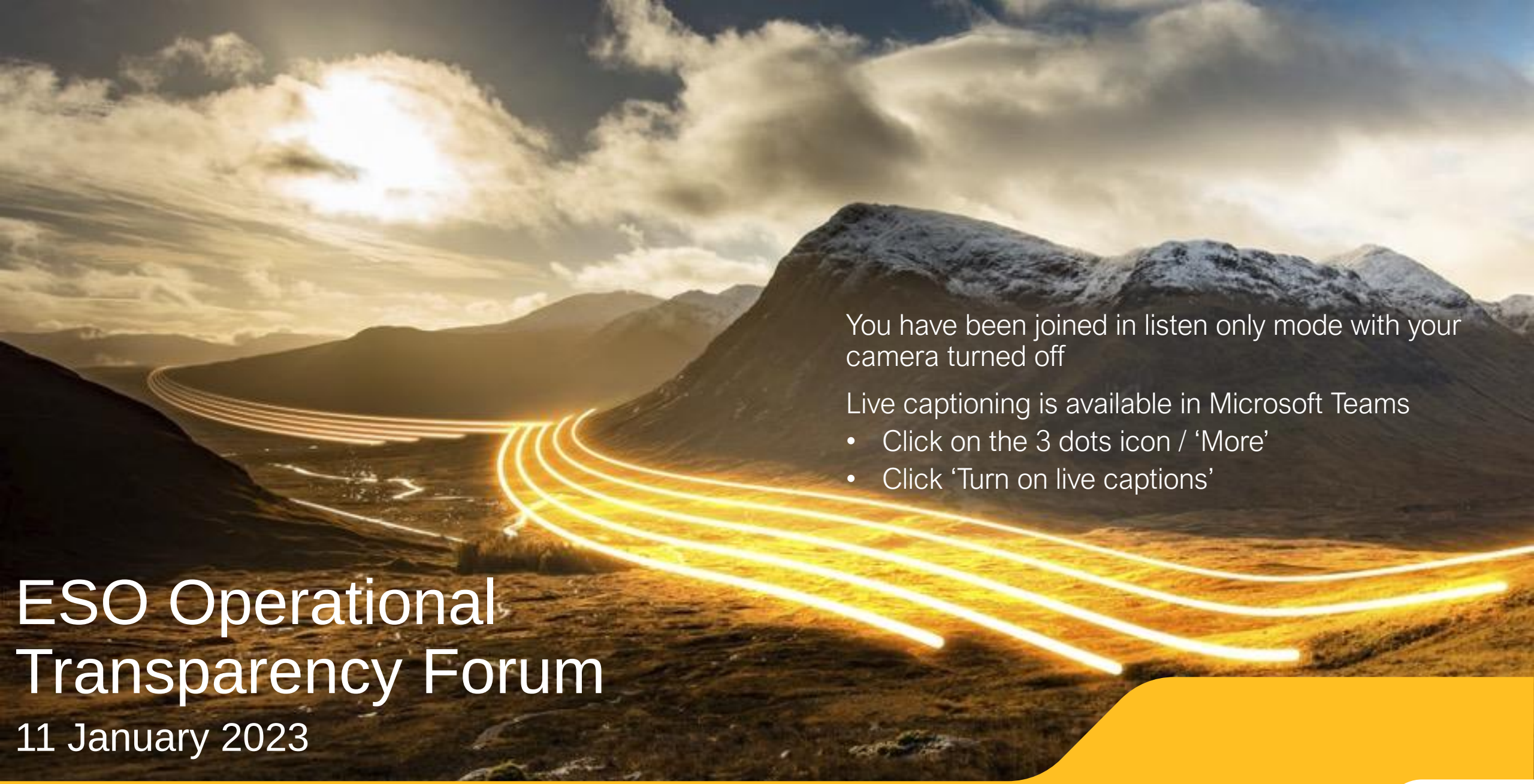


You have been joined in listen only mode with your camera turned off

Live captioning is available in Microsoft Teams

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

ESO Operational Transparency Forum

11 January 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 email: 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

Future deep dive / response topics & signposts

Today:

Operability Strategy Report 2023

Coming soon:

Reserve Reform update - January

Response markets deep dive – to be rescheduled due to winter workloads in the team

Feedback welcomed on our proposed deep dive topics

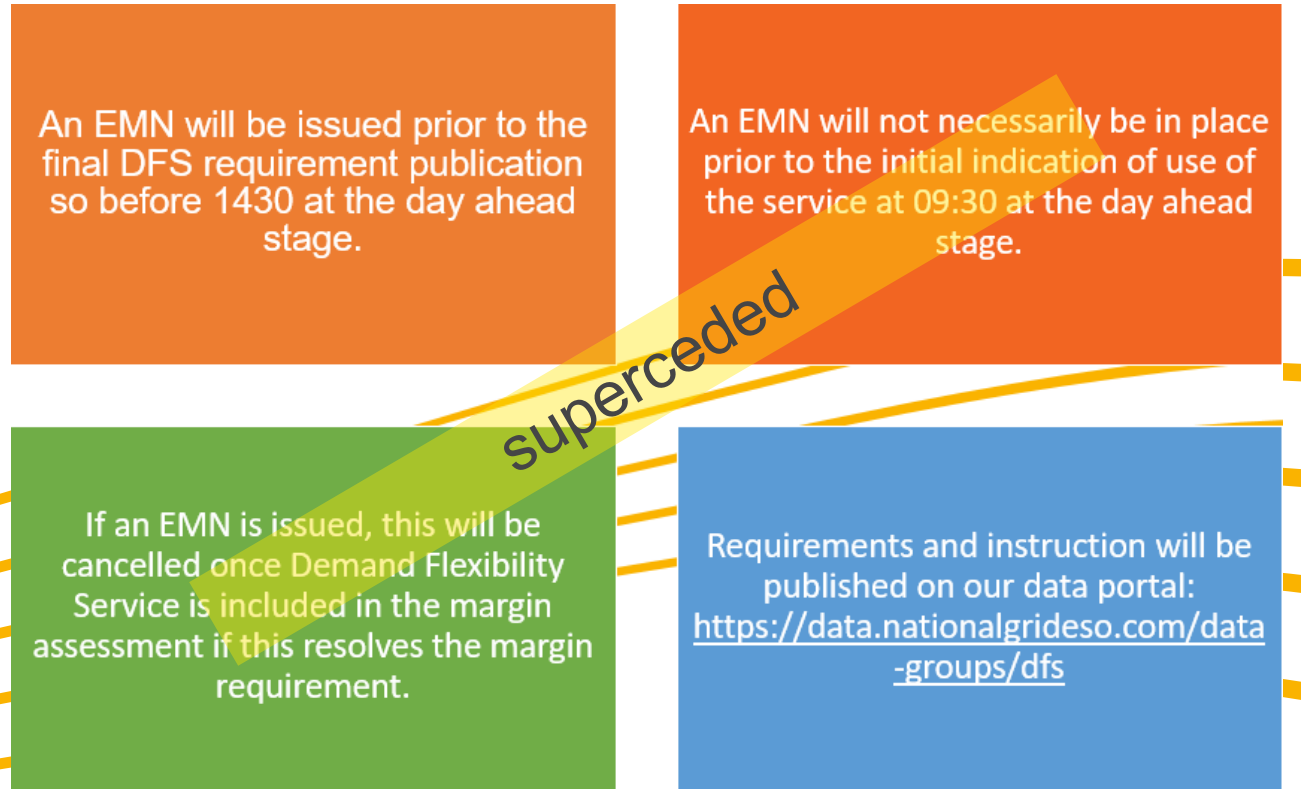
Demand Flexibility Service

On 9 November 2022, as part of the OTF: Winter takeover, we told you what is stated on the right hand side of this slide.

Following some periods of tight margins and using the processes to assess for a live DFS instruction, we have made a change to this communication.

An EMN will not necessarily be in place prior to the final DFS requirement publication.

An EMN will be issued once margin falls below the EMN trigger level and the business as usual EMN processes will be used.



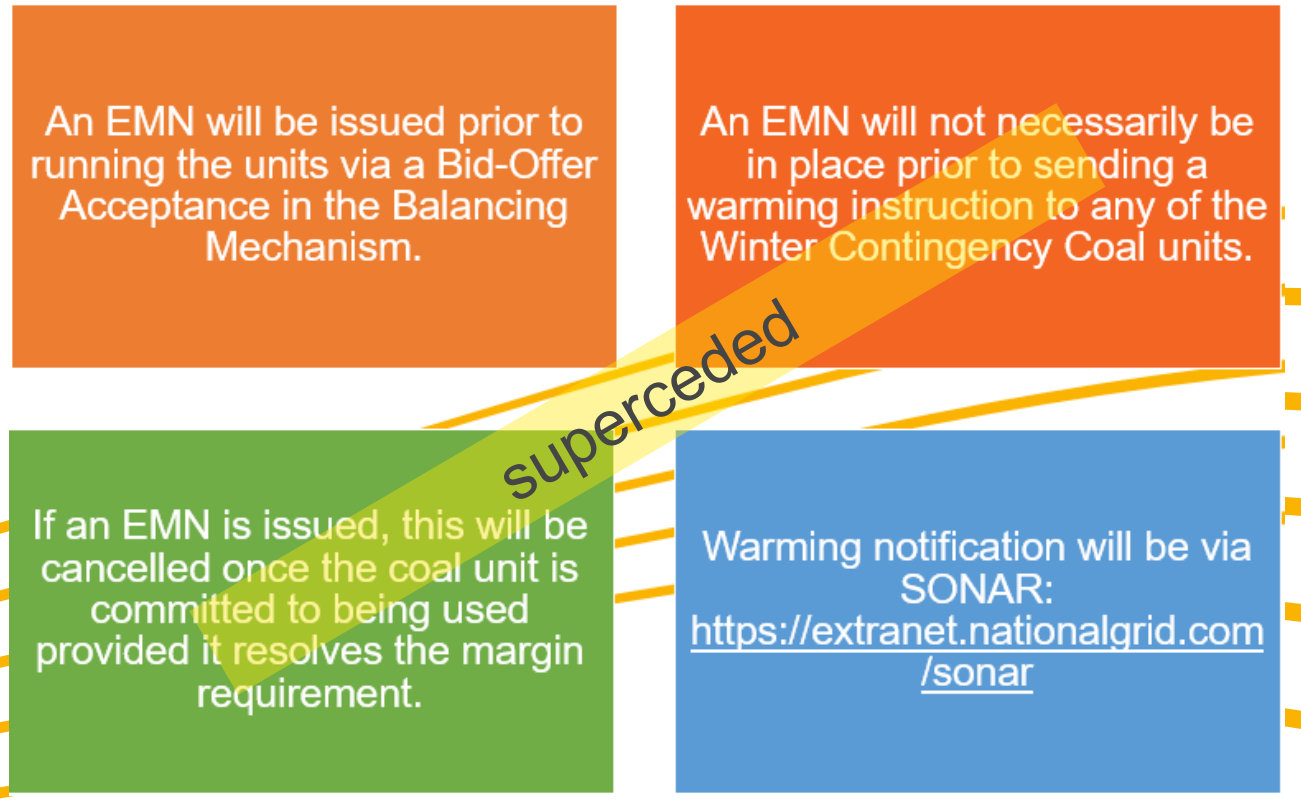
Winter Contingency Contracts

On 9 November 2022, as part of the OTF: Winter takeover, we told you what is stated on the right hand side of this slide.

Following some periods of tight margins and using the processes to consider warming the Winter Contingency Coal units, we have made a change to this communication.

An EMN will not necessarily be in place prior to sending a Bid-Offer Acceptance in the Balancing Mechanism to run the units once they are warmed.

An EMN will be issued once margin falls below the EMN trigger level and the business as usual EMN processes will be used.



Winter Contingency Units

There are currently no plans for further proving or test runs of these units.

All Offer Acceptances issued by NGESO for the operation of units under these contracts will be priced at £0/MWhr. To ensure the impact on Cashout is mitigated the £0 MWhr Offer Acceptance will be removed from settlement using the BSCP18 process and replaced through BSAD with a price of £99,999/MWhr. This ensures that both Imbalance Prices and Imbalance Charges are calculated correctly; and the Generator will not receive an additional payment relating to the BOA. The Offer volume will instead be Settled as Balancing Services Adjustment Data (BSAD) and Applicable Balancing Services Volume Data (ABSVD), in accordance with Approved Modification P447.

Further information can be found at: Winter Contingency Contracts

ESO will continue to provide formal notice through the BMRS ahead of running the winter contingency units for test or proving runs or to support margin.

Operability Strategy Report 2023 and Resource Adequacy in the 2030s

Operability Strategy Report 2023

We have published our annual Operability Strategy Report for 2023.
https://www.nationalgrideso.com/document/273801/download
Link circulated via LinkedIn and Twitter this week.

We are holding a **webinar 14:00-15:30 on Tuesday 24th January**.

- To highlight key messages within the report
- Provide an opportunity for feedback from industry
- Allow plenty of time for Q&A
- Identify whether there is interest in any future deep dives on operability topics discussed within the report.

Registration link:
https://events.teams.microsoft.com/event/3e904b1f-af9a-4e48-ae08-fdded3c73de8@f98a6a53-25f3-4212-901c-c7787fcd3495

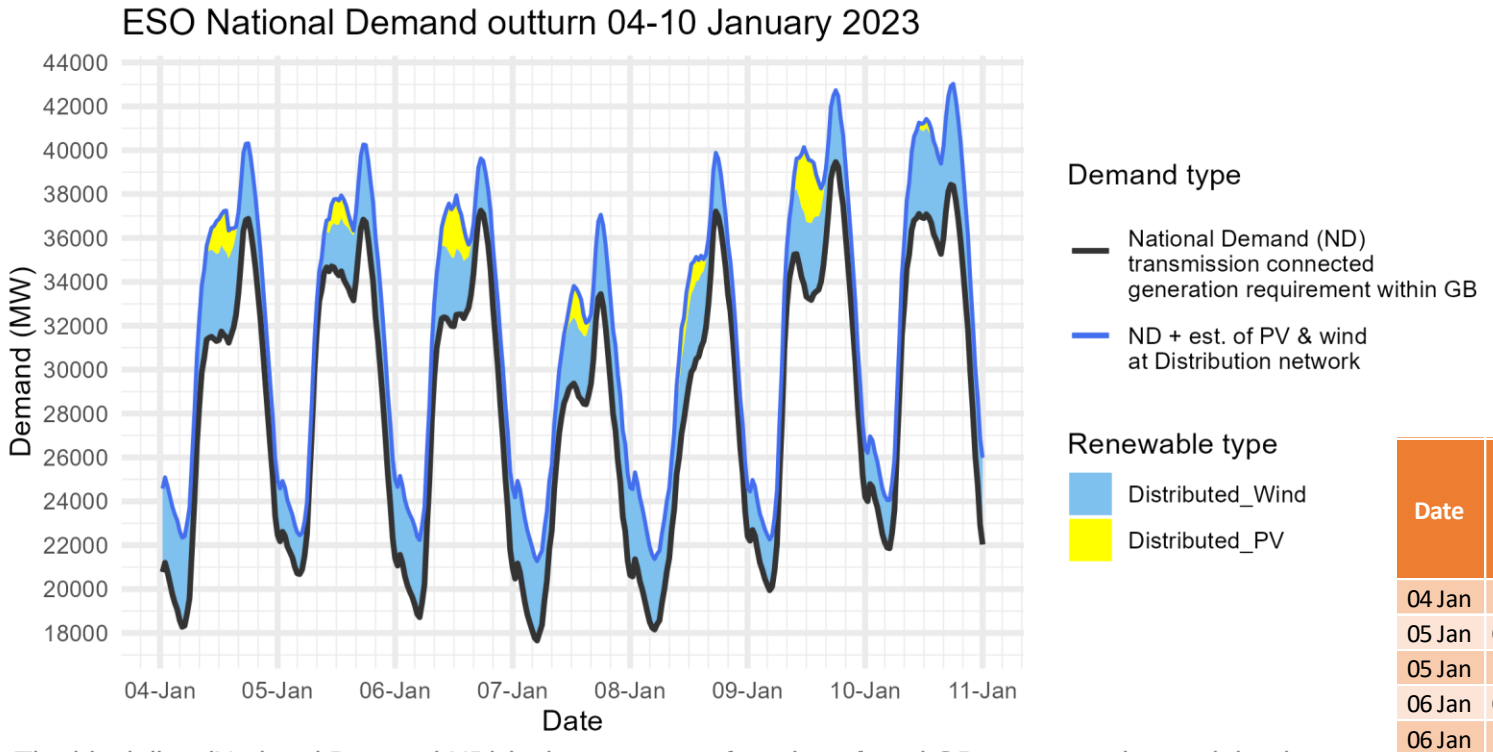
Resource Adequacy in the 2030s

We have also published our first long-term study to assess the resources needed to ensure adequacy in a fully decarbonised power system.
https://www.nationalgrideso.com/document/273781/download

We are intending to set up round table discussions with expert stakeholders between now and March to discuss the findings in more detail and to get feedback to shape future studies. These could be in-person and / or virtual.

Please email us at:
Box.NetZeroAdequacy@nationalgrideso.com to register your interest in being involved in these.

Demand | Last week demand out-turn



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

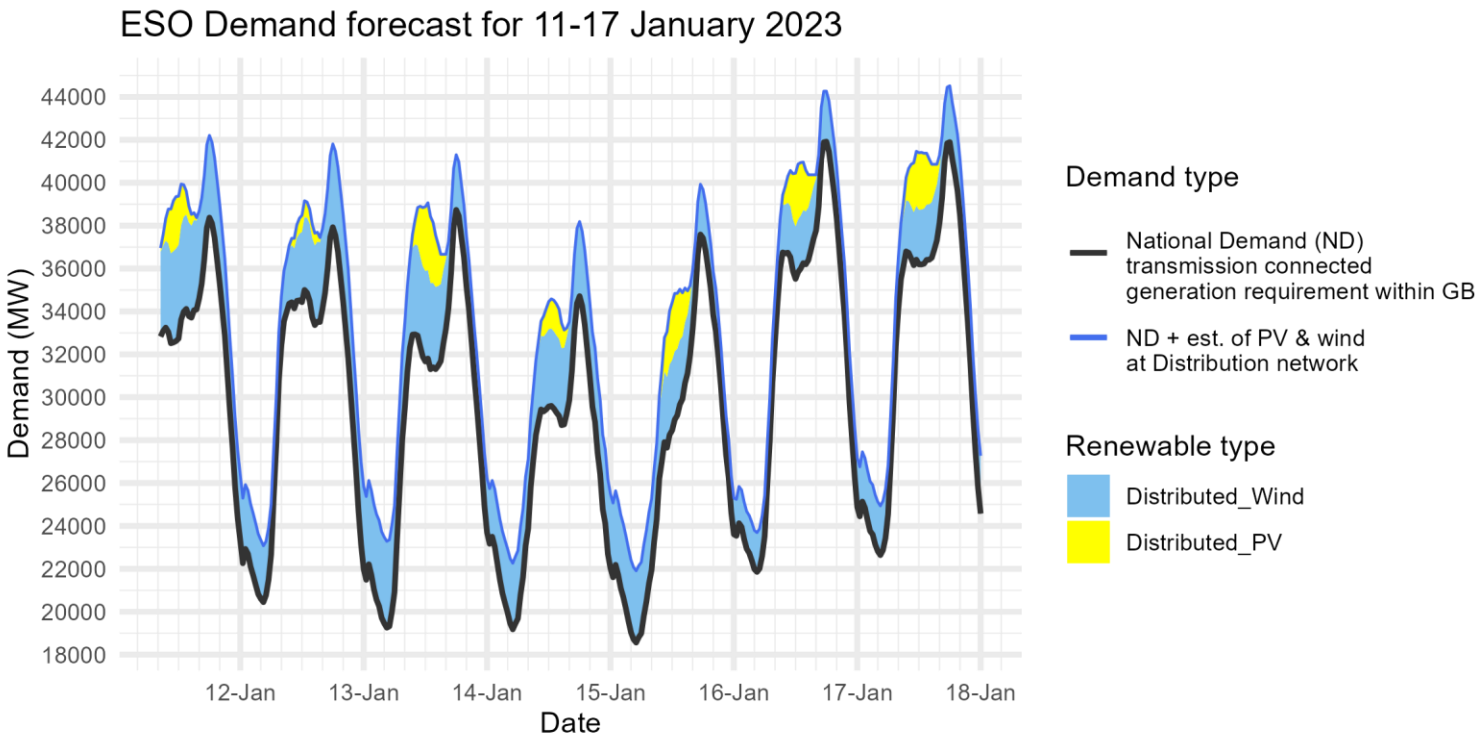
ND values **do not include** export on interconnectors or pumping or station load

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.

		FORECAST (Wed 04 Jan)		OUTTURN			
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	National Demand (GW)	Triad Avoidance est. (GW)	N. Demand adjusted for TA (GW)	Dist. wind (GW)
04 Jan	Evening Peak	37.5	3.3	36.9	0.0	36.9	3.4
05 Jan	Overnight Min	20.5	1.8	20.7	n/a	n/a	1.8
05 Jan	Evening Peak	37.7	2.9	36.8	0.0	36.8	3.4
06 Jan	Overnight Min	17.9	3.6	18.7	n/a	n/a	3.5
06 Jan	Evening Peak	37.1	2.7	37.2	0.0	37.2	2.4
07 Jan	Overnight Min	16.6	3.6	17.7	n/a	n/a	3.6
07 Jan	Evening Peak	32.9	3.5	33.4	0.0	33.4	3.6
08 Jan	Overnight Min	16.6	3.6	18.2	n/a	n/a	3.2
08 Jan	Evening Peak	34.9	3.1	37.2	0.0	37.2	2.7
09 Jan	Overnight Min	18.9	2.7	19.9	n/a	n/a	2.3
09 Jan	Evening Peak	39.6	2.7	39.5	0.9	40.4	3.3
10 Jan	Overnight Min	20.7	2.5	21.9	n/a	n/a	2.2
10 Jan	Evening Peak	39.9	2.4	38.4	0.0	38.4	4.5

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

Demand | Week Ahead



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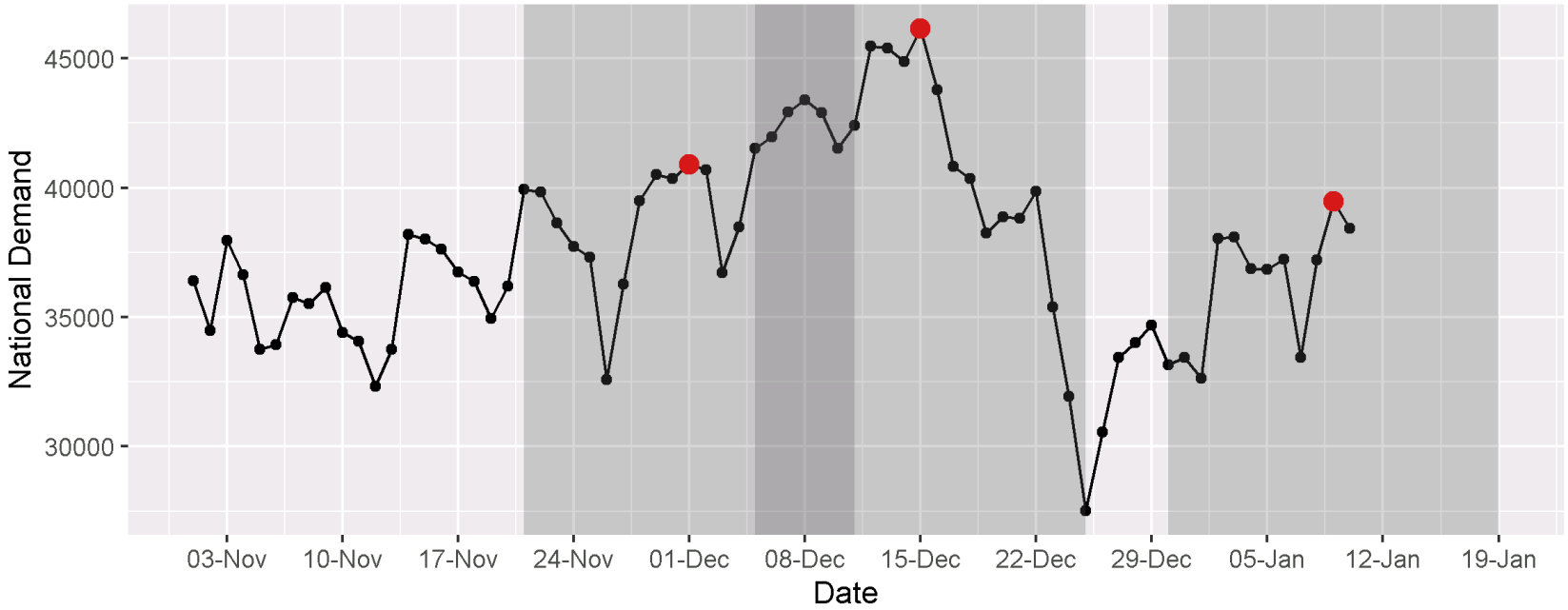
Historic out-turn data can be found on the ESO Data Portal in the following data sets: Historic Demand Data & Demand Data Update

		FORECAST (Wed 11 Jan)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
11 Jan 2023	Evening Peak	38.4	3.8
12 Jan 2023	Overnight Min	20.4	2.6
12 Jan 2023	Evening Peak	37.9	3.9
13 Jan 2023	Overnight Min	19.3	4.0
13 Jan 2023	Evening Peak	38.7	2.6
14 Jan 2023	Overnight Min	19.2	3.1
14 Jan 2023	Evening Peak	34.7	3.5
15 Jan 2023	Overnight Min	18.6	3.3
15 Jan 2023	Evening Peak	37.6	2.3
16 Jan 2023	Overnight Min	21.9	1.8
16 Jan 2023	Evening Peak	41.9	2.4
17 Jan 2023	Overnight Min	22.6	2.3
17 Jan 2023	Evening Peak	41.9	2.6

Triad avoidance: indicative triad data based on operational metering



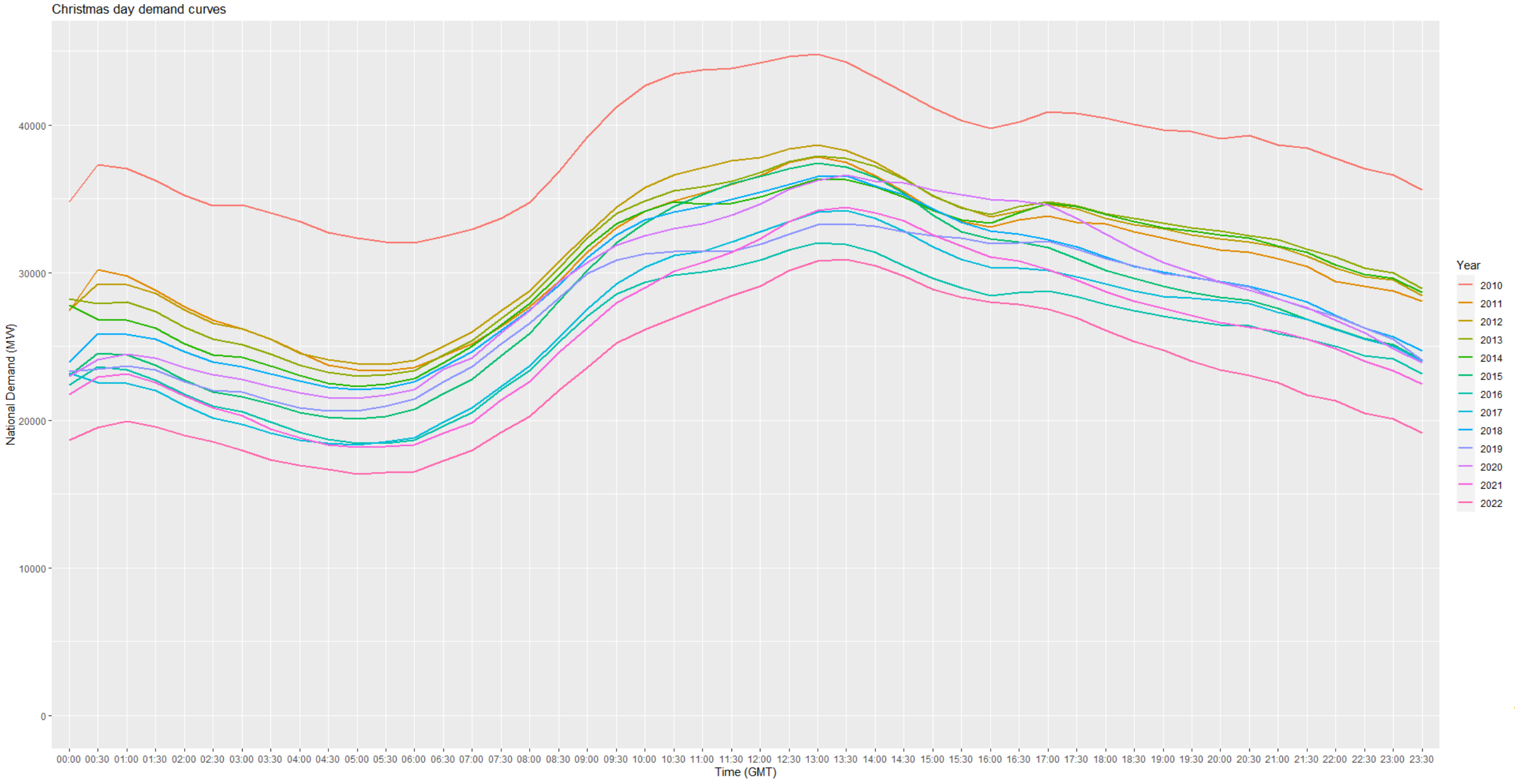
ESO operational metering			
Date	Time of peak (HH ending)	National Demand (MW)	Estimated triad avoidance (HH corresponding with the time of the peak) (MW)
15/12/2022	1730	46147	0
01/12/2022	1800	40909	200
09/01/2023	1800	39462	900

ESO does not include station load.

Indicative triad demand on Elexon's BMRS website quotes "GB Demand" which is based on the Transmission System Demand definition (it adds 500MW of station load onto the National Demand). Also, it shows time as half hour **beginning**.

Demand outturn: Christmas day

Sli.do code #OTF



Operational margins: week ahead

How to interpret this information

This slide sets out our view of operational margins for the next week. We are providing this information to help market participants identify when tighter periods are more likely to occur such that they can plan to respond accordingly.

The table provides our current view on the operational surplus based on expected levels of generation, wind and peak demand. This is based on information available to National Grid ESO as of 11 January and is subject to change. It represents a view of what the market is currently intending to provide before we take any actions. The interconnector flows are equal to those in the Base case presented in the Winter Outlook.

The indicative surplus is a measure of how tight we expect margins to be and the likelihood of the ESO needing to use its operational tools.

For higher surplus values, margins are expected to be adequate and there is a low likelihood of the ESO needing to use its tools. In such cases, we may even experience exports to Europe on the interconnectors over the peak depending on market prices.

For lower (and potentially negative) surplus values, then this indicates operational margins could be tight and that there is a higher likelihood of the ESO needing to use its tools, such as issuing margins notices. We expect there to be sufficient supply available to respond to these signals to meet demand.

Margins are adequate for the next week. This is based on our current assessment and is subject to change.

Day	Date	Notified Generation (MW)	Wind (MW)	IC Flows* (MW)	Peak demand (MW)	Indicative surplus (MW)
Thu	12/01/2023	38262	16100	4400	39140	15000
Fri	13/01/2023	39507	12350	4400	38070	13460
Sat	14/01/2023	39783	16480	4400	35150	20320
Sun	15/01/2023	40433	12240	4400	37810	14490
Mon	16/01/2023	42013	11660	4400	40870	12420
Tue	17/01/2023	42013	13170	4400	40830	13830
Wed	18/01/2023	42013	13140	4400	40500	14130

*Interconnector flow in line with the Winter Outlook Report Base Case but will ultimately flow to market price

Margins do not include NGESO enhanced or emergency actions (Outlined here: download (nationalgrideso.com))

Adequate when Indicative Surplus >= 1000 MW

Operational margins: winter update

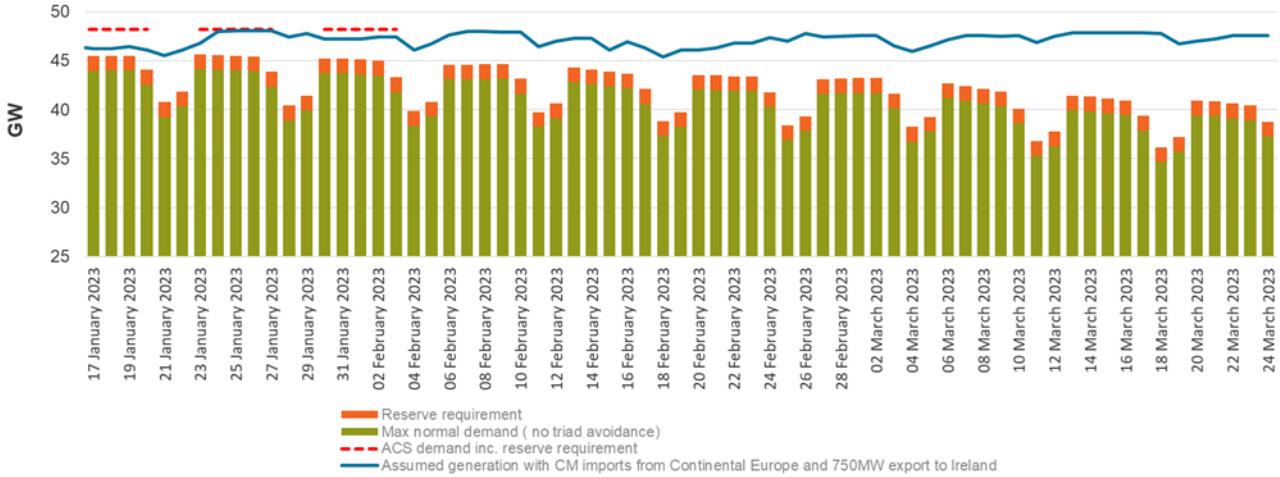
Operational margins for the rest of winter are still broadly in line with our Winter Outlook Report that we published in early October.

Our base case still shows sufficient operational surplus in each week for the rest of winter, even when we consider the expected natural variation of demand, wind and outages.

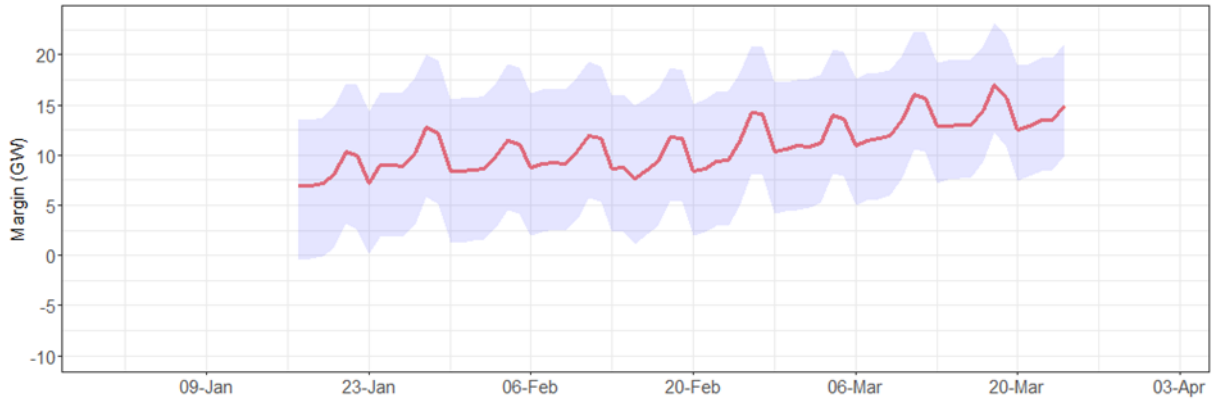
We still expect that there may be some days when we need to use our operational tools.

We are continuing to monitor risks and uncertainties that could impact operational margins for the rest of winter. These include:

- GB plant and interconnector outages
- GB demand
- Developments in Europe (e.g. availability of the French nuclear fleet, European gas storage)

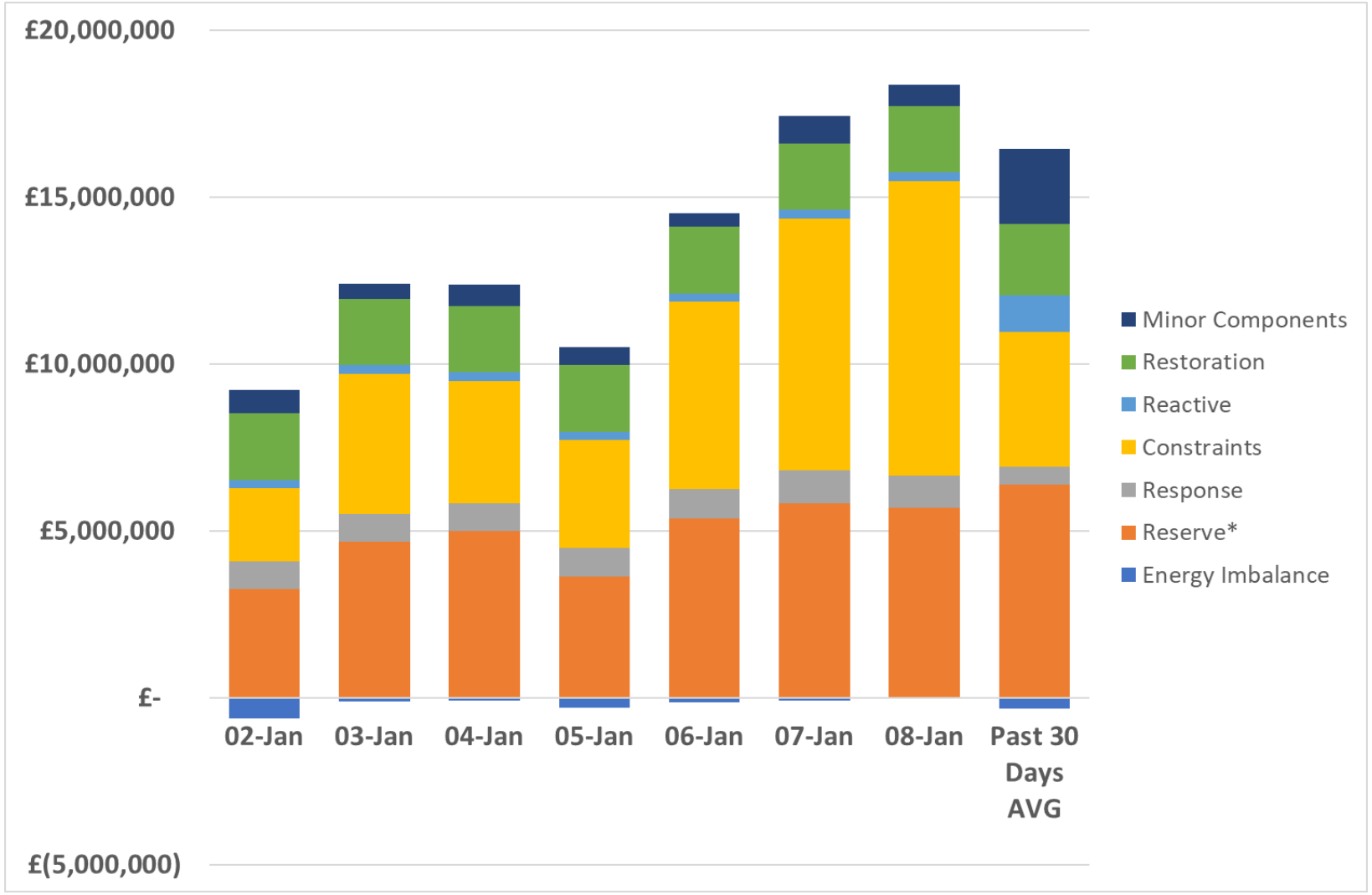


Daily operational surplus for each day in our Base Case, similar to Figure 3 in the Winter Outlook Report (updated based on market information available as of 4 Jan)



Range of operational surplus for each day in our Base Case under different supply and demand conditions, similar to Figure 4 in the Winter Outlook Report (updated based on market information available as of 4 Jan)

ESO Actions | Category costs breakdown for the last week



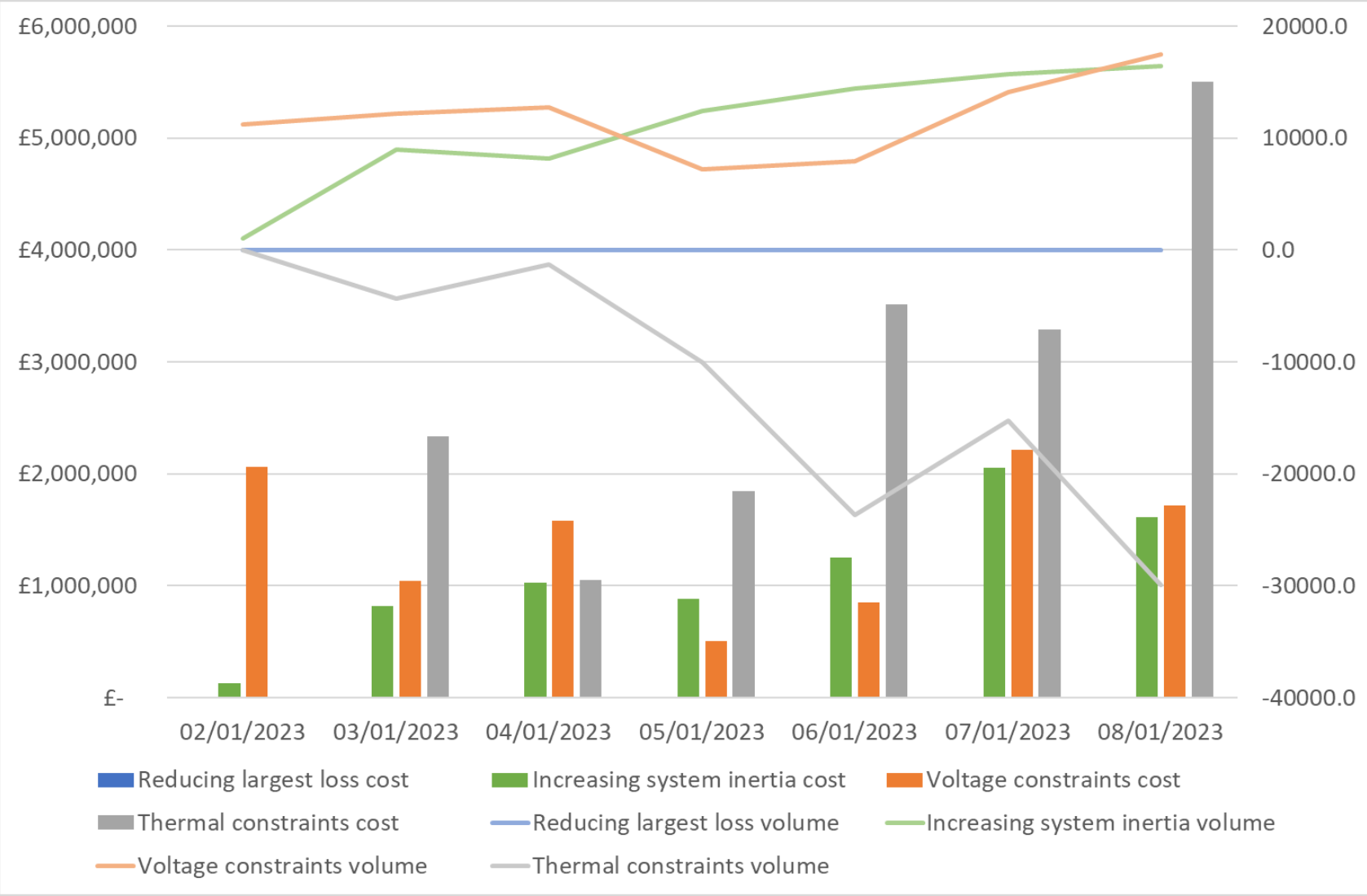
Date	Total (£m)
02/01/2023	8.6
03/01/2023	12.3
04/01/2023	12.3
05/01/2023	10.2
06/01/2023	14.4
07/01/2023	17.3
08/01/2023	18.3
Weekly Total	93.4

Reserve and 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



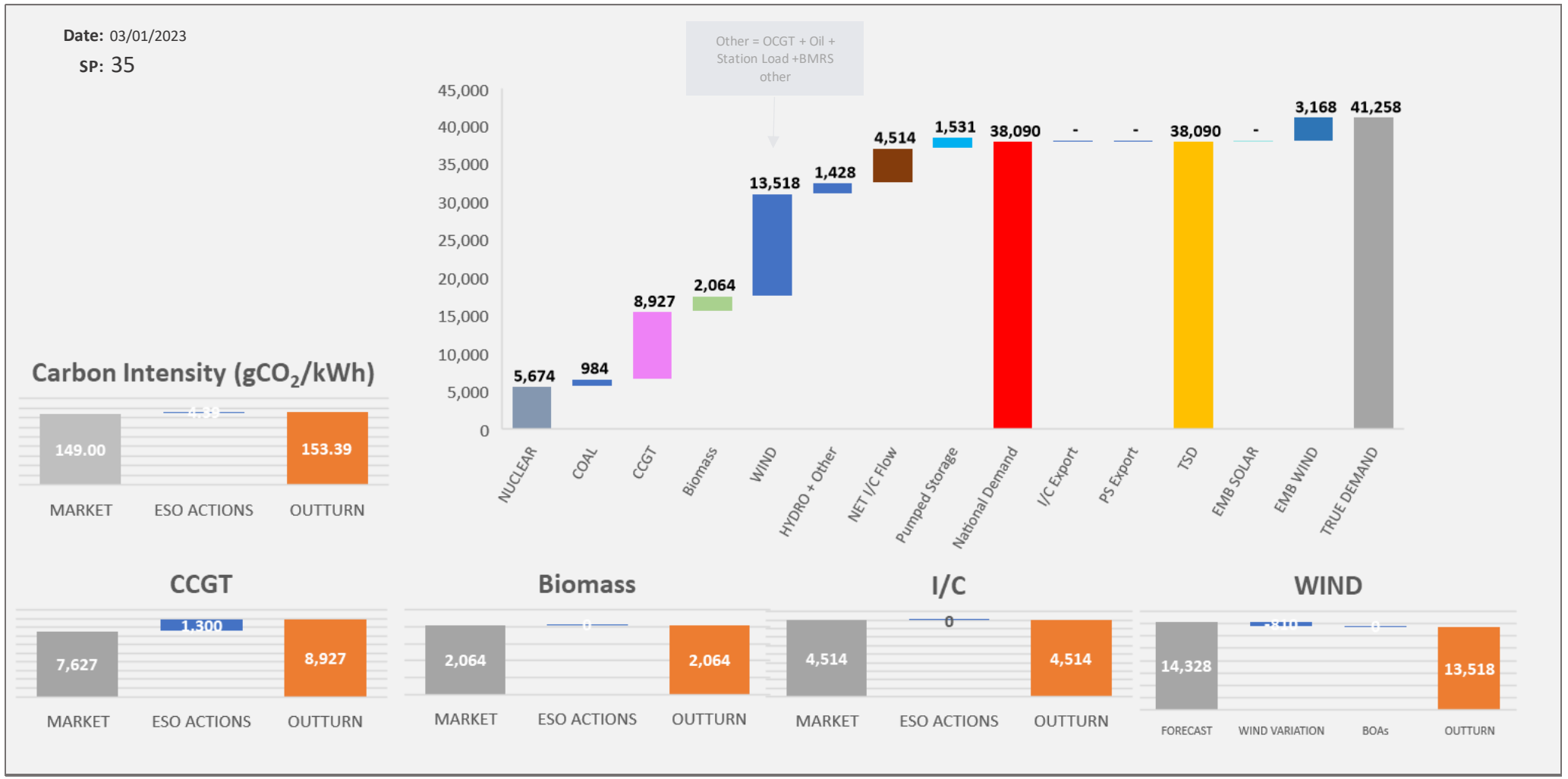
Thermal – network congestion
Actions required to manage Thermal Constraints from Tuesday to Sunday.

Voltage
Intervention was required for voltage control throughout all week.

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

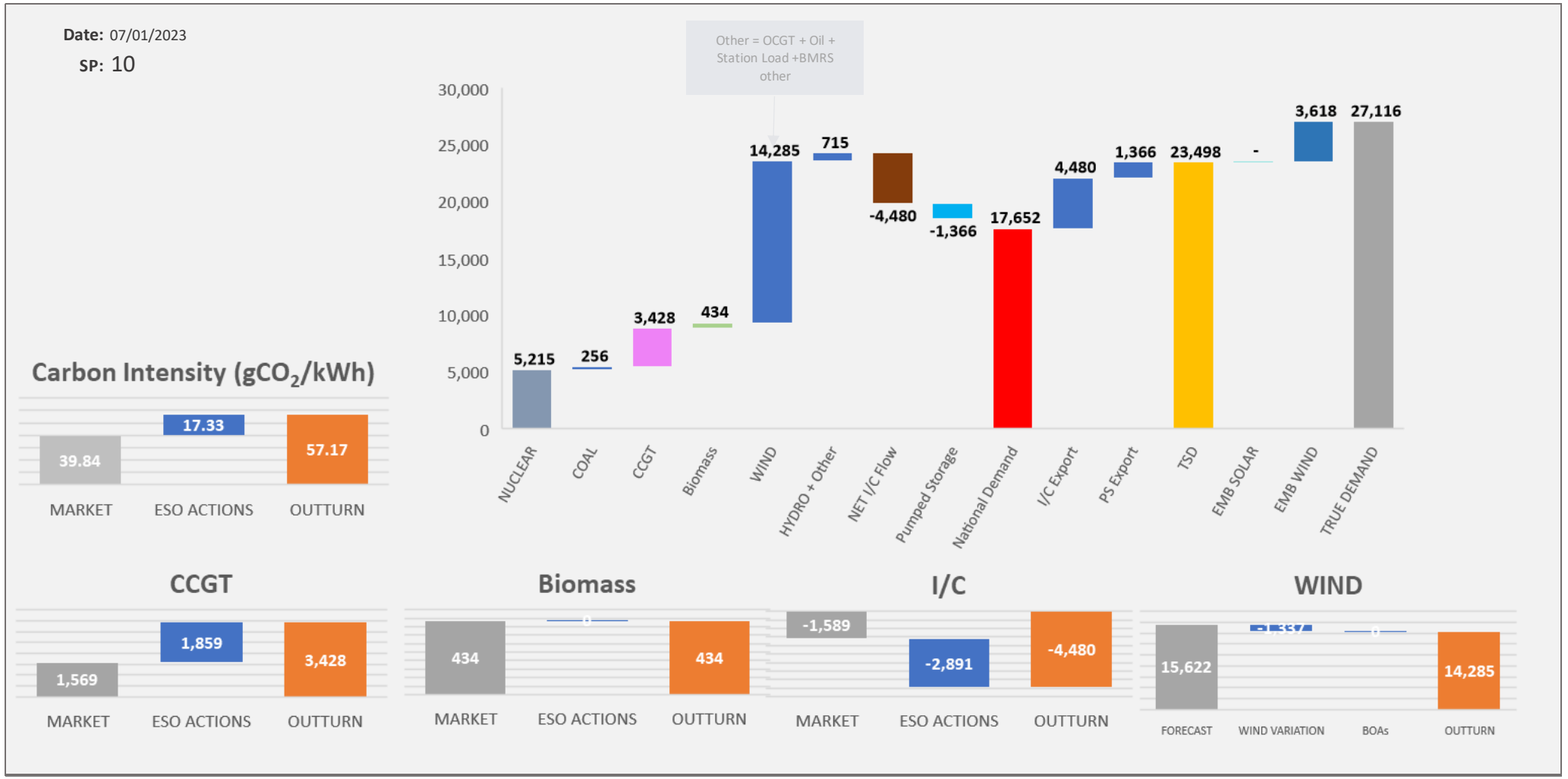
Increasing inertia
Intervention was required to manage system inertia throughout the week.

ESO Actions | Tuesday 3 January – Peak Demand – SP spend ~£138k



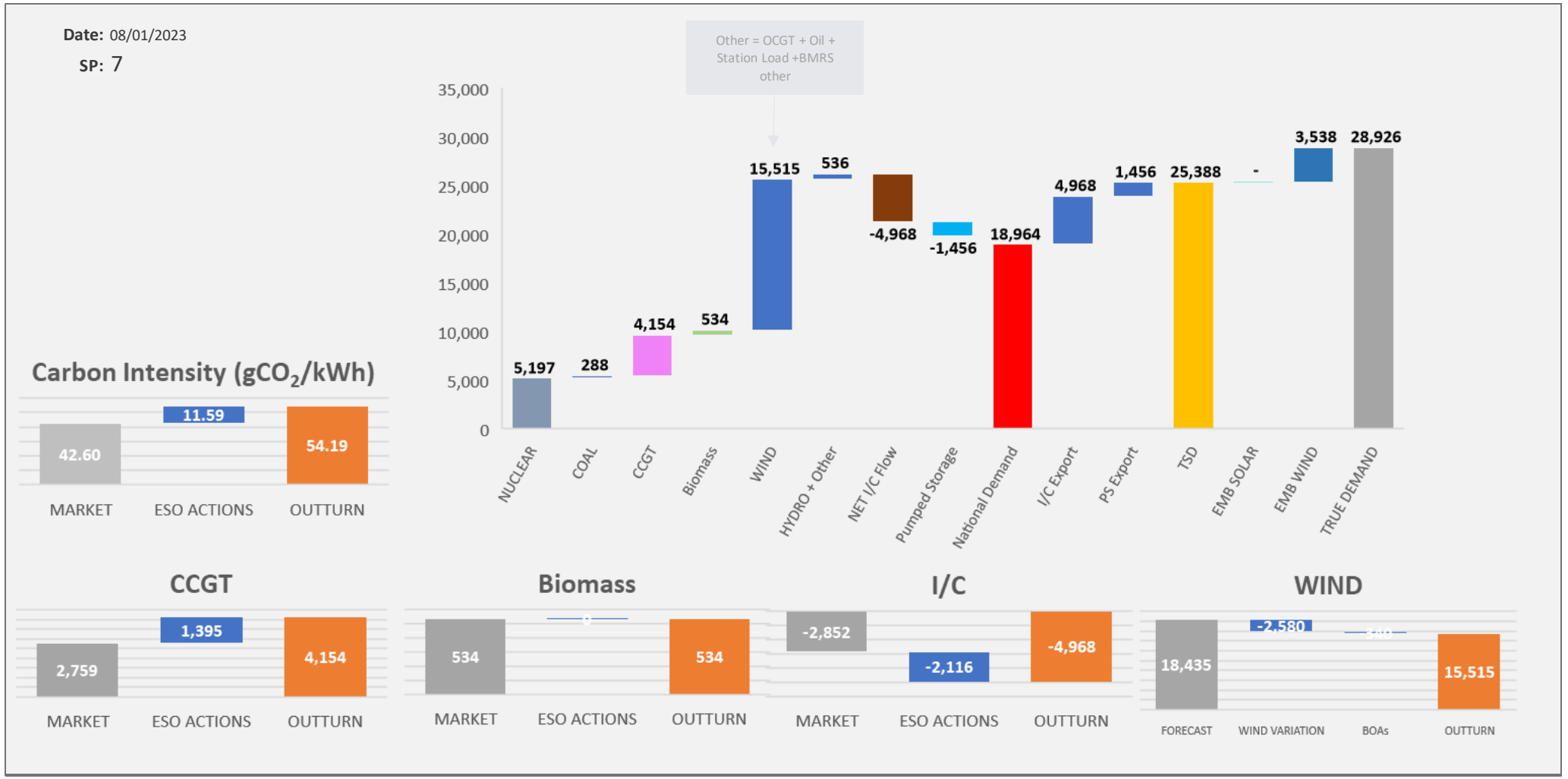
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Saturday 7 January – Minimum Demand – SP Spend ~£419k



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

ESO Actions | Sunday 8 January – Highest SP Spend ~£570k



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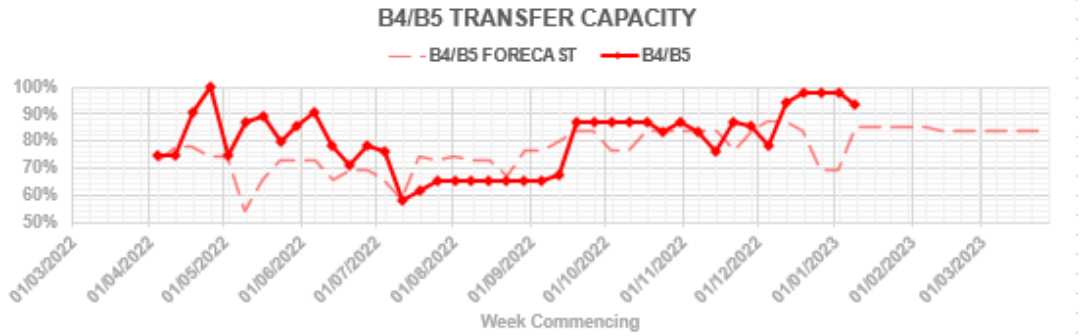
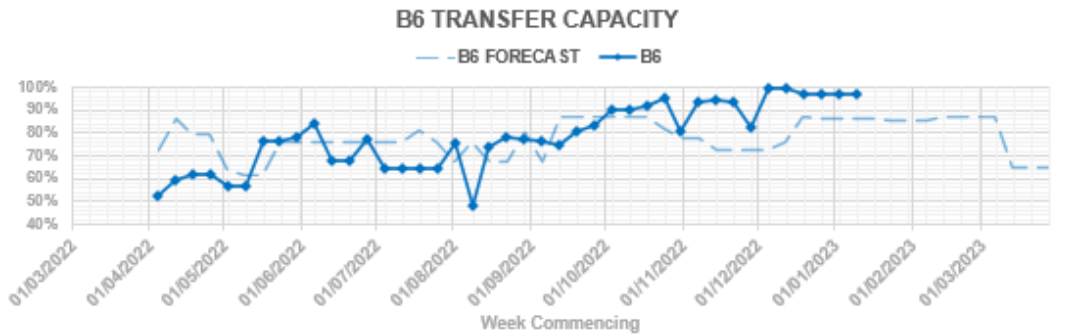
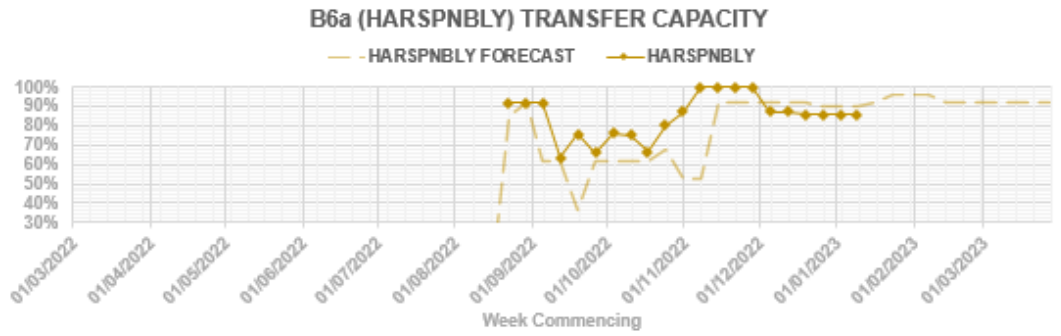
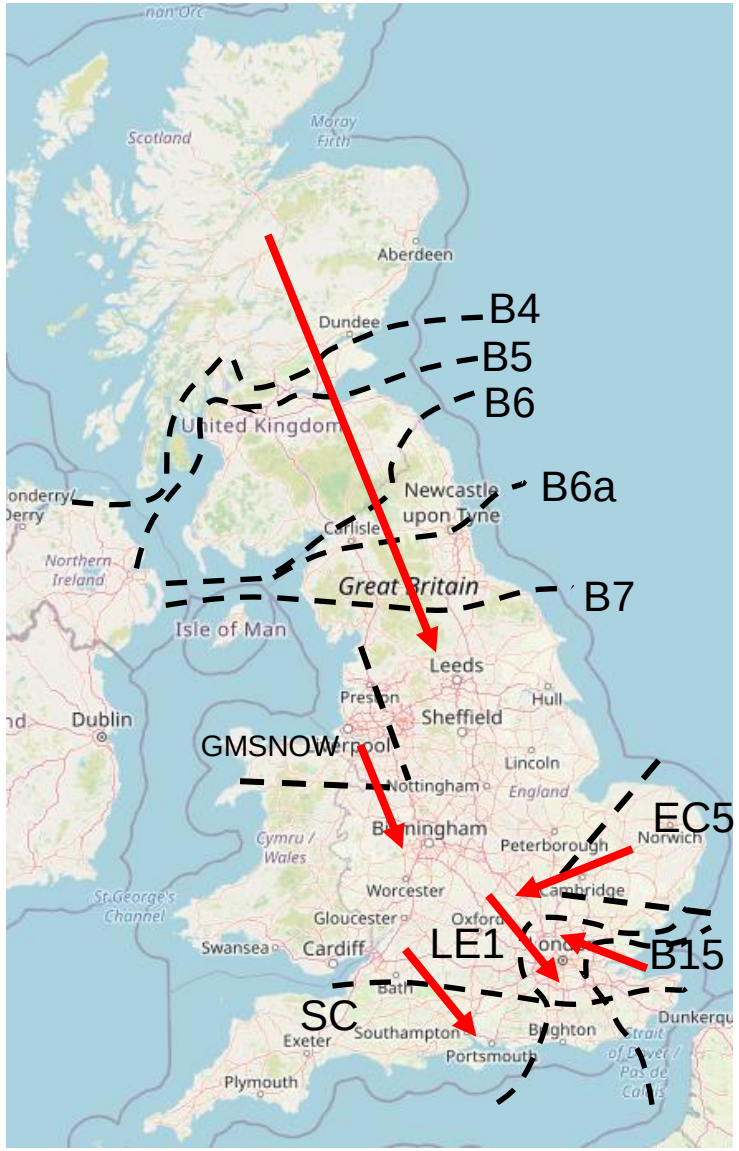
Transparency | Network Congestion





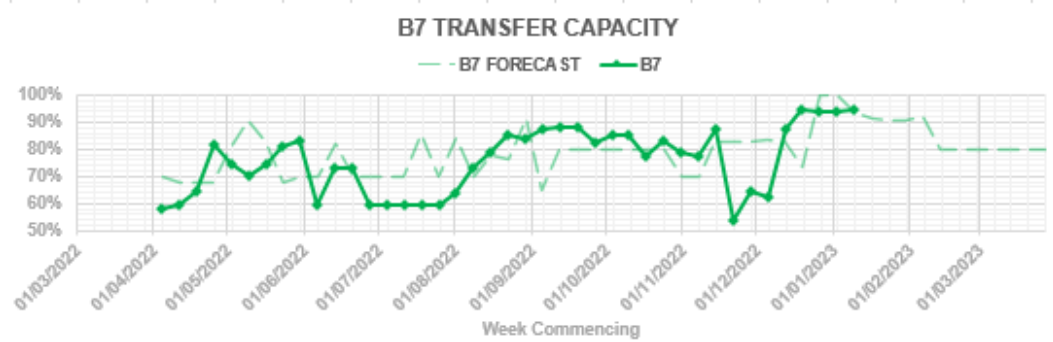


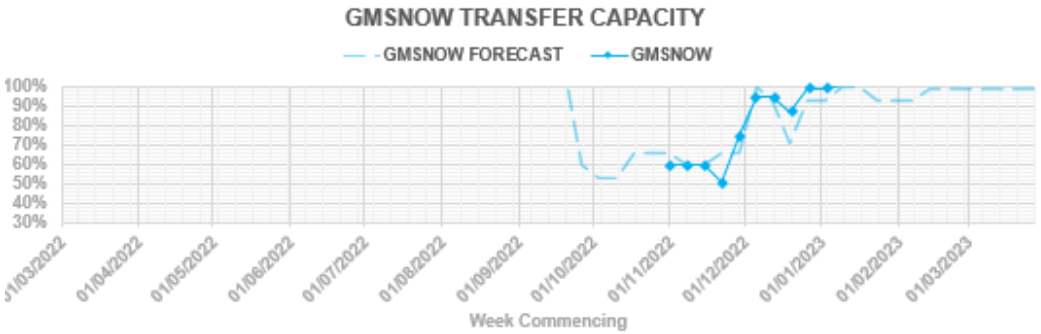
Boundary	Max. Capacity (MW)
B4/B5	2750
B6	6200
B6a	6300
B7	9300
GMSNOW	4550
EC5	5000
LE1	8500
B15	7500
SC	7000

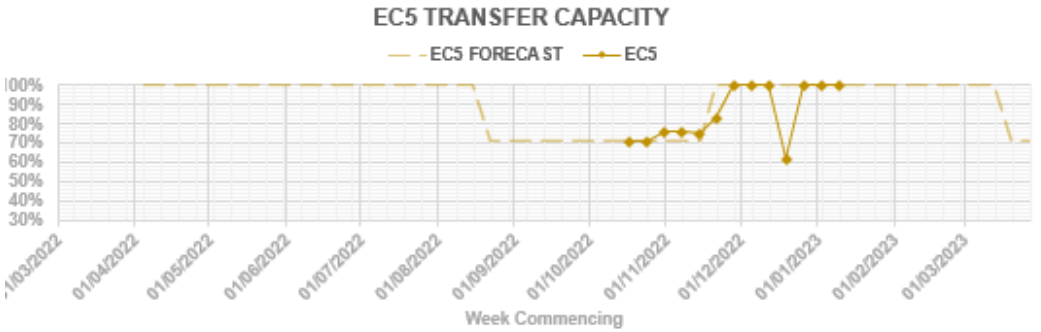


Day ahead flows and limits, and the 24 month constraint limit forecast are published on the ESO Data Portal:
https://data.nationalgrideso.com/data-groups/constraint-management

Transparency | Network Congestion







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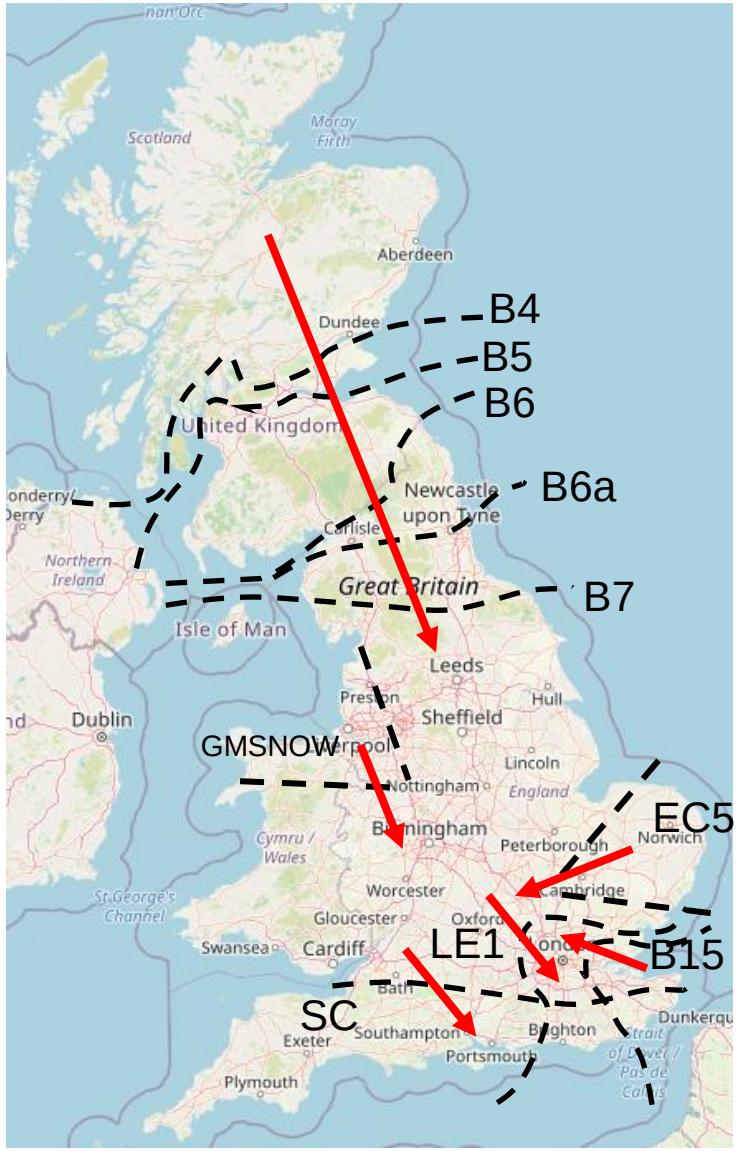

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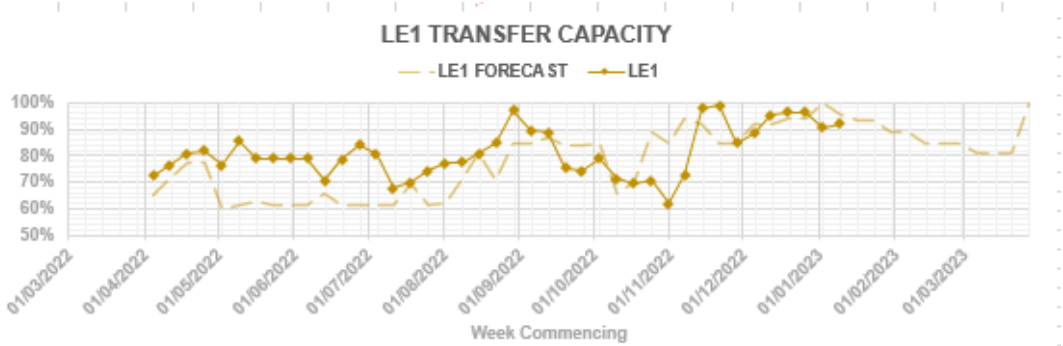
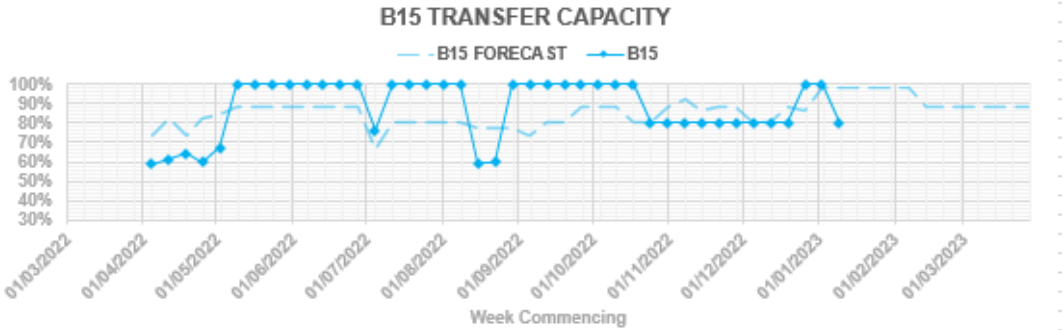
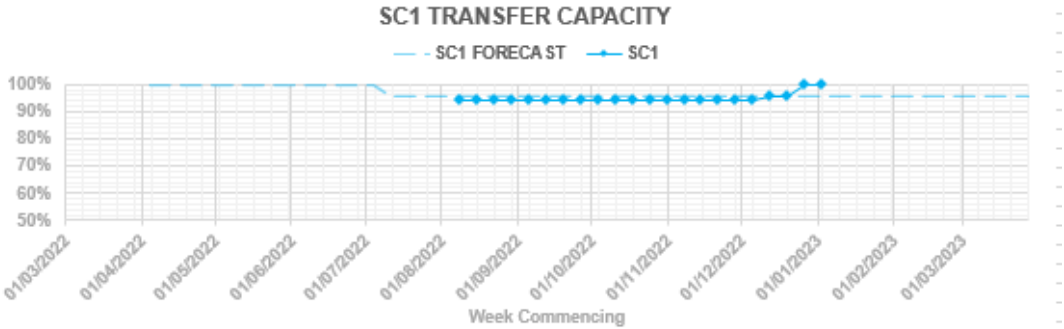
Transparency | Network Congestion







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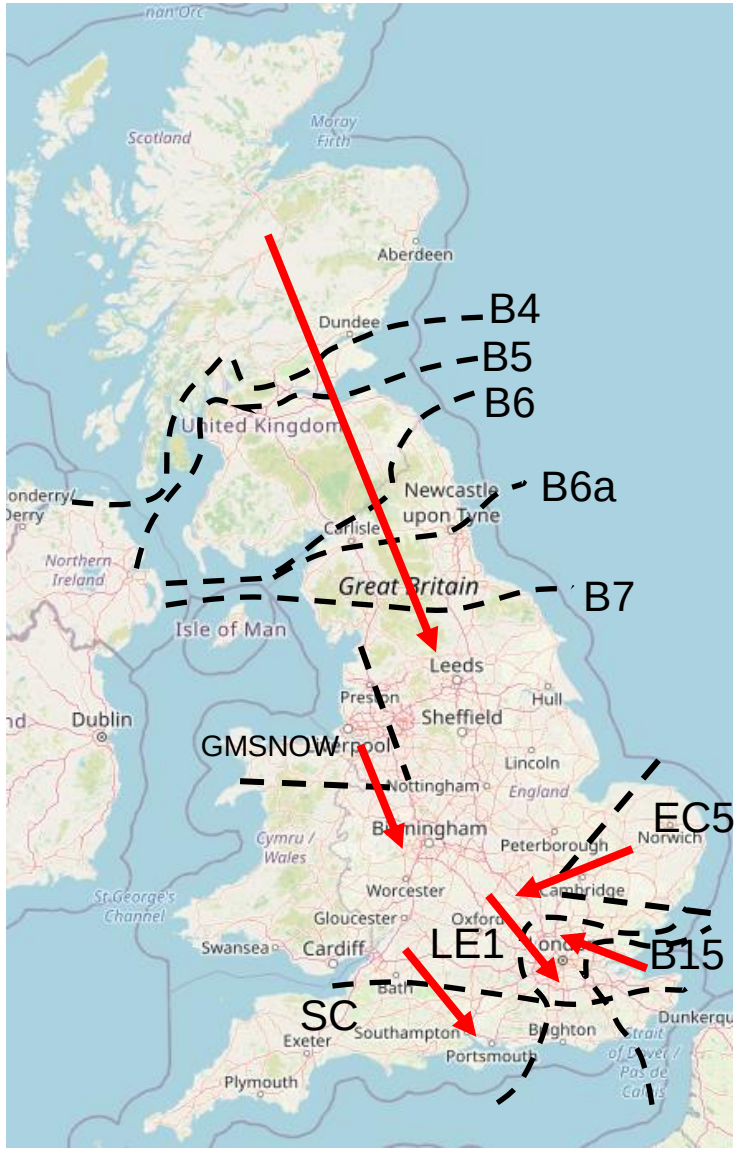


Day ahead flows and limits, and the 24 month constraint limit forecast are published on the ESO Data Portal:
https://data.nationalgrideso.com/data-groups/constraint-management

Previous weeks questions

Q: Since August imbalance costs within BSUoS have flipped to be net negative. This is a significant departure from the previous few years. Is there a specific reason for this switch?

A: Imbalance costs are influenced by a combination of factors across both the energy markets and the GB energy system. You can find more information about this topic on the Elexon website at: Imbalance Pricing. This makes comparison between time periods in different years very complex and data may not be available for all of the circumstances with potential to impact these contributing factors.

However we are aware of major transmission outages in Scotland through August to October 2022 to facilitate reinforcements and restructuring on the Scottish transmission networks. This will have had an impact on imbalance pricing. Other factors which are contributors to the direction of imbalance costs include the cumulative impacts of:

- Any factors which impact on energy prices in the short or longer term.
- Any factors which impact on energy demand in the short or longer term

Q: If I have an existing PPA in the LCM market area, how will it be affected by the LCM?

A: Could you please clarify a case where you feel you may be affected so that we can consider further whether ESO can clarify? Under LCM proposed design, any LCM qualifying assets (not otherwise excluded by their own wider agreements) can declare availability at an MPAN. Acceptance, dispatch and settlement would be matters for the parties to agree as they feel appropriate. We would welcome any feedback on specific cases so we can consider whether or not we need to be more explicit about these in LCM service terms.

Previous weeks questions

Q: Can we get a final date for when DR/DM procurement volume will increase? The date is continuously being pushed back and we need to know the date so we can have correct priorities.

A: As we communicated in the past, we are finalising our operational tools before we could increase DR/DM procurement volume and we are hoping to communicate soon via the Market Information Report when we are ready.

It's worth noting that, as a prudent system operator, the ESO is responsible to operate the electricity system in a secured and economic manner. Whilst we design and encourage the ancillary market to grow, the ESO relies on a series of operational systems to ensure the decisions we make and instructions we send to the markets cause no impacts to the system security and eventually bring values to the end consumers.

Q: Regarding LCM, how large is the potential market in MWs?

A: For design purposes only, scoping of LCM has been based on what we know of former Optional Downward Flexibility Management (ODFM) volumes: As a design envelope only, we estimate if LCM proves as successful, it could become relevant to market providers with maximum total of the order of 800MW.

In practice, many service and market factors influence the likely total combined MW availability to LCM. We expect to learn more in the Spring when market responses and take up may provide better evidence.

Advance questions

Q: In accordance with Article 40 (‘Information Exchange’) paragraph (2), and in particular sub-paragraphs (d) and (e), together with paragraph (4), of the ERNC (link below) the ESO has, since 18th December 2017, been obligated (and, as it remains applicable GB law, continues to be so obligated) to provide in due time information; to System Defence Providers, Significant Grid Users and NEMOs (for onward communication to market participants) and others; during an ‘emergency state’ (as is continuously determined by the ESO in accordance its SOGL obligations, which is also retained GB law).

The ESO has recently stated, at the OTF in December, that the GB NETS was at one point in an emergency state; however, it has not been possible for us to source where, when and to whom did the ESO discharge its Article 40 (2) (d) and (e) or (4) obligations.

Therefore, can the ESO please confirm that on each and every recent occasion that the ESO determined that the GB NETS was in an emergency state (according to the ESO obligations for so determining, continuously, as set out in SOGL) it has, in due time:

(i) notified all System Defence Providers, Significant Grid Users and NEMOs of this;

(ii) when exactly (date and time of day) this was done by the ESO; and

(iii) where other stakeholders can find this information.

For the avoidance of doubt, please list this information for each and every occasion where the ESO continuously determining (according to SOGL) that the GB NETS was in an emergency state in the last 12 months, ending 31st December 2022.

ERNC can be found at:

COMMISSION REGULATION (EU) 2017/ 2196 - of 24 November 2017 - establishing a network code on electricity emergency and restoration (europa.eu)

In answering the initial question, the ESO mentioned, at the December OTF, the GEMA decision, of 17th February 2022, on modification GC0133. However, as GC0133 relates to the publication of all five system states not just ‘emergency’ (or ‘blackout’ or ‘restoration’) and as, in legal terms, such an Authority decision cannot override a statutory duty (in this case upon the ESO, as per Article 40 (2) (d) and (e) or (4)) it follows that that ESO response did not answer the question posed – hence why it is being re-submitted here for completeness and transparency.

A: NGESO will take this away to compile a more detailed response and relevant information and bring back to the OTF.

Advance questions

Q: Dear All

I know I keep raising the issue of RMIT, but NGESO keeps ducking it, which is very unsatisfactory. The REMIT obligations on the ESO are set out in the relevant regulations, but were also set out in GC0109 (pages 3-4); could the ESO please tell stakeholders where exactly they can find current (and future) REMIT declarations by the ESO? And if you don't know what we all think should be reported, can we have a meeting to discuss at least publishing similar data to other parties?

It seems very clear that REMIT does apply to the ESO:

Article 2 -

(1) 'inside information' means information of a precise nature which has not been made public, which relates, directly or indirectly, to one or more wholesale energy products and which, if it were made public, would be likely to significantly affect the prices of those wholesale energy products.

ESO trades wholesale products and therefore can influence prices.

For the purposes of this definition, 'information' means:

(b) information relating to the capacity and use of facilities for production, storage, consumption or transmission of electricity or natural gas or related to the capacity and use of LNG facilities, including planned or unplanned unavailability of these facilities;

ESO uses facilities, oversees daily energy flows, etc. It has access to information that no one else has, such as contracts to trade over interconnectors, TO outages, etc.

(7) 'market participant' means any person, including transmission system operators, who enters into transactions, including the placing of orders to trade, in one or more wholesale energy markets;

(11) 'transmission system operator' has the meaning set out in point 4 of Article 2 of Directive 2009/72/EC (which says -'transmission system operator' means a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity) and in point 4 of Article 2 of Directive 2009/73/EC;

Advance questions

Continued:

Taking these two together it is clear the ESO is a TSO, which is defined as having the roles we see NGESO undertake.

Article 4 - Obligation to publish inside information

1. Market participants shall publicly disclose in an effective and timely manner inside information which they possess in respect of business or facilities which the market participant concerned, or its parent undertaking or related undertaking, owns or controls or for whose operational matters that market participant or undertaking is responsible, either in whole or in part. Such disclosure shall include information relevant to the capacity and use of facilities for production, storage, consumption or transmission of electricity or natural gas or related to the capacity and use of LNG facilities, including planned or unplanned unavailability of these facilities.

Recital (19) of Regulation 714/20092 also sets out that:

“Equal access to information on the physical status and efficiency of the system is necessary to enable all market participants to assess the overall demand and supply situation and identify the reasons for movements in the wholesale price. This includes more precise information on electricity generation, supply and demand including forecasts, network and interconnection capacity, flows and maintenance, balancing and reserve capacity.

NGESO sees changes in the state of the system, genco outages, changes on interconnectors, etc. before other parties. This is insider information and NGESO needs to publish it before it trades on it.

A: Thank you for the additional detail. We are continuing to work on a response to this and your earlier questions.

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.

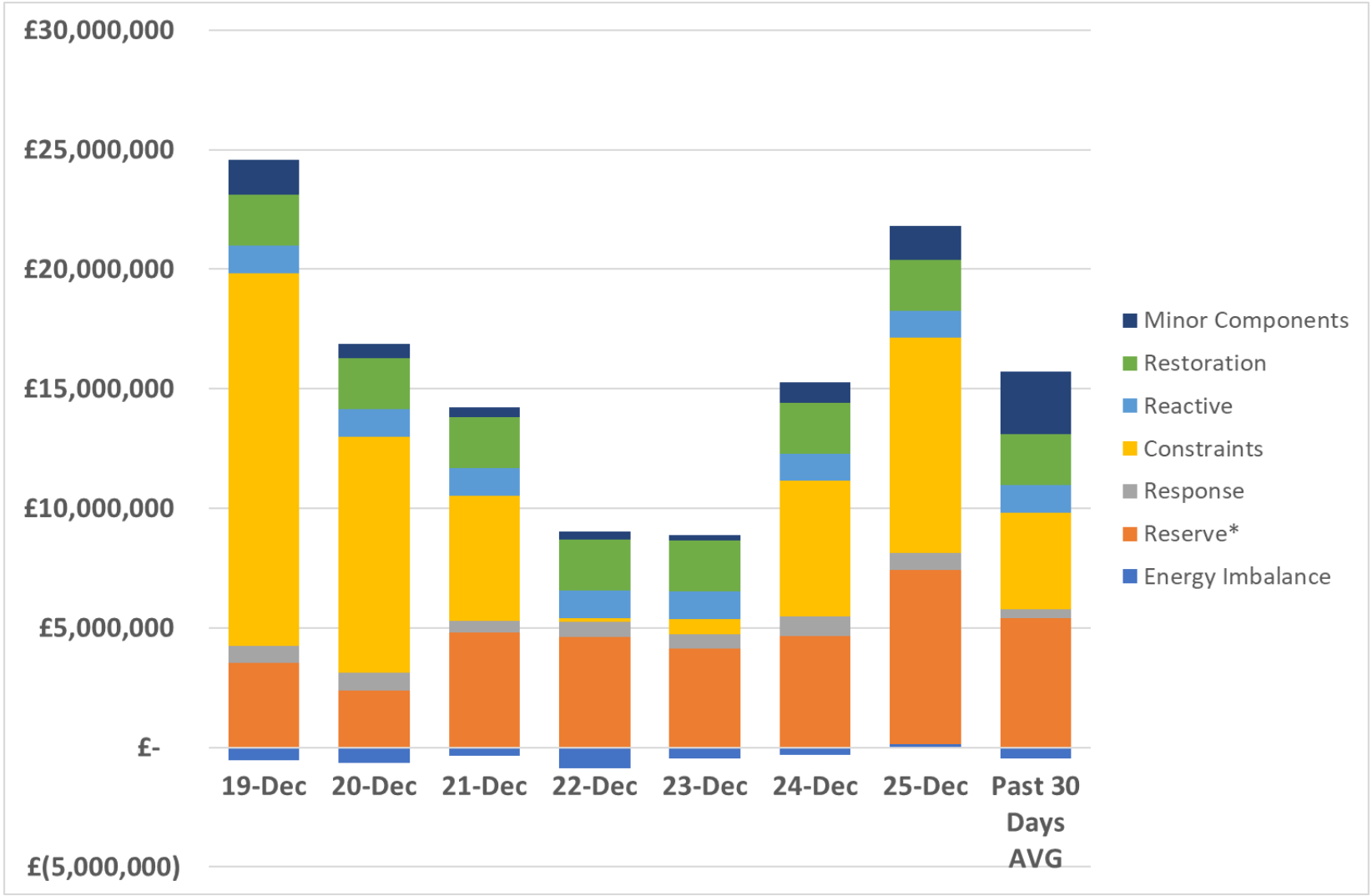
We welcome feedback to understand what we are doing well and how we can improve the event for the future.

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

Appendix

The following slides are regular content for w/c 19 December and 26 December. These were missing from last week’s pack due to insufficient time to complete the analysis.

ESO Actions | Category costs breakdown for w/c 19th Dec



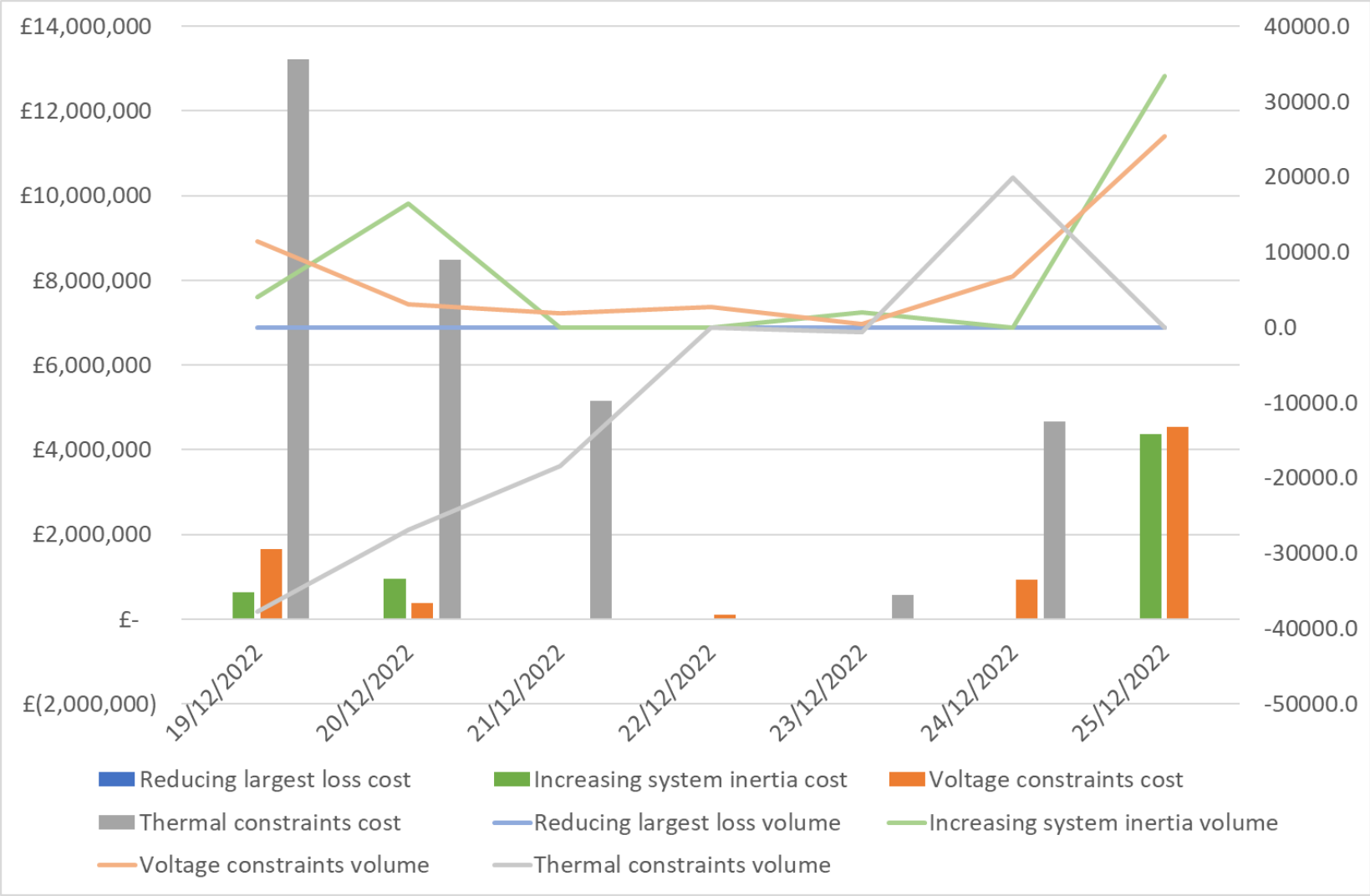
Date	Total (£m)
19/12/2022	24.0
20/12/2022	16.2
21/12/2022	13.9
22/12/2022	8.2
23/12/2022	8.4
24/12/2022	15.0
25/12/2022	21.8
Weekly Total	107.4

Reserve and 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 for w/c 19th Dec



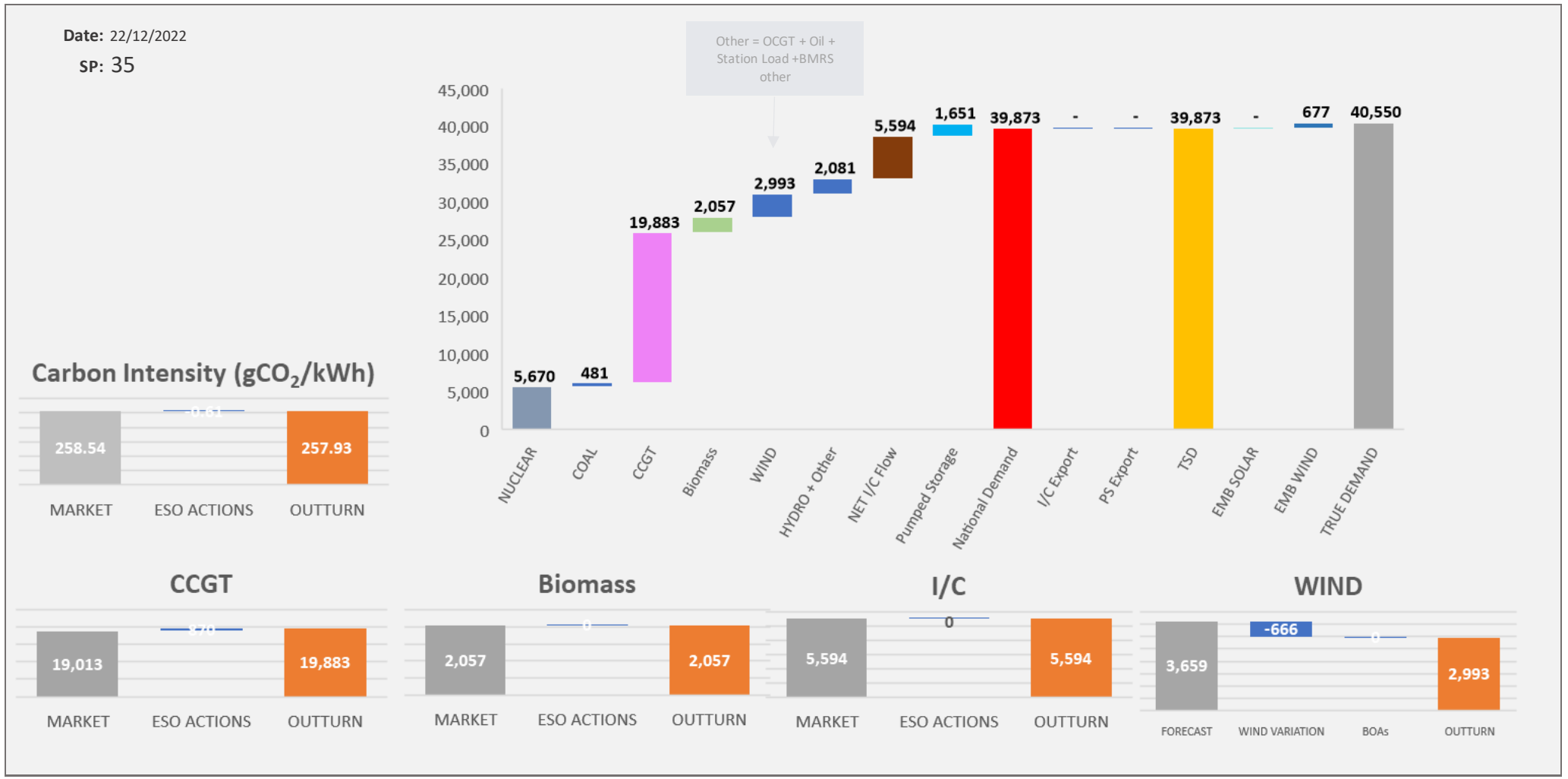
Thermal – network congestion
Actions required to manage Thermal Constraints throughout the week (except for Thursday).

Voltage
Intervention was required for voltage control on Monday, Tuesday, Thursday, and Saturday

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

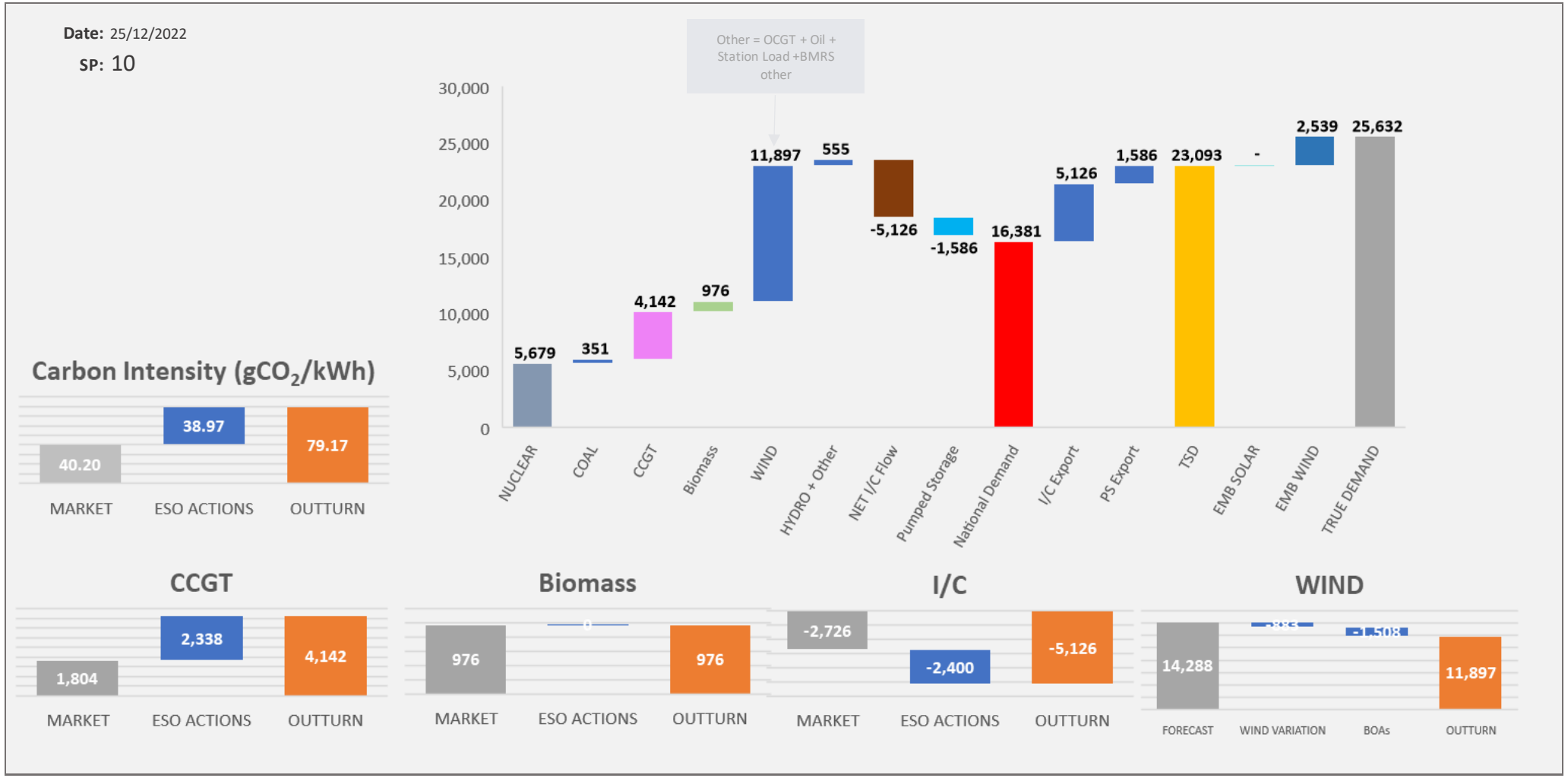
Increasing inertia
Intervention was required to manage system inertia on Monday and Tuesday.

ESO Actions | Thursday 22 December – Peak Demand – SP spend ~£50k



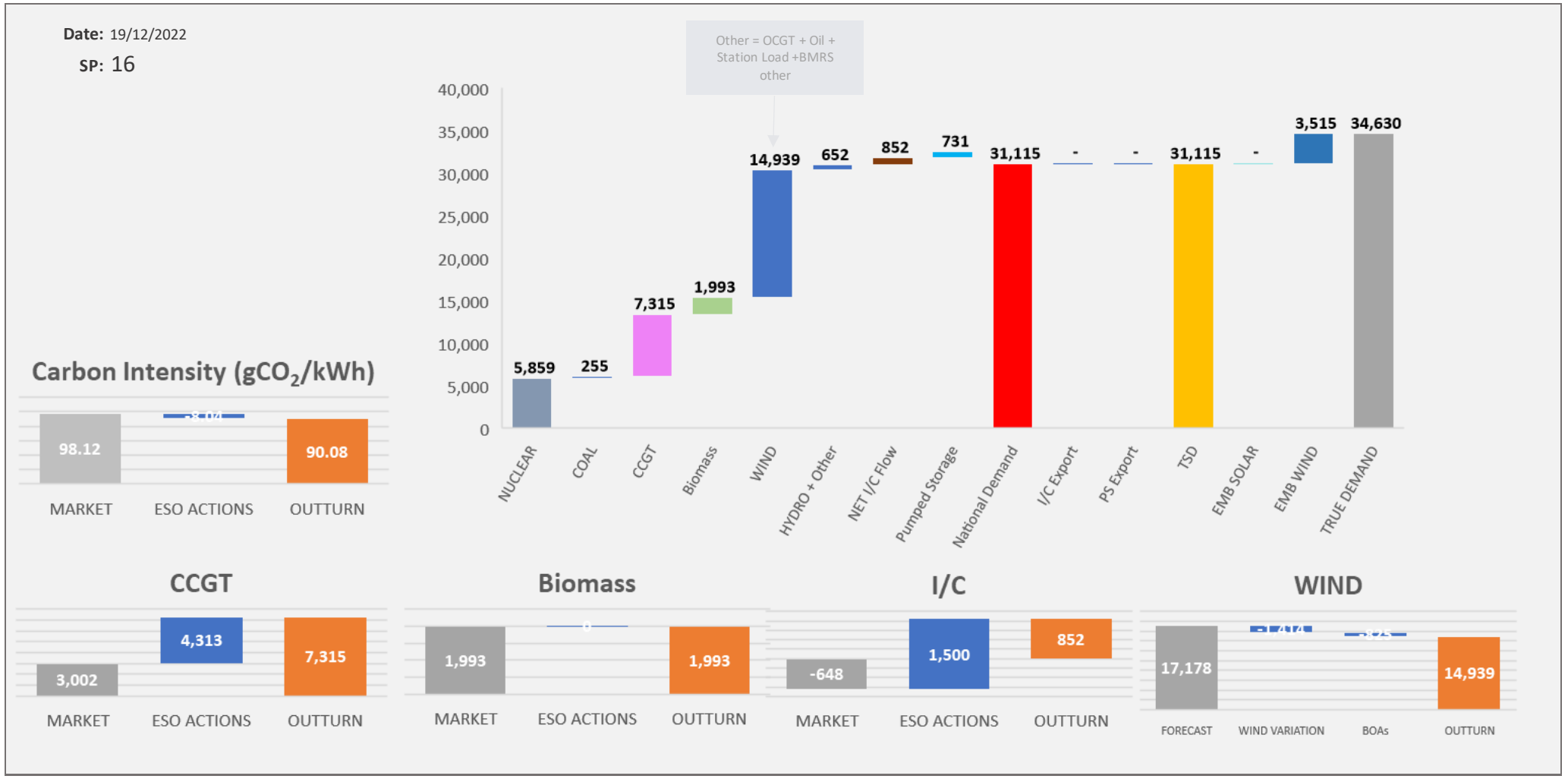
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Sunday 25 December – Minimum Demand – SP Spend ~£587k



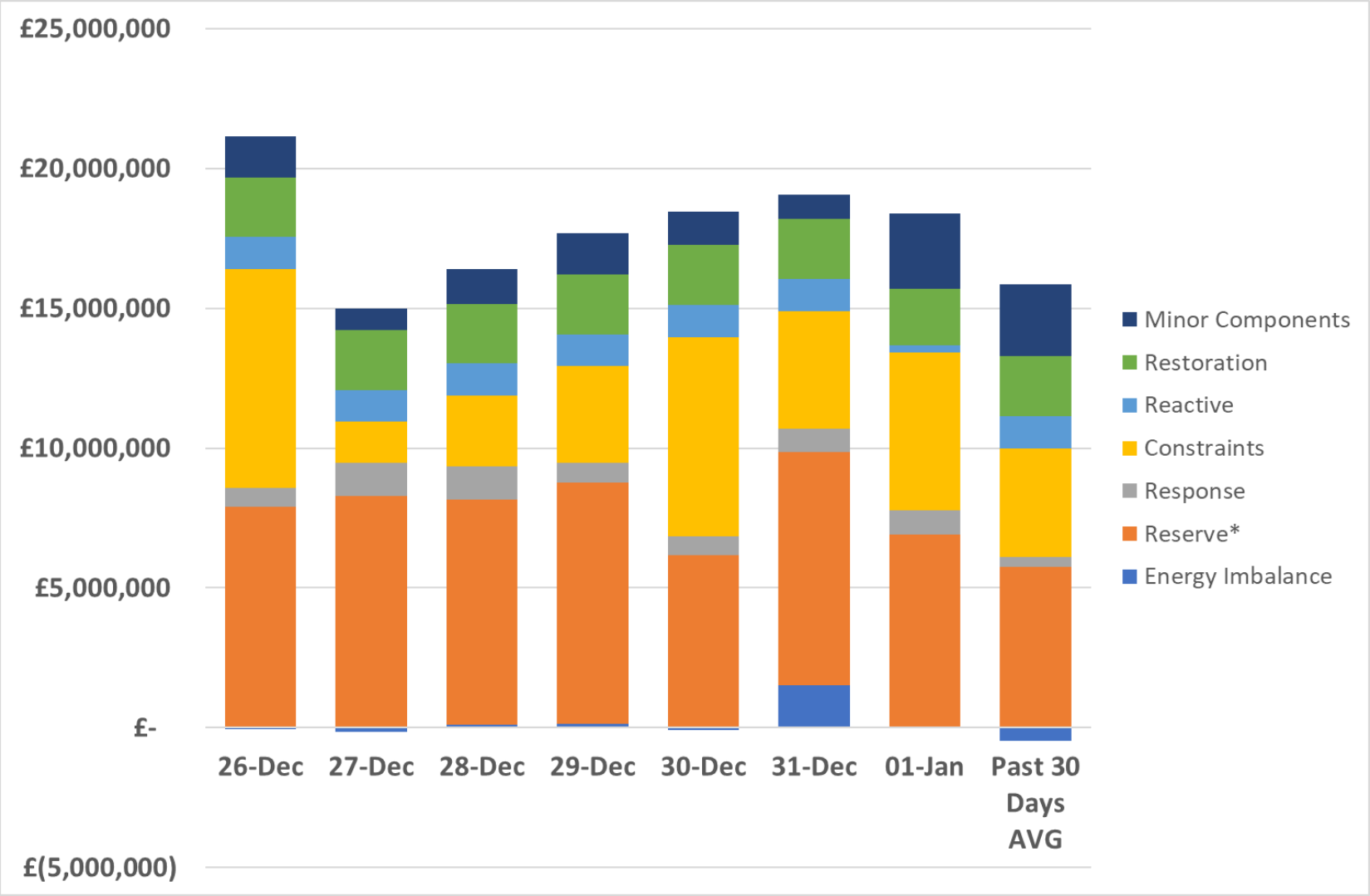
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Monday 19 December – Highest SP Spend ~£796k



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

ESO Actions | Category costs breakdown for w/c 26th Dec



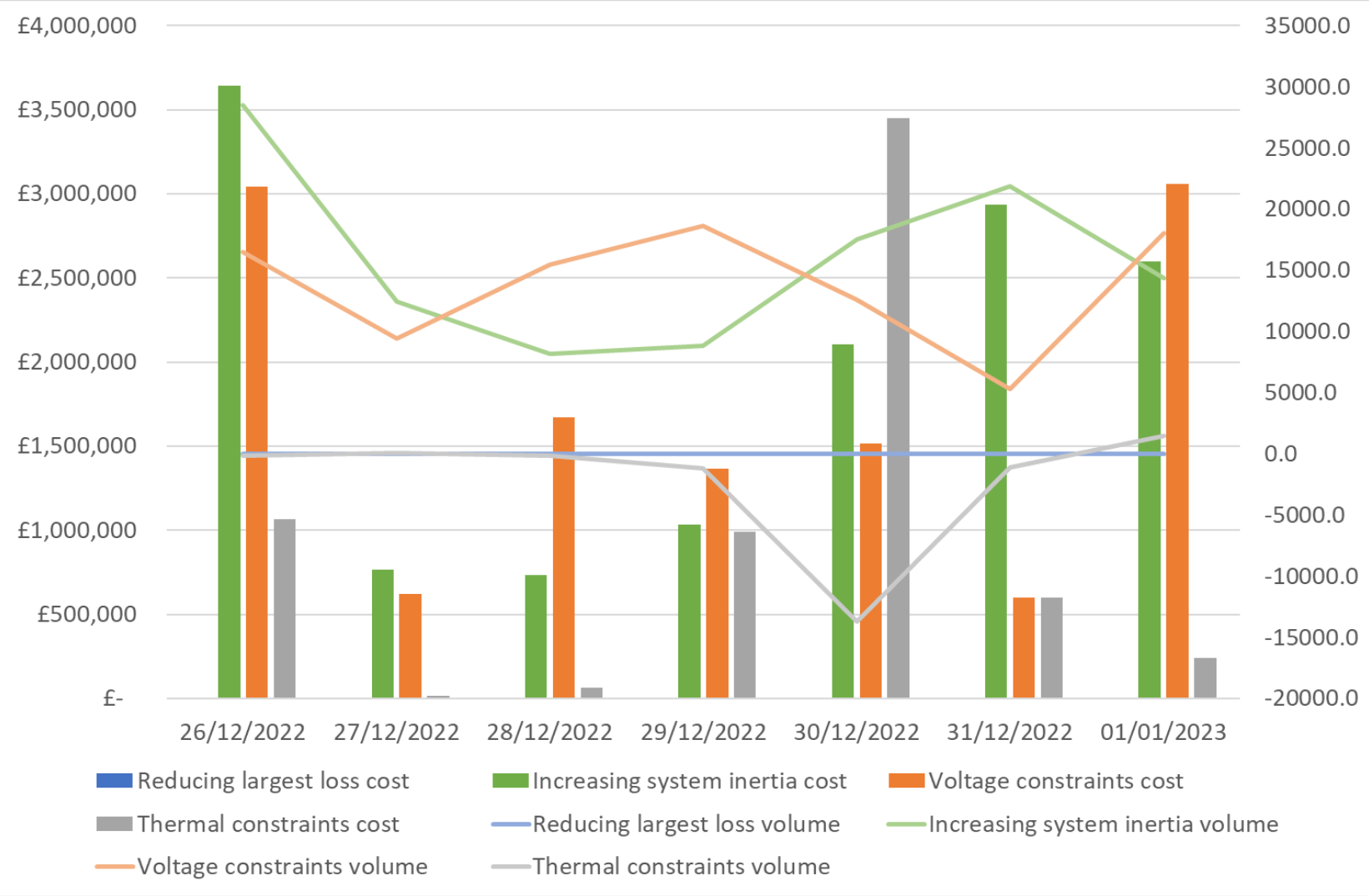
Date	Total (£m)
26/12/2022	21.1
27/12/2022	14.8
28/12/2022	16.4
29/12/2022	17.7
30/12/2022	18.4
31/12/2022	19.0
01/01/2023	18.4
Weekly Total	125.8

Reserve and 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 for w/c 26th Dec



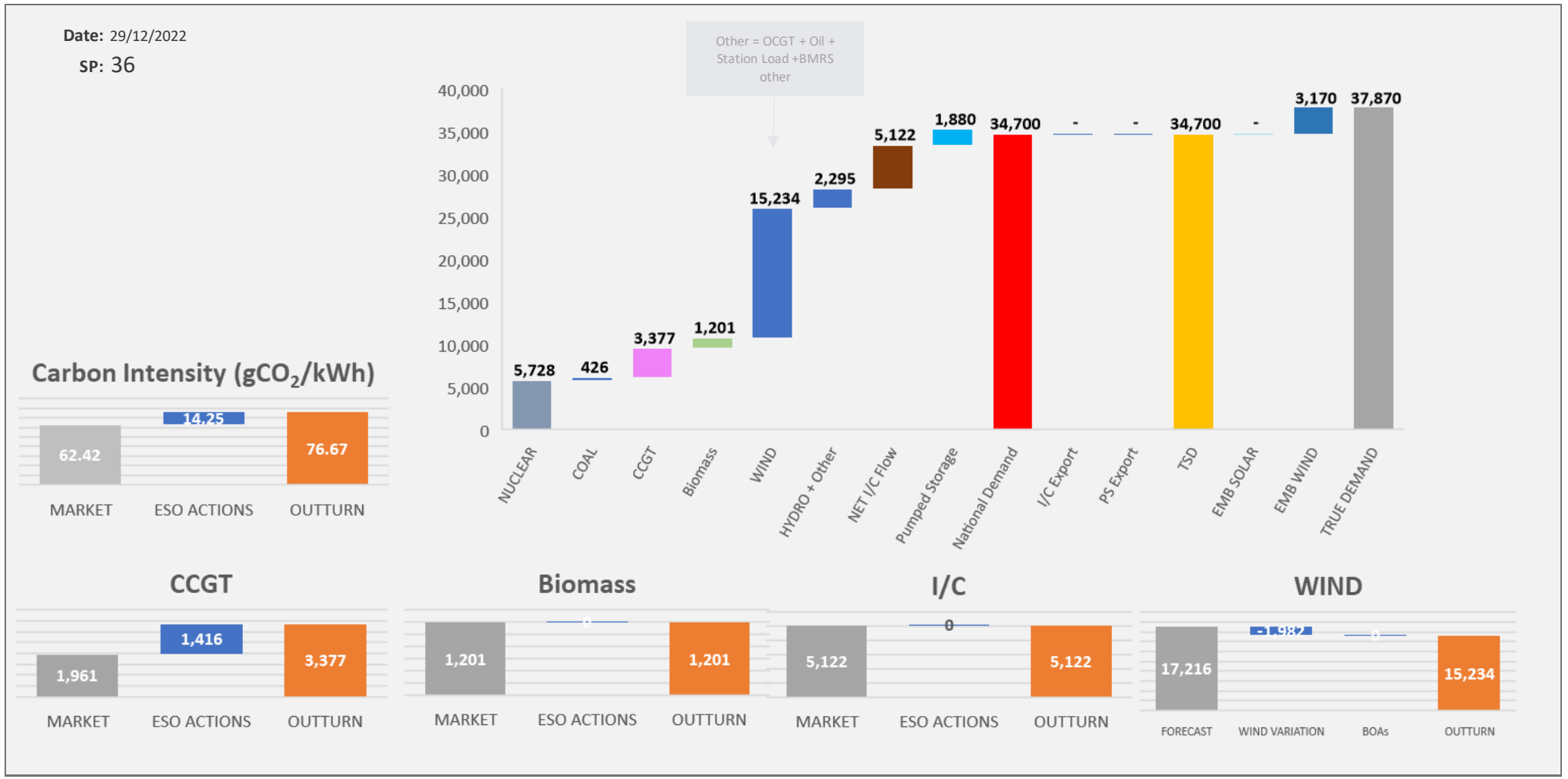
Thermal – network congestion
Actions required to manage Thermal Constraints throughout the week.

Voltage
Intervention was required for voltage control throughout the week.

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

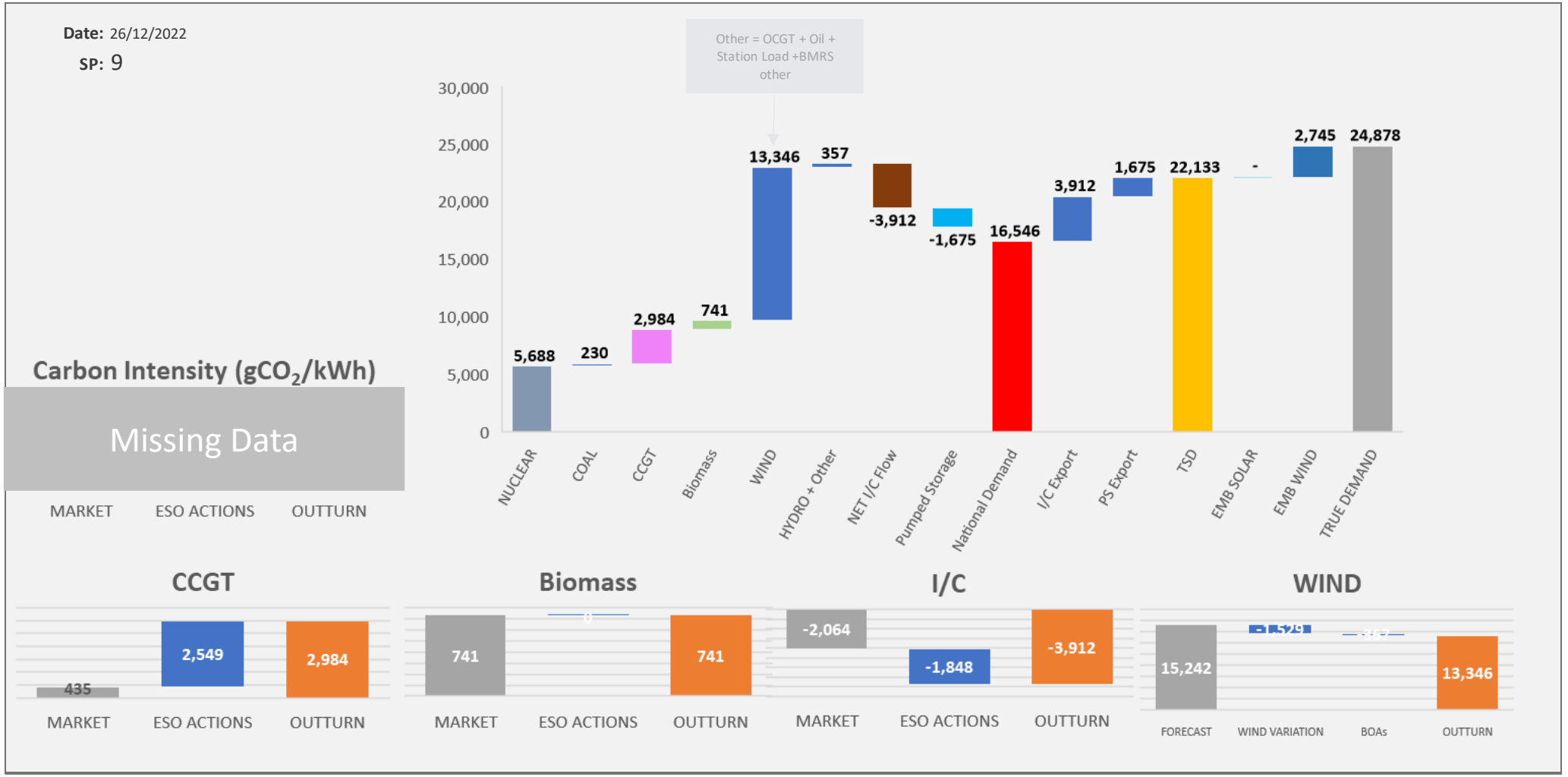
Increasing inertia
Intervention was required to manage system inertia throughout the week.

ESO Actions | Thursday 29 December – Peak Demand – SP spend ~£199k



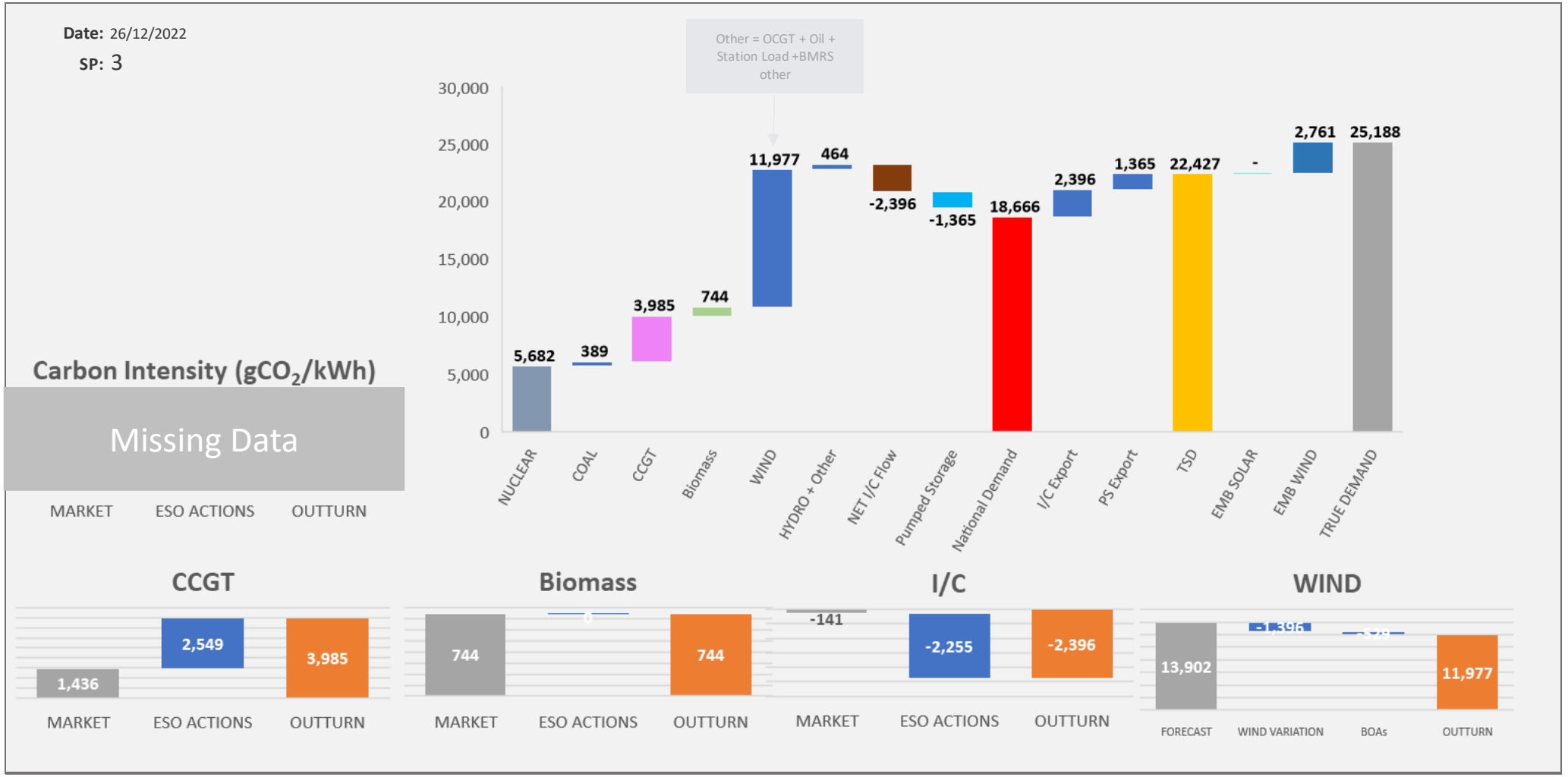
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Monday 26 December – Minimum Demand – SP Spend ~£442k



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

ESO Actions | Monday 26 December – Highest SP Spend ~£602k



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