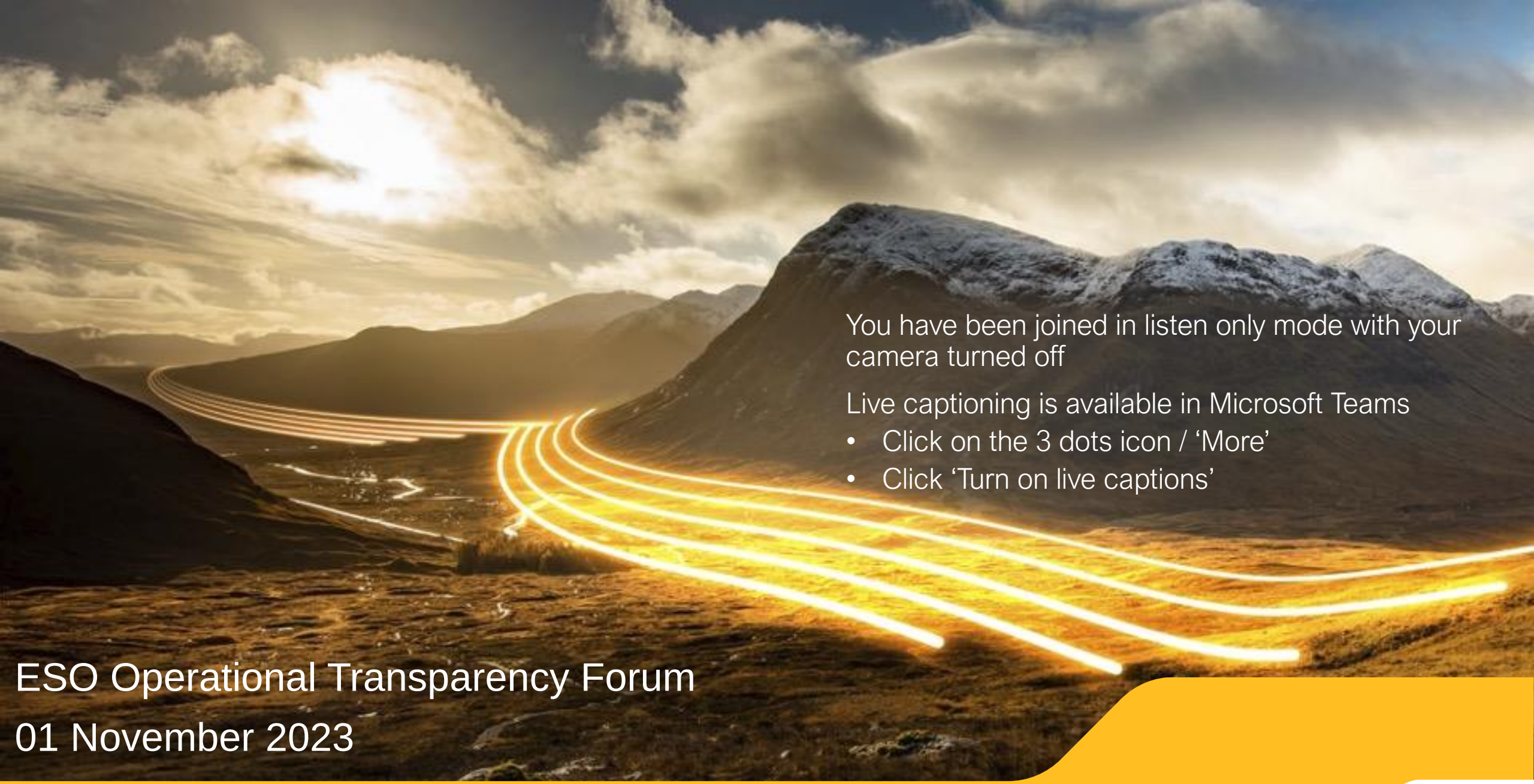


You have been joined in listen only mode with your camera turned off

Live captioning is available in Microsoft Teams

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

ESO Operational Transparency Forum

01 November 2023

Introduction | Sli.do code #OTF

To ask questions live and provide us with post event feedback go to Sli.do and join event code #OTF.

- **Ask your questions as early as possible** as our experts may need time to ensure a correct answer can be given live.
- **Please provide your name or organisation**. This is an operational forum for industry participants therefore questions from unidentified parties will not be answered live. If you have reasons to remain anonymous to the wider forum please use the advance question or email options given on the next slide.
- **Questions will be answered in the upvoted order whenever possible**. We will take questions from further down the list when: the answer is not ready; we need to take the question away or the topic is outside of the scope of the OTF.
- **Sli.do will remain open until 12:00**, even when the call closes earlier, to provide the maximum opportunity for you to ask questions.
- **All questions will be recorded and published.** Questions which are not answered on the day will be included, with answers, in the slide pack for the next OTF.

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

Future deep dive / focus topics

Today

Operational surplus overview

Future

Scottish Oscillations – 8th November

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

Enduring Auction Capability

The EAC platform officially launched on **Thursday 19th October at 08:00**, this is when the gate for bid submissions opened ahead of the first auction taking place on **Thursday 2nd November at 14:00**.

ESO Markets Forum - Reminder

Please don't forget to sign up for a space at our upcoming Markets Forum.
The day will include an optional breakout session on transmission charging aimed at people new to the industry, followed by the main event on our key priorities with breakout sessions and an industry panel in the afternoon.

Date: 8th November (in person event only)

9am: Breakfast session (optional) - Building blocks of transmission charging

10am-4pm: Main event - An overview of our key market priorities, collaborative breakout sessions, industry panel session, Q&A concluding with optional post event networking

Location: Park Plaza Hotel, Westminster Bridge, London

Sign up here

We are delighted to confirm our industry panel for the session in the afternoon (further guest to be confirmed).

Bridgit Hartland-Johnson

Chief Specialist for System Integration at Orsted

Karl Byrne

Director of the Climate Infrastructure Group at BlackRock

Rebecca Sedler

Managing Director at National Grid Ventures

Merlin Hyman

Chief Executive of Regen

Dr Robyn Lucas

Director of Analytics at Modo Energy

Balancing Reserve Webinar: Post Industry Consultation

Please join us for the Balancing Reserve Webinar on **16th November 2023 at 10:00 am**.

The purpose of this webinar is to review stakeholder feedback from our EBR Article 18 consultation prior submission to Ofgem, and to provide further information on timelines and next steps. The EBR Article 18 consultation closed on 26th October 17:00 but the documents are still available on our website.

We will also hold a Q&A session at the end of the presentation for any questions that you may have. The session will be recorded and shared on our website along with a Q&A document.

Register for Balancing Reserve Webinar here

If you have any further questions, please contact the team at:
box.futureofbalancingservices@nationalgrideso.com

Balancing Programme Engagement Event

This event has been postponed until **Tuesday 28th November**.

Further information can be found here.

Please note that the wrong date was published in PluggedIn.

Sli.do code #OTF

Operational Surplus

Dan Drew

Modelling & Insight Manager

Markets

ESO

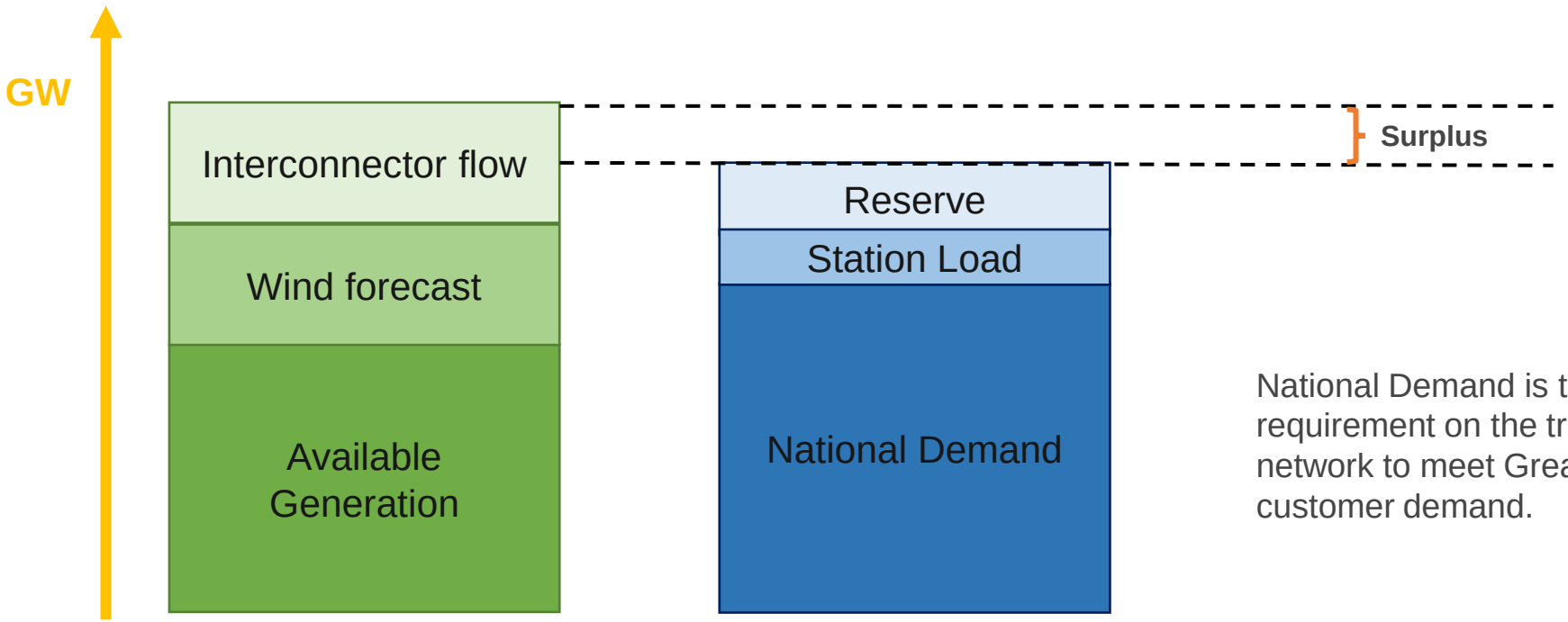
Operational surplus

Throughout the winter we provide a view of operational surplus to help market participants identify when tighter periods are more likely to occur such that they can plan to respond accordingly.

Surplus = (Available Generation + Wind Forecast + Interconnector flows)

-

(National Demand + Station Load + Reserve Requirements)



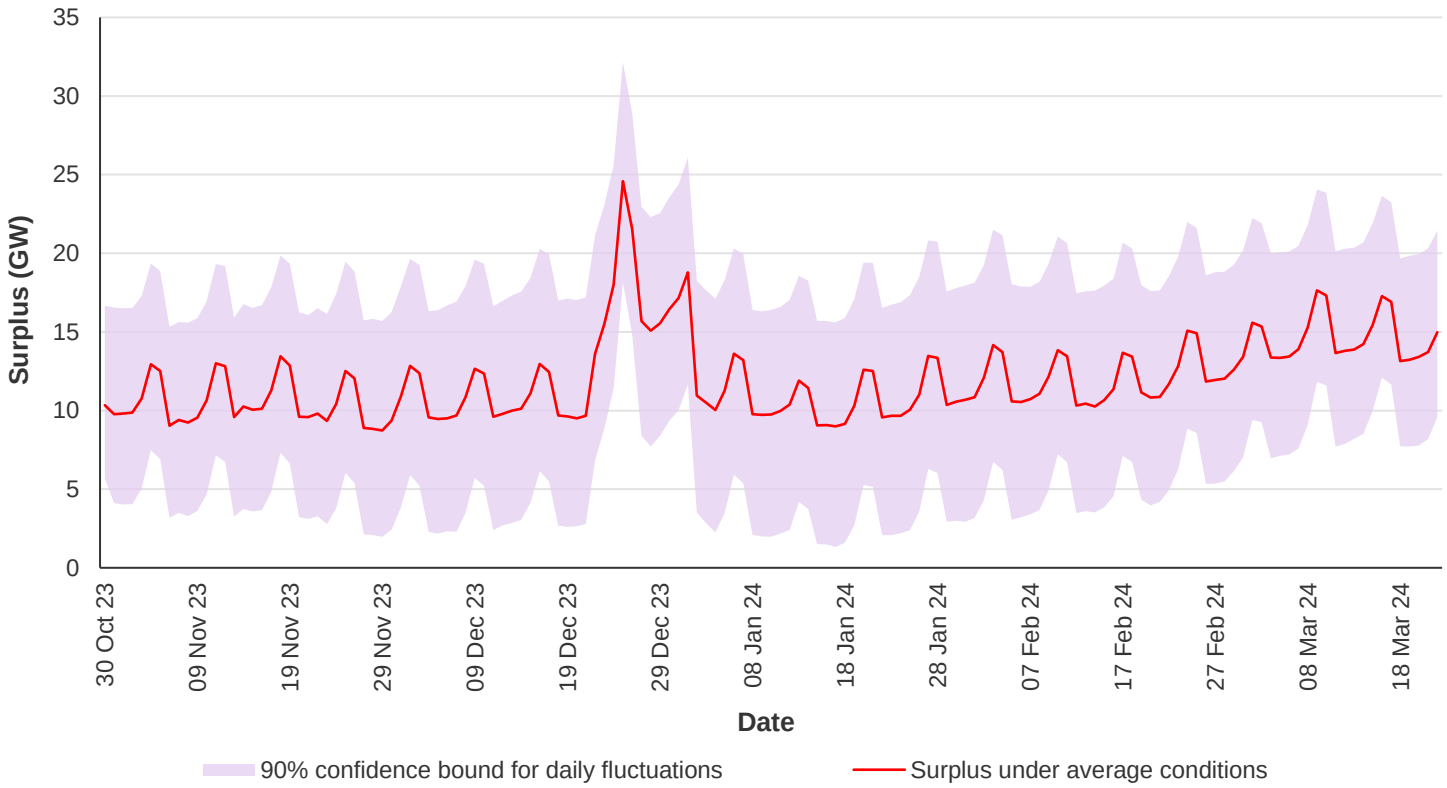
National Demand is the generation requirement on the transmission network to meet Great Britain customer demand.

Operational surplus – Winter Outlook

Central forecast (red line): under typical conditions, using average weather conditions for demand, average availability for conventional generation and average wind conditions.

Credible range (shaded region): we simulate tens of thousands of scenarios to consider variations in weather, demand, conventional generation availability, wind generation output and interconnector availability. For each of these scenarios, we calculate the daily surplus across the entire winter. We then calculate the 'credible range', defined as the 90% confidence bound for the day-by-day fluctuations in surplus (covering between the 5th and 95th percentile).

Inter-connectors delivering in-line with capacity market agreements.



We expect to have sufficient operational surplus throughout winter in our Base Case, even when we consider the expected natural variation of demand, wind and outages.

Operational surplus – week ahead

Surplus = (Available Generation + Wind Forecast + Interconnector flows)

-

(National Demand + Station Load + Reserve Requirements)

Available Generation: Expected generation based on OC2 submissions to REMIT

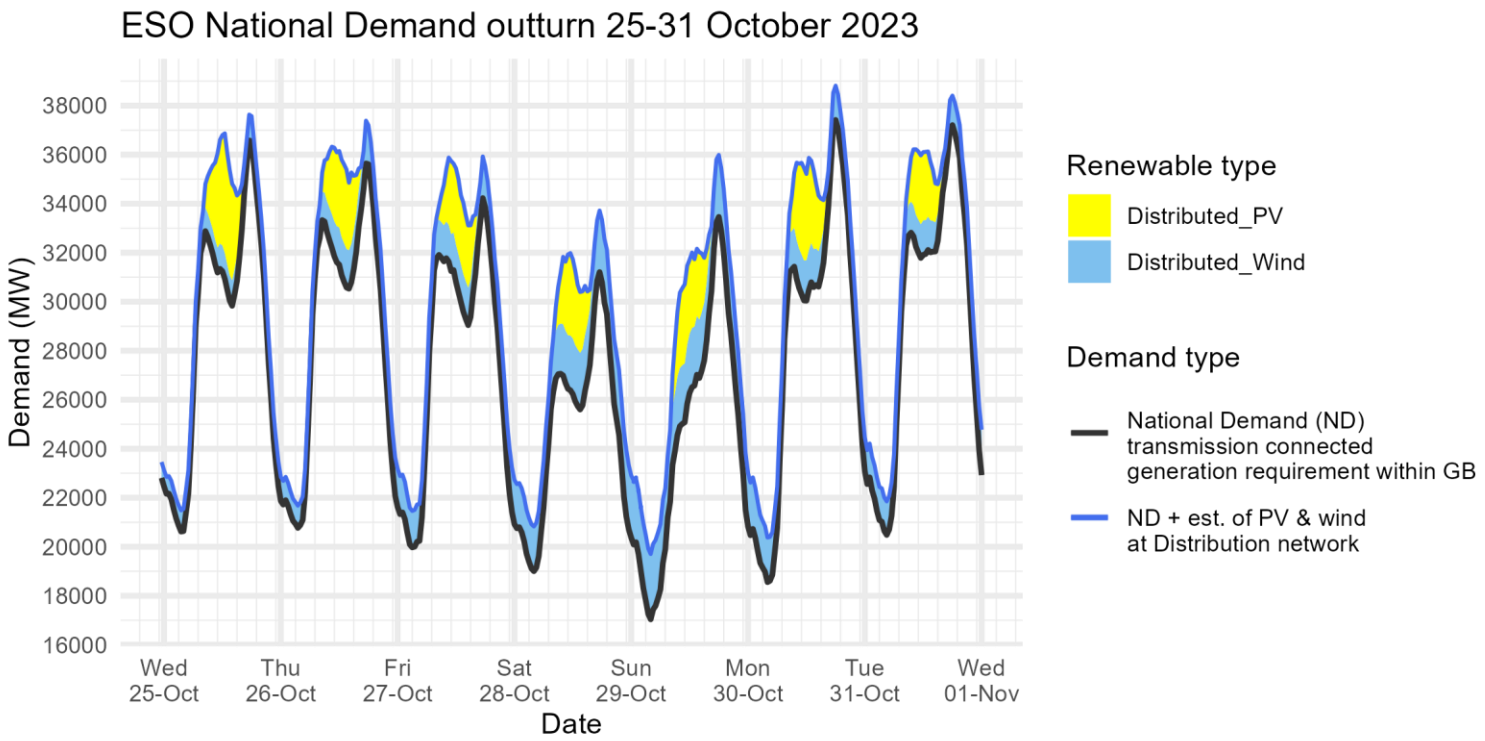
Wind Forecast: Aggregated GB wind generation based on the latest ESO forecast

National Demand Forecast: Latest ESO National Demand forecast

Inter-connector flows: The interconnector flows are equal to those in the Base case presented in the Winter Outlook.

Day	Date	Notified Generation (MW)	Wind (MW)	IC Flows* (MW)	Peak demand (MW)	Indicative surplus (MW)
Thu	02/11/2023	38841	15610	4080	36380	17030
Fri	03/11/2023	40404	11860	4080	37000	15040
Sat	04/11/2023	40132	9000	4080	34900	14150
Sun	05/11/2023	40200	10350	4080	35480	14830
Mon	06/11/2023	40809	12360	4080	39170	13590
Tue	07/11/2023	41817	10950	4080	40030	12440
Wed	08/11/2023	41817	10080	4080	40800	10800

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.

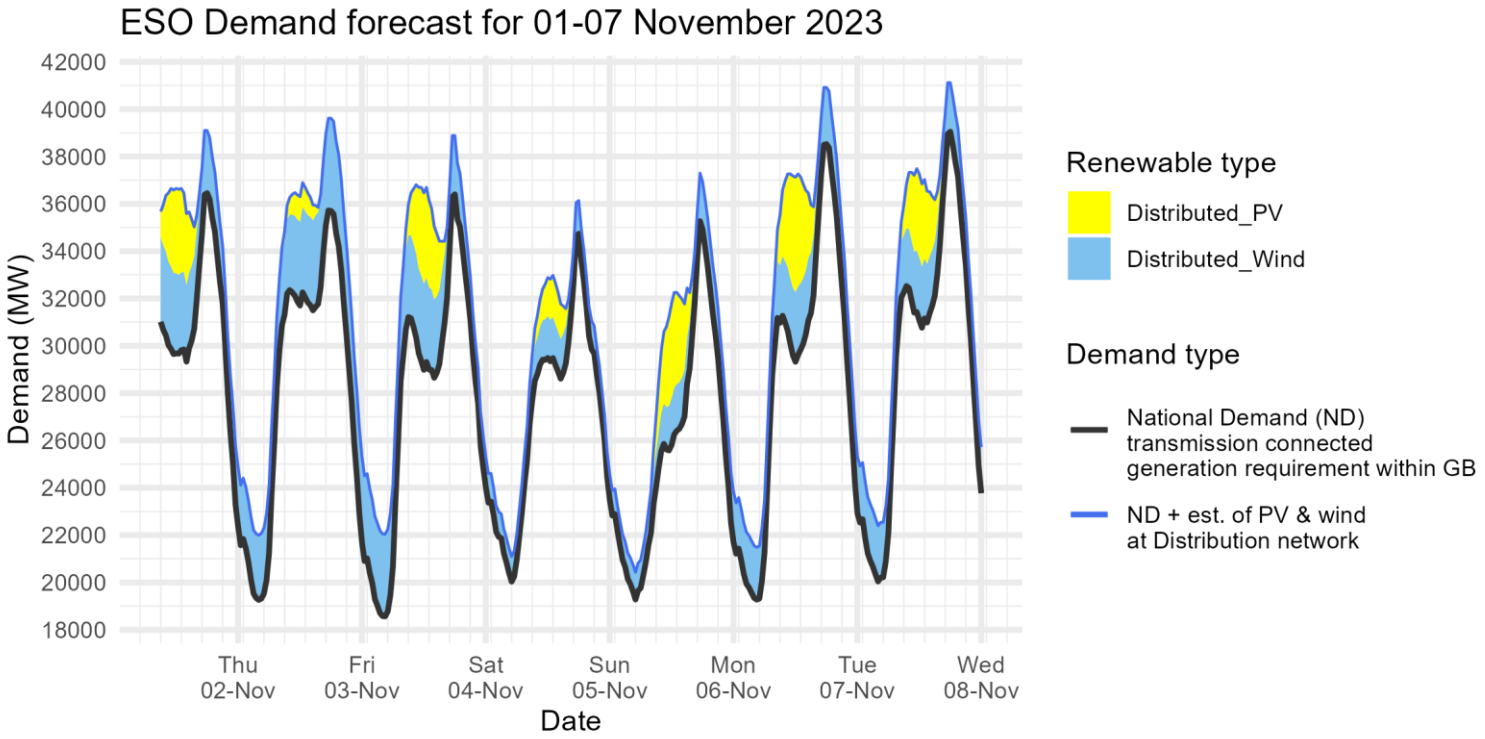
ND values **do not include** export on interconnectors or pumping or station load

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.

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 25 Oct)		OUTTURN	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	National Demand (GW)	Dist. wind (GW)
25 Oct	Evening Peak	36.4	1.0	36.6	1.0
26 Oct	Overnight Min	20.3	1.1	20.8	0.9
26 Oct	Evening Peak	36.2	1.5	35.6	1.6
27 Oct	Overnight Min	20.0	1.5	20.0	1.5
27 Oct	Evening Peak	34.5	1.6	34.2	1.6
28 Oct	Overnight Min	18.9	1.8	19.0	1.8
28 Oct	Evening Peak	31.3	2.1	31.2	2.5
29 Oct	Overnight Min	16.9	2.7	17.0	2.7
29 Oct	Evening Peak	33.3	2.7	33.5	2.5
30 Oct	Overnight Min	17.8	2.5	18.6	1.8
30 Oct	Evening Peak	38.7	1.9	37.4	1.4
31 Oct	Overnight Min	20.3	1.5	20.5	1.4
31 Oct	Evening Peak	39.7	1.3	37.2	1.2

Demand | Week Ahead



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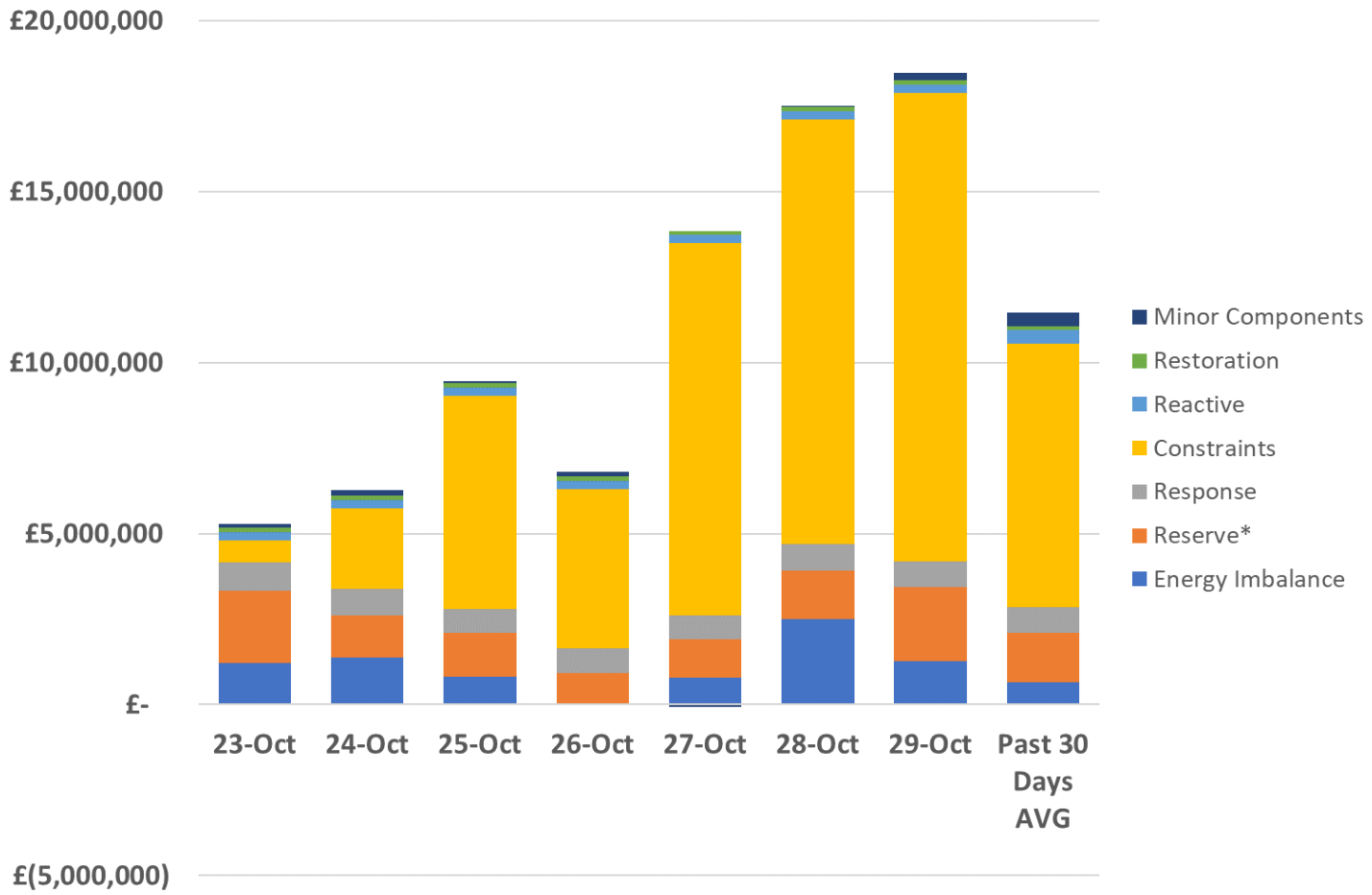
Historic out-turn data can be found on the ESO Data Portal in the following data sets: Historic Demand Data & Demand Data Update

		FORECAST (Wed 01 Nov)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
01 Nov 2023	Evening Peak	36.5	2.6
02 Nov 2023	Overnight Min	19.3	2.7
02 Nov 2023	Evening Peak	35.7	3.9
03 Nov 2023	Overnight Min	18.6	3.5
03 Nov 2023	Evening Peak	36.4	2.5
04 Nov 2023	Overnight Min	20.0	1.1
04 Nov 2023	Evening Peak	34.7	1.4
05 Nov 2023	Overnight Min	19.3	1.2
05 Nov 2023	Evening Peak	35.3	2.0
06 Nov 2023	Overnight Min	19.3	2.2
06 Nov 2023	Evening Peak	38.5	2.4
07 Nov 2023	Overnight Min	20.0	2.4
07 Nov 2023	Evening Peak	39.0	2.1

ESO Actions | Category costs breakdown for the last week



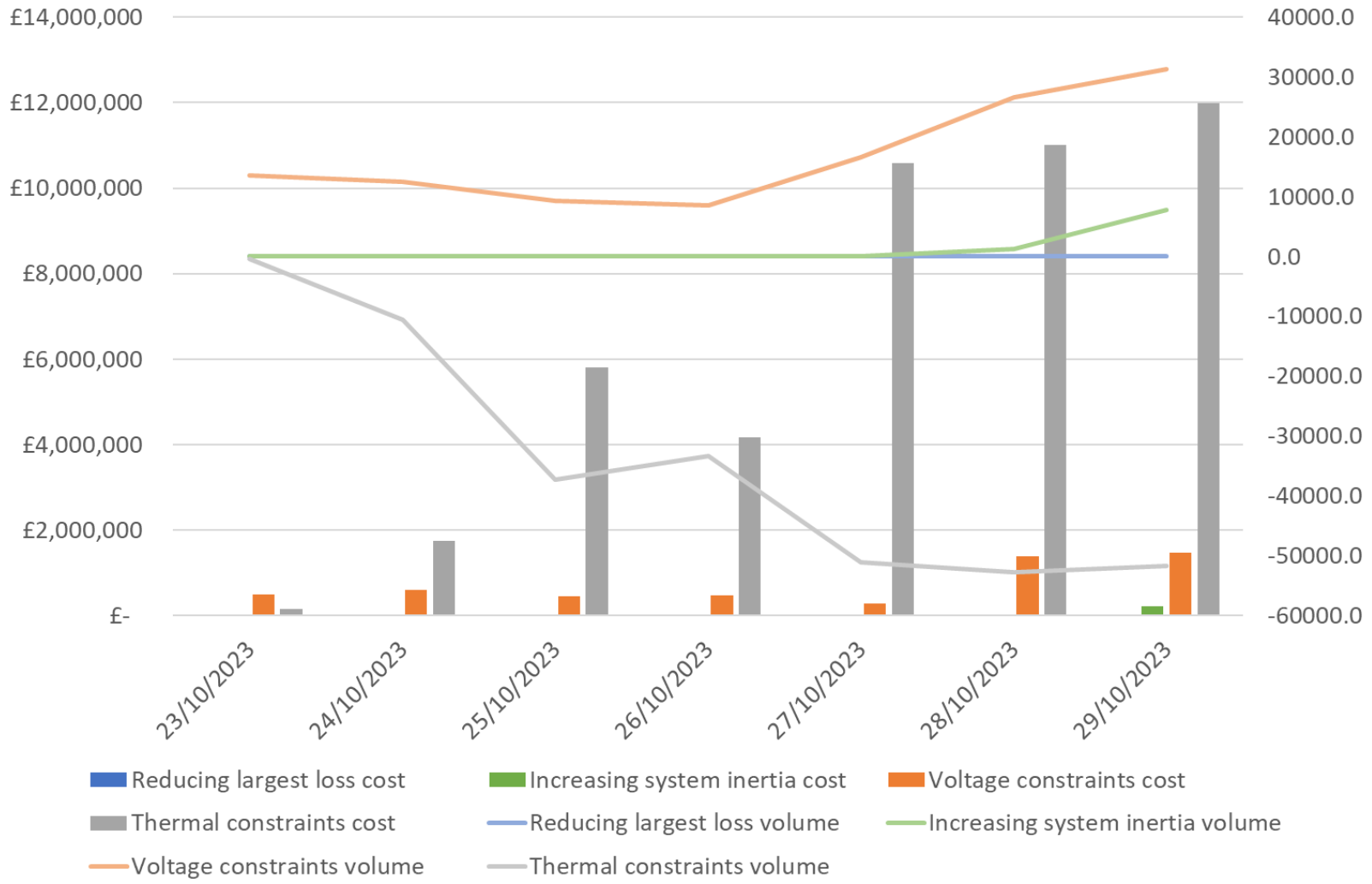
Date	Total (£m)
23/10/2023	5.3
24/10/2023	6.3
25/10/2023	9.5
26/10/2023	6.8
27/10/2023	13.8
28/10/2023	17.5
29/10/2023	18.5
Weekly Total	77.6
Previous Week	84.2

Constraints and Reserve costs were the key cost component for 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



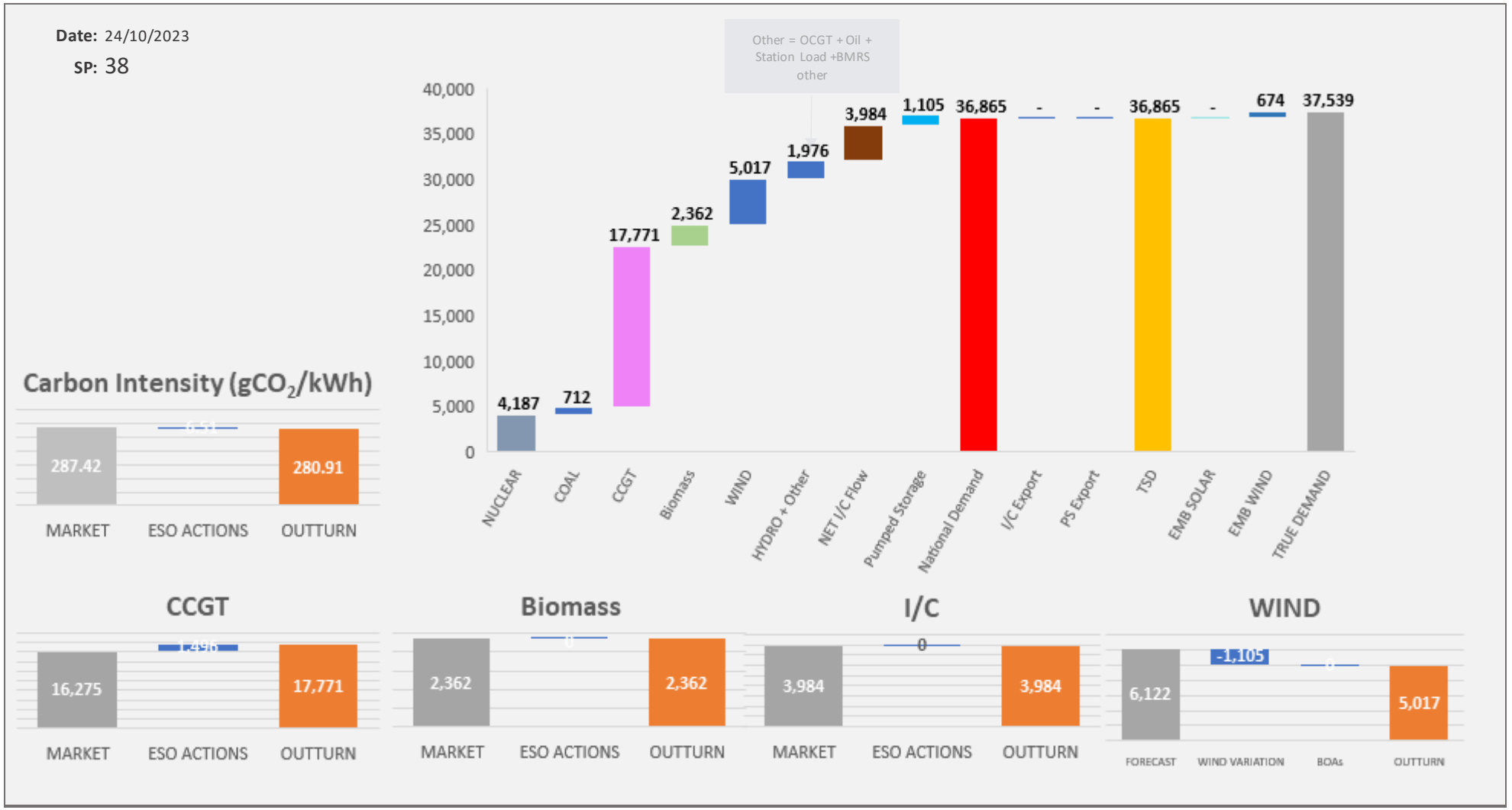
Thermal – network congestion
Actions were required to manage thermal constraints throughout the week with the most significant costs on Fri, Sat & Sun.

Voltage
Intervention was required to manage voltage levels throughout the week.

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

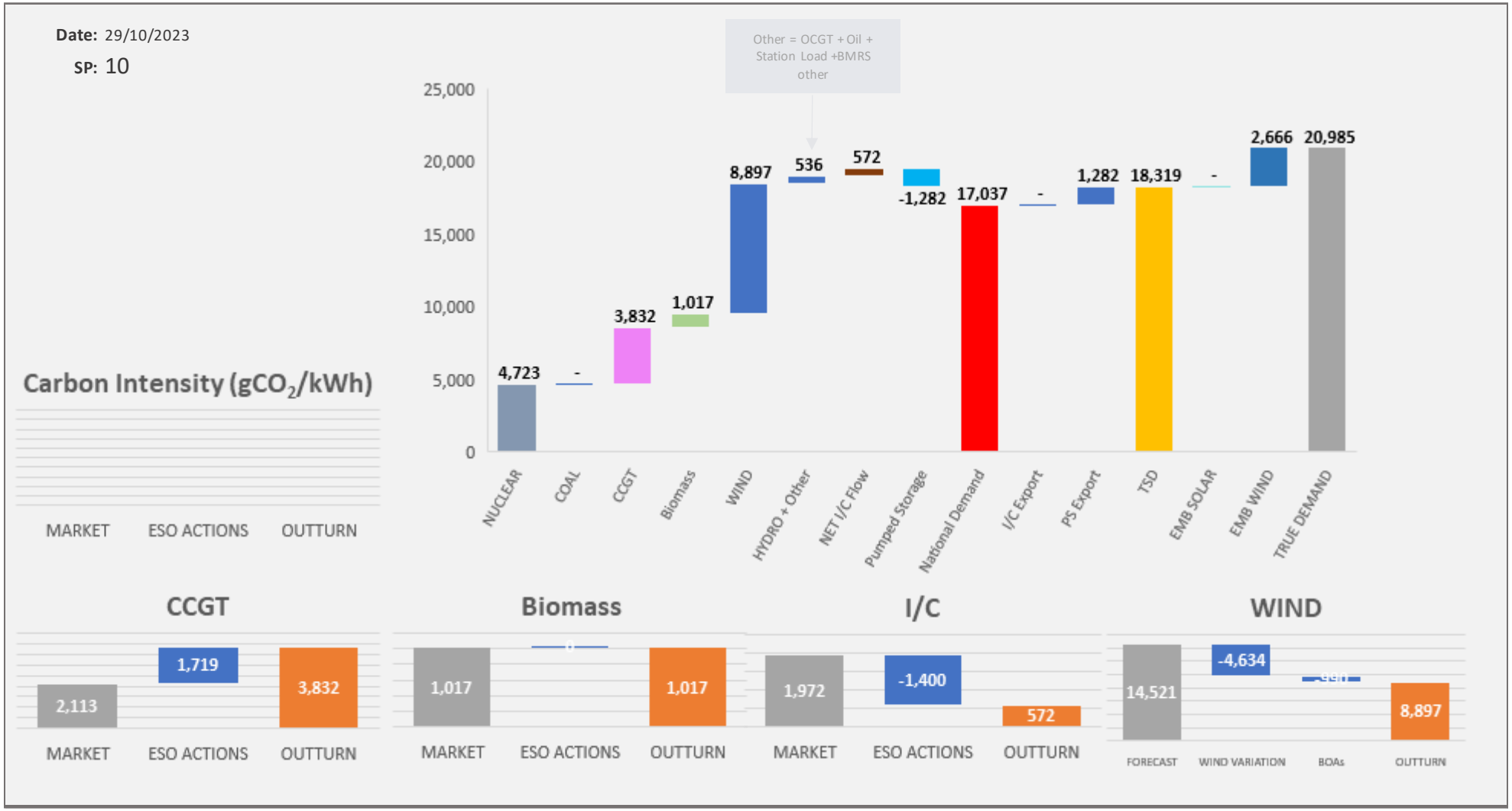
Increasing inertia
Intervention was required to manage System Inertia on Sat & Sun.

ESO Actions | Tuesday 24 October – Peak Demand – SP spend ~£40k



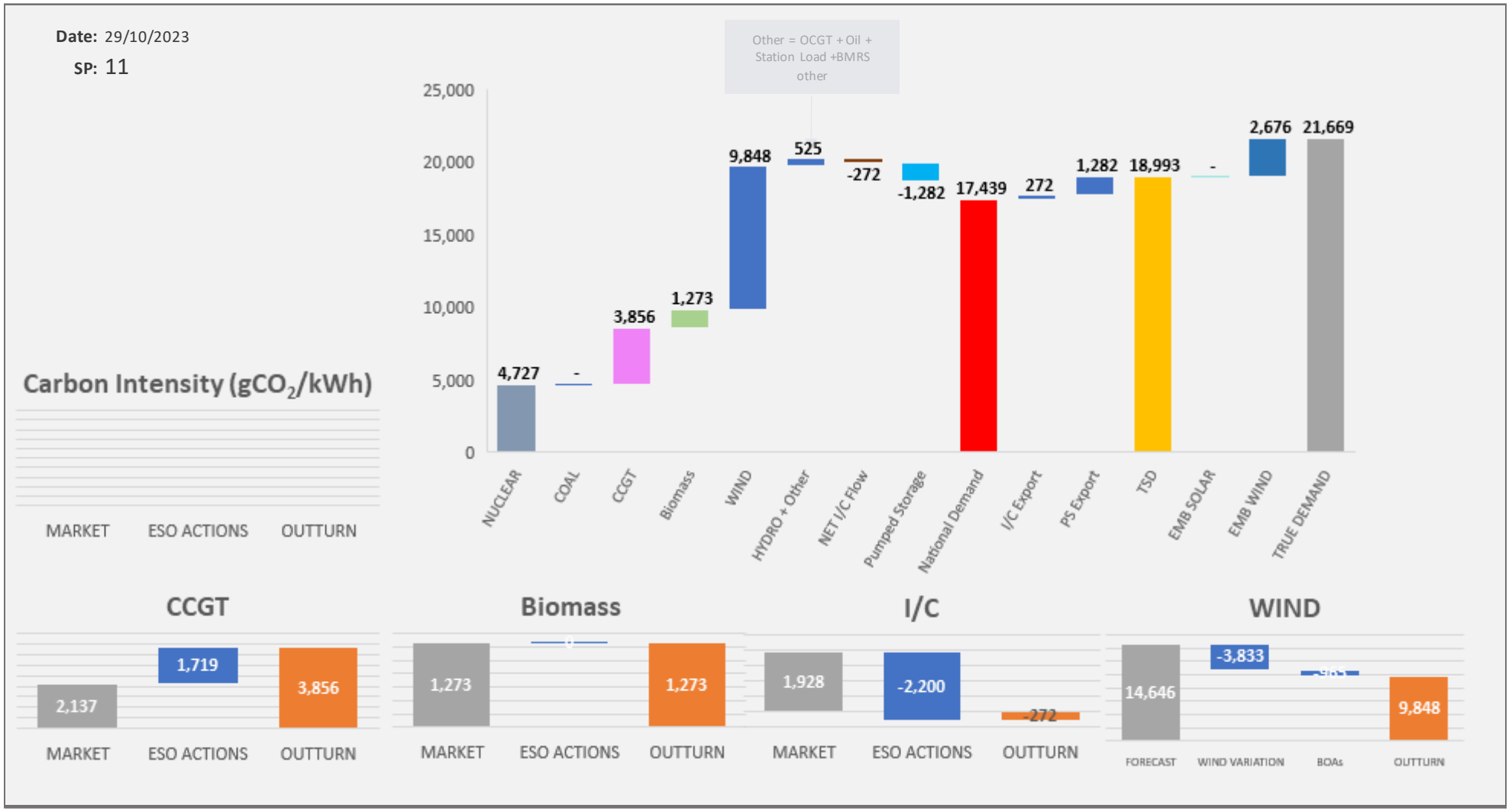
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Sunday 29 October – Minimum Demand – SP Spend ~£405k



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

ESO Actions | Sunday 29 October – Highest SP Spend ~£432k



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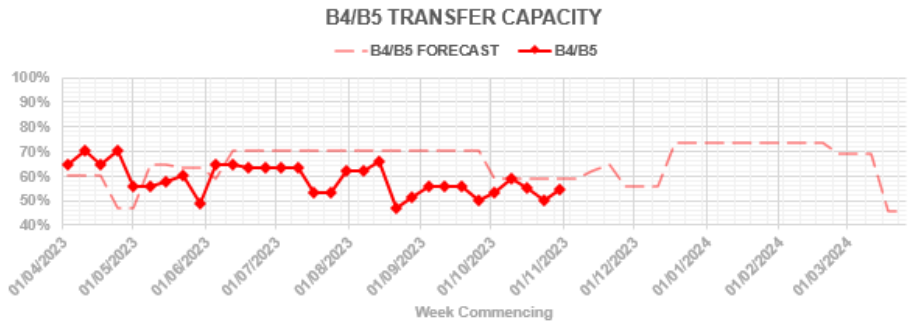
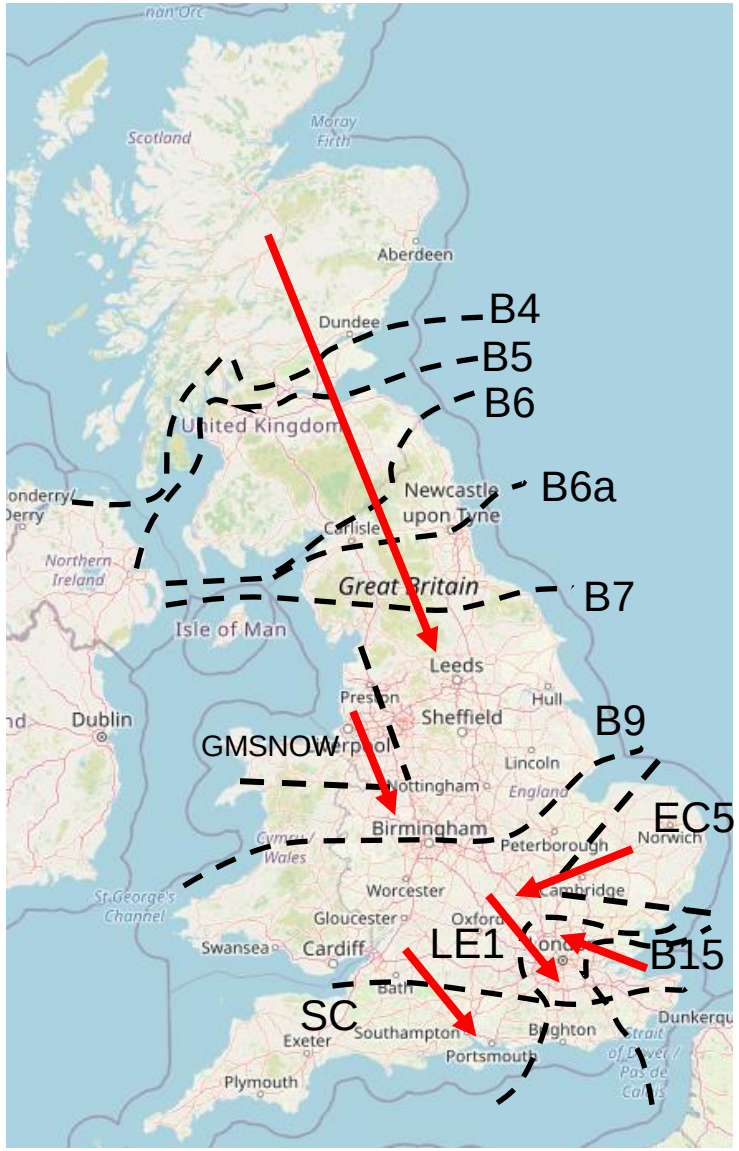
Transparency | Network Congestion

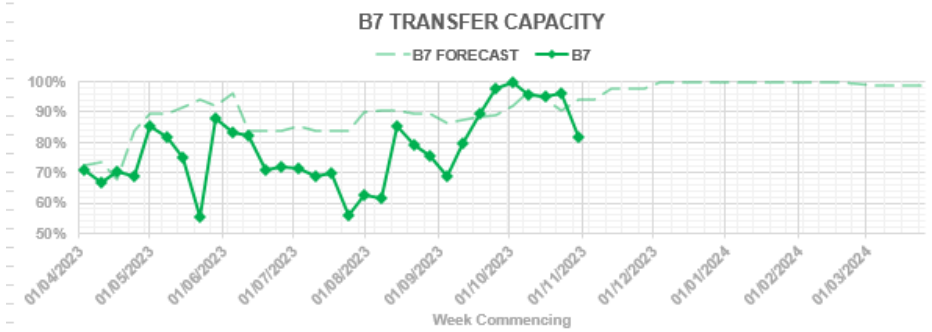


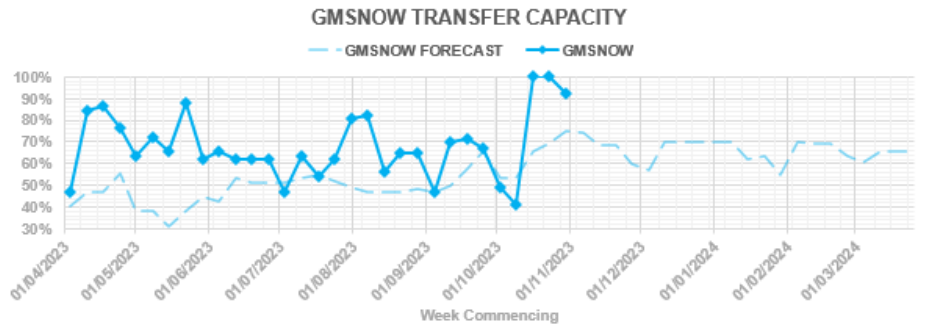
Boundary	Max. Capacity (MW)
B4/B5	3400
B6	6800
B6a	8000
B7	8325
GMSNOW	4700
B9	10600
EC5	5000
LE1	8500
B15	7500
SC	7300

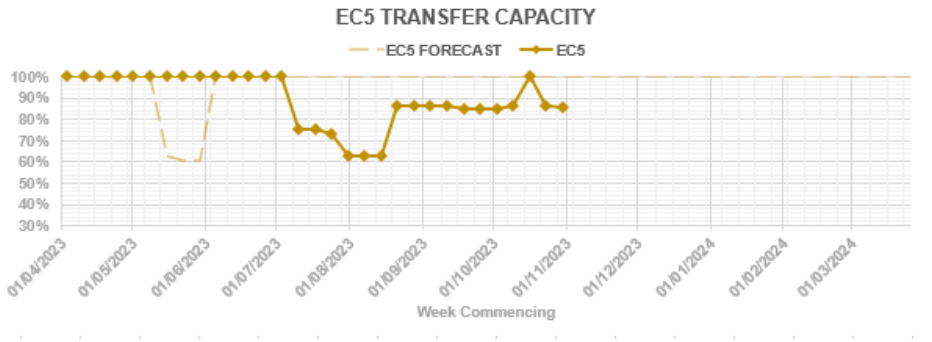


Day ahead flows and limits, and the 24-month constraint limit forecast are published on the ESO Data Portal:
https://data.nationalgrideso.com/data-groups/constraint-management

Transparency | Network Congestion







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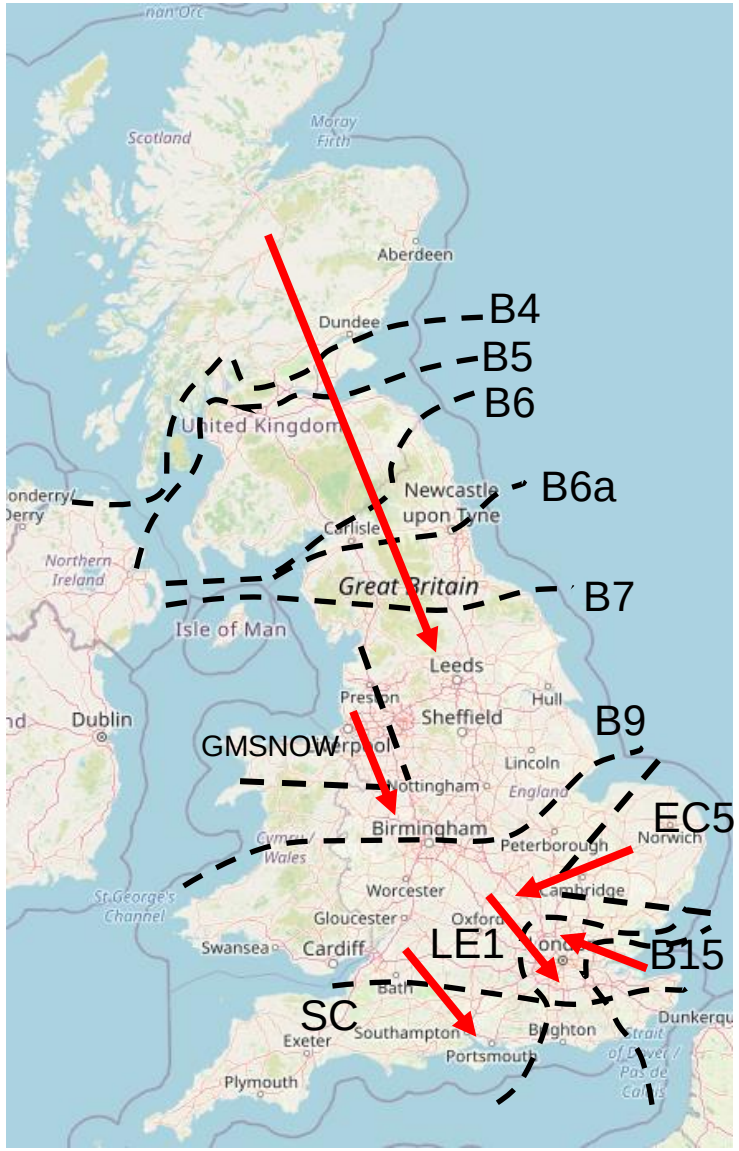

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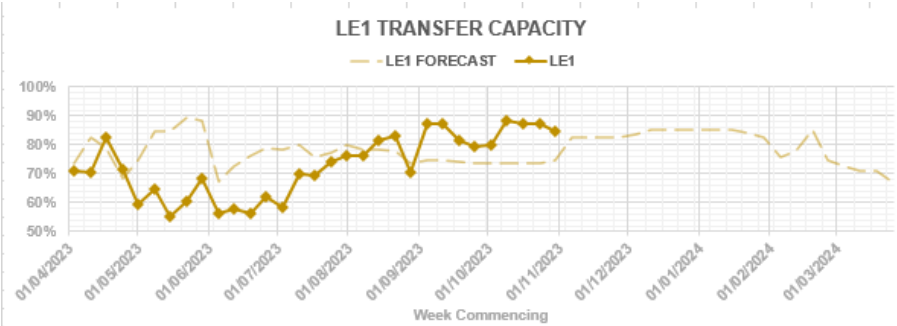
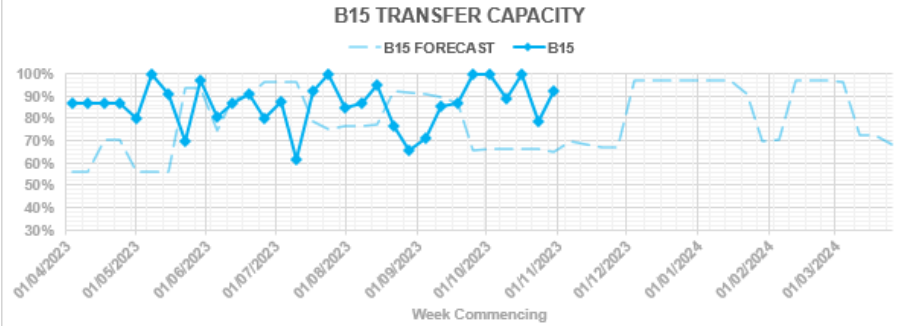
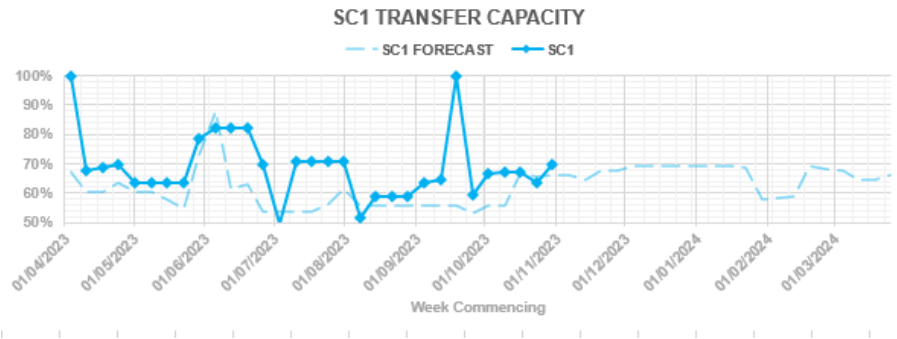
Transparency | Network Congestion







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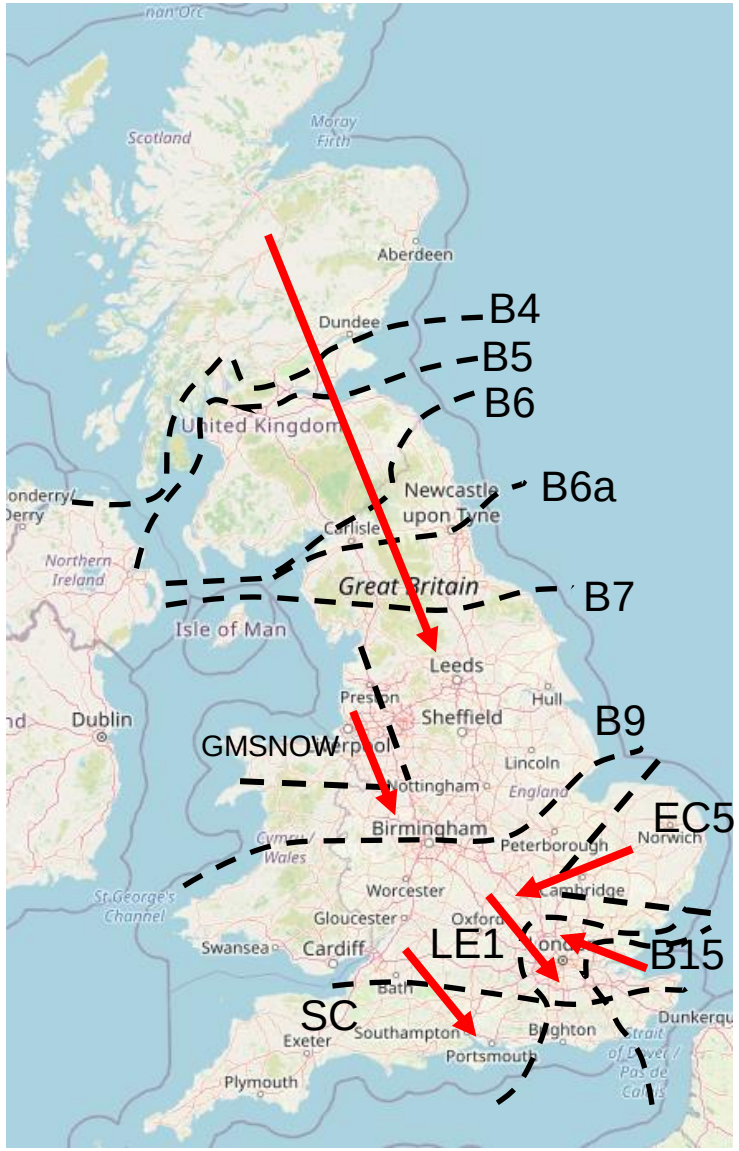

Day ahead flows and limits, and the 24-month constraint limit forecast are published on the ESO Data Portal:
https://data.nationalgrideso.com/data-groups/constraint-management

Previously Asked Questions

Q: Is Dynamic Containment (DC), Dynamic Regulation (DR) and Dynamic Moderation (DM) provision performance routinely checked based on the data you receive as part of the service terms, can you provide a summary of the overall performance ? Thanks Christopher

A: Yes, DC DR and DM service performance are routinely checked based on the data submitted by the service providers. Performance data and revenues/penalties are communicated directly to individual providers on monthly basis. ESO might promptly follow up with individual providers if we need more information for system event review or investigation purposes.

We do not publish individual performance results or summary of the overall performance. Issues and questions that are related to response service performance will be followed up immediately to ensure any system impacts are minimised.

Q: DCH procurement dropped by around 400MW from last Tuesday and only increased back to previously seen levels today. Was there a reason for this?

A: We procure adequate DC volumes based on changing system conditions to secure largest securable loss as obliged in SQSS and current FRCR policy. The variations on DC requirements and other response service requirements are reflected in our daily forecast or/and 4-day forecast published on ESO data portal. Any significant changes on the requirements will be communicated on OTF, e.g. increased DM requirement, or at least 2 days prior to the system change so the market will be ready.

Previously Asked Questions

Q: You are buying more and more inertia which is understandable with so much a-synchronous plant replacing sync. gen on the system. But how much of this is from the Stability Pathfinders contracts & how much Balancing Mechanism (BM)? You said you'd publish these contracts/ utilisation and are they in your total weekly balancing cost?

A: ESO is paying the Pathfinders an availability fee and that all the Pathfinders Phase #1 units are now operating and should be getting paid and being used unless they are on outage (their usage is published here https://www.nationalgrideso.com/data-portal/stability-pathfinder-service-information)

We publish the overall inertia costs in the Monthly Balancing Services Summary (MBSS) (https://www.nationalgrideso.com/data-portal/mbss) with the Stability Pathfinder costs published under "stability" under response and BM & Trades for inertia under RoCoF (Rate of Change of Frequency).

In our weekly costs we present breakdown of our constraints costs (see slide 15) including inertia costs, which includes the Pathfinders and BM costs.

Q: With regards to the Scottish Oscillations deep dive, will the investigation report be available before the deep dive event?

A: We won't be issuing an investigation report before 8th November OTF.

Previously Asked Questions

Q: Friday 13th October there was around 2GW to 5GW of pumped/peakers/hydro units priced around £150 to £300 utilised in the BM from 3pm until midnight (totalling over 20GWh). Batteries were priced around £20-140, at times even creating arbitrage opportunities. Yet were never utilised. Why?

A: During this period there were excessively high volumes of data being sent to the Balancing Mechanism for a number of units, mainly duplicated redeclarations of dynamic parameters. The control room will always seek to use the most economic option while maintaining system safety and security. Processing this volume of data slowed key control room systems limiting Control Engineers access to up to the minute information about available units. When speedy actions were needed to control frequency during the afternoon and evening decisions were made based on the most reliable information available to the Control Room in real time.

Q: What is ENCC's current policy on using batteries for constraints? In the past ENCC would not do this, because over a windy weekend a battery operator could constantly swap between wholesale discharging and BM charging, making money without actually helping. Has this changed? What is it now?

A: The control room will always seek to use the most economic option while maintaining system safety and security. We will ensure this question is fed into the team behind the Storage event to respond.

As well, Local Constraints Market has also taken some steps to avoid unintended behaviour so that would be able to use batteries, by asking for forecast and leading/trailing meter data to ensure a baseline is available for performance monitoring.

Outstanding Questions

Q: ESO currently utilise Dinorwig significantly more often, and at significantly higher offer and lower bid prices, than more flexible plant (e.g. batteries). It is used so much in fact, that it often breaches its Minimum Zero Time (MZT) numerous times a day. Why does ESO encourage this behaviour with more utilisation?

Q: Why does ESO bid wind for energy at -£152, opposed to using batteries, who may be priced £0 to -£50? Even if only for an hour, it would save a significant amount if they were utilised. This often results in imbalance prices being far lower than battery's bid prices, this shouldn't happen.

Thank you for providing us with the specific examples. We are working on those question right now and we will provide answer on the future OTF.

Outstanding questions

Q: The DC procurement forecast history (and probably other) dataset has recently been given two different date formats. Could NGESO consolidate on one date/datetime format? It would make data handling with your date much easier. Thank you

We followed up with this owner of this question by email as we need more clarification behind this request.

Q: Can you explain why INDQ-1, PETEM1 and CHICK-1 were all rejected in STOR for the 25/10/2023 despite their availability prices being substantially lower (£0-£0.20 availability price) than that of other competitors in the market (£2.34 clearing price)?

We are currently investigating this to identify if there was any issue how the STOR Auction ran on this date. Once we have more information, we will provide clarification.

Reminder about answering questions at the ESO OTF

- **Questions from unidentified parties will not be answered live**. If you have reasons to remain anonymous to the wider forum please use the advance question or email options. Details in the appendix to the pack.
- **Questions will be answered in the upvoted order whenever possible**. We will take questions from further down the list when: the answer is not ready; we need to take the question away or the topic is outside of the scope of the OTF.
- **Sli.do will remain open until 12:00**, even when the call closes earlier, to provide the maximum opportunity for you to ask questions.
- **All questions will be recorded and published** All questions asked through Sli.do will be recorded and published, with answers, in the Operational Transparency Forum Q&A on the webpage: https://www.nationalgrideso.com/what-we-do/electricity-national-control-centre/operational-transparency-forum
- **Takeaway questions** – these questions will be included in the pack for the next OTF, we may ask you to contact us by email in order to clarify or confirm details for the question.
- **Out of scope questions** will be forwarded to the appropriate ESO expert or team for a direct response. We may ask you to contact us by email to ensure we have the correct contact details for the response. These questions will not be managed through the OTF, and we are unable to forward questions without correct contact details. Information about the OTF purpose and scope can be found in the appendix of this slide pack

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

Purpose and scope of the ESO Operational Transparency Forum

Purpose

The Operational Transparency Forum runs once a week to provide updated information on and insight into the operational challenges faced by the control room in the recent past (1-2 weeks) and short term future (1-2 weeks). The OTF will also signpost other ESO events, provide deep dives into focus topics, and allow industry to ask questions.

Scope

Aligns with purpose, see examples below:

In Scope of OTF

Material presented i.e.: regular content, deep dives, focus topics
ESO operational approach & challenges
ESO published data

Out of Scope of OTF

Data owned and/or published by other parties
e.g.: BMRS is published by Elexon
Processes including consultations operated by other parties e.g.: Elexon, Ofgem, DESNZ
Data owned by other parties
Details of ESO Control Room actions & decision making
Activities & operations of particular market participants
ESO policy & strategic decision making
Formal consultations e.g.: Code Changes, Business Planning, Market development

Managing questions at the ESO Operational Transparency Forum

- OTF participants can ask questions in the following ways:
  - Live via Sli.do code #OTF
  - In advance (before 12:00 on Monday) at https://forms.office.com/r/k0AEfKnai3
  - At any time to box.NC.Customer@nationalgrideso.com

- **All questions asked through Sli.do** will be recorded and published, with answers, in the Operational Transparency Forum Q&A on the webpage: Operational Transparency Forum | ESO (nationalgrideso.com)
- **Advance questions** will be included, with answers, in the slide pack for the next OTF and published in the OTF Q&A as above.
- **Email questions** which specifically request inclusion in the OTF will be treated as Advance questions, otherwise we will only reply direct to the sender.
- **Takeaway questions** – we may ask you to contact us by email in order to clarify or confirm details for the question.
- **Out of scope questions** will be forwarded to the appropriate ESO expert or team for a direct response. We may ask you to contact us by email to ensure we have the correct contact details for the response. These questions will not be managed through the OTF, and we are unable to forward questions without correct contact details. Information about the OTF purpose and scope can be found in the appendix of this slide pack