

ESO Operational
Transparency Forum
13 April 2022

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

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
- Constraints

Focus Areas

- Optimising voltage constraints in real-time
- Dynamic Containment & Dynamic Regulation Dashboard

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 – inertia/ RoCoF

Questions outstanding from previous weeks

Q: Noting extreme prices in France on Monday, high French Q4 forward prices + Eleclink/IFA1 to full volume... what happens if GB market is tight at the same time as France, we are exporting max volume but ESO unable to trade that volume back? (ie no FR cap, or no one prepared to trade with you)

A: It will depend on what the rest of the market conditions are. We will have the option to trade on other interconnectors or resolve the issues via the Balancing Mechanism. If we are unable to resolve through these routes then normal system warnings/notices would be issues.

Q: Why do transmission assets not have to comply with REMIT obligations despite impact on price? Re the question about the Western Link, I accept the ESO does not own network assets and cannot provide info. However, can't the ESO work proactively with the transmission companies to ensure the info about network assets is published in some way?

A: REMIT is only applicable to Market participants and the TOs are not market participants. We have been working on a proposal around transparency of asset availability and are working with the Tos.

Q: How future Eastern links will be satisfactory to support the energy landscape change?

A: As more generation is built further away from historic sites and demand sites there is a requirement to increase network capacity and capability. The eastern links are part of a suite of works being delivered by Transmission Owners across GB to support the energy landscape change. If there's something more specific you were looking for please come back to us on box.NC.Customer@nationalgrideso.com

Questions outstanding from previous weeks

Q: Will FSO be less blasé around system risks from increased interconnection now it is no longer owned by a company who owns all the IC capacity?

A: We expect interconnectors to play an important role in a fully decarbonised power system, highlighted in our Future Energy Scenarios, helping to balance variations in renewable generation over wider geographical regions. Interconnectors also have a role to play in providing security to the GB electricity system. The ESO undertakes extensive modelling, including stress tests of conditions in Europe, such that GB energy consumers are unduly exposed to risks on energy security.

Q: Where can we find documentation on how the ESO works out its response requirements? It was mentioned in a webinar in October that you use an inertia forecast to calculate a RoCoF trigger level? Can you provide more info on how you calculate how many MWs you need to cover RoCoF loss please? Thanks!

A: We communicated the high level methodology in our industry consultation. You can review the webinar recording [here](#). We estimate how much DERs would disconnect at different ROCOF thresholds by considering the progress on the ALoMCP and the latest weather forecasts. Given the system conditions, including the expected inertia, demand and unit commitment, we calculate the largest expected loss (including the ROCOF trigger levels). Next, we calculate the largest loss than we can secure based on expected system conditions and active response contracts. This indicates how much extra response we need to match the expected loss.

Questions outstanding from previous weeks

Q: Is establishment of the FSO just BEIS trying to sidestep the responsibility for the overall integrity of Electricity Delivery, with its unique characteristics, which HMG has effectively held since the unbundling of the industry since 1/4/1989?

A: We all recognise climate change as the challenge of a generation and that decarbonisation of the energy system is integral to meeting it. Unparalleled change is required to meet this challenge and the creation of an expert, independent future system operator with responsibilities across both gas and electricity is a necessary first step in helping to address the challenge. We need to think differently and developing more low carbon, affordable and secure sources of energy has never been more critical. This creates the need for an organisation that can coordinate across the whole energy system to translate decarbonisation policy into immediate strategy and action.

Update on Oscillation event 15 February 2022

The National Grid Electricity System Operator (NGESO) Control Centre reported unexpected voltage oscillation events in the North of Scotland initiated at 13:50GMT, on 15 February 2022. Coincidentally, the oscillations occurred continuously until a Grid Code user went out of service that evening. NGESO investigated and placed an operational restriction on the 17 February on the units of a Grid Code user until they complete the investigation and submit a report to NGESO outlining what happened and what mitigation measures have been put in place. Until this has been resolved the units were Switched out of service. The Grid Code user has submitted the investigation report on 18 February 2022 and NGESO's compliance team were satisfied with the mitigation measures in place therefore the units could return to service on the 18 February 2022.

Questions outstanding from previous weeks

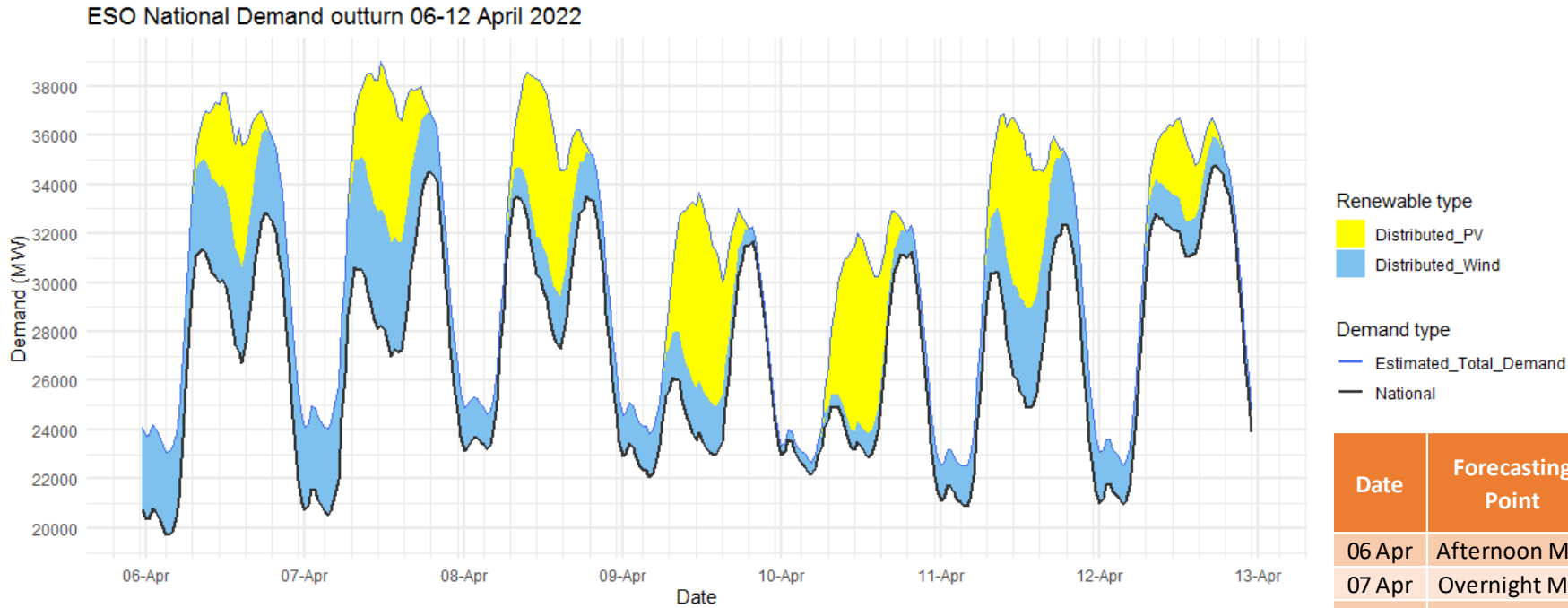
Outstanding questions we are still working on

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 e.g. bidding back wind?

Q: Can you please elaborate on the Emergency Instruction to BRITNED issued on 03/04/2022? How did this happen? What is the volume and price attached to this action? Shall we expect NIV and SIP to be reassessed for that SP in upcoming settlement runs?

Update on Oscillation event 4 April 2022 to follow

Demand | Last week demand out-turn



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.

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

Renewable type

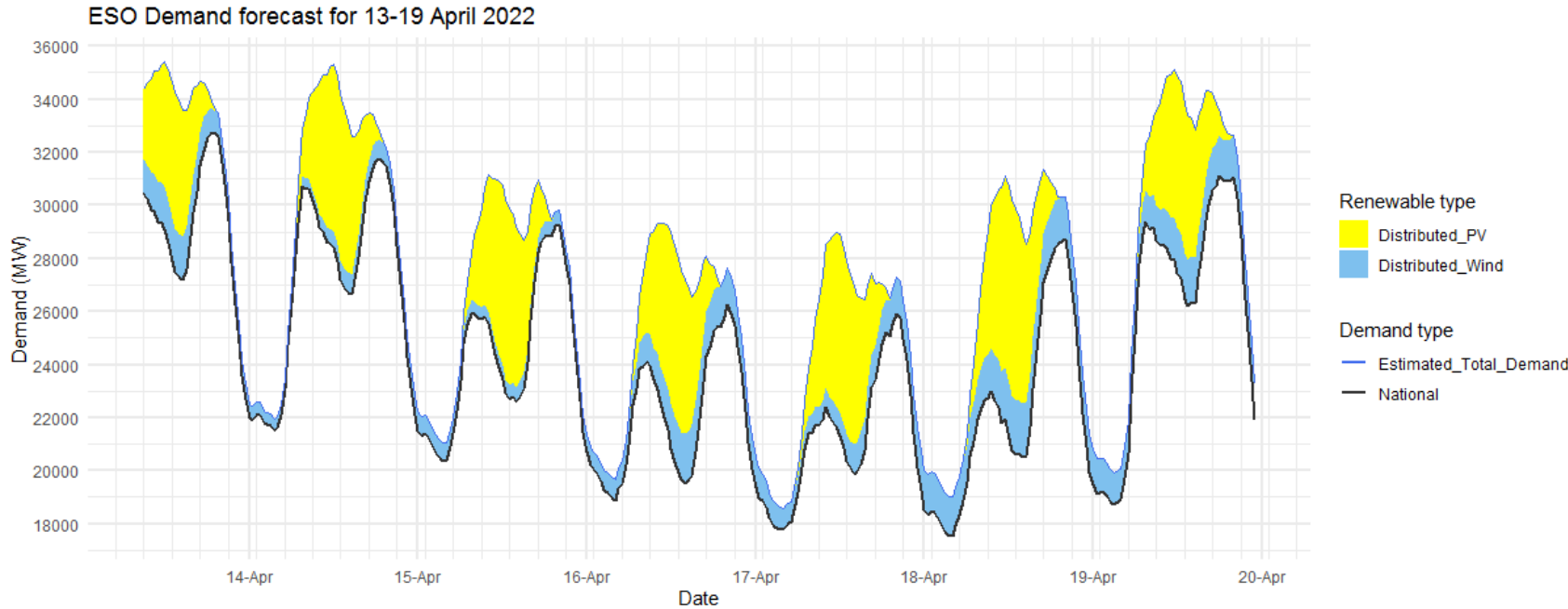
- Distributed_PV
- Distributed_Wind

Demand type

- Estimated_Total_Demand
- National

Date	Forecasting Point	FORECAST (Wed 06 Apr)			OUTTURN		
		National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)	National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)
06 Apr	Afternoon Min	27.3	4.1	4.4	26.7	3.9	4.9
07 Apr	Overnight Min	19.2	3.9	0.0	20.5	3.5	0
07 Apr	Afternoon Min	26.4	4.4	5.1	27.0	4.7	6.2
08 Apr	Overnight Min	21.9	2.3	0.0	23.1	1.8	0
08 Apr	Afternoon Min	26.9	2.7	5.4	27.3	2.2	5.1
09 Apr	Overnight Min	21.0	2.2	0.0	22.1	1.8	0
09 Apr	Afternoon Min	23.9	1.8	6.7	23.0	2.0	6.3
10 Apr	Overnight Min	21.4	0.8	0.0	22.2	0.5	0
10 Apr	Afternoon Min	25.9	2.2	3.8	22.9	0.9	7.2
11 Apr	Overnight Min	19.8	2.4	0.0	20.9	1.7	0
11 Apr	Afternoon Min	27.1	3.2	5.8	24.9	4.1	6.2
12 Apr	Overnight Min	20.2	2.2	0.0	21.0	1.6	0
12 Apr	Afternoon Min	27.2	2.6	5.3	31.1	1.4	3.4

Demand | Week Ahead



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

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Forecast of the embedded solar & wind generation for the next 14 days can be found on the [ESO Data Portal](#) in the following data set: [Embedded Solar and Wind Forecast](#)

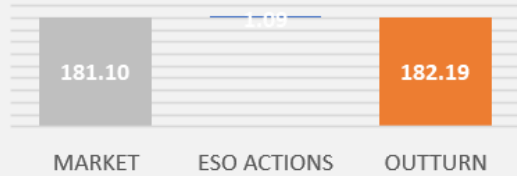
		FORECAST (Wed 13 Apr)		
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	Dist. PV (GW)
13 Apr	Afternoon Min	27.2	1.6	4.8
14 Apr	Overnight Min	21.5	0.4	0.0
14 Apr	Afternoon Min	26.6	0.8	5.2
15 Apr	Overnight Min	20.4	0.7	0.0
15 Apr	Afternoon Min	22.6	0.6	6.0
16 Apr	Overnight Min	18.9	0.8	0.0
16 Apr	Afternoon Min	19.5	1.9	5.8
17 Apr	Overnight Min	17.8	0.8	0.0
17 Apr	Afternoon Min	19.9	1.1	6.0
18 Apr	Overnight Min	17.5	1.5	0.0
18 Apr	Afternoon Min	20.5	2.0	6.4
19 Apr	Overnight Min	18.7	1.2	0.0
19 Apr	Afternoon Min	26.2	1.7	5.5

ESO Actions | Thursday 07 April Peak

Date: 07/04/2022

SP: 40

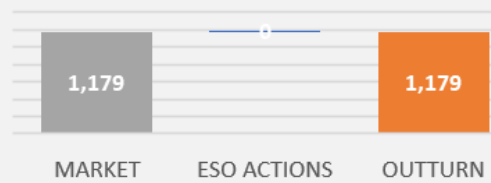
Carbon Intensity (gCO₂/kWh)



CCGT



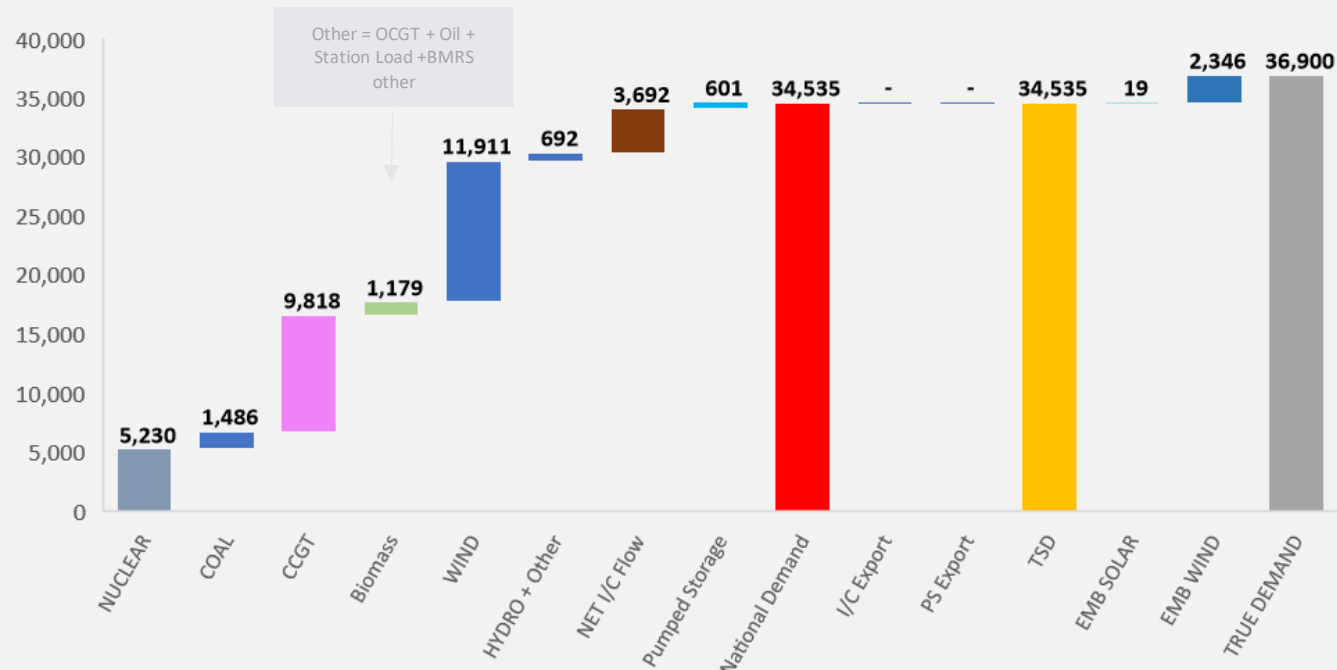
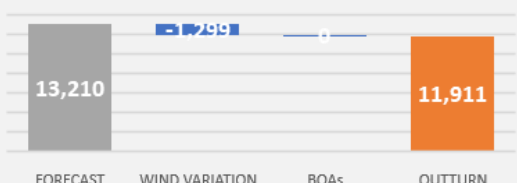
Biomass



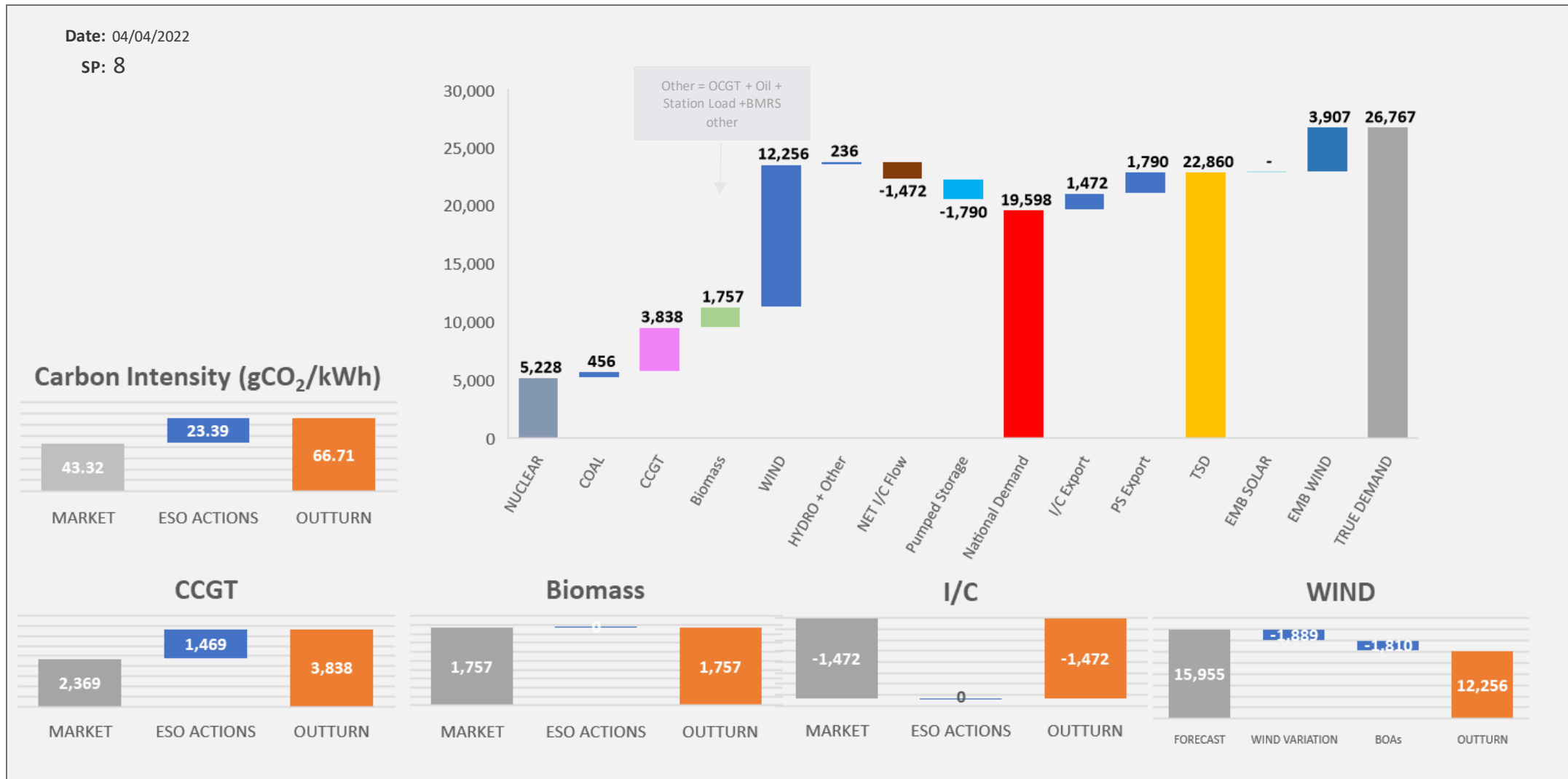
I/C



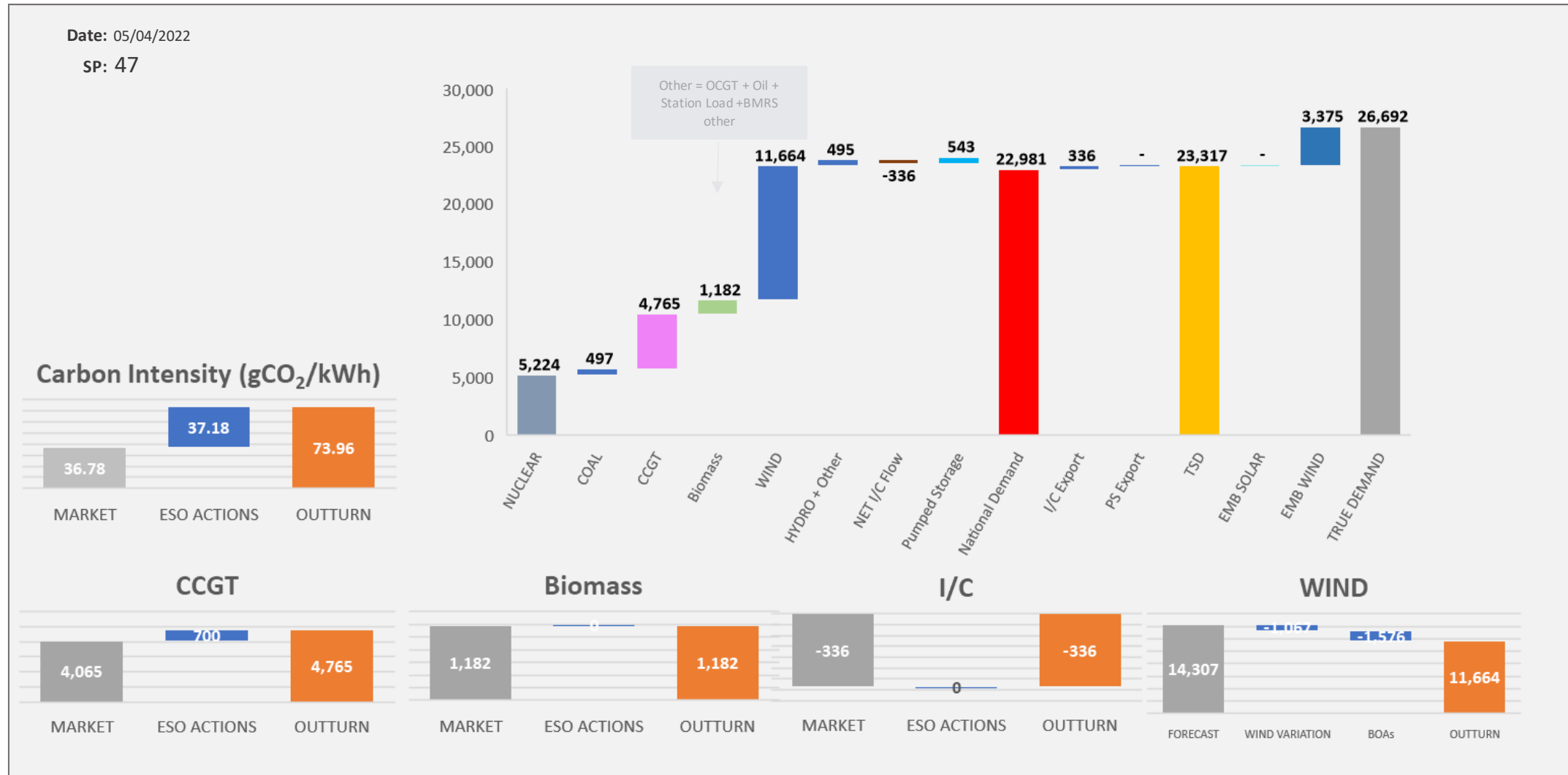
WIND



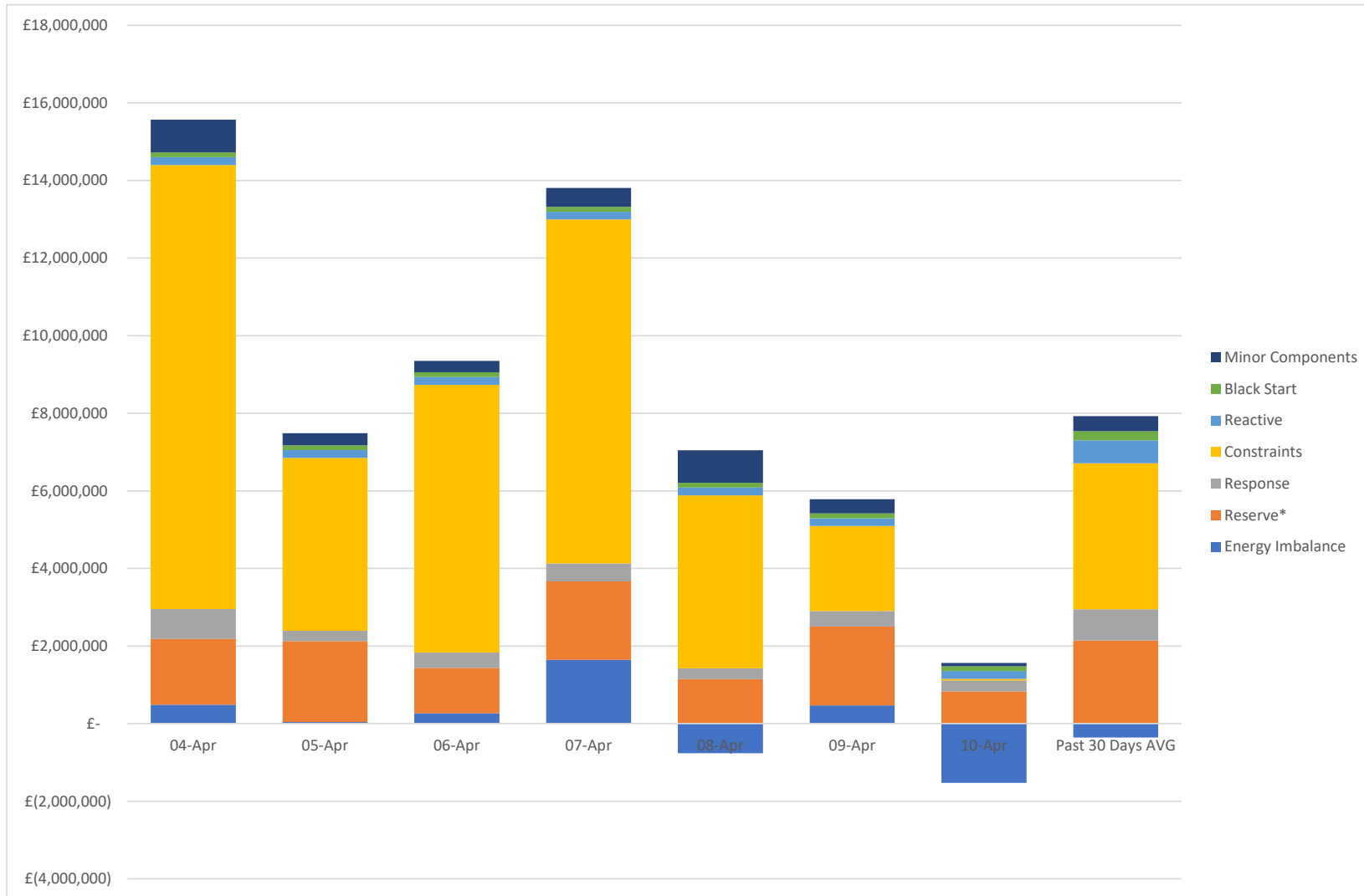
ESO Actions | Monday 04 April Minimum



ESO Actions | Tuesday 05 April Highest Spend ~£0.6m



Transparency | Category costs breakdown for the last week

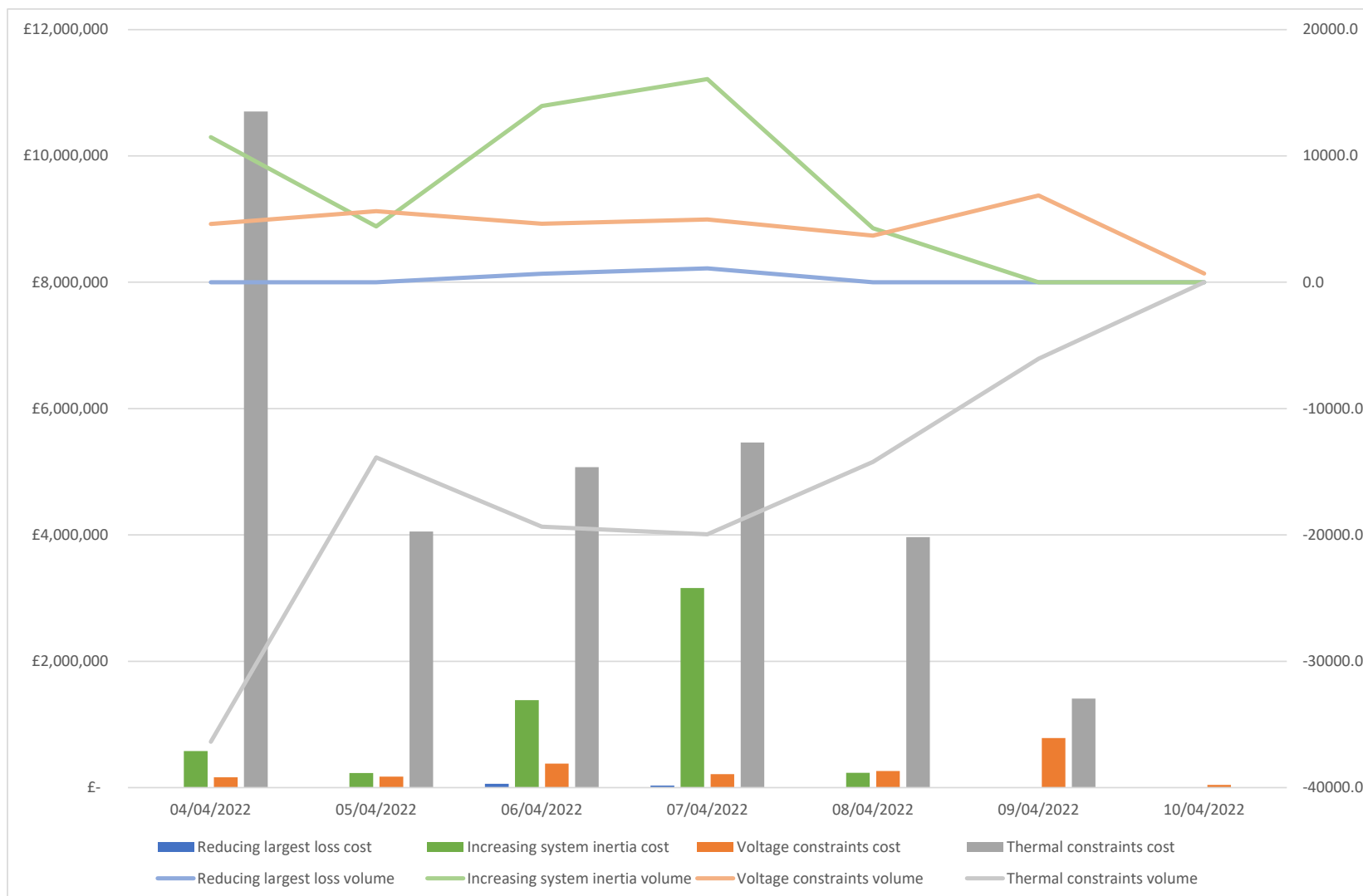


Day	£m
04/04/2022	15.6
05/04/2022	7.5
06/04/2022	9.4
07/04/2022	13.8
08/04/2022	6.3
09/04/2022	5.8
10/04/2022	0.0

Costs associated to constraints actions were predominant during the week except Sunday.

Past 30 Days Average is displayed in the chart

Transparency | Constraint Cost Breakdown



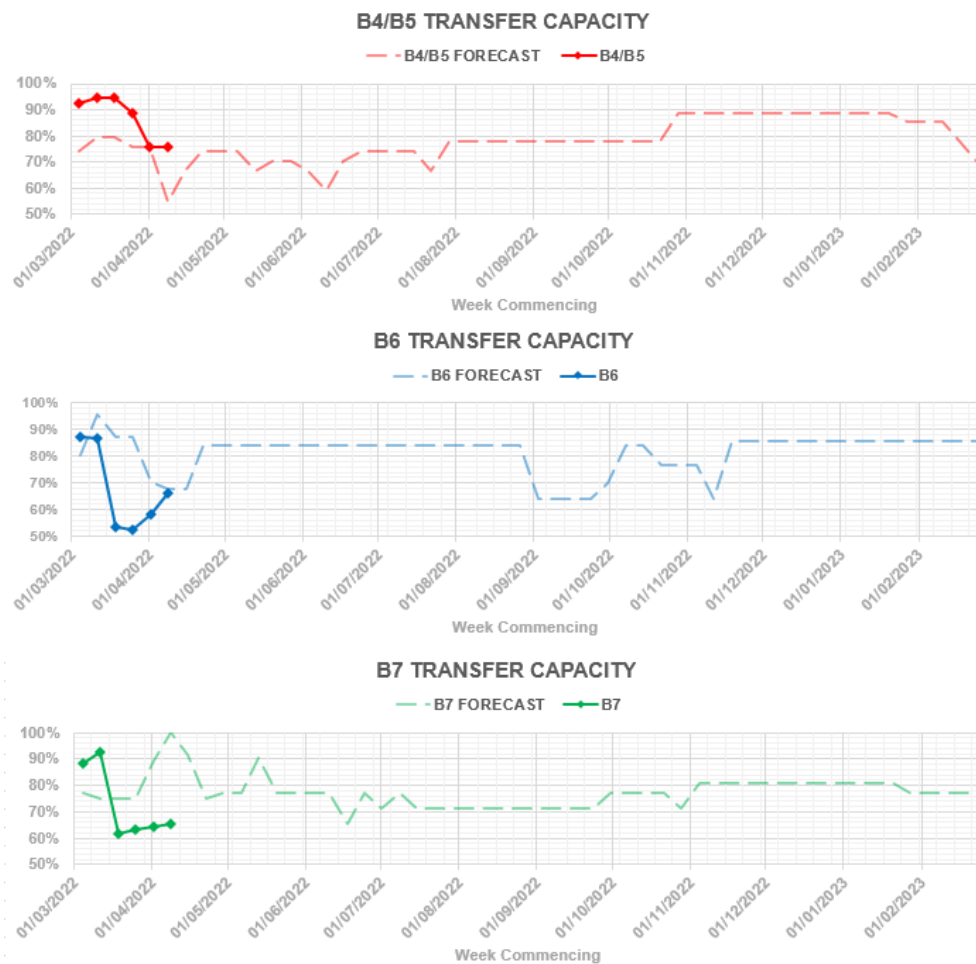
Thermal – network congestion
 Actions required to manage Thermal Constraints throughout the week except Sunday.

Voltage
 Actions taken to synchronise generation to meet voltage requirements were required throughout the week.

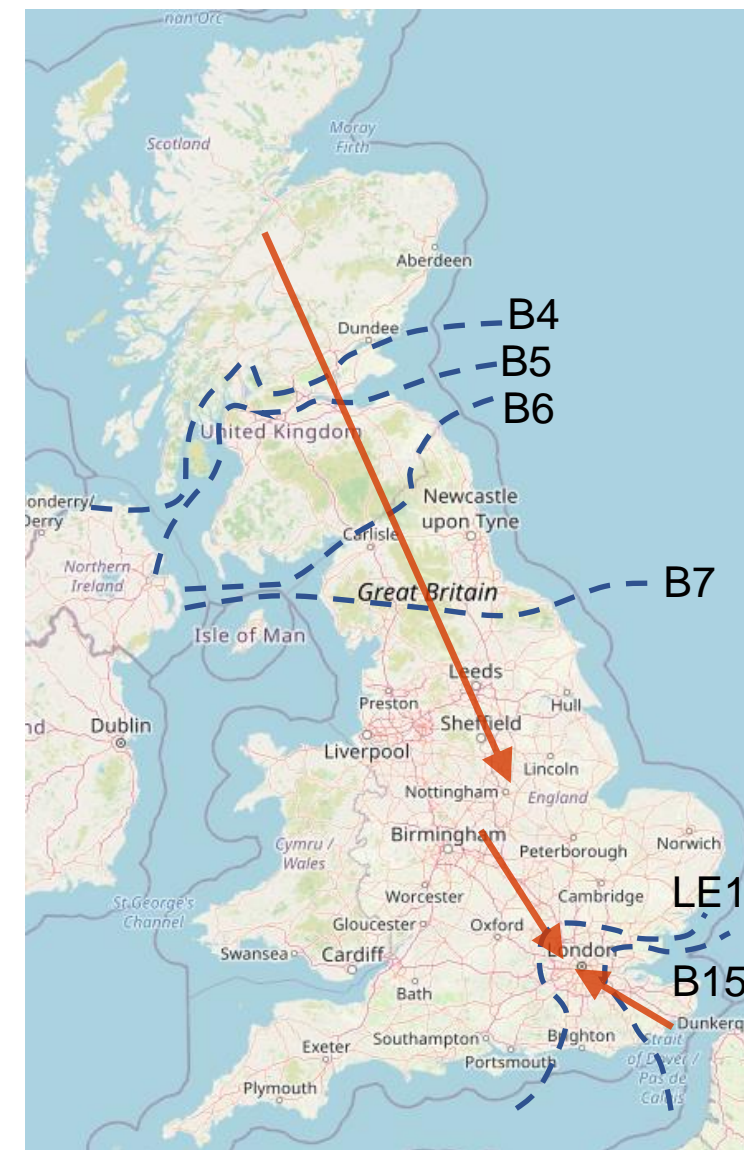
Managing largest loss for RoCoF
 No intervention required to manage largest loss on interconnectors.

Increasing inertia
 Intervention required to increase minimum inertia between Monday and Friday.

Transparency | Network Congestion



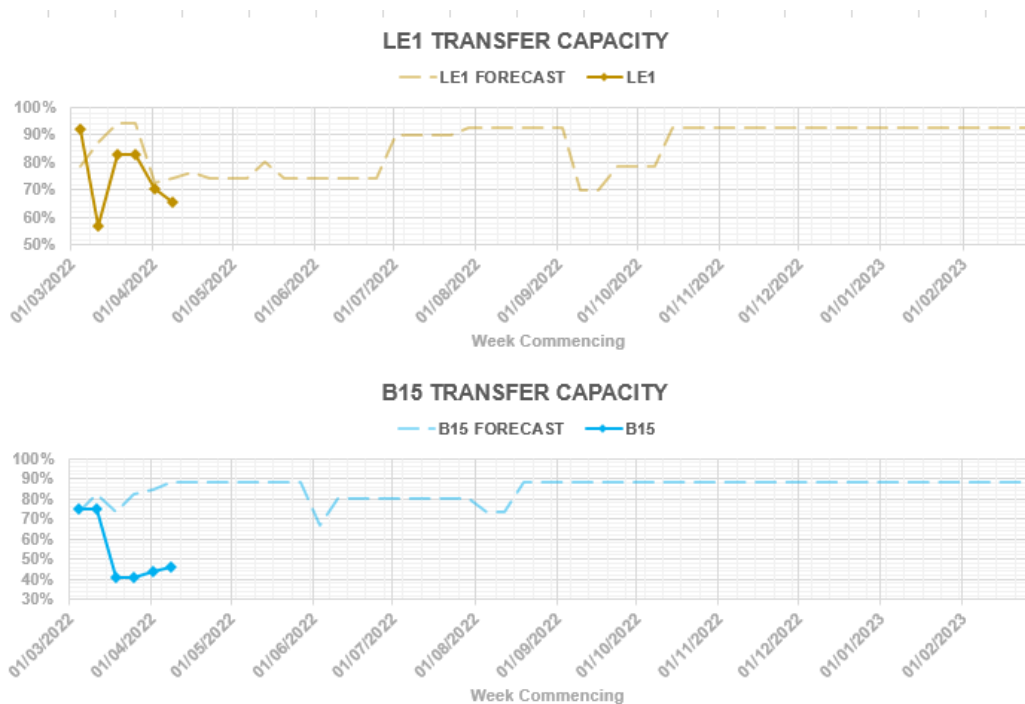
Boundary	Max. Capacity (MW)
B4/B5	2700
B6	5600
B7	8400
LE1	7000
B15	7500



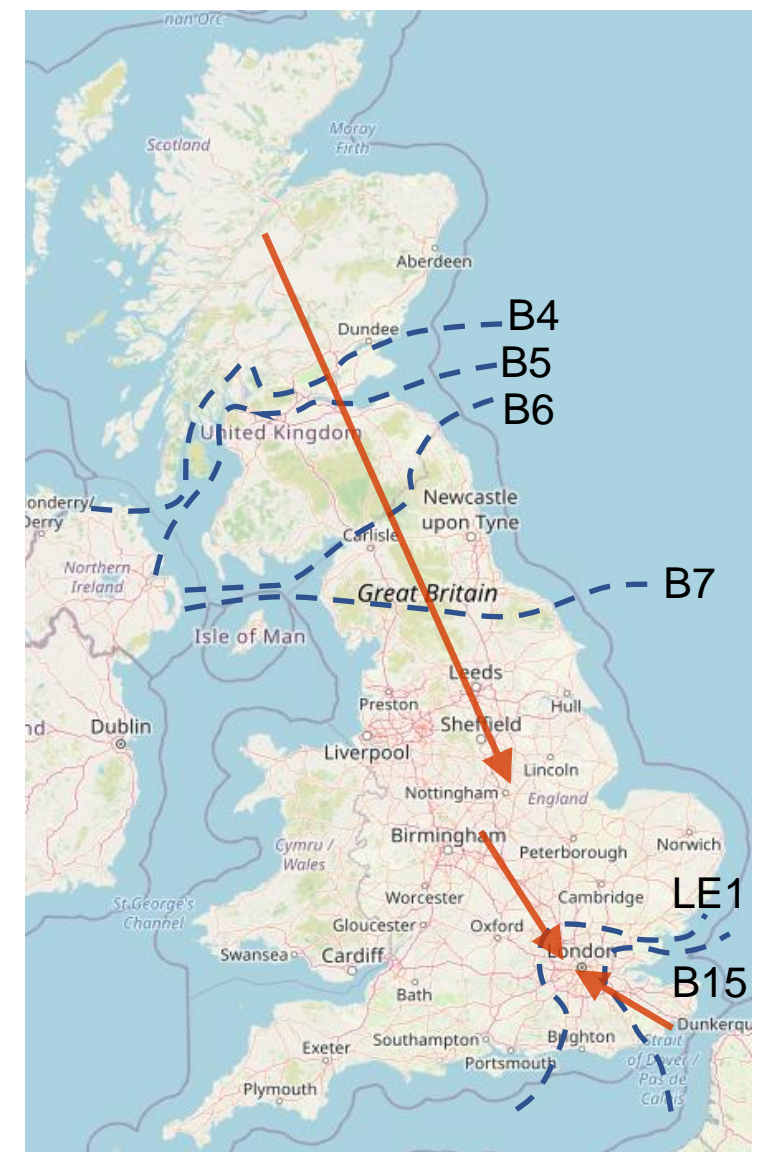
Day ahead flows and limits, and the 24 month constraint limit forecast are published on the ESO Data Portal:

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

Transparency | Network Congestion



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Optimising Voltage Constraints in Real-Time

NGESO obligations are:

- to run a secure network at all times (pre and post fault)
- operate within voltage limits (absolute and step change)
- secured events include loss of generator

Predominant issue today: high volts during low demand

Voltage constraints management requires:

Static equipment:

- switch out high gain circuits, capacitors and filters
- switch in reactors, load

Dynamic solutions:

- SVCs, Sync comps, and generators including simultaneous tap instructions

'Other' techniques:

- tap stagger, demand transfers, network configuration, Pathfinders

Voltage profile - sensitive to network flow and BV^2



A night in the life of a transmission security manager

Challenging Shift overnight 14/15 Feb

- Wind 10GW change over few hours but *forecast* and was largest ever deltaW seen in a single shift
- Western Link operation challenging re timing of de-block
- Careful management of FL to remain within standards
- Post fault switching actions:
 - Kept voltage levels within limits
 - Had to be complete within 15 minutes
 - Required pre-agreement with TO
 - Agreement with DNO

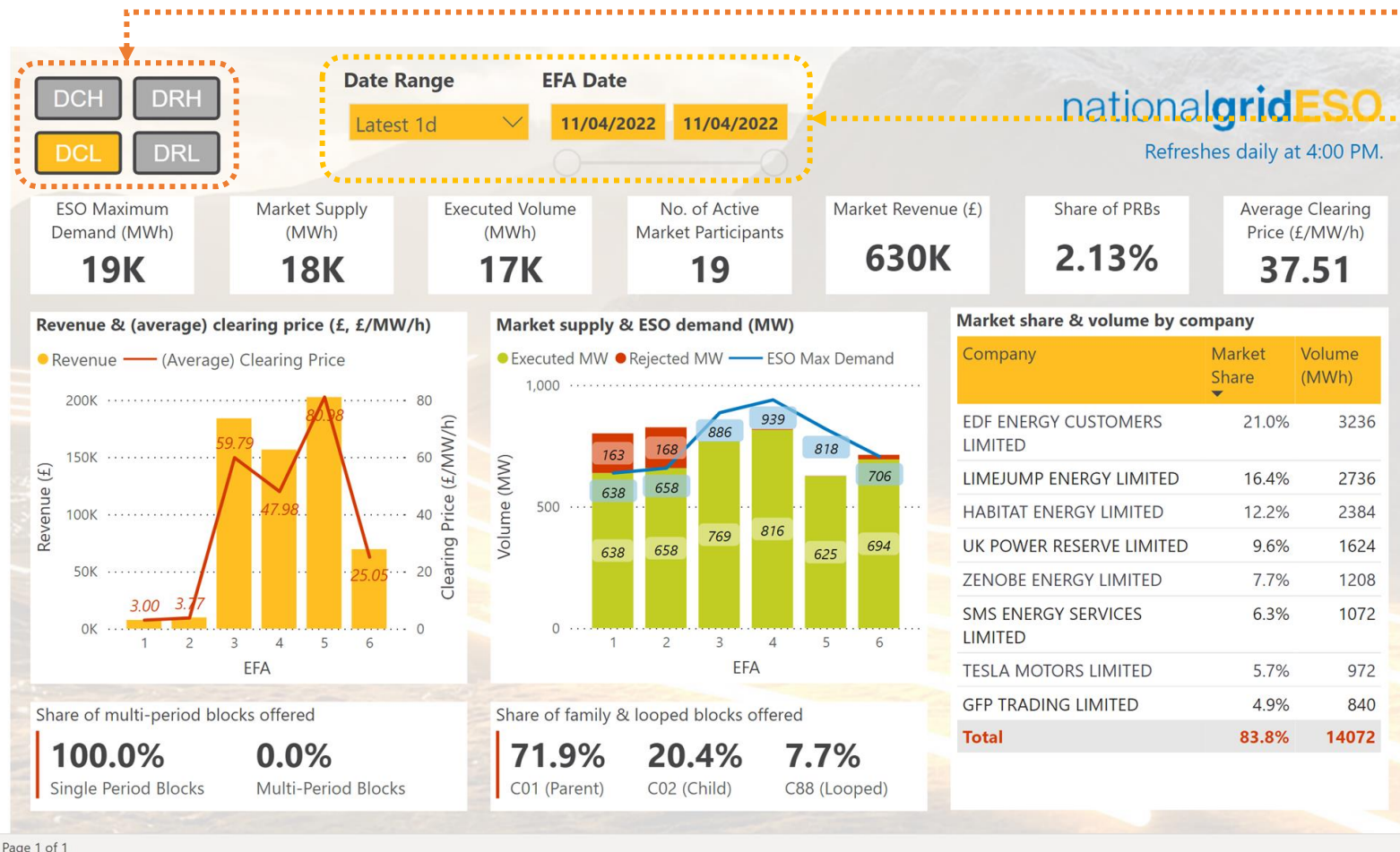


Subsequent night looked far easier

- Wind extremely high all night, planned for no additional BMUs
- However, at short notice:
- I/C X re-declared to 1GW export (from 1GW import)
- Other European I/C changed resulting in Flowsouth reduction to 2GW (form 6GW)
- Due to dynamic data (MZT) local generation which had de-sync'd not available
- Advancing sync time of sets due on in morning was solution on this occasion

Our asks: TO- equipment availability, Generators- flexible dynamic data, I/C market driven, all partake pathfinders

Transparency | Dynamic Containment & Dynamic Regulation dashboard

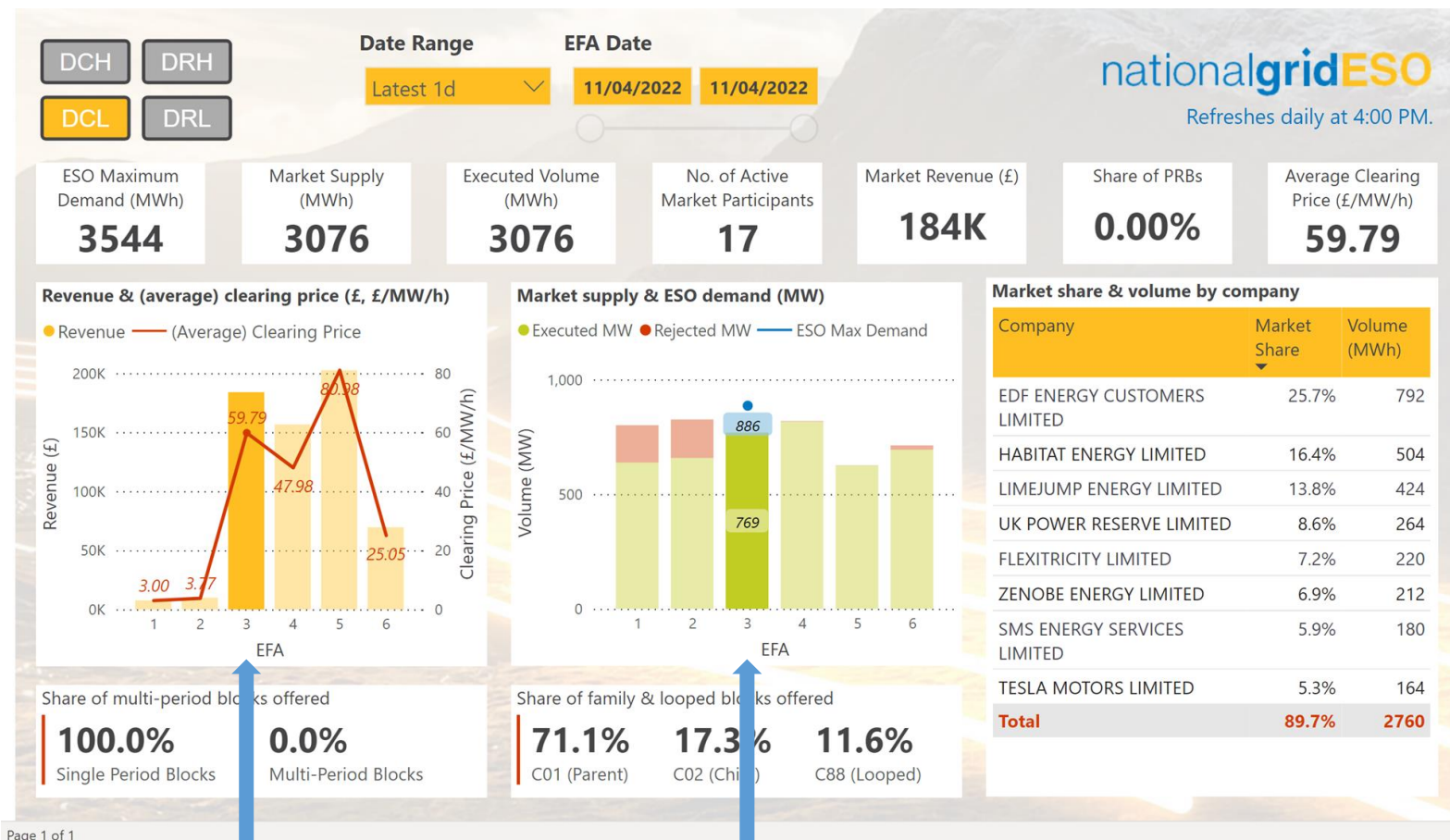


Market filter:
Filter the data for selected markets
- multi-selection is enabled

Date range filter:
A date filter with a list of drop down options

- Latest 1 day
- Latest 7 days
- Latest 30 days
- This month
- Last Month
- All
- Custom

Transparency | Dynamic Containment & Dynamic Regulation dashboard

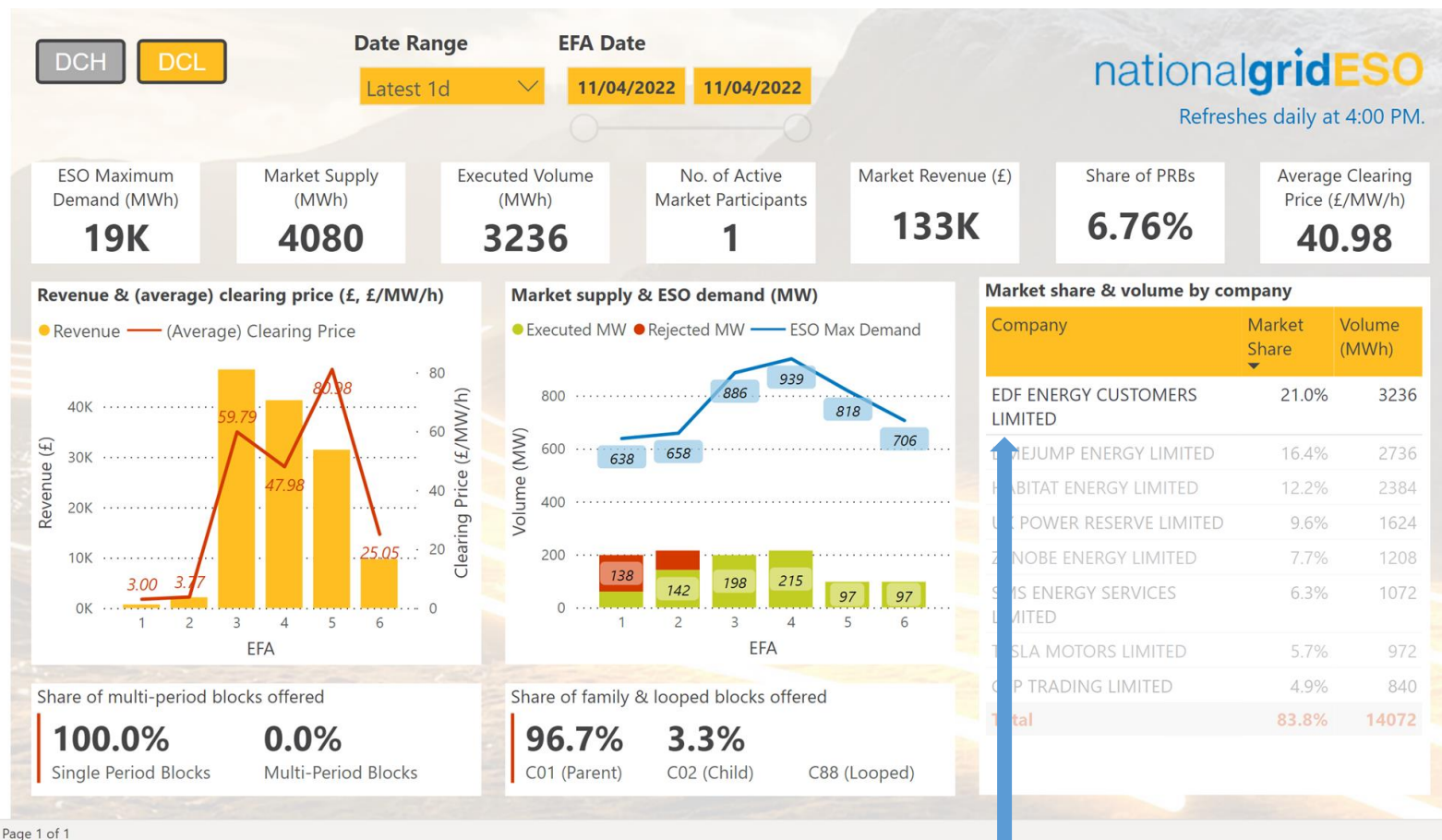


Interactive Features (1/2)

- Click on one EFA bar on either one of the two charts to see auction results for this EFA
- Click on one participant name to see auction results for this participant

Example: Click on the bar for EFA 3 on either one of the two charts to see the auction results for EFA 3, 11 Apr 2022, DCL market

Transparency | Dynamic Containment & Dynamic Regulation dashboard



Interactive Features (2/2)

- ❑ Click on one EFA bar on either one of the two charts to see auction results for this EFA
- ❑ Click on one participant name to see auction results for this participant

Example: Click on the first participant to see the auction results for this participant in on 11 Apr 2022, DCL market

Transparency | Dynamic Regulation Requirements

Dynamic Regulation requirements have been published on the data portal: <https://data.nationalgrideso.com/ancillary-services/dynamic-regulation-requirements>

Dynamic Regulation Requirements

[Home](#) / [Ancillary Services](#) / [Dynamic Regulation Requirements](#)

Dynamic Regulation Requirements


Ancillary Services

This dataset will contain our forecasted requirements for Dynamic Regulation. For an initial period, we will validate the performance of the products on the live system during which time the volume we can procure of this service will be capped at 100MW.

To support the development of the market whilst also capturing sufficient data regarding performance, our requirement is expected to be around 80MW (with up to 20MW overholding) at most times throughout this period. However, to fully validate the services there will be occasions when the requirement for one or all of the services will be 0MW or reduced (e.g. to test Dynamic Moderation without Dynamic Regulation) and this will be signaled with as much notice as possible through updates to this dataset and via supporting communicating channels (such as the operational transparency forum and the Future of Balancing newsletter)

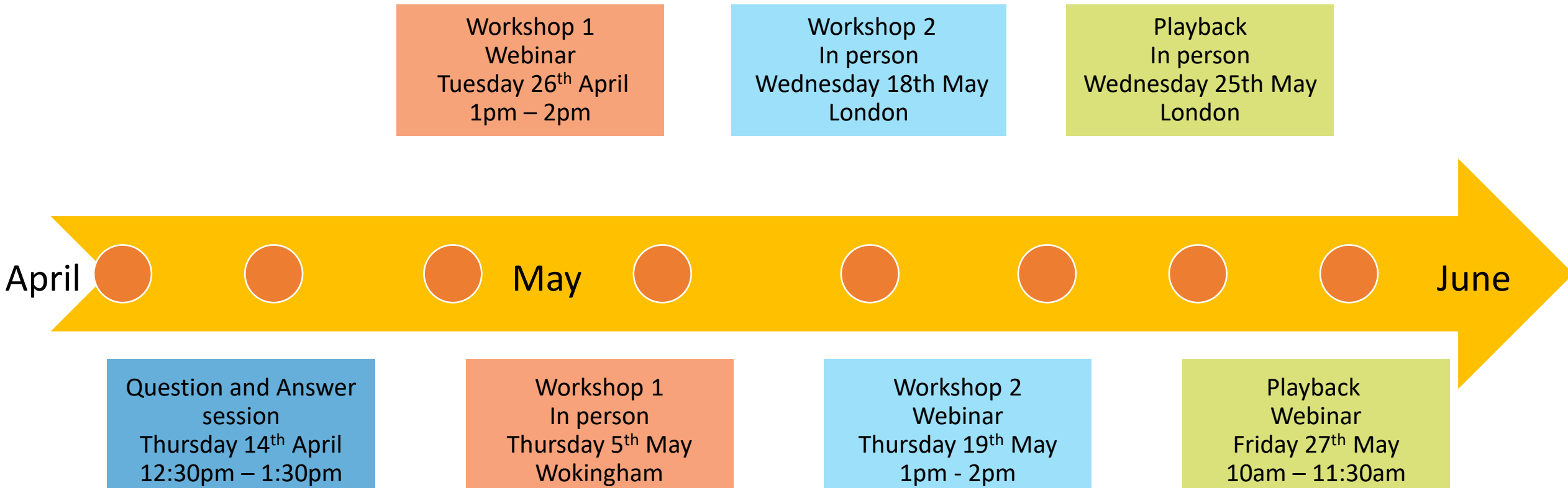
Further information regarding requirements and transition to our new services can be found in the [ESO Frequency Response Requirements Update – February 2022](#)

Showing 1 - 1 of 1 Data File

Name	Format	Last Changed	Download
Indicative DR Requirements	csv	6 hours ago	 Explore

*BM providers wishing to complete light touch testing with Nortech, please contact box.SmallBMUOpsMeter-ESO@nationalgrid.com

Balancing capability strategic review engagement timeline



Details of registration will be available on our website

[Strategic capability review | National Grid ESO](https://www.nationalgrideso.com/industry-information/balancing-services/balancing-programme/strategic-capability-review)

<https://www.nationalgrideso.com/industry-information/balancing-services/balancing-programme/strategic-capability-review>

slido

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

