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

ESO Operational Transparency Forum

23 March 2022

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Introduction | Sli.do code #OTF

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

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

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

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

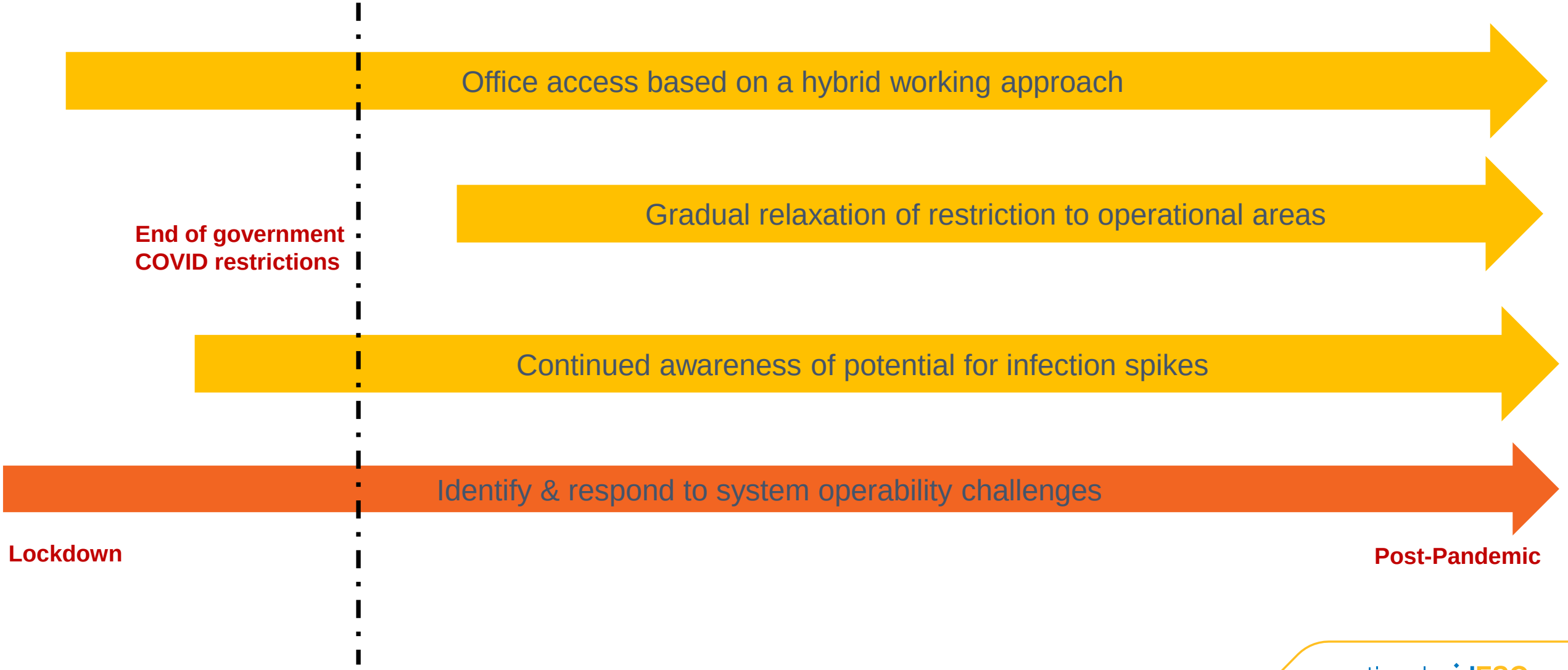
Regular Topics

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

Focus Areas

Dynamic Containment – Linear Order File

Protecting critical staff to maintain critical operations



Future forum topics

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

We have the following deep dives planned:

- Managing constraints in real-time – voltage, inertia, RoCoF

Questions outstanding from previous weeks

Q: Can you share the document for the waterfall decision making chart for BM actions?

A: This is in the pack from the webinar 17 February 2021:

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Transparency | NGESO Order of Action – Low demands

Everyday Actions	Order	Comments
Bid actions on all other flexibility in the BM, including Super-SEL	#1 based on cost	Forecast at Day Ahead volumes, actions taken in real-time
Selling power to the continent to create exports on the interconnectors	#1 based on cost	Forecast at Day Ahead, action taken at Day Ahead by National Grid ESO traders
Creating demand through pumping demand at pump storage sites	#1 based on cost	Managed within control timescales with actions taken within day

Enhanced Actions (if everyday actions are insufficient)	Order	Comments
Usage of ODFM service (out for consultation)	#2 based on cost	Enacted at day ahead based on forecasts of other actions
Issuing an NRAPM and flag as alert status on the ENTSO-E transparency platform	#3	Issue if there is a requirement remaining after taking the above actions. Managed within control timescales with action taken within day
Taking additional actions obtained through NRAPM	#4	Managed in real time

Emergency Actions	Order	Comments
Emergency Instruction to Transmission connected generation	#5 (can only be done following #2)	Unlikely to offer a capability due to actions already taken, the ESO will not EI a unit we have instructed on
Emergency Instruction to DNO to disconnect DER	#5	GC mod in progress

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Questions outstanding from previous weeks

Q: Last week there was ca. £4m costs to increase system inertia. Why are these costs still being incurred? Certainly, previous suggestion was that new operating regime (e.g. lower minimum inertia & increased RoCoF tolerance) would limit need to increase system inertia especially in Winter

A: The minimum inertia levels were not changed through the first version of the FRCR and remain at 140GVA, if the market provided inertia is below this level then we need to take action to address. Maintaining the minimum level will typically involve less actions in the winter due to higher demands and more synchronous generation on the system.

As a result of the FRCR we now allow a RoCoF loss following a BMU-only event where we can contain the total frequency deviation to 49.2Hz.

Overall, the FRCR is delivering a net reduction in frequency response spend by formalising the balance between the cost of securing the system and which risks are required to be secured operationally.

Our midyear report provides some further context on the savings associated with FRCR.
https://www.nationalgrideso.com/document/215871/download

Q: The boundary capacities and predicted flows for each SP at day ahead stage are available to download from the Data Portal, but the actual flows are not (though some can be viewed live: https://extranet.nationalgrid.com/RealTime). Can you please publish the actual values alongside the predictions? Thanks

A: We do not at present, plan to publish all real time flows of power on the transmission system. The data would always show the flows after actions taken by the ENCC to manage constraints and other system requirements. The real time flows will always be below the constraint limits.

Questions outstanding from previous weeks

Q: Knowing how much wind was connecting in Scotland under Connect and Manage the plan was to build 4GW of Transmission by 2018 (4 boot straps) but this never materialised despite constraint costs increasing costing consumers £2bn of unnecessary cost. Why, & where was the mistake, by who, ESO or Ofgem?

A: The ESO-led Network Options Assessment annually recommends which transmission investments should be taken forward by the TOs to meet the system needs. The decision is based on comparing the forecast cost of managing constraints with the CAPEX cost of reinforcements. The inputs to the NOA are the Future Energy Scenarios – which are reflective of Government policy, which has significantly increased in its green ambition in recent years.

The first NOA in 2016 gave a "Proceed" signal for "Eastern subsea HVDC Link Peterhead – Hawthorn Pit" connecting in 2023. In NOA 2016/17 the signal was enhanced for E4DC Eastern subsea HVDC Link from Peterhead to Hawthorn Pit, and E2DC Eastern subsea HVDC Link from Torness to Hawthorn Pit both in 2024. In the most recent NOA we have recommended 4 HVDC links plus onshore reinforcements for north to south flows.

The ESO provides recommendations about what is required through the NOA – and we have been doing so since the first NOA for the Eastern bootstraps. Ultimately the decision about what is built and funded, and the responsibility for delivery lies with the relevant Transmission Owner and Ofgem.

Q: Back to Mat, could you publish boundary capacities as a % of the maximum capacity? The way it is presented now is misleading

A: Maximum capacity should be the same as the highest forecasted limit. We will take this away to see what we can present to make it as clear as possible.

Questions outstanding from previous weeks

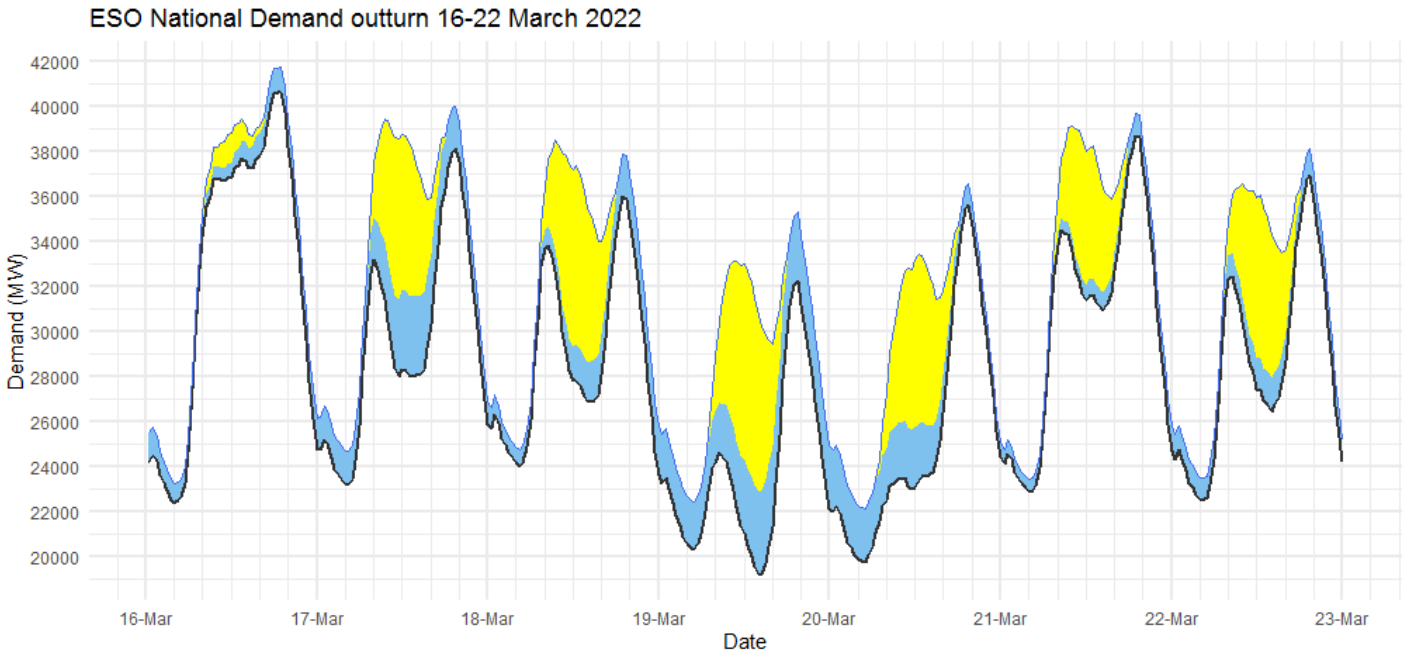
Outstanding questions we are still working on

Q: Clarity on BMU data: This is the data. A lot of wind units outturn data doesn't get published: Actual Generation Output Per Generation Unit (B1610) https://www.bmreports.com/bmrs/?q=actgenration/actualgeneration

Referring to: There are a lot of wind BMUs that don't submit outturn meter data. Why is that? And can we get this data published please?

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

Demand | Last week demand out-turn

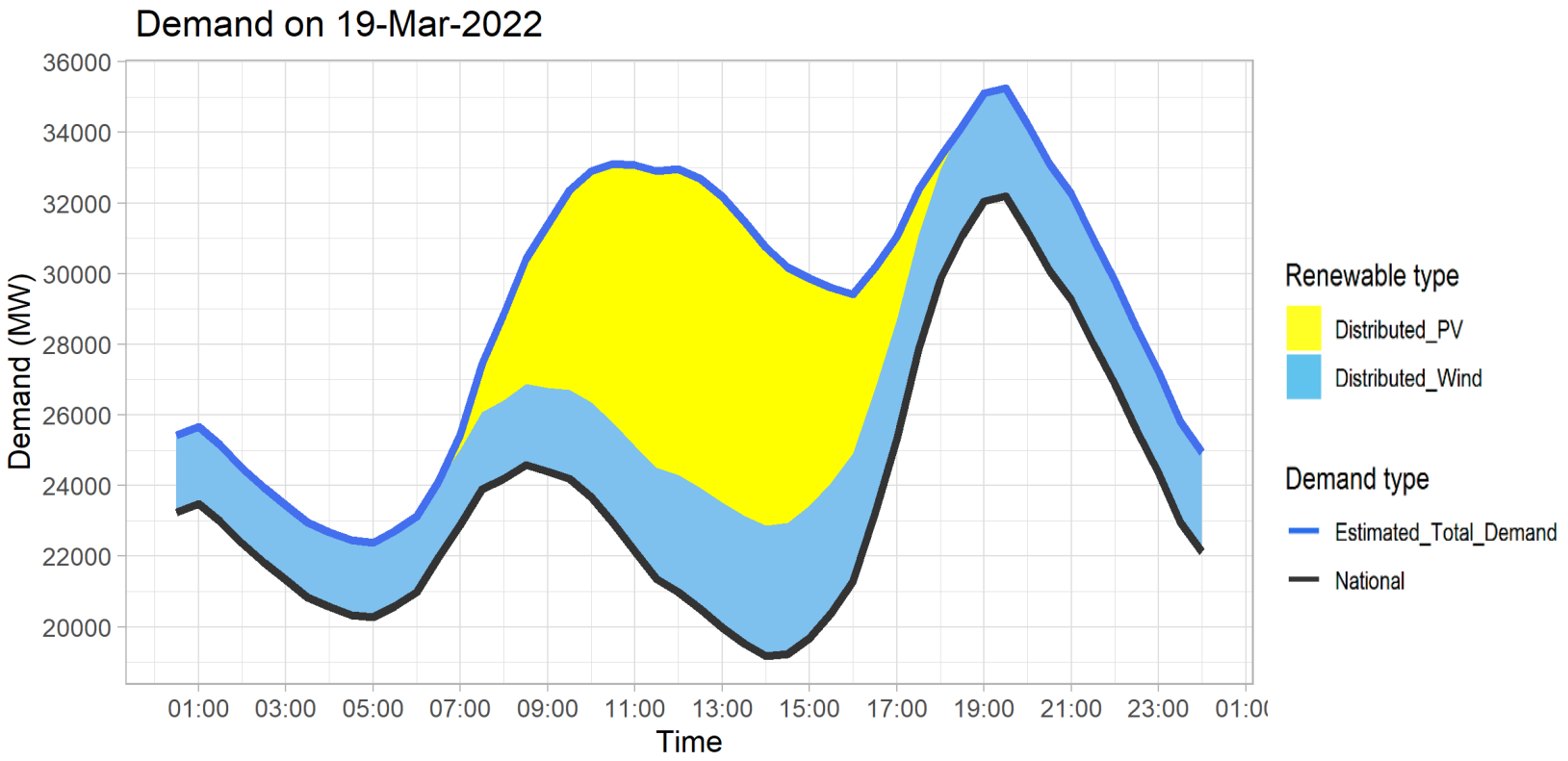


		FORECAST (Wed 16 Mar)		OUTTURN	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	National Demand (GW)	Dist. wind (GW)
16 Mar	Evening Peak	40.1	0.7	40.6	1.1
17 Mar	Overnight Min	22.5	1.3	23.2	1.5
17 Mar	Evening Peak	38.8	1.8	38.1	1.9
18 Mar	Overnight Min	23.5	0.8	24.0	0.7
18 Mar	Evening Peak	36.6	2.0	36.0	1.9
19 Mar	Overnight Min	20.7	1.9	20.3	2.1
19 Mar	Evening Peak	33.4	1.9	32.2	3.1
20 Mar	Overnight Min	20.7	1.5	19.7	2.4
20 Mar	Evening Peak	35.5	1.8	35.6	1.0
21 Mar	Overnight Min	21.6	1.6	22.8	0.6
21 Mar	Evening Peak	39.3	2.1	38.7	1.0
22 Mar	Overnight Min	22.3	1.6	22.5	1.0
22 Mar	Evening Peak	39.4	1.4	36.9	1.2

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

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

Demand | Saturday 19th March demand out-turn



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First time ever during GMT daytime national demand was lower than the overnight national demand.

Overnight min: 20.3GW at 05:00 (SP10)

Daytime min: 19.2GW at 14:00 (SP28)

Estimated generation from wind & solar generation at the distribution network at 14:00 (SP28):

wind: 3.7GW

solar: 7.9GW

Actions taken to manage it:

Trades on the interconnectors for downward regulation

Additional plant ordered for inertia & response reasons

Actions on wind generation for downward regulation

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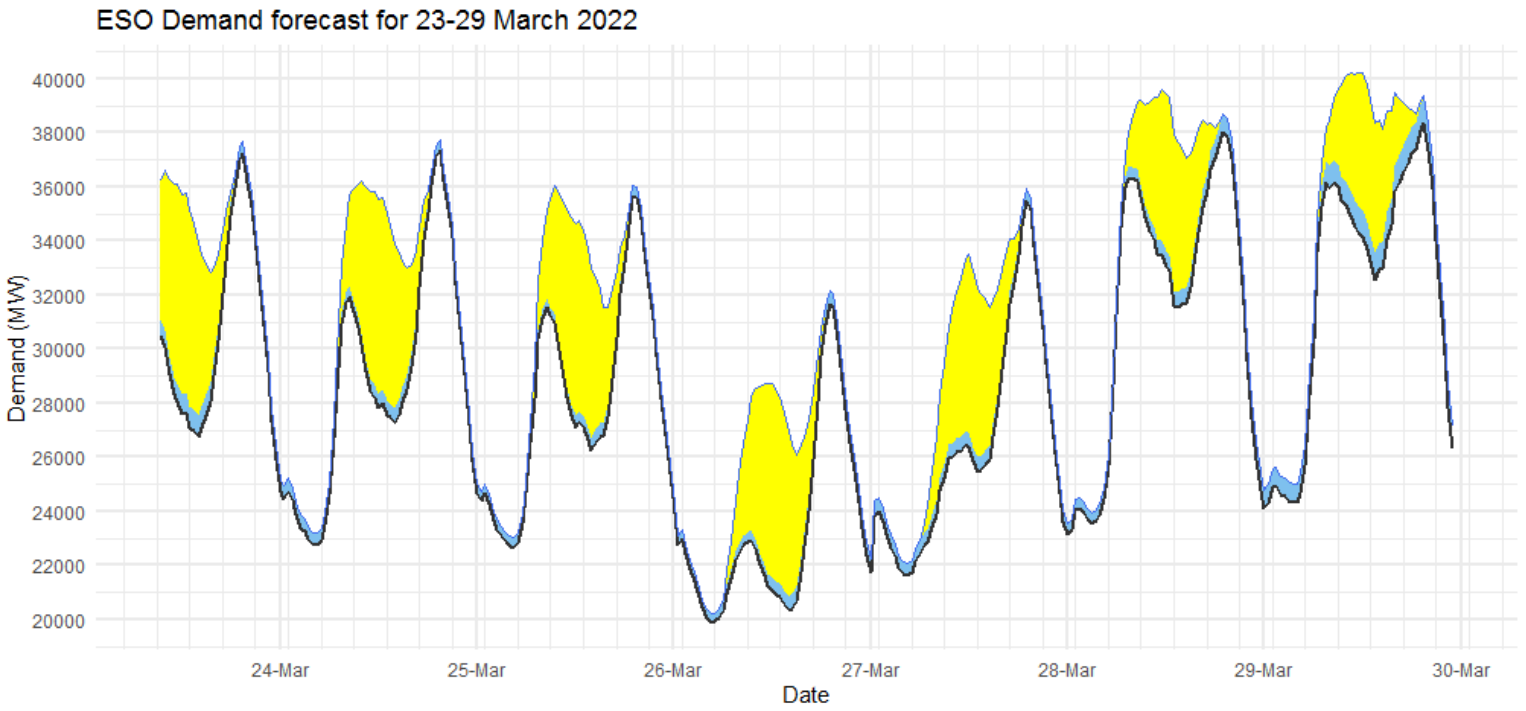
Demand | Week Ahead



		FORECAST (Wed 23 Mar)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
23 Mar	Evening Peak	37.2	0.5
24 Mar	Overnight Min	22.8	0.4
24 Mar	Evening Peak	37.3	0.4
25 Mar	Overnight Min	22.7	0.3
25 Mar	Evening Peak	35.6	0.4
26 Mar	Overnight Min	19.9	0.3
26 Mar	Evening Peak	31.7	0.5
27 Mar	Overnight Min	21.6	0.5
27 Mar	Evening Peak	34.5	0.5
28 Mar	Overnight Min	23.1	0.4
28 Mar	Evening Peak	37.6	0.7
29 Mar	Overnight Min	24.1	0.7
29 Mar	Evening Peak	37.4	1.0

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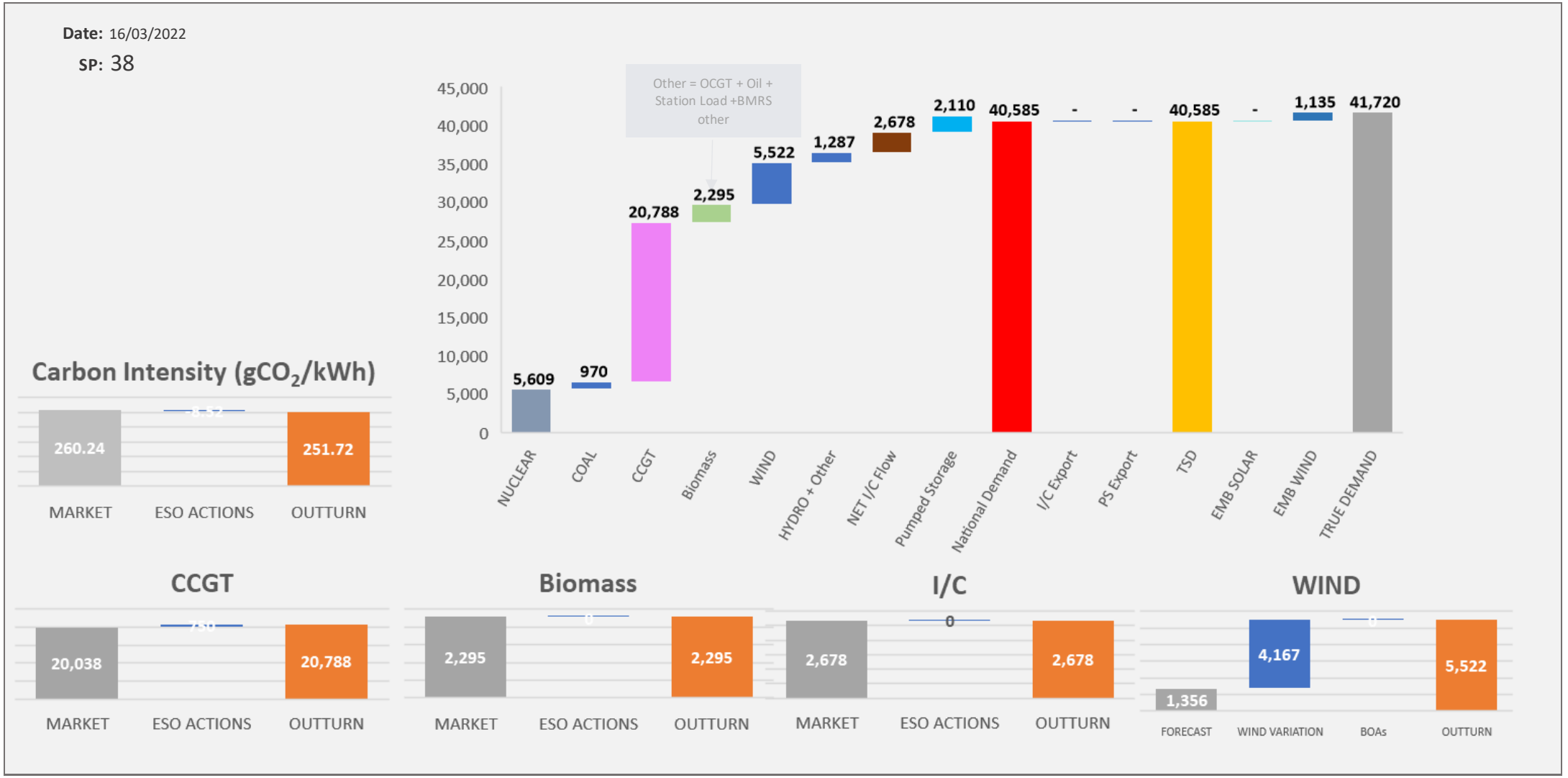
ESO Actions | Wednesday 16 March Peak

Date: 16/03/2022

SP: 38

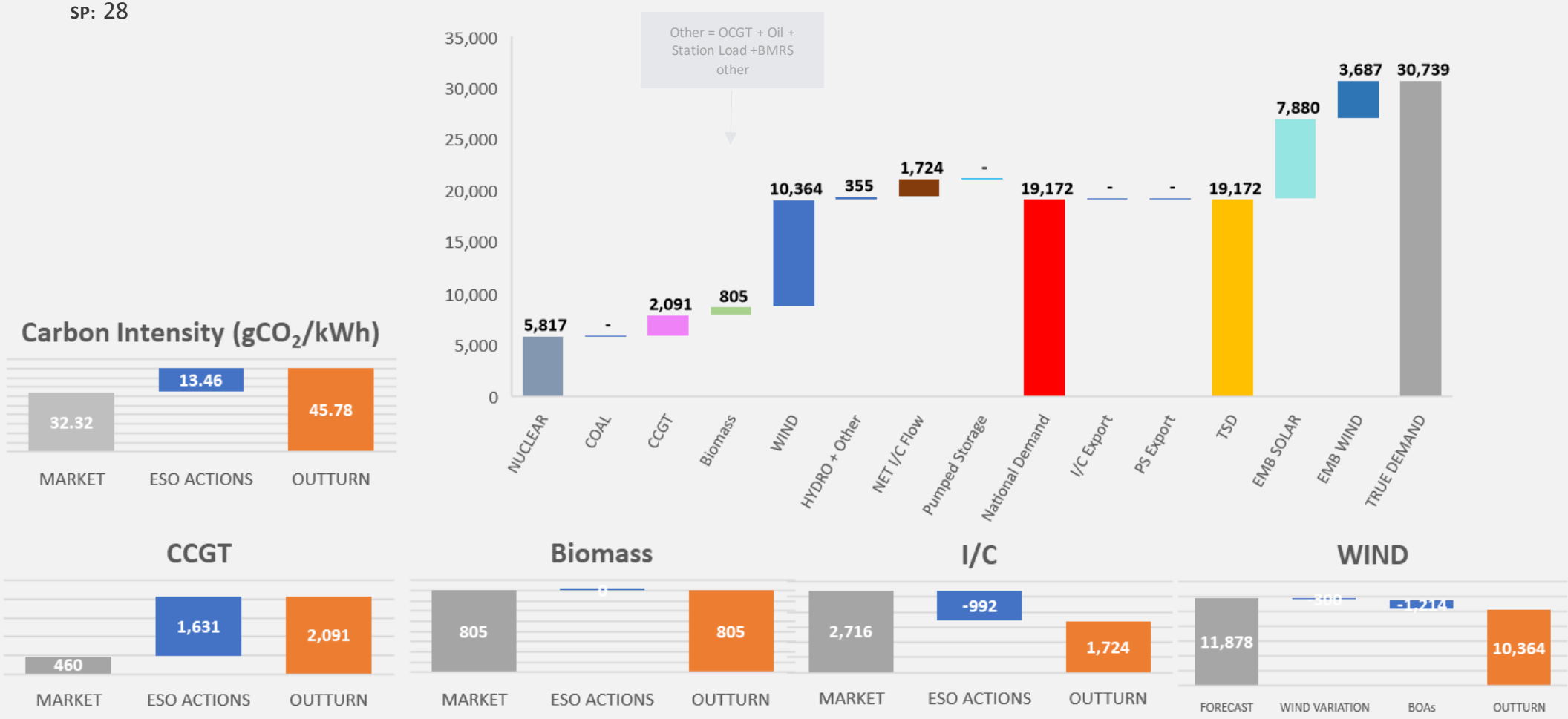


Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Saturday 19 March Minimum

Date: 19/03/2022

SP: 28

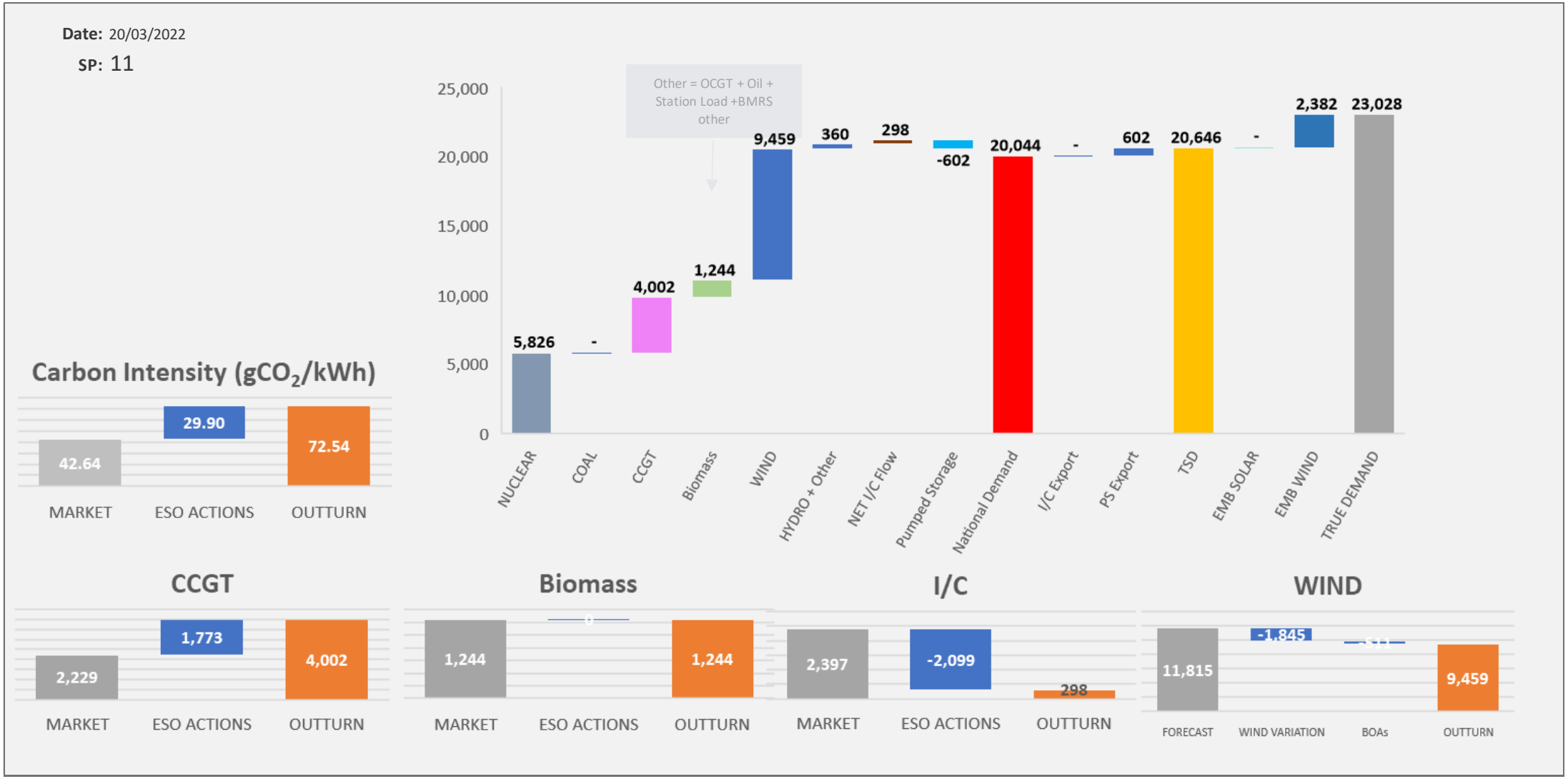


Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Sunday 20 March Highest Spend ~£0.5m

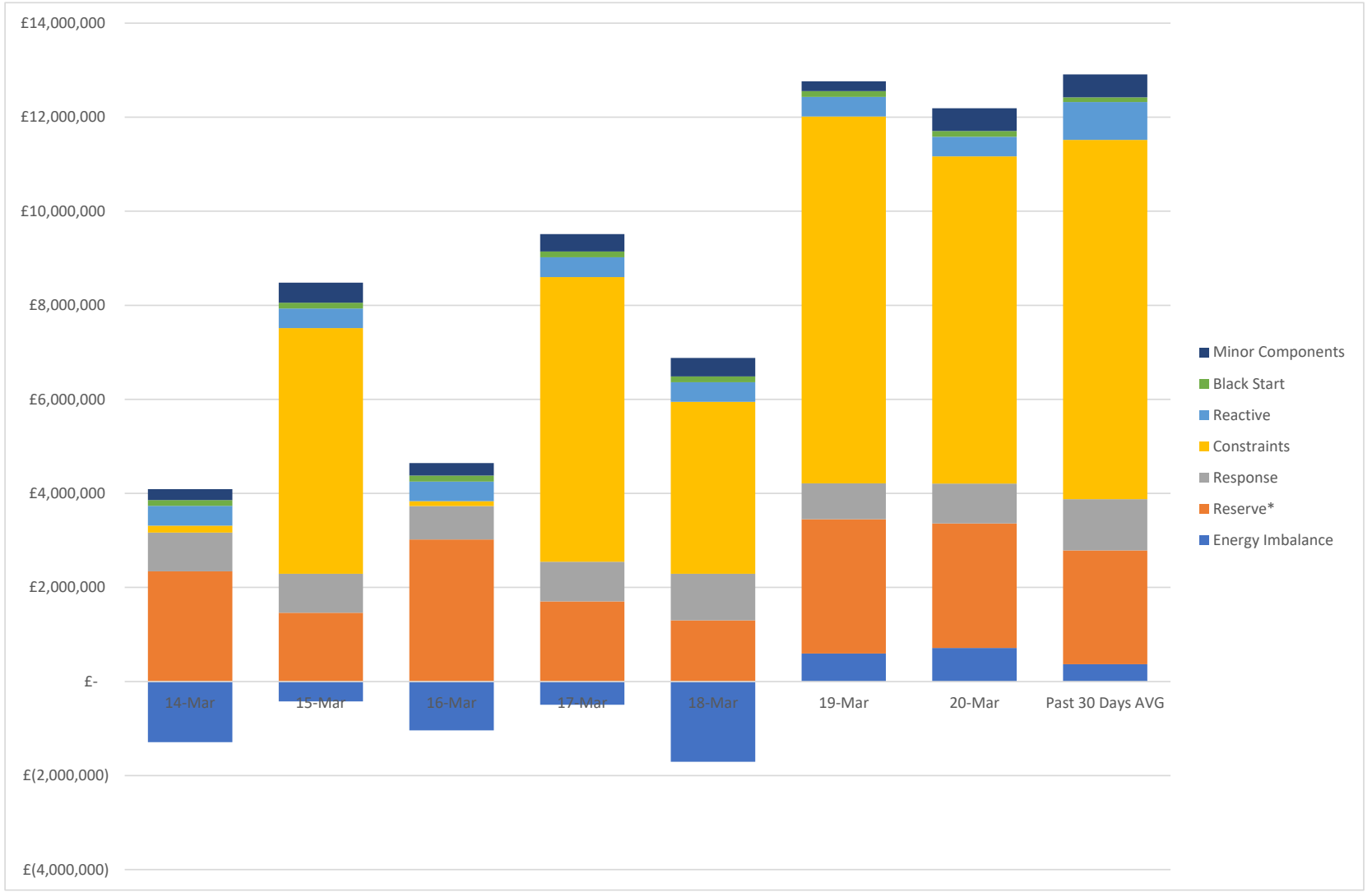
Date: 20/03/2022

SP: 11



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

Transparency | Category costs breakdown for the last week

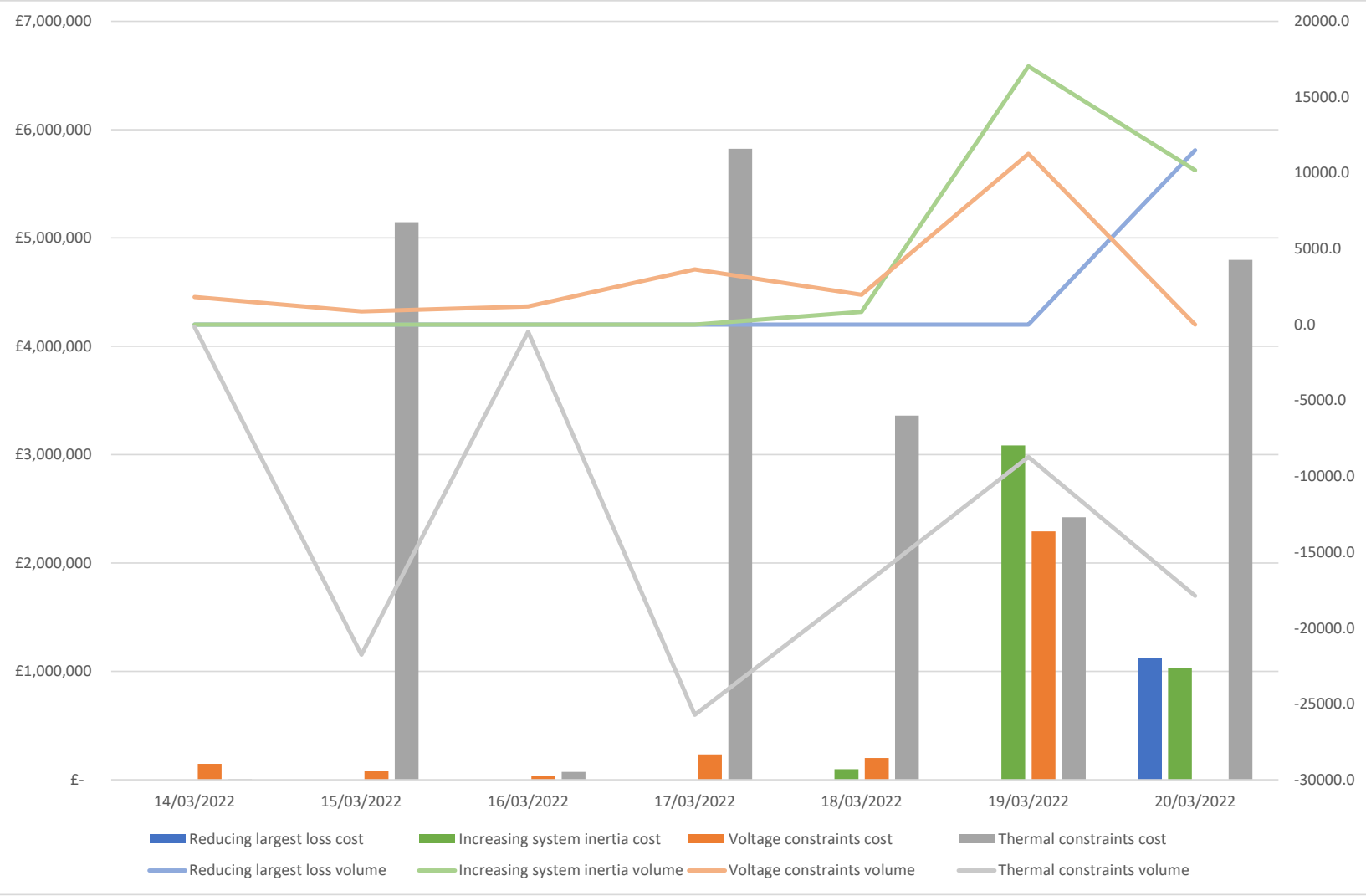


Day	£m
14/03/2022	**2.8**
15/03/2022	**8.1**
16/03/2022	**3.6**
17/03/2022	**9.0**
18/03/2022	**5.2**
19/03/2022	**12.8**
20/03/2022	**12.2**

The main component of the daily spend on most days were costs associated to constraint actions.

Past 30 Days Average is displayed in the chart

Transparency | Constraint Cost Breakdown



Thermal – network congestion
Actions were required to manage Thermal Constraints all days except Monday.

Voltage
Action taken to synchronise generation to meet voltage requirements were required all days except Sunday.

Managing largest loss for RoCoF
On Sunday intervention required to manage
largest loss on interconnectors

Increasing inertia
Between Friday and Sunday intervention required to increase minimum inertia

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, imports and peak demand. This is based on information available to National Grid ESO as of 23 March and is subject to change. It represents a view of what the market is currently intending to provide before we take any actions.

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.

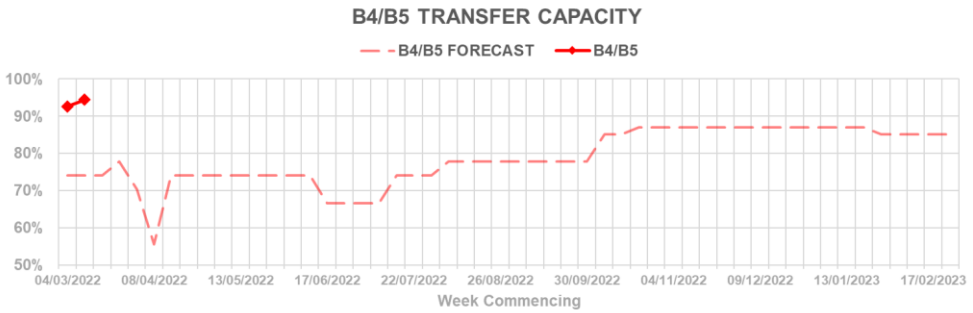
For higher surplus values, margins are expected to be adequate and there is a low likelihood of the ESO needing to use its tools. In such cases, we may even experience exports to Europe on the interconnectors over the peak depending on market prices.

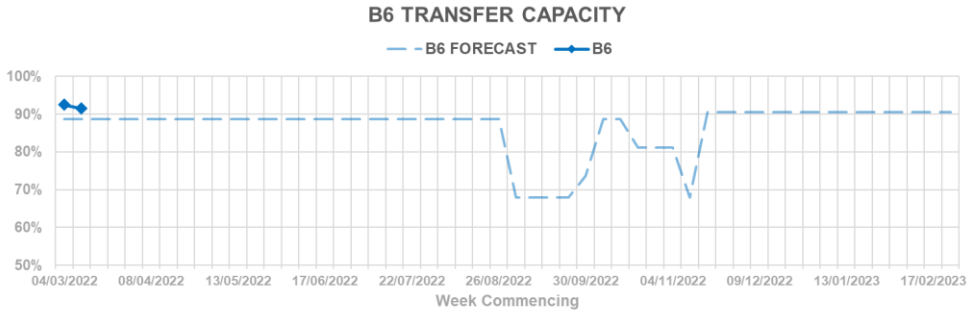
For lower (and potentially negative) surplus values, then this indicates operational margins could be tight and that there is a higher likelihood of the ESO needing to use its tools, such as issuing margins notices. We expect there to be sufficient supply available to respond to these signals to meet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

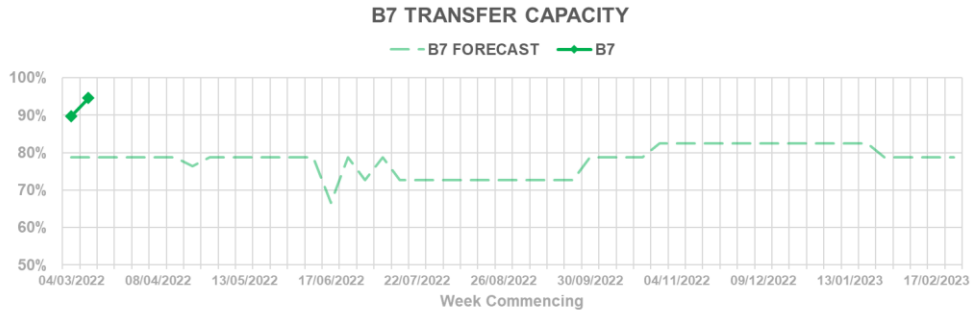
Margins are adequate for the next seven days.

Day	Date	Notified conventional generation (MW)	Wind (MW)	Interconnector availability (MW)	Peak demand (MW)	Indicative surplus (MW)
Thu	24/03/2022	41984	980	4294	38341	4625
Fri	25/03/2022	41287	898	4860	36380	6796
Sat	26/03/2022	40541	1003	4860	32377	9994
Sun	27/03/2022	41656	923	4860	35962	7326
Mon	28/03/2022	42640	1662	4860	38516	6192
Tue	29/03/2022	42640	3189	4860	39316	6623
Wed	30/03/2022	43174	2820	4860	40045	5387

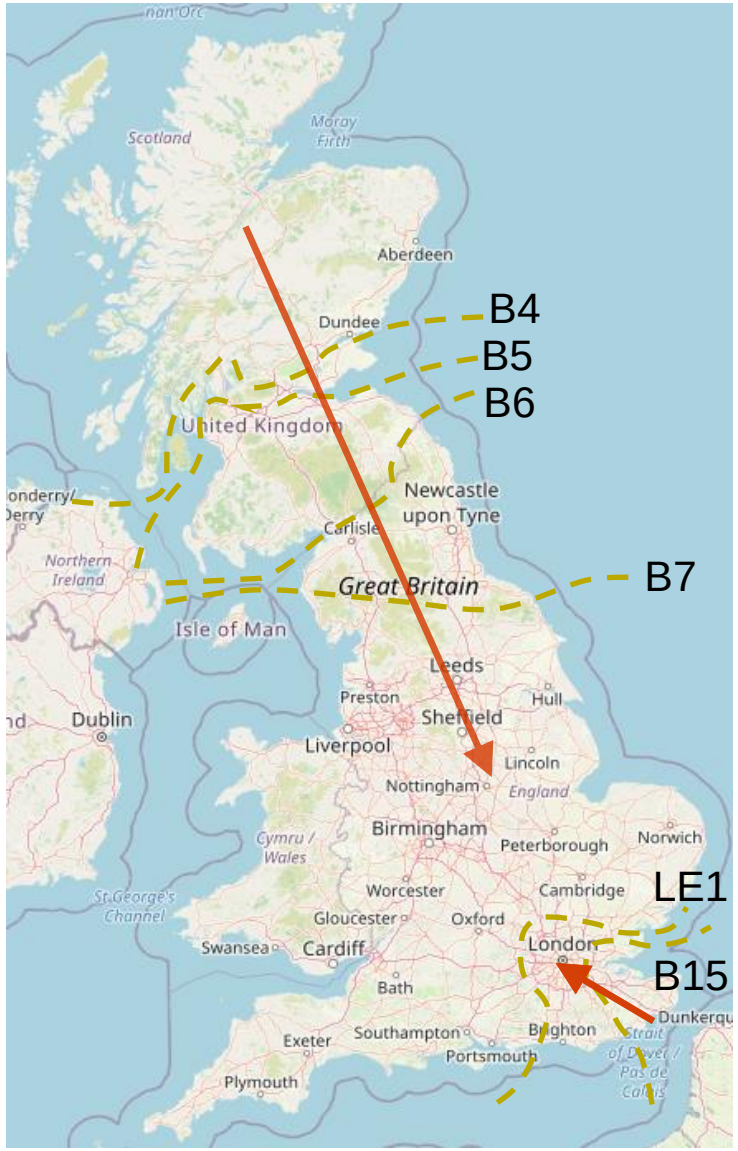
Transparency | Constraint Capacity





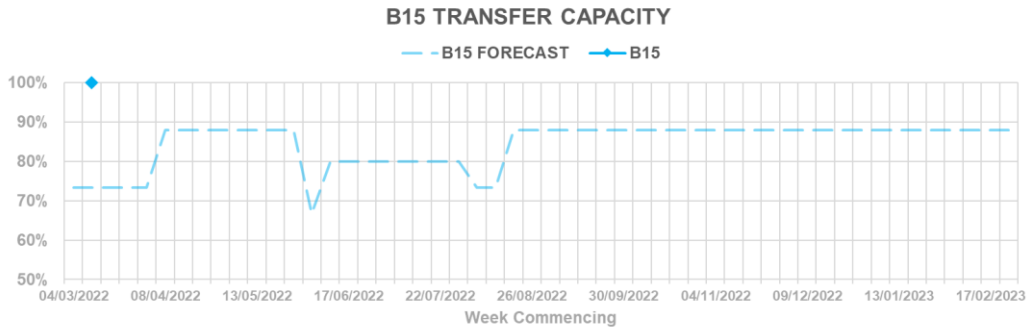


Boundary	Max. Capacity (MW)
B4/B5	2700
B6	5300
B7	8400
LE1	7000
B15	10000



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 | Constraint Capacity



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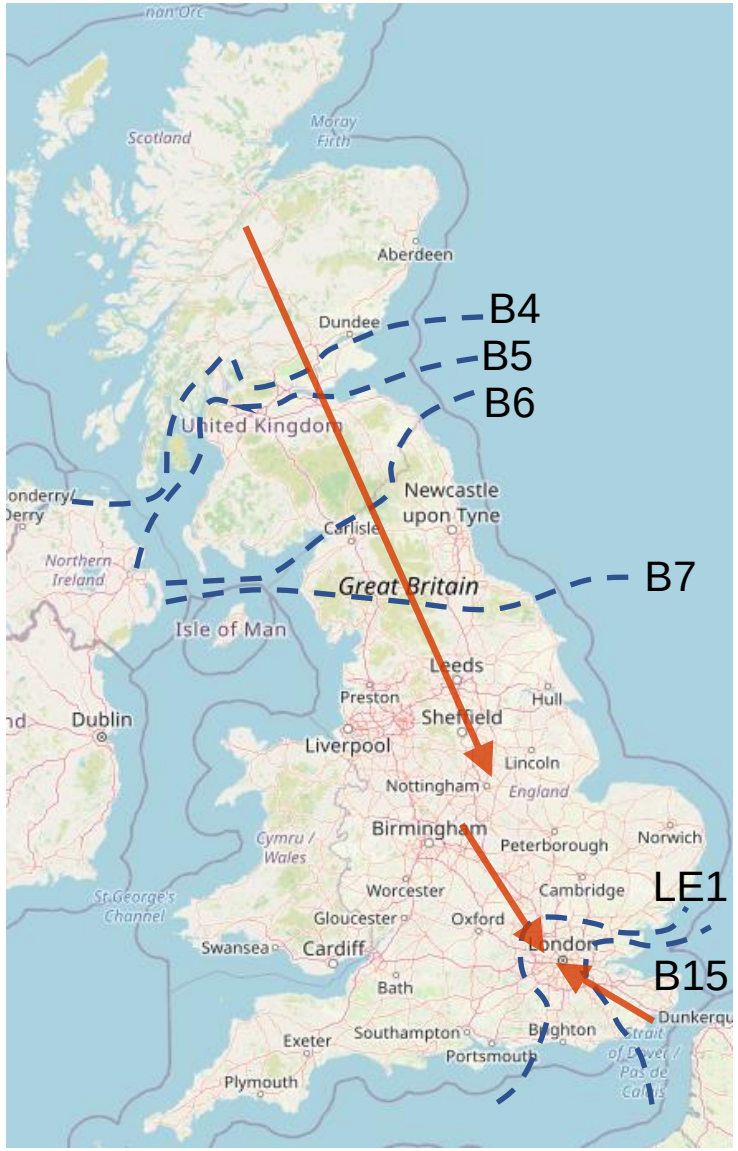

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Dynamic Containment – Linear Order file

Current format of “DC Linear Orders Master Data 2021-2022” on ESO Data Portal:

These fields describe the volume and price data of the ESO Buy Order

Table | Chart | Map

odl	TradeID	EFA	DeliveryStart	DeliveryEnd	ExecutedVolume	1P	1V	2P	2V	3P	3V	4P	4V
027 951	100000000272951	1	2022-03-19T23:00:00	2022-03-20T03:00:00	568	0	568	17	568	17	0	999.99	0
027 953	100000000272953	2	2022-03-20T03:00:00	2022-03-20T07:00:00	651	0	651	17	651	17	0	999.99	0
027 955	100000000272955	3	2022-03-20T07:00:00	2022-03-20T11:00:00	640	0	791	17	791	17	0	999.99	0

We will soon include additional fields in this file (“5P”, “5V”, “6P”, “6V”, etc.). The number of these fields that will be populated with data will vary from day to day, we do not expect to exceed “50P” and “50V”.

This change will be reflected in the downloadable .csv file, the API, and the .html table displayed on the data portal web page. We anticipate this change to take effect on Monday 28th March 2022.

After launch of Dynamic Regulation and Dynamic Moderation, the Dynamic Containment Datasets (i.e. Block Orders, Linear Orders, Results by Unit, and Results Summary) will also contain data records pertaining to the DML, DMH, DRL, and DRH products. This change will take effect from Friday 25th March 2022.

Dynamic Containment – Performance Monitoring

24 March 10:30-12:00

Over the past weeks the ESO has received valuable feedback on Dynamic Containment performance monitoring process. As a result of this feedback we will be hosting a webinar on the 24th March between 10:30 –12:00 where we will be presenting the changes that we have made to make the performance methodology clearer to providers of the service

The Agenda for the webinar will be as follows:

#	Agenda item
1	Introduction
2	High level walkthrough of the DC performance monitoring process
3	Explanation of why changes in the performance monitoring methodology were required
4	Example calculations for each service (DCL, DCH, DCLH) Demonstrate how the calculator is used
5	Live Q&A session with providers

If you are interested in attending the webinar , please email Sotiria.kordi@nationalgrideso.com and you will receive an invite.

5 Point Plan Update

In February 2021 the ESO announced a 5 Point Plan to look at ways to mitigate constraint costs.

On the **29 March 13:00 – 14:00** Julian Leslie (Head of Networks) will host an update webinar to run through the progress of the plan.

https://www.eventbrite.co.uk/e/eso-5-point-plan-update-tickets-296586948547

Details will be published in the ESOs Plugged In Newsletter as well.

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Audience Q&A Session

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

Q&A

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

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

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