

ESO Operational Transparency Forum

20 April 2022

You have been joined in listen only mode with
your camera turned off

Introduction | Sli.do code #OTF

Please visit www.sli.do and enter the code #OTF to ask questions & provide us with post event feedback.

We will answer as many questions as possible at the end of the session. We may have to take away some questions and provide feedback from our expert colleagues in these areas during a future forum. **Ask your questions early in the session to give more opportunity to pull together the right people for responses.**

To tailor our forum and topics further we have asked for names (or organisations, or industry sector) against Sli.do questions. If you do not feel able to ask a question in this way please use the email: box.NC.Customer@nationalgrideso.com

These slides, event recordings and further information about the webinars can be found at the following location:
<https://data.nationalgrideso.com/plans-reports-analysis/covid-19-preparedness-materials>

Regular Topics

- Questions from last week
- Business continuity
- Demand review
- Costs for last week
- Constraints

Focus Areas

- 24 month constraint forecast
- BSUoS outturn March 2022 & Forecast May 2022
- RIIO-2 BP2 webinar signpost

Future forum topics

While we want to remain flexible to provide insight on operational challenges when they happen, we appreciate you want to know when we will cover topics.

We have the following deep dives planned:

Managing constraints in real-time – inertia/ RoCoF

Questions outstanding from previous weeks

Q: Can you please elaborate on the Emergency Instruction to BRITNED issued on 03/04/2022? How did this happen? What is the volume and price attached to this action? Shall we expect NIV (Net Imbalance Volume) and SIP (System Imbalance Price) to be reassessed for that SP in upcoming settlement runs?

A: We issued the EI to ensure we could manage a specific system issue in that part of the network – due to the short timescales we needed to ask Britned to change their export for a short period. Costs are not paid for energy exchanged for EI. NGESO pays the imbalance cost against the market position to the asset owner in GB and the imbalance caused for the other SO in their national market (TenneT in NL). We are unable to confirm the impact on NIV and SIP as these are calculations carried out by Elexon.

Q: If the CMP intertrip is being used, when will data on who is providing the service be published? Can you point us to the B6 contract award Dan mentioned?

A: this has been published on the CMP website. it can be found at <https://www.nationalgrideso.com/document/247836/download>

Q: hi, to follow on;- for longer duration batteries, happy to do more than 15Mins BOAi; when will your restriction of 'max 15mins' be lifted? SOE mgmt should be at the control of the BESS operator and MNZT set accordingly.

A: It is correct that we will endeavour to only send BOAs to battery units for a maximum duration of 15 minutes. However, we would send a 15min BOA at MEL and then extend another 15mins at the prevailing MEL and continue until they reduce their MEL and run out of capacity. So for a large battery, it would mean we wouldn't have to reduce their MEL until a much later BOA. This is the most effective way to BOA battery units and maintain their state of charge with our current BM systems.

Questions outstanding from previous weeks

Q: Would recovering penalties for poor Dynamic Containment (DC) performance over that period not have helped reduce costs rather than providing very good revenues for not actually delivering the service as intended?

A: We are generally pleased with delivery of DC assets. We are taking a learning by doing approach to the implementation of DC over the past 18 months. We have received detailed feedback on the information that we have shared, the way in which we have set out to communicate this and not providing this performance data on a monthly basis.

Over the past 18 months we have collectively made significant steps forward in delivering a brand new service that is meeting the requirements of our changing system. Monitoring is, and will continue to be, an important part of ensuring value for money for GB consumers, however we recognise that need for a robust approach which ensures confidence in our products and we are committed to ensuring this.

On an enduring basis, we will be implementing a monthly feedback process to share performance data. Performance monitoring Penalties will be applied across the new suite of response services, DC, Dynamic Moderation, Dynamic Regulation, from April.

Q: Can you make an email address that's easier to remember to contact you (even if it's only to forward the messages to the original address)? The box one is really complicated.

A: Yes we can look at this for the future if it would be helpful. In the interim, it is the same email that has been used throughout the OTF and is on every slidepack

Q: Do you intend to publish the actual Mar 22 BSUoS rate and the latest BSUoS 24-month forecast before or after the Easter break? Thanks

A: This is published and we will be discussing in the forum today

Questions outstanding from previous weeks

Update on Oscillation event 4 April

The National Grid Electricity System Operator (NGESO) Control Centre reported unexpected frequency oscillation events across all GB but more severely in South England and Wales initiated in the late afternoon, on 4 April 2022. Coincidentally, the oscillations occurred continuously until a Grid Code user switched in their Power system stabilizer (PSS). NGESO investigated and questioned one of the Grid Code User. The Grid Code User explained that their Power system stabilizer (PSS) was automatically switched off in the morning of 4 April as generator output dropped below 50MW due to unusual Gas pressure issue. The power output recovered subsequently, however, the PSS was left offline unintentionally. This is due to a control defect that PSS will only be automatically switched back in if generation breaker is switched off and on again. The turbine continued operation stably without PSS during the day with low power output. When the plant began to ramp up in the afternoon, oscillation started when power output started to increase. The oscillation lasted about 20 minutes until PSS was manually switched back to service, the oscillation was immediately brought under control. Grid Code User has been in service with PSS since the event and no further oscillation was observed. They are currently doing a detailed investigation on the control system and operation process to ensure the root cause is identified and fixed. For now, they will ensure PSS is in service when power output is above 55MW.

Questions outstanding from previous weeks

Outstanding questions we are still working on

Q: on 8th Apr 2022: The ndf (national demand forecast) was unusual - sudden drop in demand forecast for period 15 and then sudden rise in demand forecast for period 21 - was there any specific rational/reason for that forecast – referring to the within day 6 hour ahead forecast

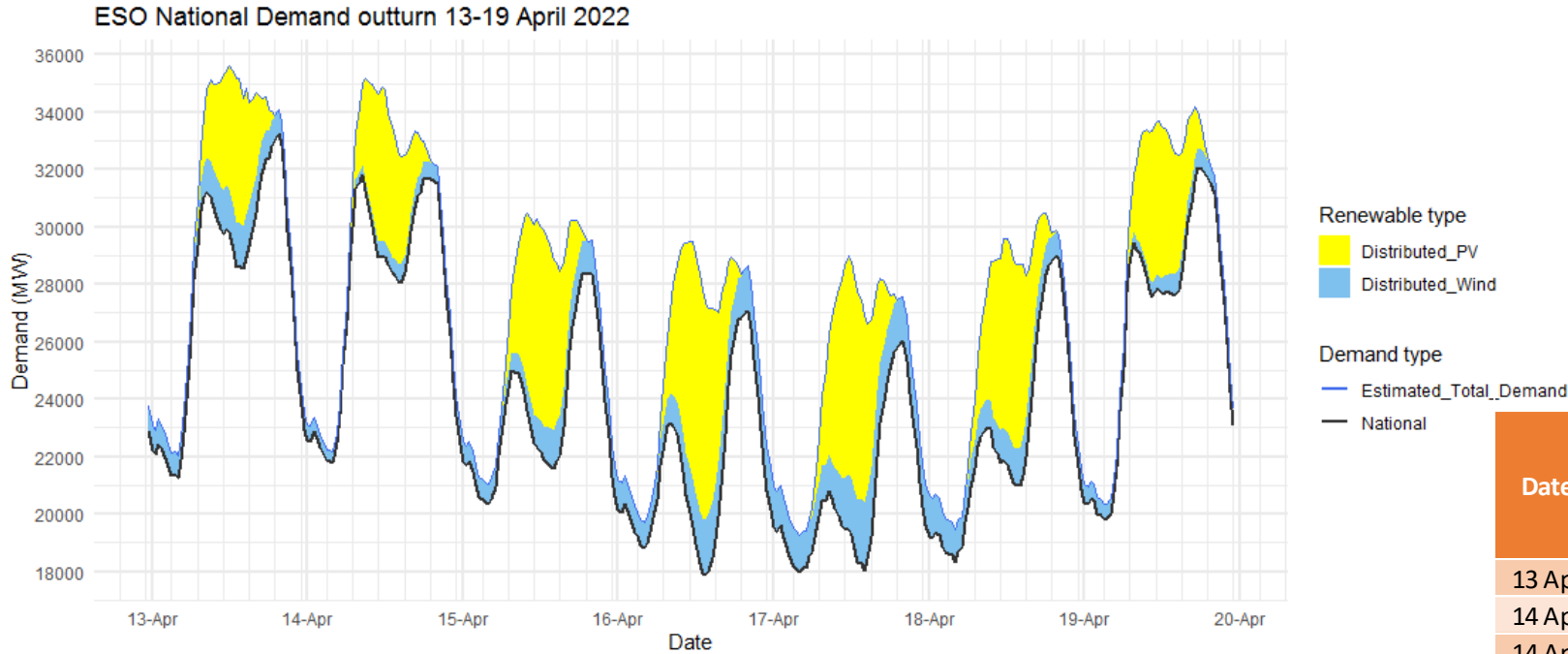
Q: on 8th Apr: Non-BM Ancillary Service Dispatch Platform instructions offer price on NG website (£324.9) was different from BMRS website (£349.9). what was the reason for discrepancy?

Q: Reserve requirements are currently published for cardinal points in the SOP. It would be better to publish this for settlement periods or hours, as there isn't much clarity on the timing of cardinal points throughout the year.

Q: Thanks Dan on voltage management case study- i guess the point is that the sizes of power flow change and forecast position uncertainty are probably the tip of a larger iceberg as we transition to NZ- are you considering more automated arrangements/ more dynamic support resources going forward?

Q: So it sounds like the LCM will result in costs to bid back generation but you still haven't addressed why you don't bid pumped storage to pump, often at lower cost than e.g. bidding back wind?

Demand | Last week demand out-turn



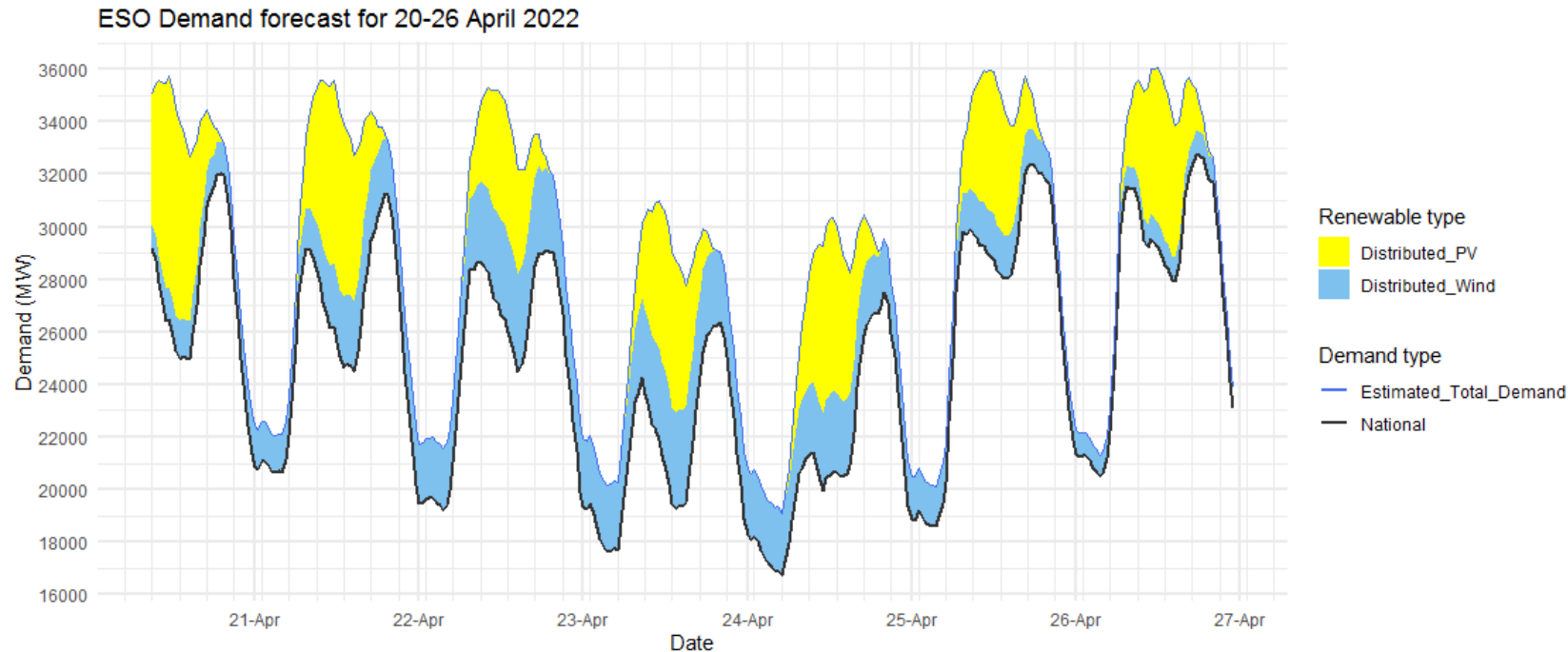
The black line (National Demand) is the measure of portion of total GB customer demand that is supplied by the transmission network.

Blue line serves as a proxy for total GB customer demand. It includes demand supplied by the distributed wind and solar sources, but it does not include demand supplied by non-weather driven sources at the distributed network for which ESO has no real time data.

Historic out-turn data can be found on the [ESO Data Portal](#) in the following data sets: [Historic Demand Data](#) & [Demand Data Update](#)

Date	Forecasting Point	FORECAST (Wed 13 Apr)			OUTTURN		
		National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)	National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)
13 Apr	Afternoon Min	27.2	1.6	4.8	28.6	1.5	4.4
14 Apr	Overnight Min	21.5	0.4	0.0	21.8	0.4	0.0
14 Apr	Afternoon Min	26.6	0.8	5.2	28.1	0.6	3.8
15 Apr	Overnight Min	20.4	0.7	0.0	20.3	0.7	0.0
15 Apr	Afternoon Min	22.6	0.6	6.0	21.6	1.3	5.9
16 Apr	Overnight Min	18.9	0.8	0.0	18.8	0.9	0.0
16 Apr	Afternoon Min	19.5	1.9	5.8	17.9	1.9	7.6
17 Apr	Overnight Min	17.8	0.8	0.0	18.0	1.3	0.0
17 Apr	Afternoon Min	19.9	1.1	6.0	18.1	2.4	6.5
18 Apr	Overnight Min	17.5	1.5	0.0	18.3	1.1	0.0
18 Apr	Afternoon Min	20.5	2.0	6.4	21.0	1.3	6.4
19 Apr	Overnight Min	18.7	1.2	0.0	19.8	0.5	0.0
19 Apr	Afternoon Min	26.2	1.7	5.5	27.6	0.7	4.2

Demand | Week Ahead



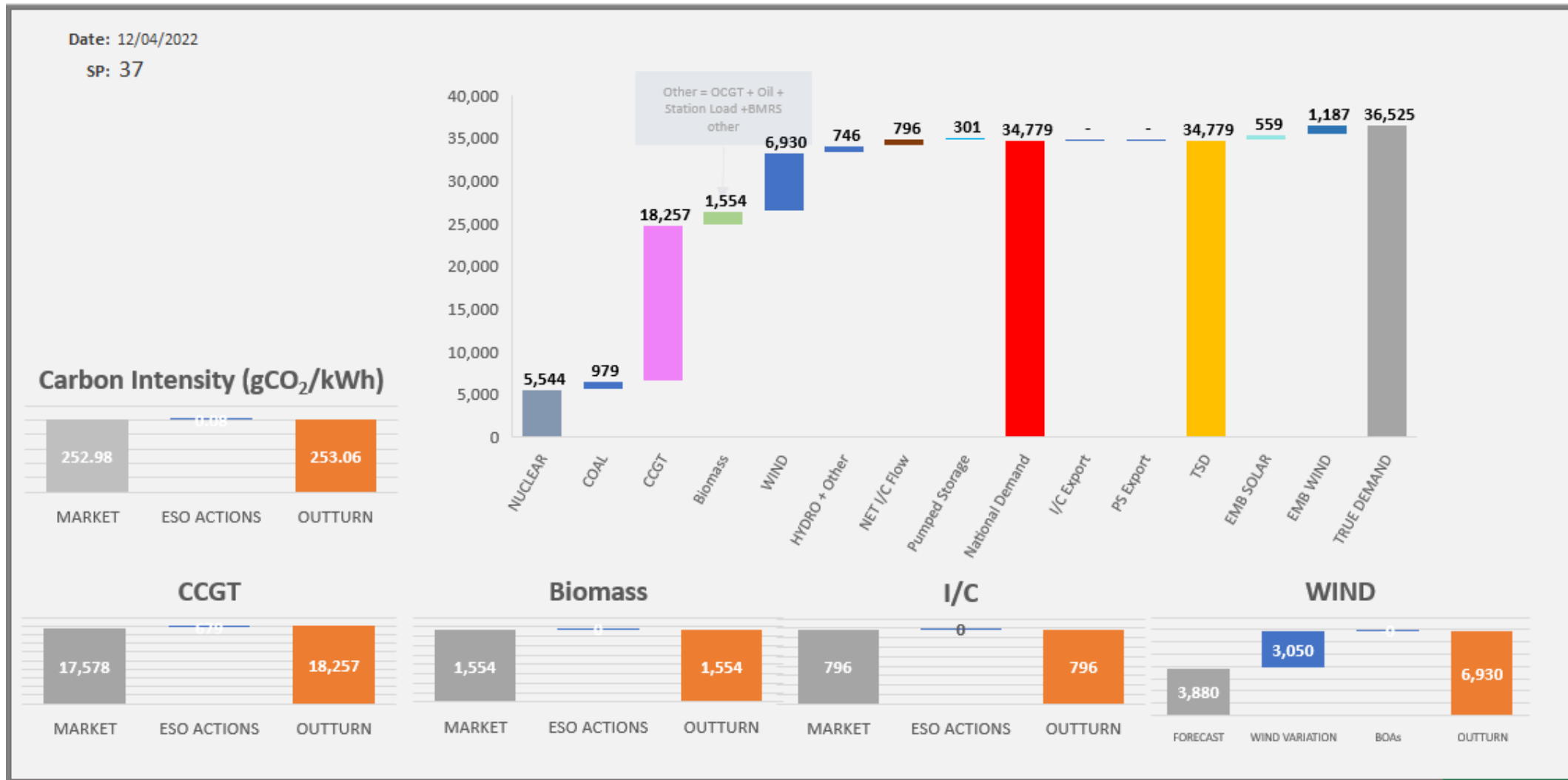
The black line (National Demand) is the measure of portion of total GB customer demand that is supplied by the transmission network.

Blue line serves as a proxy for total GB customer demand. It includes demand supplied by the distributed wind and solar sources, but it does not include demand supplied by non-weather driven sources at the distributed network for which ESO has no real time data.

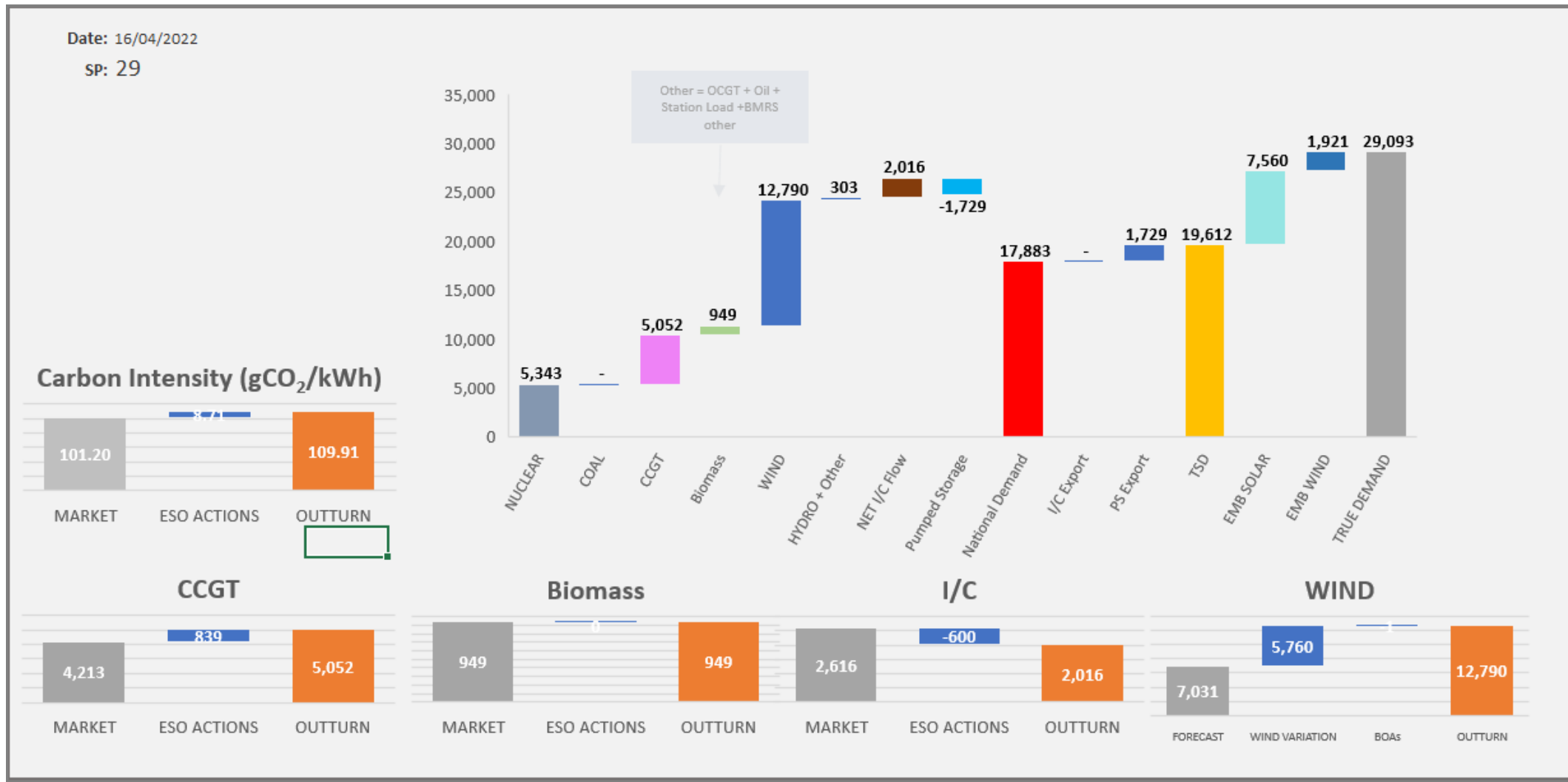
Forecast of the embedded solar & wind generation for the next 14 days can be found on the [ESO Data Portal](#) in the following data set: [Embedded Solar and Wind Forecast](#)

Date	Forecasting Point	FORECAST (Wed 20 Apr)		
		National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)
20 Apr	Afternoon Min	25.0	1.4	7.6
21 Apr	Overnight Min	20.7	1.4	0.0
21 Apr	Afternoon Min	24.5	2.7	5.5
22 Apr	Overnight Min	19.2	2.3	0.0
22 Apr	Afternoon Min	24.5	3.7	4.0
23 Apr	Overnight Min	17.6	2.6	0.0
23 Apr	Afternoon Min	19.2	3.7	5.8
24 Apr	Overnight Min	16.7	2.4	0.0
24 Apr	Afternoon Min	20.5	2.9	5.6
25 Apr	Overnight Min	18.6	1.6	0.0
25 Apr	Afternoon Min	28.0	1.7	4.8
26 Apr	Overnight Min	20.5	0.8	0.0
26 Apr	Afternoon Min	27.9	0.9	5.0

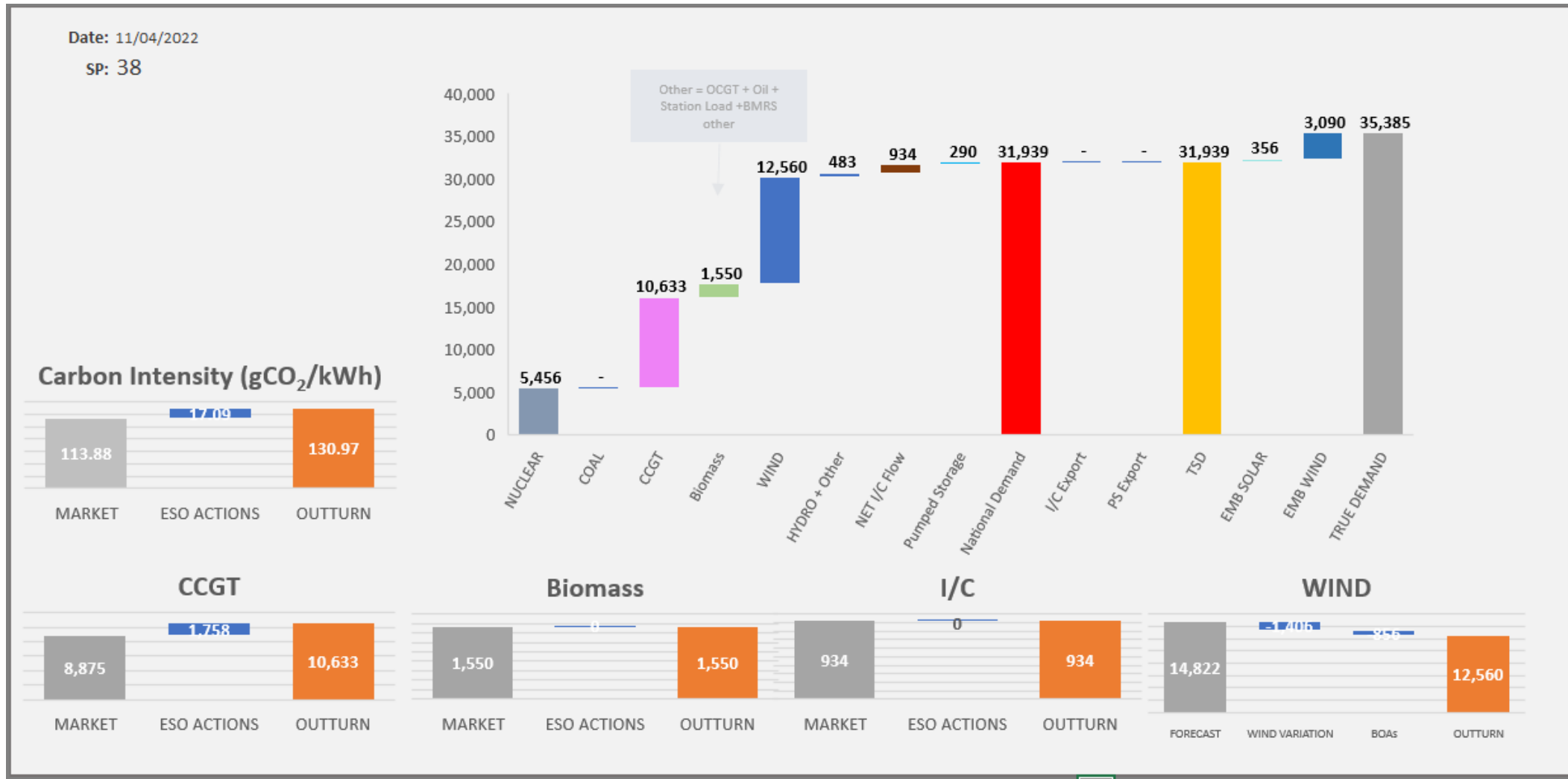
ESO Actions | Tuesday 12 April Peak



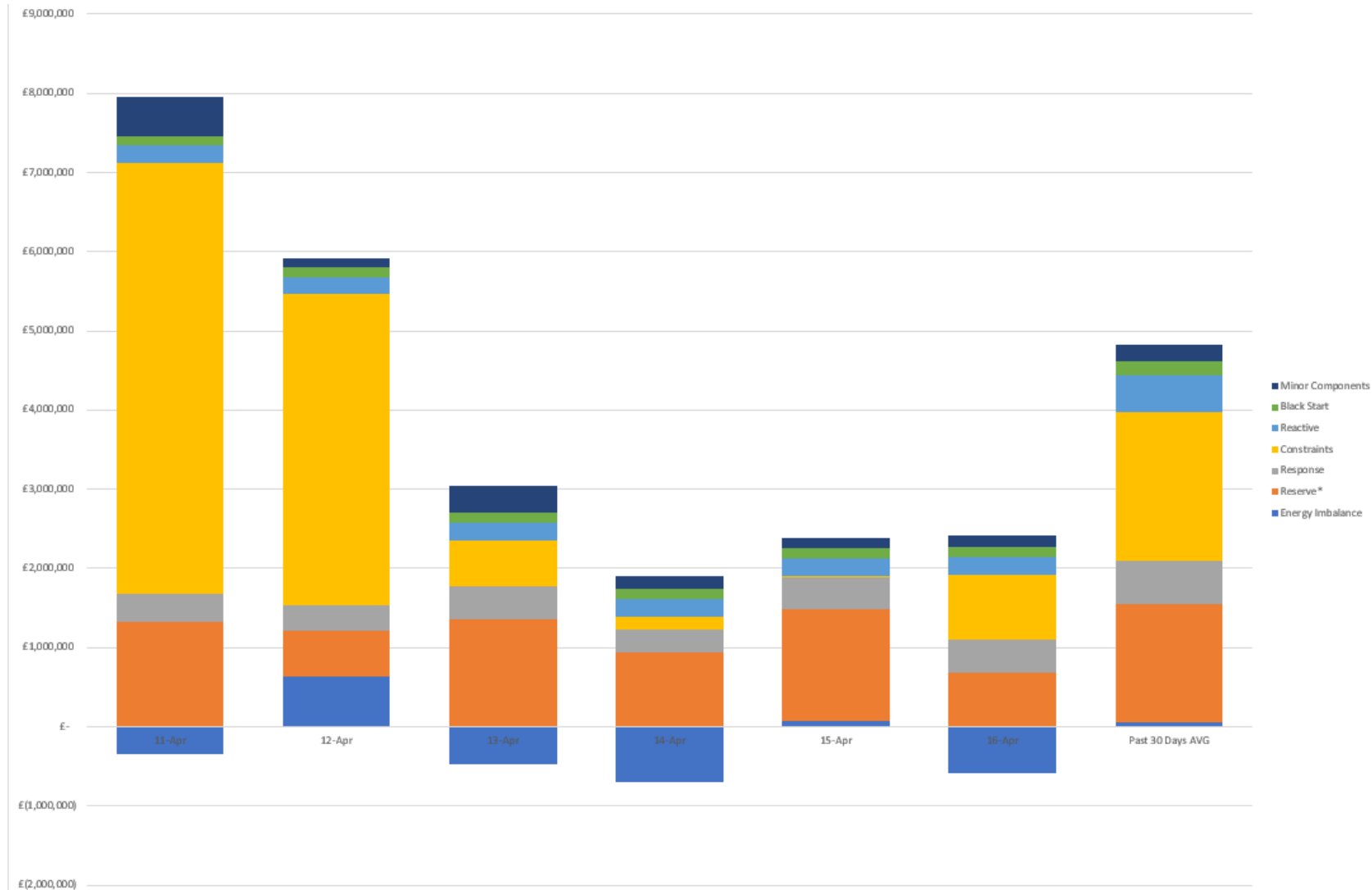
ESO Actions | Saturday 16 April Minimum



ESO Actions | Monday 11 April Highest Spend ~£0.4m



Transparency | Category costs breakdown for the last week



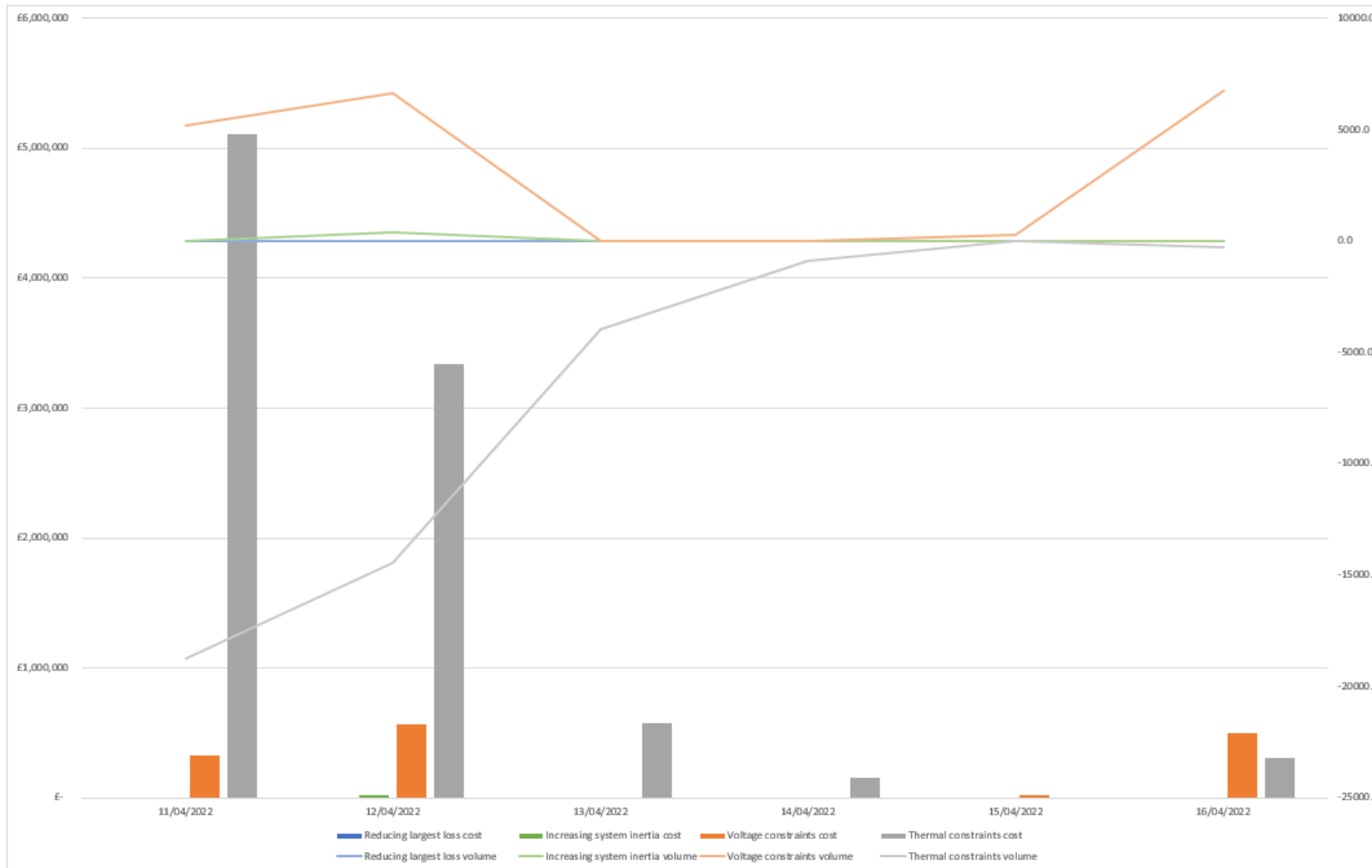
Day	£m
11/04/2022	7.6
12/04/2022	5.9
13/04/2022	2.6
14/04/2022	1.2
15/04/2022	2.4
16/04/2022	1.8

Key driver of costs was constraints category

Note: Sunday costs will be presented next week

Past 30 Days Average is displayed in the chart

Transparency | Constraint Cost Breakdown



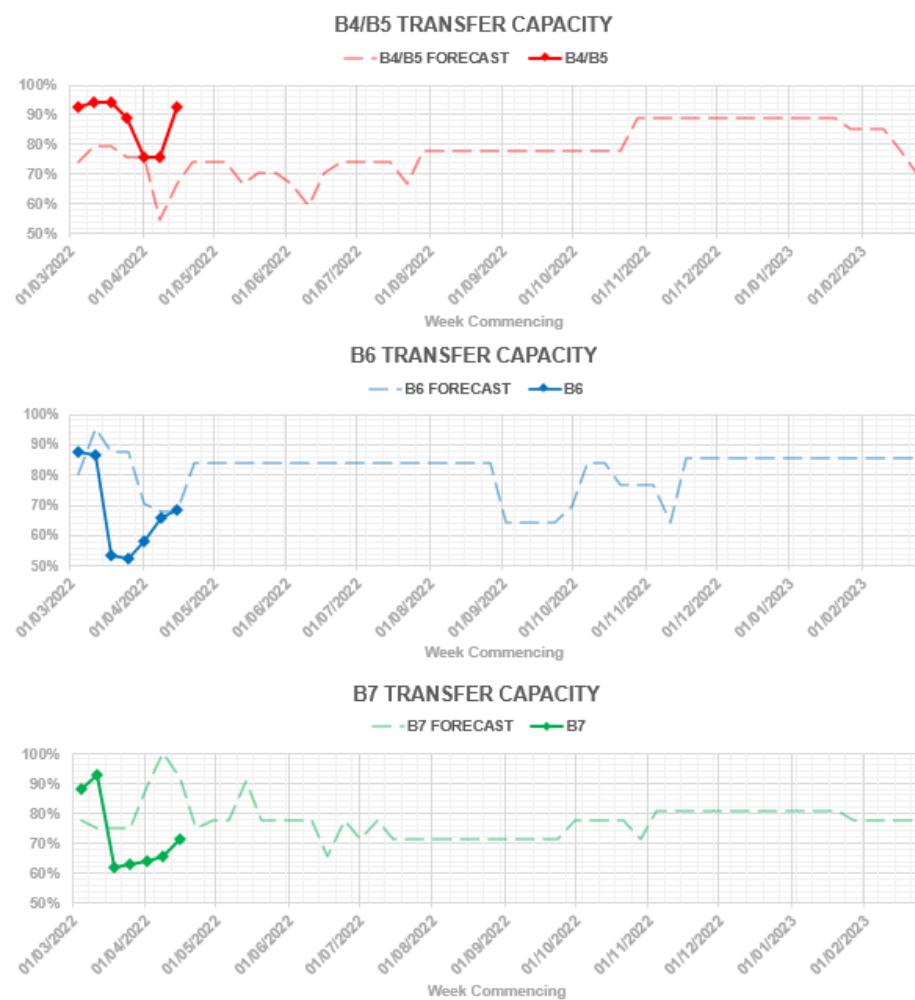
Thermal – network congestion
 Actions required to manage Thermal Constraints in the early part of the week

Voltage
 Actions taken to synchronise generation to meet voltage requirements were required on various days through the week.

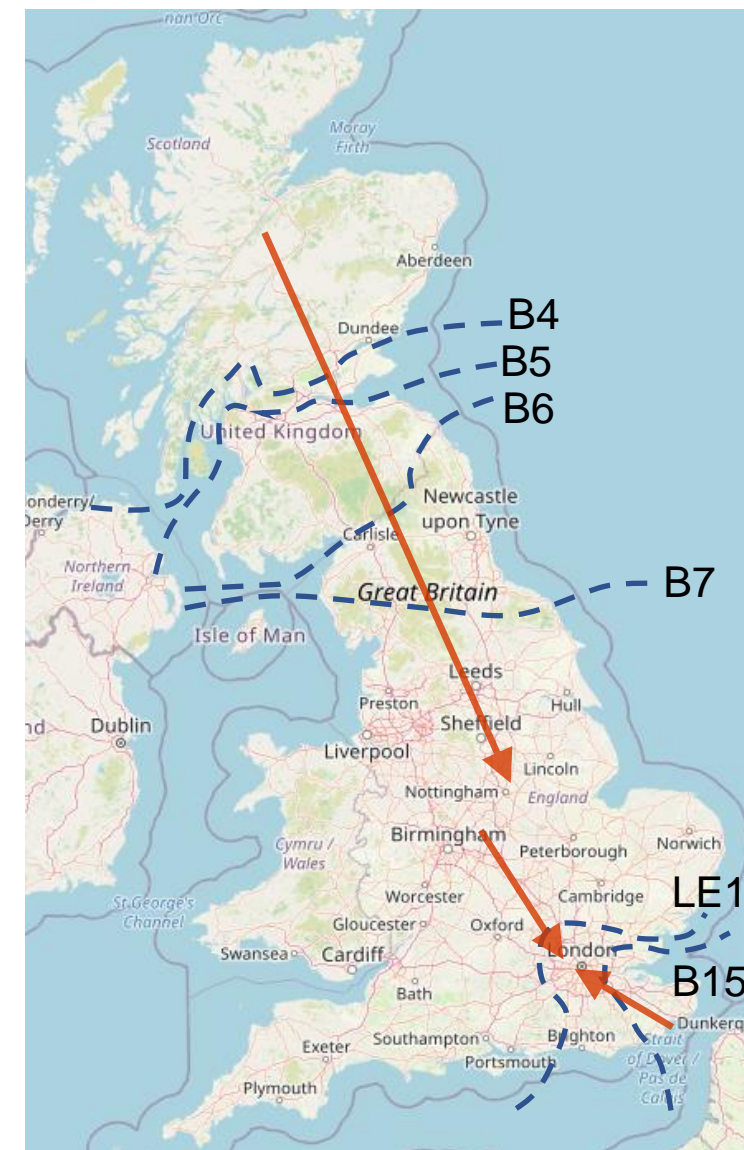
Managing largest loss for RoCoF
 No intervention required to manage largest loss

Increasing inertia
 Small volume of intervention required to increase minimum inertia on Tuesday

Transparency | Network Congestion



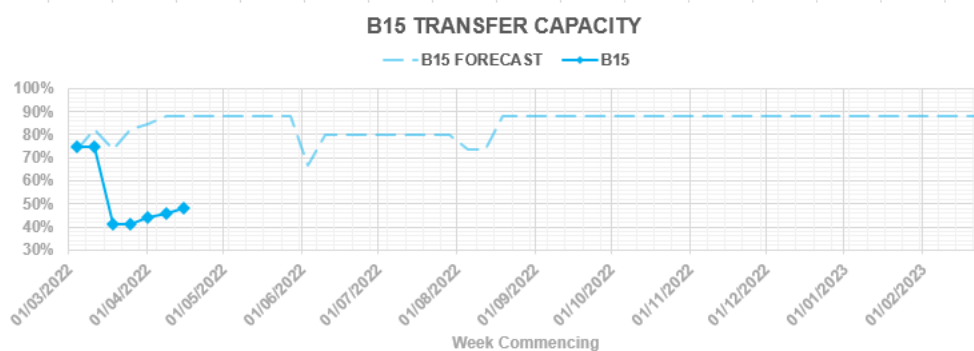
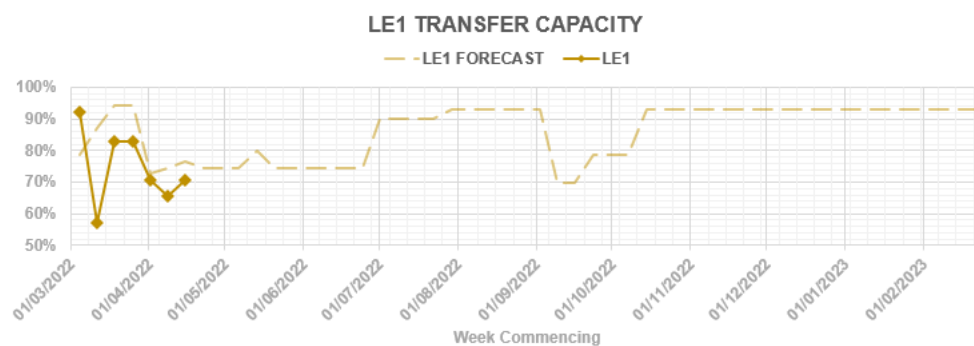
Boundary	Max. Capacity (MW)
B4/B5	2700
B6	5600
B7	8400
LE1	7000
B15	7500



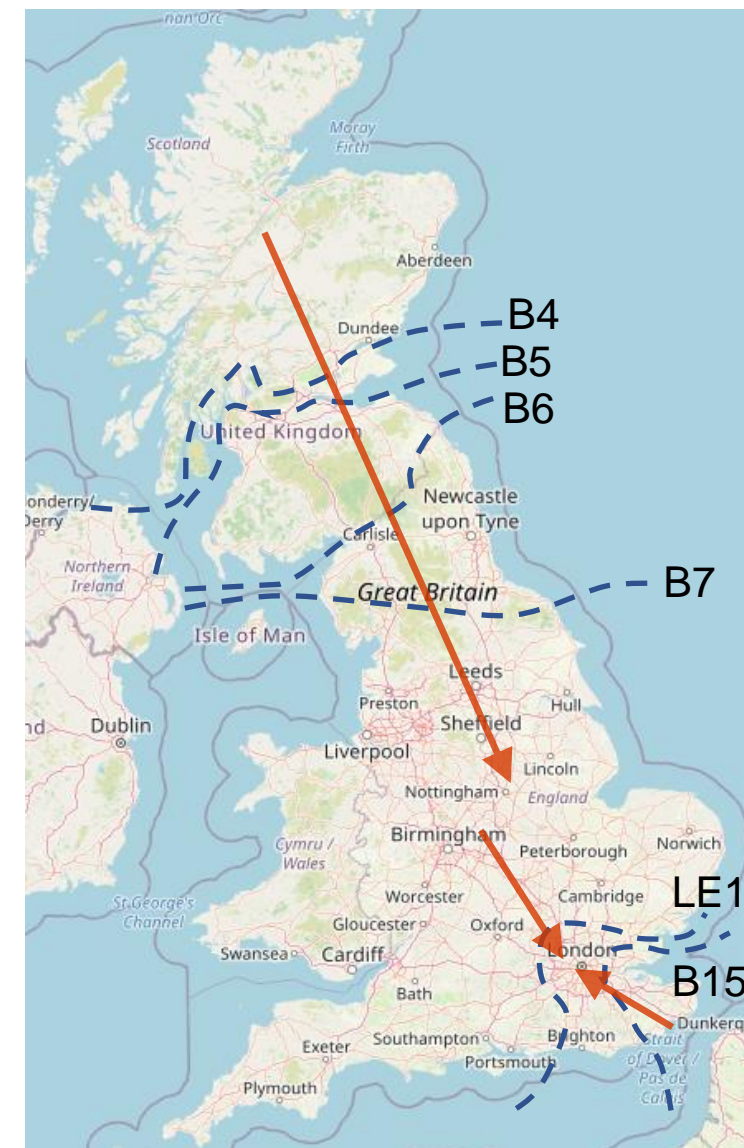
Day ahead flows and limits, and the 24 month constraint limit forecast are published on the ESO Data Portal:

<https://data.nationalgrideso.com/data-groups/constraint-management>

Transparency | Network Congestion



Boundary	Max. Capacity (MW)
B4/B5	2700
B6	5600
B7	8400
LE1	7000
B15	7500

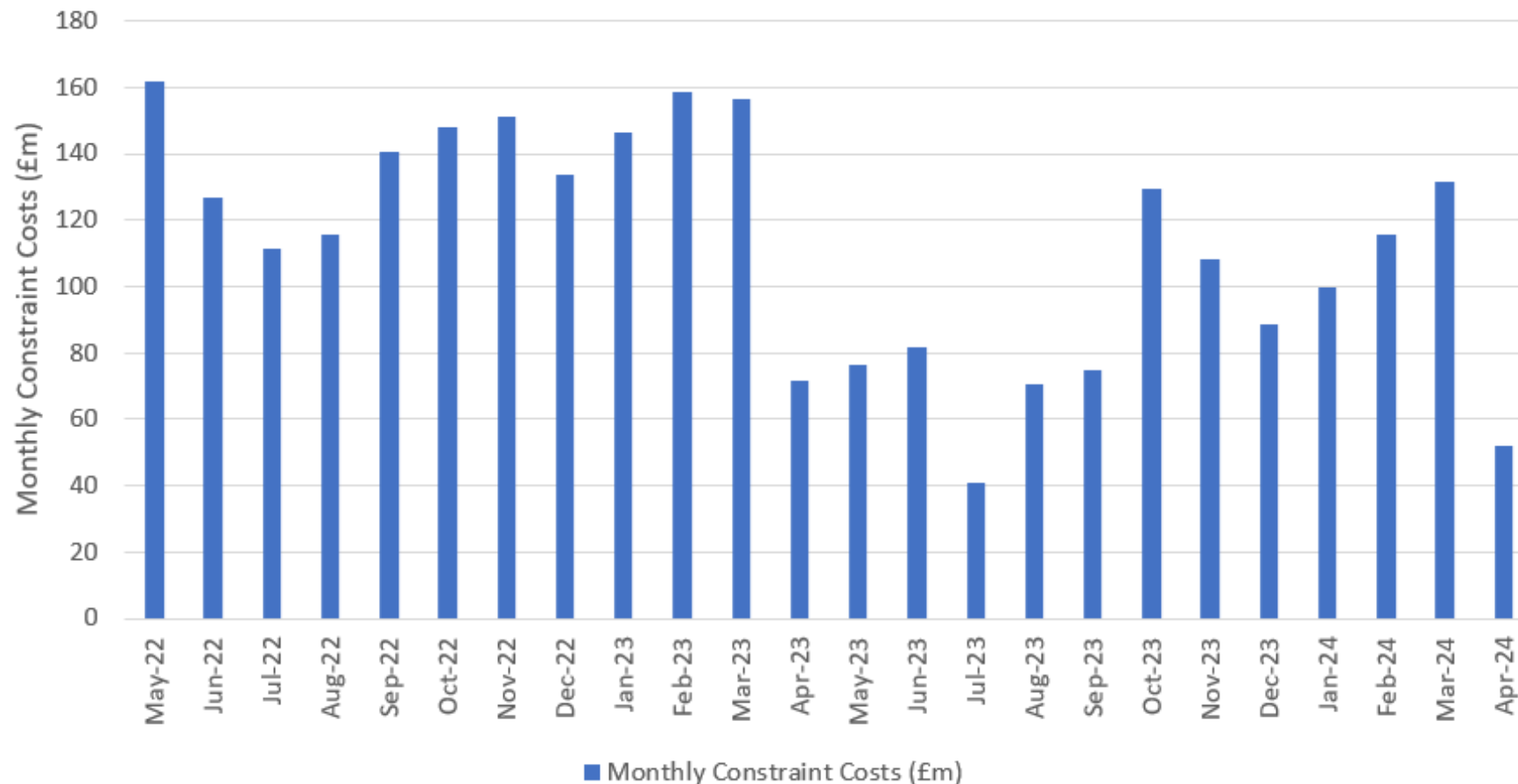


Day ahead flows and limits, and the 24 month constraint limit forecast are published on the ESO Data Portal:

<https://data.nationalgrideso.com/data-groups/constraint-management>

24 month Constraint Cost Forecast – published on the ESO Data Portal

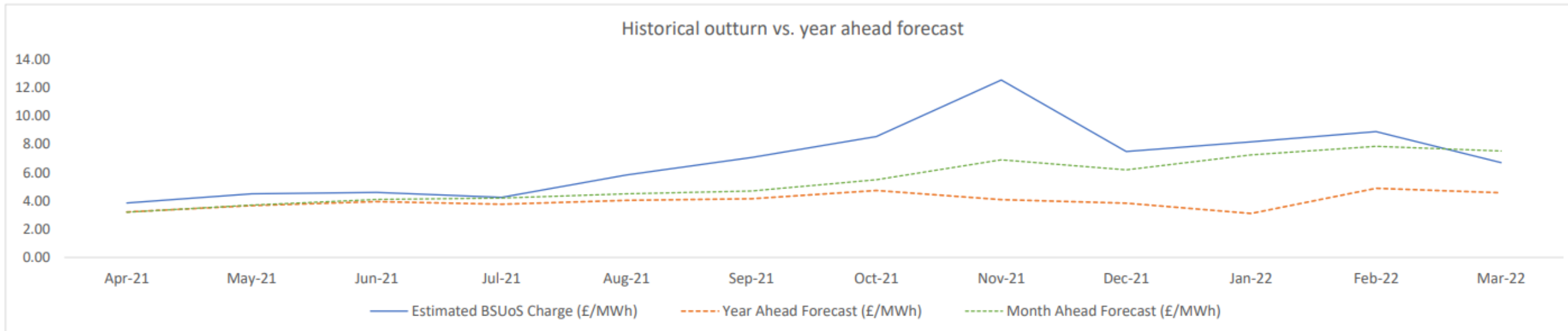
Total Monthly Constraint Costs - April 2022 Run



Total cost per month of managing constraints and meeting regional voltage requirements

BSUoS Outturn March 2022

Total Balancing Costs outturn: £262.1m
 Total BSUoS outturn for: £294.9m
 Estimated BSUoS charge £6.70/MWh



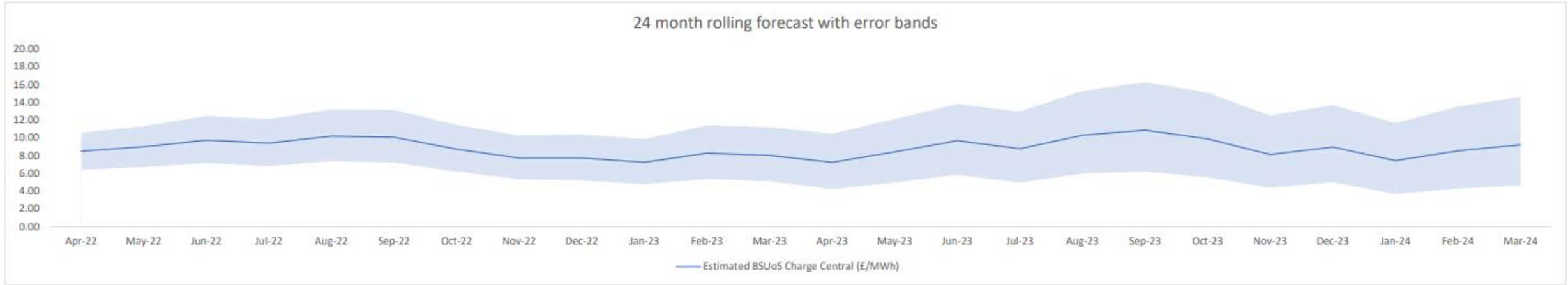
March 2022 outturn was 22% lower than outturn for February.

Wind load factors for March (28%) were lower than in February (51%) which reduced the quantity of actions required for constraints, but this was partially offset by higher wholesale electricity prices (dayahead March price was £250/MWh compared to £170/MWh in February).

Balancing costs forecasting for March made at the start of February was £303m. March outturn costs were equivalent to approximately the 30th percentile of the forecast produced at the beginning of February. This is due to the lower than average wind generation during the month.

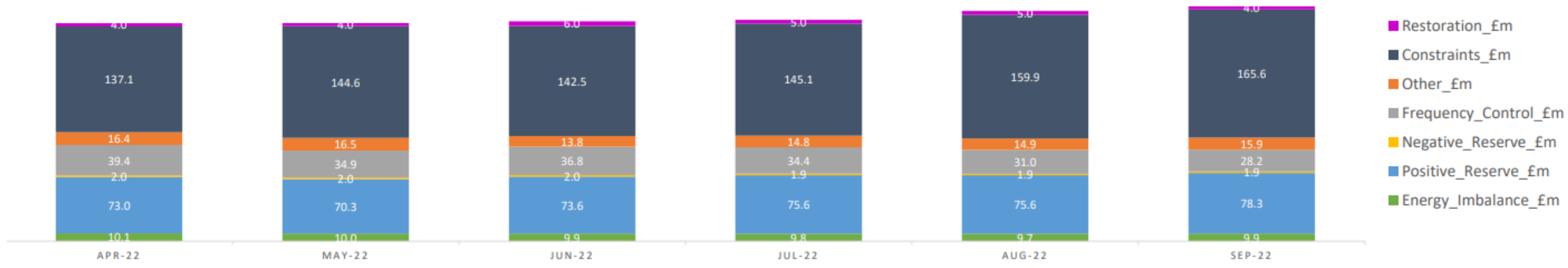
[ESO Data Portal: Monthly Balancing Services Use of System \(BSUoS\) Forecast Reports - Dataset | National Grid Electricity System Operator \(nationalgrideso.com\)](#)

BSUoS Forecast May 2022



	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	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Balancing Costs (Central) £m	282.0	282.3	284.6	286.6	298.0	303.8	313.9	299.0	295.2	278.3	287.9	273.1	244.7	275.4	296.2	279.0	315.3	344.6	375.8	330.4	363.0	300.7	310.0	333.6
Balancing Costs (Upper) £m	358.6	365.7	374.7	380.7	396.9	407.7	424.3	410.0	409.5	393.3	410.0	396.6	365.4	408.0	433.7	425.1	481.2	529.4	587.6	522.8	568.9	487.4	506.7	545.1
Balancing Costs (Lower) £m	205.2	200.5	199.1	196.0	205.1	206.7	212.5	194.5	186.7	170.9	175.3	160.1	132.0	151.9	168.3	145.5	171.7	185.7	199.0	166.5	190.6	135.8	143.0	154.6
Estimated Internal BSUoS & ESO Incentive £m	31.53	32.58	31.53	32.58	32.58	31.53	32.58	31.53	32.58	32.58	29.43	32.58	25.64	26.50	25.64	26.50	26.50	25.64	26.50	25.64	26.50	26.50	24.79	26.50
ALoMCP £m	0.99	1.02	0.99	1.02	1.02	0.99	1.02	0.99	1.02	1.02	0.92	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CMP381 Deferred Costs £m	0.00	3.88	4.01	4.15	4.15	4.01	4.15	4.01	4.15	4.15	3.75	4.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total BSUoS (Central) £m	314.5	319.8	321.1	324.3	335.7	340.3	351.6	335.5	332.9	316.0	322.0	310.8	270.3	301.9	321.8	305.5	341.8	370.2	402.3	356.0	389.5	327.2	334.8	360.1
Total BSUoS (Upper) £m	391.1	403.2	411.2	418.4	434.6	444.2	462.0	446.5	447.2	431.0	444.1	434.3	391.0	434.5	459.3	451.6	507.7	555.0	614.1	548.4	595.4	513.9	531.5	571.6
Total BSUoS (Lower) £m	237.7	238.0	235.6	233.7	242.8	243.2	250.2	231.0	224.4	208.6	209.4	197.8	157.6	178.4	193.9	172.0	198.2	211.3	225.5	192.1	217.1	162.3	167.8	181.1
Estimated BSUoS Volume (TWh)	37.02	35.58	32.98	34.50	32.91	33.78	40.34	43.47	43.08	43.66	38.94	38.74	37.35	35.89	33.27	34.80	33.20	34.08	40.69	43.85	43.46	44.04	39.28	39.08
Estimated BSUoS Charge Central (£/MWh)	8.49	8.99	9.74	9.40	10.20	10.08	8.72	7.72	7.73	7.24	8.27	8.02	7.24	8.41	9.67	8.78	10.30	10.87	9.89	8.12	8.96	7.43	8.52	9.21
Estimated BSUoS Charge Upper (£/MWh)	10.56	11.33	12.47	12.13	13.21	13.15	11.46	10.27	10.38	9.87	11.41	11.21	10.47	12.11	13.81	12.98	15.29	16.29	15.09	12.51	13.70	11.67	13.53	14.63
Estimated BSUoS Charge Lower (£/MWh)	6.42	6.69	7.14	6.78	7.38	7.20	6.20	5.31	5.21	4.78	5.38	5.11	4.22	4.97	5.83	4.94	5.97	6.20	5.54	4.38	5.00	3.68	4.27	4.63

Balancing Costs Component Forecast May 2022



Balancing Costs forecast for May 2022 is £282 million. This is approximately £20 million higher than the outturn for March. The forecast for May is significantly lower than the forecast produced in March (£408m) but similar to the forecast produced in February.

This is due to changes in the price of wholesale electricity in the future markets.

The forecast was produced based on a forward price curve derived on 11th April 2022.

No new planned or current outages on interconnectors or Western link.

Remaining Components Forecast May 2022

	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	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Balancing Costs (Central) £m	282.0	282.3	284.6	286.6	298.0	303.8	313.9	299.0	295.2	278.3	287.9	273.1	244.7	275.4	296.2	279.0	315.3	344.6	375.8	330.4	363.0	300.7	310.0	333.6
Balancing Costs (Upper) £m	358.6	365.7	374.7	380.7	396.9	407.7	424.3	410.0	409.5	393.3	410.0	396.6	365.4	408.0	433.7	425.1	481.2	529.4	587.6	522.8	568.9	487.4	506.7	545.1
Balancing Costs (Lower) £m	205.2	200.5	199.1	196.0	205.1	206.7	212.5	194.5	186.7	170.9	175.3	160.1	132.0	151.9	168.3	145.5	171.7	185.7	199.0	166.5	190.6	135.8	143.0	154.6
Estimated Internal BSUoS & ESO Incentive £m	31.53	32.58	31.53	32.58	32.58	31.53	32.58	31.53	32.58	32.58	29.43	32.58	25.64	26.50	25.64	26.50	26.50	25.64	26.50	25.64	26.50	26.50	24.79	26.50
ALoMCP £m	0.99	1.02	0.99	1.02	1.02	0.99	1.02	0.99	1.02	1.02	0.92	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CMP381 Deferred Costs £m	0.00	3.88	4.01	4.15	4.15	4.01	4.15	4.01	4.15	4.15	3.75	4.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total BSUoS (Central) £m	314.5	319.8	321.1	324.3	335.7	340.3	351.6	335.5	332.9	316.0	322.0	310.8	270.3	301.9	321.8	305.5	341.8	370.2	402.3	356.0	389.5	327.2	334.8	360.1
Total BSUoS (Upper) £m	391.1	403.2	411.2	418.4	434.6	444.2	462.0	446.5	447.2	431.0	444.1	434.3	391.0	434.5	459.3	451.6	507.7	555.0	614.1	548.4	595.4	513.9	531.5	571.6
Total BSUoS (Lower) £m	237.7	238.0	235.6	233.7	242.8	243.2	250.2	231.0	224.4	208.6	209.4	197.8	157.6	178.4	193.9	172.0	198.2	211.3	225.5	192.1	217.1	162.3	167.8	181.1
Estimated BSUoS Volume (TWh)	37.02	35.58	32.98	34.50	32.91	33.78	40.34	43.47	43.08	43.66	38.94	38.74	37.35	35.89	33.27	34.80	33.20	34.08	40.69	43.85	43.46	44.04	39.28	39.08
Estimated BSUoS Charge Central (£/MWh)	8.49	8.99	9.74	9.40	10.20	10.08	8.72	7.72	7.73	7.24	8.27	8.02	7.24	8.41	9.67	8.78	10.30	10.87	9.89	8.12	8.96	7.43	8.52	9.21
Estimated BSUoS Charge Upper (£/MWh)	10.56	11.33	12.47	12.13	13.21	13.15	11.46	10.27	10.38	9.87	11.41	11.21	10.47	12.11	13.81	12.98	15.29	16.29	15.09	12.51	13.70	11.67	13.53	14.63
Estimated BSUoS Charge Lower (£/MWh)	6.42	6.69	7.14	6.78	7.38	7.20	6.20	5.31	5.21	4.78	5.38	5.11	4.22	4.97	5.83	4.94	5.97	6.20	5.54	4.38	5.00	3.68	4.27	4.63

Estimated Internal BSUoS

Unchanged from last forecast

ALoMCP

Changed from previous forecasts and now standing at £12m for the year recovered over the whole financial year

CMP381 Deferred Costs

Based on II data, ~£35.8m deferred to 2022/23 and recovered from 3 May 2022

Estimated BSUoS Volume

Updated with new forecast

National Grid ESO's second RIIO-2 Business Plan (BP2)



Our 2019 RIIO-2 Business Plan set out ambitious goals for the **five-year period 2021-2026**

Business Plan 2 (BP2) is a refresh of our RIIO-2 plans and details what we will deliver from **April 2023 – March 2025**

Draft BP2 will be submitted to Ofgem on **Friday 29 April 2022**
We will consult on our draft BP2 from **Friday 29 April to Friday 10 June**
Consultation feedback will inform our final BP2, which we will submit in **August 2022**

Join us for our [launch webinar](#) on **Wednesday 4th May at 13:00** where we will provide an overview of what is in our BP2 plan and provide further details for how you can respond to the consultation

slido

Audience Q&A Session

 Start presenting to display the audience questions on this slide.

Q&A

Please remember to use the feedback poll after the event. We welcome feedback to understand what we are doing well and how we can improve the event ongoing.

If you have any questions after the event, please contact the following email address: box.NC.Customer@nationalgrideso.com

