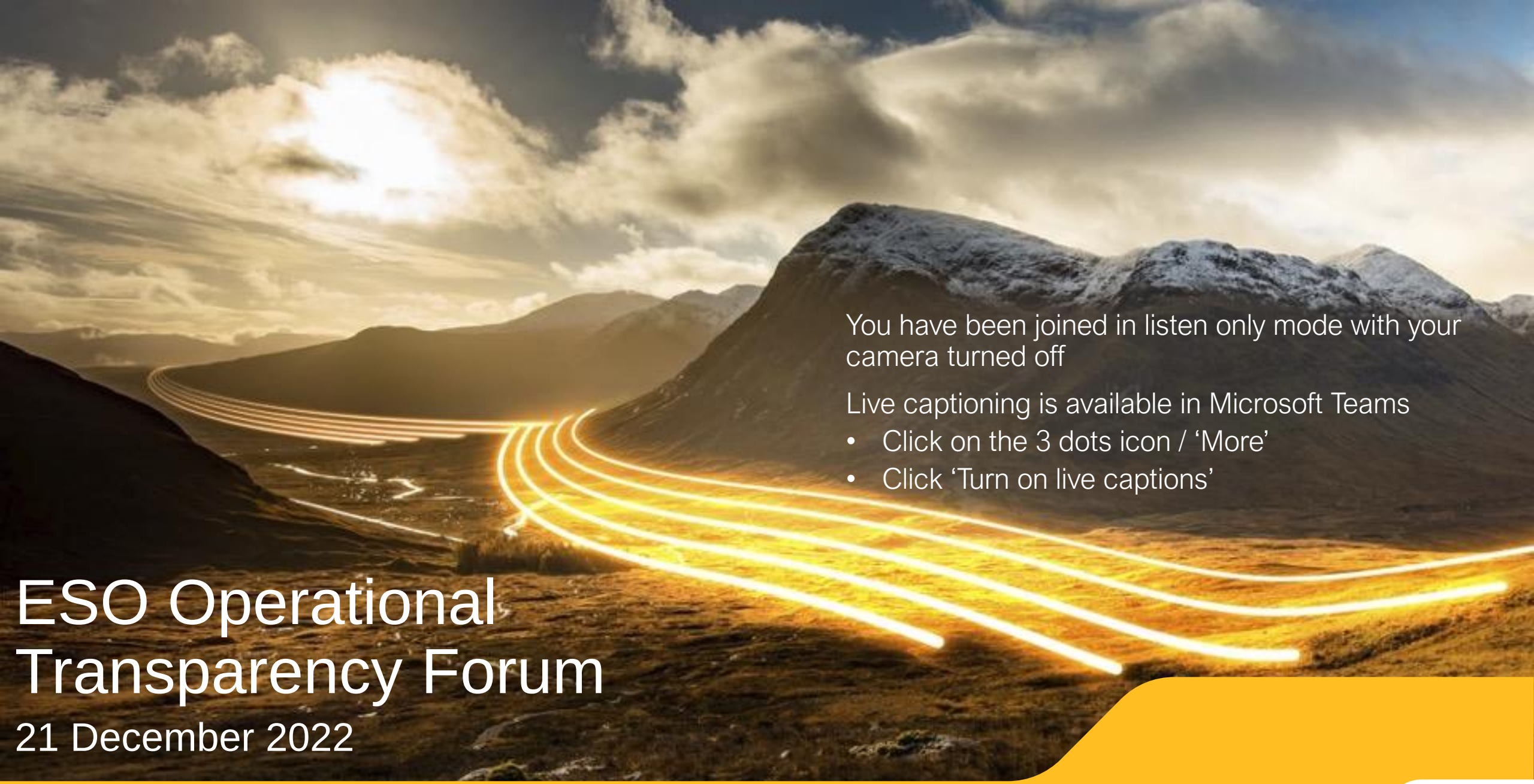


You have been joined in listen only mode with your camera turned off

Live captioning is available in Microsoft Teams

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

ESO Operational Transparency Forum

21 December 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:

Advanced question can be asked here: https://forms.office.com/r/k0AEfKnai3

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

Future deep dive/ response topics

Today:

Local Constraint Markets update

Coming soon:

Reserve Reform update - January

Response markets deep dive – to be rescheduled due to winter workloads in the team

Feedback welcomed on our proposed deep dive topics

Other dates for your diary

28th December - No OTF planned in Christmas week

4th January – Provisional booking for an abbreviated OTF

Winter Contingency Units

Non-Proving run

16th December 2022 – DRAXX-6

In accordance with the contingency service contract terms, Drax undertook a planned non-proving run for DRAXX-6 on Friday 16th December 2022 between 07:55 and 13:25 with a maximum 300MW output

Proving runs

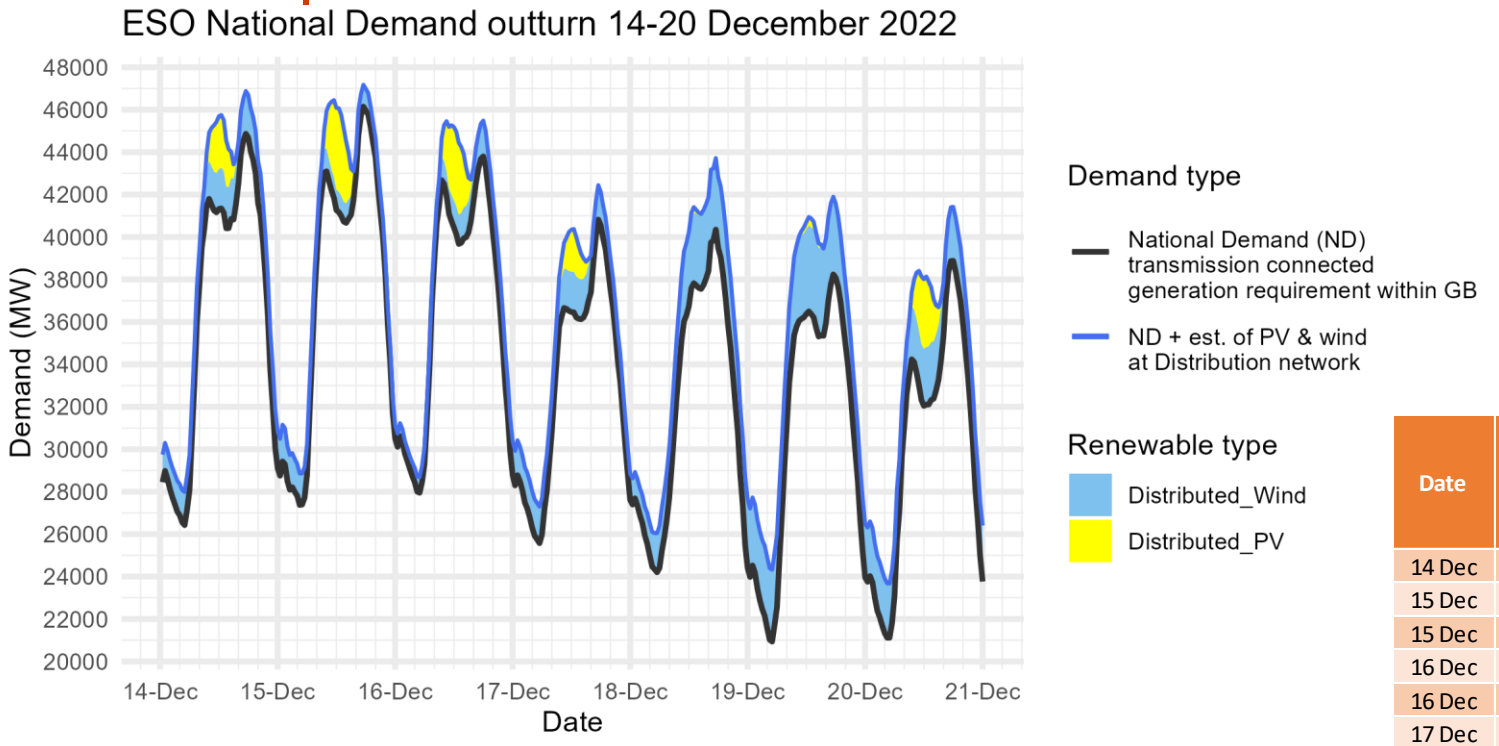
19th - 20th December 2022 – RATS-1

Additionally, Uniper also undertook planned proving runs for RATS-1 on Monday 19th December 2022 between 09:00 and 21:00 with a maximum output of 230MW and on Tuesday 20th December 2022 between 05:00 and 23:00 with a maximum output of 480MW.

All Offer Acceptances issued by NGESO as part of the above runs were priced at £0/MWhr and are in the process of being removed from Settlement using the BSCP18 process. The Offer volume will instead be Settled as Balancing Services Adjustment Data (BSAD) and Applicable Balancing Services Volume Data (ABSVD), in accordance with Approved Modification P447.

ESO will continue to provide formal notice through the BMRS ahead of running the winter contingency units for test or proving runs or to support margin.

Demand | Last week demand out-turn



		FORECAST (Wed 14 Dec)		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)
14 Dec	Evening Peak	45.0	2.0	44.9	0.0	44.9	2.0
15 Dec	Overnight Min	25.8	1.8	27.4	n/a	n/a	1.5
15 Dec	Evening Peak	45.9	1.1	46.1	0.0	46.1	1.0
16 Dec	Overnight Min	27.2	0.6	27.9	n/a	n/a	0.7
16 Dec	Evening Peak	43.5	1.6	43.8	0.0	43.8	1.7
17 Dec	Overnight Min	23.7	2.2	25.6	n/a	n/a	1.7
17 Dec	Evening Peak	37.8	2.7	40.8	0.0	40.8	1.6
18 Dec	Overnight Min	20.0	3.8	24.2	n/a	n/a	1.8
18 Dec	Evening Peak	36.2	3.6	40.4	0.0	40.4	3.4
19 Dec	Overnight Min	19.0	3.4	20.9	n/a	n/a	3.4
19 Dec	Evening Peak	40.1	2.6	38.2	0.0	38.2	3.7
20 Dec	Overnight Min	20.9	2.3	21.1	n/a	n/a	2.6
20 Dec	Evening Peak	41.4	2.0	38.9	0.0	38.9	2.5

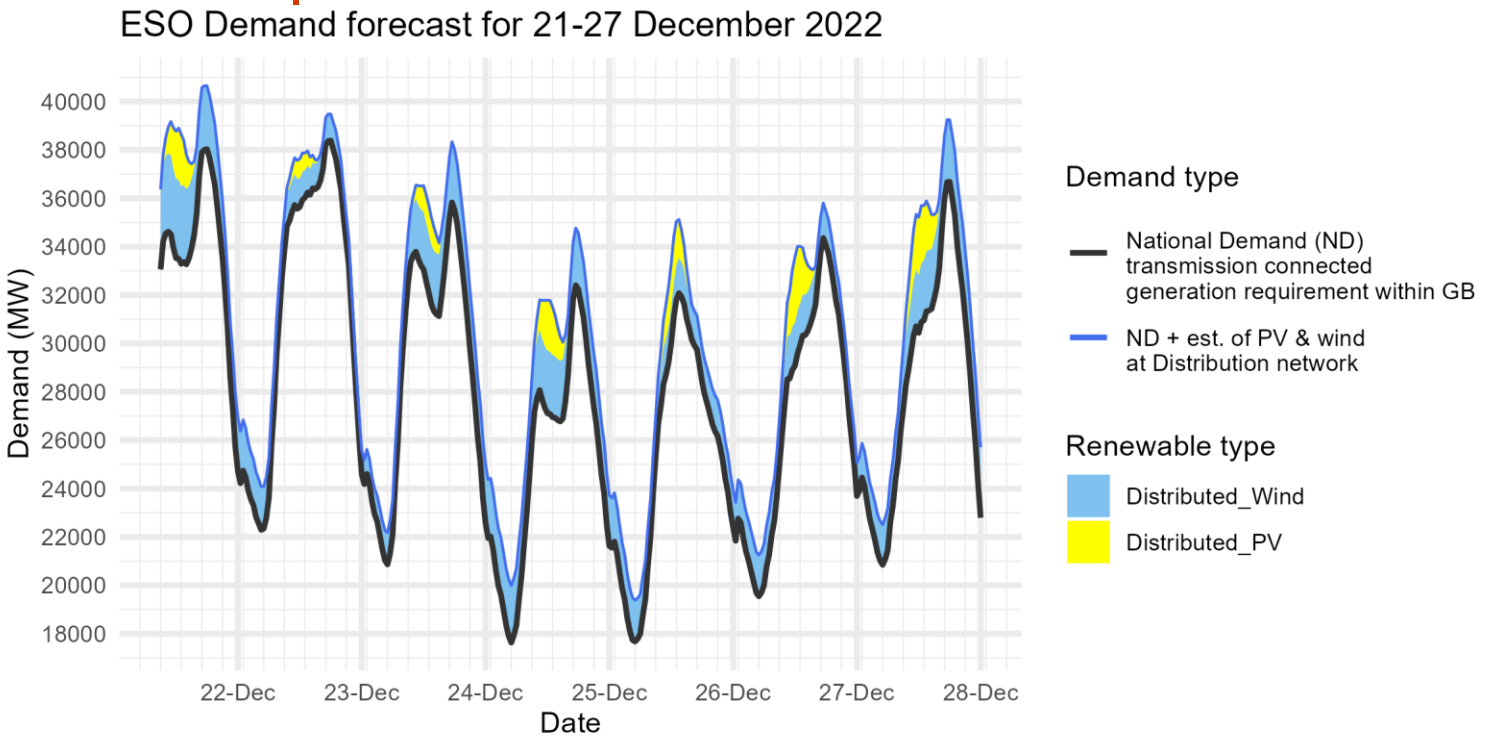
The black line (National Demand ND) is the measure of portion of total GB customer demand that is supplied by the transmission network.

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 21 Dec)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
21 Dec 2022	Evening Peak	38.0	2.6
22 Dec 2022	Overnight Min	22.3	1.8
22 Dec 2022	Evening Peak	38.4	1.1
23 Dec 2022	Overnight Min	20.9	1.3
23 Dec 2022	Evening Peak	35.8	2.5
24 Dec 2022	Overnight Min	17.6	2.4
24 Dec 2022	Evening Peak	32.4	2.4
25 Dec 2022	Overnight Min	17.7	1.7
25 Dec 2022	Evening Peak	29.7	1.4
26 Dec 2022	Overnight Min	19.5	1.7
26 Dec 2022	Evening Peak	34.4	1.4
27 Dec 2022	Overnight Min	20.8	1.7
27 Dec 2022	Evening Peak	36.7	2.6

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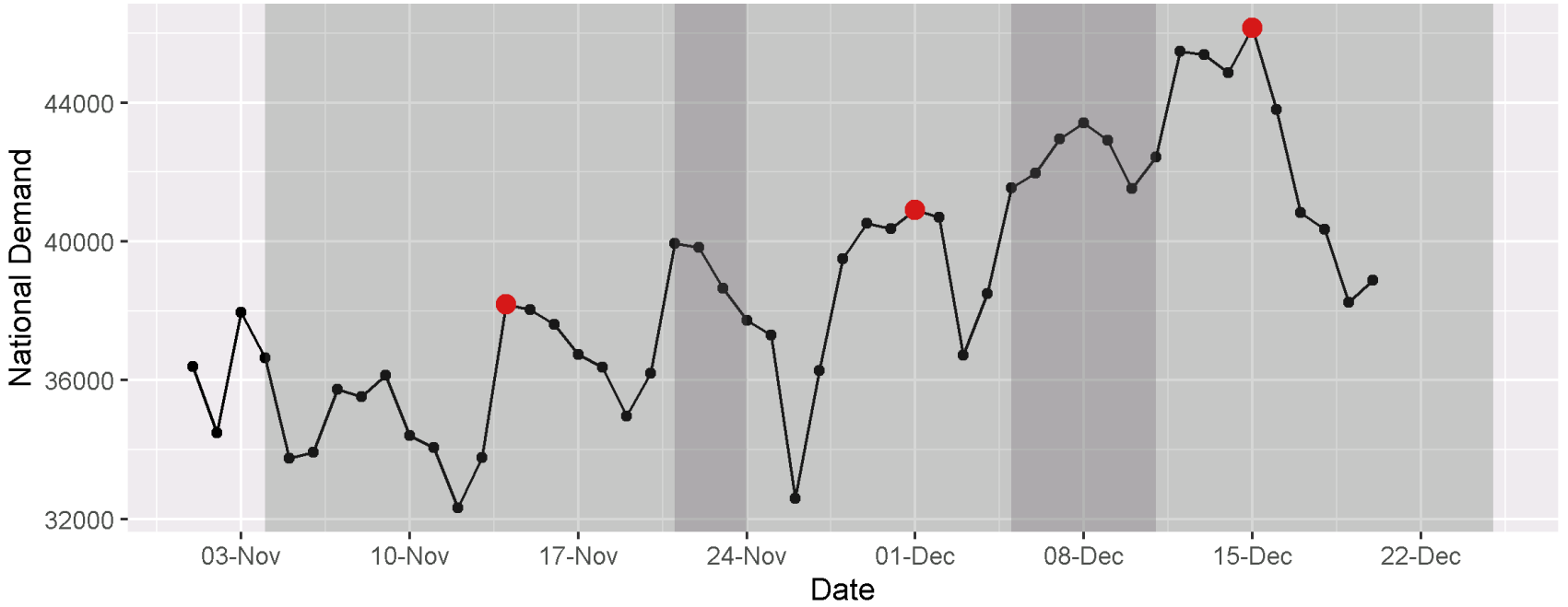
Triad avoidance: indicative triad data based on operational metering

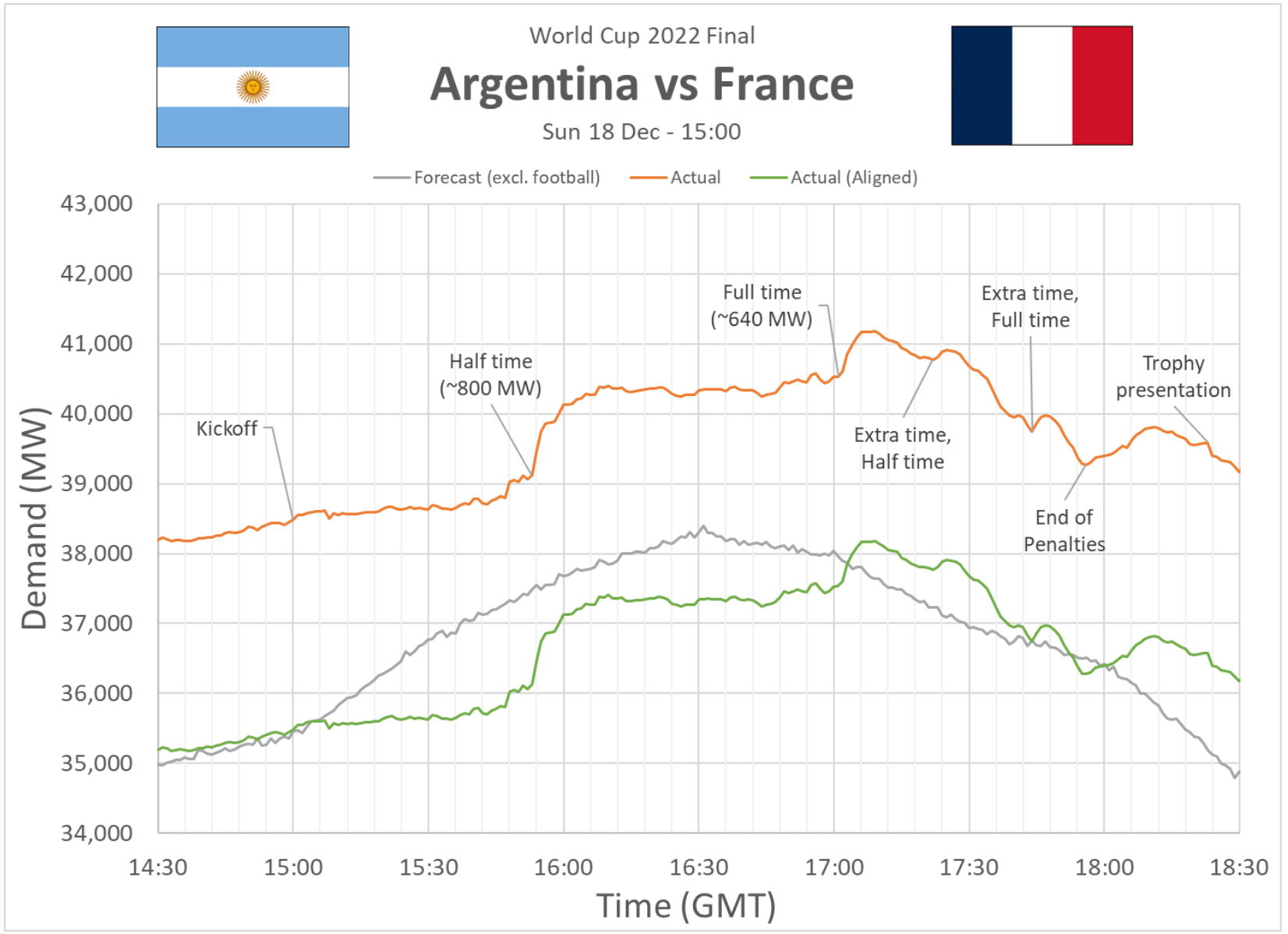


ESO operational metering			
Date	Time (HH ending)	National Demand (MW)	Estimated triad avoidance (HH corresponding with the time of the peak) (MW)
15/12/2022	1730	46147	0
01/12/2022	1800	40909	200
14/11/2022	1800	38193	0

ESO does not include station load.

Indicative triad demand on Elexon's BMRS website quotes "GB Demand" which is based on the Transmission System Demand definition (it adds 500MW of station load onto the National Demand). Also, it shows time as half hour **beginning**.

TV Pickup: World cup 2022 Final – Sun 18 Dec



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 21 December 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. This is based on our current assessment and is subject to change.

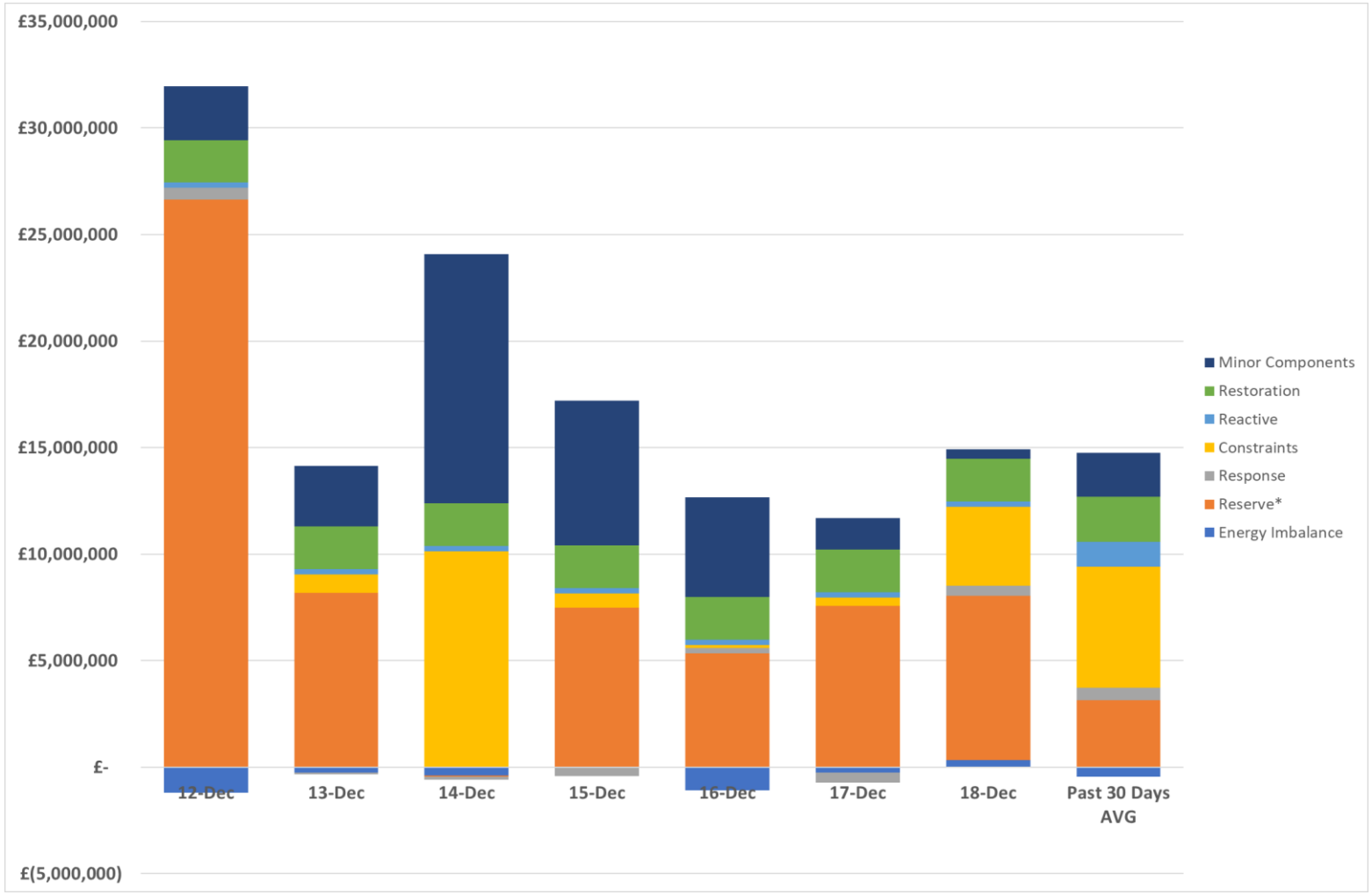
Day	Date	Notified Generation (MW)	Wind (MW)	IC Flows* (MW)	Peak demand (MW)	Indicative surplus (MW)
Thu	22/12/2022	41431	4490	4020	39680	5770
Fri	23/12/2022	42056	12150	4020	36570	16730
Sat	24/12/2022	42501	12380	4020	34360	19620
Sun	25/12/2022	43146	6880	4020	33120	16340
Mon	26/12/2022	42690	7820	4020	34850	15130
Tue	27/12/2022	42265	13510	4020	38310	15790
Wed	28/12/2022	42000	16010	4020	39750	16680

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

Margins do not include NGESO enhanced or emergency actions (Outlined here: download (nationalgrideso.com))

Adequate when Indicative Surplus >= 1000 MW

ESO Actions | Category costs breakdown for the last week



A deep dive into actions taken on 12 December was provided in last week's OTF.

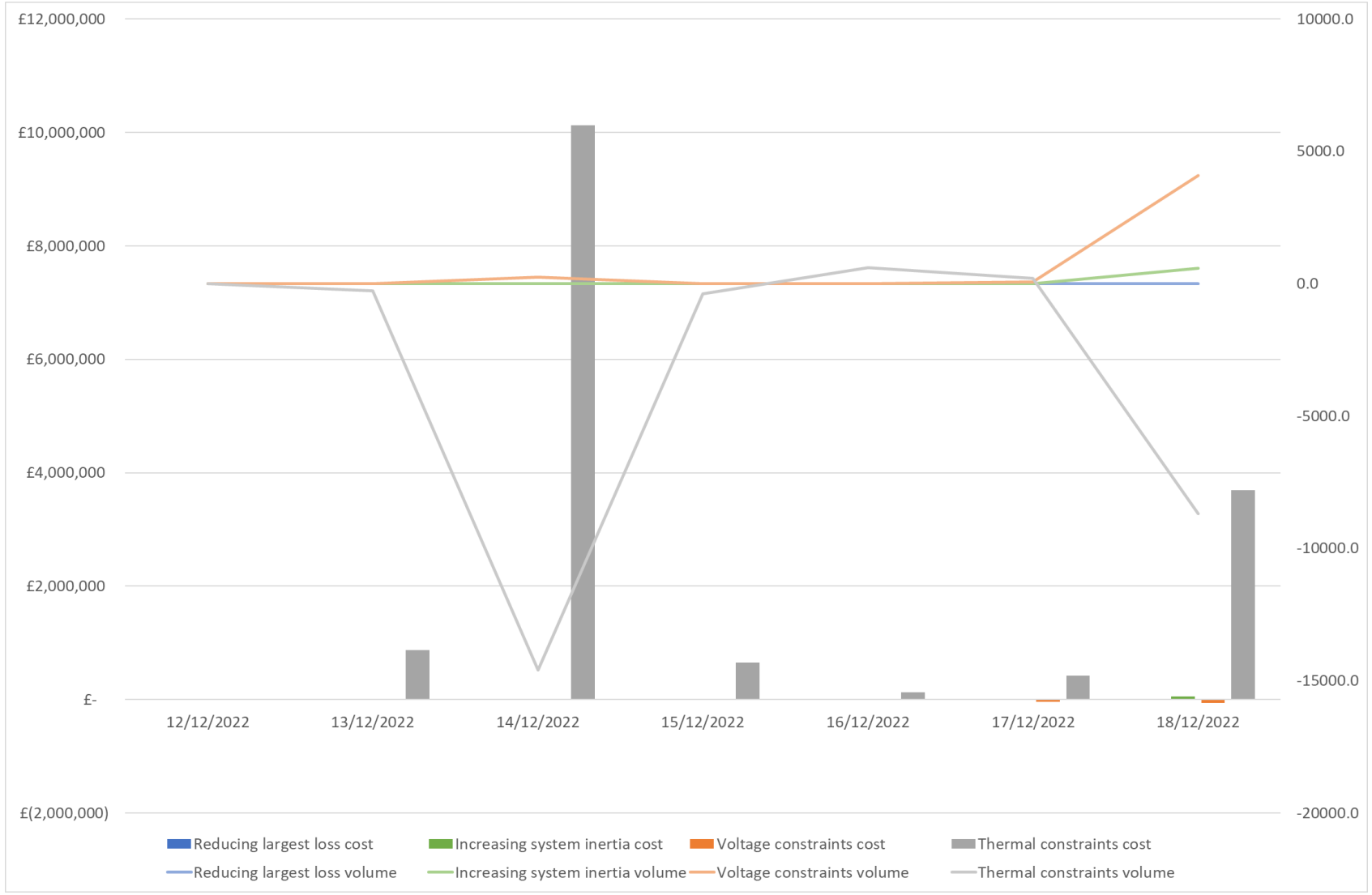
Date	Total (£m)
12/12/2022	30.8
13/12/2022	13.8
14/12/2022	23.5
15/12/2022	16.8
16/12/2022	11.6
17/12/2022	11.0
18/12/2022	14.9
Weekly Total	122.3

Reserve and Constraints costs were the key cost component throughout the week.

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

Data issue: Please note that due to a data issue on a few days over the last few months, the Minor Components line in Non-Constraint Costs is capturing some costs on those days which should be attributed to different categories. It has been identified that a significant portion of these costs should be allocated to the Operating Reserve Category. Although the categorisation of costs is not correct, we are confident that the total costs are correct in all months. We continue to investigate and will advise when we have a resolution.

ESO Actions | Constraint Cost Breakdown



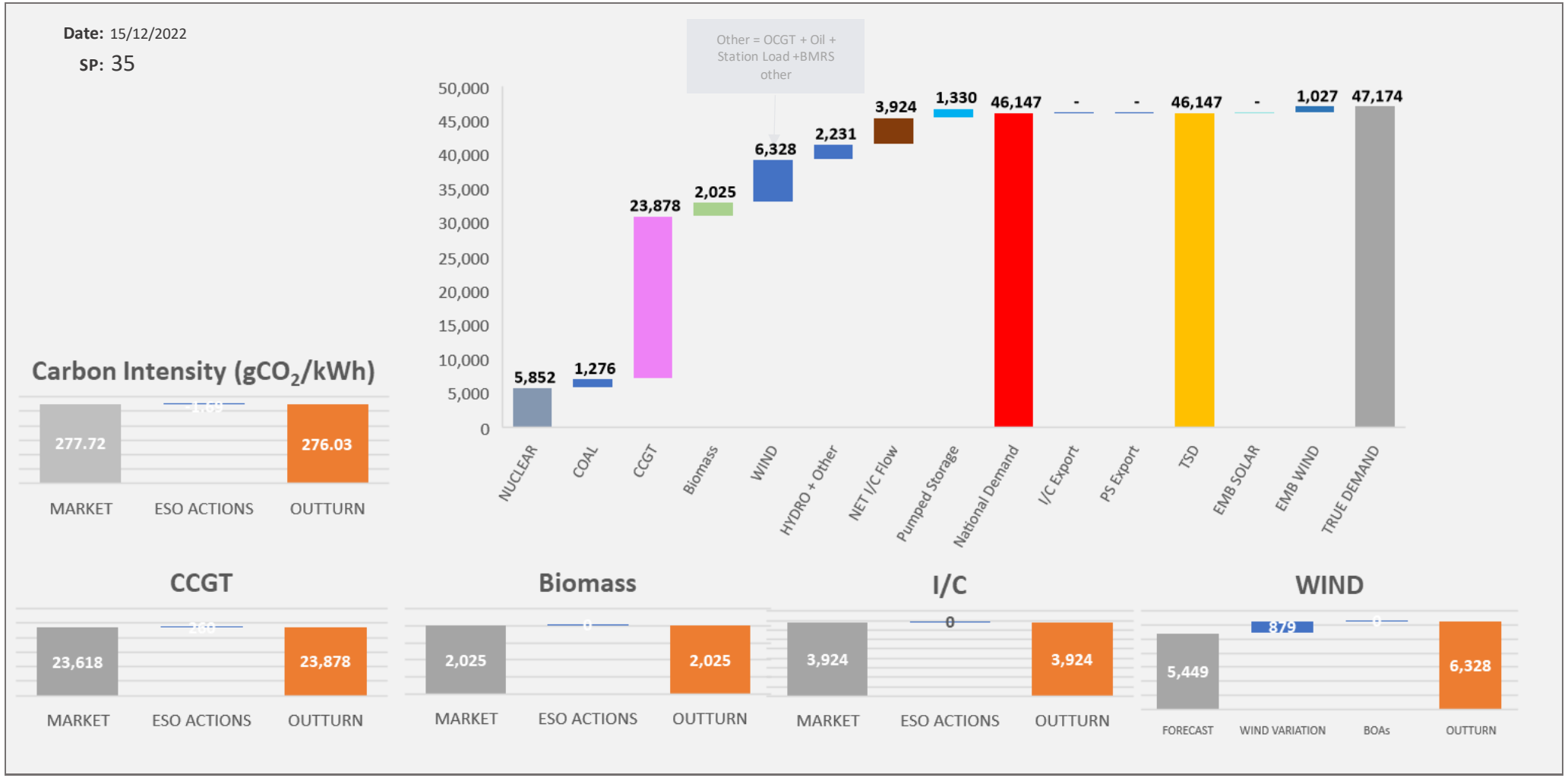
Thermal – network congestion
Actions required to manage Thermal Constraints from Tuesday to Saturday.

Voltage
Intervention was required for voltage control on Wednesday, Saturday & Sunday.

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

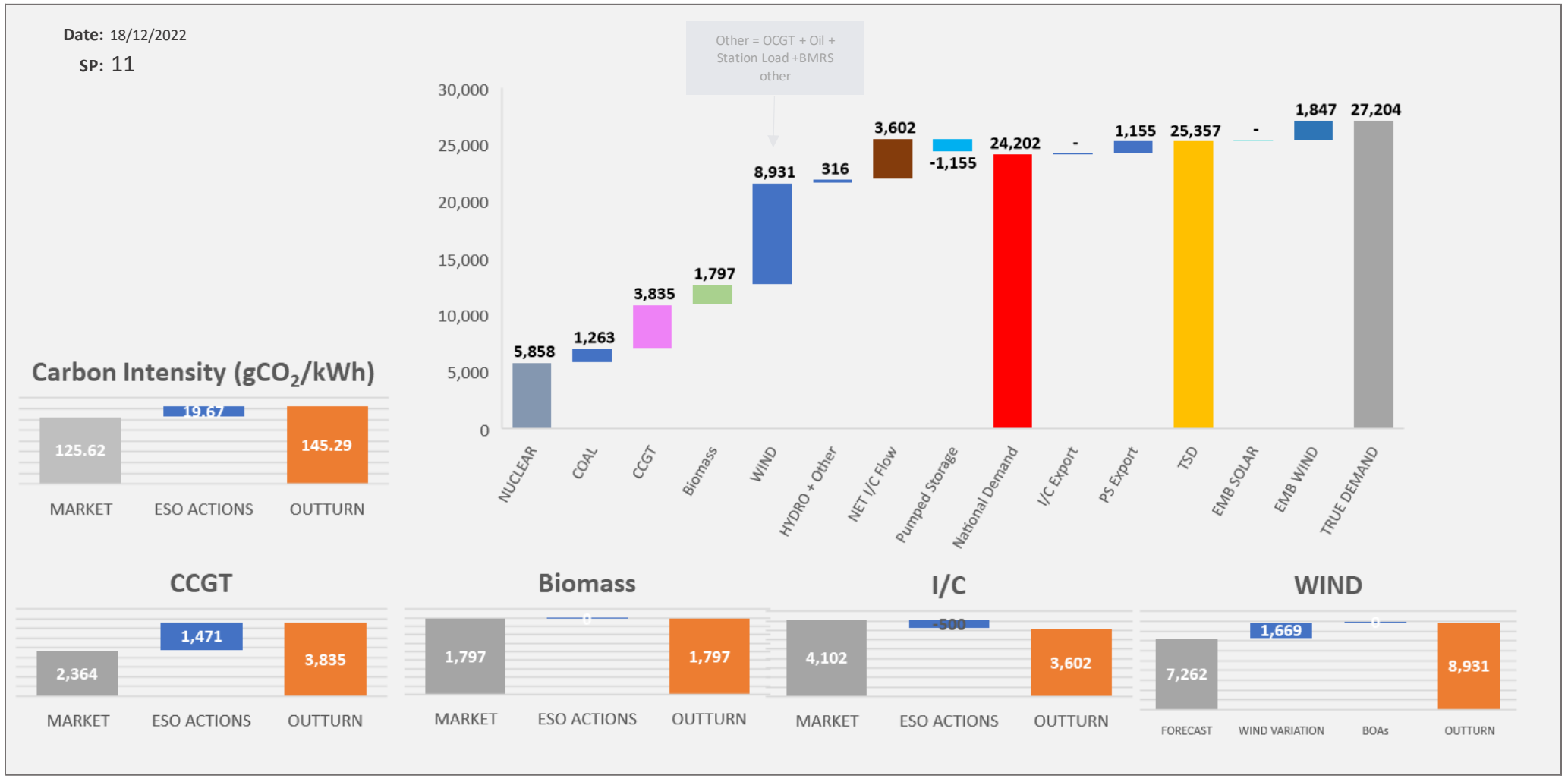
Increasing inertia
Intervention was required to manage system inertia on Sunday.

ESO Actions | Thursday 15 December – Peak Demand – SP spend ~£276k



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

ESO Actions | Sunday 18 December – Minimum Demand – SP Spend ~£181k



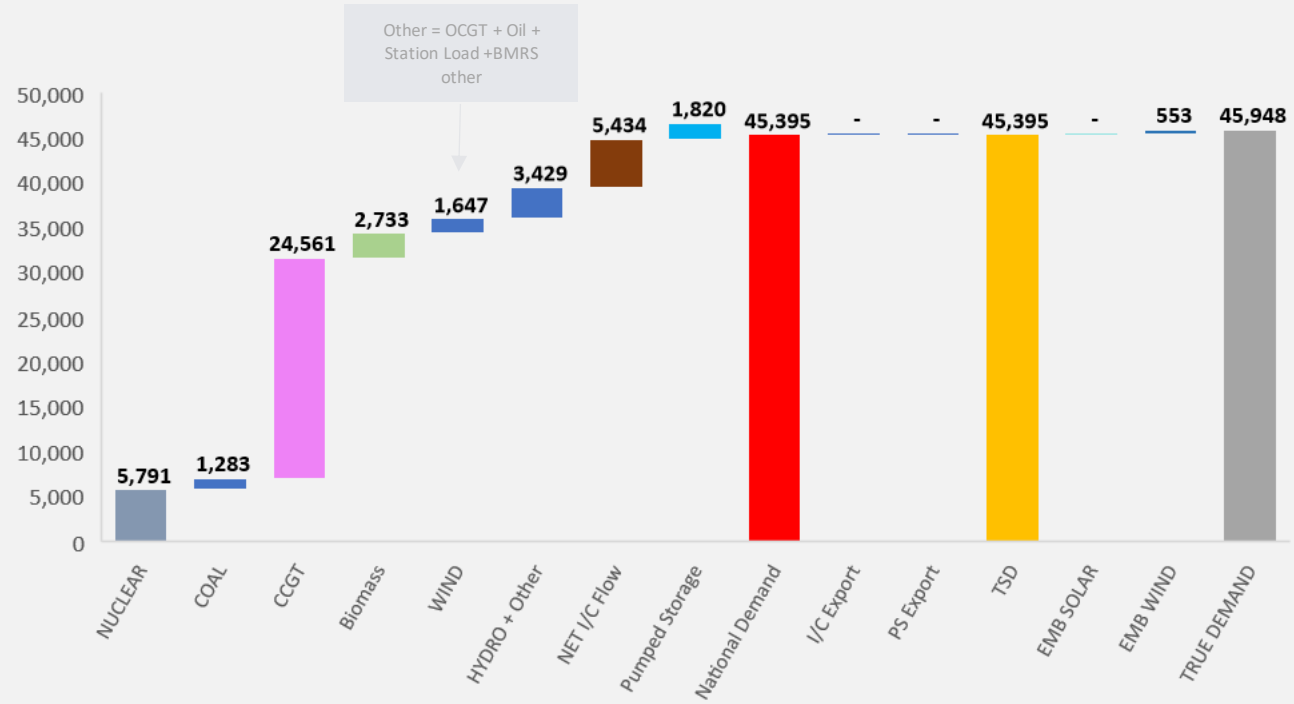
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

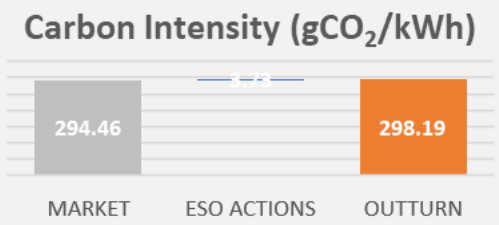
ESO Actions | Monday 12 December – Highest SP Spend ~£1.8M

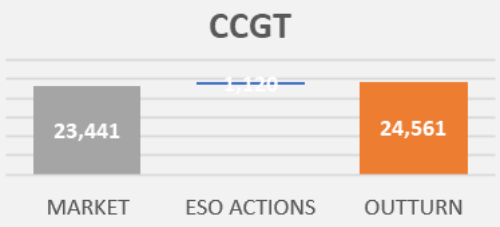
Date: 12/12/2022

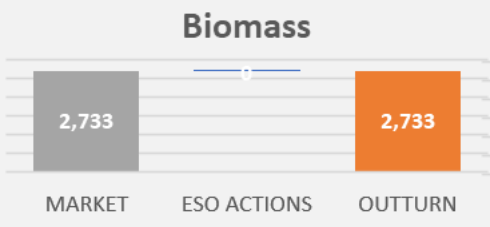
SP: 35

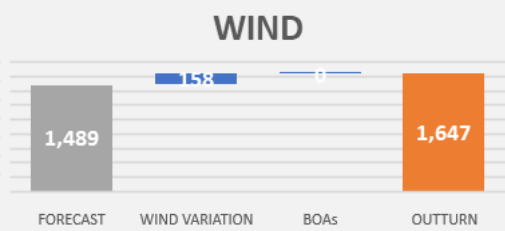
A deep dive into actions taken on 12th December was provided in last week's OTF.











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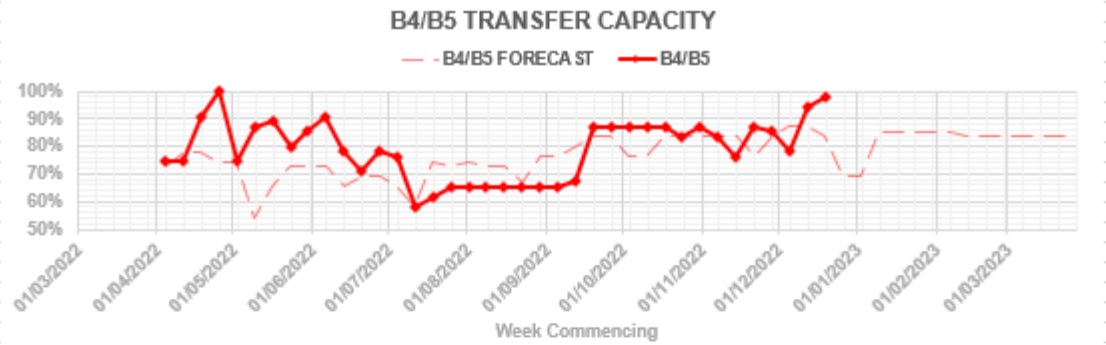
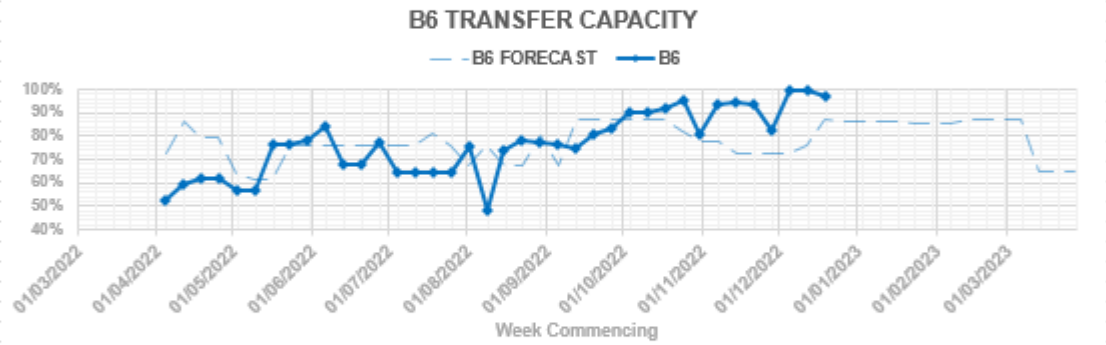
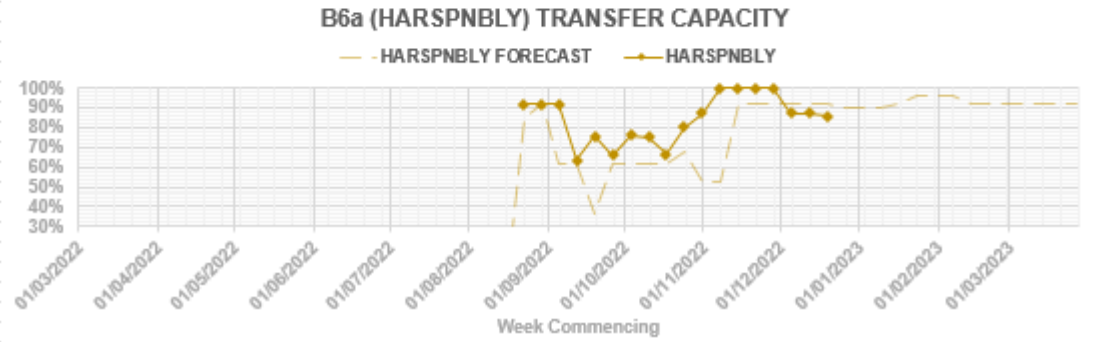
Transparency | Network Congestion







Boundary	Max. Capacity (MW)
B4/B5	2750
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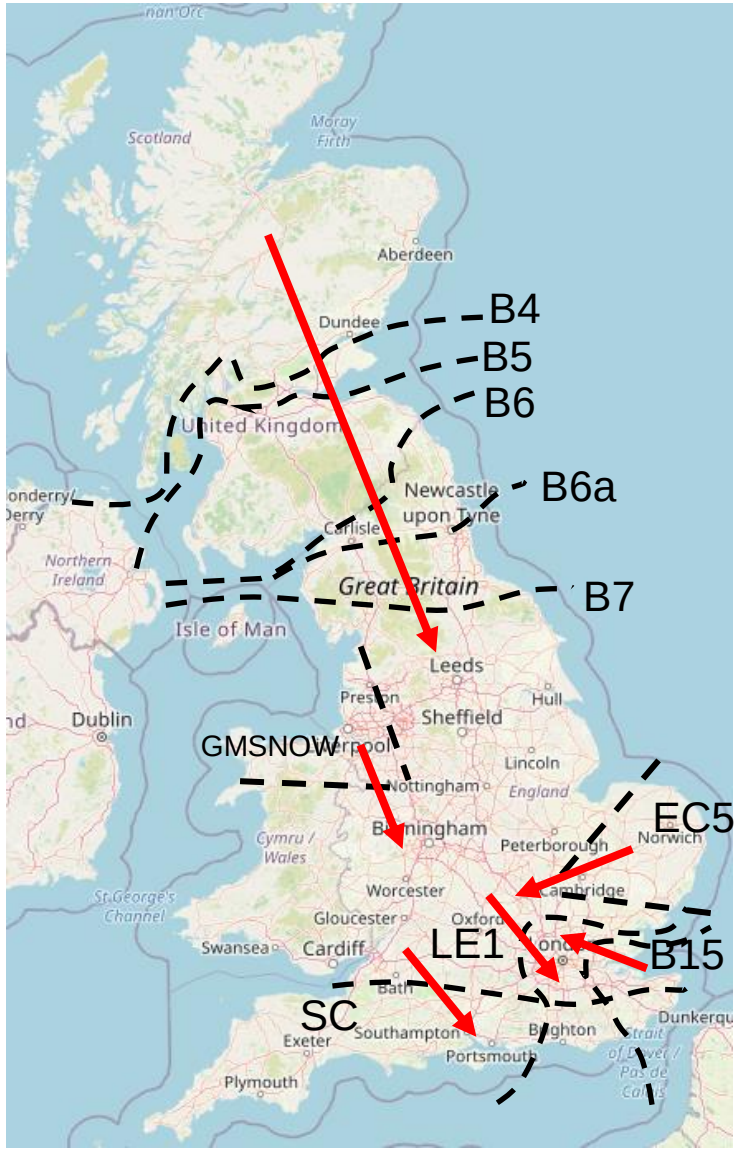
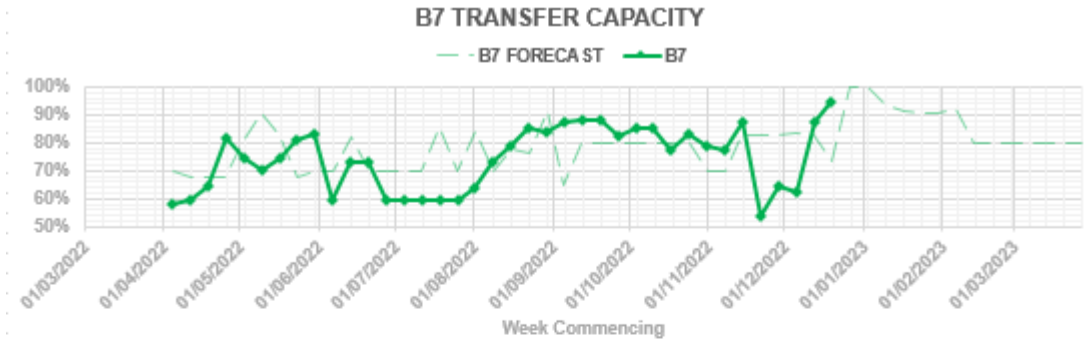
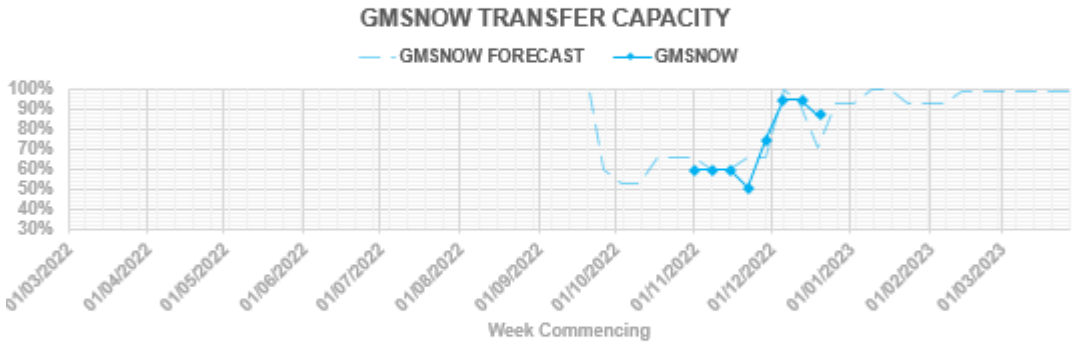
EC5	5000
LE1	8500
B15	7500
SC	7000

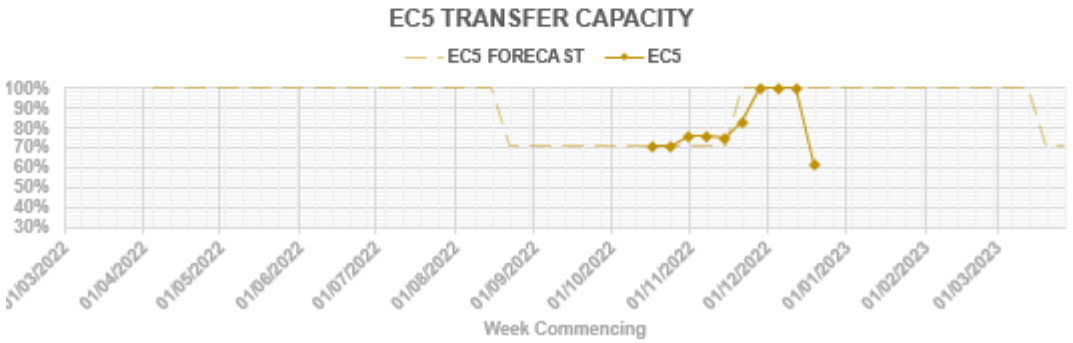


Day ahead flows and limits, and the 24 month constraint limit forecast are published on the ESO Data Portal:
https://data.nationalgrideso.com/data-groups/constraint-management

Transparency | Network Congestion







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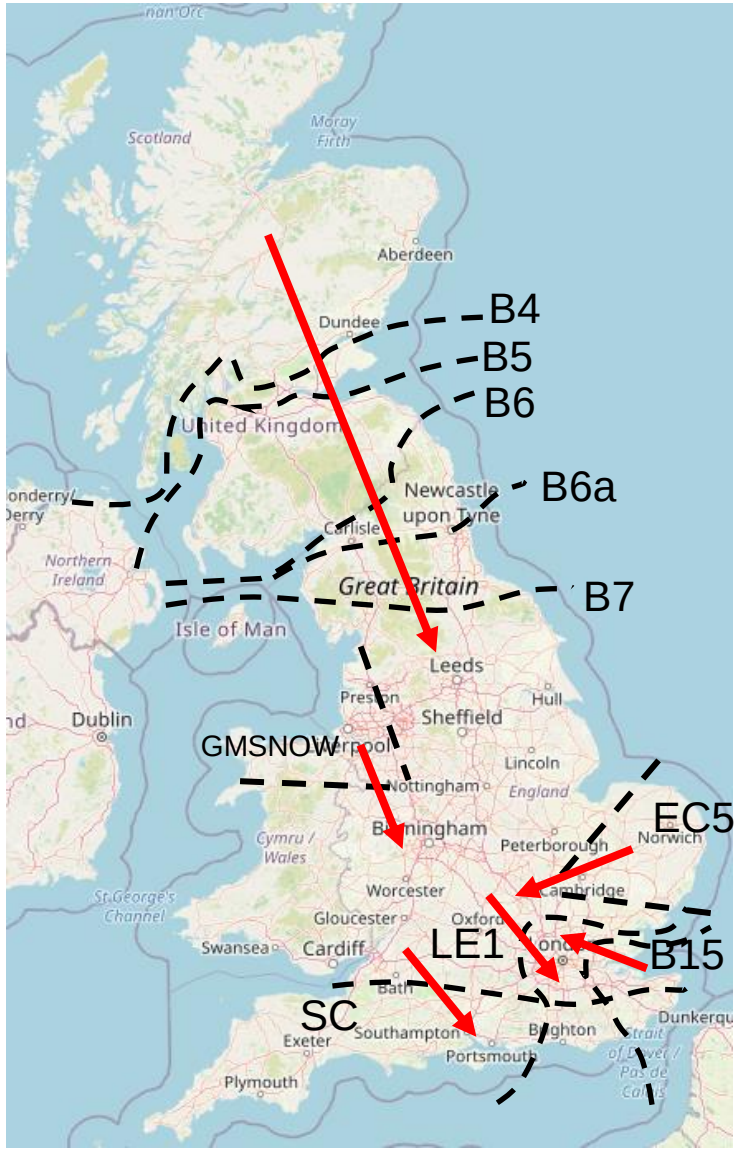

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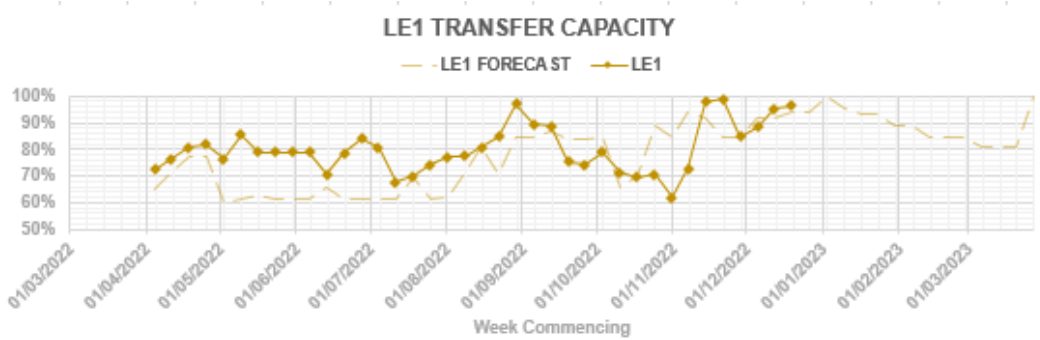
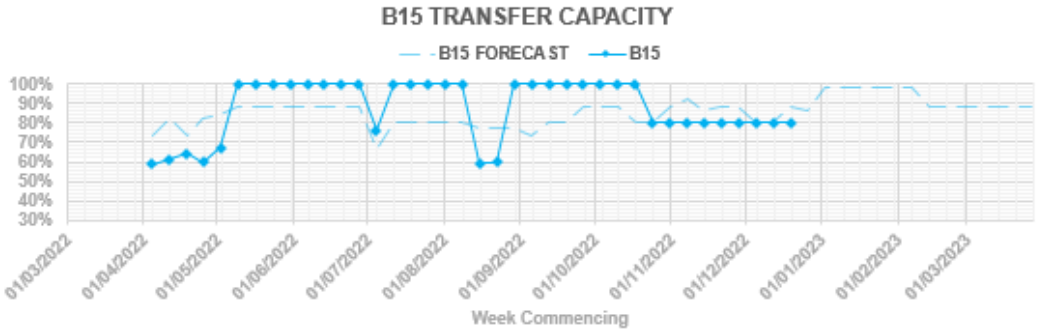
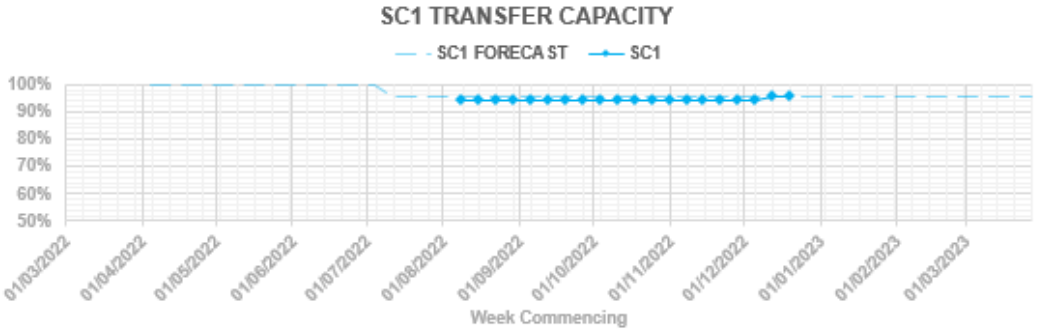
Transparency | Network Congestion







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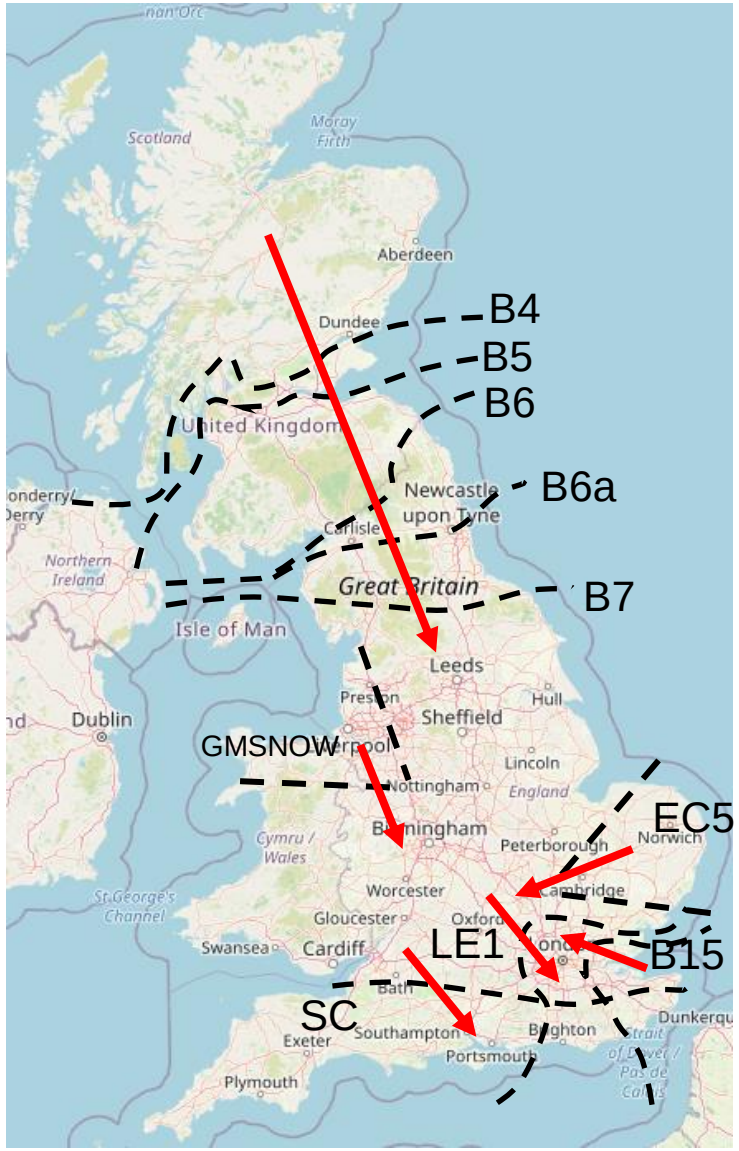

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A new Local Constraint Market to access new sources of flexibility to help manage our most constrained boundaries

Local Constraint Market (LCM)

Design update, Progress & next steps

ESO

Why

The Anglo Scottish boundary (B6) currently has the highest constraints and these are set to increase over time.

Our most congested boundaries are constrained 85% of the time. Between now and 2025 we will require a range of innovative solutions to manage some of the increase in thermal constraint costs.

How

Trials have shown Distributed Energy Resources (DER) can provide more flexibility and competition. Regional Development Programmes will offer an enduring approach. ***Ahead of* RDPs we can accelerate market participation with LCM above B6 Boundary**

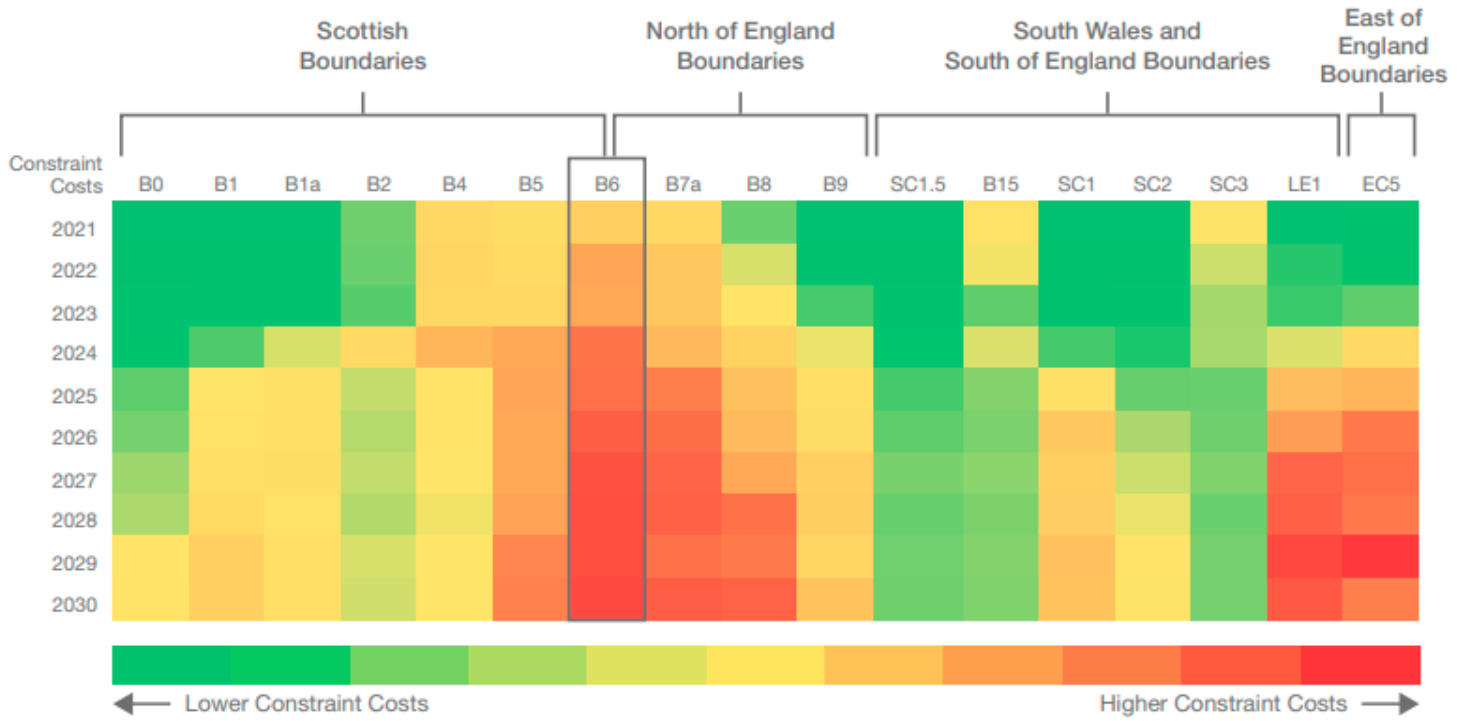
We see this local constraint market working alongside existing ESO and DNO approaches and providing visibility, flexibility and coordinated control through appropriate systems and processes.

Pre-fault spend on constraints set to rise across the B6 boundary

..with this in mind, ESO industry consultations about this service began in March 2022

The requirement

This heat map shows the boundaries incurring significant costs as thermal constraints increase in particular areas. The B6 boundary has the highest constraints and increasing costs over time



Source: Electricity Ten Year Statement (ETYS) 2020

Example only| Operating LCM for a constraint case

BM continues to *fulfil the System Requirement* for managing boundary constraints

- Daily analyses and view will be taken at an early stage about the detailed boundary requirement(s)
- Established engineering practice and judgements consistently applied to determine options, via daily operating plans. LCM is now an *additional option.*
- Past experience is then reapplied to optimise how, where and when LCM can be best utilised.
- Service reporting via https://data.nationalgrideso.com/

Boundary	EXAMPLE Max. Capacity (MW)
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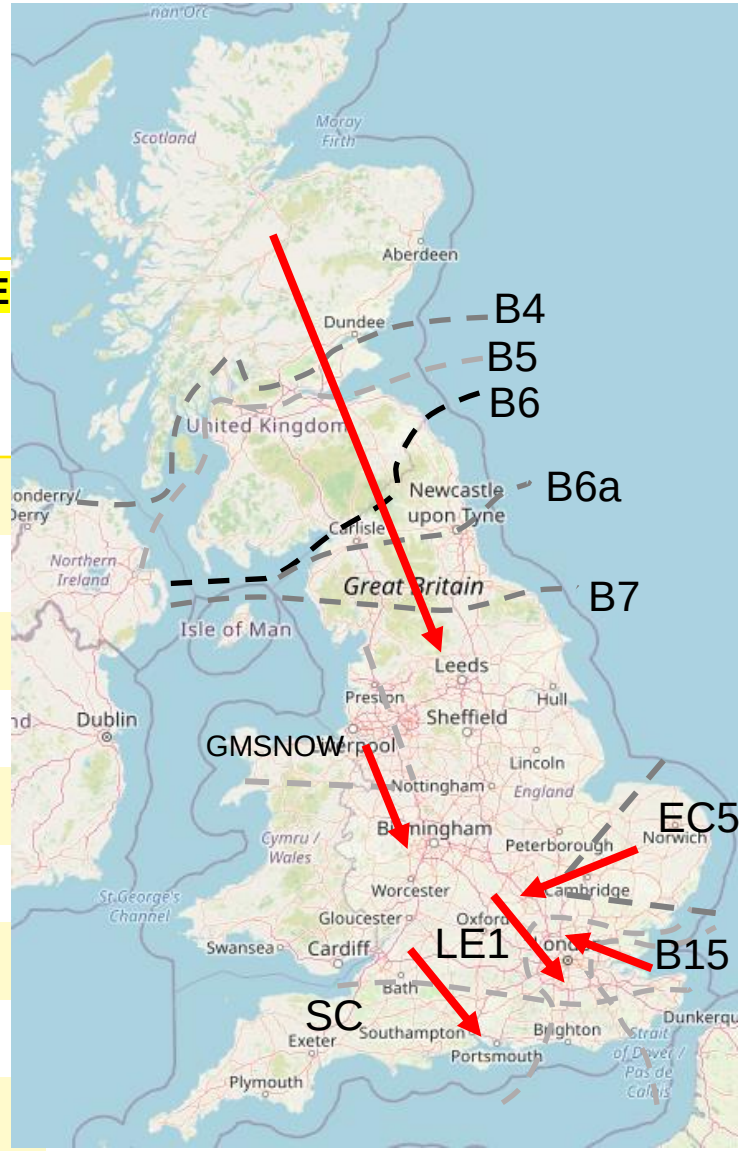

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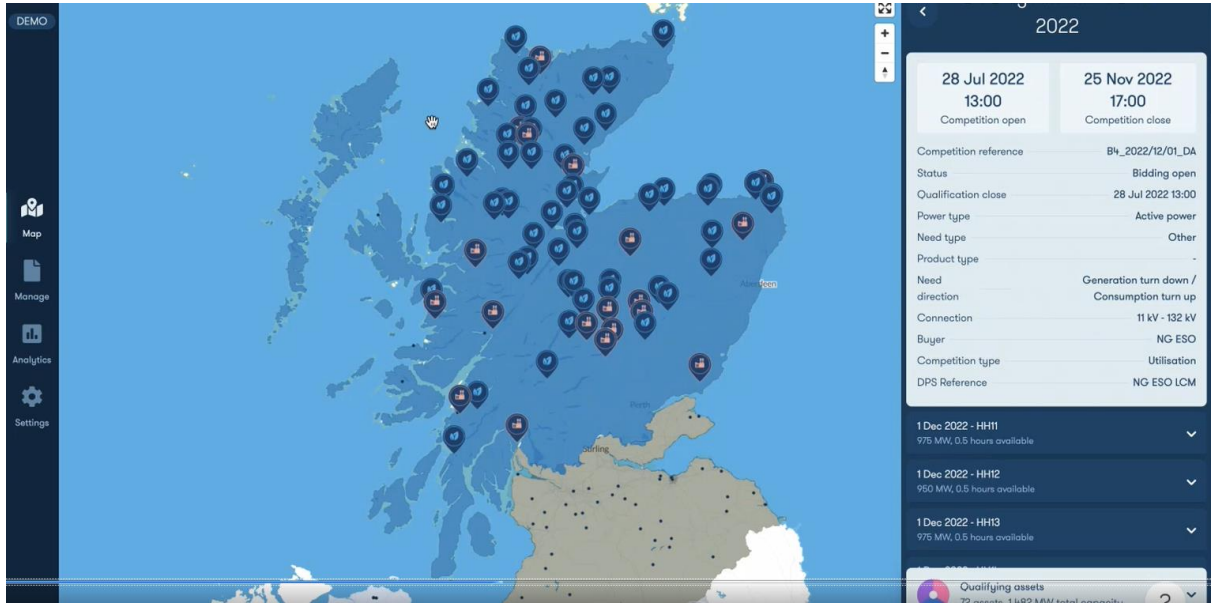
How a local constraint market will work



- A geographically-targeted market
  - for constraint management services,
  - focussing on north of the B6 boundary
  - procured from predominantly distribution connected DER
- Designed to avoid any need for deep integration needed with Control Room systems
- Piclo has offered a fast-track market approach via Piclo Flex platform and leverage external expertise
- **Target delivery date:** before end of March 2023 Service go-live

Progress update

- **Service design improved** with feedback from ongoing LCM consultations with our flex provider stakeholders (slide 2)
- **Enabling wider, easier market participation** – completed a 3rd party competitive tender for rapid delivery of LCM
- **We now invite flexible assets in Scotland** to take part in LCM via the platform
- **Non-BM parties only**
- ***NEW*: ESO hopes to avoid 1 MW minimum requirement..** to allow wider market participation

Ahead of implementing longer-term Regional Development Programmes (RDP) across Scotland, a tactical solution is needed for rising constraint costs on GB's most congested boundary, utilising Distributed Energy Resources (DER). The Anglo-Scottish (B6) boundary currently has the highest constraints of any GB boundary and these are set to increase.

LCM specifically targets B6 constraint costs as an interim solution.

LCM Requirement

Local Constraint Market specifically targets rising costs of managing the Anglo-Scottish B6 boundary

- **Not a system requirement** – System requirements remain fulfilled, by retaining all Balancing Mechanism options.
- **Cost reduction Interim solution** – through engagement and increased competition from new assets, over ~3yrs.
- **Day-Ahead, Downwards Flexibility – open to generation turn-down/demand turn-up** assets north of B6 boundary.
- **DNO coordination** – we continue to coordinate with DNOs, to offer visibility, coordination via the LCM Platform
- **Platform Procurement** – via 3rd Party - Reduced burden on ESO and improved user experience for flexibility providers

- **Estimated Delivery in Q1 2023 (calendar)** – We have now engaged Piclo, who expect to deliver trials early in 2023

LCM Platform progress update (Dec 2022)

1. **Platform delivery is now in Progress**

   Testing in National Control Room & with Trading is scheduled end Jan-Feb; Shift Training follows;

   Following competitive tender, Piclo platform to deliver LCM, driving market engagement in Scotland

2. **Service Design Consultation**

   Service design is developed by co-creation with internal and external stakeholders

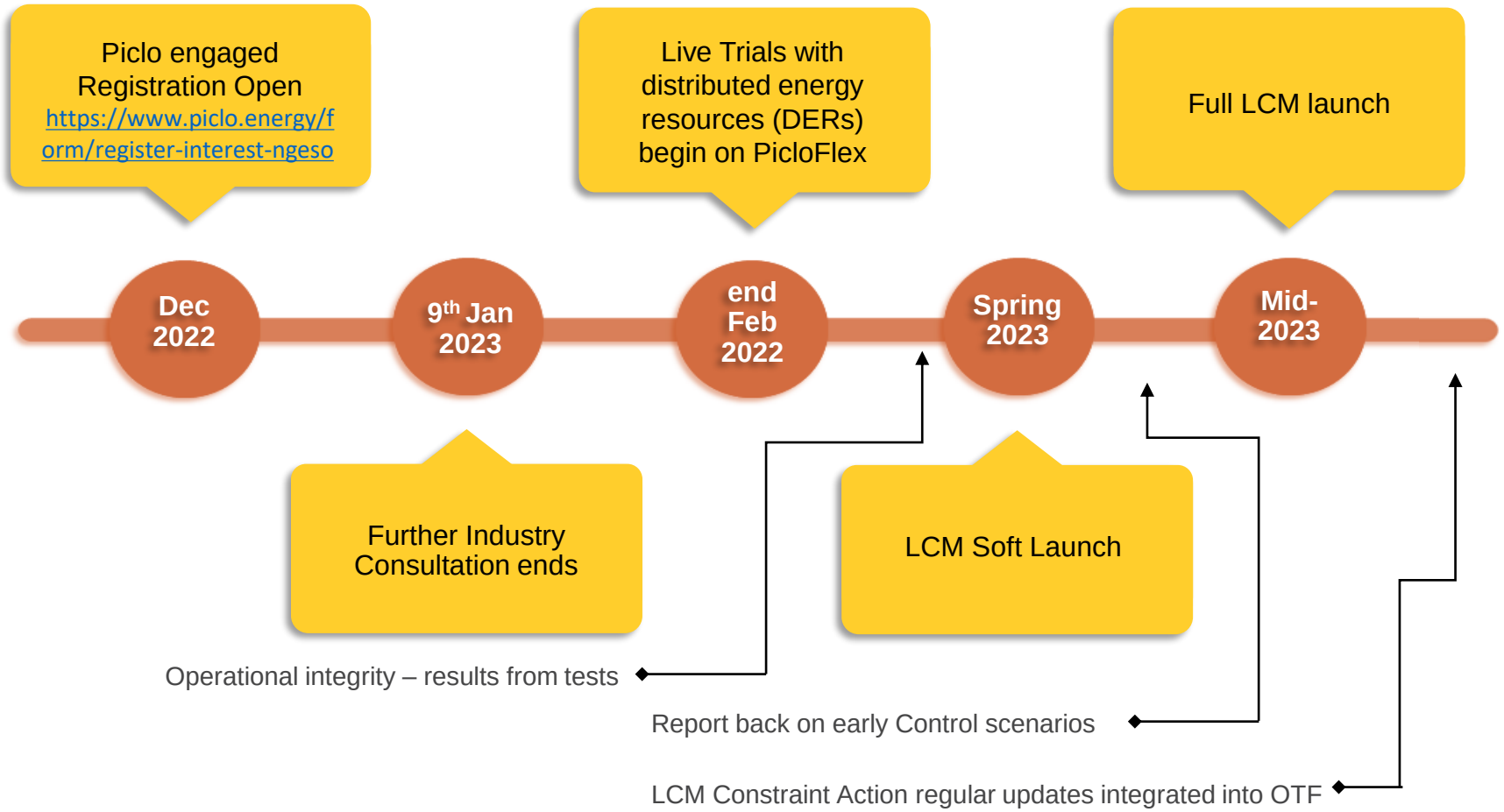
   Inviting and incorporating service user comments and feedback.

3. **Joined-up industry approach –** ESO, DNO, Stakeholders, flexibility markets & open flex platform

   ESO is working with our DNO partners, SSEN, SPEN for coordinated actions with local flexibility

   Active dialogues continue with our stakeholders across industry to ensure smooth LCM operation

Next steps*



*For updates please visit: https://www.nationalgrideso.com/local-constraint-market

Next steps

- LCM Service Design – updated for public review and consultation prior to live trial
  - https://www.nationalgrideso.com/local-constraint-market

- OTF: Reporting back expected in the spring. For latest markets news, sign-up for the ESO's Future of Balancing Services Newsletter

- Interested parties can register via Piclo
  - Piclo Flex - find out more
  - To participate in upcoming Q1 early trials:
  - Trial asset onboarding in January via PicloFlex

Previous weeks questions

Q: DFS - What was the available MW contingency at 1430 on Sunday?

A: Any assessment done at day ahead stage has to take into account expected generation, wind + solar output, Interconnector flows against demand forecast and reserve requirement. There is always a level of uncertainty at this point in time; with the numbers firming up as you move closer to real time.

Q: Does the additional DFS volume that is delivered (above that procured) go in to the cashout calculation?

A: As with all of our ancillary services, the whole volume delivered in DFS is factored into cash out as this is part of the total market length.

Q: Regarding the DSF, how do you differ the DFS from usual fluctuation of the demand?

A: The assessment of DFS delivery is done using settlement data sent by participants (2 weeks after delivery). We also review operational data during the event to understand service delivery in real time.

Q: DFS Test events should be 1 hour, this week we had a 2 hour event or 2 "1 hour " events. Either way, Should a live event be called for a longer period, why do you think you will have more engagement? Looking at the auction details for Monday nothing changed over those 2hrs.

A: This is precisely what we are trying to answer by having tests in contiguous blocks. The delivery data for both tests on Dec-12, will be submitted to the ESO by Dec-27. We will then process and analyse the data to gain insights that will help us assess service aspects such as “User Fatigue” and forecast errors in DFS delivery.

Previous weeks questions

Q: There was emergency reduction in import on IFA on Monday (i.e. below PN level) - please can you point me in the direction of where this is published in real time or in advance?

A: NGESO haven taken this away to investigate the submission of the BMRS message for this occurrence. Normally any activation of Emergency Assistance on any Interconnector is reported on BMRS. These messages will be under the System Warnings section of the Elexon BMRS website.

Q: What is the price of the BSAD for the emergency assistance to France? When will it be reflected in the settlement data?

A: NGESO haven taken this away to investigate the submission of the BMRS message for this occurrence. Normally any activation of Emergency Assistance on any Interconnector is reported on BMRS. These messages will be under the System Warnings section of the Elexon BMRS website. The volumes will still show up in cash-out and imbalance calculations.

Q: Are your cost caps in STOR and DC etc kept up to date if generators are offering at VoLL?

A: hey are kept under a continual review and we will come back with more information in the future on this forum.

Previous weeks questions

Q: Regarding the DSF, how do you differ the DFS from usual fluctuation of the demand?

A: The assessment of DFS delivery is done using settlement data sent by participants (2 weeks after delivery). We also review operational data during the event to understand service delivery in real time.

Q: There was no CMN warning, no DCI notice, no need4 Coal, it signals a lack of tightness in the market. Why was there a need to accept BOAs at £6k? Was it to support France? Would a CMN not have provided MW cheaper than an asset at VoLL?

A: A CMN is an automatically triggered notice to alert CM parties that they may be required to delivery on their obligations – it is not an operational tool.

There was some uncertainty following the out turn of the morning demand peak. In addition, wind was shortfalling by approx. 300MW with an additional request for support to Ireland. As the afternoon progressed there was a loss of a gas turbine and RTE went into Alert state due to changes in their forecasts, assistance was offered to RTE but there was a loss of 400MW on Intraday gates to France which was sufficient.

There was a lot of uncertainty, and the additional energy was required.

Advance questions

Q: David Lenaghan noted that the real-time demand service hosted on the extranet is not always reliable, and there is a lot that goes into producing it. This figure is very useful for getting a real-time insight into national demand, unlike the 30 minutely figures available as the Initial Transmission System Demand Outturn and can be used to inform future demand forecasting undertaken by BSC parties. So that we can interpret this number accurately, can you please confirm precisely how this demand value is produced (i.e. what specific data feeds in and what assumptions, if any, are made in producing it) so that we can interpret it correctly and appropriately heed David's warning by knowing in what instances it is most likely to be potentially misleading.

A: The Real Time website demand is closest to Transmission System Demand as it includes Station Load and Pumped Storage demand in the calculations. Interconnectors are not directly included in the calculation but are accounted for. This is because the calculation is based on several internal zones (different geographical regions used internally). We look at the zones and also the inter-zonal transfers. So, where an interconnector is generating in a zone the calculation will see a higher transfer out of (or lower transfer in to) that zone because of the additional generation versus demand in that area. Similarly, if the interconnector is taking demand this would result in lower transfers out or higher flows in. When we sum up all the zones this effectively includes the interconnectors.

Q: Furthermore, we'd ask if there's any way to get an extract of the historical values from this service (not what is currently on the data portal which is only 30-minutely). Our intended purpose would be training demand forecasting models and examining demand spikes during events like live sports. Even if it's not possible to offer a fully productionised solution like the data portal, in the meantime we'd appreciate if even a one-off extract in whatever format is easiest for the teams involved (even a CSV or Excel over email is fine to get us started).

A: We will pass this question to the relevant team to best answer this request.

Q: I see through the RTE website that they requested some emergency interconnector flows across the IFA2 from the UK today (12th Dec 0800-0900), in previous instances, the provision of emergency assistance to a foreign TSO has been accompanied with a system warning through BMRS, why was this not the case today? Should we still expect volumes to turn up in the imbalance calculation as SO-flagged bids?

A: NGESO haven taken this away to investigate the submission of the BMRS message for this occurrence. Normally any activation of Emergency Assistance on any Interconnector is reported on BMRS. These messages will be under the System Warnings section of the Elexon BMRS website.

The volumes will still show up in cash-out and imbalance calculations.

Advance questions

Q: Apologies if covered previously I am new to the forums. Since the increase in consumer energy prices has there been a notable reduction in demand figures, if so when did this occur, what was the reduction and does this appear to be holding?

A: Demand levels - both National and Virtual (Sum of National Demand + embedded wind/solar) - have been dropping year on year even without additional price pressures.

While Covid effects in 2020 and 2021 make it more difficult to analyse the trend and give specific values, this drop has been larger from 2021-2022 than in recent previous years.

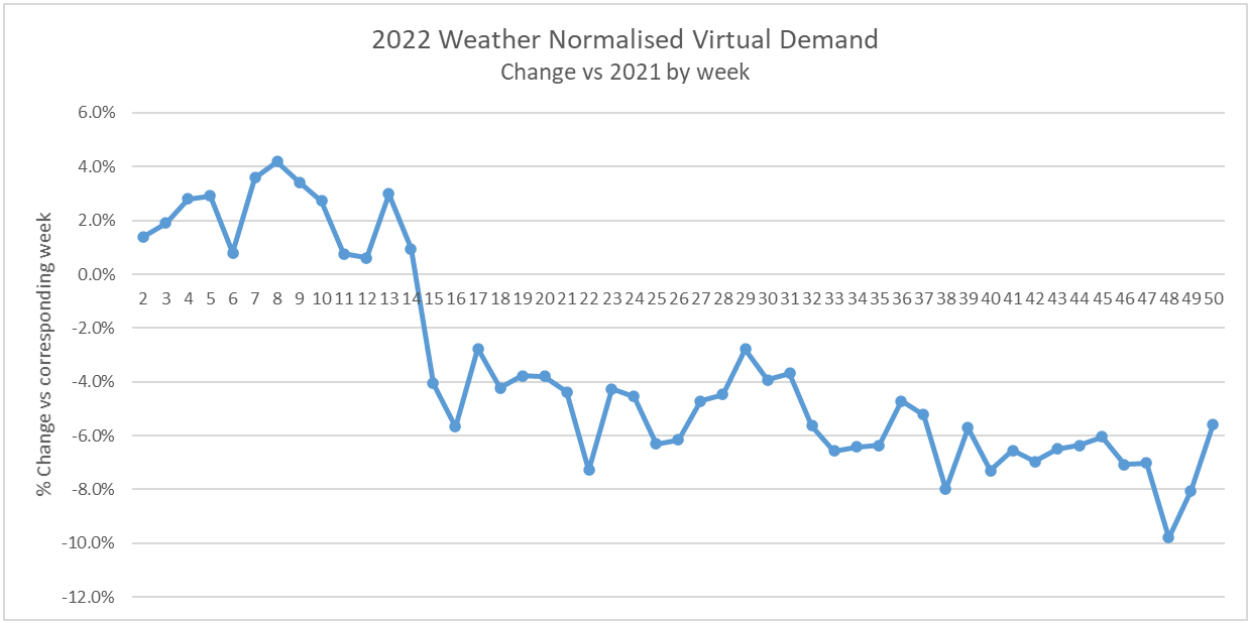
From around week 15 - week 47, the % drop compared to the same week in 2021 has been between 4 and 8%, and approximately 6.5% for most of Autumn.

In week 48 (week starting 28 Nov), it did reach around 10% drop vs 2021 - the highest non-lockdown drop of the last 5 years.

The last 2 weeks, coinciding with a cold snap, has shown an increase in demand, and the change compared to 2021 has shrunk back to 6%.

Though this data is based on weather corrected models (ie. assuming the same weather conditions each year), the change from a very mild autumn to the recent cold snap may have pushed consumers enough that price avoiding behaviour was not as easy.

We will continue to monitor demand outturns to see how the weather-related usage patterns evolve.



Advance questions

Q: In the latest MBSS for October, a cost of £62m has been incurred under the BM Restoration Other category. Can you please provide more information to explain what this cost relates to?

A: The cost of £62m relates to the estimated costs of the Winter contingency coal contracts. We are looking into which category will be more appropriate for these costs.

Questions outstanding we are still working on

Q: Regarding the day-ahead wind forecast data published on the data portal https://data.nationalgrideso.com/demand/day-ahead-wind-forecast/r/day_ahead_wind_forecast:

1. What is meant by 'incentive forecast'? Why does it differ from the wind forecast published on BMRS? https://bmreports.com/bmrs/?q=generation/windforcast/out-turn

2. Why is the capacity listed below the installed capacity and what we have seen in the real-time generation data (FUELINST)?

Q: Regarding the 14 days ahead wind forecast published on the data portal:

1. Why is the capacity listed less than what we have seen in outturn?

2. Could you please publish the historical forecasts?

Q: Since August imbalance costs within BSUoS have flipped to be net negative. This is a significant departure from the previous few years. Is there a specific reason for this switch?

slido

Audience Q&A Session

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

Feedback

Please remember to use the feedback poll in sli.do after the event.

We welcome feedback to understand what we are doing well and how we can improve the event for the future.

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

Appendix slides for LCM

LCM Requirement

We are exploring the implementation of a Local Constraint Market to address the rising costs of managing the Anglo-Scottish B6 boundary.

- **Interim Tactical Solution -** Growing need for a tactical solution utilising Distributed Energy Resources DER to manage rising constraint costs on GB's most congested boundary ahead of any delivery of an RDP in Scotland (c. 3 years).

- **Downwards Flexibility –** open to **generation turn-down/demand turn-up** assets located north of the B6 (Anglo-Scottish) boundary.

- **Simple Service to attract new volume –** we are looking to take the learning from the simple construct of the ODFM service and deliver a service with lower barriers to entry that can provide competition to the BM.

- **Delivery through a 3rd Party Platform** – to alleviate the burdensome and resource intensive nature we experienced with ODFM due its manual processes through a light touch system to facilitate an accelerated DER market using existing third-party platform software.

LCM Context

- Targeted specifically at the B6 boundary over next c.3 years:
- **Not a system requirement** - The LCM should not be considered as a system requirement as existing tools are in place to manage the constraint safely and securely through the Balancing Mechanism.
- **Cost reduction objective** - The objective of the LCM is to reduce the annual B6 (Scotex) boundary cost through increased competition from new assets.

  During Lockdown, the ODFM service showed improved access to DER can provide additional flexibility. It is anticipated cheaper prices seen in ODFM could be used to manage the B6 boundary and provide good competition to the BM.
- **Day ahead, measured against the BM (BM is Default means of constraint management)**
- **DNO coordination** – we continue to coordinate with DNOs, to offer visibility, coordination and options for DSOs to express GSP availability into the platform (see over)
- **Platform Procurement** – Reduce burden on ESO teams and provide greater user experience for the provider
- **Estimated Delivery in Q1 2023 (calendar)** – We have now engaged Piclo, who expect to deliver trials early in 2023.

LCM Design Influences

- **Relieving v Resolving the B6 boundary –** LCM is not attempting to 'resolve' the B6 boundary constraint;
  - Aims only to relieve it through cheaper DER, or provide competition to prices seen in the BM
  - Relieving LCM action will only be taken if and when cost effective versus the BM.

- **Platform influence on Service Design -** As an accelerated solution, with time and costs in mind, LCM is exploiting capabilities and functionality of quickly configured 'off-the-shelf' services, rather than via custom platform development

- **A System Product -** The LCM is used only for managing constraints. LCM is not relied upon for System Requirements.
  - Considered to be a 'System' product under the Clean Energy Package (CEP).
  - As a 'non-balancing' product, formal consultation (CEP Article 18) is not required…
  - *However* to follow best practice, ESO continues to drive a productive 'Light-touch' consultation with industry.

- **Provider Base -** service open to a range of DER north of the B6 boundary; drawing on ODFM feedback and successes:
  - ODFM providers told us that they value the simplicity of ODFM service.
  - The 2021 ODFM service was also improved with provider feedback from 2020 service.

- **Provider Engagement -** delivery in collaboration with our Subject Matter Experts in National Control, NAP, Trading,

  We also engaged bi-laterally with interested stakeholders - *Flexibility Provider* feedback helped further update design.

LCM Service Design Highlights

Service Description

- Constraint Management to support the resolution of B6 boundary constraints.
- Daily day-ahead and within day market.
- Service day runs from 05:00 – 05:00 to align with daily Picasso outage plans.
- Two instruction windows:
    - **Instruction window 1:** @21:00 day-ahead for delivery from 07:00 – 06:59
    - **Instruction window 2:** @13:00 within day for delivery from 19:00 – 06:59

Assessment

- Daily assessment based on Day-ahead handover to the control-room.
- Due to day ahead uncertainty, the LCM will only look to resolve a maximum of 75% of any constraint e.g. B6.
- Hedge against the BM, using a ‘target benefit score’, consistent with ESO Trading team established practice (SEIMP)
- Platform assesses bids, provider-submitted forecast volumes and expected delivered volumes and availability times
- If B4 boundary needs resolving, units north of the B4 boundary to be considered first, so as to resolve both B6 and B4.

LCM Service Design Highlights

Dispatch

- **Instructing Party.**
  Instruction window 1 – ESO OSM @21:00 – day ahead (07:00 – 06:59 dispatch)
  Instruction window 2 – ESO Trading Team @13:00 – within day (19:00 – 06:59 dispatch)
- **Instruction ramping** will not exceed 300MW per settlement period to avoid excess frequency excursions.

Settlement

- Proposed for the platform and platform provider to deal with the settlement alleviating ESO settlements of this process, including the capture of bank details etc at the onboarding stage.
- Pay as bid
- Utilisation payments only (no payment is made in LCM for just having energy volume Available)

DNO Coordination

- Using learnings from ODFM, DNOs invited to access to the LCM market platform, providing a range of options for:
  - DNO visibility of available and instructed assets.
  - DNO access to review units and update GSPs.
  - DNO to highlight assets that could present a network issue to them.

LCM Service Design Highlights

Eligibility

- Generation turn-down / demand turn-up, connected north of B6 boundary.
- Non-BM parties* only
- **No minimum 1 MW requirement** to allow wider participation, subject to trials
- No requirement to manage assets at a Unit level, subject to trials
- Assets to be detailed in the platform in geo-locationally accurate manner, to allow accurate forecasting per-GSP

Integration with Cashout & ABSVD

- Service to be included in both Cashout and ABSVD via ESO Settlements.

Onboarding

- Aiming at speed and simplicity, Piclo our platform provider is enabling onboarding
- Using the familiar ‘Form A, B..’ Application process and supporting easy access as far as possible
- Asset Registration and onboarding will follow once providers have applied for participation in LCM.

* Capacity Market assets should review Relevant Balancing Services statement and 2023 updates for details.