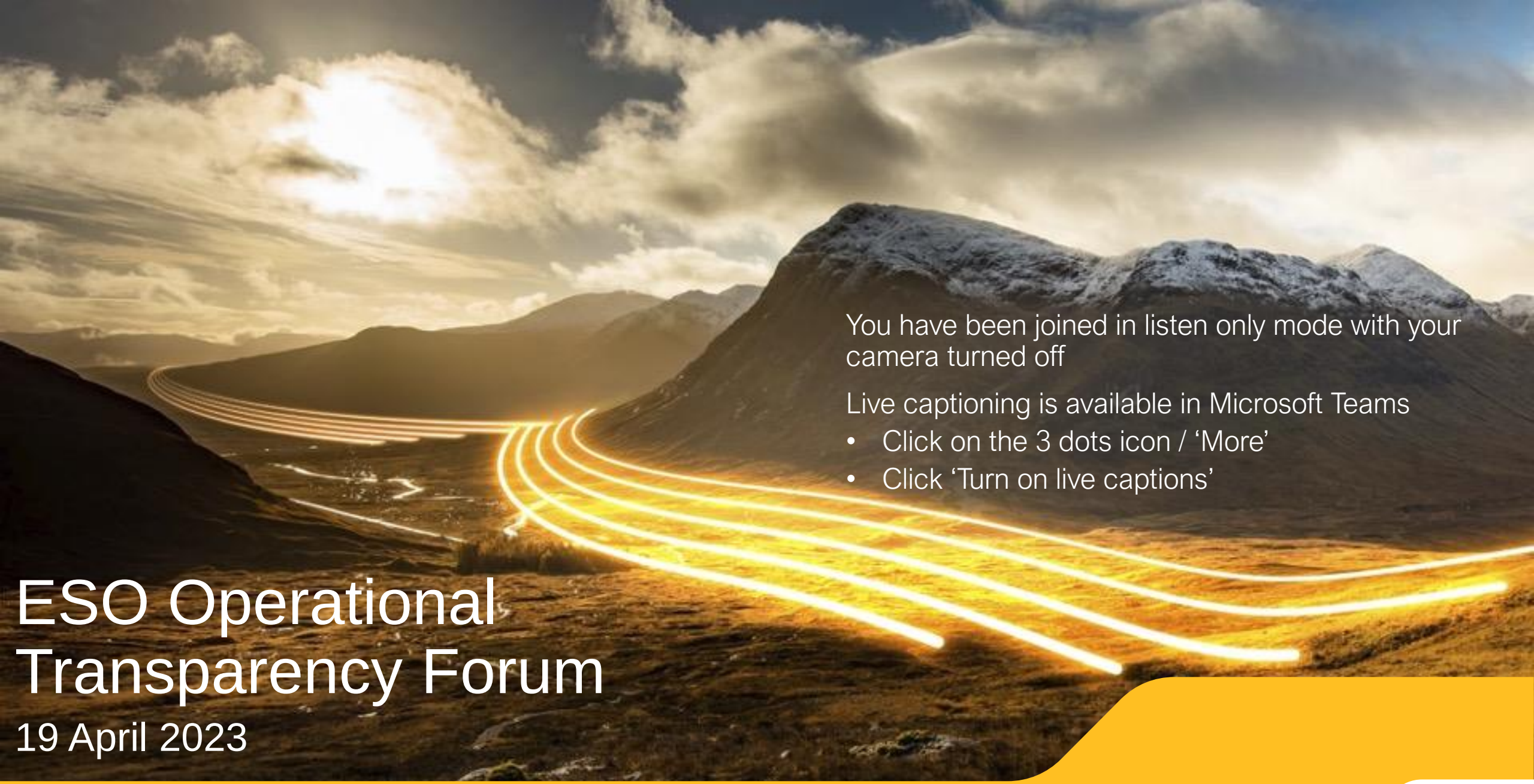


You have been joined in listen only mode with your camera turned off

Live captioning is available in Microsoft Teams

- Click on the 3 dots icon / ‘More’
- Click ‘Turn on live captions’

ESO Operational Transparency Forum

19 April 2023

ESO

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 Advanced questions option (see below) or email us at: box.NC.Customer@nationalgrideso.com

These slides, event recordings and further information about the webinars can be found at the following location:

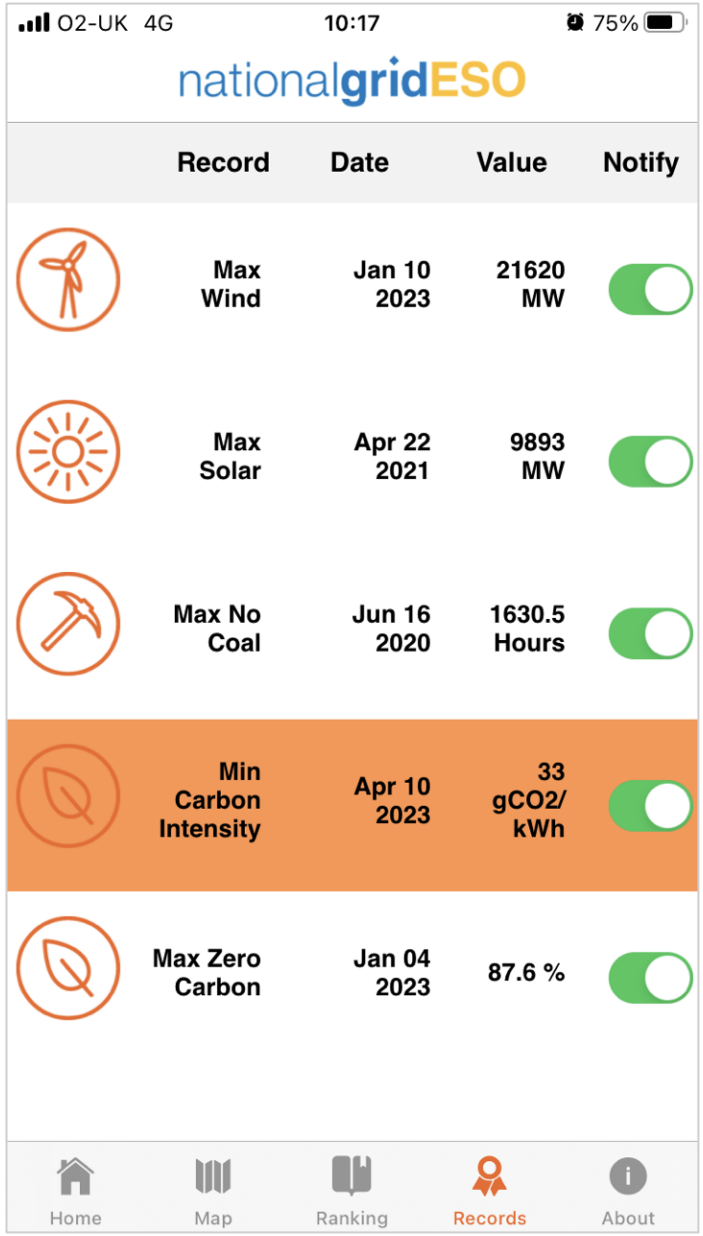
Advanced question can be asked here: https://forms.office.com/r/k0AEfKnai3

Stay up to date on our new webpage: https://www.nationalgrideso.com/OTF

Low carbon record – 10th April

We had a minimum carbon intensity record on the 10th April of 33gCO2/kWh.

More information is available on our National Grid ESO app or Carbon Intensity website and our Carbon Intensity dashboard here.



Future deep dive / focus topics

Future

Response markets deep dive – watch this space for more information about a future webinar in the upcoming month

Link to more information on our response market and materials from past webinars are available here on ESO website.

If you have suggestions for future deep dives or focus topics please send them to us at: .box.NC.customer@nationalgrideso.com and we will consider including them in a future forum

ESO Markets Roadmap 2023

The **ESO Markets Roadmap 2023** was published on Friday 31 March 2023.

Link: https://www.nationalgrideso.com/research-and-publications/markets-roadmap

On **Tuesday 25 April at 11am**, we will be discussing the highlights of the report at a webinar.

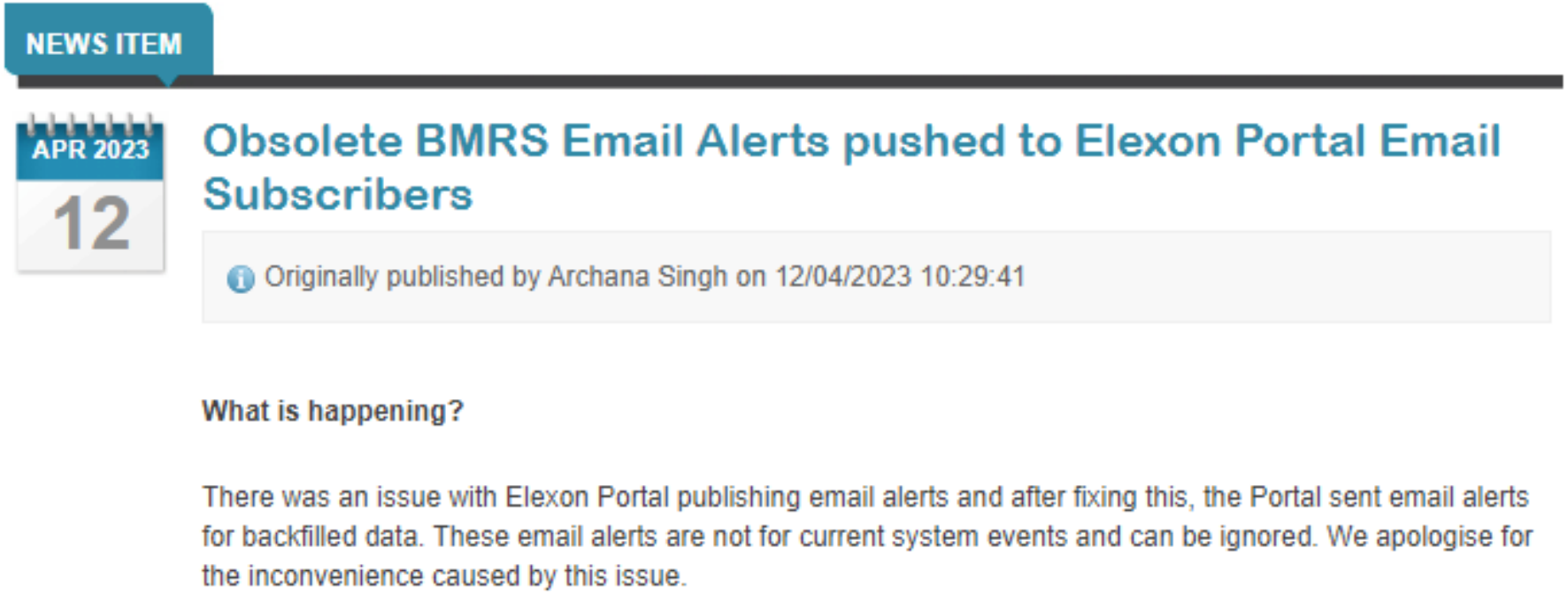
This includes:

- Highlights of the reforms introduced in 2022
- The vision for 2023 and beyond
- Why we are implementing these reforms
- Q&A session

To register for the webinar sign up here: Markets Roadmap Webinar or scan the QR code:

System events

For information only



NEWS ITEM

APR 2023

12

Obsolete BMRS Email Alerts pushed to Elexon Portal Email Subscribers

Originally published by Archana Singh on 12/04/2023 10:29:41

What is happening?

There was an issue with Elexon Portal publishing email alerts and after fixing this, the Portal sent email alerts for backfilled data. These email alerts are not for current system events and can be ignored. We apologise for the inconvenience caused by this issue.

Link to ELEXON Portal

Summer Outlook 2023 / Key messages

1. Security of supply

We will meet out world-leading reliability standards throughout summer 2023.

We expect there to be sufficient available supply to meet demand at all times this summer. We expect to be able to support exports to neighbouring European countries if needed, continuing the close-working and coordinated support with our neighbouring Transmission System Operators from last summer and winter.

2. Managing the system

We are confident that we can use our existing tools to manage system operability this summer.

Periods of low demand typically represent the more challenging operational events during summer. We already have operational tools and services in place to manage these, including our stability services and Dynamic Containment.

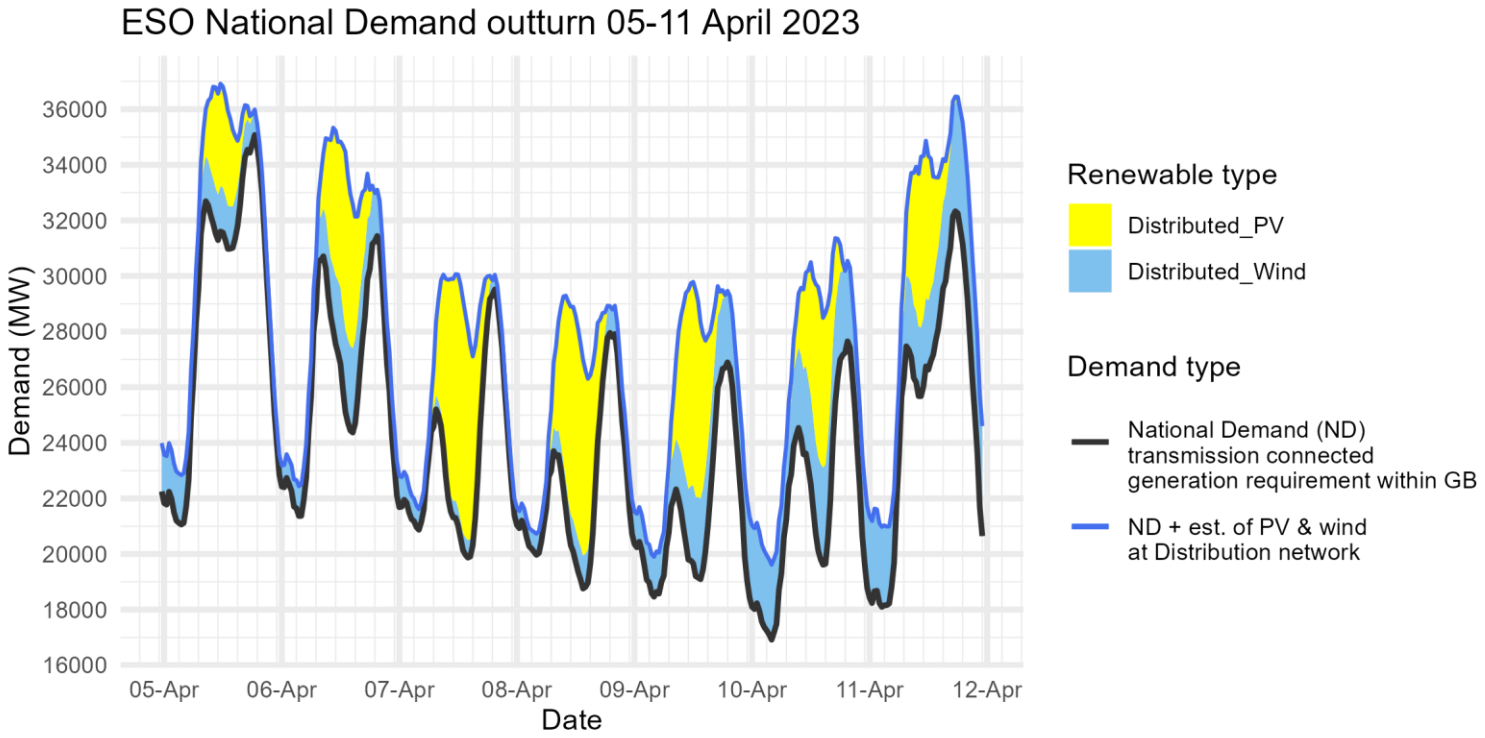
3. Market prices and balancing costs

We expect balancing costs to be lower than last summer due to lower wholesale prices and because of activities implemented by the ESO.

While wholesale prices remain high, they have fallen since last summer. This will reduce the cost of our balancing actions. The ESO has undertaken an extensive number of activities to reduce costs to consumers. This includes our recommendation to reduce the existing minimum inertia requirement under our Frequency Risk and Control Report policy; delivery of the Voltage Mersey and Stability Phase 1 pathfinders; and the Constraint Management Intertrip Service. Overall, we forecast that balancing costs could be around 30% lower than last summer.

Please see the link to Summer Outlook here

Demand | Previous to last week demand out-turn



Date	Forecasting Point	FORECAST (Wed 05 Apr) National Demand (GW)	FORECAST (Wed 05 Apr) Dist. wind (GW)	FORECAST (Wed 05 Apr) Dist. PV (GW)	OUTTURN National Demand (GW)	OUTTURN Dist. wind (GW)	OUTTURN Dist. PV (GW)
05 Apr	Afternoon Min	30.6	1.7	2.3	31.0	1.6	3.4
06 Apr	Overnight Min	22.3	0.9	0.0	21.4	1.1	0.0
06 Apr	Afternoon Min	25.6	2.5	4.7	24.4	3.0	5.2
07 Apr	Overnight Min	21.9	0.7	0.0	20.9	0.7	0.0
07 Apr	Afternoon Min	21.3	0.6	6.4	19.9	0.6	7.6
08 Apr	Overnight Min	20.8	0.7	0.0	20.0	0.8	0.0
08 Apr	Afternoon Min	19.4	1.2	5.9	18.8	1.2	7.1
09 Apr	Overnight Min	18.9	1.2	0.0	18.5	1.4	0.0
09 Apr	Afternoon Min	16.6	2.2	6.6	19.1	2.9	6.3
10 Apr	Overnight Min	17.6	2.3	0.0	16.9	2.7	0.0
10 Apr	Afternoon Min	20.7	2.7	4.3	19.6	3.5	5.4
11 Apr	Overnight Min	19.0	1.7	0.0	18.1	2.9	0.0
11 Apr	Afternoon Min	24.2	2.5	5.2	26.9	2.6	4.7

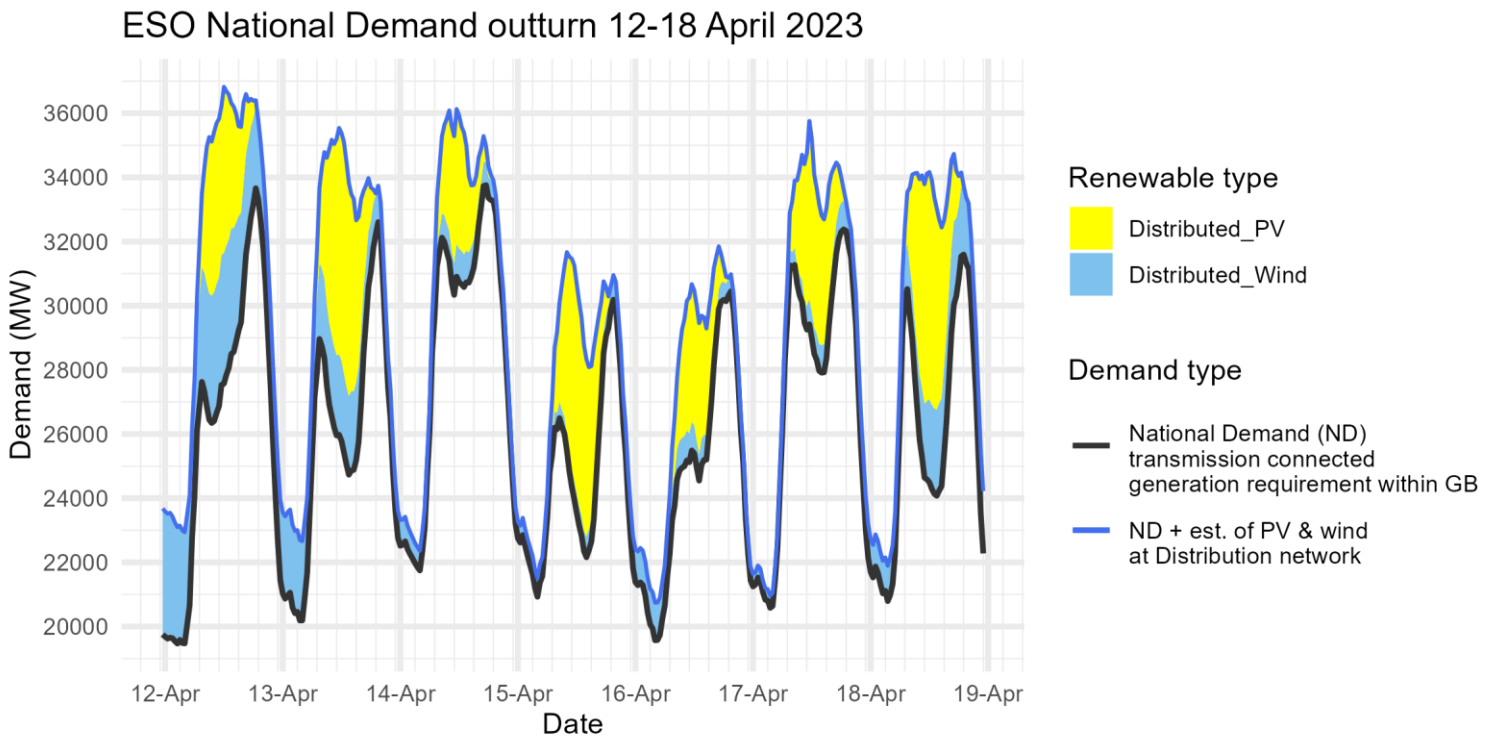
The black line (National Demand ND) is the measure of portion of total GB customer demand that is supplied by the transmission network.

ND values **do not include** export on interconnectors or pumping or station load

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

Demand | Last week demand out-turn



		FORECAST (Wed 12 Apr)			OUTTURN		
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)	National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)
12 Apr	Afternoon Min	28.1	4.1	4.8	27.8	4.0	4.8
13 Apr	Overnight Min	20.4	2.5	0.0	20.2	2.5	0.0
13 Apr	Afternoon Min	25.4	2.6	5.5	24.7	2.5	6.7
14 Apr	Overnight Min	22.5	1.1	0.0	21.7	0.6	0.0
14 Apr	Afternoon Min	29.4	0.8	3.2	30.6	1.0	3.8
15 Apr	Overnight Min	22.1	0.4	0.0	20.9	0.6	0.0
15 Apr	Afternoon Min	21.6	1.3	4.9	22.2	0.6	5.5
16 Apr	Overnight Min	19.6	1.1	0.0	19.6	1.2	0.0
16 Apr	Afternoon Min	18.8	1.7	6.5	24.5	0.8	4.1
17 Apr	Overnight Min	19.0	1.5	0.0	20.6	0.4	0.0
17 Apr	Afternoon Min	23.2	1.6	6.2	27.9	0.9	4.0
18 Apr	Overnight Min	19.8	1.0	0.0	20.8	1.1	0.0
18 Apr	Afternoon Min	24.6	1.4	4.7	24.1	2.7	6.3

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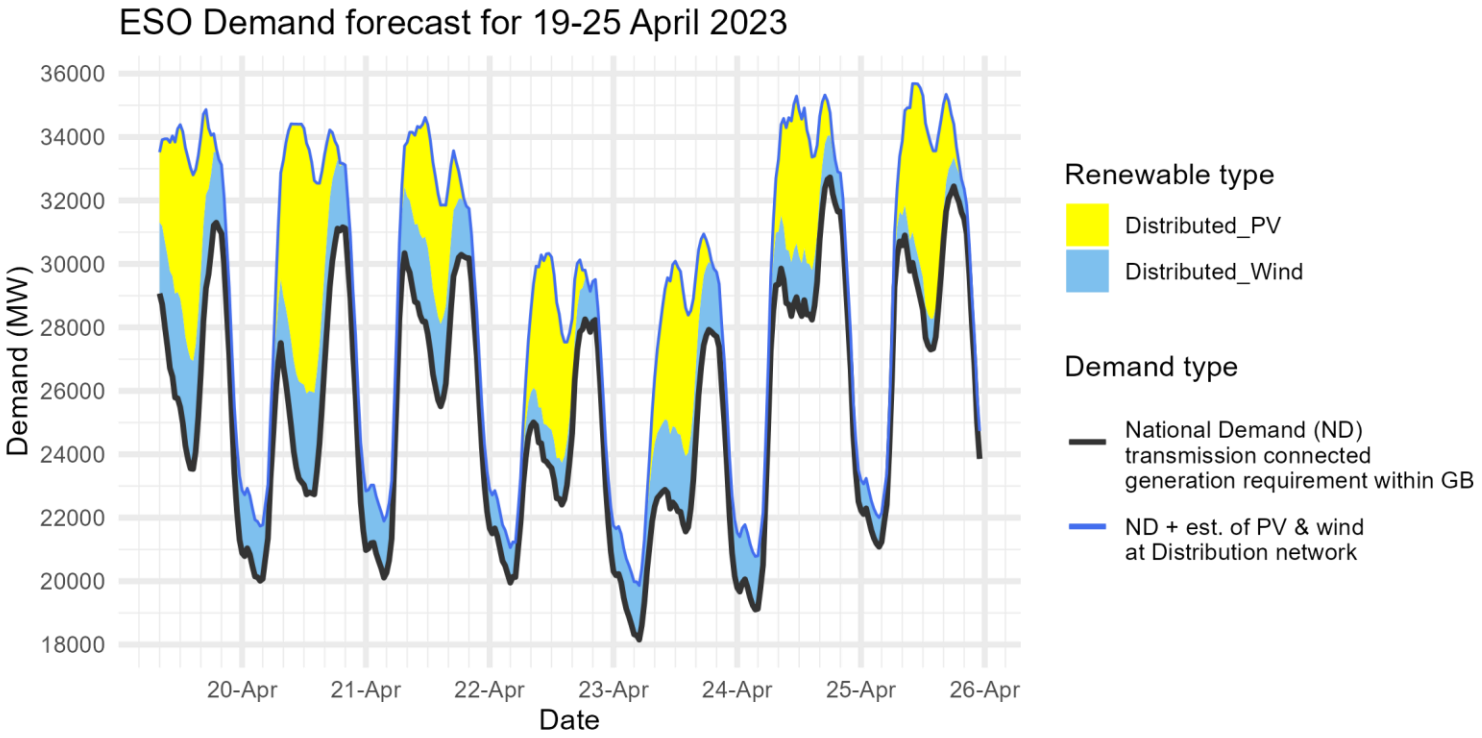
Demand | Week Ahead



		FORECAST (Wed 19 Apr)		
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)
19 Apr 2023	Afternoon Min	23.5	3.4	5.9
20 Apr 2023	Overnight Min	20.0	1.7	0.0
20 Apr 2023	Afternoon Min	22.7	3.2	7.9
21 Apr 2023	Overnight Min	20.1	1.8	0.0
21 Apr 2023	Afternoon Min	25.5	2.6	3.7
22 Apr 2023	Overnight Min	20.0	1.1	0.0
22 Apr 2023	Afternoon Min	22.4	1.3	4.1
23 Apr 2023	Overnight Min	18.2	1.7	0.0
23 Apr 2023	Afternoon Min	21.6	2.4	4.7
24 Apr 2023	Overnight Min	19.1	1.7	0.0
24 Apr 2023	Afternoon Min	28.2	1.6	3.6
25 Apr 2023	Overnight Min	21.1	0.9	0.0
25 Apr 2023	Afternoon Min	27.3	1.0	5.5

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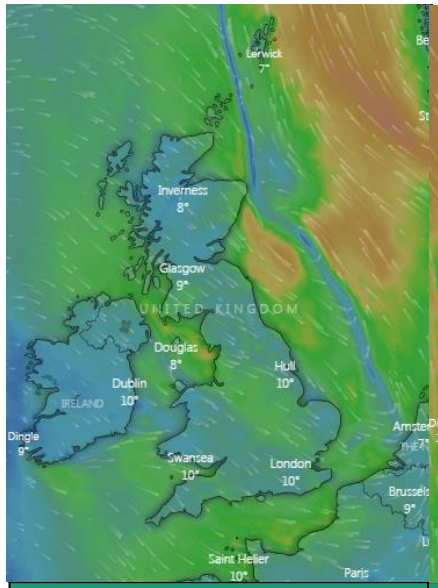
Demand | Easter weekend forecast

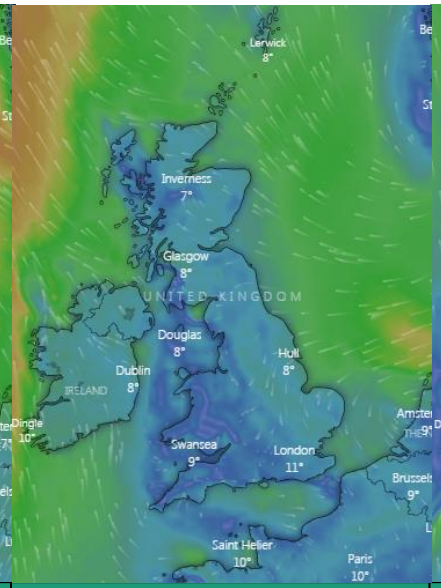
Small low pressure system to east

Some effects seen from large low pressure system far west

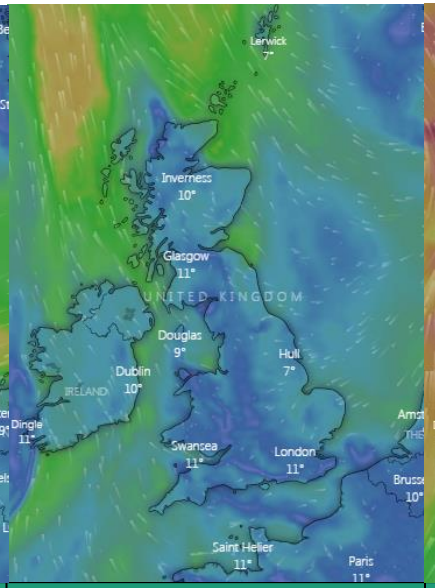
New low pressure system appearing west of Scotland



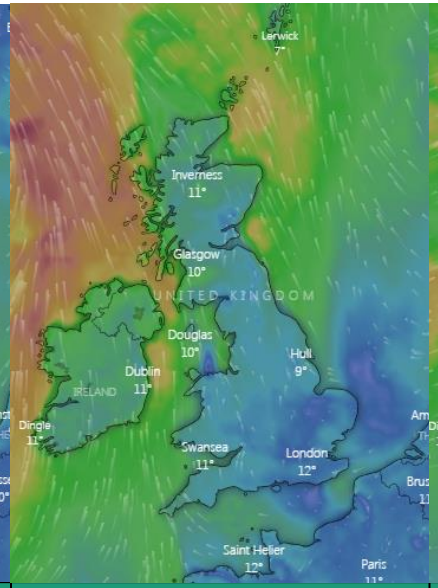
18:00
Thursday 06/04



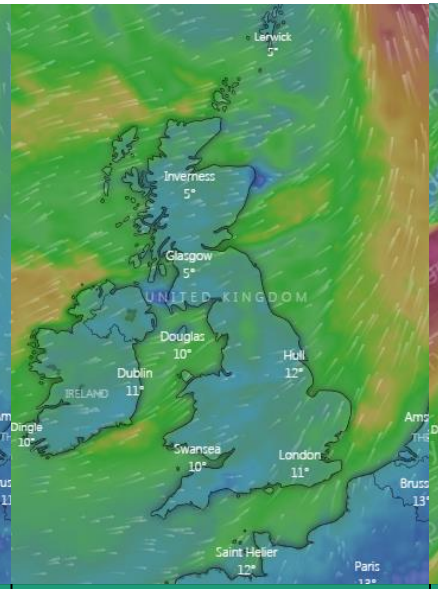
18:00
Friday 07/04



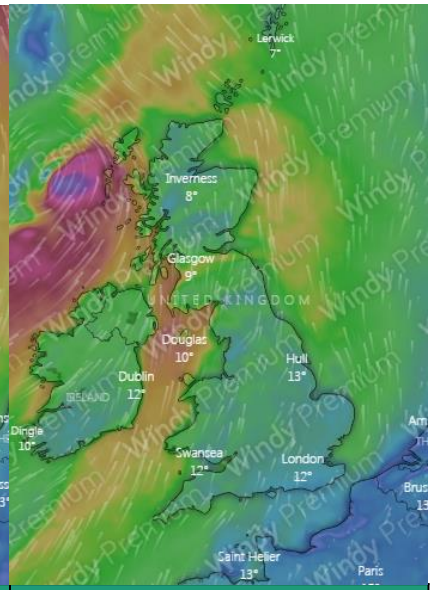
18:00
Saturday 08/04



18:00
Sunday 09/04



18:00
Monday 10/04

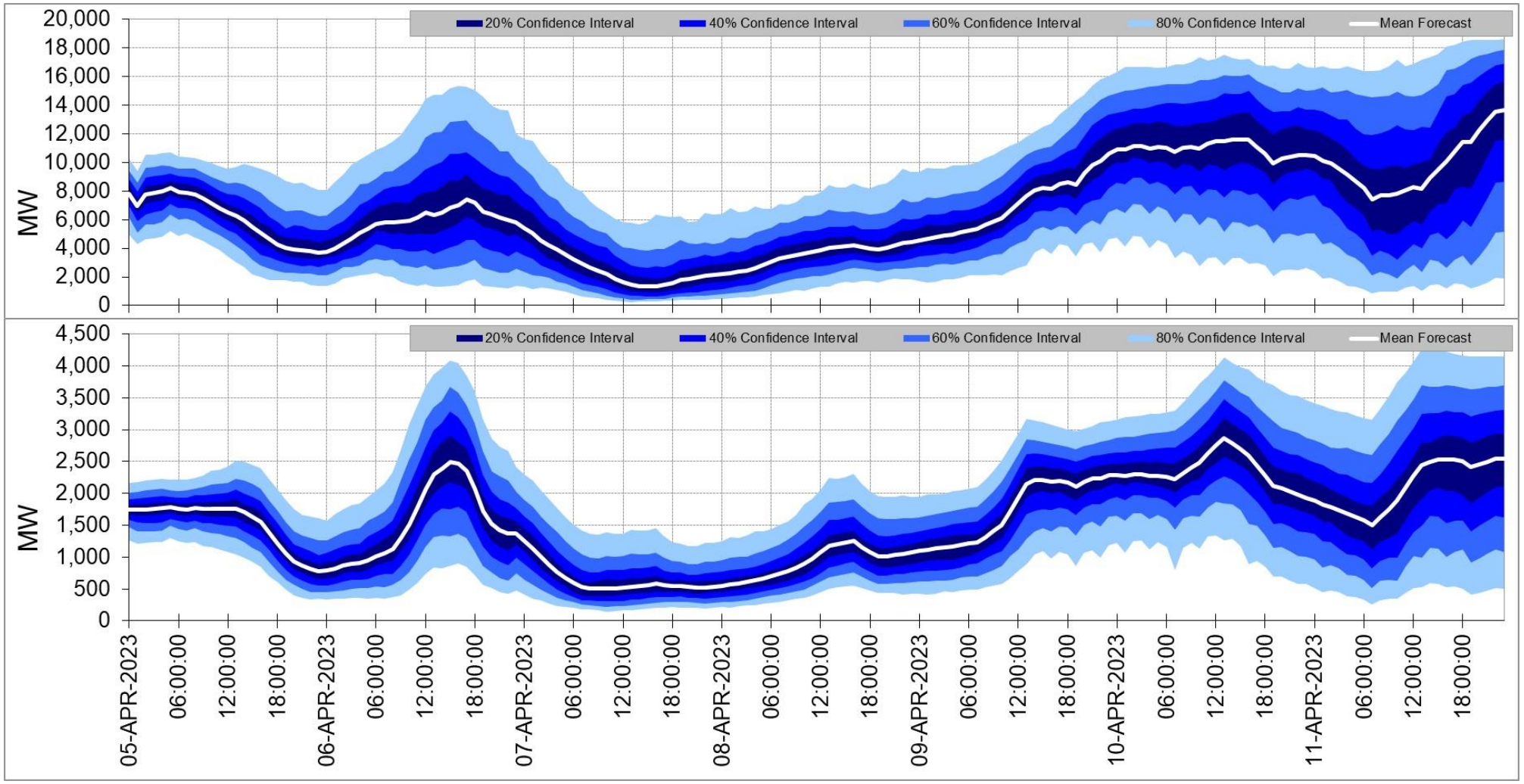


18:00
Tuesday 11/04

View as of Wednesday 05/04
Source: https://www.windy.com/

Demand | Easter weekend forecast

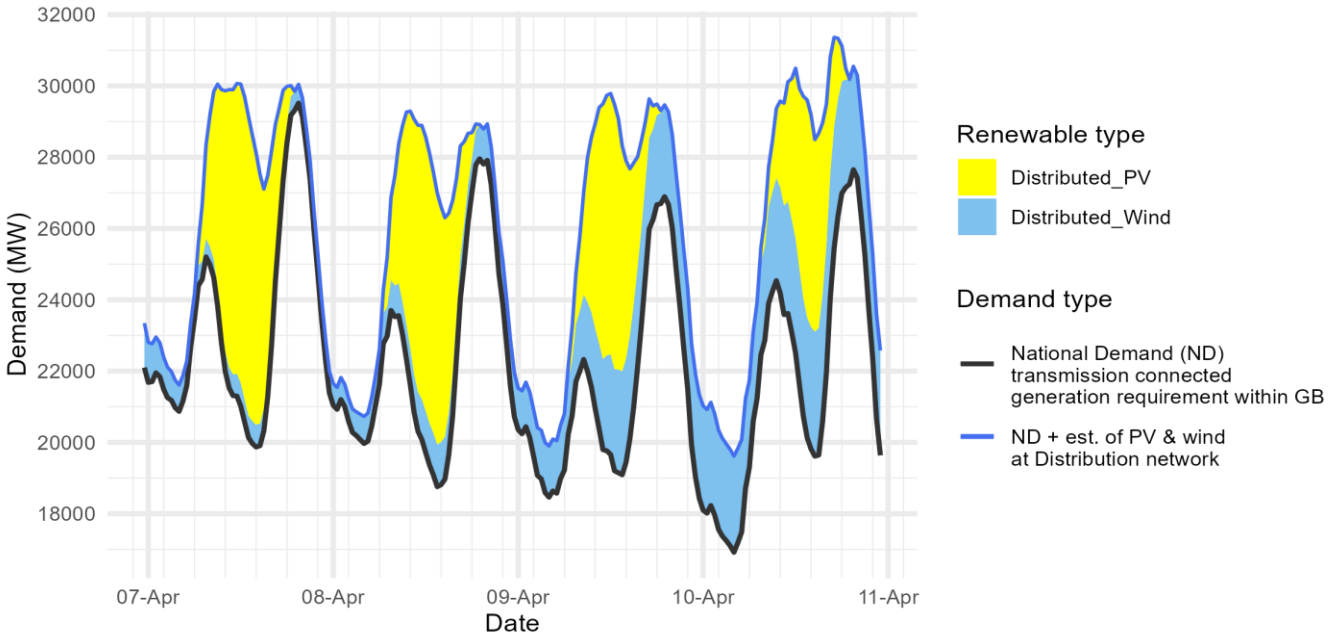
BMU

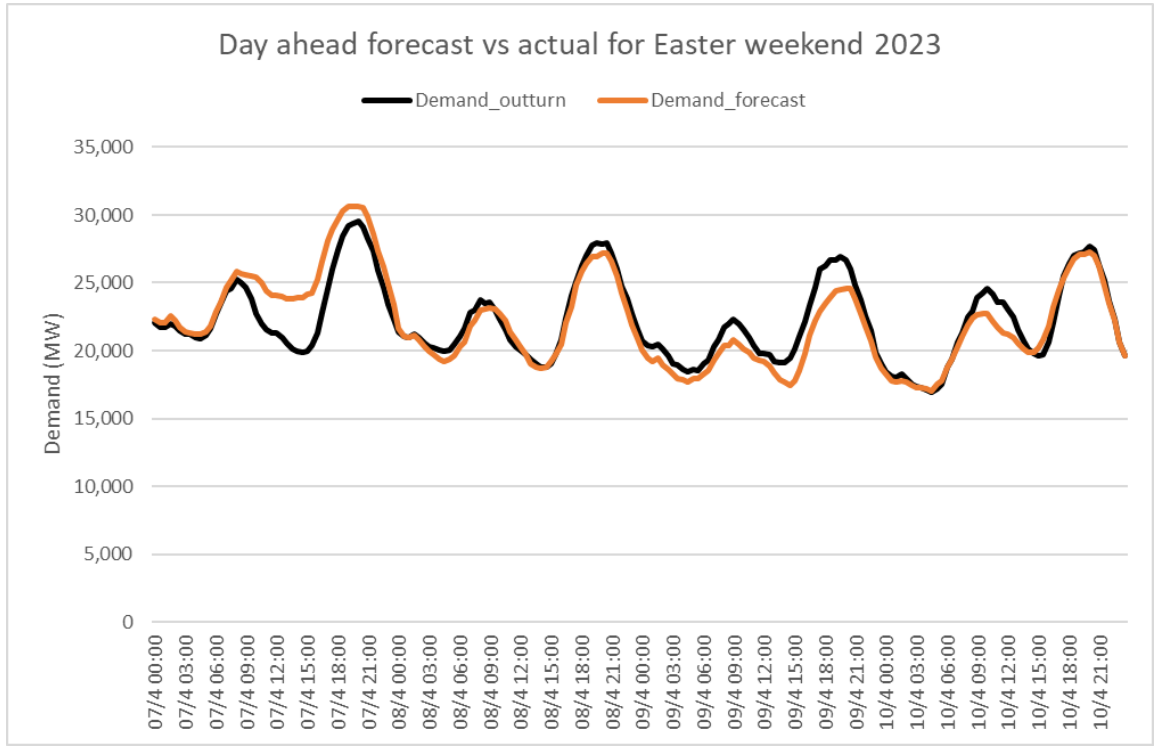


Embedded

View as of Wednesday 05/04

Demand | Easter weekend demand out-turn





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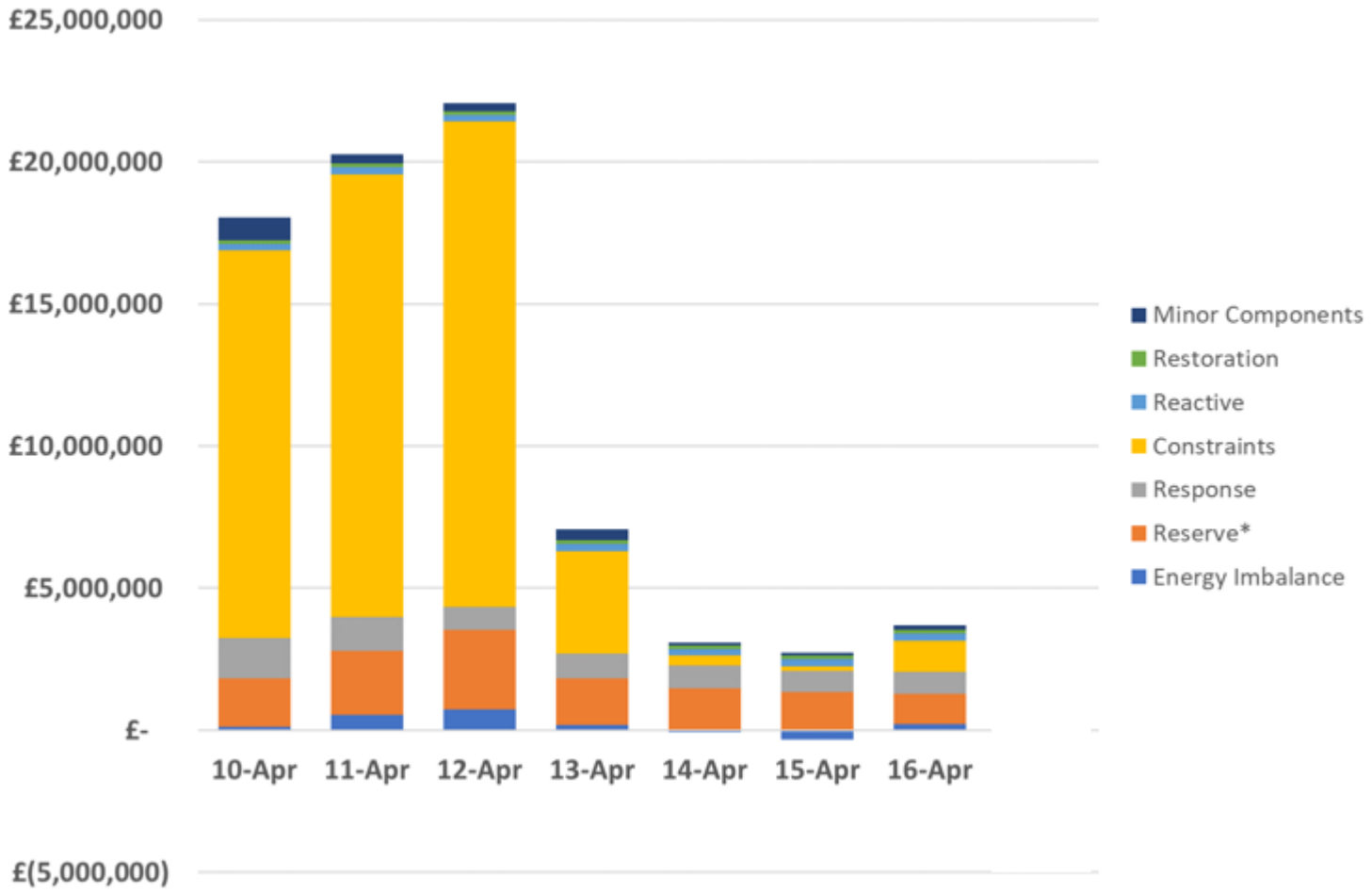
ESO Actions | Category costs breakdown for the last week

Date	Total (£m)
10/04/2023	18.0
11/04/2023	20.2
12/04/2023	22.1
13/04/2023	7.1
14/04/2023	3.0
15/04/2023	2.4
16/04/2023	3.7
Weekly Total	76.5
Previous Week	48.8



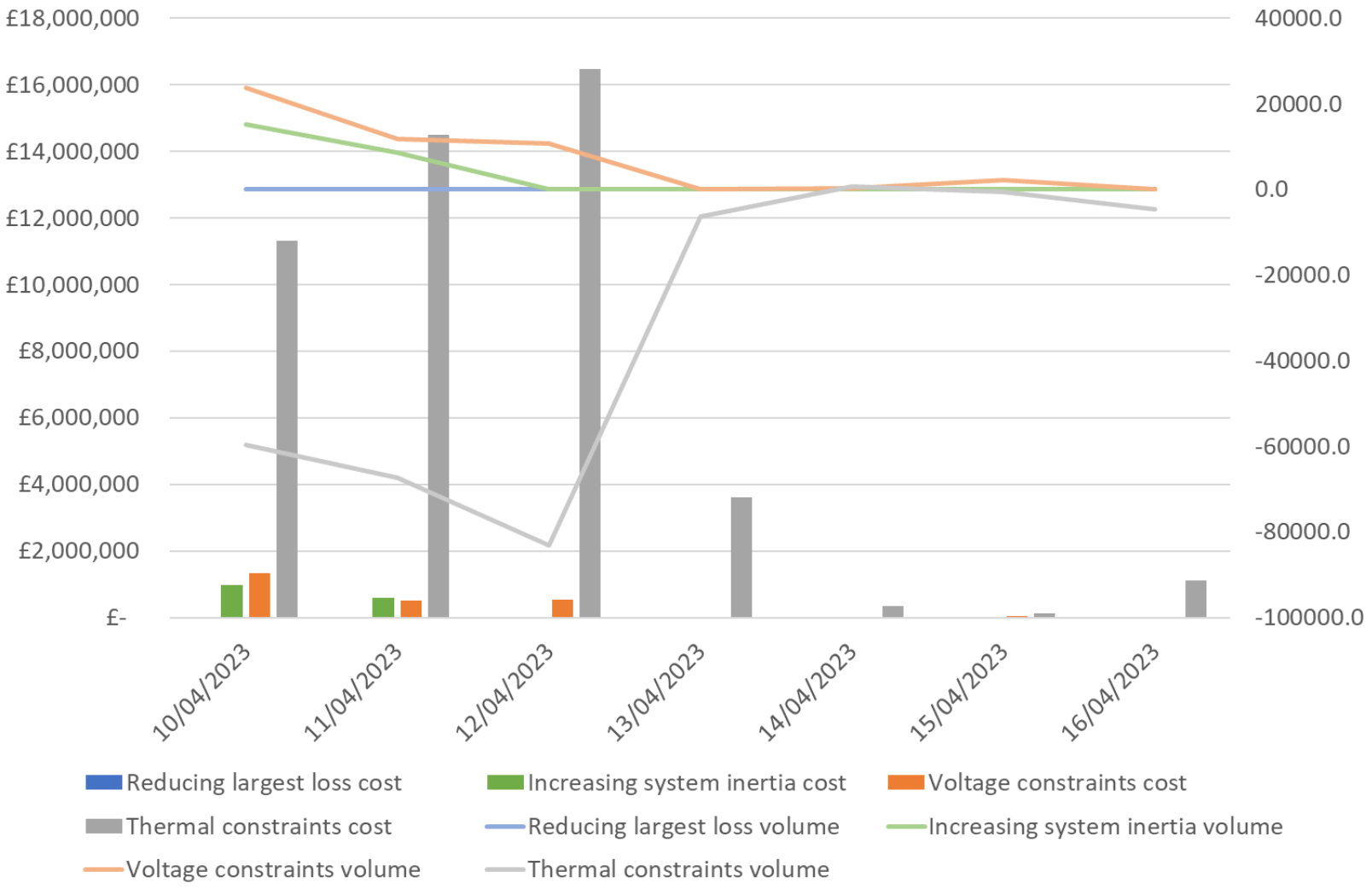
Previous week's analysis is included in an annex

Constraints costs were the key cost component throughout the week.

Please note that all the categories are presented and explained in the MBSS.

Data issue: Please note that due to a data issue on a few days over the last few months, the Minor Components line in Non-Constraint Costs is capturing some costs on those days which should be attributed to different categories. It has been identified that a significant portion of these costs should be allocated to the Operating Reserve Category. Although the categorisation of costs is not correct, we are confident that the total costs are correct in all months. We continue to investigate and will advise when we have a resolution.

ESO Actions | Constraint Cost Breakdown



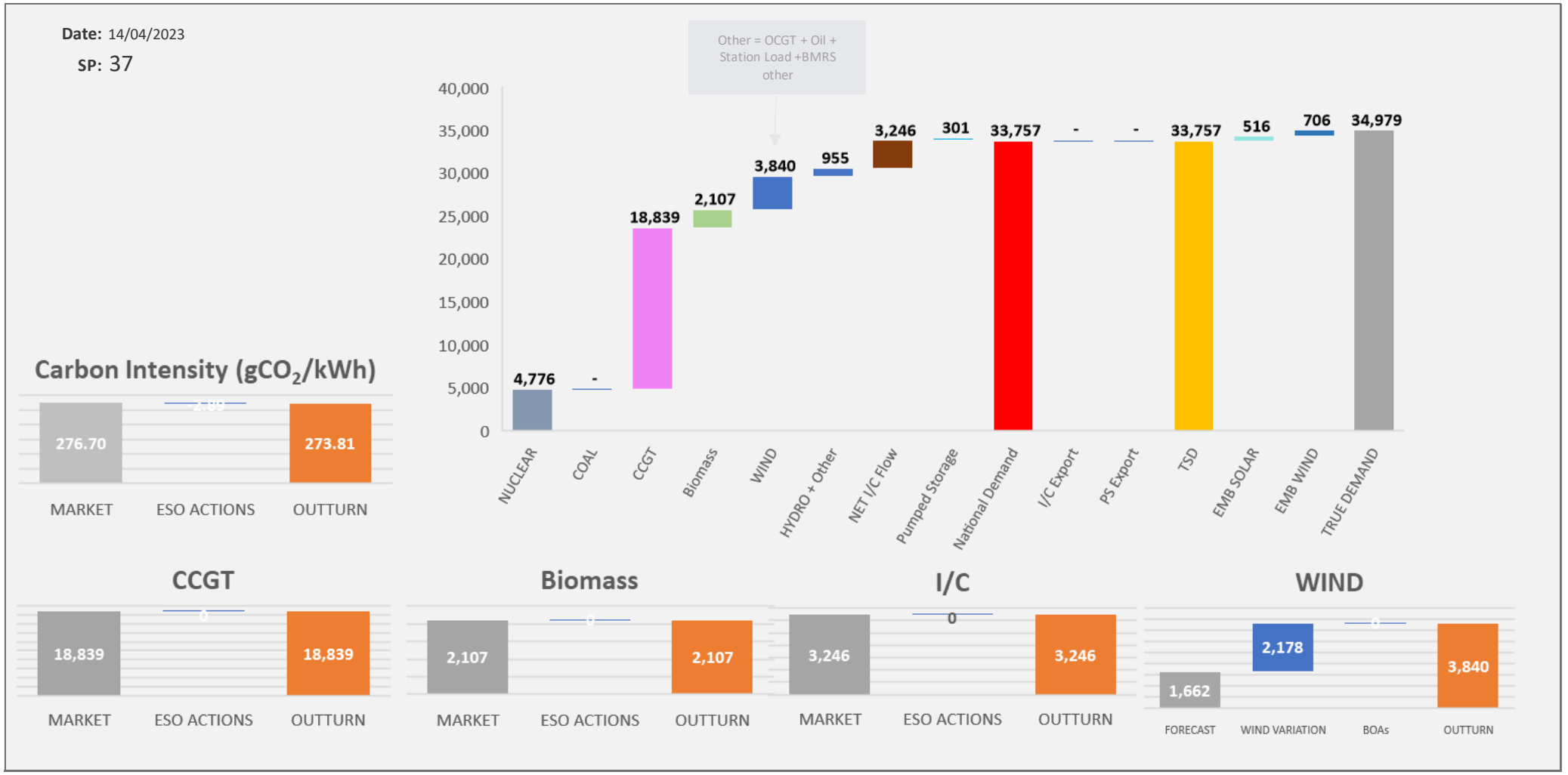
Thermal – network congestion
Actions required to manage Thermal Constraints throughout the week with the highest costs on Mon/Tue/Wed.

Voltage
Intervention was required to manage voltage levels on Mon, Tue, Wed & Sat.

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

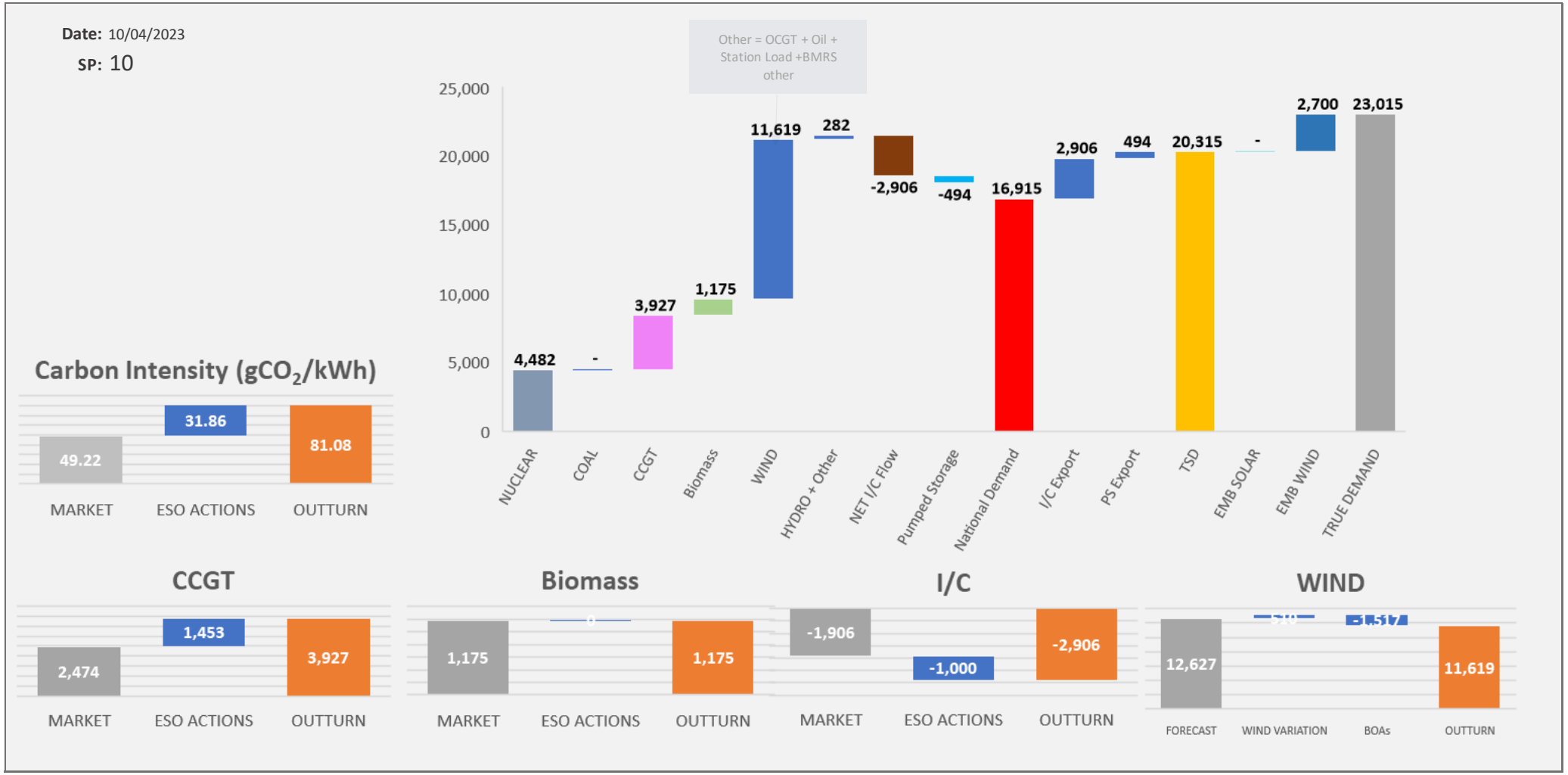
Increasing inertia
Intervention was required to manage system inertia on Mon & Tue.

ESO Actions | Friday 14 April – Peak Demand – SP spend ~£29k



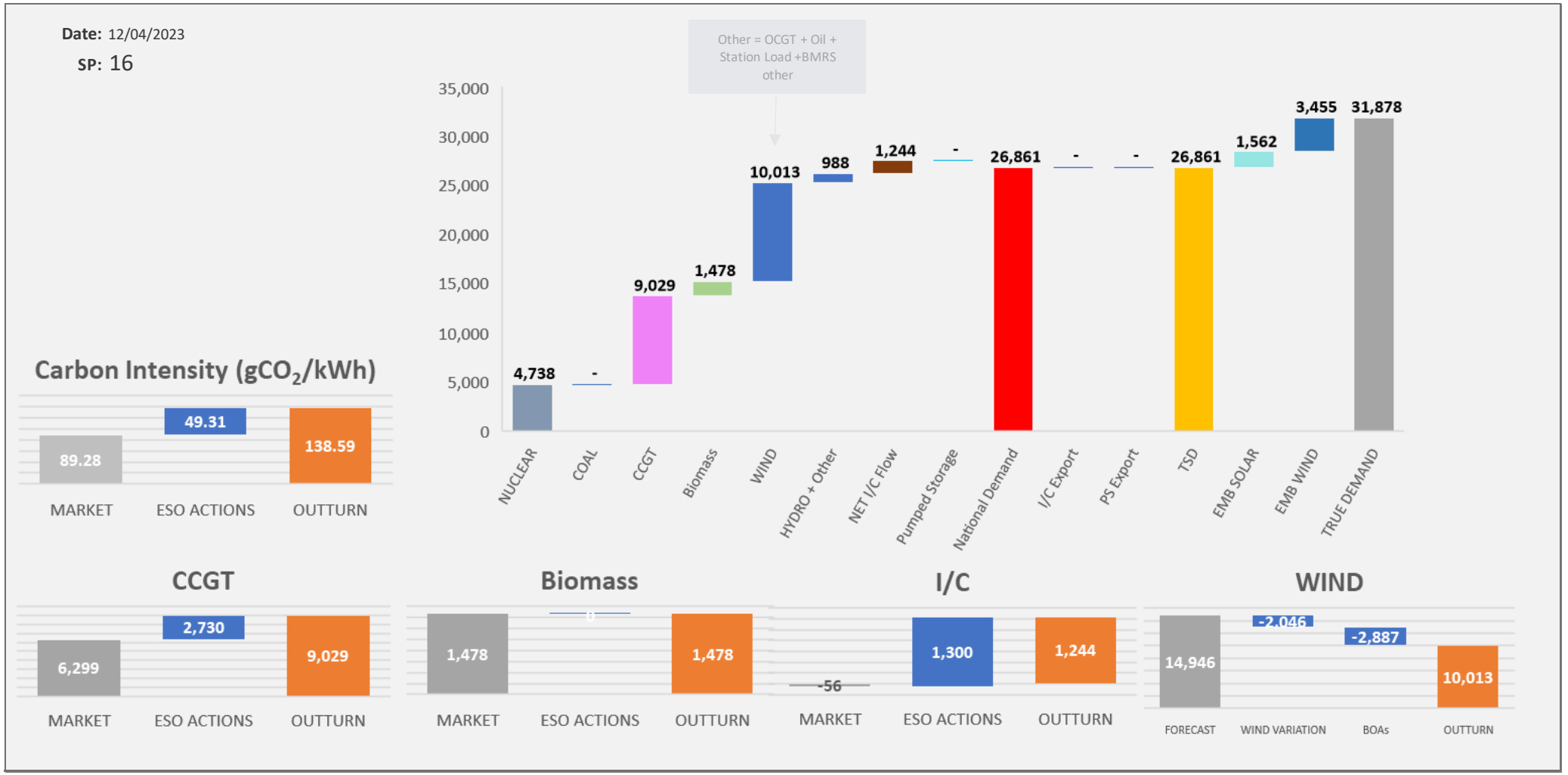
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Monday 10 April – Minimum Demand – SP Spend ~£355k



Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Wednesday 12th April – Highest SP Spend ~£830k



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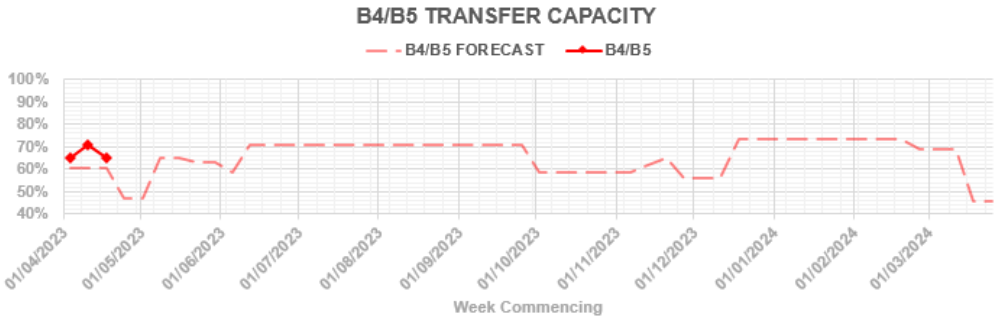
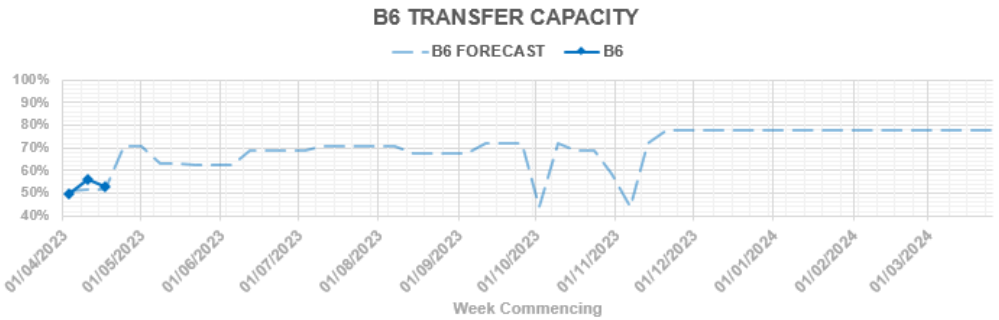
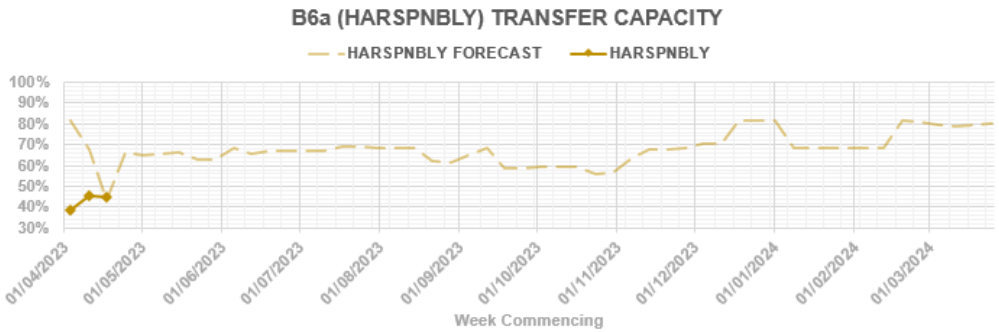
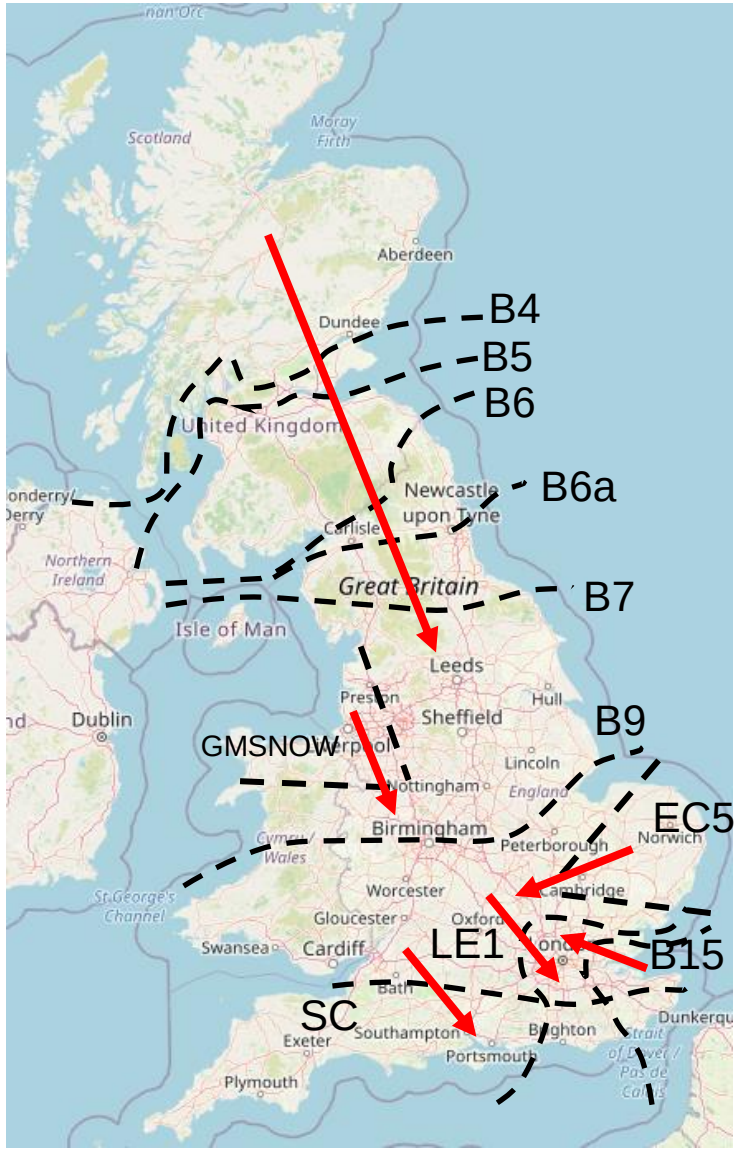
Transparency | Network Congestion





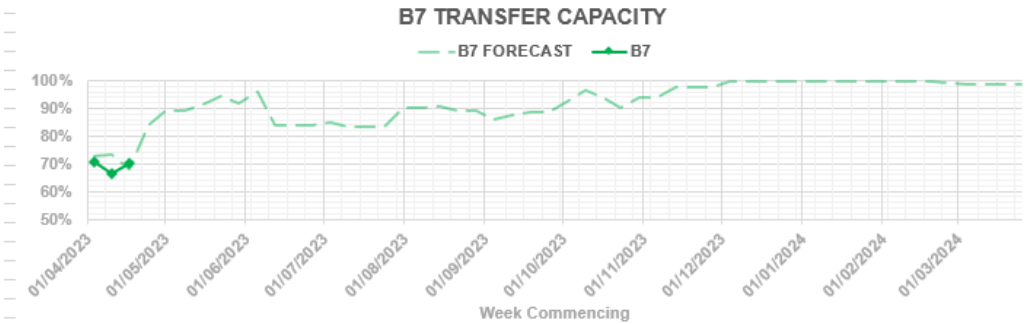


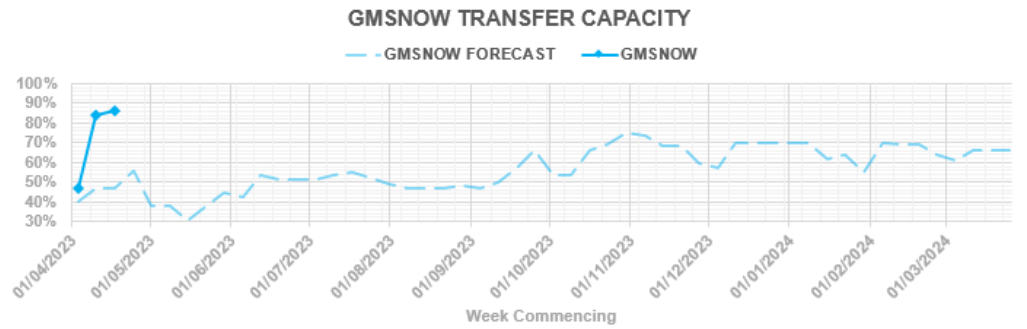
Boundary	Max. Capacity (MW)
B4/B5	2700
B6	4500
B6a	5800
B7	6050
GMSNOW	4500
B9	9800
EC5	5000
LE1	8500
B15	6600
SC	6700

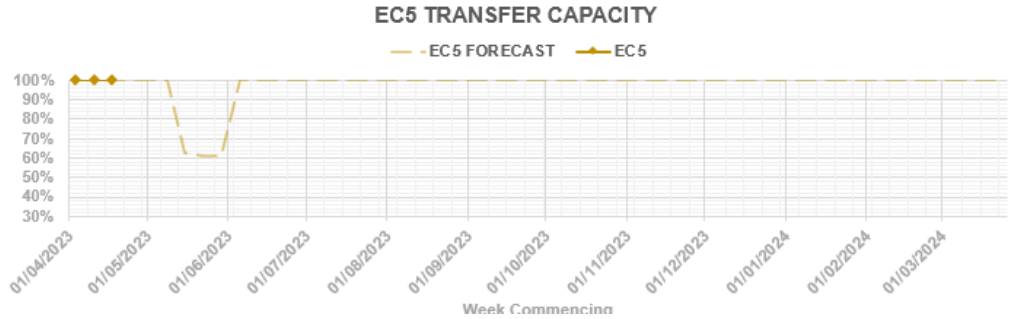


Day ahead flows and limits, and the 24-month constraint limit forecast are published on the ESO Data Portal:
https://data.nationalgrideso.com/data-groups/constraint-management

Transparency | Network Congestion







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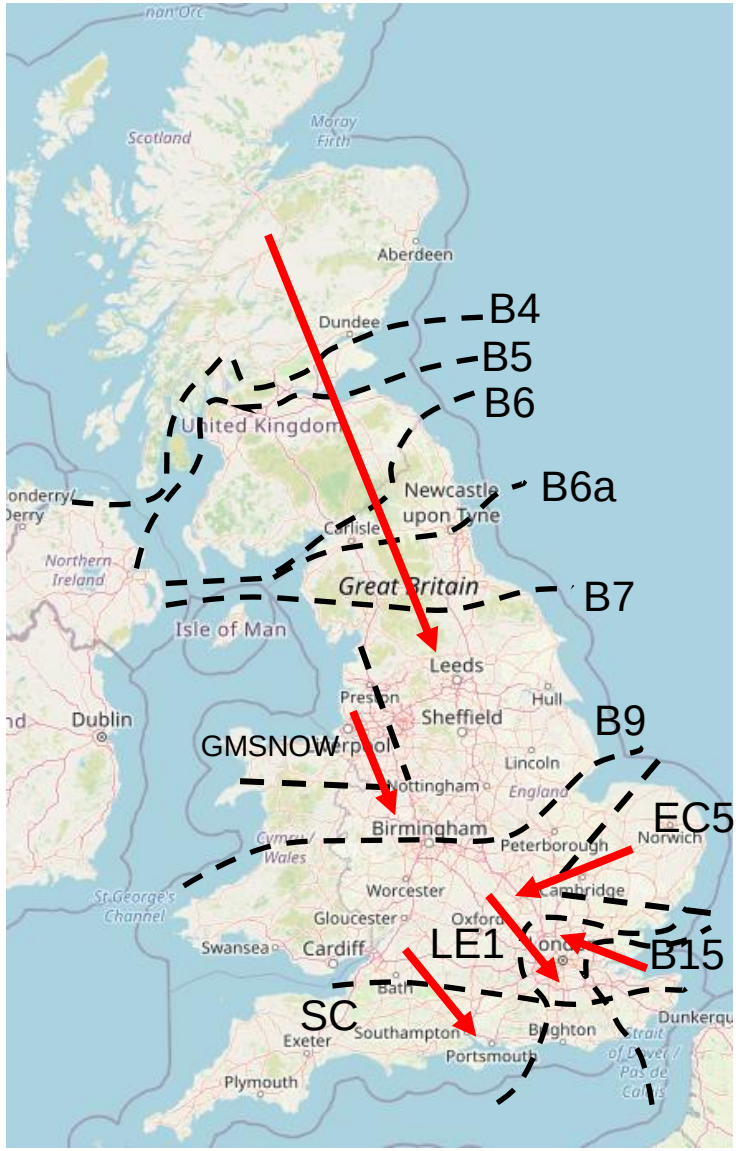

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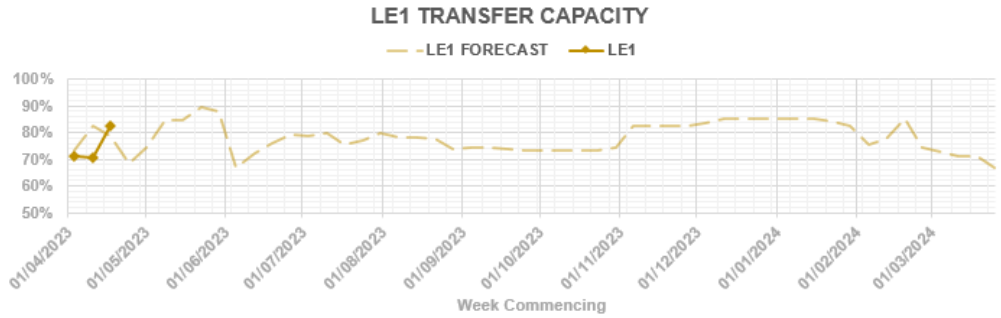
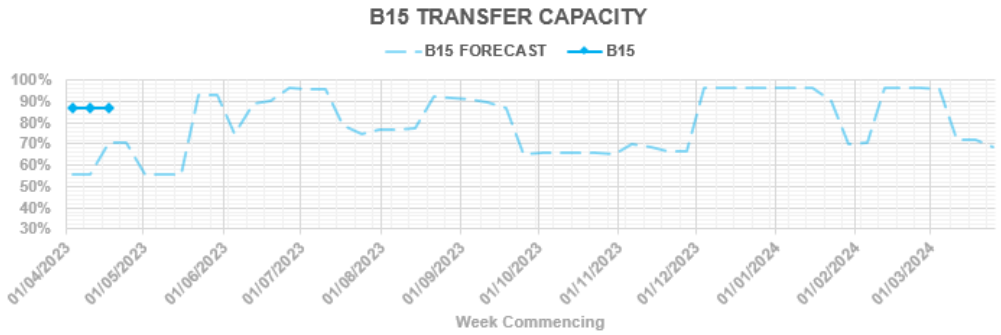
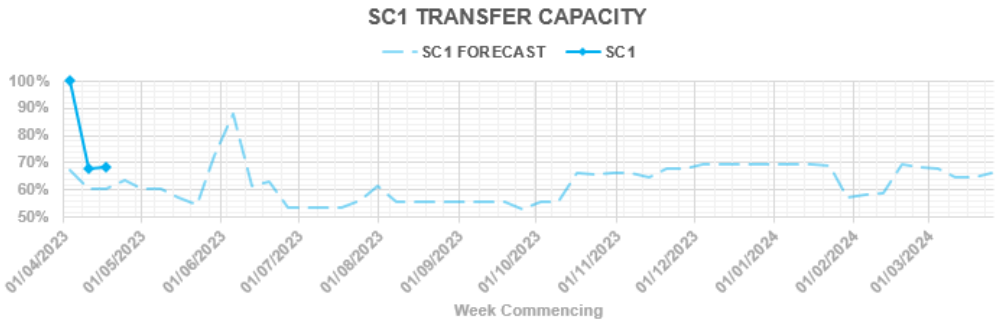
Transparency | Network Congestion







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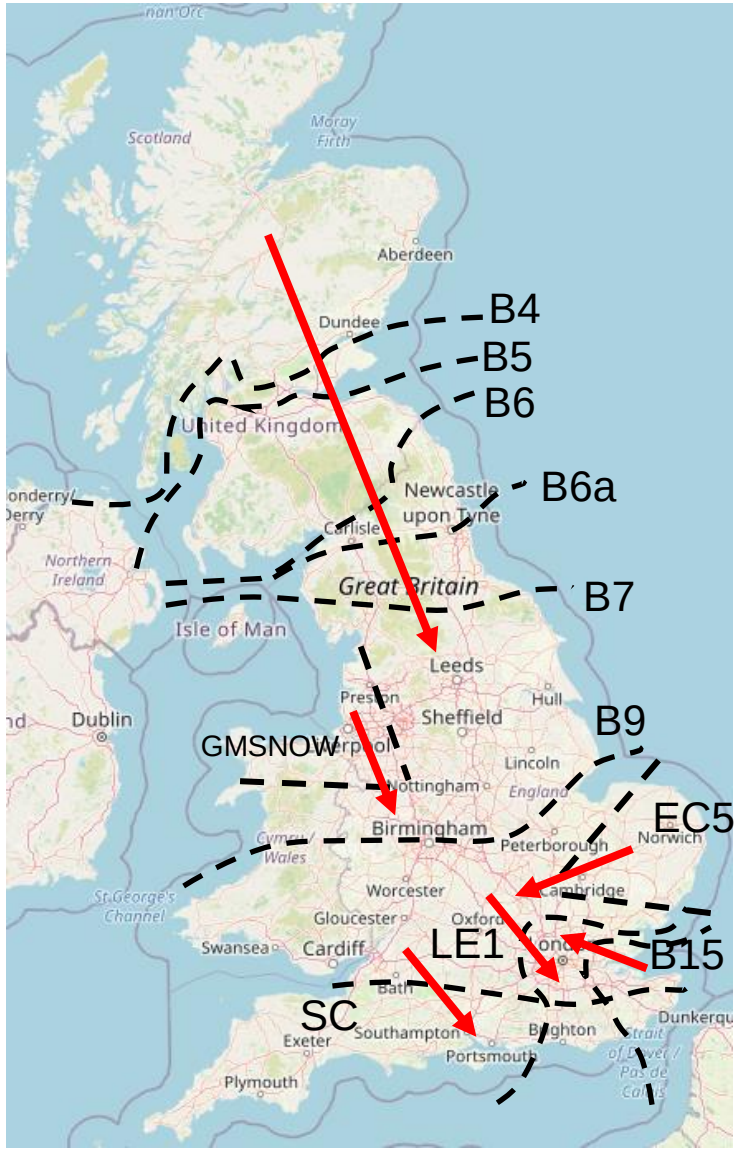
B15	6600
SC	6700



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

Questions from last week

Q: Has NGESO estimated the increased CO2 emissions caused by the NGESO restrictions to the NSL interconnector? Historic gCO_2eq/kWh for GB and Norway suggest the 300MW import restrictions could increase GB CO2 emission by as much as 1,325 tonnes CO_2eq/day or 483,552 tonnes $CO_2eq/year$.

A: The restrictions on NSL are required in order to operate a secure and economic system in line with our licence conditions.

Q: What's status on publishing mandatory frequency response instructions live?

A: Our Settlements team publishes all MFR holding volumes by BMU at a daily granularity with a month's delay on the website. Please see the link.

Q: Thanks for the update regarding the DC procurement question from last week. Quick add on - can we expect this higher level of procurement going forward? I understand procurement depends on system conditions, but has something changed in the methodology?

A: The methodology and model to decide how much DC we need are unchanged. Due to the highly complexity and interactions of determining factors, i.e. system conditions of inertia level, demand and largest loss we need to secure that are considered in the model, the DC requirements keep varying on different EFAs, under different weather conditions or seasons. We will proactively signal our requirements to the market in our 4-days forecasts and our monthly market information report.

Questions from last week

Q: I have few queries from today's session (8th March):

- The presenter mentioned that BALIT service is now called as "Excess Energy" service. I understood that service is still in use and only name is changed but it is mentioned in the ppt that ESO can not use this service (see snip). On a different slide: it is mentioned that Excess energy service is used by NGESO (see snip2).
- Please clarify can NGESO use "Excess Energy" service?
- If yes: What is the minimum notice period?
- If no – what is the minimum notice period?
- Please explain in detail how, when & why "excessive Energy" service is used by NGESO.

A: BALIT and Excess Energy are separate services.

BALIT was a within-gate-closure SO-SO Trade service between NGESO and RTE (the French System Operator) which could be used to trade blocks of energy between the SOs. The introduction of TERRE by EU TSOs resulted in the removal of the BALIT service due to overlapping timescales. NGESO cannot participate in TERRE as a result of EU-Exit.

Excess Energy is a near-to real-time SO-SO Trade service between NGESO and RTE which can be used to trade energy flows between the SOs. This service is still available, however due to changes in interconnector gate closures, i.e. hourly, there is a mis-alignment with the Excess Energy required notice period. NGESO is working with RTE to try and realign this service with hourly gate closure timings.

Until this alignment is complete ESO is not reliant upon the Excess Energy service as any instructions by ESO would have to be carried out before the nominated flow is firm thus introducing risk to ESO not knowing what the final interconnector flow would be.

Questions from last week

Q: CCGTs inflexible dynamic data have made headlines recently. SHABA1 was BOA'd on during their MZT 11/04/2023. Is this within Grid Code? And what's the key difference between winter and 11/04/2023 that made this possible?

A: There is no change in policy or practice with respect to adhering to BM unit's dynamic parameters. Should a BM Unit receive a bid or offer acceptance which does not adhere to their parameters they are able to reject this on technical grounds if their units cannot achieve it.

Q: In regards to STOR data, the auction results are really useful and for the most part transparent. However, could the STOR hours also be populated? I understand that hours change dependent on WD/NWD and bank holidays. This makes it a little easier to calculate costs.

A: Thank you for the feedback, we will investigate how best to provide this information.

Q: Ref volts, will they (stsb projects) be reported along with other mandatory reactive utilisation and can the reactive utilisation file be updated in a more timely manner please.

A: The costs for reactive utilisation is published within out MBSS but if you would like to know if you can publish reactive utilisation from the stability project, please get in touch with: settlement.queries@nationalgrideso.com

slido

Audience Q&A Session

ⓘ Start presenting to display the audience questions on this slide.

Feedback

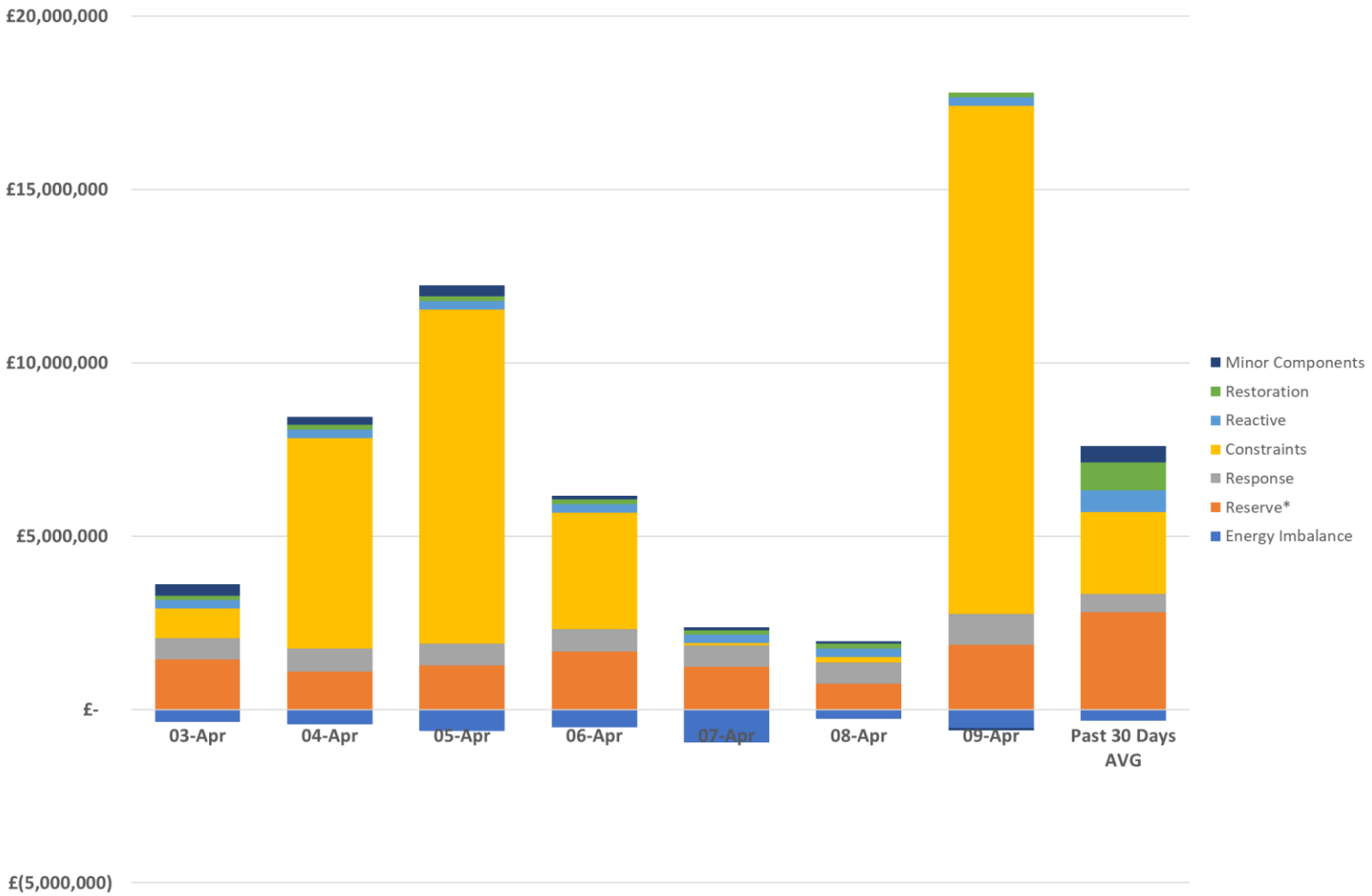
Please remember to use the feedback poll in sli.do after the event.

We welcome feedback to understand what we are doing well and how we can improve the event for the future.

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

Annex – w/c 3rd April

ESO Actions | Category costs breakdown w/c 3rd April



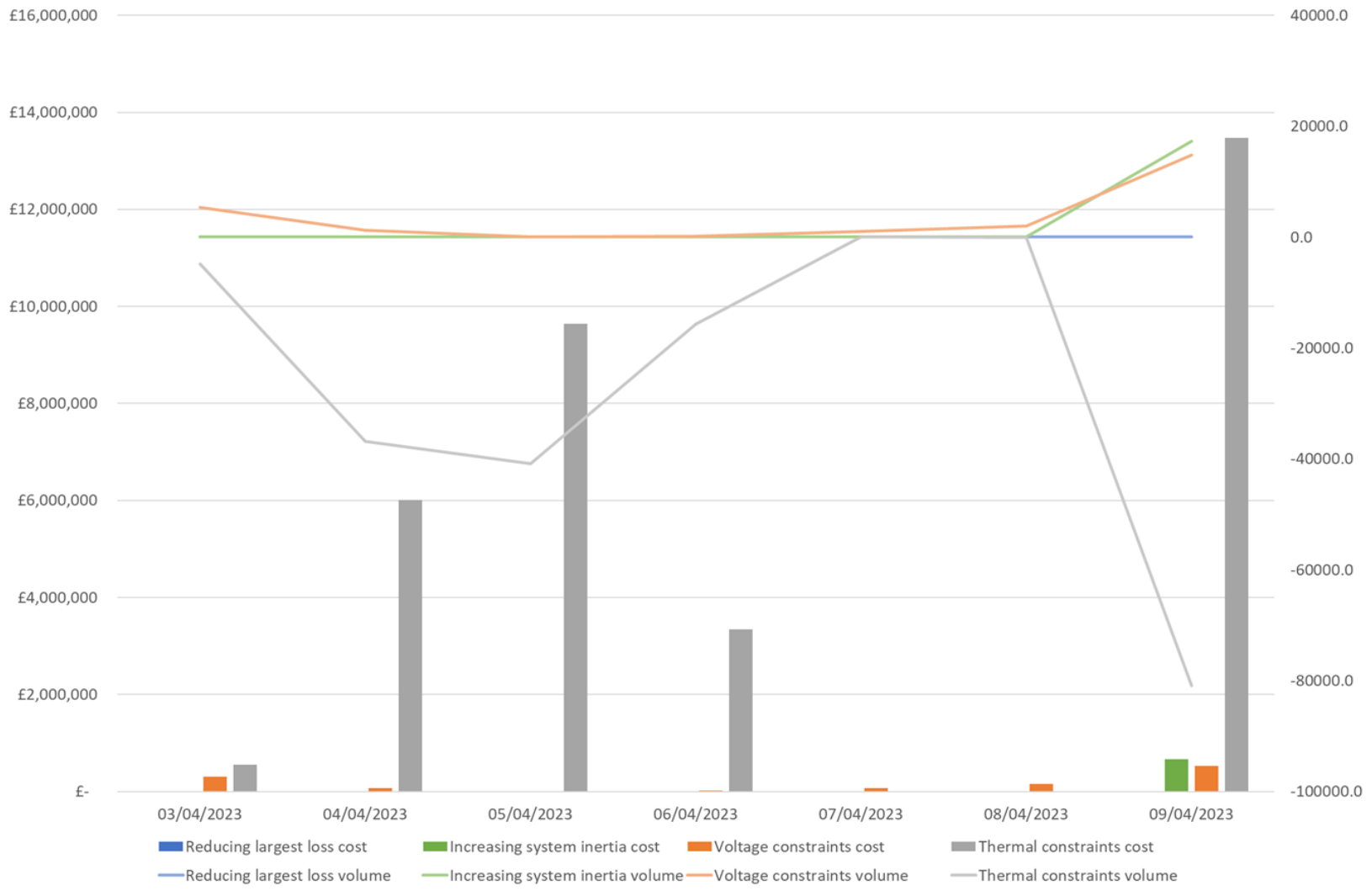
Date	Total (£m)
03/04/2023	3.2
04/04/2023	8.0
05/04/2023	11.6
06/04/2023	5.6
07/04/2023	1.4
08/04/2023	1.7
09/04/2023	17.2
Weekly Total	48.8
Previous Week	47.2

Constraints costs were the key cost component throughout the week.

Please note that all the categories are presented and explained in the MBSS.

Data issue: Please note that due to a data issue on a few days over the last few months, the Minor Components line in Non-Constraint Costs is capturing some costs on those days which should be attributed to different categories. It has been identified that a significant portion of these costs should be allocated to the Operating Reserve Category. Although the categorisation of costs is not correct, we are confident that the total costs are correct in all months. We continue to investigate and will advise when we have a resolution.

ESO Actions | Constraint Cost Breakdown w/c 3rd April



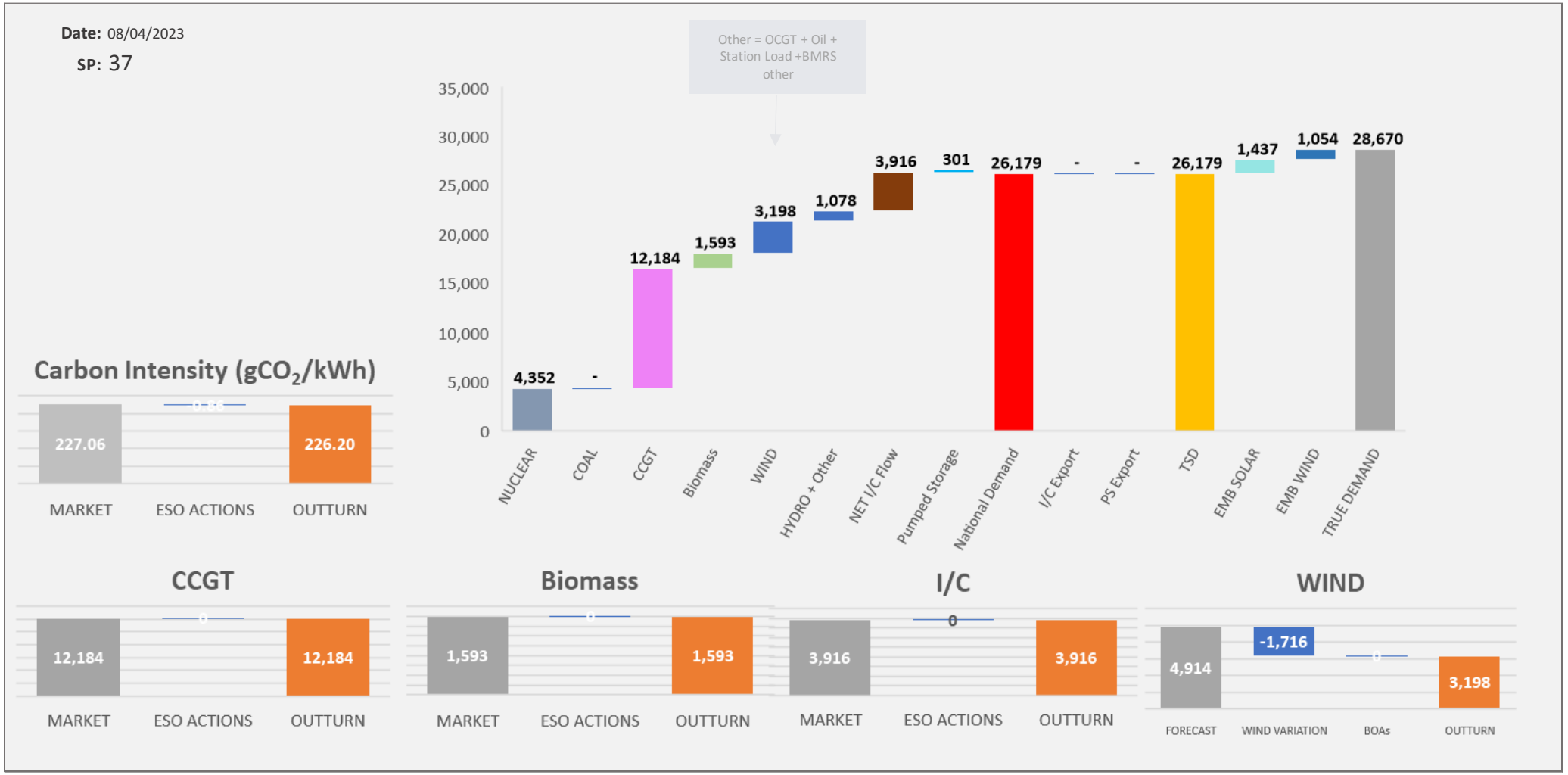
Thermal – network congestion
Actions required to manage Thermal Constraints from Monday to Thursday & Sunday, with the highest volume on Sunday.

Voltage
Intervention was required to manage voltage levels for most of the week – Mon/Tue/Thu/Fri/Sat/Sun.

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

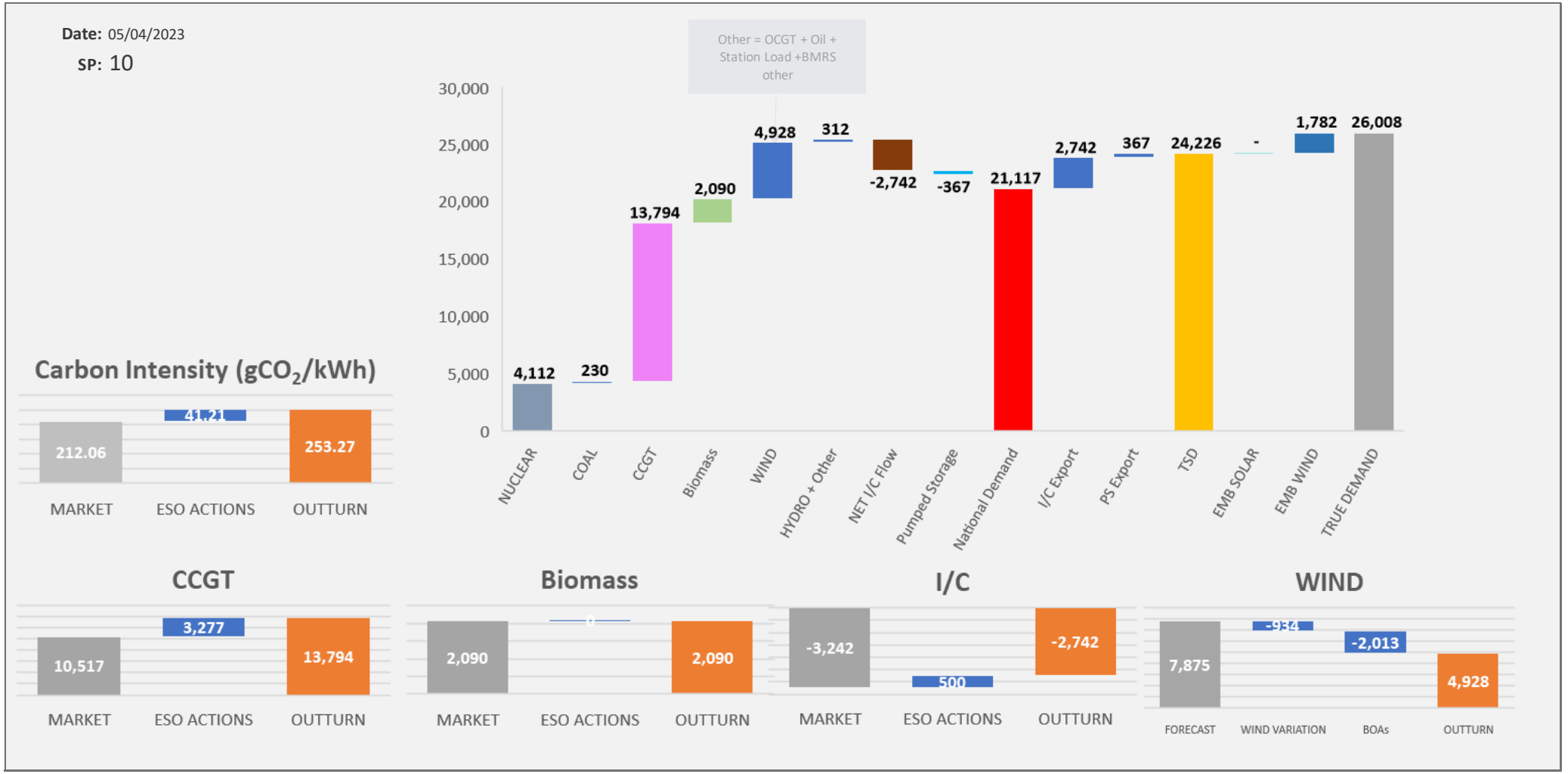
Increasing inertia
Intervention was required to manage system inertia on Sunday.

ESO Actions | Saturday 8 April – Peak Demand – SP spend ~£16k



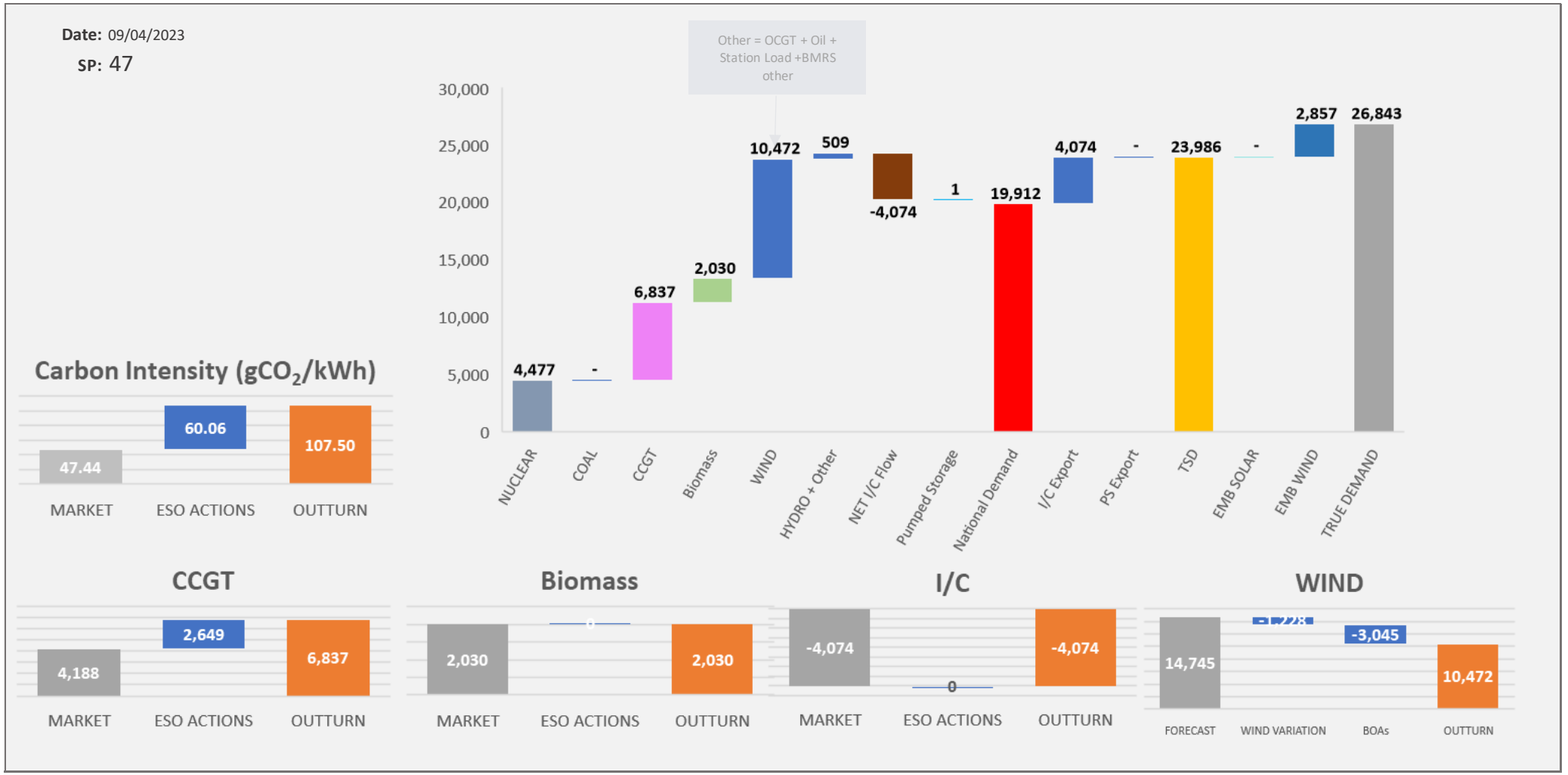
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Wednesday 5 April – Minimum Demand – SP Spend ~£485k



Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Sunday 9 April – Highest SP Spend ~£721k



Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions