

BSUoS Outturn

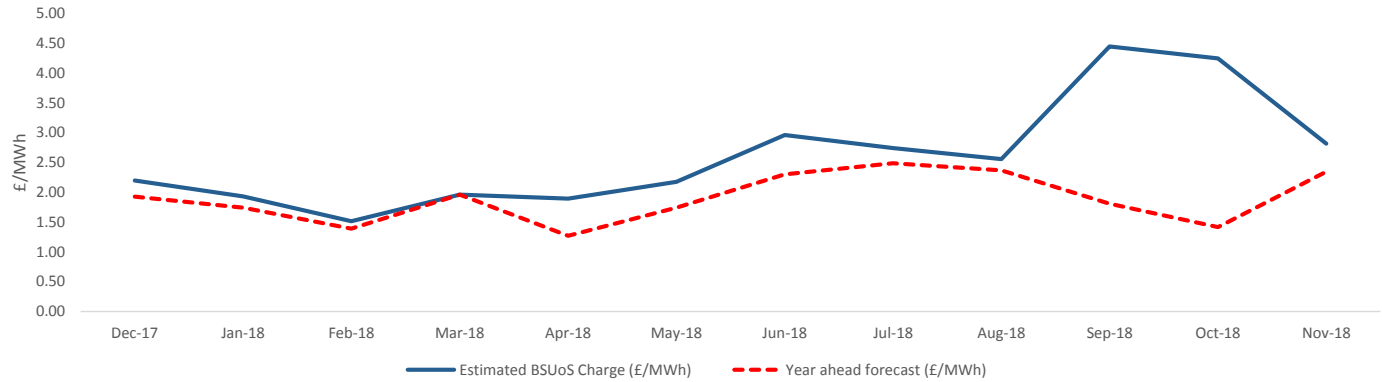


Average BSUoS charge	£/MWh
Nov-18	2.81
Past 12 months	2.56
2017/18	2.31

Outturn costs for November were £16m higher than forecast. Operating Reserve outturn ~£4m lower than forecast, but constraint costs were £16m higher than forecast which was, in part, due to constraint contracts being struck after the forecast was published. In addition, the BSUoS volume was 2TWh less than forecast contributing to a further £0.12/MWh error.

The blue line on the chart shows the estimated monthly average BSUoS charge for the past 12 months. The red line shows our forecast for each month, made at year ahead. The table shows a breakdown of the elements that make up the BSUoS charge (including volume), broken down by cost category. The total cost divided by the volume gives the estimated average charge.

Historical outturn vs year ahead forecast



Month	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18
Energy Imbalance	5.1	-1.9	-3.0	3.3	-5.7	-6.8	-2.8	-1.1	-3.9	-0.7	0.0	2.1
Operating Reserve	9.0	8.6	9.2	15.9	4.1	4.4	3.3	4.6	4.5	5.4	8.0	8.3
STOR	9.4	9.4	8.6	8.1	6.1	7.0	6.6	7.4	6.8	5.8	5.3	5.5
Constraints - E&W	9.8	12.3	4.0	14.2	8.8	20.3	32.3	37.2	32.1	77.7	71.1	29.8
Constraints - Cheviot	19.2	11.9	5.4	2.3	13.2	1.5	7.8	1.4	1.6	18.2	8.8	13.9
Constraints - Scotland	5.2	5.4	2.8	1.4	0.4	2.1	6.3	0.2	1.3	4.1	10.9	5.6
Constraints - AS	1.9	0.5	0.4	3.7	2.7	0.9	3.8	0.8	0.4	1.6	13.2	11.8
Negative Reserve	0.1	0.9	0.1	0.4	0.4	2.1	0.4	0.6	0.4	0.6	0.2	0.3
Fast Reserve	7.7	8.1	6.9	7.8	6.5	6.5	6.0	7.6	8.2	7.6	8.5	6.8
Response	11.4	10.4	9.3	11.6	11.0	12.2	11.5	10.5	10.8	11.4	10.5	11.9
Other Reserve	1.3	1.6	1.2	1.1	0.8	0.9	0.8	1.2	1.2	1.1	1.3	0.9
Reactive	6.7	6.6	5.7	5.9	6.5	7.1	7.4	6.6	6.8	6.1	7.0	6.6
Minor Components	2.1	1.8	1.6	1.2	1.4	1.1	1.2	1.2	2.0	1.4	0.5	1.8
Black Start	4.5	3.8	3.4	3.7	3.4	3.7	3.2	3.1	3.6	3.8	5.0	3.6
Total BSUOs	93.4	79.4	55.3	80.7	59.6	63.0	87.7	81.3	75.6	144.0	150.3	108.9
Estimated BSUOs Vol (TWh)	49.2	48.9	45.4	48.7	40.4	37.0	35.3	36.0	36.4	36.2	39.5	44.7
Estimated Internal BSUOs (£m)	14.0	14.0	12.6	14.0	15.6	16.1	15.6	16.1	16.1	15.6	16.1	15.6
Estimated NGET Profit/(Loss)	0.8	0.8	0.8	0.8	1.2	1.3	1.2	1.3	1.3	1.2	1.3	1.2
Estimated BSUoS Charge (£/MWh)	2.20	1.93	1.51	1.96	1.89	2.17	2.96	2.74	2.56	4.44	4.25	2.81
Year ahead forecast (£/MWh)	1.92	1.74	1.39	1.96	1.27	1.74	2.30	2.49	2.37	1.81	1.42	2.35

BSUoS Forecast



Average BSUoS charge	£/MWh
Dec-18	2.62
2018/19	2.67
2019/20	2.54
Next 12 months	2.53

December forecast includes initial outturn for 1st-11th Dec.

Following the suspension of the Capacity Market we have completed a review of our BSUoS forecast; we had already forecast the potential for high margin prices during the winter based on historic events, and we increased Operating Reserve costs in November last month following a reduction in previous forecasts. Despite some days in December experiencing low wind and being relatively cold, we have not seen particular increases in prices. For this reason, we have not increased our forecast as a result of the Capacity Market suspension.

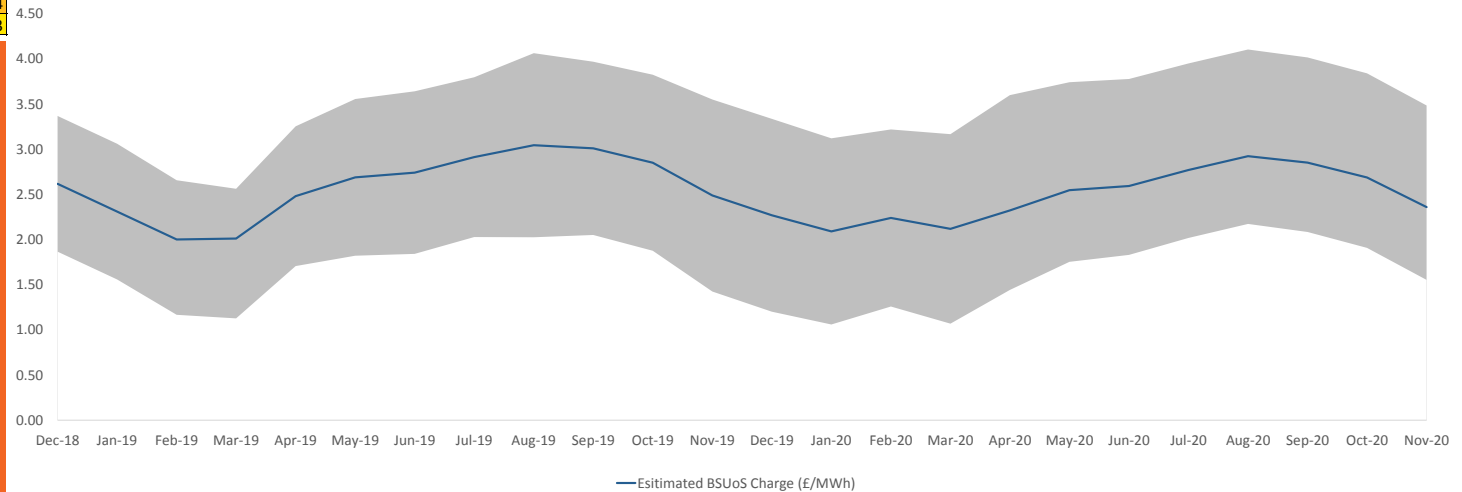
However, following extensions to some Nuclear station outages into January and February, a colder than average forecast for January, and go-live of the NEMO interconnector, we have increased Operating Reserve and Constraints in January by £2m and £10m respectively.

Following another month of over-forecast BSUoS demand, we have reduced our demand forecast in December - March 2019.

We also anticipate the possibility of a high margin cost day (~£10m) over the winter (similar to Nov 2016 and March 2018). We have not included this in our forecast due to the uncertainty of when it may happen, but we wish to inform industry and allow you to build into your own forecasts.

In addition, ~£110m has been added to the Internal BSUoS figure for 2019/20 following the BSUoS circular sent on 5th December (also available on our website - <https://www.nationalgrideso.com/sites/eso/files/documents/Charging%20Circular%20-%20BSUoS%20Revised%20Forecast%20post%20OPCFM.pdf>)

24 month rolling forecast with error bands



Month	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
Energy Imbalance	-2.2	-0.9	1.1	-1.9	-6.9	-4.9	-4.2	-3.5	-4.1	-2.3	-1.5	-1.7	-0.9	1.0	-2.0	-6.9	-4.9	-4.2	-3.5	-4.1	-2.3	-1.5	-1.5	
Operating Reserve	10.8	11.8	12.8	13.1	8.2	8.9	5.8	7.0	8.2	14.1	16.3	16.1	11.8	10.0	13.0	12.9	8.3	9.0	5.8	7.0	8.2	14.1	16.4	16.1
STOR	7.8	7.1	6.5	6.4	5.0	5.4	5.2	5.8	5.6	6.1	6.0	7.4	7.5	7.6	6.5	7.6	5.2	5.6	5.4	6.0	5.8	6.3	6.2	7.4
Constraints	55.8	40.9	17.8	23.3	21.3	25.2	23.7	27.5	31.6	29.6	28.6	30.5	26.5	19.9	19.1	19.5	21.3	25.2	23.7	27.5	31.6	29.6	28.6	30.5
Negative Reserve	0.6	0.6	0.1	0.2	0.4	0.9	1.6	1.8	1.7	1.8	1.2	0.5	0.5	0.6	0.1	0.2	0.4	0.9	1.6	1.8	1.7	1.8	1.2	0.5
Fast Reserve	7.8	8.6	8.7	9.7	9.0	9.0	8.8	9.1	9.6	8.8	9.1	9.4	10.0	10.3	8.7	9.9	9.0	9.0	8.8	9.1	9.6	8.8	9.1	9.4
Response	12.1	11.9	12.3	11.4	11.8	11.6	11.2	11.8	11.6	11.5	11.7	11.3	11.4	11.2	11.1	11.6	11.8	12.6	11.9	12.6	13.1	11.3	11.2	11.2
Other Reserve	1.3	1.6	1.2	1.1	1.1	0.9	1.0	1.2	1.3	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.1	0.9	1.0	1.2	1.3	1.0	0.9	0.9
Reactive	6.5	6.3	5.1	5.4	6.0	6.8	6.4	6.2	6.1	5.9	6.1	5.8	6.4	6.3	5.1	5.4	6.0	6.8	6.4	6.2	6.1	5.9	6.1	5.8
Minor Components	0.6	-2.0	1.1	-0.8	1.8	2.1	1.4	1.1	0.1	-0.3	0.9	-0.8	0.0	-1.6	1.3	-0.6	3.0	3.0	2.6	2.6	1.5	1.1	2.1	0.6
Black Start	3.8	3.8	3.5	3.8	3.7	3.8	3.7	3.8	3.8	3.7	3.8	3.7	3.8	3.8	3.5	3.8	3.7	3.8	3.7	3.8	3.8	3.7	3.8	3.7
Total BSUOs	104.9	89.7	70.2	71.6	61.6	69.6	64.8	71.9	75.5	79.9	83.2	83.3	77.2	68.2	70.4	69.3	63.0	71.7	66.9	74.2	78.6	81.3	84.1	84.6
Estimated BSUOs Vol (TWh)	46.7	46.4	42.9	44.3	35.3	35.8	33.1	33.8	33.6	35.1	38.6	43.9	45.8	45.4	42.2	45.3	35.3	35.8	33.1	33.8	33.6	35.1	38.6	43.9
Estimated Internal BSUOs (£m)	16.1	16.1	14.5	16.1	24.9	25.7	24.9	25.7	25.7	24.9	25.7	24.9	25.7	23.2	25.7	17.9	18.5	17.9	18.5	18.5	17.9	18.5	17.9	18.5
Estimated NGET Profit/(Loss)	1.3	1.3	1.2	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Estimated BSUoS Charge (£/MWh)	2.62	2.31	2.00	2.01	2.48	2.69	2.74	2.91	3.04	3.01	2.85	2.49	2.27	2.09	2.24	2.12	2.32	2.55	2.59	2.77	2.92	2.85	2.69	2.36

High Error Band (£/MWh)	3.37	3.06	2.66	2.56	3.25	3.56	3.64	3.80	4.06	3.97	3.82	3.55	3.34	3.12	3.22	3.17	3.60	3.74	3.78	3.95	4.10	4.02	3.84	3.48
Low Error Band (£/MWh)	1.86536	1.55881	1.16675	1.1268	1.7065	1.82144	1.84084	2.02802	2.02572	2.05039	1.87652	1.42482	1.20138	1.05923	1.25839	1.06793	1.44207	1.75398	1.83035	2.01784	2.17279	2.08433	1.9083	1.55317

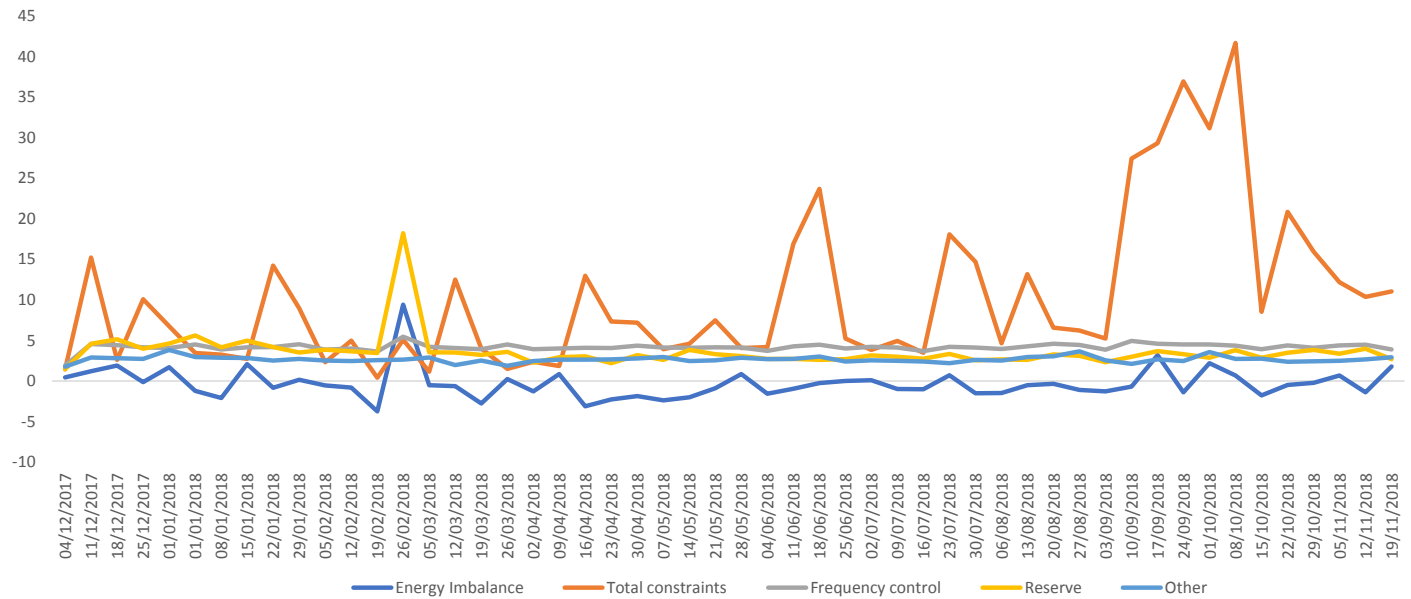
BSUoS Volatility and Forecast Accuracy

The first chart shows the volatility of the cost categories that make up BSUoS. Constraint costs shown in red are the most variable and difficult to predict, mainly driven by the output of wind generation combined with the transmission outage plan at the time. A fault on the transmission system can add to the underlying volatility and cause large unforeseen increases in constraint costs. Reserve, shown in yellow, is generally stable but can have large deviations when the cost of generator margin increases significantly when generation is short. Predicting increases in the cost of reserve is difficult at long timescales, and can have a significant impact on the average BSUoS charge. Energy Imbalance is the other category that contributes to BSUoS volatility, which is the cost of residual balancing when the energy market is long or short. The other cost categories are relatively stable across the year, although there may be longer term trends that we consider.

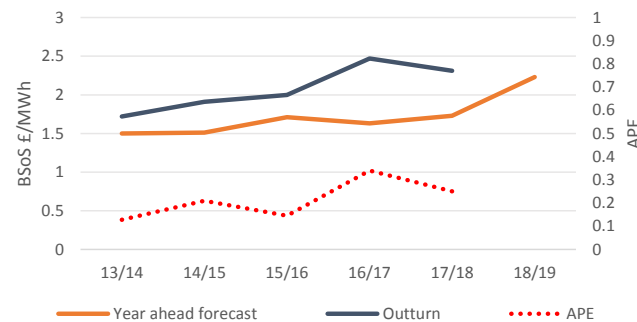
The second chart shows the annual outturn BSUoS charge compared with the forecast made at 12 months ahead, and the absolute percentage error for each year.

The third chart shows the month ahead forecast compared with outturn and absolute percentage error.

Cost volatility by category over past 12 months



Yearly History and APE



Month ahead forecast vs actual and APE

