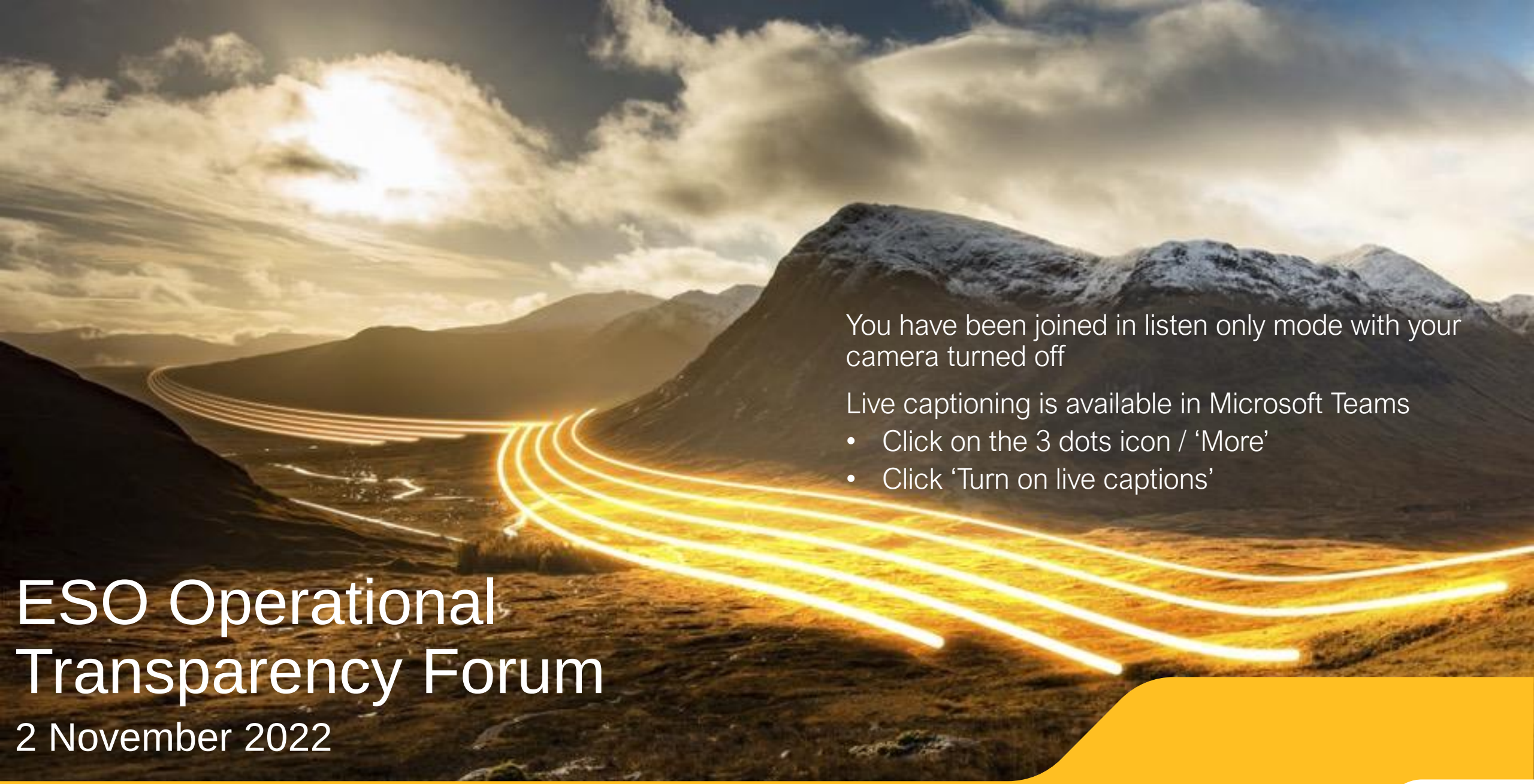


You have been joined in listen only mode with your camera turned off

Live captioning is available in Microsoft Teams

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

ESO Operational Transparency Forum

2 November 2022

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

Regular Topics

System Events

Demand Review

Costs for last week

Constraints

Questions from last week

Signposts

Demand Flexibility Webinar 4th December

OTF Takeover – Operational Focus on Winter

System Stress Event webinar

Deep Dives

ESO BM Actions on 1st October

Transparency Forum Changes

From the 2nd of November your current calendar invite will stop working.

If you have downloaded this from the website please delete this and register using the following link

https://subscribers.nationalgrid.co.uk/h/d/2A778732FDAC77ED

After 2nd November, everyone registered on this list will receive a direct calendar invitation allowing us to manage event changes more appropriately and keep you updated on event status. Only those registered will be able to join the event but it will remain open to everybody to register, please use business rather than personal emails for registration.

Please send us questions in advance

Today we are trialling the use of advance questions: https://forms.office.com/r/k0AEfKnai3

In order to ensure we effectively respond on any topic please submit questions by 12:00 on Monday 7th November for priority, we will endeavour to answer all questions but may still need to take some responses away.

Sli.do will still continue to be used for live Q&A following the weekly slides being presented

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

Advance Questions

Future deep dive/ response topics

Coming soon:

OTF Takeover - GB Energy Market Operational Focus on Winter - 09 November 2022

Items we have taken away and will come back to this forum on in the future

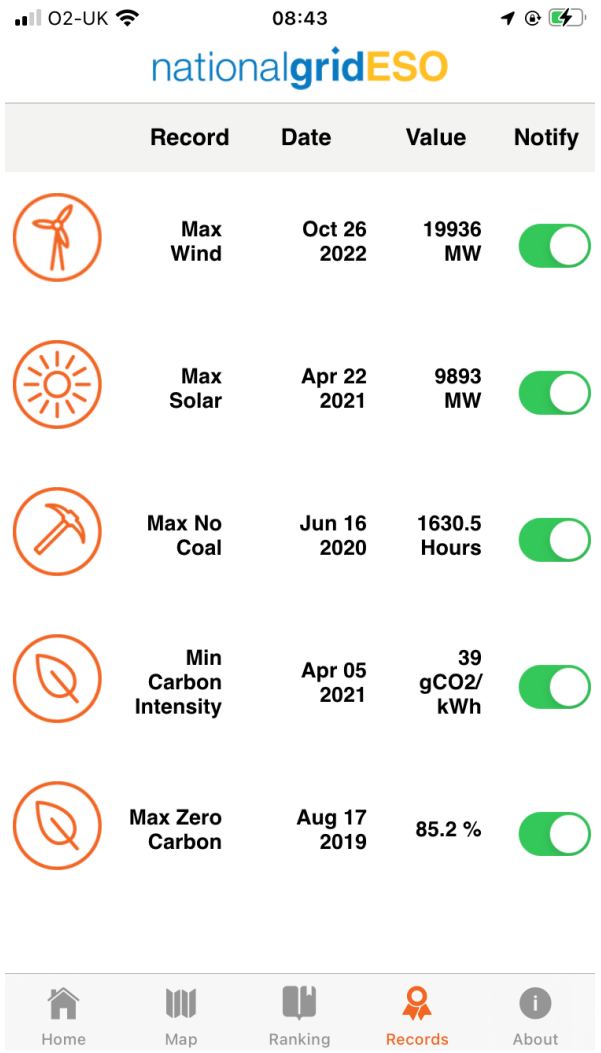
REMIT obligations on ESO

Dispatch Transparency ("Skip Rate") Event

Feedback welcomed on our proposed deep dive topics

System Events

New wind record on 26th October of 19,936 MW



Demand Flexibility Service Update

- We anticipate to receive Ofgem's decision on the EBR Article 18 Consultation Demand Flexibility Service imminently and will officially launch the service once this has been received.
- We will be holding a Demand Flexibility Service Launch webinar ***4th November 10.00am***. In this industry webinar, we'll provide an overview of the Demand Flexibility Service and the final agreed terms. We'll also hold a Q&A at the end of the webinar for any questions that you may have.

Sign up to the webinar here.

- Over the past few months, we've been working with industry to develop the Demand Flexibility Service at pace, and last week, **we were pleased to share a few key industry documents,** included the confirmation of the DFS Guaranteed Acceptance Price for Testing which has been set at **£3,000/MWh.**
- **DFS Guaranteed Acceptance Price Document**
- **DFS Requirements Paper**
- **DFS Communications Principles**

These documents can also be accessed via our Demand Flexibility Website.

If you would like to speak to the Demand Flexibility Service team or if you would like to be included on our mailing list, please email DemandFlexibility@nationalgrideso.com

We will notify the market of DFS dispatch decisions (both tests and actual utilisations) on BMRS and all assessment results will be published on our data portal https://data.nationalgrideso.com/data-groups/dfs

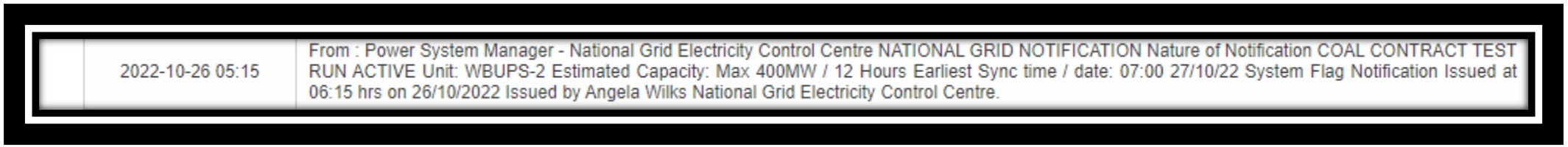
Winter Contingency Service (coal) – Proving Runs

In accordance with the contingency service contract terms, West Burton undertook planned **proving** runs last week.

Notified in BMRS	Unit	Start time	End time	BSCP18 process
24/10/22 07:02	WBUPS-1 – proving	25/10/22 07:00	25/10/22 19:00	ESO action complete
26/10/22 07:15	WBUPS-2 – proving	27/10/22 07:00	27/10/22 19:00	ESO action complete

No further proving runs are planned at present

For the avoidance of doubt, where NGESO instructs any contracted unit, either for initial proving runs or service instructions, across all three contracted sites (EDF, Drax and Uniper) NGESO will inform the market via the BMRS.



	2022-10-26 05:15	From : Power System Manager - National Grid Electricity Control Centre NATIONAL GRID NOTIFICATION Nature of Notification COAL CONTRACT TEST RUN ACTIVE Unit: WBUPS-2 Estimated Capacity: Max 400MW / 12 Hours Earliest Sync time / date: 07:00 27/10/22 System Flag Notification Issued at 06:15 hrs on 26/10/2022 Issued by Angela Wilks National Grid Electricity Control Centre.

Opportunities to hear more on Winter Operations and ask your questions are detailed on the next slide.

Two opportunities to discuss Winter

Wednesday 9 November (OTF)

Operational Focus

OTF takeover – Managing the power system

We will walkthrough the operational scenarios we anticipate facing this Winter and will provide more information about our emergency arrangements.

Tuesday 15 November (2:30-3:30)

Market Focus

Trading the power market

With LCP Delta we are going to drill into the specifics of how we will balance this Winter and specifically how a trader will successfully navigate the market.

Register here

Please see our one pagers on a number of topics related to Winter on the website: https://www.nationalgrideso.com/winter-operations

Stress Event Customer Webinar

In our EMR Delivery Body role, ESO hosted the Stress Event Customer Webinar along with EMRS and ESC on 20th October.

The webinar was designed to aid Capacity Market Participant's winter preparations by presenting the following:

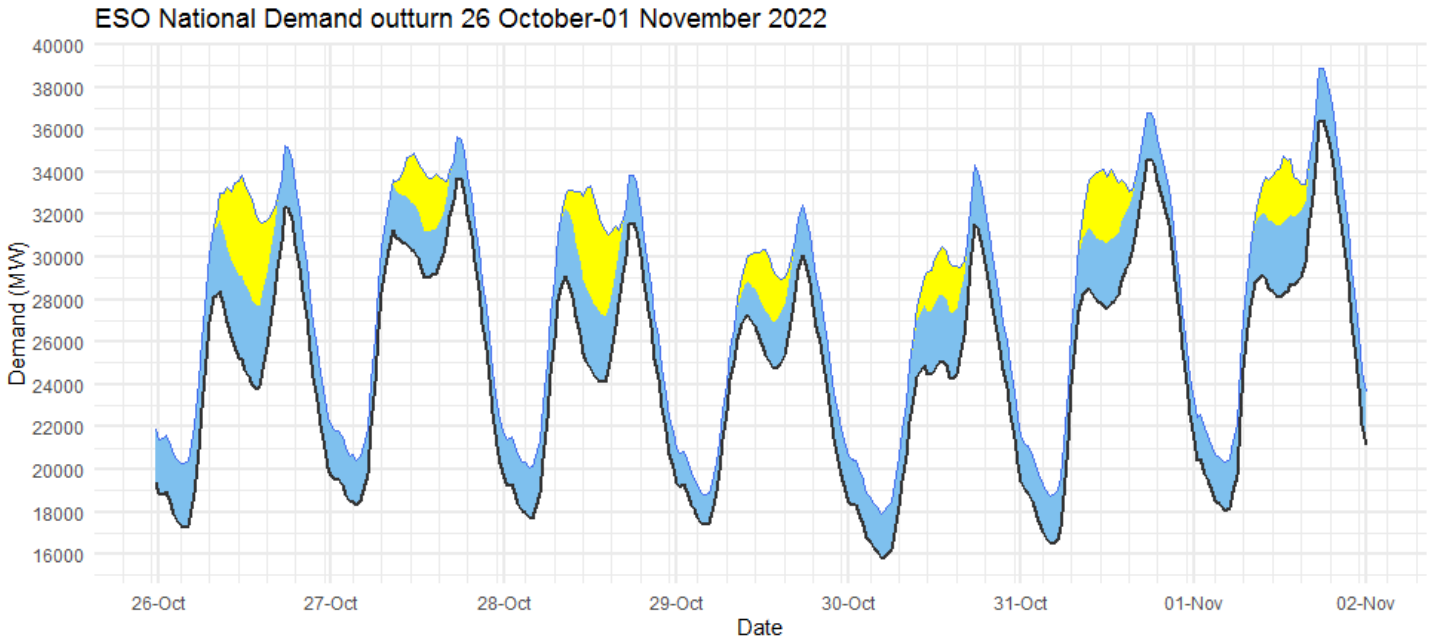
- Overview of obligations for Capacity Market Participants
- The definition of a System Stress Event and notification channels
- What to do after a System Stress Event has been announced

The webinar was well attended by over 160 people from the industry with plenty of questions raised.

Please find the slides and Q&As published on the EMR Delivery Body website.

EMR Portal - System-Stress-Event (emrdeliverybody.com)

Demand | Last week demand out-turn



		FORECAST (Wed 26 Oct)		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)
26 Oct 2022	Evening Peak	33.5	2.7	32.3	0.0	32.3	2.8
27 Oct 2022	Overnight Min	18.0	2.2	18.3	n/a	n/a	2.1
27 Oct 2022	Evening Peak	33.7	2.1	33.7	0.0	33.7	1.9
28 Oct 2022	Overnight Min	17.7	2.6	17.7	n/a	n/a	2.4
28 Oct 2022	Evening Peak	32.3	2.5	31.6	0.0	31.6	2.3
29 Oct 2022	Overnight Min	18.4	1.6	17.4	n/a	n/a	1.4
29 Oct 2022	Evening Peak	30.1	1.4	30.1	0.0	30.1	2.4
30 Oct 2022	Overnight Min	15.9	1.9	15.8	n/a	n/a	2.1
30 Oct 2022	Evening Peak	32.4	2.3	31.5	0.0	31.5	2.8
31 Oct 2022	Overnight Min	17.0	2.0	16.5	n/a	n/a	2.2
31 Oct 2022	Evening Peak	37.4	2.3	34.6	0.0	34.6	2.2
01 Nov 2022	Overnight Min	18.4	1.9	18.1	n/a	n/a	2.3
01 Nov 2022	Evening Peak	37.8	2.3	36.4	0.0	36.4	2.5

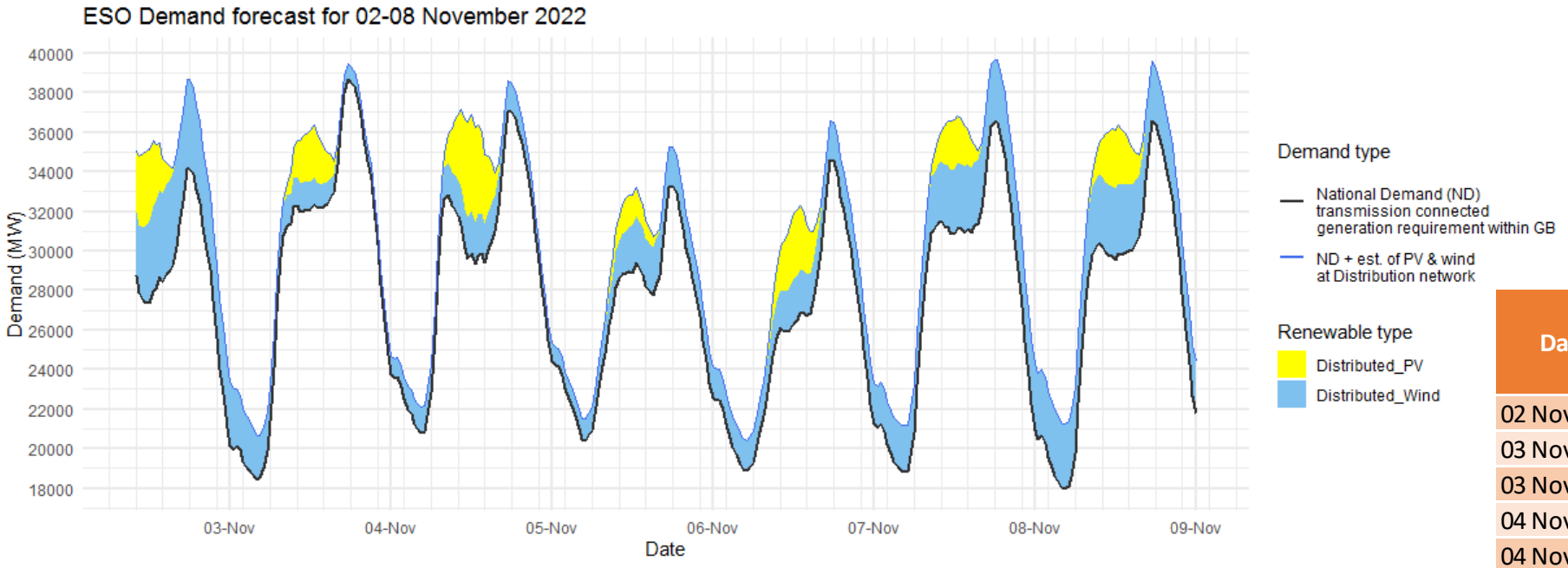
The black line (National Demand ND) is the measure of portion of total GB customer demand that is supplied by the transmission network.

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 | Week Ahead



		FORECAST (Wed 02 Nov)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
02 Nov 2022	Evening Peak	34.2	4.5
03 Nov 2022	Overnight Min	18.4	2.2
03 Nov 2022	Evening Peak	38.7	0.8
04 Nov 2022	Overnight Min	20.8	1.3
04 Nov 2022	Evening Peak	37.1	1.5
05 Nov 2022	Overnight Min	20.4	1.1
05 Nov 2022	Evening Peak	33.3	2.0
06 Nov 2022	Overnight Min	18.9	1.6
06 Nov 2022	Evening Peak	34.6	2.0
07 Nov 2022	Overnight Min	18.8	2.3
07 Nov 2022	Evening Peak	36.5	3.2
08 Nov 2022	Overnight Min	17.9	3.3
08 Nov 2022	Evening Peak	36.6	2.9

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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 2 November 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.

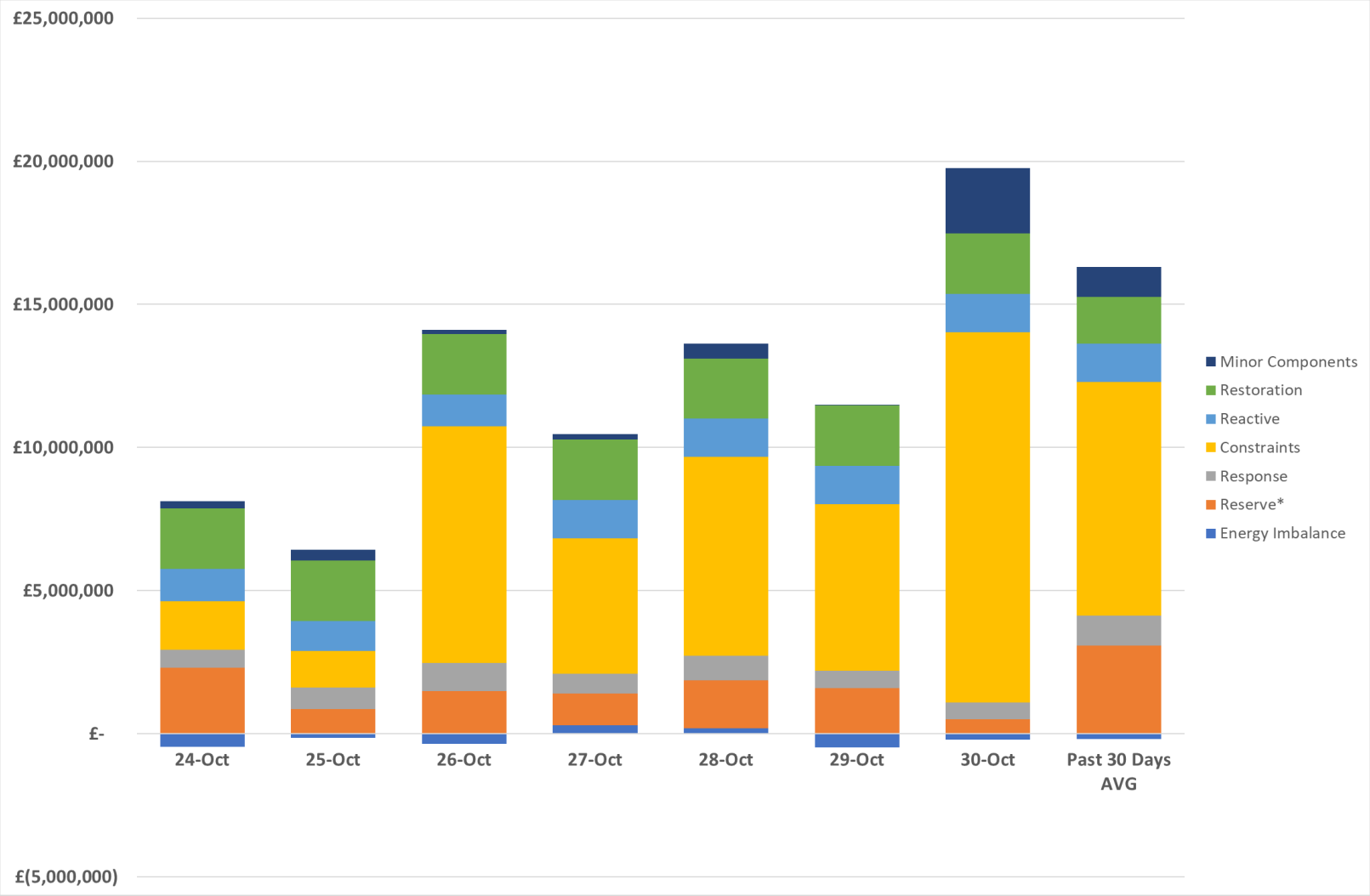
For lower (and potentially negative) surplus values, then this indicates operational margins could be tight and that there is a higher likelihood of the ESO needing to use its tools, such as issuing margins notices. We expect there to be sufficient supply available to respond to these signals to meet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

Margins are adequate for the next week.

Day	Date	Notified Generation (MW)	Wind (MW)	IC Flows* (MW)	Peak demand (MW)	Indicative surplus (MW)
Thu	03/11/2022	40808	2020	4020	38610	3650
Fri	04/11/2022	41282	7910	4400	37430	11510
Sat	05/11/2022	40532	10870	4020	33470	17110
Sun	06/11/2022	41177	10040	4020	34450	15950
Mon	07/11/2022	41602	16120	4020	37290	18090
Tue	08/11/2022	41602	15460	4020	36850	18300
Wed	09/11/2022	41602	14400	4020	38230	15880

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

ESO Actions | Category costs breakdown for the last week

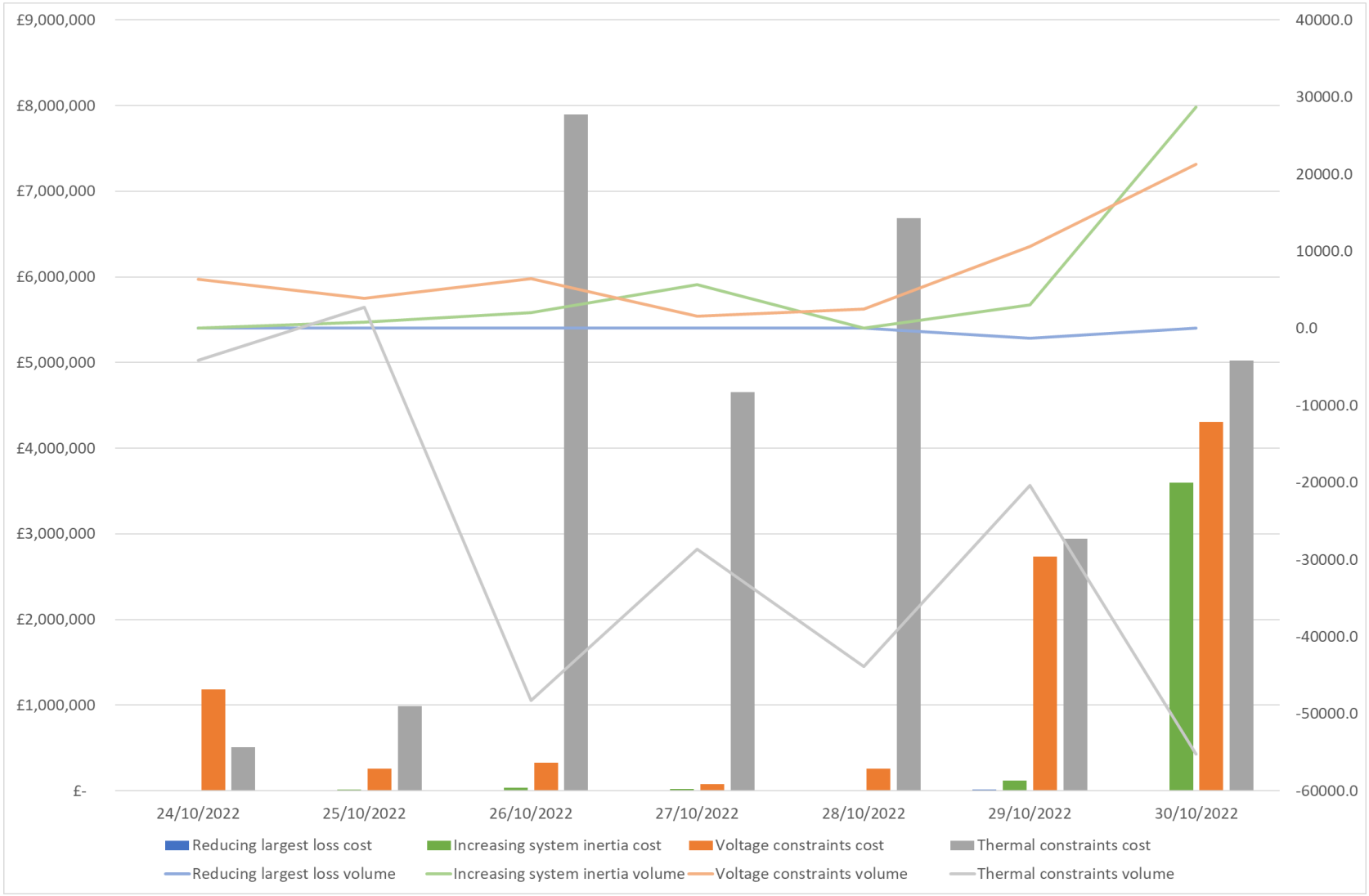


Date	Total (£m)
24/10/2022	7.7
25/10/2022	6.3
26/10/2022	13.8
27/10/2022	10.5
28/10/2022	13.6
29/10/2022	11.0
30/10/2022	19.5
Weekly Total	82.4

Constraints costs (mostly thermal) were the key cost component on Wednesday onwards. Reserve was the key cost component for Monday, and Restoration on Tuesday.

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

ESO Actions | Constraint Cost Breakdown



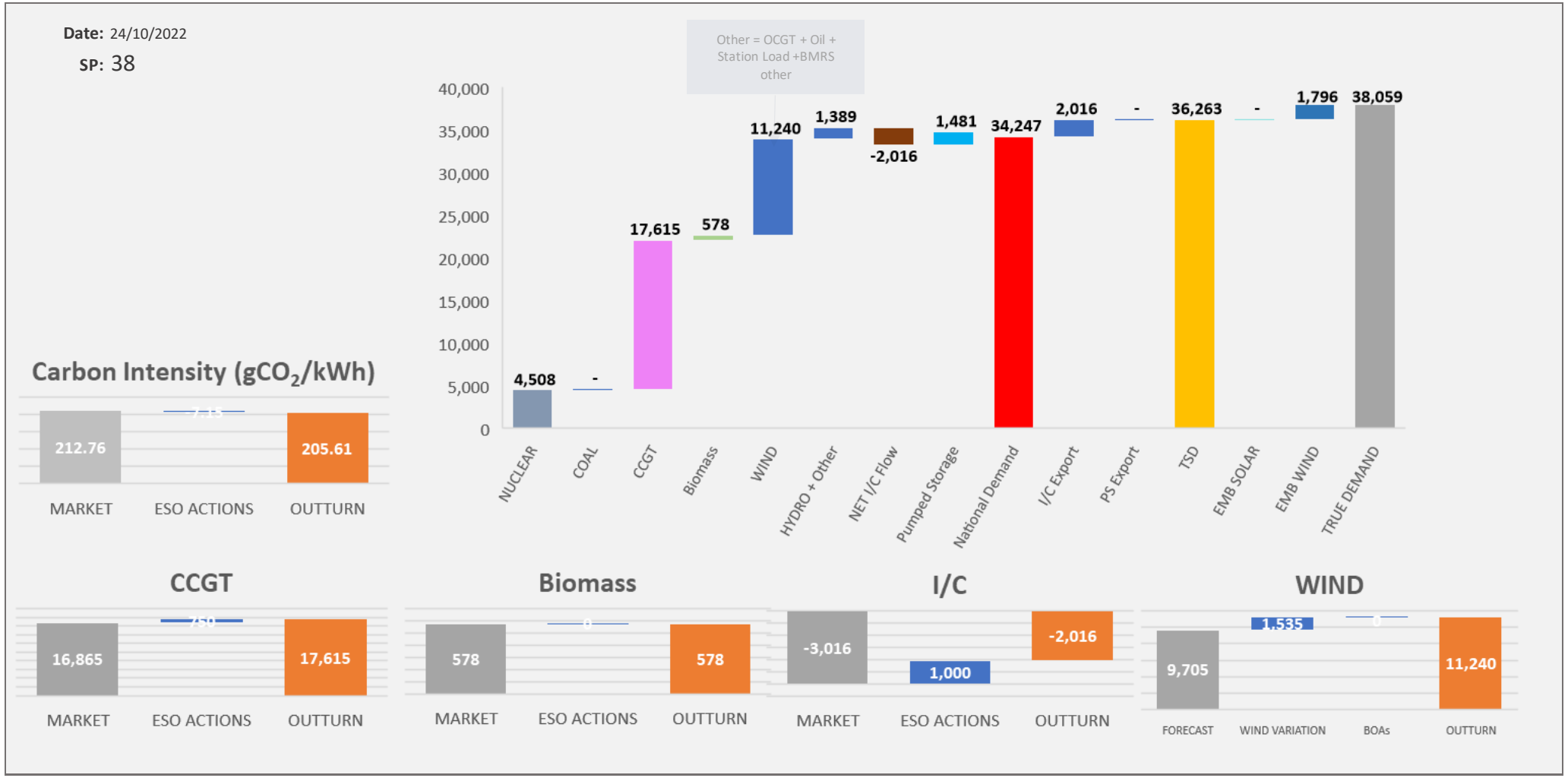
Thermal – network congestion
Actions required to manage Thermal Constraints throughout the week.

Voltage
Intervention to manage the voltage levels throughout the week.

Managing largest loss for RoCoF
Intervention required to manage largest loss on Saturday.

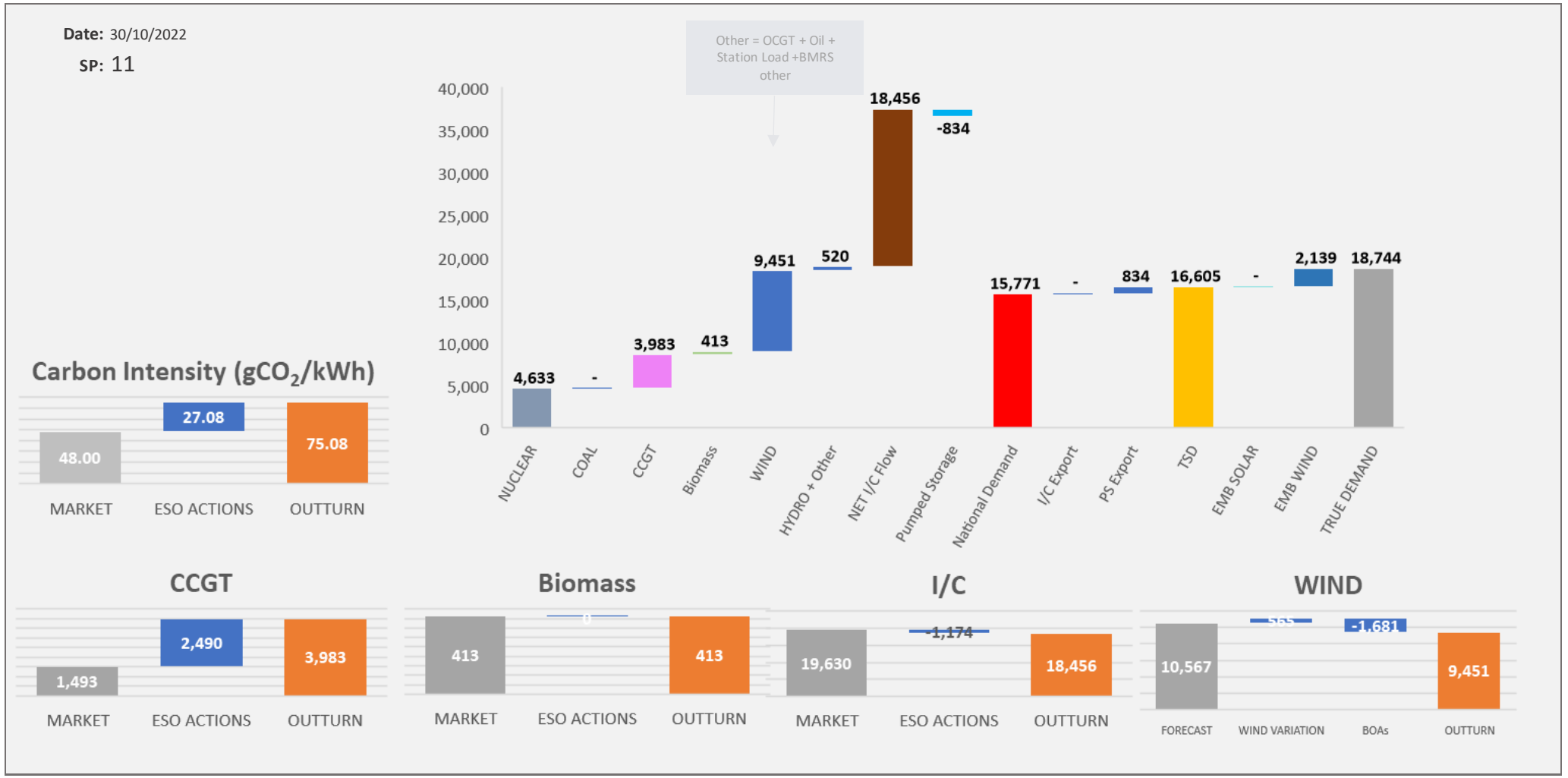
Increasing inertia
Intervention required to manage system inertia on Wednesday, Thursday, Saturday and Sunday.

ESO Actions | Monday 24 October– Peak Demand – SP spend ~£72k



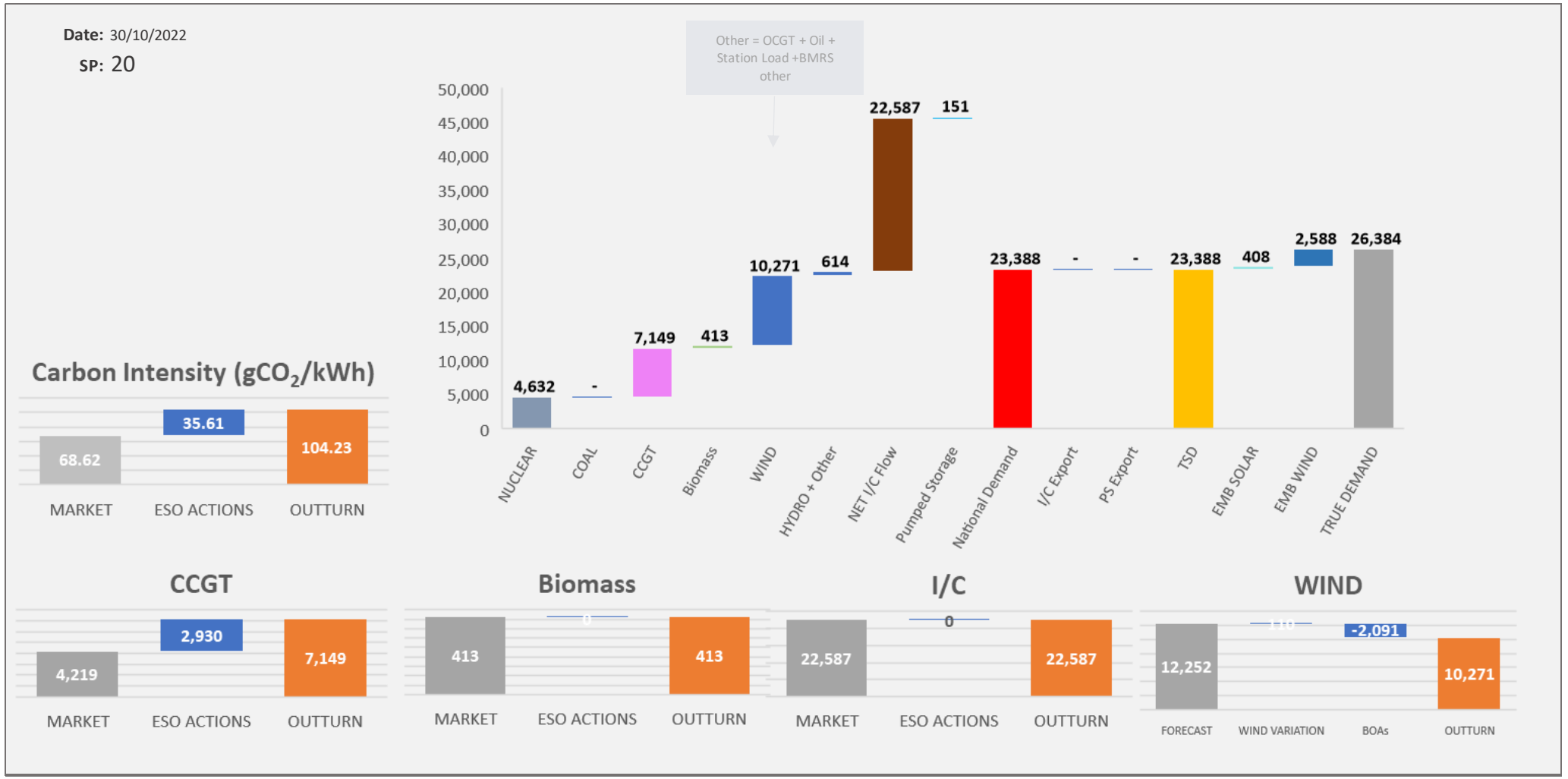
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Sunday 30 October – Minimum Demand – SP Spend ~£554k



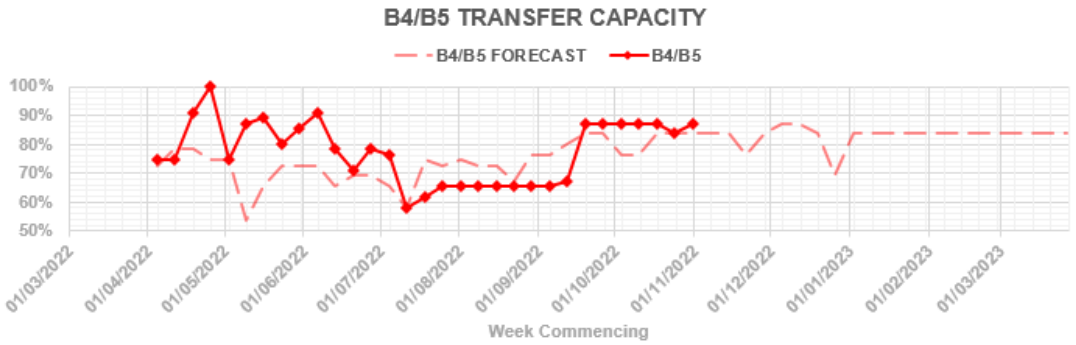
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

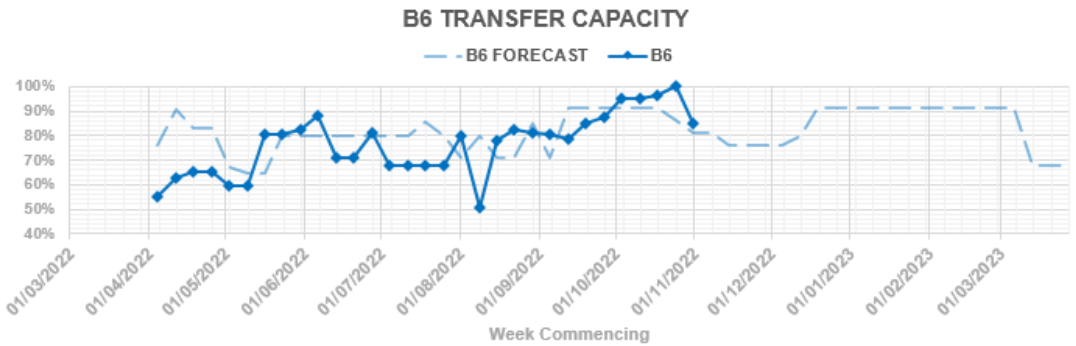
ESO Actions | Sunday 30 October – Highest SP Spend ~£774k



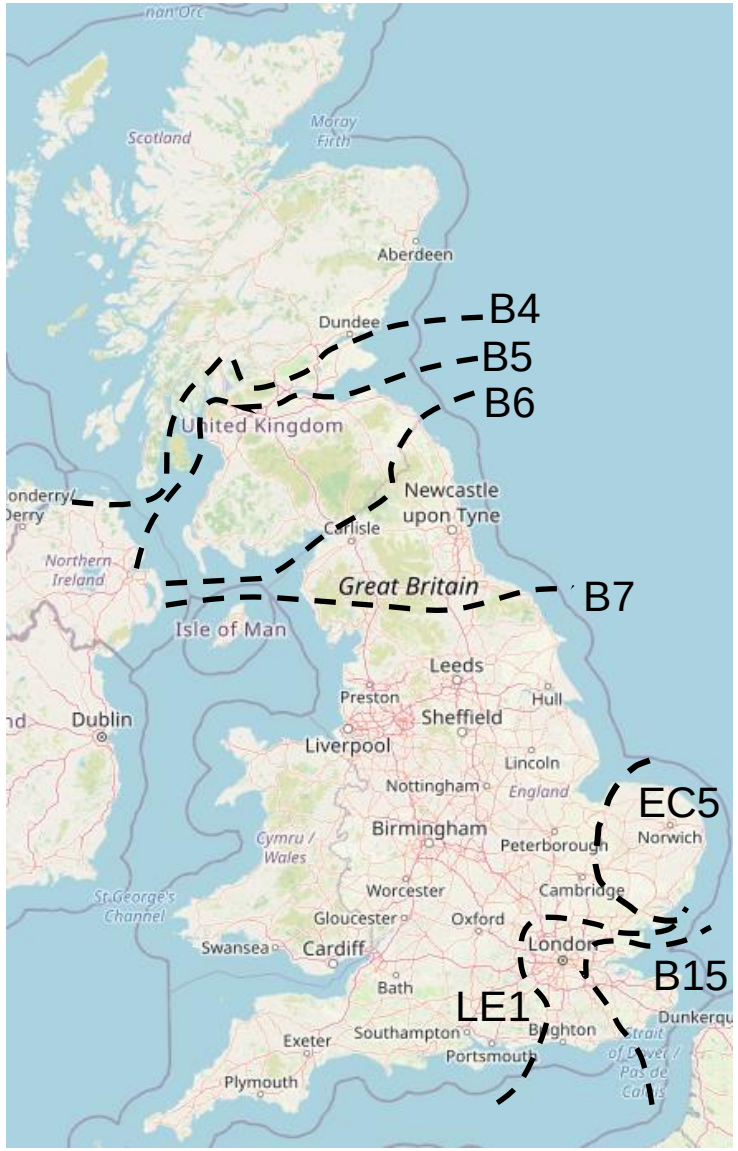
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

Transparency | Network Congestion



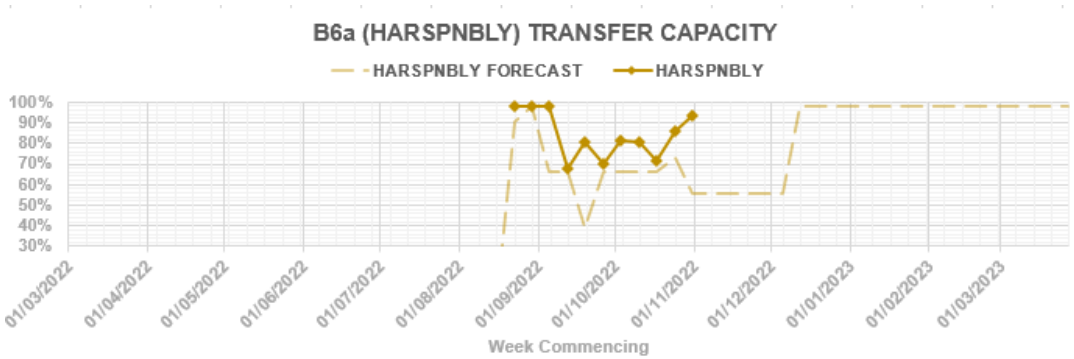


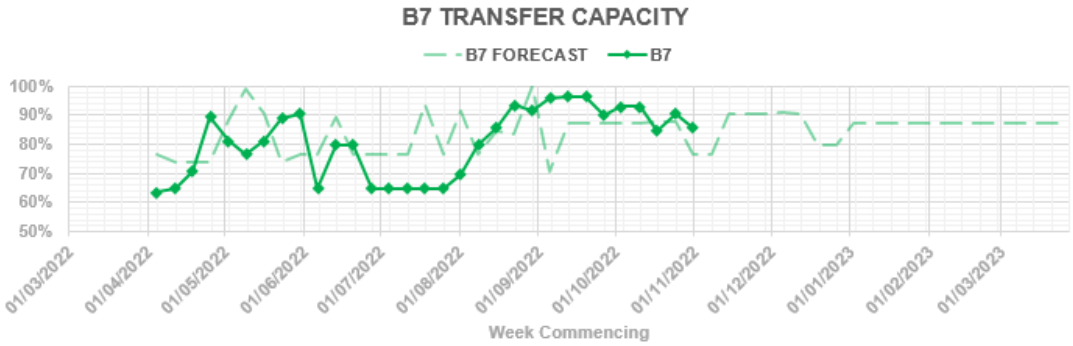
Boundary	Max. Capacity (MW)
B4/B5	2750
B6	5600
B6a	5850
B7	8500
LE1	8250
B15	7500
EC5	5000



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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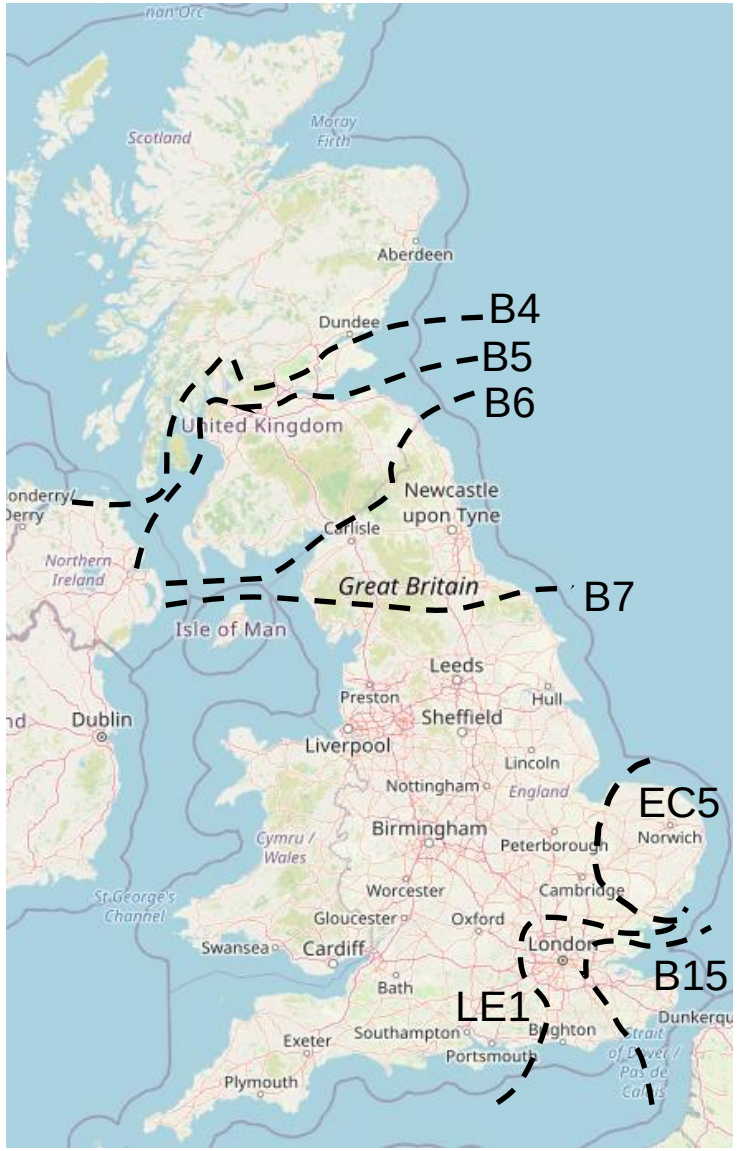

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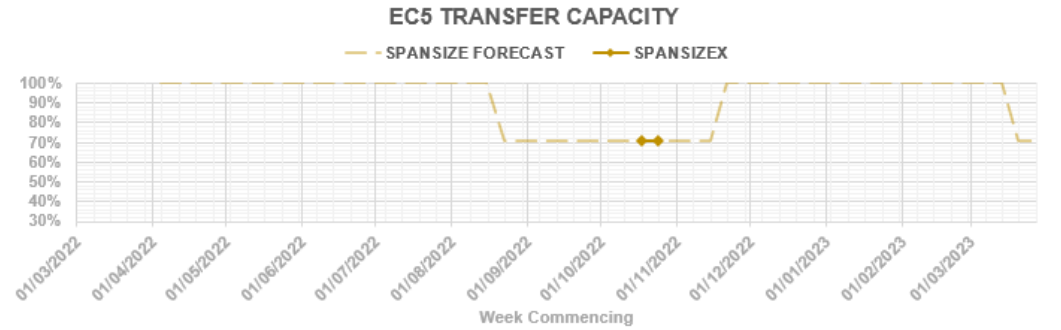

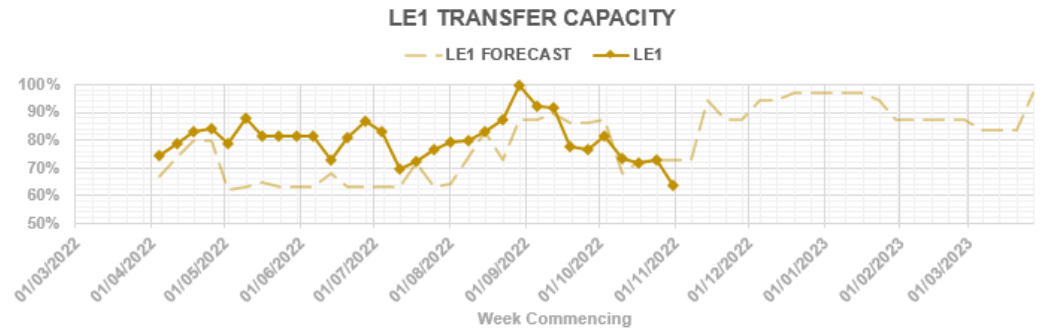

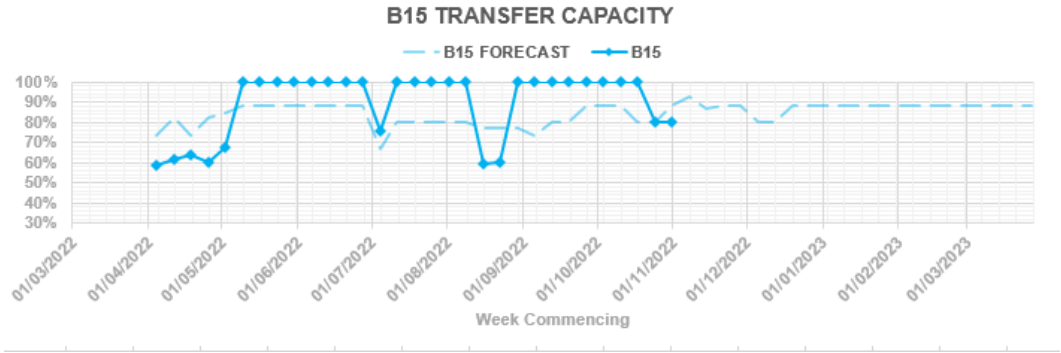

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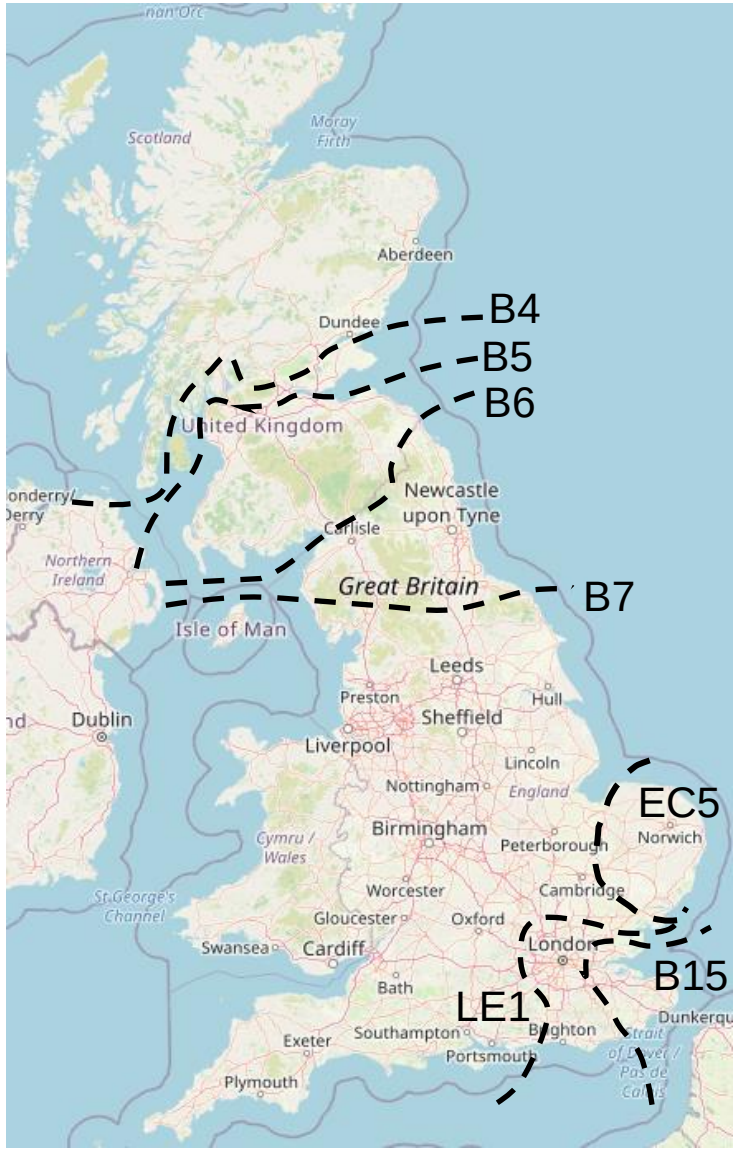

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https://data.nationalgrideso.com/data-groups/constraint-management

Deep Dive into 1 October system operations

- **Q1: On 1/10 Ratcliffe on Soar 2 was activated at 8000£/MWh even though the wind level was above 12 GW and on a Saturday. Can you comment on the reason for the high activation?**
- **Q2: it would be good to understand why there was £5m of inertia costs on 1st Oct Also, why was the B4/5 capacity only at 60% - were they for outages? And if yes, were they planned ?**

Challenging system conditions:

High wind >17GW nothing unusual there, however….

Demand <17GW (at 1B minimum) - it was a weekend

Many active constraints driven by outages on the system (many planned, some not)

Short answers are

- A1: Ratcliffe was bought at ≈£250/ MWh following a period of warming priced at £8000 / Hr to provide the option for MW later (after the warming and any subsequent hot-standby period).
- A2: With underlying system conditions not providing sufficient levels of inertia action had to be taken to bring on additional BMUs. These additional sets were predominantly gas fuelled as no other economic solutions were available. These are tagged as system so don't feed into energy pricing.

https://data.nationalgrideso.com/system/system-operating-plan-sop/r/system_operating_plan_-_data_table

Sli.do code #OTF

Deep Dive into 1 October system operations

timeline

Thermal constraints active across local boundaries – required bids (turn-down of generation) within specified areas, often least flexible

Voltage constraints are regional rather than local so have some flexibility and these are solved next utilising a variety of solutions

Once these geographical restrictions are solved *then* address any shortfall in **inertia** as this can be provided anywhere on the system

Review against previous Deep Dives into thermal, voltage and inertia

Since previous deep dives into constraints we have:

….. commissioned more BMUs into B6 inter-trip scheme

…. introduced new solution utilising a TO directly enacting system solution

….we have introduced new inertia products which are now delivering

1 October was an expensive day with many system operator interventions required to maintain system security as well as balance energy under onerous system conditions but many recent developments meant this cost was significantly reduced

Previous weeks questions

Q: "inextricably linked with the Winter Contingency Contracts"... isn't really an answer (at least not one the whole audience will understand).

A: This is a follow on from a question received on 19 October 2022:

> Q: On slide 11, can you explain why there were "restoration" costs? What was happening on the system that caused this system requirement? And where on the system was this happening?
>
> A: It is a cost inextricably linked with the Winter Contingency Contracts

To clarify our reply: there are ongoing costs associated with the Winter Contingency Contracts which will be recovered over the period from 1 October 2022 to 31 March 2023. These additional costs are being included in the Restoration costs because this is the most closely applicable category.

Q: 3 days for £0 BOA's to be removed, why not just get the contracted coal to price at £99,999/MWh and you can sort out BM cashflows in settlement? At least within day cash

A: For the contingency winter contracts, we put forward our approach and went through industry consultation with no issues identified. We know that this approach means cashout pricing will need to be corrected and we expect that market participants will recognise this.

Questions outstanding we are still working on

Q: Just a follow up, for settlement, what if actual delivery of DFS is less than forecast, what goes into settlement and recalc of imbalance?

Q: Any update on ABSVD moving from R2 to SF runs?

Note: ABSVD: Applicable Balancing Services Volume Data. R2 and SF are data runs in the settlement process.

Advanced Questions

Q: Given the cost of constraints, is it possible to have a 'deep dive' on how boundary capacities are calculated? Even a session on a single boundary (e.g B6) would be useful. It could look at; what defines the thermal limit, what defines stability limit, why is total boundary capacity not sum of individual circuits, what are implications for service providers behind constraint (e.g when constraint is biting does the SO still consider them available for certain services (e.g. DC-High, DR-High)

A: We did a constraint management deep dive on 27 January 2021 and have since done some deep dives on how we reassess and increase these limits within control room timescales. We do not currently consider constraint limits in our procurement of frequency services, however we are reviewing the need for this and will explore this functionality as we develop our Enduring Auction Capability.

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

ESO