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ESO Operational Transparency Forum

1st December 2021

nationalgridESO

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.**

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

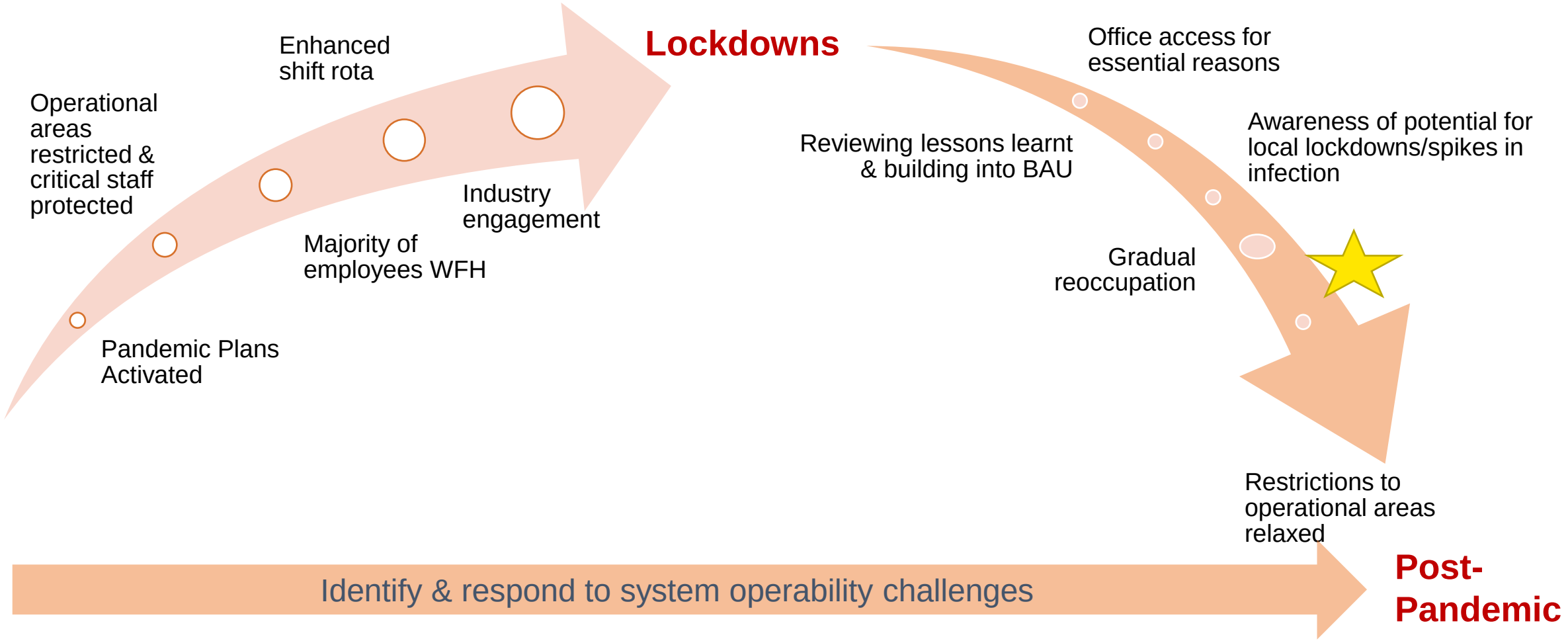
Regular Topics

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

Focus Areas

Trading

Protecting critical staff to maintain critical operations



Questions outstanding from last week

Q:Will you expect to take actions to supplement margins over the coming week if the forecast margins you presented materialise?

A: Currently margins are adequate, so we do not expect to take many margin actions unless circumstances change materially.

Q: The Notified Conventional Generation that is used in Margins calculations, where is that data published and does it include wind or why is wind generation separated?

A:The data is published in REMIT. Wind generation is treated separately because in preparing the system, forecast wind generation is more relevant than availability of wind units.

Q:Good that the margin outlook is looking "rosy". I think we had the same message last week (but the table presented was wrong). Can you compare the margin yesterday v the forecast of 23/11 last week pls given that the balancing cost was >£30m and explain what out turned differently

A:We cannot respond to all requests to provide detailed breakdown of variance in our indicative margins, particularly since the outturn values for the inputs are in the public domain.

But to demonstrate the likely variance between a week ahead value and the outturn: Last week the surplus indication for 23 November was reported as 6349MW. The outturn value over the peak was 4991MW. The main difference in wind: outturn 3859MW compared to week ahead forecast of 5329MW. This is well within expected tolerance for a week ahead wind forecast.

Wind forecasts can have large errors at that lead time, demand is subject to the effects of the Triad scheme, non-wind generation is subject to unplanned breakdowns, as are interconnectors, which are also subject to market forces.

Questions outstanding from last week

Q:Hi! When will you publish the Market Information Report with Frequency Response Requirements for January? Will you notify the market if you intend to procure below the values in the report ahead of time? Thank you

A:The Market Information Report will be published later today (24/11) and will set out our requirements for January. If our requirements change we will look to communicate this in as timely a manner as possible.

Q:What is the latest state of play re the 5 point plan re constraints? I don't believe an update was provided since the document was first published

A: We will feed this back to our Networks team and let you know of any updates – I know work is progressing on the BSUoS constraints forecasting

7 x questions still awaiting SME input

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:

January

Balancing Services Adjustment Data (BSAD) Overview

ESO Review of Balancing Market

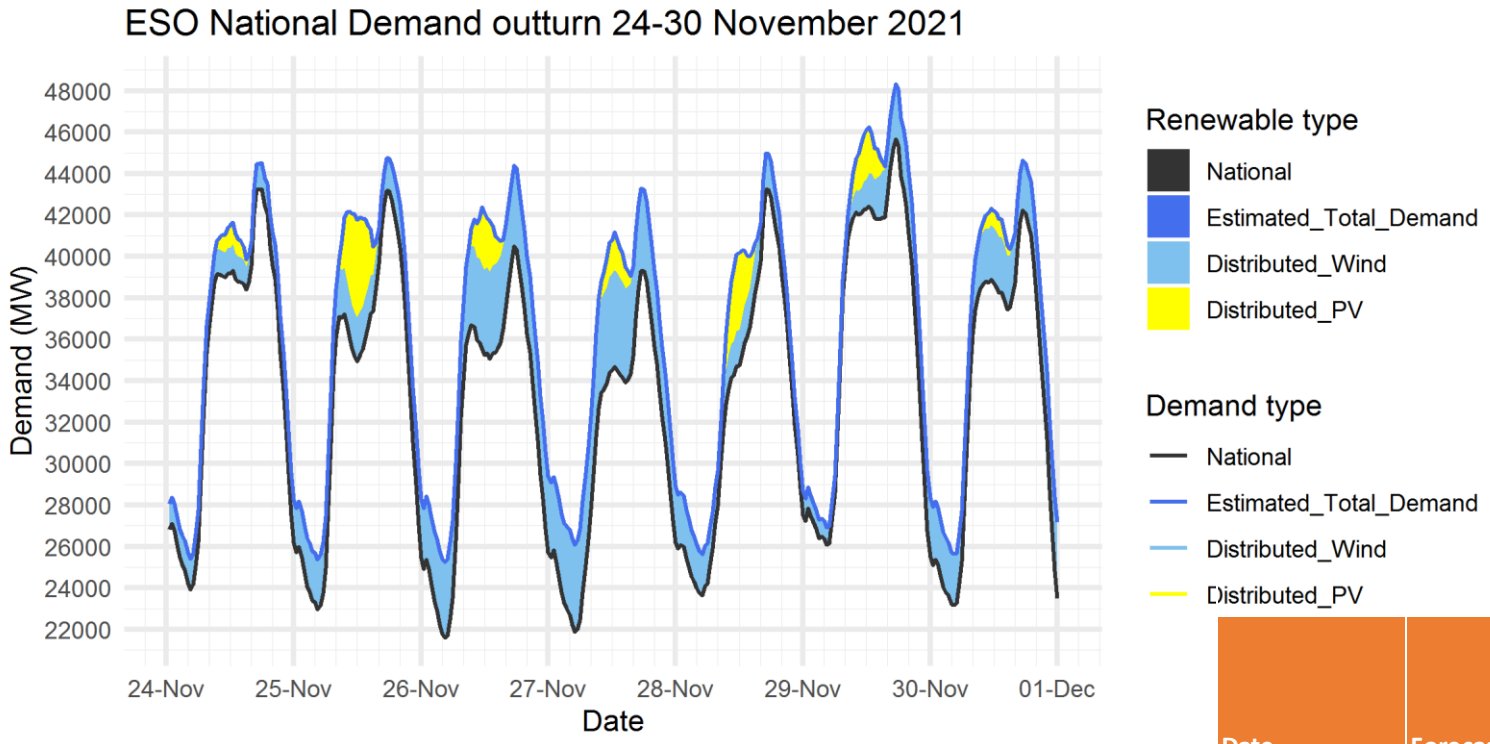
Every day the ESO balances supply and demand across the power system. In recent weeks there have been some very high-cost days in the balancing mechanism. As those costs are ultimately borne by consumers it is important to fully understand the factors driving the market.

The ESO will therefore undertake a review of the balancing market. It will be run by the National Grid ESO Market Monitoring Team and will be carried out by external consultants.

There are many issues that can, and will, have contributed to the high costs. Our review will seek to ensure that, at a time when households' budgets are under strain, consumers can continue to have confidence in the market.

https://www.nationalgrideso.com/news/national-grid-eso-announces-review-balancing-market

Demand | Last 7 days outturn



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.

		FORECAST (Wed 24 Nov)		OUTTURN			
Date	Forecasting Poin	National Den	Dist. wind (G	National Demand (GW)	Triad Avoidance est. (GW)	N. Demand adjusted for TA (GW)	Dist. wind (GW)
24 Nov 2021	Evening Peak	44.0	1.3	43.3	0.0	43.3	1.3
25 Nov 2021	Overnight Min	22.8	2.5	23.0	n/a	n/a	2.4
25 Nov 2021	Evening Peak	44.3	1.8	43.2	1.2	44.4	1.6
26 Nov 2021	Overnight Min	22.4	3.4	21.6	n/a	n/a	3.7
26 Nov 2021	Evening Peak	40.9	3.8	40.5	0.0	40.5	3.9
27 Nov 2021	Overnight Min	20.8	3.9	21.9	n/a	n/a	4.2
27 Nov 2021	Evening Peak	37.8	4.2	39.3	0.0	39.3	3.9
28 Nov 2021	Overnight Min	21.3	2.7	23.6	n/a	n/a	2.0
28 Nov 2021	Evening Peak	42.0	1.4	43.2	0.0	43.2	1.8
29 Nov 2021	Overnight Min	24.4	1.2	26.1	n/a	n/a	0.8
29 Nov 2021	Evening Peak	45.6	1.6	45.7	0.0	45.7	2.6
30 Nov 2021	Overnight Min	23.9	2.2	23.2	n/a	n/a	2.5
30 Nov 2021	Evening Peak	42.9	3.0	42.2	0.0	42.2	2.4

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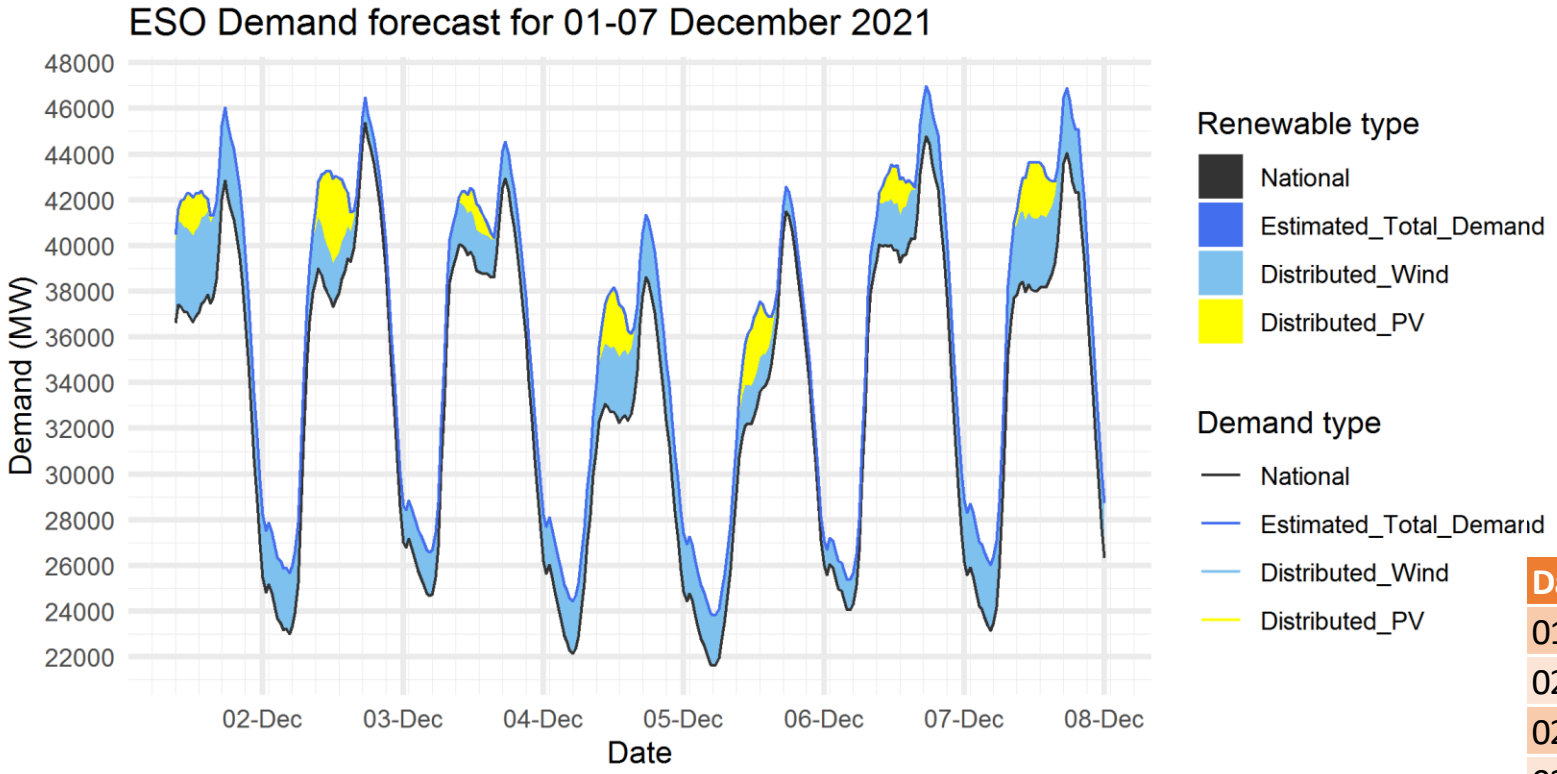
Demand | Week Ahead



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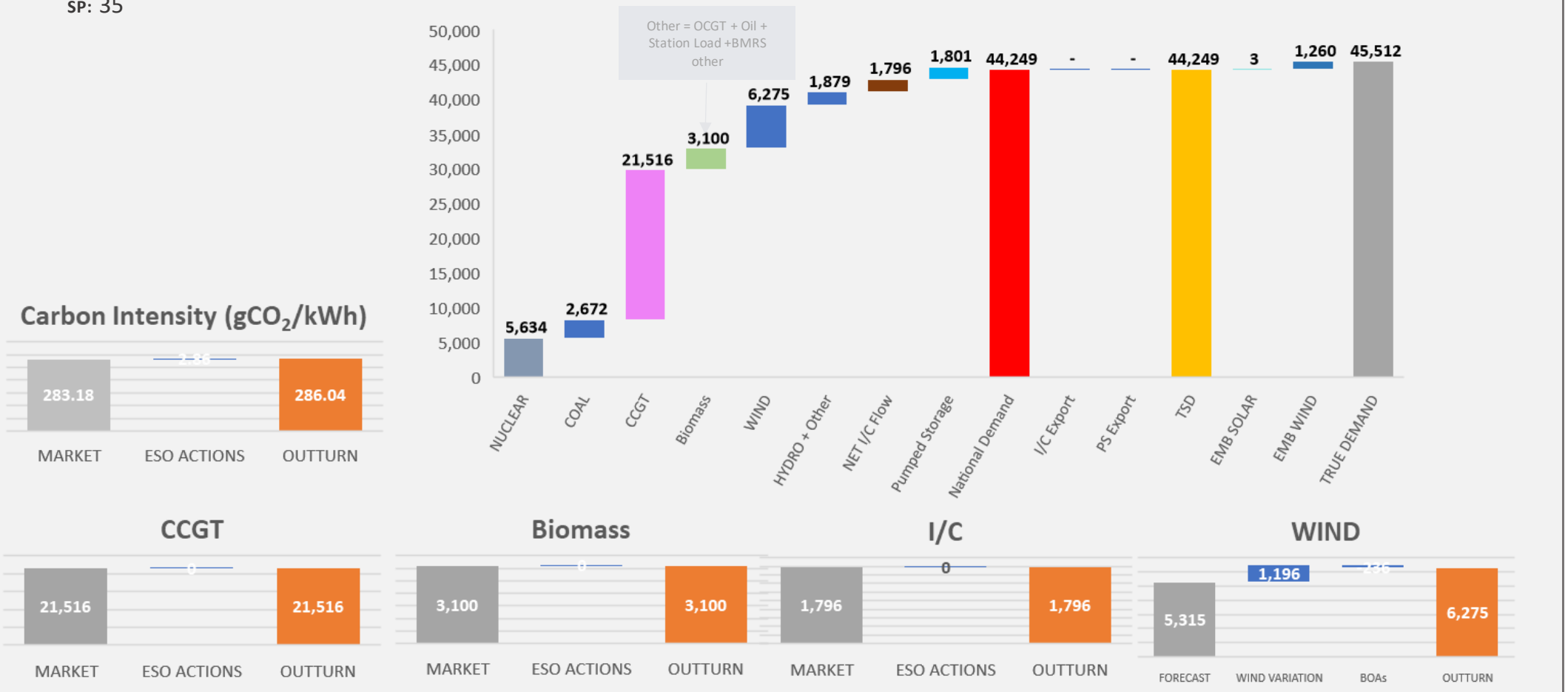
		FORECAST (Wed 01 Dec)	
Date	Forecasting Poin	National Den	Dist. wind (G
01 Dec 2021	Evening Peak	42.8	3.2
02 Dec 2021	Overnight Min	23.0	2.7
02 Dec 2021	Evening Peak	45.4	1.1
03 Dec 2021	Overnight Min	24.7	1.9
03 Dec 2021	Evening Peak	42.9	1.6
04 Dec 2021	Overnight Min	22.1	2.3
04 Dec 2021	Evening Peak	38.6	2.7
05 Dec 2021	Overnight Min	21.6	2.2
05 Dec 2021	Evening Peak	41.5	1.1
06 Dec 2021	Overnight Min	24.1	1.4
06 Dec 2021	Evening Peak	44.8	2.2
07 Dec 2021	Overnight Min	23.1	2.9
07 Dec 2021	Evening Peak	44.0	2.9

ESO Actions | Monday 22 November Peak

Date: 22/11/2021

SP: 35

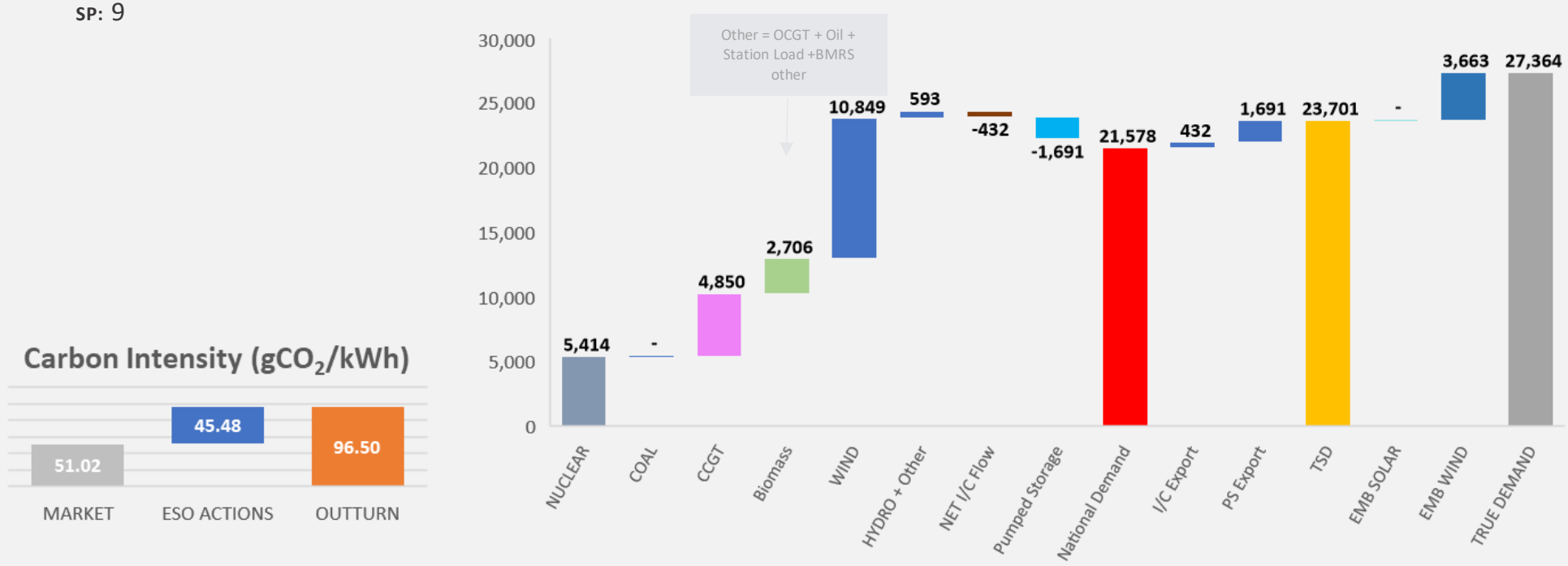


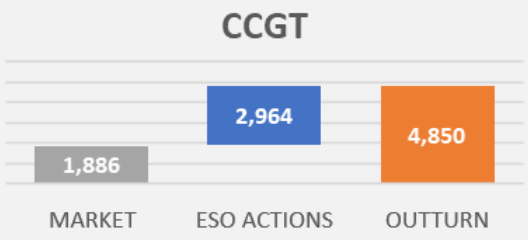
Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

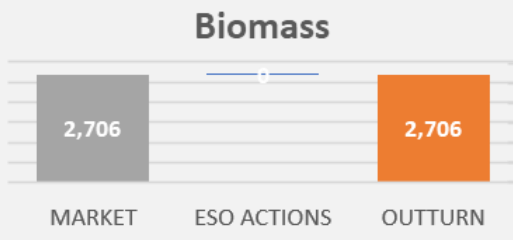
ESO Actions | Friday 26 November Minimum

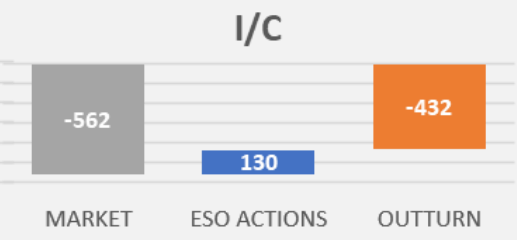
Date: 26/11/2021

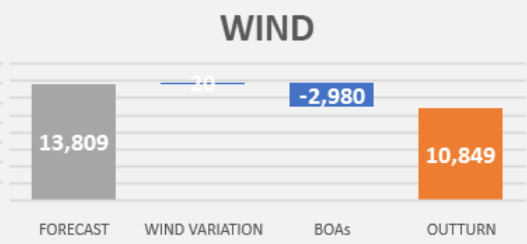
SP: 9





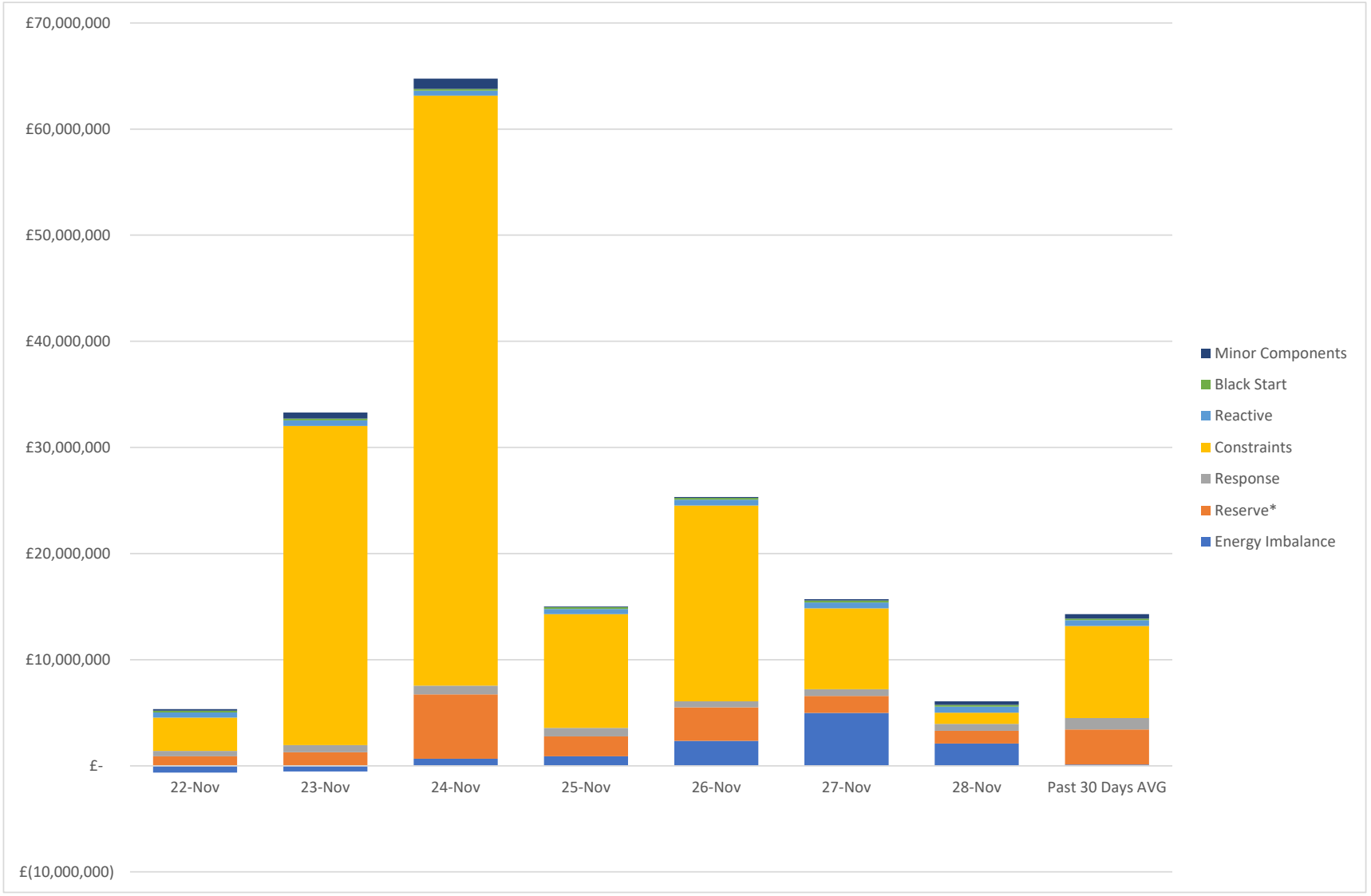






Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

Transparency | Costs for the last week



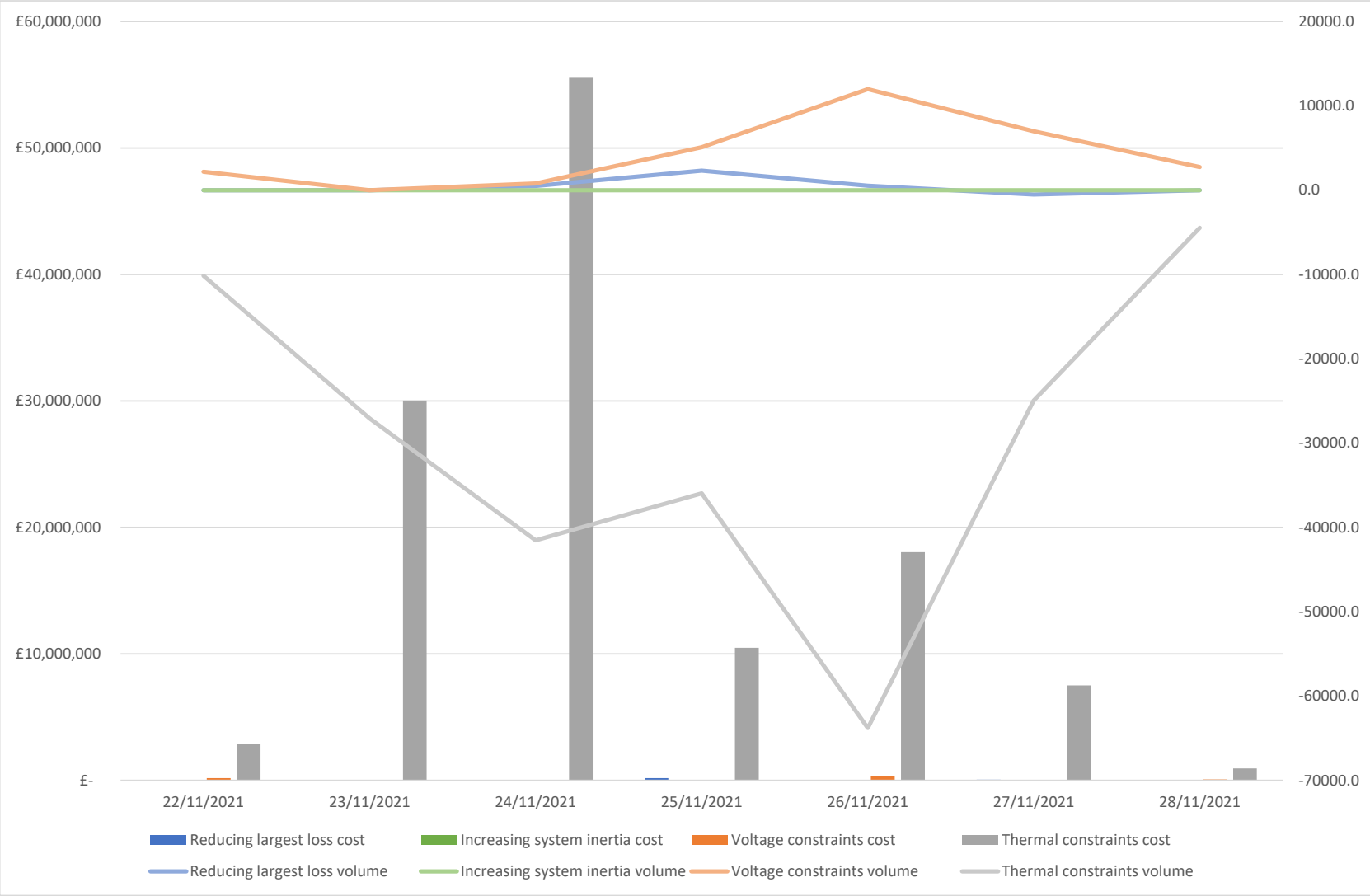
Between Tuesday and Saturday costs were above £10m. Most expensive days were Tuesday and Wednesday with a daily spend of £33m and £64m respectively.

Constraints actions were needed due to the windy weather that was requiring large volume of BM actions to reduce generation to manage thermal constraints

We are actively reviewing categorization of costs across these days.

Past 30 Days Average added

Transparency | Constraint cost breakdown



Thermal
On most days, high volume of actions required to manage thermal constraints, particularly in Scotland.

Voltage
Monday and Friday some action required to synchronise generation to meet voltage requirements

Managing largest loss for RoCoF
On Thursday some action required to manage largest loss on interconnectors.

Increasing inertia
No intervention required to increase minimum inertia.

https://data.nationalgrideso.com/balancing/constraint-breakdown

Operational margins: week ahead

How to interpret this information

This slide sets out our view of operational margins for the next week. We are providing this information to help market participants identify when tighter periods are more likely to occur such that they can plan to respond accordingly.

The table provides our current view on the operational surplus based on expected levels of generation, wind, imports and peak demand. This is based on information available to National Grid ESO as of 1st 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 indicative surplus is a measure of how tight we expect margins to be and the likelihood of the ESO needing to use its operational tools.

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

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

Margins are adequate for the next week.

Day	Date	Notified conventional generation (MW)	Wind (MW)	Interconnector availability (MW)	Peak demand (MW)	Indicative surplus (MW)
Thu	02/12/2021	45065	5770	3900	46378	5134
Fri	03/12/2021	44590	6476	4300	44388	6579
Sat	04/12/2021	42680	10618	4300	39700	13096
Sun	05/12/2021	43970	4876	4300	42530	6125
Mon	06/12/2021	45084	9008	3900	45732	7409
Tue	07/12/2021	44976	12321	3900	45482	10176
Wed	08/12/2021	45073	7000	3900	46874	5167

Operational margins: look ahead for the rest of winter

How to interpret this information

This slide sets out our view of operational margin range for the rest of the winter period. 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.

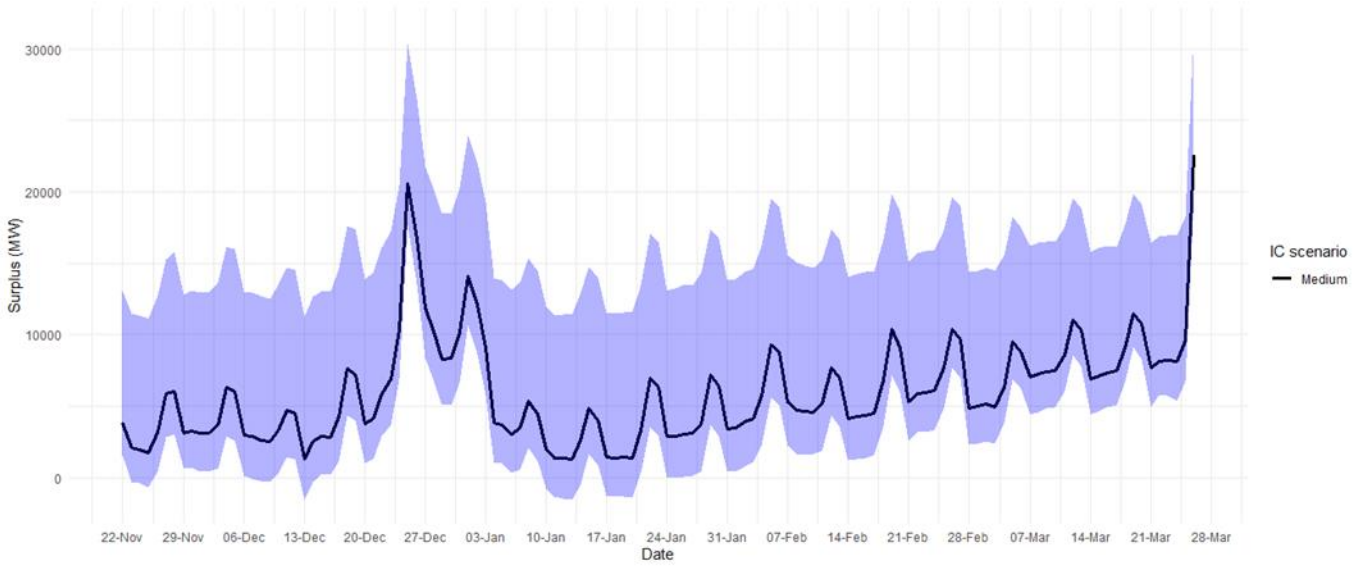
This view is based on information available to National Grid ESO as of 28 November and is subject to change as generators update their availability via REMIT.

The chart represents the potential surplus range we may expect on each day. It is based on 50,000 simulations that account for variation in demand, wind, generation and interconnector availability.

The chart represents a view before the ESO takes any actions. Periods where the lower bound is lowest (and even negative) represent the times when there is a higher likelihood of the ESO needing to use its operational tools such as issuing margins notices. We expect there to be sufficient supply available to respond to these signals to meet demand.

We don't provide an update of this view each week, since in most weeks there is little change.

The chart shows that second week in December and second and third weeks in January are currently the most likely times when we could issue margins notices. We still expect there to be sufficient supply available to respond to these market signals to meet demand.



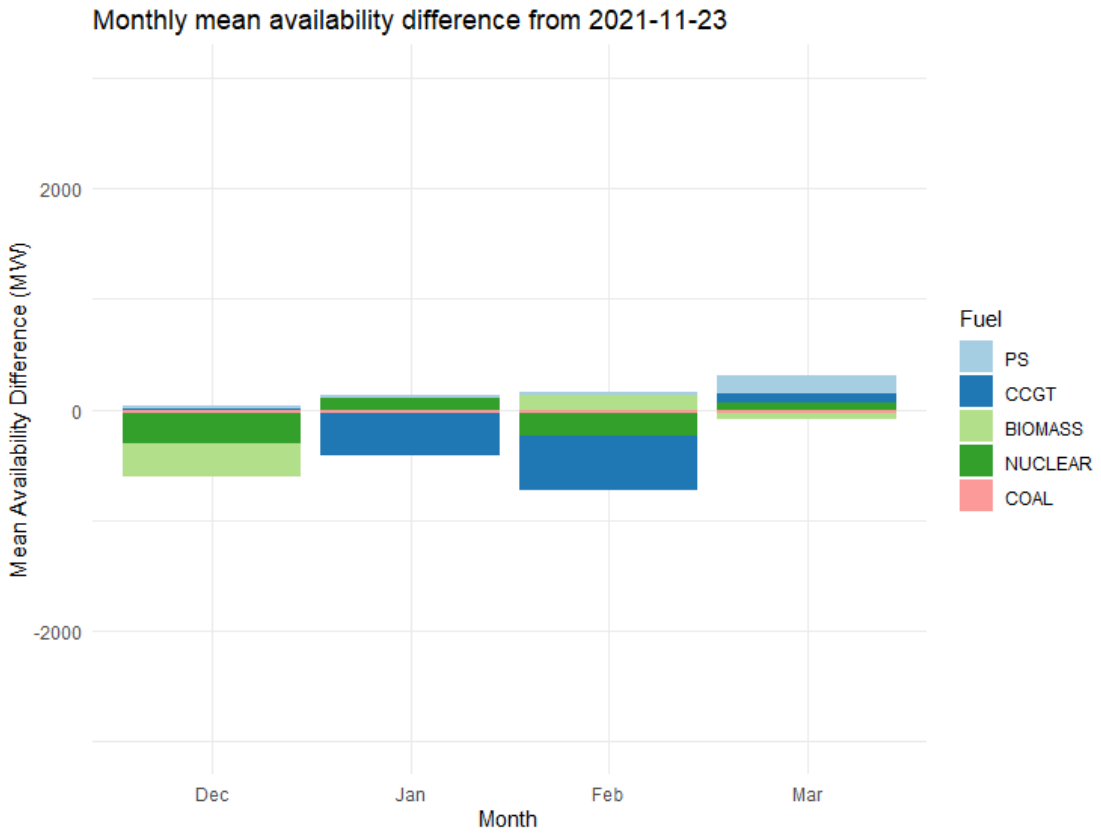
Operational margins: changes in generator availability

This slide sets out how generator availability for the rest of the winter has changed since our last update on 24 November.

The material changes since our last update are:

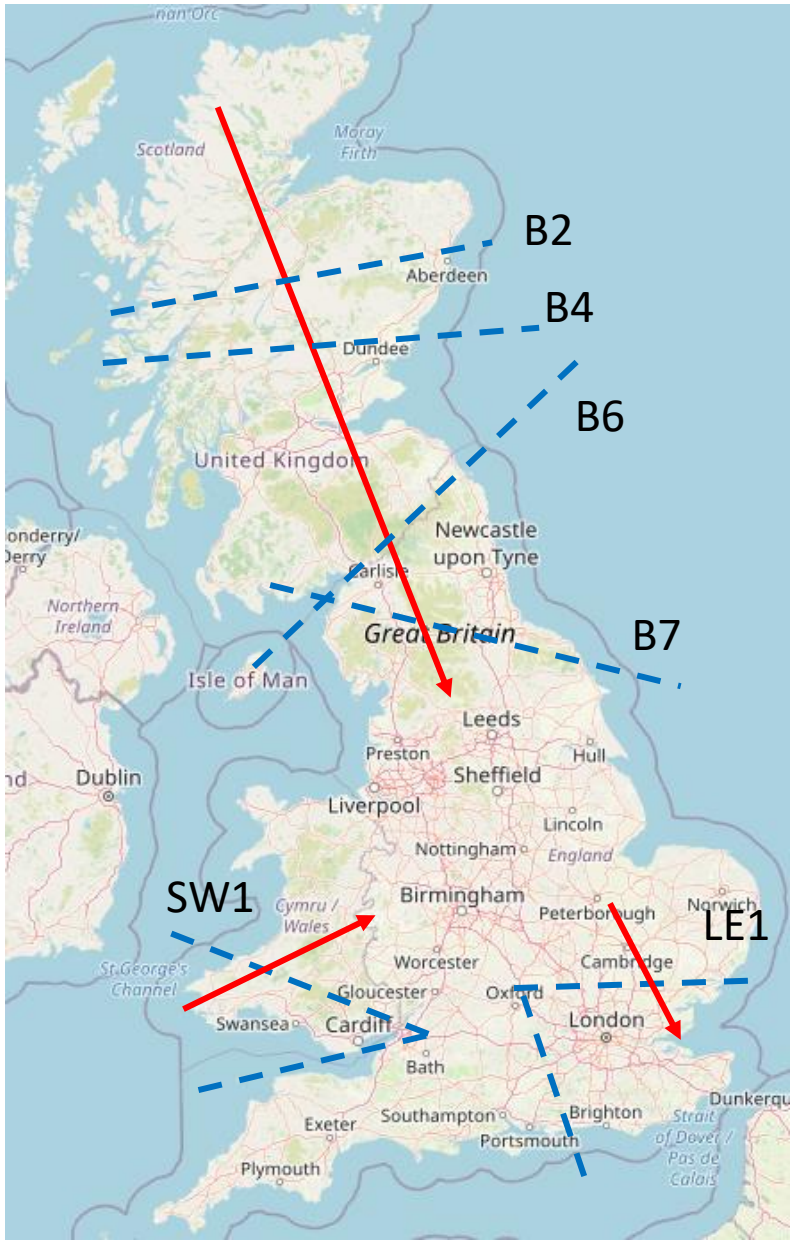
- In December a reduction of about 600 MW, split between Nuclear and Biomass units
- In January a reduction of about 400 MW in CCGT units
- In February a reduction of about 700 MW, split between Nuclear and CCGT units
- An overall increase in availability in March

The change in the overall position of margin leaves our view of the winter as presented in the Winter Outlook Report unchanged. This coming winter remains comparable to last winter, and we expect sufficient operational surplus for each week of winter 2021/22.



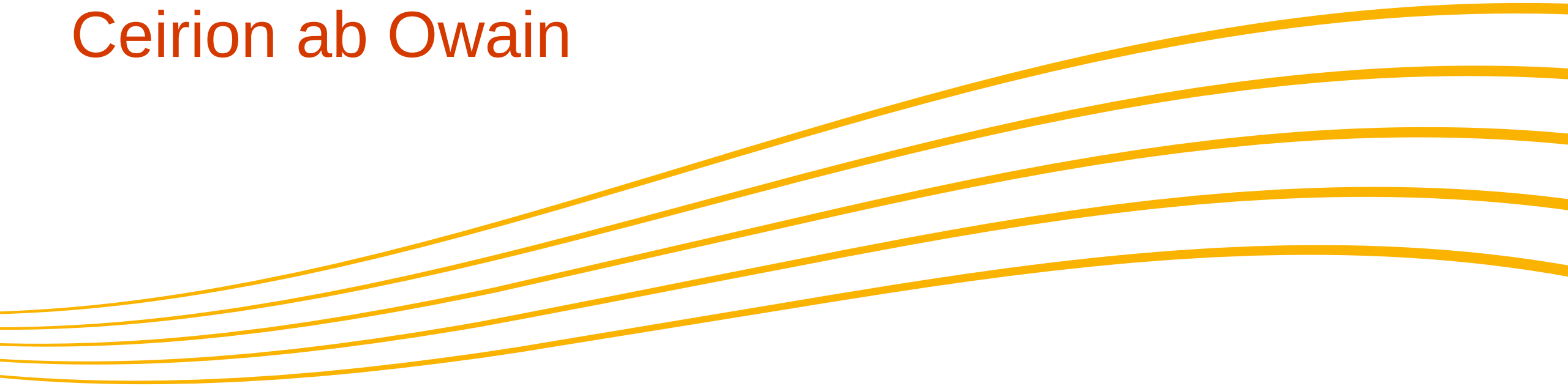
Transparency | Constraint Capacity

100% transfer capacity (MW)	
B6	5400
B7	8250
B2/B4	2700



Trading Overview

Ceirion ab Owain



Why we trade

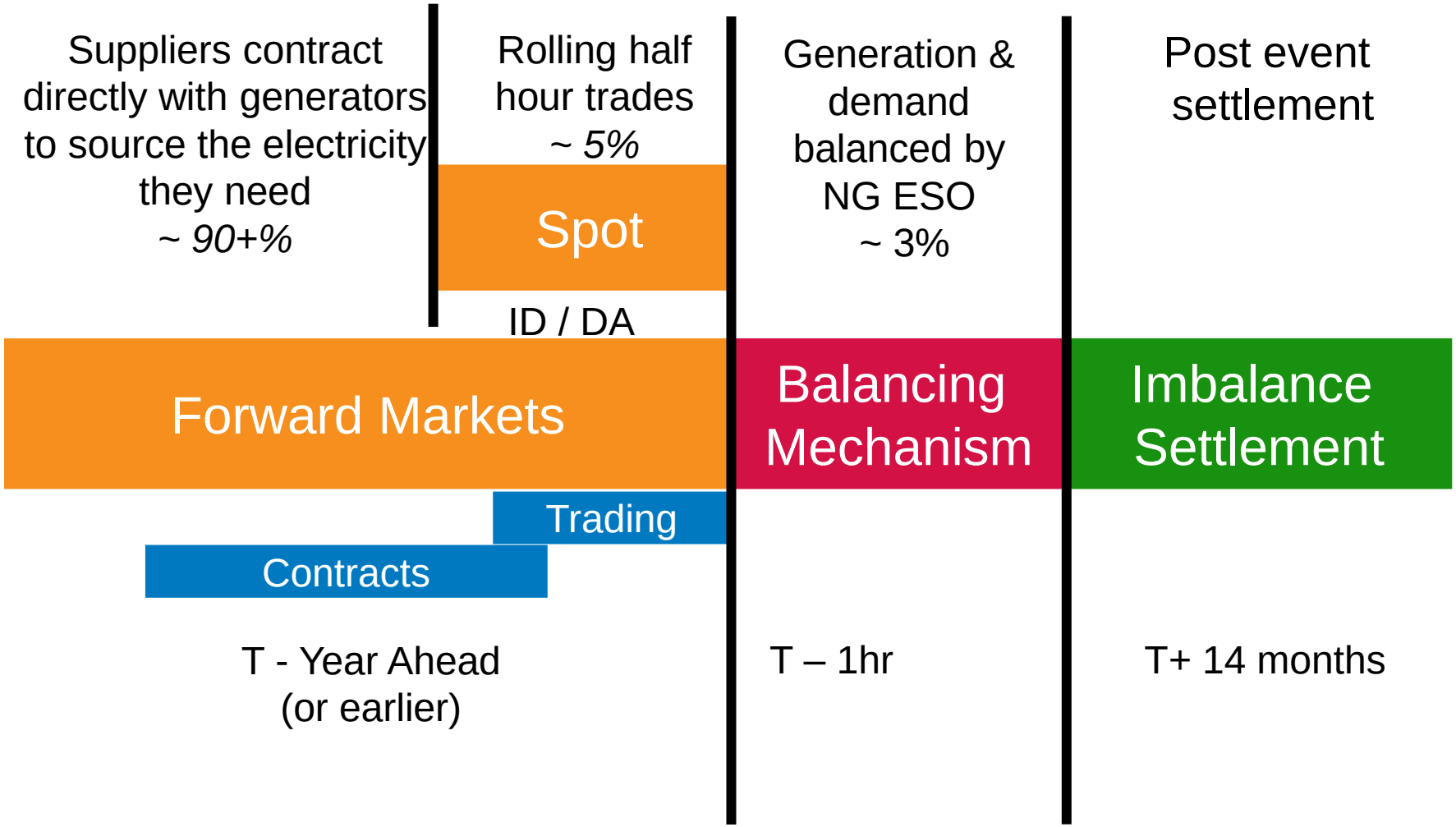
- Licence obligation to balance the system economically - benefits the end consumer.
- Additional tool in ESO system balancing portfolio.
- Risk mitigation – helps alleviate BM uncertainty for system planning purposes.
- Gives BMUs more certainty which hopefully results in more favourable prices.
- Avoid emergency actions: emergency assistance, emergency instruction & demand disconnection.

However:

- Further out our requirements are less certain and there is the risk of over trading.
- Could leave us exposed to expensive BM actions.

No speculative Trading

Market Structure and Timescales



Key Trading Products

GTMA Trading Schedule 7A

- **Interconnector**

  Running Interconnector auctions, trade with Interconnector capacity holders:

  - Thermal Constraints (LE1 / SC1 / SC1.5 / SC2 / SC3)
  - Margin (Upwards / Downwards)
  - Response
  - RoCoF

- **BMUs**

  Contact qualified CPs, Trade against BM, providing certainty ahead of BM, deliver better value to end consumer.

  - Voltage

- **Wind / Hydro**

  Manage constraints, trade against EI

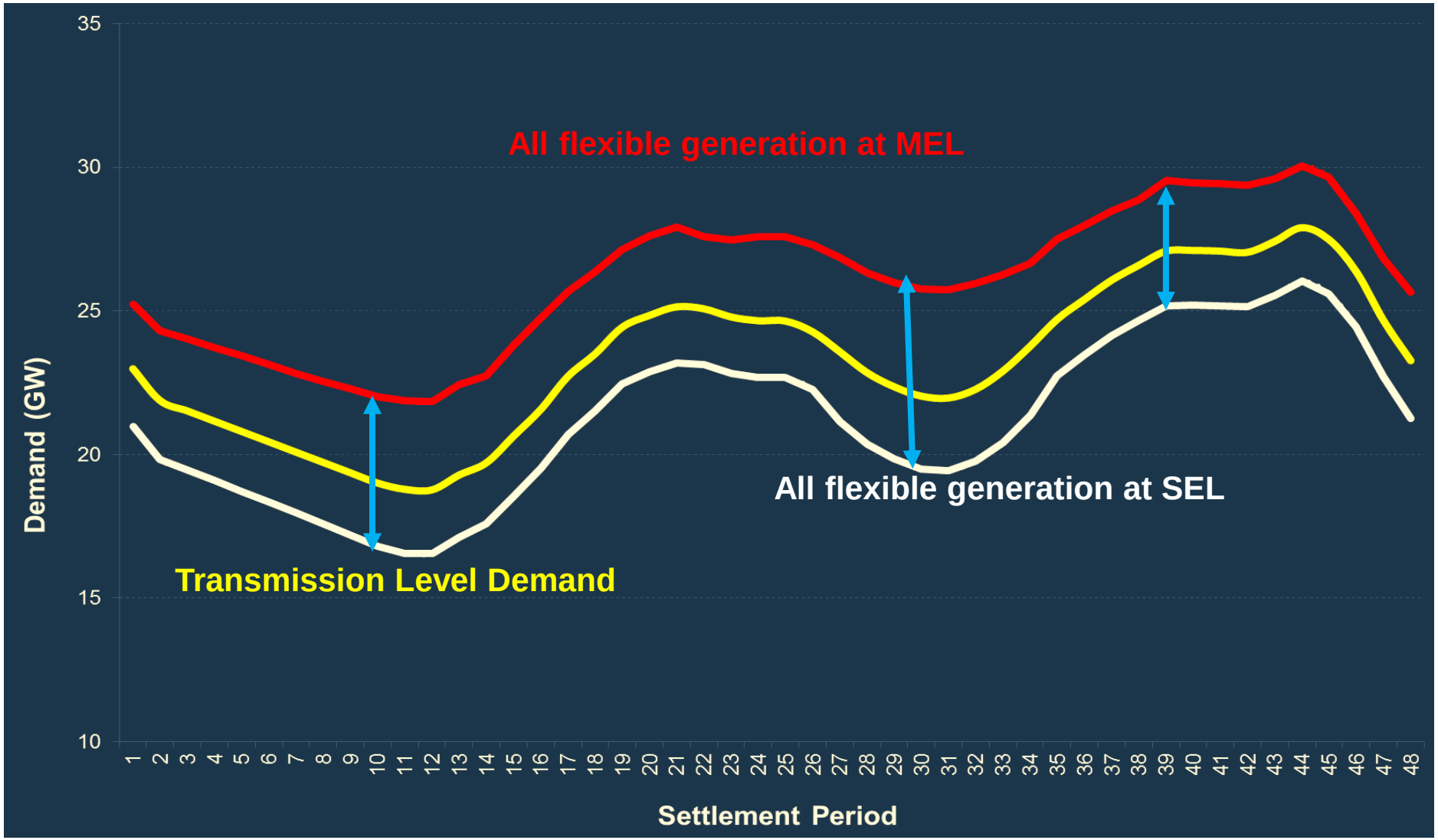
  - Thermal

Contract Enactment:

- Spread index Contract / SuperSEL / Reactive / Constraint Management

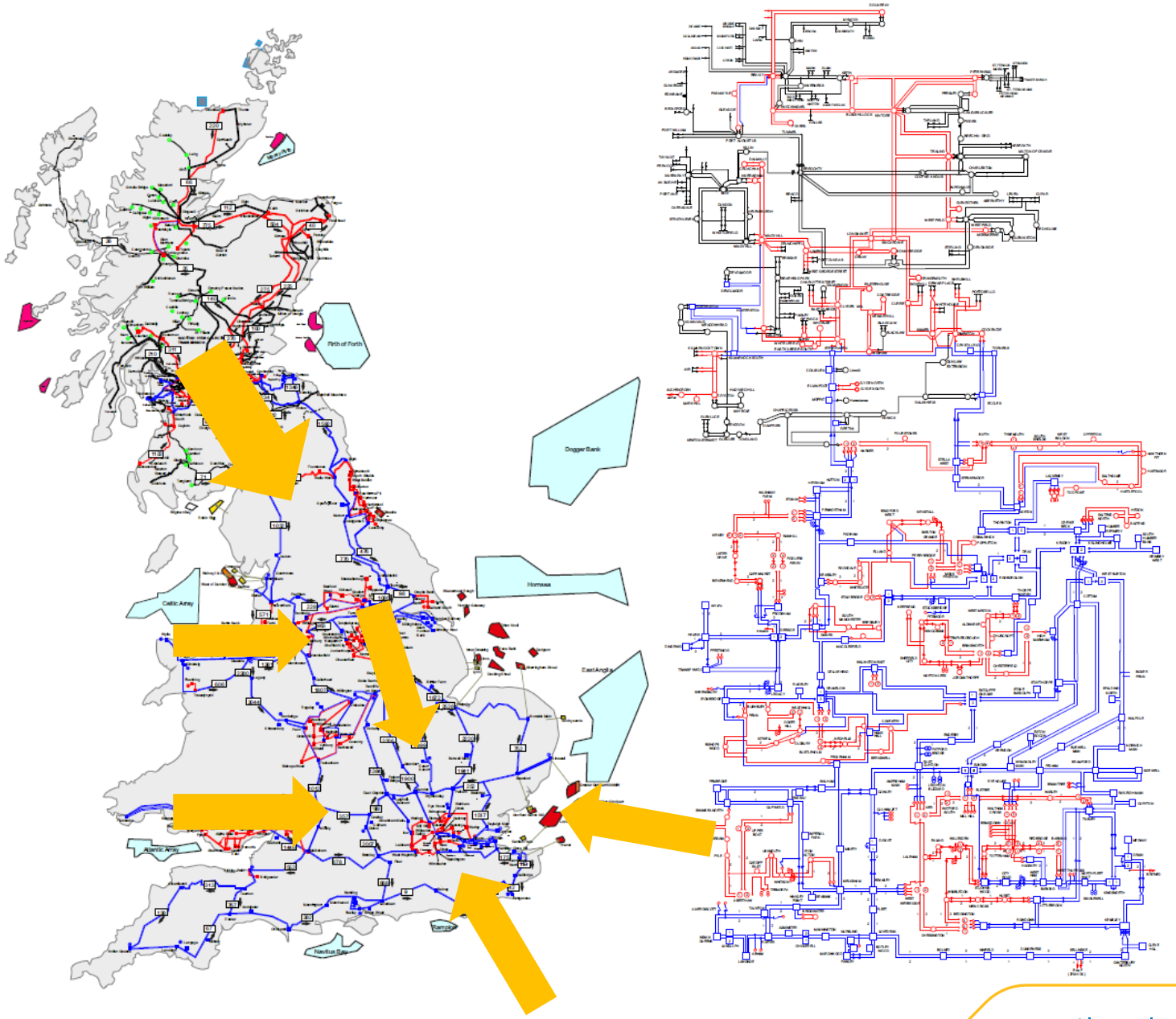
ESO Data Portal: Trading | National Grid Electricity System Operator (nationalgrideso.com)

Maintain Sufficient Margins



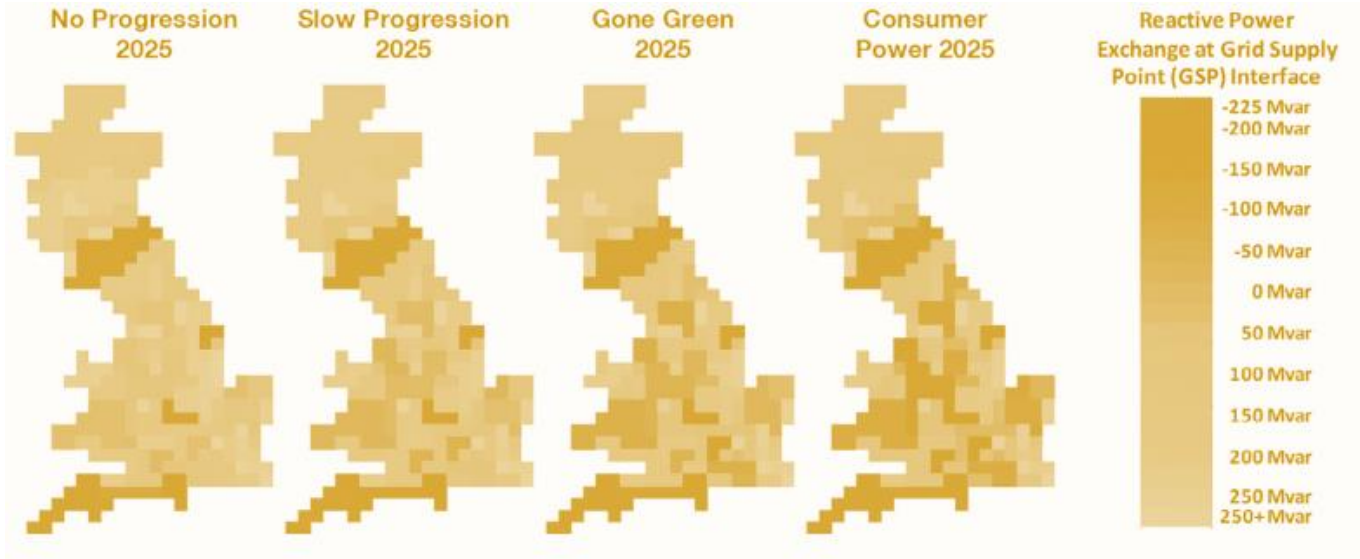
Thermal Constraints

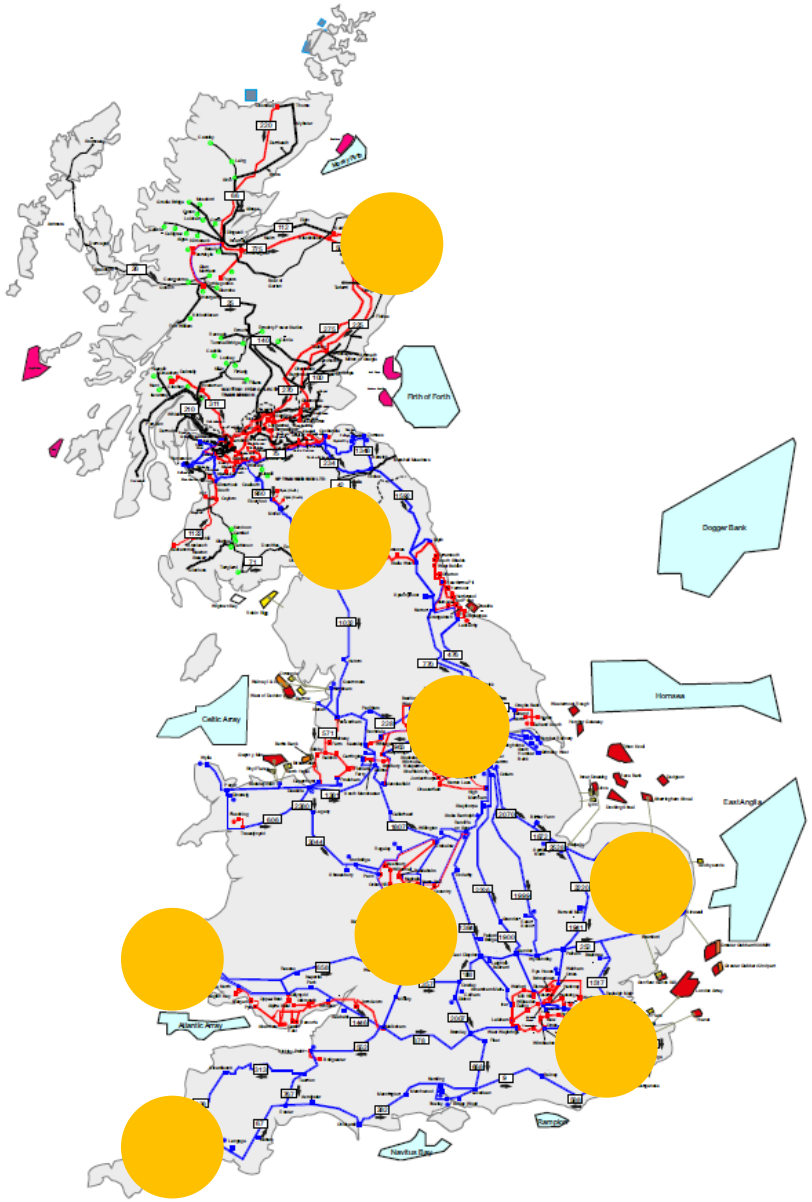
- Generation is rarely located near demand.
- An overloaded network is dangerous to the asset and the public.
- The ESO must constrain generators that are overloading the local network.
- Wind generation is frequently located in Scotland but demand is still centred around London.
- Switching off generators to relieve network congestion results in energy imbalance.



Voltage Management

- All areas in the network require voltage support.
- Provided by synchronised generators in that area.
- Voltage issues can occur during periods of low demand.
- Low usage during night-time and summer.
- High distributed generation output during midday and summer.
- Switching on generators to provide voltage support in that area results in energy imbalance.





Dynamic Moderation and Dynamic Regulation

- **Consultation webinars** – recordings, slides and FAQ available
- **Service Terms video** – published on DM & DR webpages
- **For 1-2-1s,** contact: box.futureofbalancingservices@nationalgrideso.com

EBR Article 18 DM & DR consultation closes on 15 December

Q&A

After the webinar, you will receive a link to a survey. We welcome feedback to understand what we are doing well and how we can improve the event ongoing.

Please ask any questions via Slido (code #OTF) and we will try to answer as many as possible now. If we are unable to answer your question today, then we will take it away and answer it at a later webinar.

Please continue to use your normal communication channels with ESO.

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

slido

Audience Q&A Session

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

Q&A

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