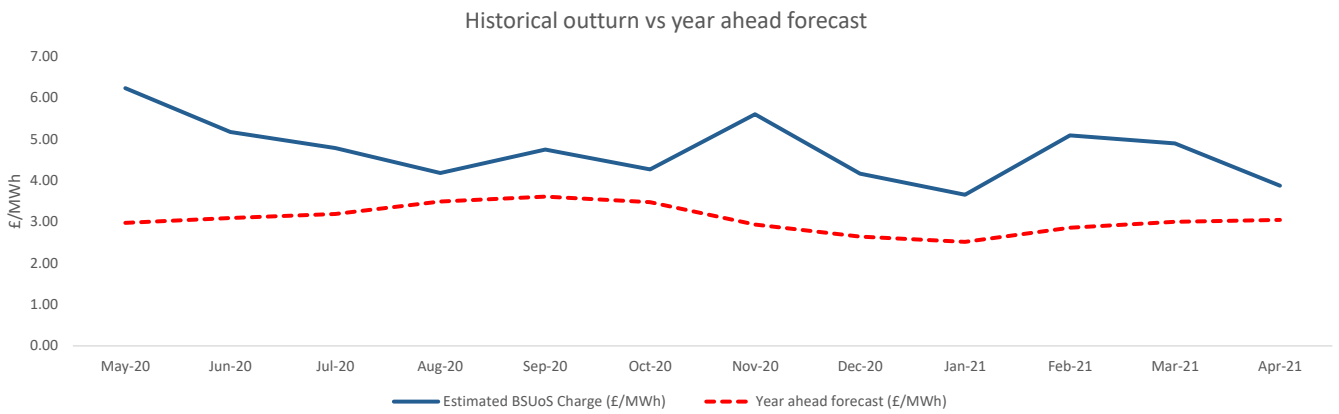
BSUoS Outturn

Average BSUoS charge	£/MWh
Apr-21	3.88
Past 12 months	4.66
2020/21	4.77

The outturn BSUoS for April was lower than March. Constraint costs fell on the back of lower wind and the Western Link HVDC being available having returned in mid-March. The volume rose slightly due to implementation of CMP333 from the 1st April which offset the seasonal demand reduction normally observed as we move to BST.

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.



Month	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21
Energy Imbalance	12.3	7.6	5.7	6.8	8.5	10.9	7.7	12.3	6.5	7.8	4.0	6.0
Operating Reserve	4.8	3.8	3.1	4.8	8.7	11.1	13.8	18.0	50.3	23.4	36.2	22.9
STOR	4.0	3.5	3.2	2.8	2.7	3.3	4.0	4.3	3.4	2.7	2.9	4.1
Constraints - E&W	67.5	74.6	69.4	41.9	43.1	59.5	119.9	61.3	32.8	36.9	37.9	36.4
Constraints - Cheviot	17.4	0.5	0.5	0.6	10.7	8.0	0.9	17.3	1.3	57.6	15.9	1.5
Constraints - Scotland	3.1	5.7	7.9	13.1	19.0	17.3	15.9	12.5	6.5	6.4	20.1	5.7
Constraints - AS	19.0	13.7	21.8	22.4	17.8	0.9	2.1	1.4	0.5	0.5	1.1	0.8
Negative Reserve	0.6	0.2	0.2	0.5	0.6	0.5	0.4	0.3	0.0	0.3	0.2	0.3
Fast Reserve	7.8	8.8	7.1	8.5	9.7	9.2	10.5	11.0	11.4	10.3	14.7	15.1
Response	8.7	7.0	8.1	7.2	8.2	12.6	14.4	15.6	15.1	15.3	20.1	20.5
Other Reserve	2.6	1.8	2.5	1.9	1.9	1.6	1.6	1.5	1.2	1.4	2.0	1.4
Reactive	5.9	4.9	4.7	4.6	4.2	4.5	5.4	5.9	5.4	5.6	7.6	8.2
Minor Components	5.2	4.0	1.8	2.6	1.7	3.0	1.0	0.9	2.4	0.3	3.0	1.4
Black Start	3.8	3.6	3.4	3.3	8.9	7.6	7.9	4.5	8.0	5.4	6.0	3.5
Total BSUoS	162.8	139.8	139.4	120.9	145.7	150.0	205.4	166.9	144.8	173.8	171.5	127.7
Estimated BSUoS Vol (TWh)	29.1	30.5	33.1	33.4	34.5	39.6	39.9	44.6	46.5	38.7	40.2	40.7
Estimated Internal BSUoS (£m)	18.9	18.3	18.9	18.9	18.3	18.9	18.3	18.9	18.9	17.1	18.9	23.3
ESO Incentive	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.3	1.5	0.0
ALoMCP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8	4.8	4.8
CMP345/350 Deferred Costs												1.7
Estimated BSUoS Charge (£/MWh)	6.24	5.18	4.78	4.19	4.75	4.27	5.60	4.17	3.66	5.10	4.90	3.88

Year ahead forecast (£/MWh)	2.98	3.10	3.19	3.49	3.61	3.48	2.94	2.65	2.52	2.86	3.00	3.05

BSUoS Forecast

Average BSUoS charge	£/MWh
May-21	4.09
2021/22	4.17
2022/23	3.23
Next 12 months	4.13

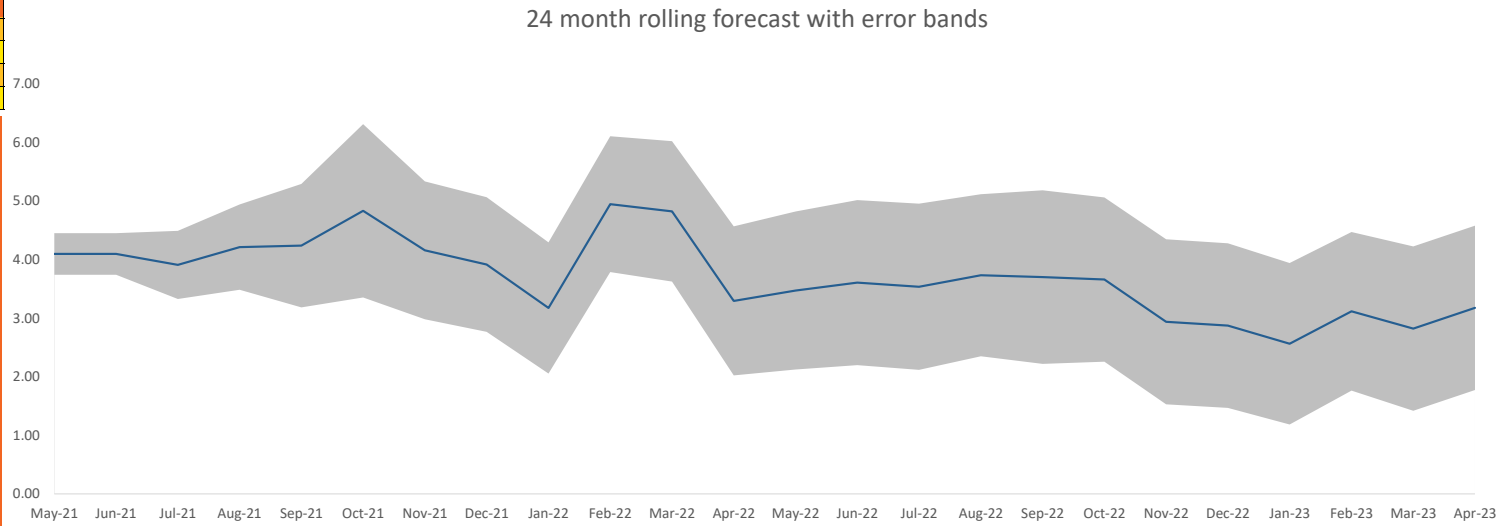
Minor adjustments have been made to Fast Reserve based on recently observed data. ESO Incentive has been removed as a separate cost and is now included in the ESO internal costs as part of the Price Control Financial Model.

In March for the FY21/22 forecast we have re-costed the outage plan and adjusted the constraint costs accordingly. When producing a forecast of constraint costs, we apply a historical wind profile for each month. Variations in the constraint costs month on month will therefore be driven by the reduction in constraint limits due to outages in addition to the wind level applied. As such these are indicative of where costs may outturn but variations are expected due to outturn wind not following a particular historical profile exactly.

We have added an additional line to the forecast from Apr 21 to Mar 22 to account for the deferred BSUoS as per CMP345/350.

From April 21 CMP333 comes into effect changing the demand base to gross demand (NB. This has been included in the forecast figures for some time).

The chart shows the average monthly BSUoS forecast for the next 24 months. The grey band shows the upper and lower range of the forecast. The forecast uses a combination of forecast models and historical data. Constraint costs are adjusted in line with major changes to the outage plan, system faults, and commissioning programmes. The other energy cost categories are forecast using a baseline of historical trends with adjustments for expected changes in system operation or balancing services markets.



Month	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23
Energy Imbalance	13.8	10.2	11.3	10.7	12.0	13.4	12.8	13.2	13.9	14.6	9.8	8.5	7.9	8.2	9.3	8.7	10.1	11.3	10.9	11.1	11.9	12.8	10.8	8.5
Operating Reserve	13.0	10.8	11.0	11.2	14.1	16.4	16.1	18.9	21.1	20.9	18.2	15.3	12.0	10.8	11.0	11.2	14.1	16.4	16.1	18.9	21.1	20.9	13.2	15.3
STOR	5.9	5.4	6.0	5.8	6.3	6.2	7.4	7.5	7.6	6.5	7.4	5.2	5.6	5.4	6.0	5.8	6.3	6.2	7.4	7.5	7.6	6.5	7.4	5.2
Constraints	50.0	44.8	37.1	49.0	58.7	88.5	97.2	83.1	57.4	113.7	117.4	38.9	39.5	39.2	40.5	49.5	53.1	56.0	52.6	46.5	39.8	45.3	41.6	38.9
Negative Reserve	0.7	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	0.5	0.6	0.1	0.2	0.4
Fast Reserve	9.8	13.0	13.4	14.0	10.3	10.6	10.9	11.6	11.8	10.1	11.2	9.0	9.0	8.8	9.1	9.6	8.8	9.1	9.4	10.0	10.3	8.7	9.7	9.0
Response	16.3	15.9	16.6	17.2	15.2	15.3	15.1	15.4	15.2	14.1	15.4	11.8	12.6	11.9	12.6	13.1	11.3	11.2	11.2	11.3	11.1	10.5	11.4	11.8
Other Reserve	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	0.9	0.9	0.9	1.0	1.1
Reactive	7.4	7.0	6.9	6.8	6.6	6.7	6.5	7.1	7.0	5.7	6.1	6.7	7.5	7.0	6.9	6.8	6.6	6.7	6.5	7.1	7.0	5.7	6.1	6.7
Minor Components	2.9	2.6	2.6	2.6	2.0	3.1	1.6	2.0	0.5	2.3	0.3	3.0	3.0	2.6	2.6	1.5	1.1	2.1	0.6	1.0	-0.6	2.3	0.3	3.0
Black Start	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Total BSUoS	124.4	116.2	111.7	124.0	131.9	166.2	172.8	163.8	139.8	192.9	191.0	103.8	102.5	100.5	104.7	113.0	118.0	125.0	119.9	118.6	113.7	117.6	105.7	103.8
Esitmated BSUoS Vol (TWh)	37.9	35.7	36.4	36.7	38.2	40.7	48.8	49.7	53.7	44.7	46.0	40.0	37.9	35.7	36.4	36.7	38.2	40.7	48.8	49.7	53.7	44.7	46.0	40.0
Estimated Internal BSUoS (£m)	24.0	23.3	24.0	24.0	23.3	24.0	23.3	24.0	24.0	21.7	24.0	23.3	24.0	23.3	24.0	24.0	23.3	24.0	23.3	24.0	24.0	21.7	24.0	23.3
ESO Incentive	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALoMCP	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CMP345/350 Deferred Costs	1.8	1.7	1.8	1.8	1.7	1.8	1.7	1.8	1.8	1.6	1.8													
Estimated BSUoS Charge (£/MWh)	4.09	4.09	3.91	4.21	4.24	4.83	4.16	3.91	3.17	4.94	4.82	3.29	3.47	3.61	3.53	3.73	3.70	3.66	2.94	2.87	2.56	3.12	2.82	3.17

High Error Band (£/MWh)	4.45	4.45	4.49	4.94	5.29	6.31	5.33	5.06	4.29	6.10	6.02	4.56	4.82	5.01	4.95	5.11	5.18	5.06	4.34	4.28	3.94	4.47	4.22	4.58
Low Error Band (£/MWh)	3.74	3.74	3.33	3.48	3.18	3.35	2.98	2.77	2.05	3.79	3.62	2.02	2.12	2.20	2.12	2.35	2.22	2.26	1.53	1.47	1.18	1.76	1.42	1.77

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. Month ahead is the month ahead of the reporting month.