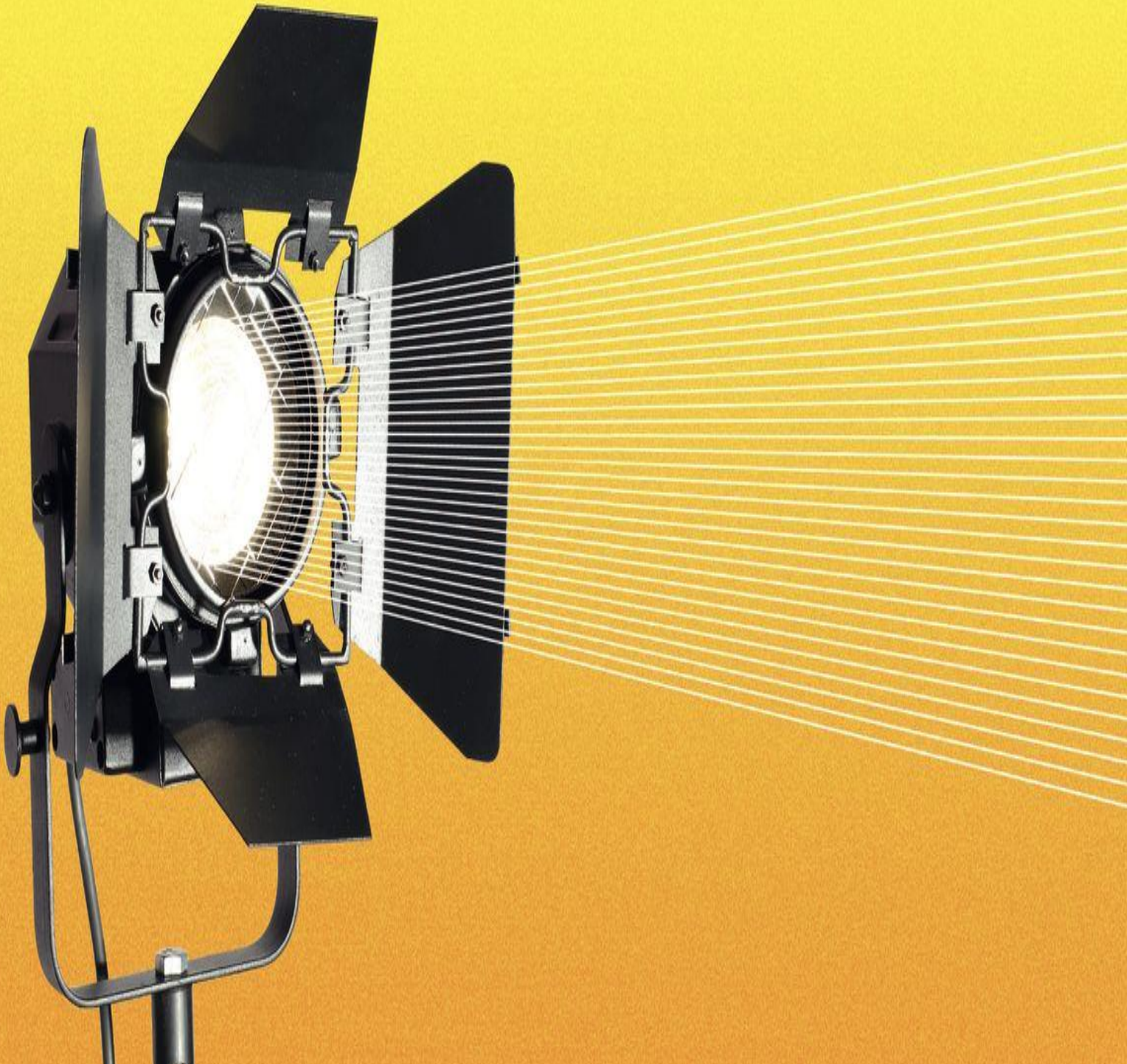


Balancing Costs

Hotspots

November 2018

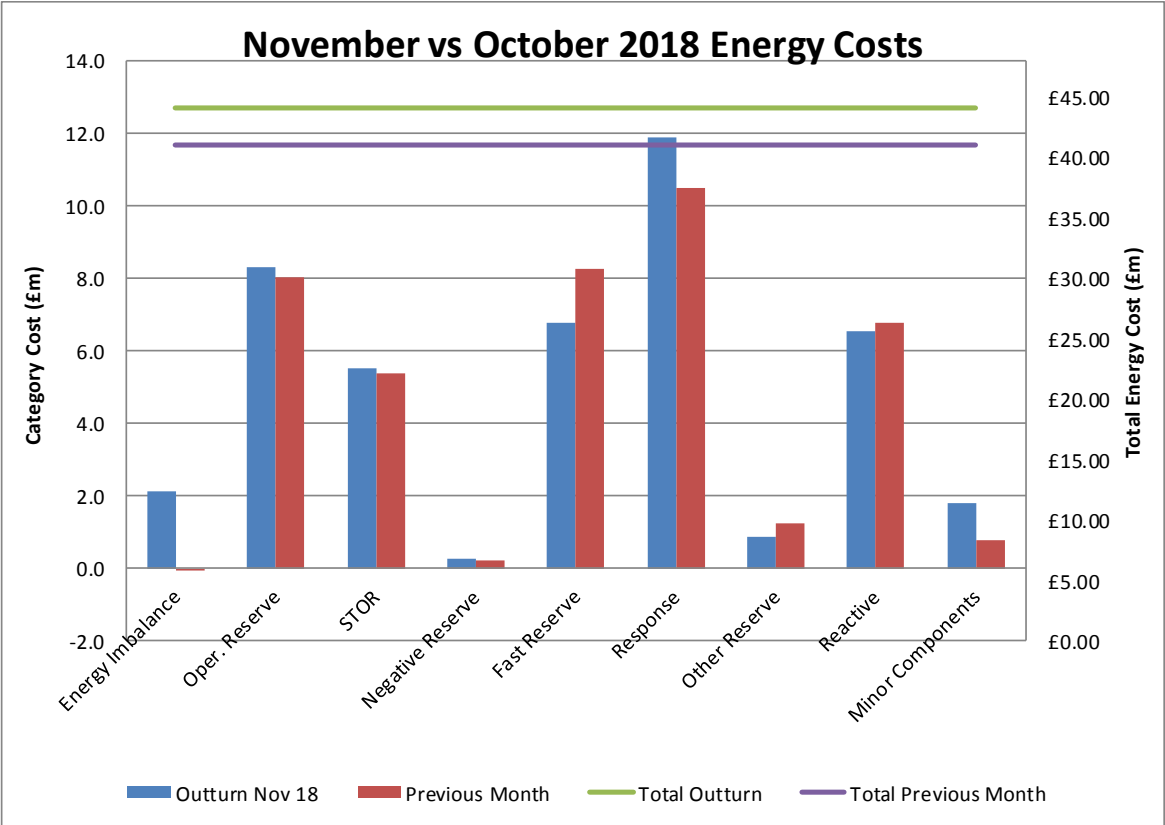


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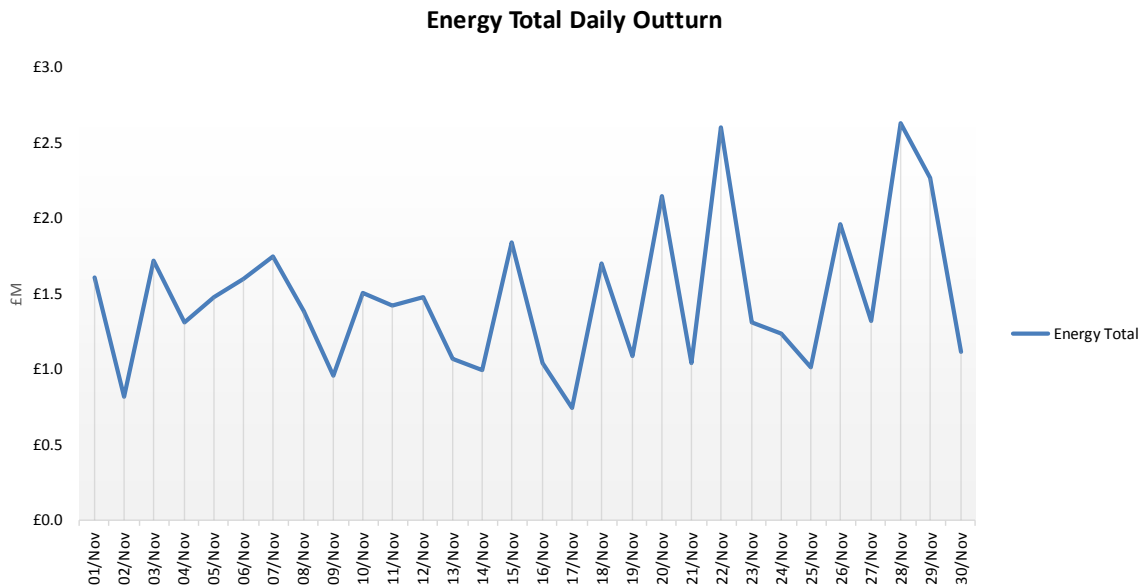
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Energy Costs

Energy costs (including energy imbalance) for November 2018 out-turned at around £44.16m, with a £3.1m increase from the previous month outturn. The energy costs increase from the previous month, was mainly due to longer periods of short market throughout the months resulting in a positive Energy Imbalance spend £2.2m higher than previous month. Another main drive behind the cost increase was the Frequency Response that recorded a cost £1.4m higher than previous month. All the other category costs showed little variance from October 2018.



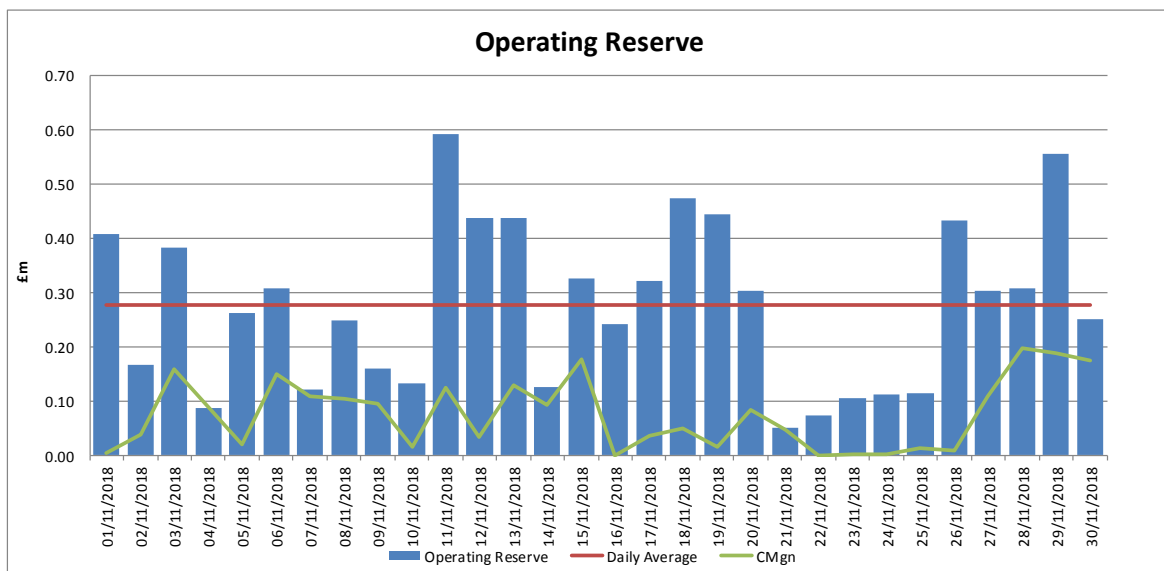
1. Energy Total Daily Outturn



The average daily cost for November 2018 was around £1.5m. The most expensive days were Tuesday 20th with costs of £2.1m, Thursday 22nd and Monday 28th with daily costs peaking at around £2.6m in both cases. The main driver behind these high cost days were long periods of short market, throughout the 24 hours, sometimes in excess of 2GW, resulting in actions costing up to £200MW/h to meet positive reserve requirements.

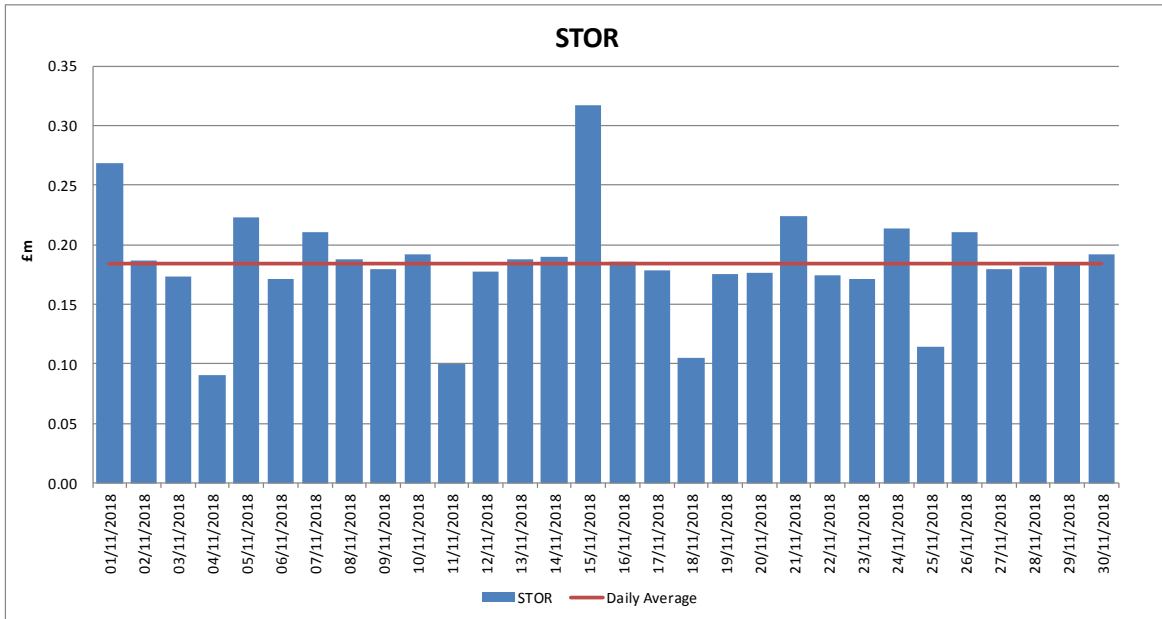
2. Operating Reserve

Operating Reserve out-turned at around £8.3m showing an increase from October 2018 of around £0.3m. The average daily cost was around £0.3m in November 2018. The highest daily spend for this category was recorded on Sunday 11th and Thursday 29th outturning at around £0.6m in both cases. Wind volatility and period of short market were the main drive behind these high cost days for this category. The higher cost days have some correlation with Constrained Margin (CMgn) which is the costs associated with Reserve that is unavailable due to active constraints.



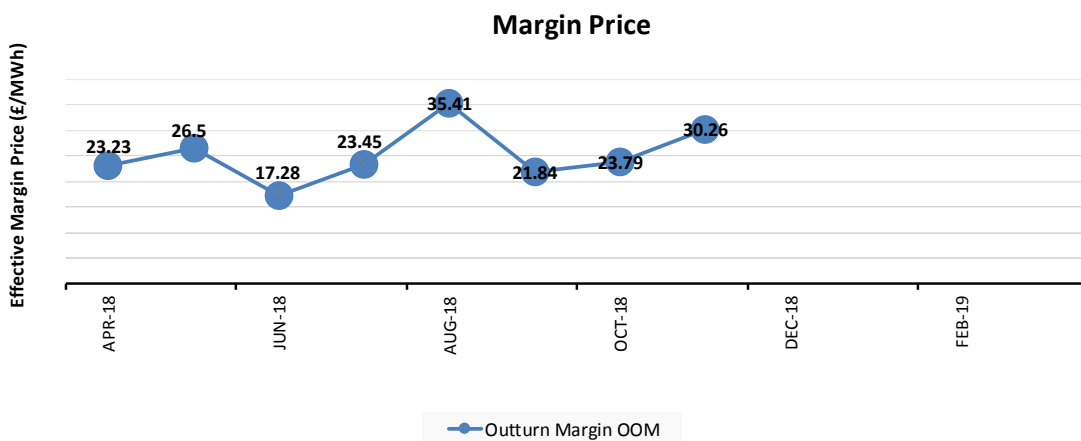
3. STOR

STOR cost for November 2018 was around £5.5m showing little variance from the past month. The average STOR daily cost was £0.2m. Thursday 15th was the most expensive day for this category with a spend of £0.3m. On that day, over the morning peak and when the market was short, the unexpected loss of up to 1600MW of generation, combined with wind short fall, required in excess of 800MW to be utilised.



4. Margin Price

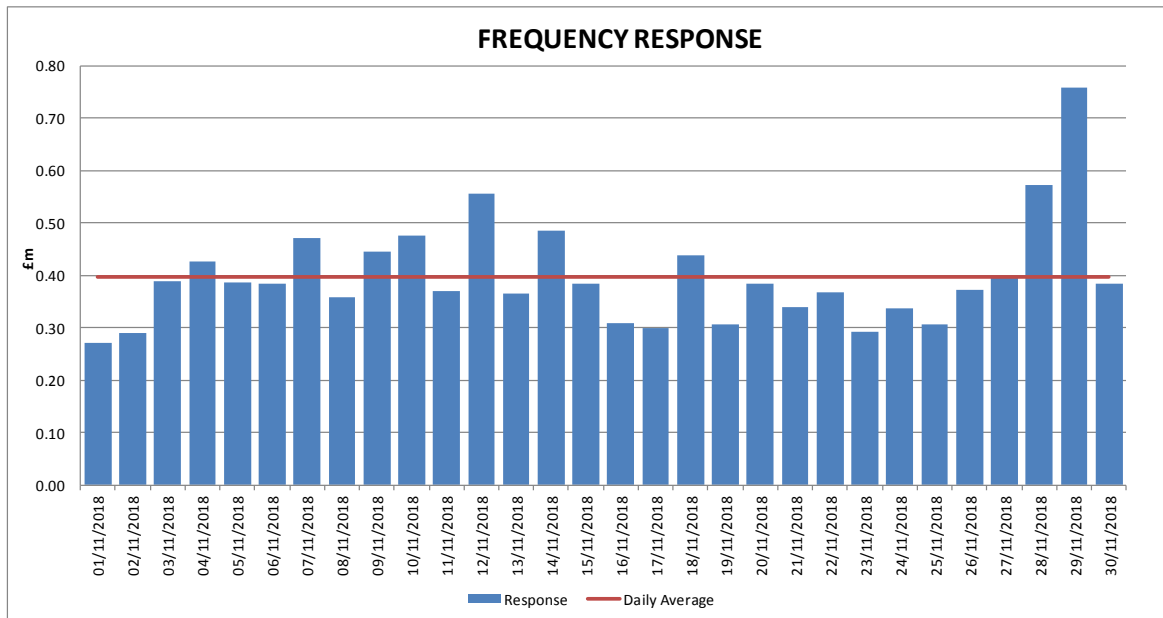
The Average margin price in November 2018 increased from the past month out-turning at £30.26/MWh.



5. Frequency Response

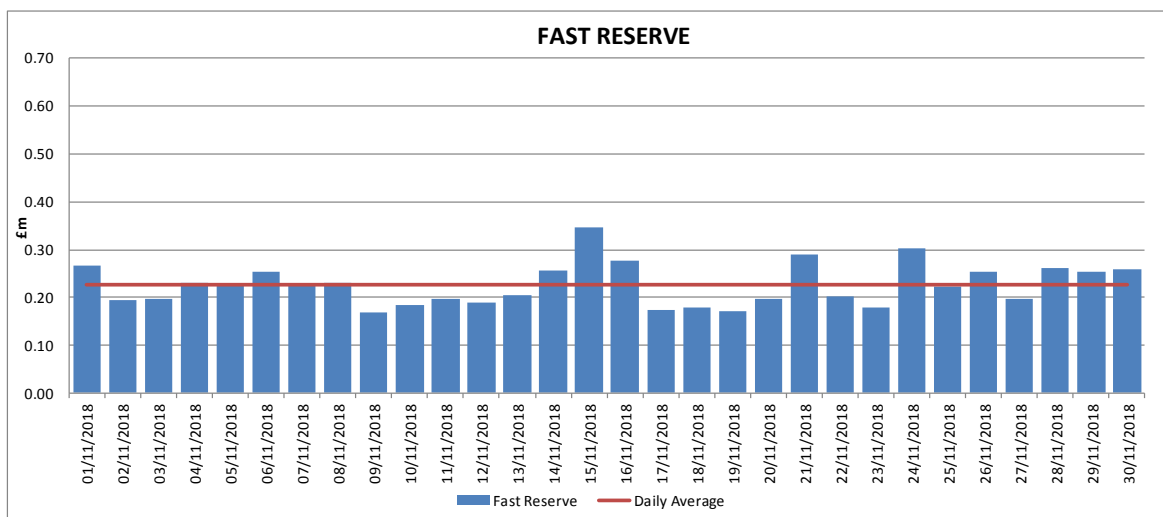
Frequency response in November 2018 out turned at £11.9m with an increase from last month of around £1.4m. The reason of this increase can be sought in the higher volume of generating units repositioned in the BM to provide response service, compared to the last month. In fact, the monthly ancillary costs incurred in November were 73% of the total spend, showing an 8% decrease from the past month. The average daily cost was around £0.4m. Thursday 29th was the

most expensive day for this category with a spend of nearly £0.8m. Negative bid prices were required on both the 28th and 29th contributing to the increased costs.



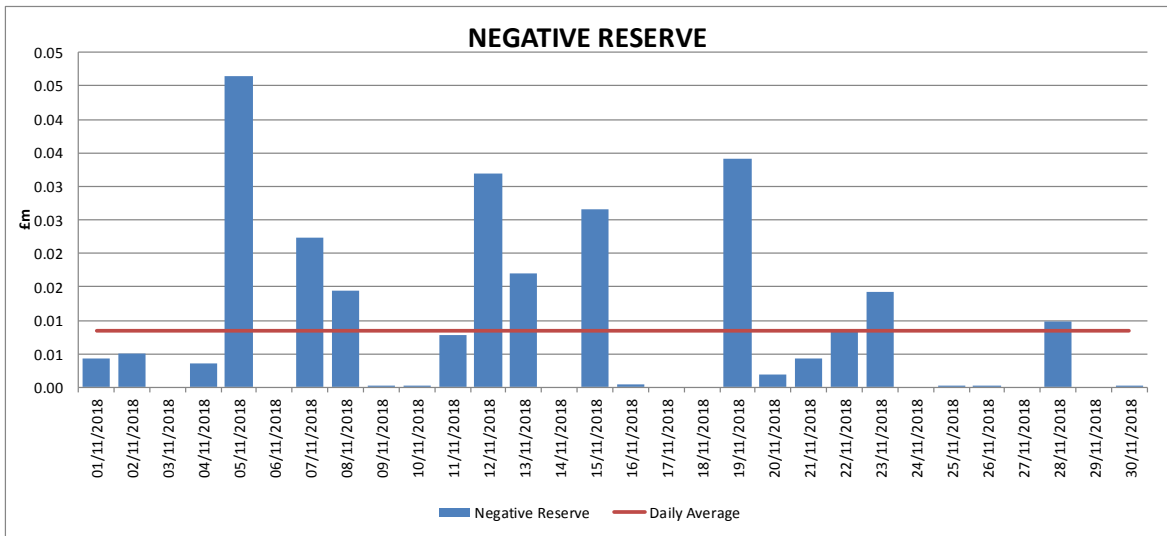
6. Fast Reserve

Fast reserve out turned at £6.8m in November 2018, which is nearly £1.5m lower than October 2018 costs. Throughout the month, the average daily cost was around £0.2m and the ancillary costs made up over 83% of the total costs, most of which is incurred on the SpinGen service. Arming the service delivers consumer value over procuring reserve in the BM (Operating Reserve).



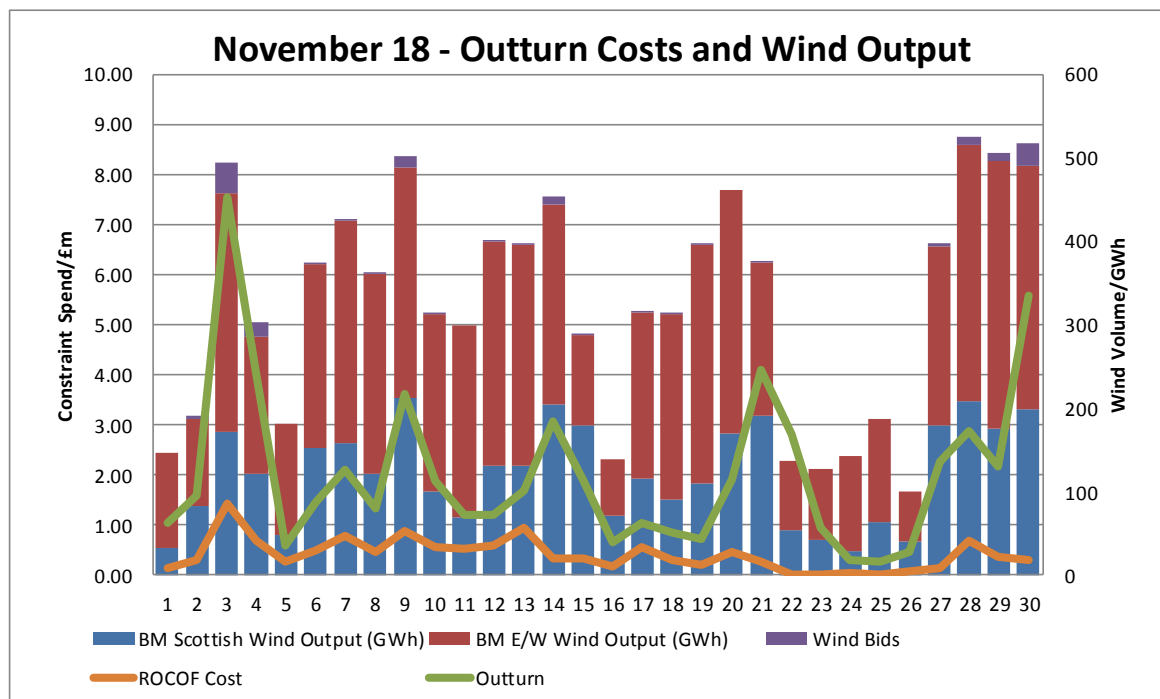
7. Negative Reserve

Negative Reserve out-turned at £0.3m, showing little variance from the past month. The costs for this category were nil or below £0.01m for most of the days in November 2018.



Constraints Costs

The total constraints cost for November 2018 was £61.2m; £11.1m for England and Wales, £11.0m for Cheviot, £4.5m for Scotland, £10.3m for Sterilised Headroom, £12.4m on ROCOF, and £11.8m on Ancillary Services costs.



The graph above shows the daily outturn costs and the portion made up by ROCOF. It also shows output levels of BM wind and volume of wind bids (including trades) to indicate the extent to which wind output drives constraint costs. Over the first half of October the constraint spend was high over many days.

The constraint daily spend remained below £4.0m for most of the days in November 2018. Except for Saturday 3rd when the daily cost peaked at around £7.5m. On that day, sustained high levels of wind generation exacerbated the transmission constraints already in place due to planned outages in both Scotland and North of England, resulting in large volume of BM actions taken throughout the 24 hours on hydro, wind and conventional units to solve the constrains.

Another high cost day was Friday 30th, when costs peaked at around £5.6m. Even in this case the combination of planned outages in Scotland and North of England and high wind levels, required high volume of BM actions and trades on conventional and non-conventional generation to solve transmission constraints.

The Western Link was available throughout November, except on 11th, however no costs were directly incurred as a result of the unavailability.

8. RoCoF

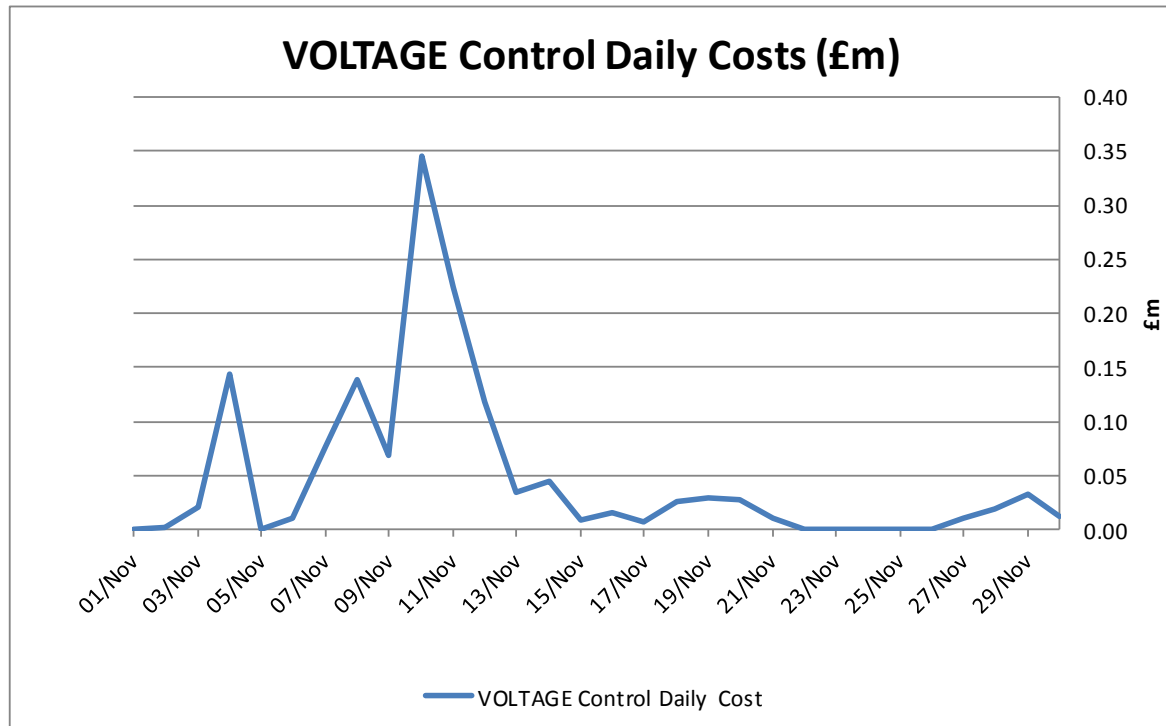
The RoCoF outturn for November 2018 was £12.4m, with a decrease of around £4.0m from the previous month. Wind and demand levels are the main drive behind high costs days for this category, requiring large volumes of trades on the interconnectors and on generating units, sometimes with the support of BM actions, to limit the largest generation loss on the system. The highest daily costs for this category incurred on Saturday 3rd, and Tuesday 13th with a spend of around £1.4m and £1.0m respectively.

9. Voltage

These costs relate to the buying of energy in order to access the voltage capability on the generating units. The costs for voltage are reported in the Reactive Power category.

Voltage costs in November 2018 out-turned at around £1.9m to deliver 166.4GWh of energy with voltage supporting capabilities, of which around 53% of volumes were solved with forward trading.

The highest daily cost for this category incurred on Saturday 10th November with a spend of nearly £0.35m. A total of seven generating units were synchronised (six were traded) to provide voltage support across five voltage regions.



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