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

20 September 2023

ESO

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

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Future deep dive / focus topics

Today

Network Constraints

Data Portal and DEP (Digital Engagement Platform)

Planned

Winter Outlook – 4 October

Future

Scottish Oscillations – following conclusion of current investigative work

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

Please note: **there won't be a forum on Wednesday 27 September** due to availability. Regular content will still be published on 27 September.

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C16 Additional Consultation 2023

We welcome industry's views on the proposed changes within our consultation.

*Standard Condition Licence C16 **"Procurement and use of balancing services"** sets out the obligation on the ESO to publish five statements addressing the procurement and use of balancing services. In accordance with C16 of its Transmission Licence, we are conducting an additional review of all licence statements, following proposed changes to the Procurement Guidelines and ABSVD Statement.*

Our official consultation is open from the **1st September 2023**. Please respond by **5pm on 29th September 2023**.

Please find the consultation documents on our [C16 web page](#)

If you would like to receive notification of future C16 events, consultations and updates, then please sign up to our [mailing list](#).

Any questions, please contact balancingservices@nationalgrideso.com

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Response reform webinar

We are hosting a response reform webinar on Thursday 21 September, 13:00 – 14:00.

The webinar will cover topics around the Response Release 2 consultation feedback
as well as sharing an update on our future plans and engagement.

For further information please contact
National Grid ESO box.futureofbalancingservices@comms.nationalgrideso.com

Microsoft Virtual Events Powered by Teams

Click here to sign up

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Data portal & Digital Engagement Platform (DEP)

September 2023

Viorel Zamaneagra & Lisa Macdougall

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Data Portal Overview

The Data Portal enables you to access all ESO published data. It offers powerful tools to search and query data and consume data via APIs.

The portal was built to address the customer's 3 main pain points:

• Consumption & reuse (format and structure often made it difficult to reuse or manipulate data).

• Discover & Search (it was often difficult to find data, leading to inefficiency and frustration)

• Understanding data (not enough details about datasets, jargon, acronyms etc.)

The portal has now grown from 30 datasets to over 90 datasets.

Next step: Data Portal and ESO website integration

We are integrating the Data Portal with the ESO website, giving you a more consistent experience across our digital services, and a single search capability across the ESO website and Data Portal.

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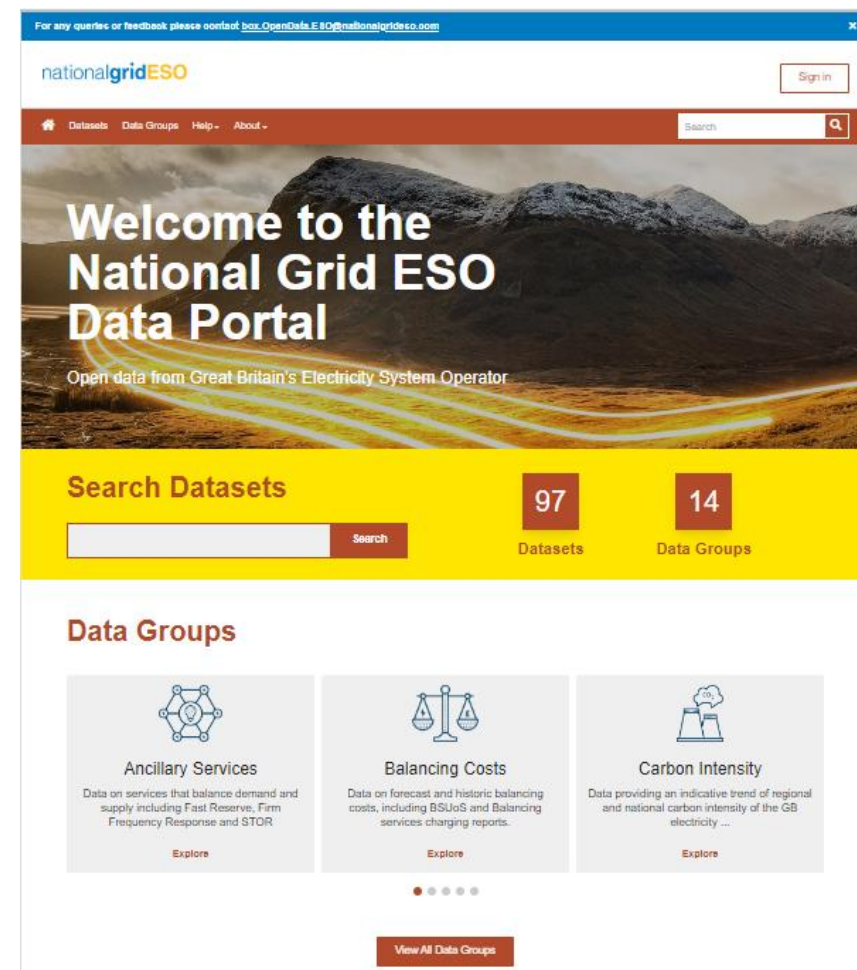
What is changing?

From beginning of the October

- The way that you log into the Data Portal and manage your subscriptions will change

- **You will need to create a new account** on our new secure platform

- You will be able to set up your account to sign in with either your email address and a password or using a Microsoft account

- **You will carry on receiving email or SMS notifications of changes to datasets as you do now**

- We will add all your existing subscriptions into your new account when you create it, so that you can manage these from your new ESO account dashboard

- **If you are an SMP user** then your account will already be set up for you, and we'll send you details separately to tell you how to access it. Look out for emails from the SMP team.
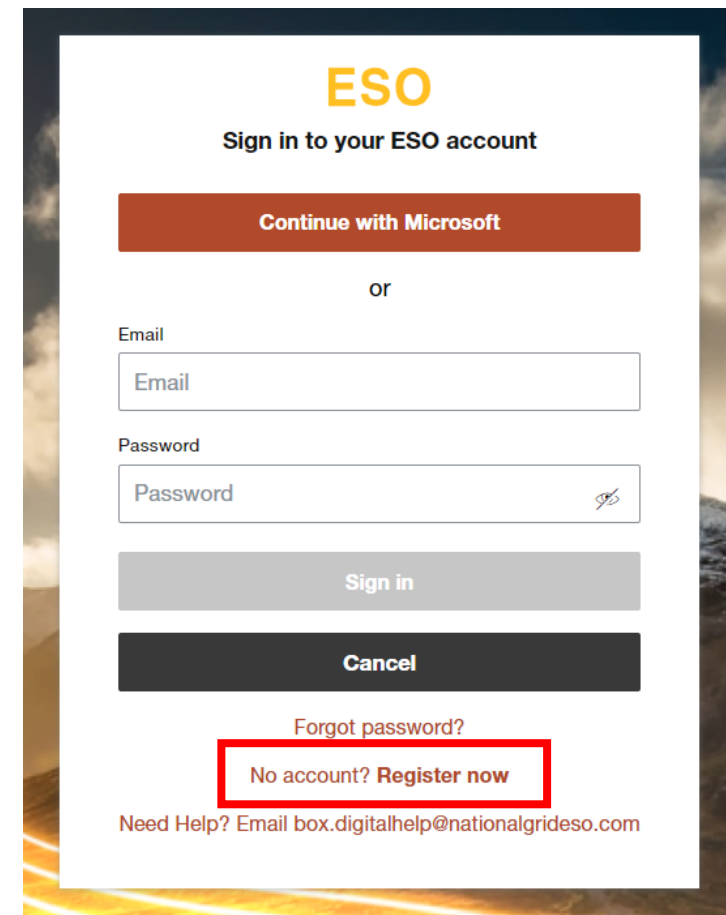
- Box.digitalhelp@nationalgrideso.com
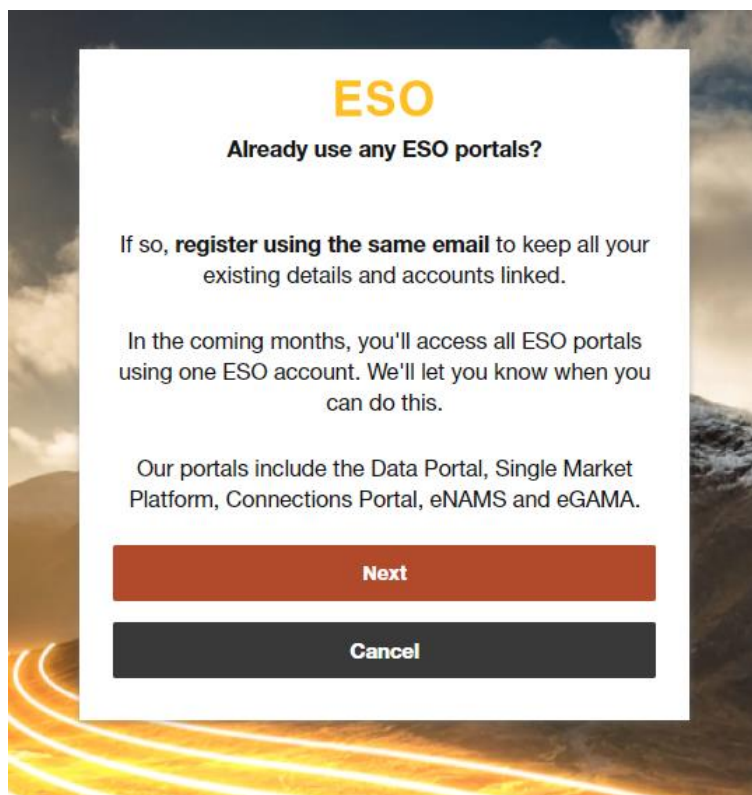
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What you'll need to do

1. You will need to Register for a new secure account from the ESO website
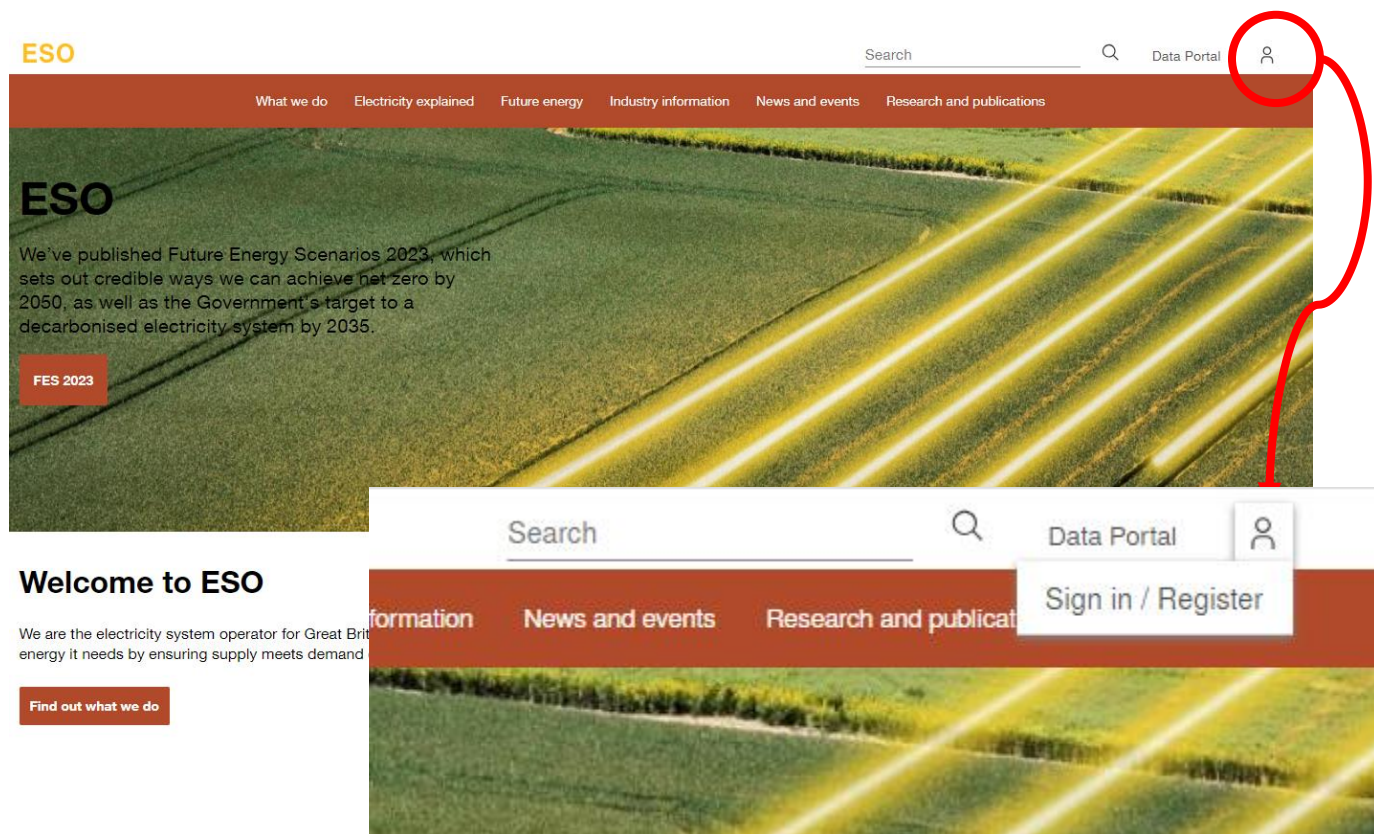

2. Select **Register Now** on the Sign in screen

New screens – registration

1. Enter your email to create an account with your email and a password **Or** choose 'Continue with Microsoft' to use a Microsoft account to sign in
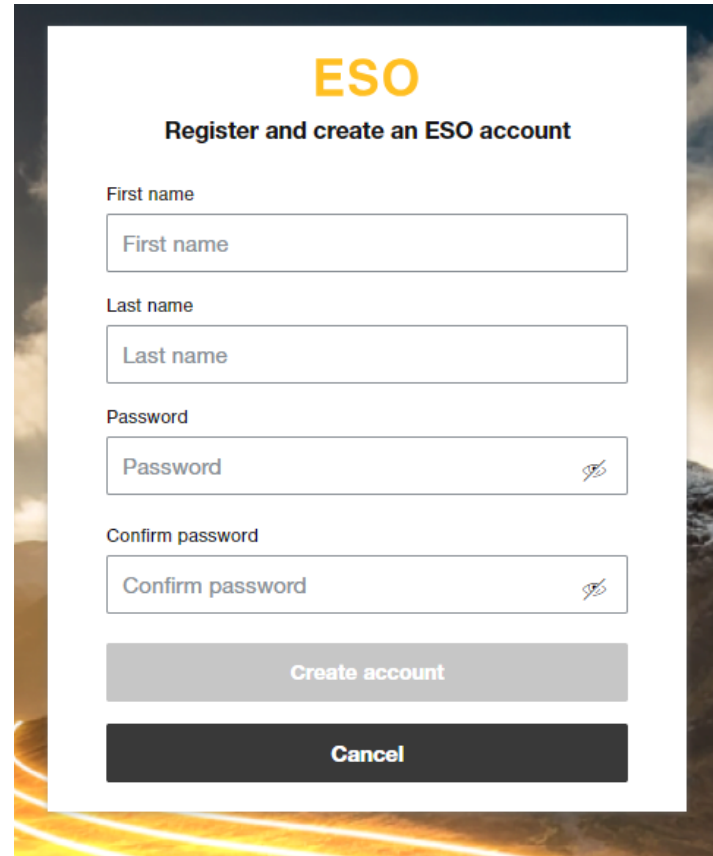
2. If you choose email, make sure you use the same email that you receive your data portal notifications to so we can add your subscriptions to your new account
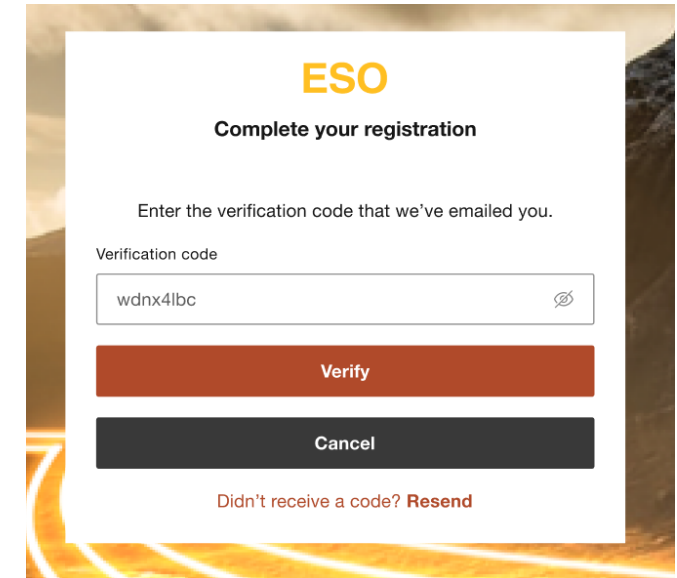

ESO
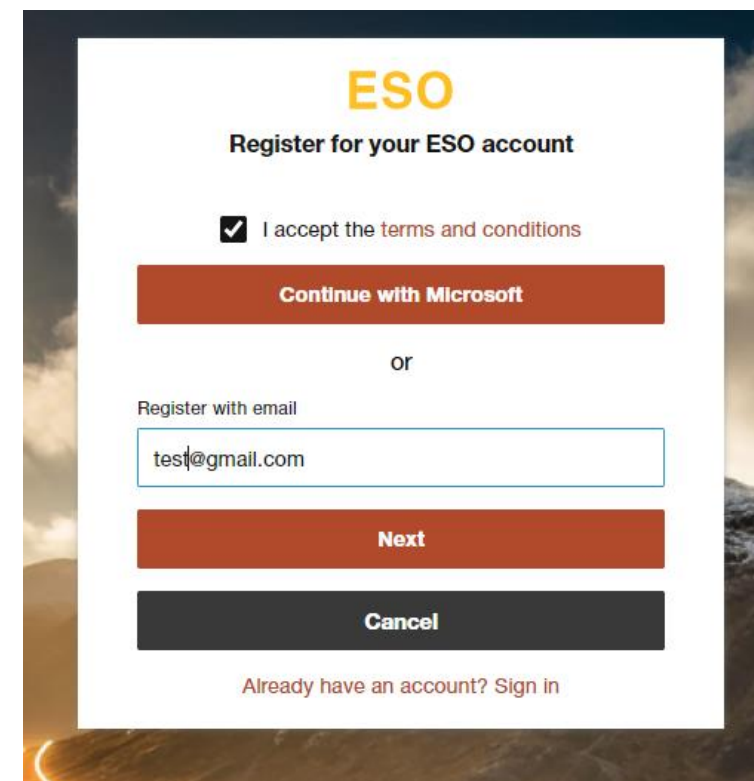
New screens – registration continued

1. If you chose to register with your email address, enter your name and create your password. Then you'll need to verify your email address.

2. If you chose to register with Microsoft, you will need to sign into your Microsoft account in the normal way. We will get your name and email address from your Microsoft account.
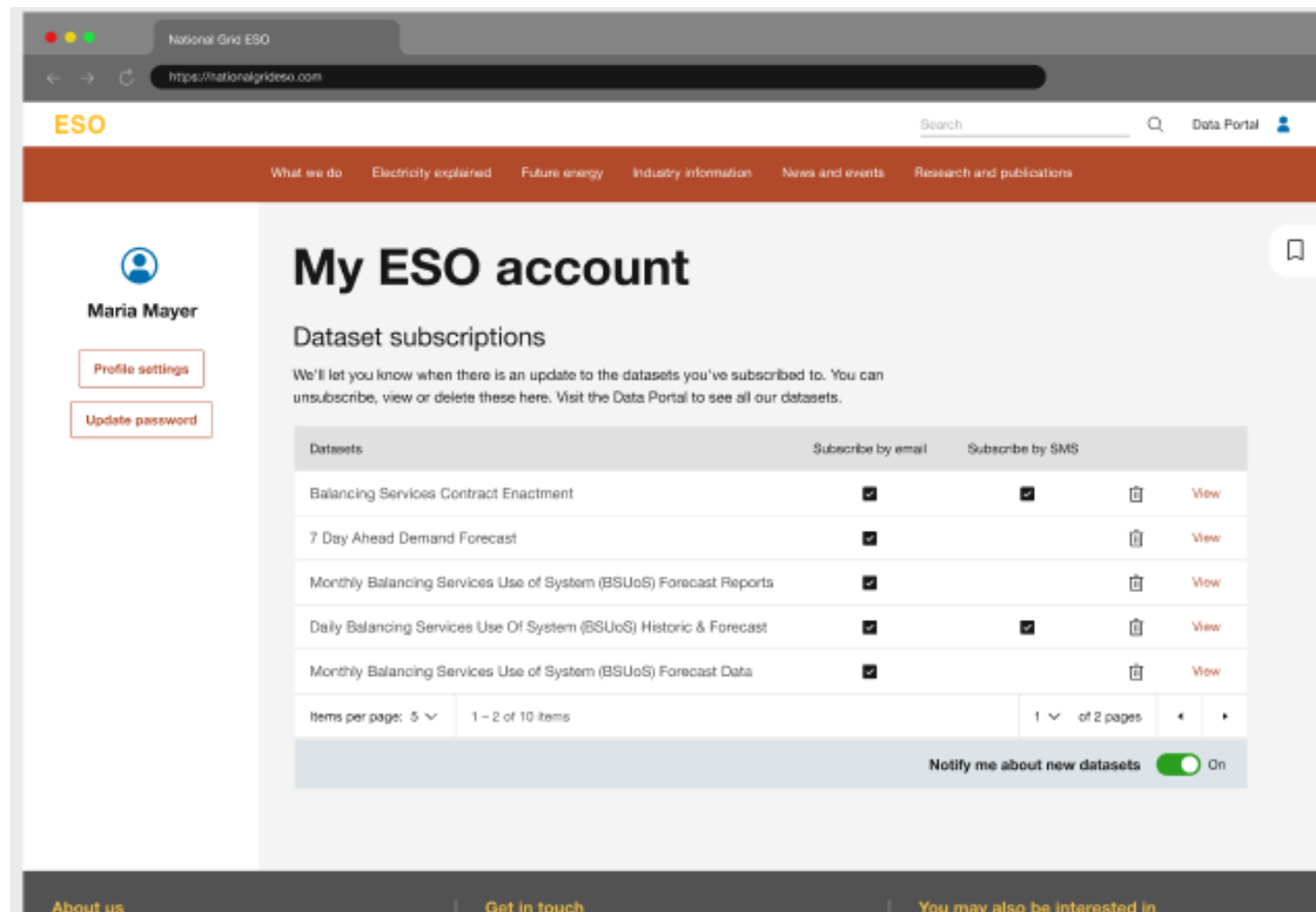

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Register and create an ESO account

First name

First name

Last name

Last name

Password

Password

Confirm password

Confirm password

Create account

Cancel

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Complete your registration

Enter the verification code that we've emailed you.

Verification code

wdnx4lbc

Verify

Cancel

Didn't receive a code? **Resend**

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Your new ESO account dashboard

We will add all your existing subscriptions into your new account when you create it, so that you can manage these in your ESO account

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Next Steps

- We will email you to confirm the date when this change will take place and give details of what you need to do

- If you have any questions in the meantime or problems with signing in for the first time, then contact:

  Box.digitalhelp@nationalgrideso.com

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ESO Constraints Deep Dive

Kathryn Sorrell & Joe Murrell

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Introduction to Constraints

The system is not geographically balanced for generation and demand.
    Generation is often located near its fuel source whilst demand is greatest in cities and
    industrial hubs.

As power flows around the system from generation to demand, bottlenecks arise that require power flows to be 'Constrained'
    This requires generation/demand to be reduced/ increased within the constraint boundary.
    These actions gives rise to Constraint Costs.

These constraints may be due to:
- Thermal limits (line loading)
- System voltages – working within the voltage standards
- Stability of generators
- Fault levels

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GB Transmission Network

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Influences on Outturn Constraint Costs

The next 2 examples show the effect on constraint costs, for the same outage but under different scenarios.

The 1st example shows the effect on constraint costs due to varying wind levels.

The 2nd example shows the effect on constraint costs due to the changes in interconnector flow.

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Example, typical Export Constraint B6 ('SCOTEX')

SCOTEX
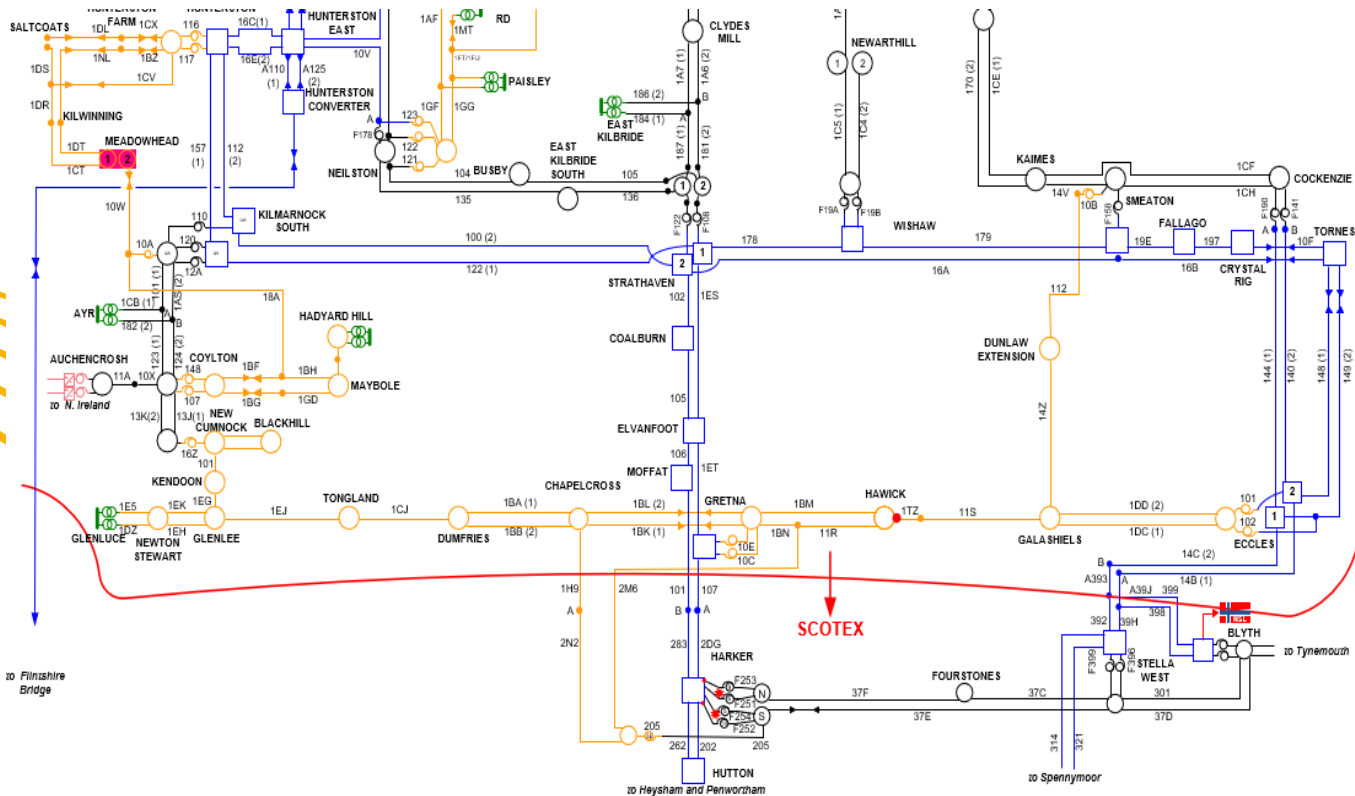
When there is a lot of generation dispatching in Scotland, the excess will flow to England via the Western Link HVDC + Harker-Moffat/Harker-Gretna Double cct + Blyth-Eccles-Stella West Double cct.

We must secure the power flows such that for a fault on any of these three routes, the remaining two can support the flow without overloading.

We secure for the 'worst single loss', this could be a single circuit, or a double circuit, etc.

We can do this through pre-fault actions, post-fault actions, and arming inter-trips.

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Example, typical Export Constraint B6 ('SCOTEX')

Typical B6 intact boundary limit = 6200MW, this is the physical capability of the network

Peak Demand within B6 region = 3200MW, therefore any generation > 3200MW will flow across the boundary to England

Maximum total generation in Scotland before ESO needs to take actions to manage boundary = (3200+6200)MW = 9400MW

Total non-wind generation behind B6 (e.g. hydro, pumped storage, CCGTs, nuclear) = 6600MW

Total wind generation behind B6 = 12500MW

Scenario	Wind Gen (MW)	Non-wind Gen (MW)	Demand (MW)	Gen Curtailed (MW)	Cost (£)
20% wind + 50% non-wind	2500	3300	3200	0	0
50% wind + 50% non-wind	6250	3300	3200	150	£33k/hr
90% wind + 50% non-wind	11250	3300	3200	5150	£1.1m/hr

Cost calculated as -£70/MWh to curtail a wind gen and £150/MWh to replace the energy using a synchronous machine outside the boundary.

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Example, typical Import Constraint LE1 ('South East Import')
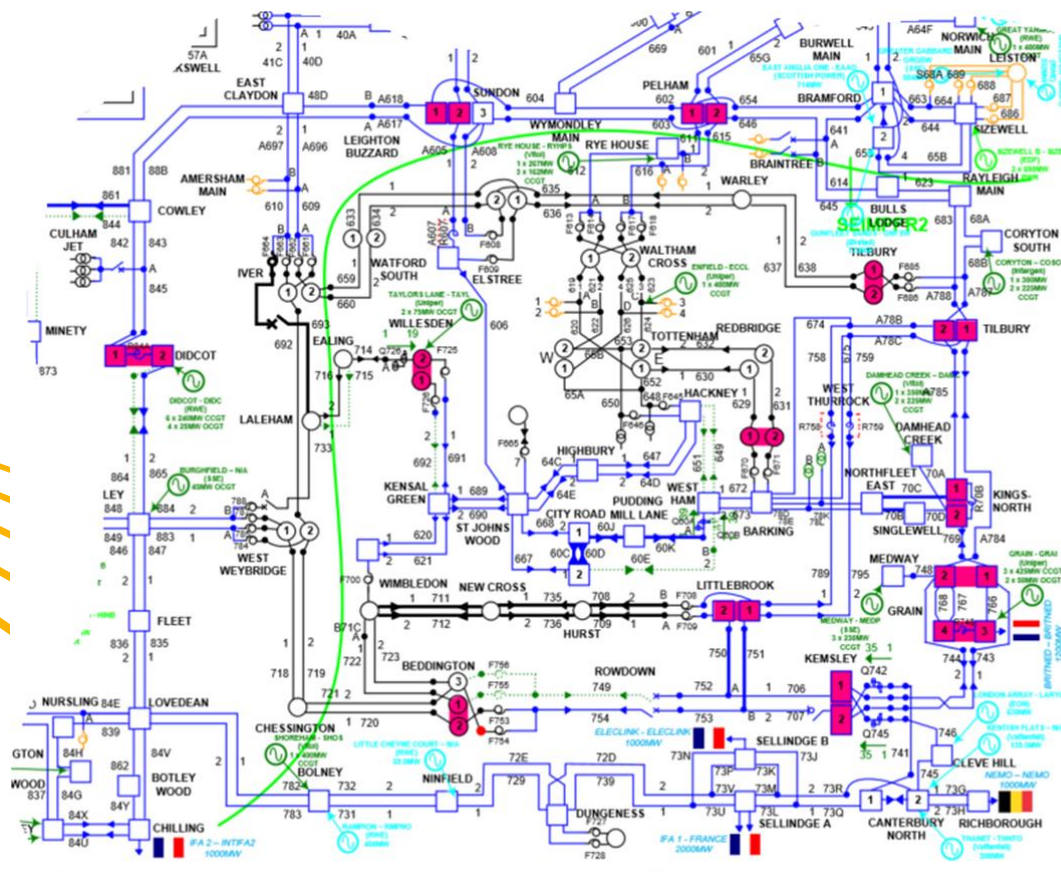
Typical LE1 intact boundary limit = 5900MW

This boundary is characterised by two areas:
- **London: High local demand and little generation.**
- **Outside London: contains both high demand, high levels of generation, wind generation (in particular in the Thames estuary area), and Interconnectors to France, Belgium and Netherland.**

LE1 also imports power from the North and West into the South-East.

With the existing interconnectors importing power from the continent, power flows enter London from all directions, to the extend that the flows across LE1 reduce and limited constraints are seen.

With the existing interconnectors exporting power to the continent, LE1 is becoming a higher demand area, hence, the circuits entering LE1 from North can become overloaded as power is drawn into and through London toward the South and East.

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Example, typical Import Constraint LE1 ('South East Import')

Typical LE1 intact boundary limit = 5900MW, this is the physical capability of the network.

Peak Demand within LE1 region = 8500MW, therefore need at least 2600MW generation with the LE1 boundary to meet demand

Interconnectors importing, act as generation within the LE1 boundary

Interconnectors exporting, act as demand within the LE1 boundary

Total generation in LE1 = 3700MW

Scenario	Generation (MW)	Demand (MW)	I/C acting as Demand	I/C acting as Generation	Trading on I/C	Cost (£)
4000MW export to Europe	3700	8500	4000	n/a	2900	£70,000hr
4000MW import to GB	3700	8500	n/a	4000	0	

Costs vary depending on energy prices in GB and Europe

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What Factors Effect Constraint Limits
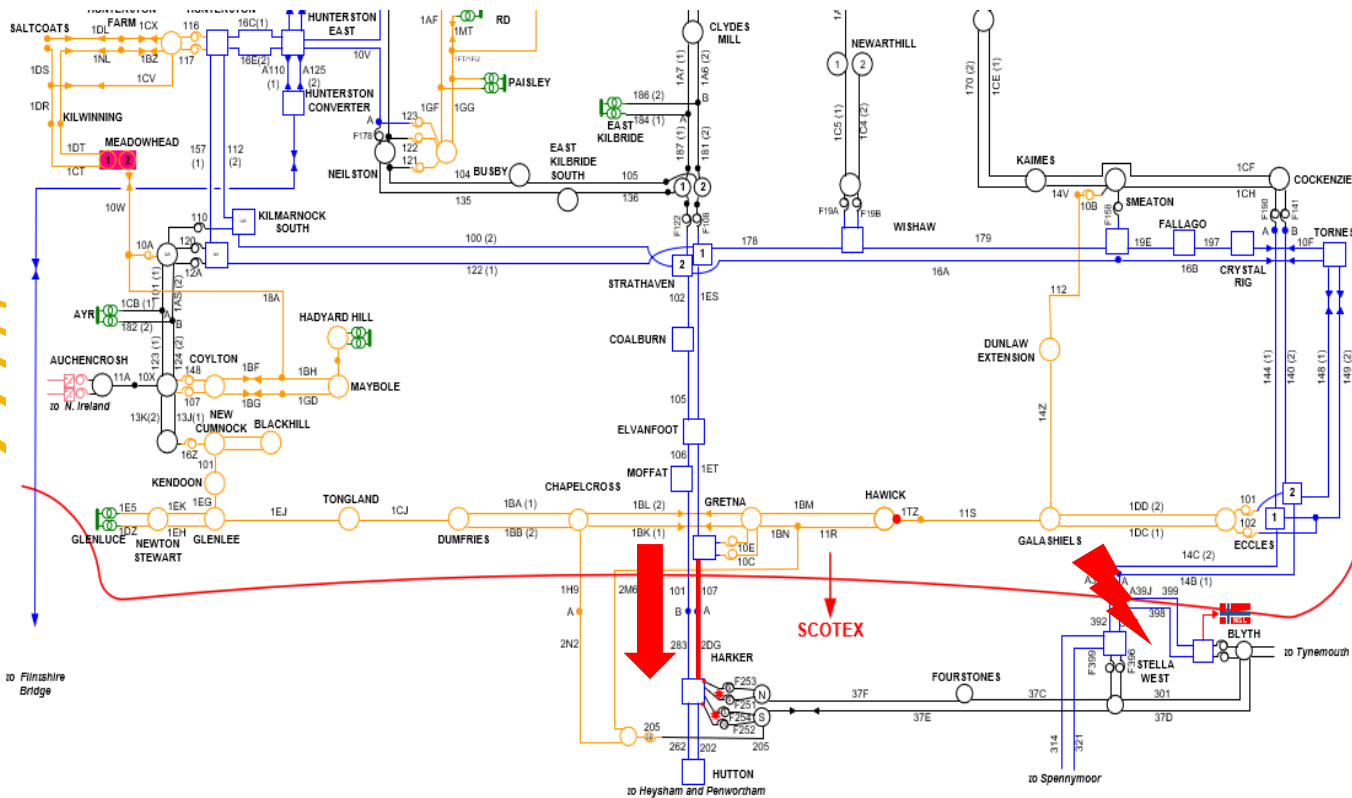
So far we have looked at intact conditions.

When there are system outages, this can impact the value of a constraint limit.

Using SCOTEX as an example.

If there is an outage on the Gretna – Harker circuit (shown in Red), the SCOTEX constraint will be limited.

Pre-fault this may have little to no impact on power flow, as each of the remaining circuits has sufficient thermal capacity.

However constraints are secured to the worst single loss, in this case the Blyth-Eccles-Stella West DC fault.

This then leaves the single circuit between Moffat – Harker to take the power flowing out of Scotland.

Compared to intact, this means there are half the number of circuits taking the same power as before. This will overload and potentially damage the remaining circuit.

To prevent this it is necessary to reduce the power flowing over the boundary, this is done by reducing the constraint limit.

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Common Misconceptions/Questions for System Constraints

The maximum capacity of the boundary is the 'normal' capacity.

Constraints have a maximum capacity, this is the absolute maximum for an intact system. If there are any outages on the network, then there will be some restriction on some of the system constraints. The more outages, the more restrictions, or the greater the restriction will be. It is not unusual that constraints are rarely at the maximum capacity.

Why is there a difference between constraint values at Year Ahead and Real Time/ Day Ahead.

The network, is live and often very volatile, and from time to time, unforeseen issues arise. At year ahead, major projects and significant maintenance work can be planned. At this stage it is mainly concerned with resource and ensuring that the works and outages do not clash and cause unnecessary system congestion. Throughout the year, system faults will occur, and delays to work will happen. This all has a knock on effect on the work that can happen on the network. Due to the this the plan is reviewed at regular intervals to ensure it is optimised and that we are always minimising the operational costs where possible. This does however lead to different limits from year ahead compared to day ahead. When possible we will aim to avoid reducing the limits compared to year ahead, by optimising outage placement, however this is not always possible.

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Demand | Last week demand out-turn

ESO National Demand outturn 13-19 September 2023
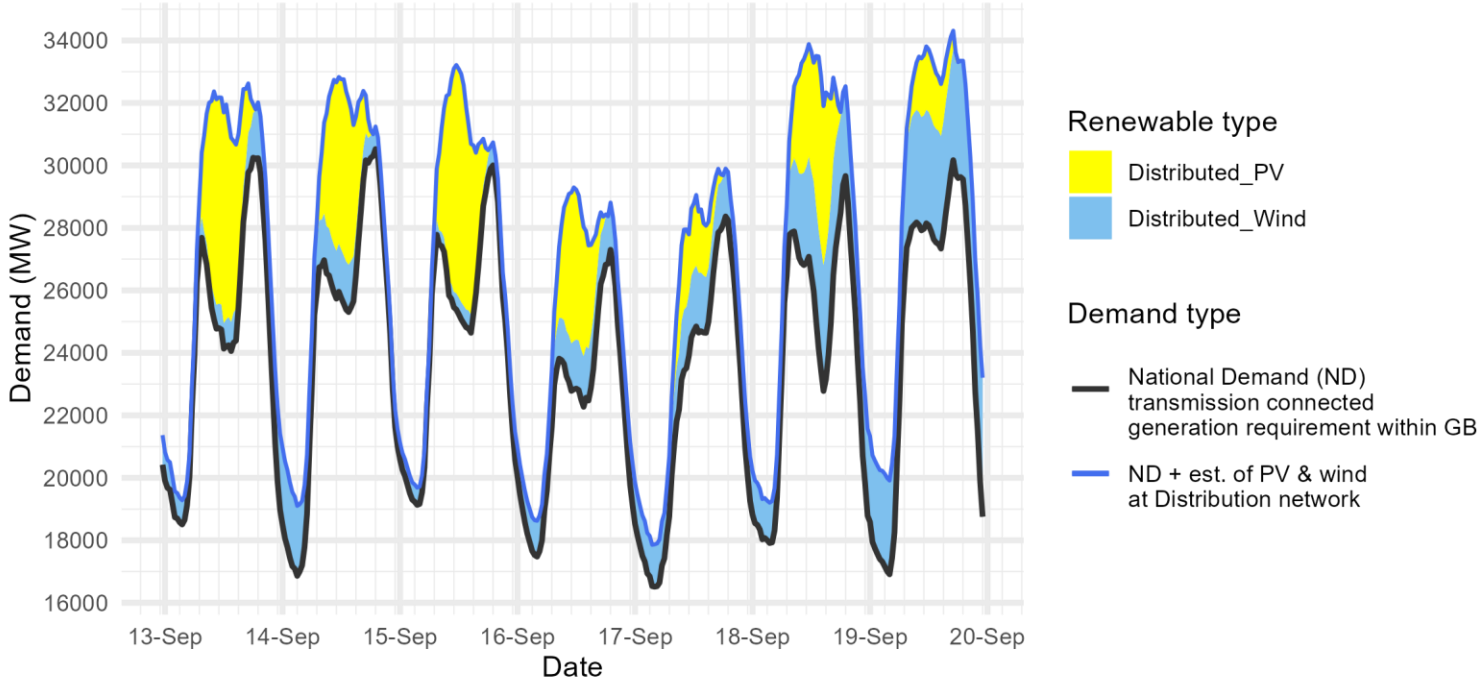
Renewable type
- Distributed_PV (yellow)
- Distributed_Wind (light blue)

Demand type
- — National Demand (ND) transmission connected generation requirement within GB
- — ND + est. of PV & wind at Distribution network

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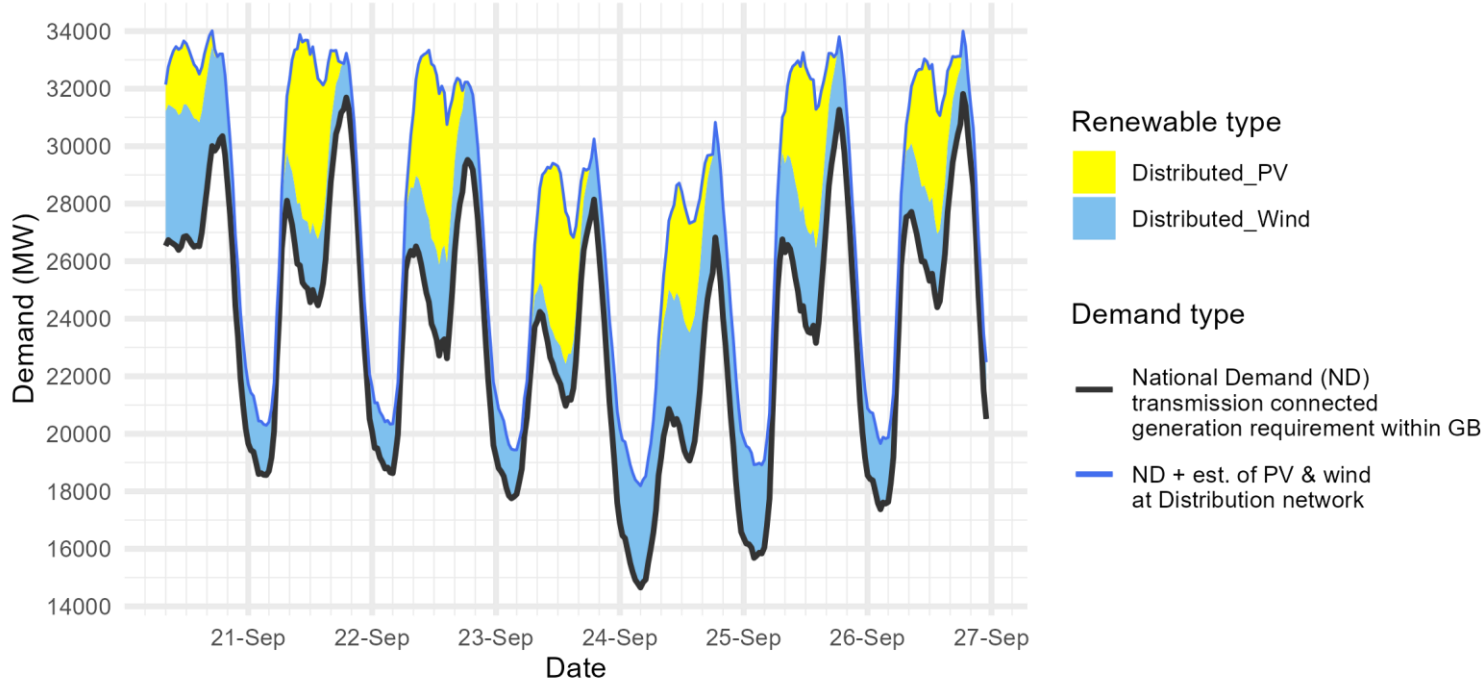
Blue line serves as a proxy for total GB customer demand. It includes demand supplied by the distributed wind and solar sources, but it does not include demand supplied by non-weather driven sources at the distributed network for which ESO has no real time data.

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

| Date | Forecasting Point | FORECAST (Wed 13 Sep) | | OUTTURN | |
		National Demand (GW)	Dist. wind (GW)	National Demand (GW)	Dist. wind (GW)
13 Sep	Evening Peak	30.3	1.5	30.2	1.4
14 Sep	Overnight Min	17.3	2.2	16.9	2.2
14 Sep	Evening Peak	30.6	0.8	30.3	0.7
15 Sep	Overnight Min	18.6	0.7	19.1	0.6
15 Sep	Evening Peak	29.2	0.9	29.9	0.7
16 Sep	Overnight Min	17.4	0.9	17.5	1.1
16 Sep	Evening Peak	26.6	1.2	26.9	1.5
17 Sep	Overnight Min	16.2	1.2	16.5	1.4
17 Sep	Evening Peak	27.4	1.9	28.4	1.5
18 Sep	Overnight Min	16.6	1.8	17.9	1.3
18 Sep	Evening Peak	30.4	2.2	29.4	3.0
19 Sep	Overnight Min	17.0	2.1	16.9	3.0
19 Sep	Evening Peak	30.4	2.3	30.2	3.6

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Demand | Week Ahead

ESO Demand forecast for 20-26 September 2023

Renewable type

- 🟨 Distributed_PV
- 🟦 Distributed_Wind

Demand type

— National Demand (ND) transmission connected generation requirement within GB

— ND + est. of PV & wind at Distribution network

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Date	Forecasting Point	FORECAST (Wed 20 Sep)	
		National Demand (GW)	Dist. wind (GW)
20 Sep 2023	Evening Peak	30.2	3.0
21 Sep 2023	Overnight Min	18.6	1.7
21 Sep 2023	Evening Peak	31.3	1.6
22 Sep 2023	Overnight Min	18.6	1.7
22 Sep 2023	Evening Peak	29.5	2.7
23 Sep 2023	Overnight Min	17.8	1.7
23 Sep 2023	Evening Peak	27.6	2.0
24 Sep 2023	Overnight Min	14.7	3.5
24 Sep 2023	Evening Peak	26.8	4.0
25 Sep 2023	Overnight Min	15.7	3.2
25 Sep 2023	Evening Peak	31.3	2.5
26 Sep 2023	Overnight Min	17.4	2.3
26 Sep 2023	Evening Peak	31.8	2.0

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ESO Actions | Category costs breakdown for the last week
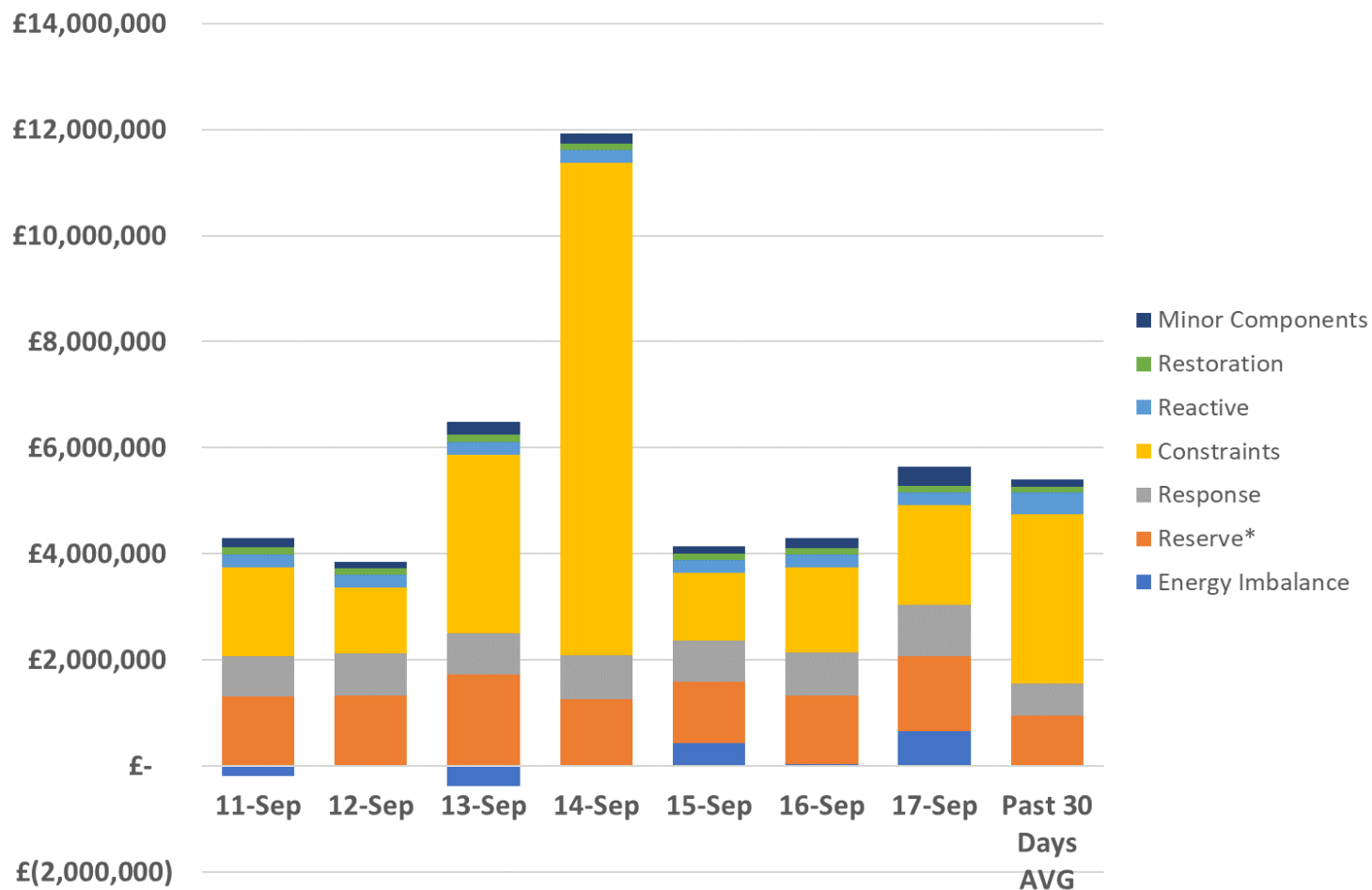
Date	Total (£m)
11/09/2023	4.1
12/09/2023	3.8
13/09/2023	6.1
14/09/2023	11.9
15/09/2023	4.1
16/09/2023	4.3
17/09/2023	5.6
Weekly Total	40.1
Previous Week	25.0

Legend:
- Minor Components
- Restoration
- Reactive
- Constraints
- Response
- Reserve*
- Energy Imbalance

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.

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ESO Actions | Constraint Cost Breakdown
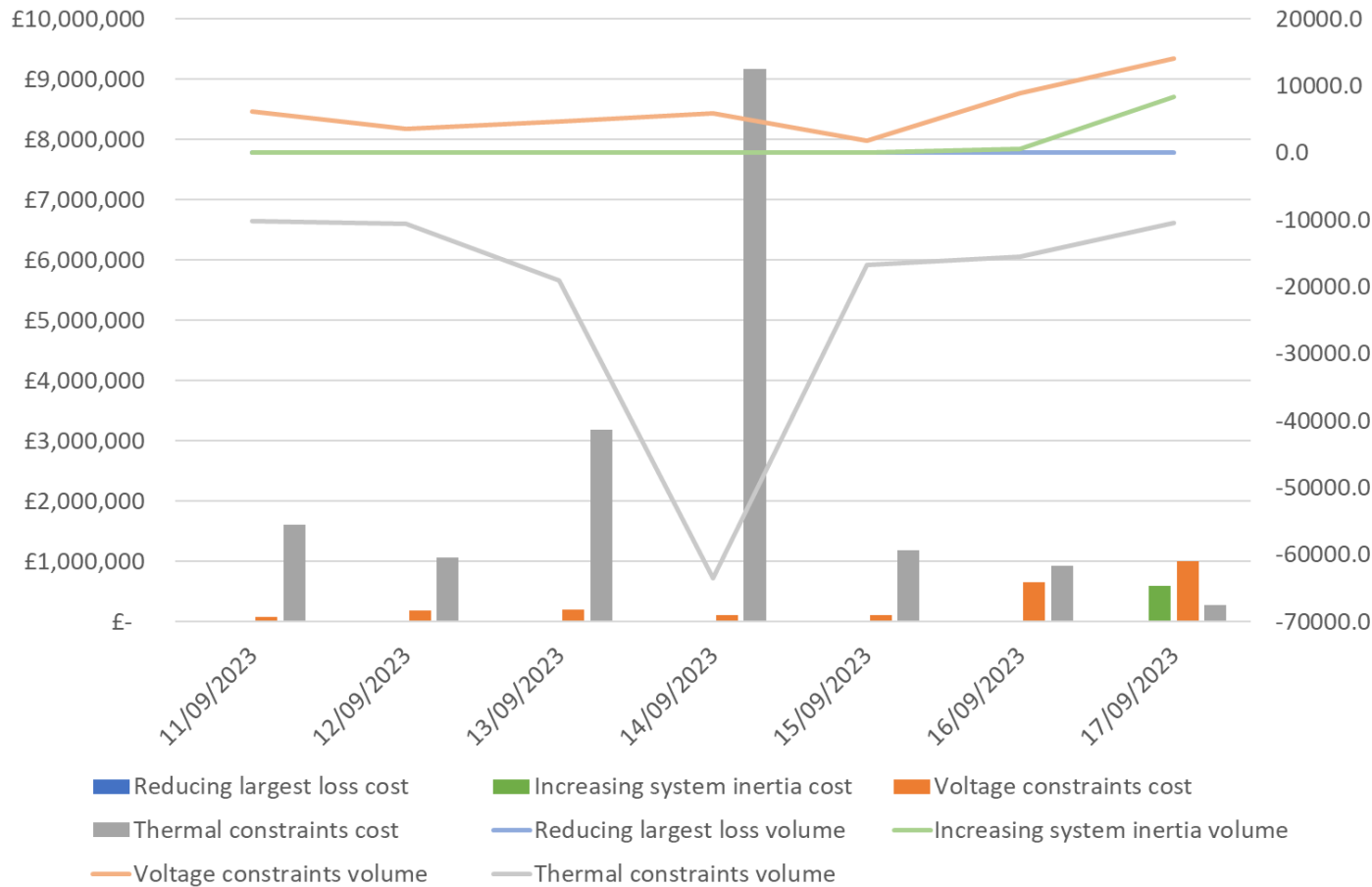
Thermal – network congestion
Actions were required to manage thermal constraints throughout the week with the most significant costs on Thursday.

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 Sunday.

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ESO Actions | Monday 11 September – Peak Demand – SP spend ~£60k
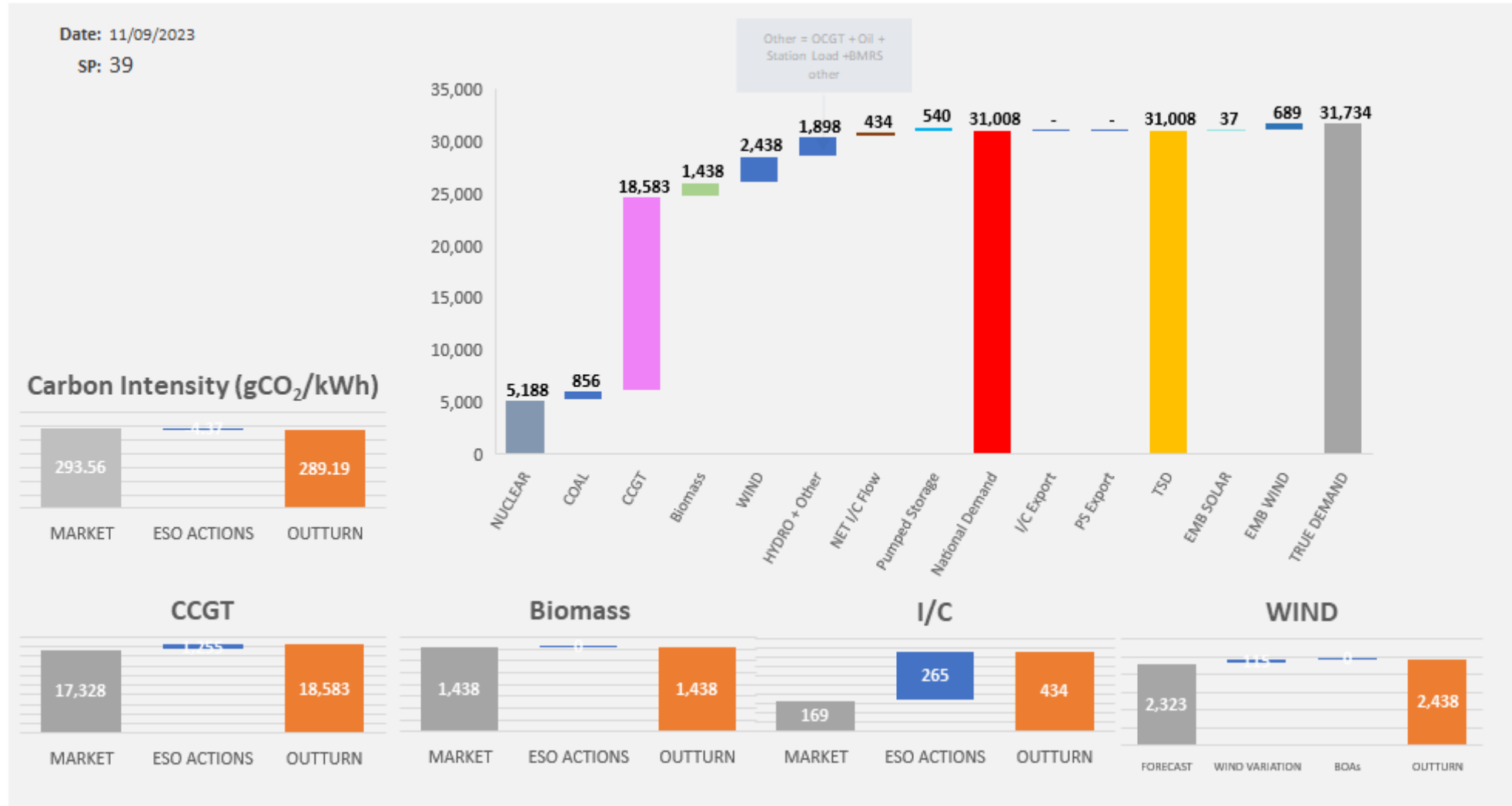
ESO Actions | Sunday 17 September – Minimum Demand – SP Spend ~£110k

Sli.do code #OTF

Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions
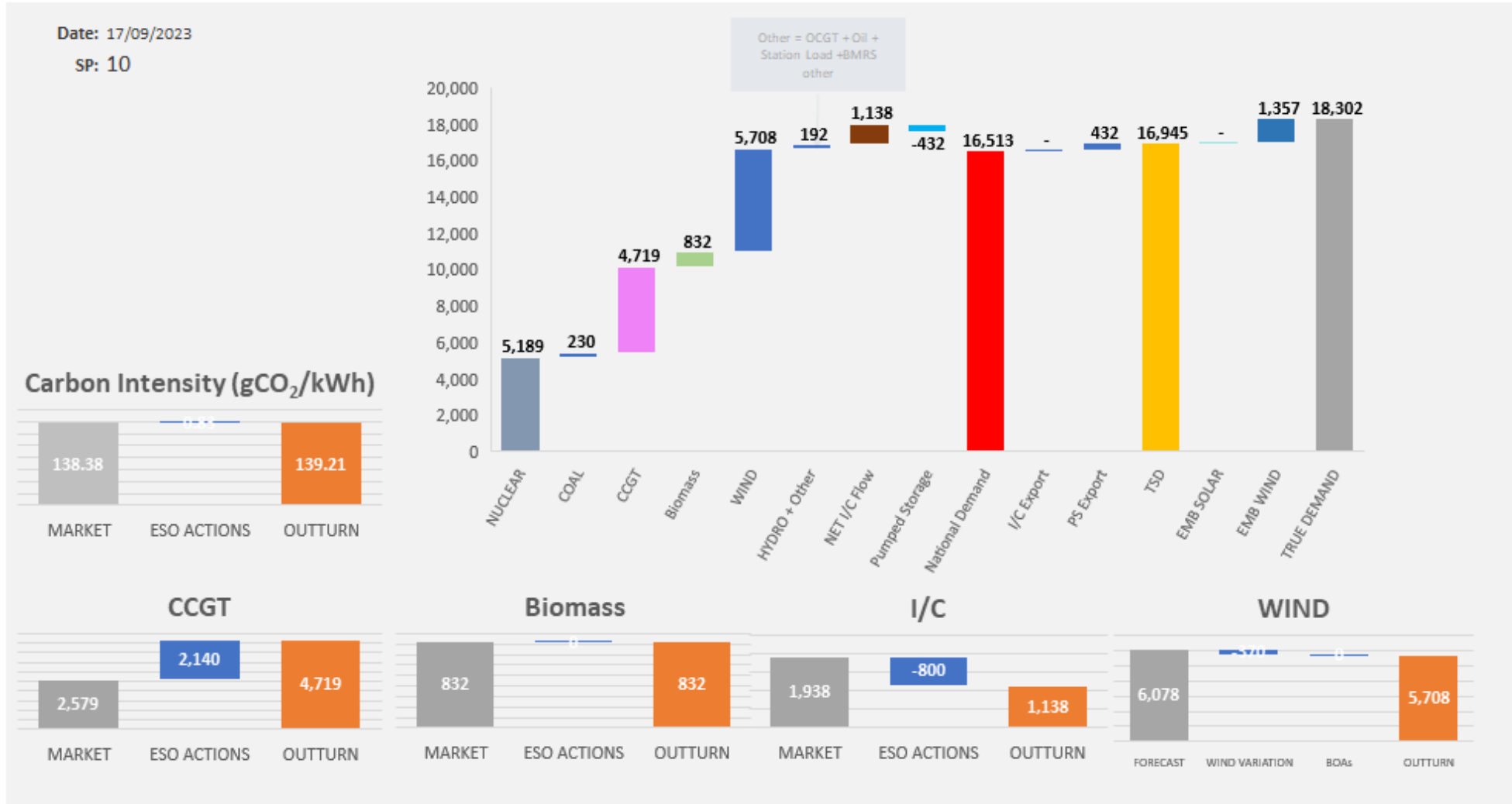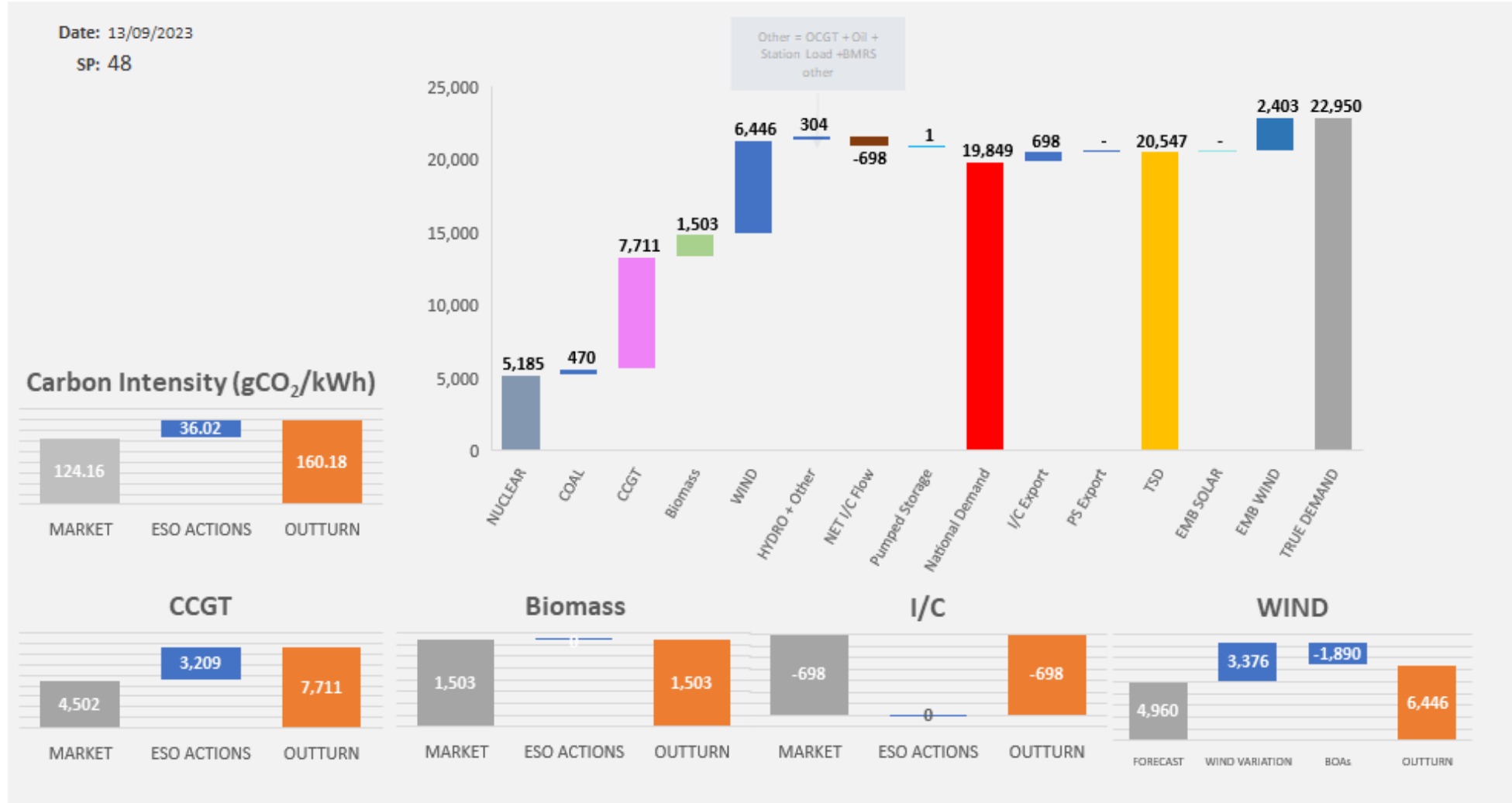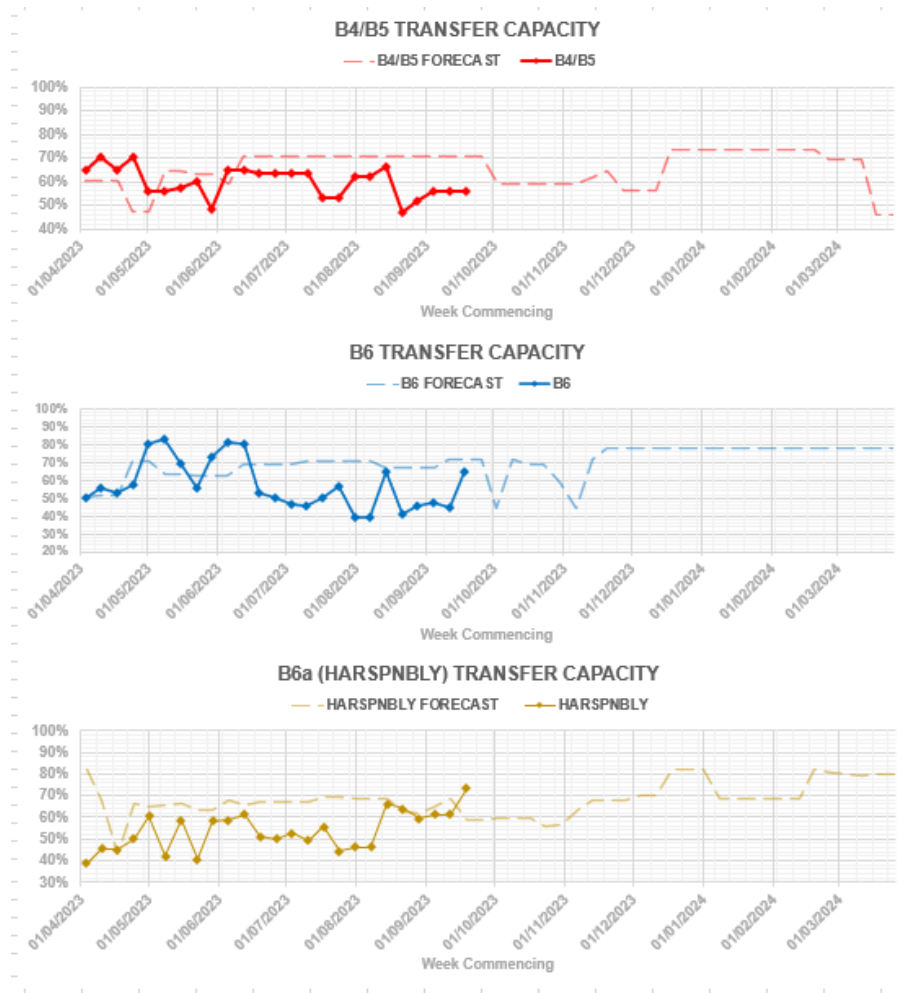
ESO Actions | Wednesday 13 September – Highest SP Spend ~£398k

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

Transparency | Network Congestion

B4/B5 TRANSFER CAPACITY
- - B4/B5 FORECAST — B4/B5

B6 TRANSFER CAPACITY
- - B6 FORECAST — B6

B6a (HARSPNBLY) TRANSFER CAPACITY
- - HARSPNBLY FORECAST — HARSPNBLY

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

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Transparency | Network Congestion

Boundary	Max. Capacity (MW)
B4/B5	3400
B6	6800
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Transparency | Network Congestion

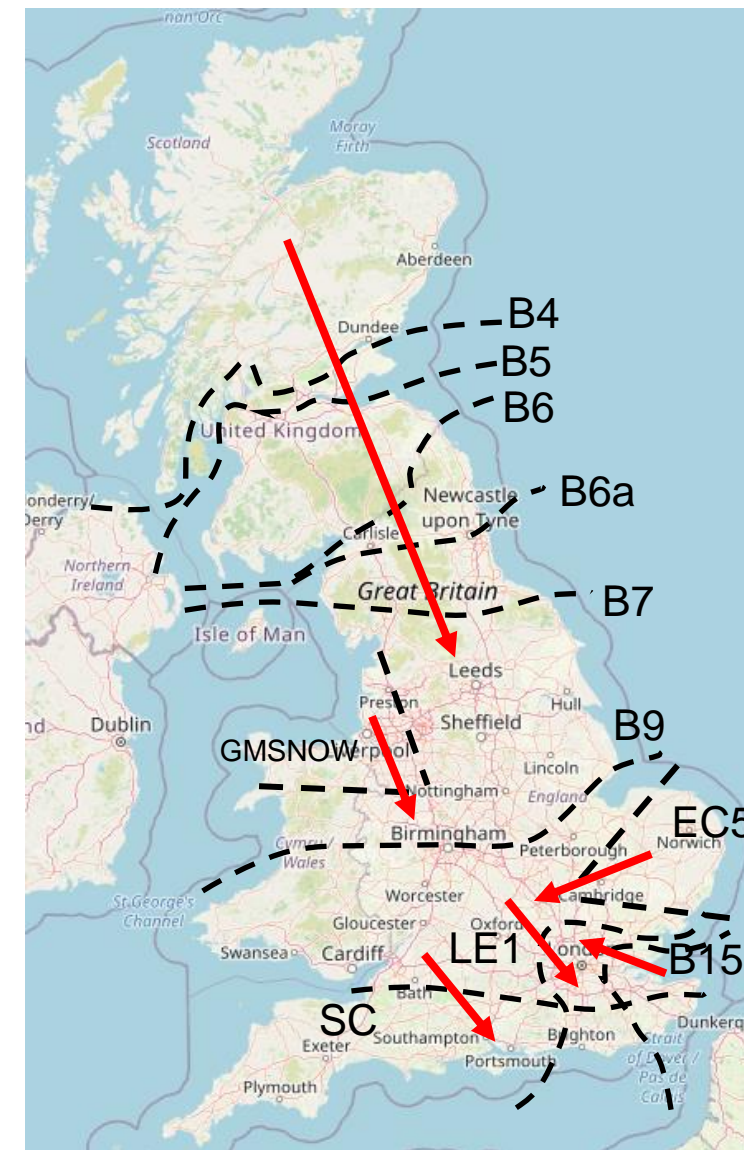| Boundary	Max. Capacity (MW)
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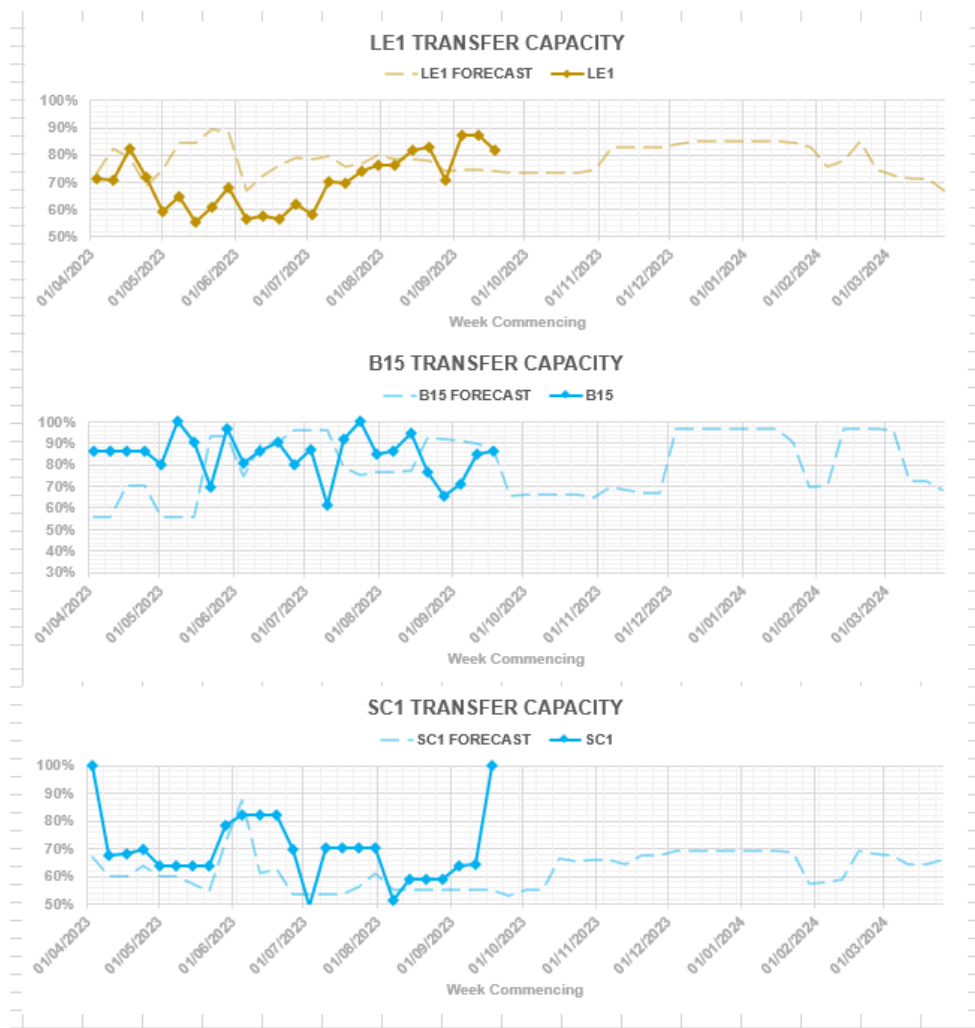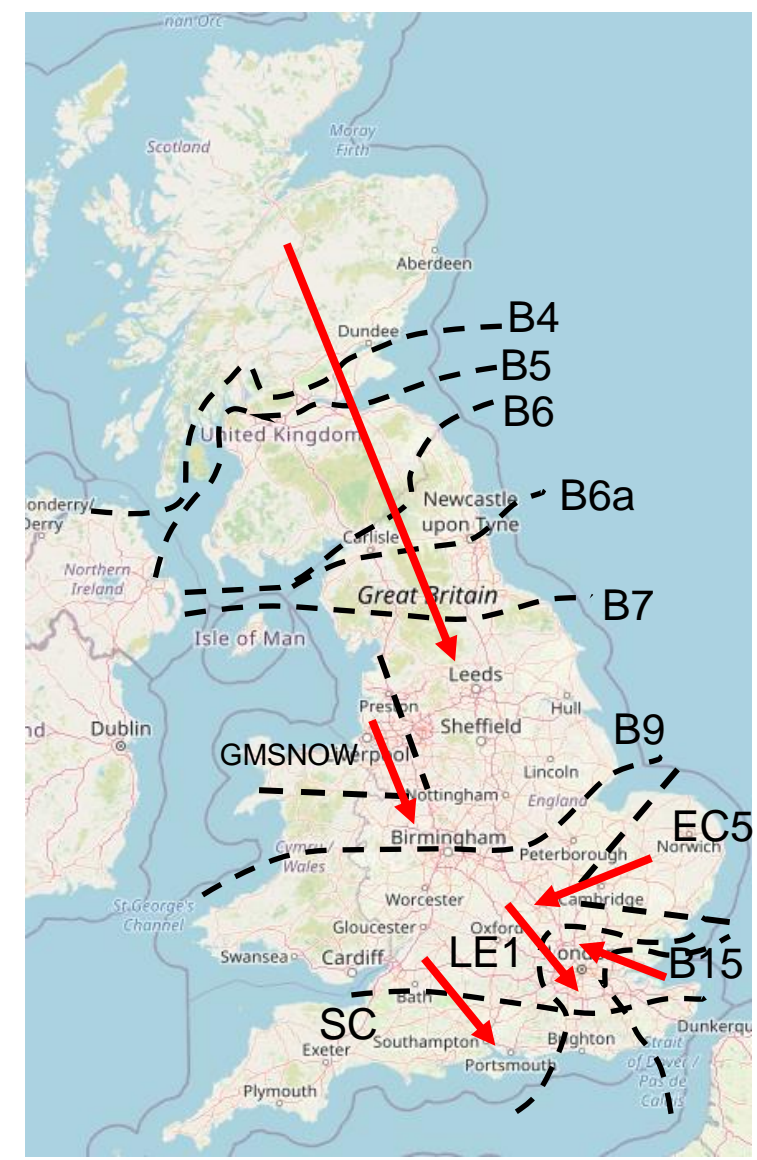https://data.nationalgrideso.com/data-groups/constraint-management

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Previously Asked Questions

Q: Balancing costs are low due to low wind output which would have been much high especially considering how low Boundary transfer capacity is lately. Is it possible to attribute a congestion cost for each boundary constraint?

A: There are no plans to provide this data at present but we will keep it in consideration for any future review.

Q: When you say Demand is based on NG ESO's operational metering, what metering is that? Is it metering at generation sites, or flows across the network (if so at which points, or somewhere else?

A: Yes, the vast majority of this is derived from the MW telemetry (SCADA) metering at the generation site.

Q: Are we still expecting EAC go-live in Oct and OBP in December? Just checking the IT timescales are not slipping!

A: The best place to see up to date information is through our Markets Roadmap Delivery Plans which are updated each month at this link: Markets Roadmap | ESO (nationalgrideso.com)

EAC is on track for go-live in October and OBP is also on track for Release 1 delivery in December.

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Previously Asked Questions

Q: Major national market reforms are being proposed on the back of high constraint costs. We see that boundary transfer capability rarely gets above 70% of the supposed maximum across B4-B6 in particular, and often sits below 50%. Do the maximum values have any real meaning? Can they ever be realised?

A: In recent times a lot of network upgrade projects are being carried on across these boundaries. As such the limit is low during the summer months. Looking at last winter, the real boundary transfers across the boundary is almost 90%.

Q: Recent comms have had a launch date for OBP of both Dec 9th and Dec 23rd. Which is correct please? If the latter, what are the implications of launching a major IT systems change to the market 2 days before Christmas?

A: OBP remains on track for Release 1 delivery in December, we will be able to communicate specific dates closer to the time. We will consider the impact of the release with the backdrop of the time of year and plan accordingly.

Q: can you confirm EAC results will be published before 15:00 each day, in time to in adjust our plan when bidding in the day-ahead half-hourly energy auction?

A: Pending full solution testing, NGESO plan to make the results post EAC auction available on the data portal by no later than 3pm each day.

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Previously Asked Questions

Q: Topic for the updates at OTF - what demand forecasting we need, how we get them and when?!

A: Thank you for the suggestion – we have presented some deep dives on our demand forecasting methodology in the past. Please see the slide decks/recordings here: [Operational Transparency Forum | ESO (nationalgrideso.com)](nationalgrideso.com)

- 12 Jan 2022 - High level summary of Forecasting31

- May 2023 - 'Virtual'/National demand, related to afternoon minimums23

- Aug 2023 - Minutely level forecast for control room, related to women's world cup final

- 19 Apr 2023 - Forecasting of Easter weekend, including wind

If these deep dives aren't able to answer your query please send further details to the .box.

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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

ESO

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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

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Appendix

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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

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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

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