of wind on the GB power market is becoming more pronounced and this is driving changes in the activity of the market, with conventional power generators having to adapt to lower levels of activity within the year and needing ways to offset any lost income as a result.



The second largest share of renewable generation came from biomass plants in the market –



heavily supported by the generation levels being achieved at Drax power station – and these stations generated a total of 24.9TWh. These levels were up 10.8% from the previous year.

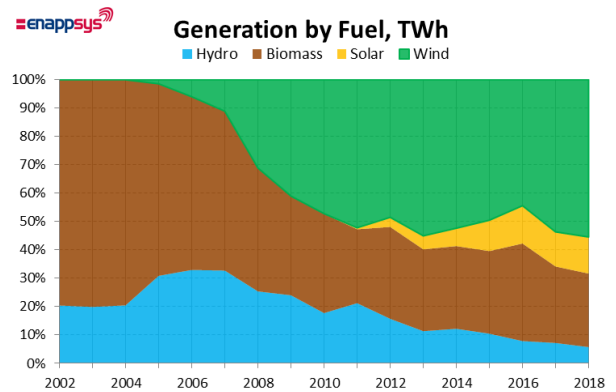
The market has seen significant growth in levels of solar generation in recent years, but whilst peak levels are high the aggregated levels from this fuel source remain relatively low, with solar generation totals being only half those from biomass sources and less than a quarter of the levels being produced from wind farms.

Despite this solar farms still managed to generate 12.4TWh in the year (up 21.8% from the previous year) and provide 13% of all renewable generation.



The smallest share of renewable generation in the year came from hydro plants which saw generation fall back by 8.1% from the high levels of generation achieved in 2017. This saw levels of generation from these sources total 5.5TWh.

On an aggregated basis, 55.4% of total generation came from wind farms, 25.9% from biomass plants, 12.9% from solar farms and 5.8% from hydro plants.



## Statistics

The following tables contain some of the key statistics relating to 2018 and some previous years:

*GB Only (Excludes Northern Ireland)	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>TOTAL GENERATION BY FUEL (TWh)</b>									
Biomass	7.51	7.62	11.69	12.84	15.67	19.03	23.61	22.43	24.86
Hydro	3.80	6.21	5.68	5.06	6.56	6.84	5.40	6.00	5.51
Solar	0.01	0.16	1.21	2.12	3.39	7.13	9.15	10.15	12.37
Wind	10.12	15.26	17.51	24.49	28.13	32.35	30.48	44.62	53.15
<b>TOTAL RENEWABLES</b>	<b>21.45</b>	<b>29.24</b>	<b>36.09</b>	<b>44.51</b>	<b>53.75</b>	<b>65.35</b>	<b>68.64</b>	<b>83.20</b>	<b>95.88</b>
<b>SHARE OF RENEWABLE GENERATION (%)</b>									
Biomass	35.0%	26.1%	32.4%	28.9%	29.2%	29.1%	34.4%	27.0%	25.9%
Hydro	17.7%	21.2%	15.7%	11.4%	12.2%	10.5%	7.9%	7.2%	5.8%
Solar	0.0%	0.5%	3.4%	4.8%	6.3%	10.9%	13.3%	12.2%	12.9%
Wind	47.2%	52.2%	48.5%	55.0%	52.3%	49.5%	44.4%	53.6%	55.4%
<b>LARGEST RENEWABLE SOURCE</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>	<b>WIND</b>
<b>INCREASE FROM YEAR TO 2018 (%)</b>									
Biomass	230.9%	226.2%	112.6%	93.5%	58.6%	30.6%	5.3%	10.8%	0.0%
Hydro	45.0%	-11.2%	-2.8%	9.0%	-16.0%	-19.4%	2.0%	-8.1%	0.0%
Solar	117541.1%	7810.2%	919.3%	483.7%	265.3%	73.5%	35.1%	21.8%	0.0%
Wind	425.1%	248.3%	203.6%	117.0%	88.9%	64.3%	74.4%	19.1%	0.0%
<b>Total</b>	<b>347.1%</b>	<b>227.9%</b>	<b>165.7%</b>	<b>115.4%</b>	<b>78.4%</b>	<b>46.7%</b>	<b>39.7%</b>	<b>15.2%</b>	<b>0.0%</b>

## Demand, Margin and Prices

Levels of demand in 2018 averaged 30.2GW, down slightly from the 30.3GW recorded in 2017, but the most significant activity came as overall generation costs across the market rose due to increased carbon prices and due to increased gas prices.

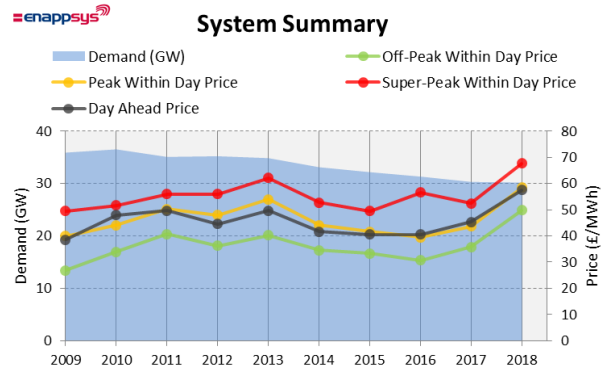
At the very beginning of the year, gas prices increased significantly during the Beast from the East and with oil prices having generally recovered across the year, prices have remained high.

This was combined with a large recovery in the EU ETS carbon price following reduction of the amount of allowances in the market.

This increase in the cost of running meant that market prices rose, as the fossil-fuel-burning portion of the thermal fleet needed higher prices in order to cover these higher running costs. This increase in costs fed through to the system and day-ahead prices.

With the increase in costs and higher renewable generation, the fossil fuel fleets have seen increased pressure on their market, resulting in the low levels of combined coal and gas output seen in 2018.

Otherwise the market has been characterised by a general decline in spark spreads in 2018:



Day Ahead Price (Clean Spark Spread (inc fuel, eu ets and CPS), 49% Ref Effy)

£/MWh	-21	-19	-17	-15	-13	-11	-9	-7	-5	-3	-1	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	45	55	
2014	0%	0%	1%	1%	1%	2%	3%	4%	7%	11%	11%	9%	9%	9%	7%	6%	5%	4%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
2015	0%	0%	1%	1%	1%	1%	2%	3%	5%	10%	14%	10%	10%	10%	7%	5%	4%	4%	3%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%
2016	0%	0%	0%	0%	0%	1%	1%	2%	3%	7%	14%	12%	10%	9%	7%	6%	5%	4%	3%	3%	2%	1%	1%	1%	1%	1%	0%	1%	0%	1%	1%	0%
2017	0%	0%	0%	0%	0%	1%	1%	2%	4%	10%	14%	10%	9%	8%	8%	5%	5%	4%	4%	3%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%
2018	0%	0%	0%	0%	1%	1%	2%	4%	8%	11%	9%	8%	8%	7%	6%	5%	4%	3%	3%	3%	2%	3%	2%	1%	1%	1%	0%	0%	0%	1%	0%	

This has come about as a result of high levels of competition within the market for generation during the periods of moderate to high renewable generation.

As a year, 2018 has been particularly notable due to the size of the reduction in levels of income, but with profit levels set to be very tight if the Capacity Mechanism is not reinstated. This could see plants exit the market in future years.

## Statistics

The following tables contain some of the key statistics relating to 2018 and some previous years:

*GB Only (Excludes Northern Ireland)	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>WHOLESALE PRICES (£/MWh)</b>									
Day Ahead Price	47.92	49.61	44.54	49.69	41.55	40.51	40.47	45.27	57.44
Within Day Price (MIDP)	41.75	47.83	45.21	50.58	42.10	39.94	39.01	44.73	56.84
<b>WITHIN DAY PRICE BREAKDOWN (£/MWh)</b>									
Off-Peak Hours	33.88	40.69	36.23	40.21	34.46	33.24	30.62	35.67	49.81
Peak Hours (excl Superpeak)	44.12	50.17	47.95	53.96	44.03	41.58	39.43	43.64	58.42
Superpeak Hours	51.60	56.00	55.96	62.18	52.74	49.40	56.58	52.44	67.73
<b>DEMAND (MW)</b>	38,321	36,907	37,327	37,078	35,536	35,479	34,746	32,820	34,369
<b>AVAILABILITY (MW)</b>						52,250	49,895	50,465	53,527
<b>MARGIN (MW)</b>						16,771	15,149	17,645	19,158
<b>DEMAND (TWh)</b>	335.7	323.3	327.9	324.8	311.3	310.8	305.2	287.5	301.1
<b>AVAILABILITY (TWh)</b>						457.7	438.3	442.1	468.9
<b>MARGIN (TWh)</b>						146.9	133.1	154.6	167.8
<b>WHOLESALE PRICE INCREASE FROM YEAR TO 2018</b>									
Day Ahead Price	20%	16%	29%	16%	38%	42%	42%	27%	
Within Day Price (MIDP)	36%	19%	26%	12%	35%	42%	46%	27%	
<b>WITHIN DAY PRICE INCREASE FROM YEAR TO 2018</b>									
Off-Peak Hours	47%	22%	37%	24%	45%	50%	63%	40%	
Peak Hours (excl Superpeak)	32%	16%	22%	8%	33%	40%	48%	34%	
Superpeak Hours	31%	21%	21%	9%	28%	37%	20%	29%	
<b>DEMAND INCREASE FROM YEAR TO 2018</b>									
	-10%	-7%	-8%	-7%	-3%	-3%	-1%	5%	

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## Notes on the Report

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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.

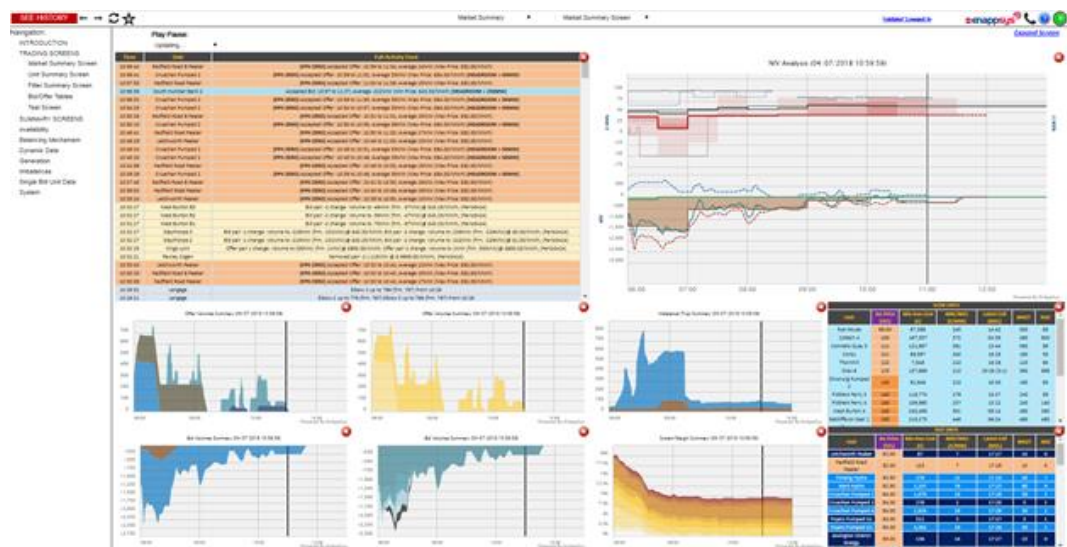
## About EnAppSys

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 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](mailto:about@enappsys.com) or visit the company's website at [www.enappsys.com](http://www.enappsys.com).