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ESO Operational Transparency Forum

3rd Nov 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 and outlook
- Costs for last week
- Constraints

Focus Areas

Digitised Whole System Technical Code
Scotland Voltage Oscillations

Questions outstanding from last week

Q:Considering the prices accepted for month ahead ffr why is week ahead ffr being capped artificially so far below these rates?

A: The market information report was published 26/10/21 on our data portal.

Q:Can we have a deep dive on BSADs please?

A: Yes – we'll add this to our list.

Q:It appears that interconnectors have recently been traded to reduce input to UK at prices less competitive than available from UK pumped storage - why is that? Is it lack of flexibility on interconnectors or some other reason?

A: We trade for a variety of operability reasons on the interconnectors, can you provide specific dates for this occurrence please?

Q: Please could you let people know in advance of the day if DM & DR will be covered and not leave it to 4 mins before the session ends?

A: We'll signpost on the OTF future slots slide

Q:Are we decarbonising the system too quickly and before the ESO/ Grid's can catch up new renewable generation given there is 29y until 2050. This is causing excessive costs and system issues with a more fragile system. How much more is ESO's 2025 zero Co2 ambition costing consumers than say in 2028?

A: Through the connect and manage regime we have the fastest decarbonising grid in the World, through this, the impact on TNUoS charges has moved to increased BSUoS costs, through higher constraint costs, as well as increased operational actions required to manage renewable generation. However, increased renewable generation means lower wholesale electricity prices overall.

More answers to questions being posted next week.

Future forum topics

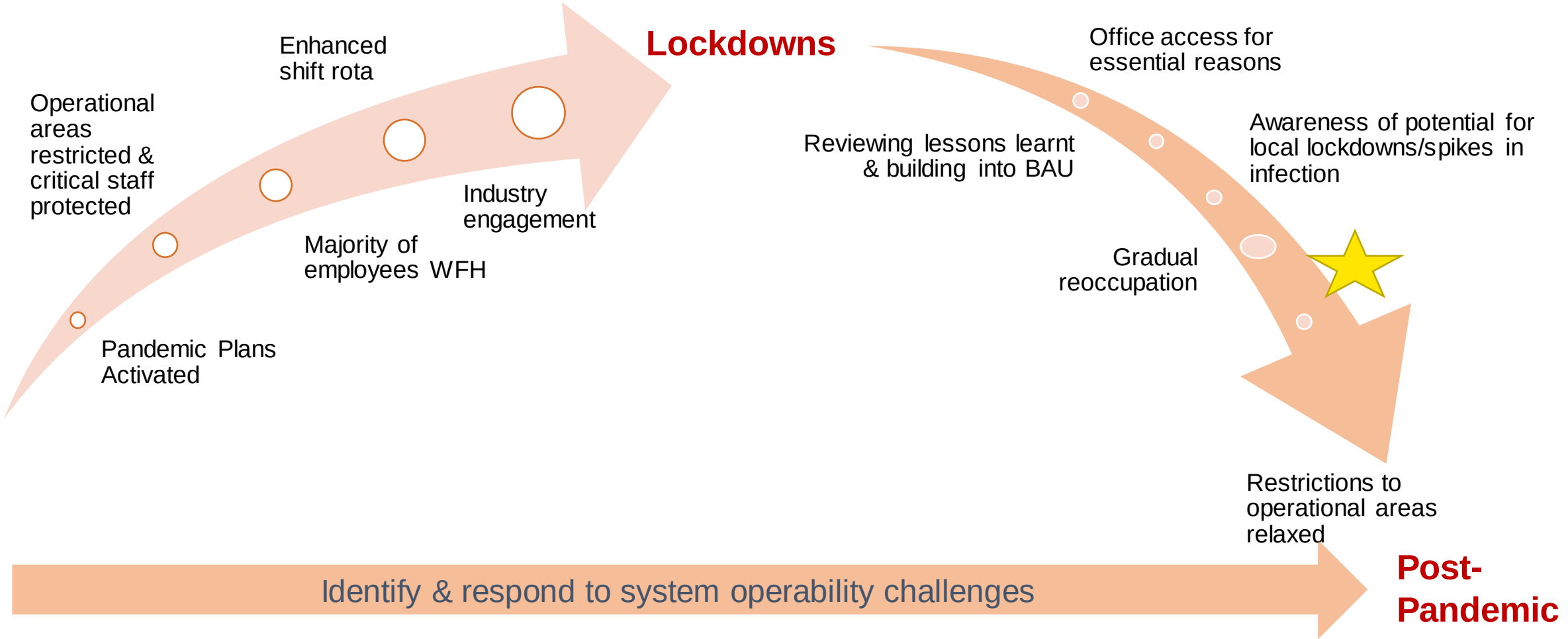
While we want to remain flexible to provide insight on operational challenges when they happen, we appreciate you want to know when we will cover topics.

We have the following deep dives planned:

10th November:

Market Monitoring Team introduction

Protecting critical staff to maintain critical operations



Demand | Triad Avoidance (TA)

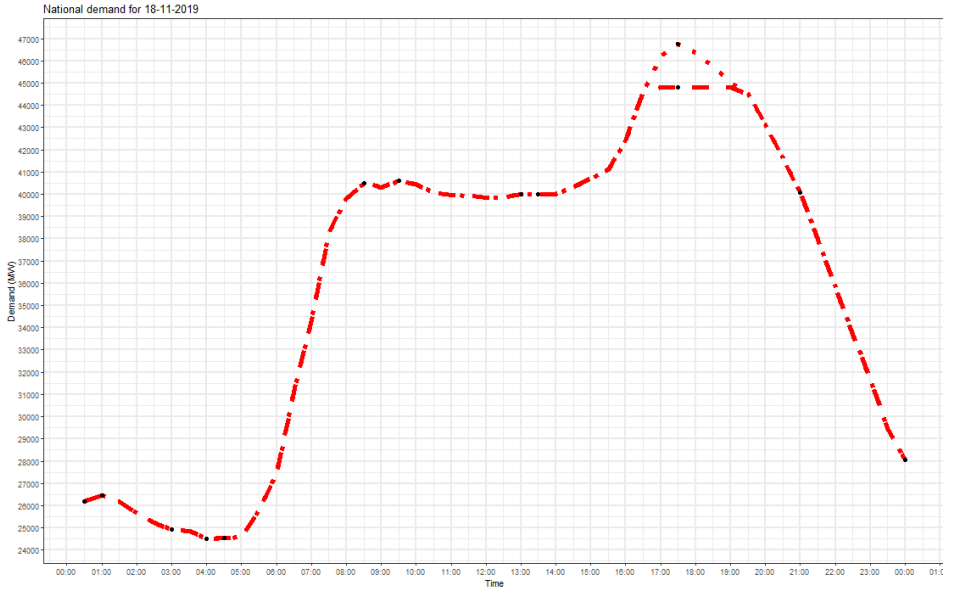
The Triads are the 3 half hour settlement periods with highest system demand between 1st Nov and the end of Feb
Have to be separated from each other by a minimum of 10 clear days

Demand shape over the peak time interval, from 17:00 to 19:30GMT, is going to be flattened. Sometimes the avoidance activity starts before 17:00.

First time ESO shares its TA adjusted National Demand forecast is after 21:00 on D-1

As the a result of the “Embedded benefits” changes ESO anticipates lower than previous years triad avoidance volumes.
Maximum expected TA during winter 2021/22 is 1200MW.

Indicative peak demand (operational metering)
On Elexon’s website shows the Transmission System Demand (TSD): ND + station load + pumping + I/C export
*operational metering



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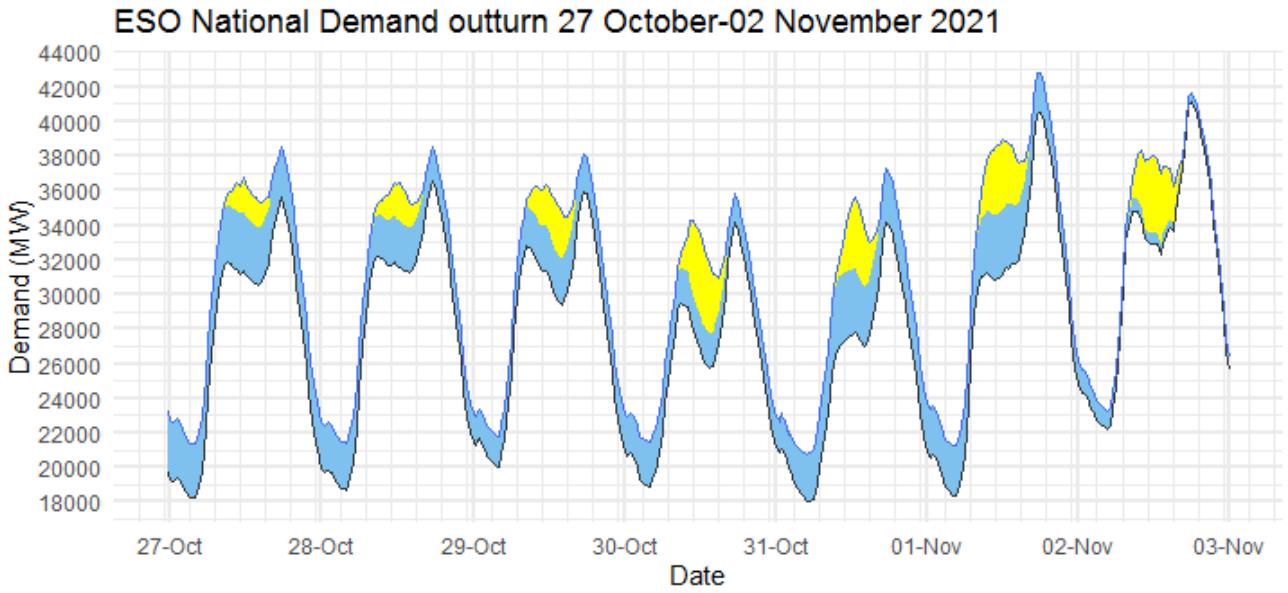
Demand | Last 7 days outturn



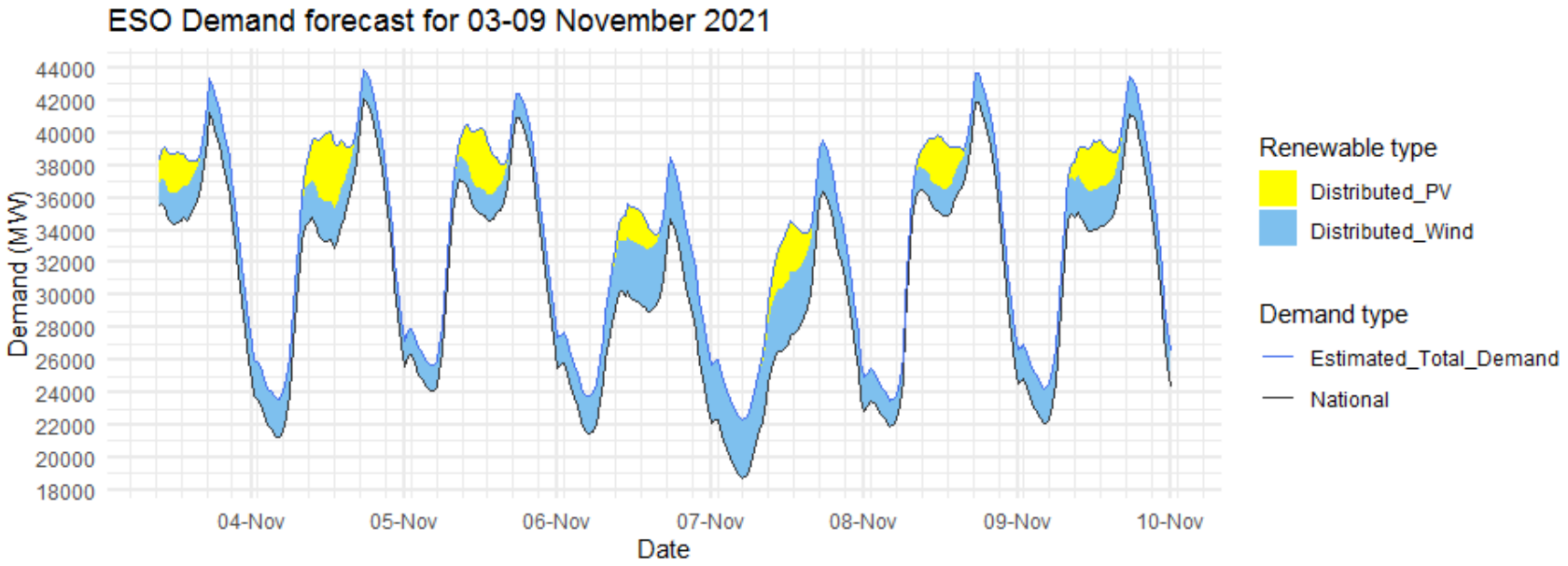
The black line (National Demand) is the measure of portion of total GB customer demand that is supplied by the transmission network.

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 27		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)
27 Oct	Evening Peak	35.8	3.0	35.6	0.0	35.6	3.0
28 Oct	Overnight Min	19.1	2.4	18.6	n/a	n/a	2.7
28 Oct	Evening Peak	37.0	2.2	36.6	0.0	36.6	1.9
29 Oct	Overnight Min	19.5	1.9	20.0	n/a	n/a	1.7
29 Oct	Evening Peak	36.5	1.9	35.9	0.0	35.9	2.2
30 Oct	Overnight Min	18.7	2.0	18.9	n/a	n/a	2.6
30 Oct	Evening Peak	34.1	1.8	34.1	0.0	34.1	1.7
31 Oct	Overnight Min	19.2	1.7	18.0	n/a	n/a	2.8
31 Oct	Evening Peak	35.8	2.2	34.2	0.0	34.2	3.1
01 Nov	Overnight Min	19.9	2.4	18.3	n/a	n/a	2.9
01 Nov	Evening Peak	41.4	2.0	40.6	0.0	40.6	2.2
02 Nov	Overnight Min	22.7	1.3	22.2	n/a	n/a	1.0
02 Nov	Evening Peak	42.5	1.5	41.2	0.0	41.2	0.5

Sli.do code #OTF

Demand | Week Ahead



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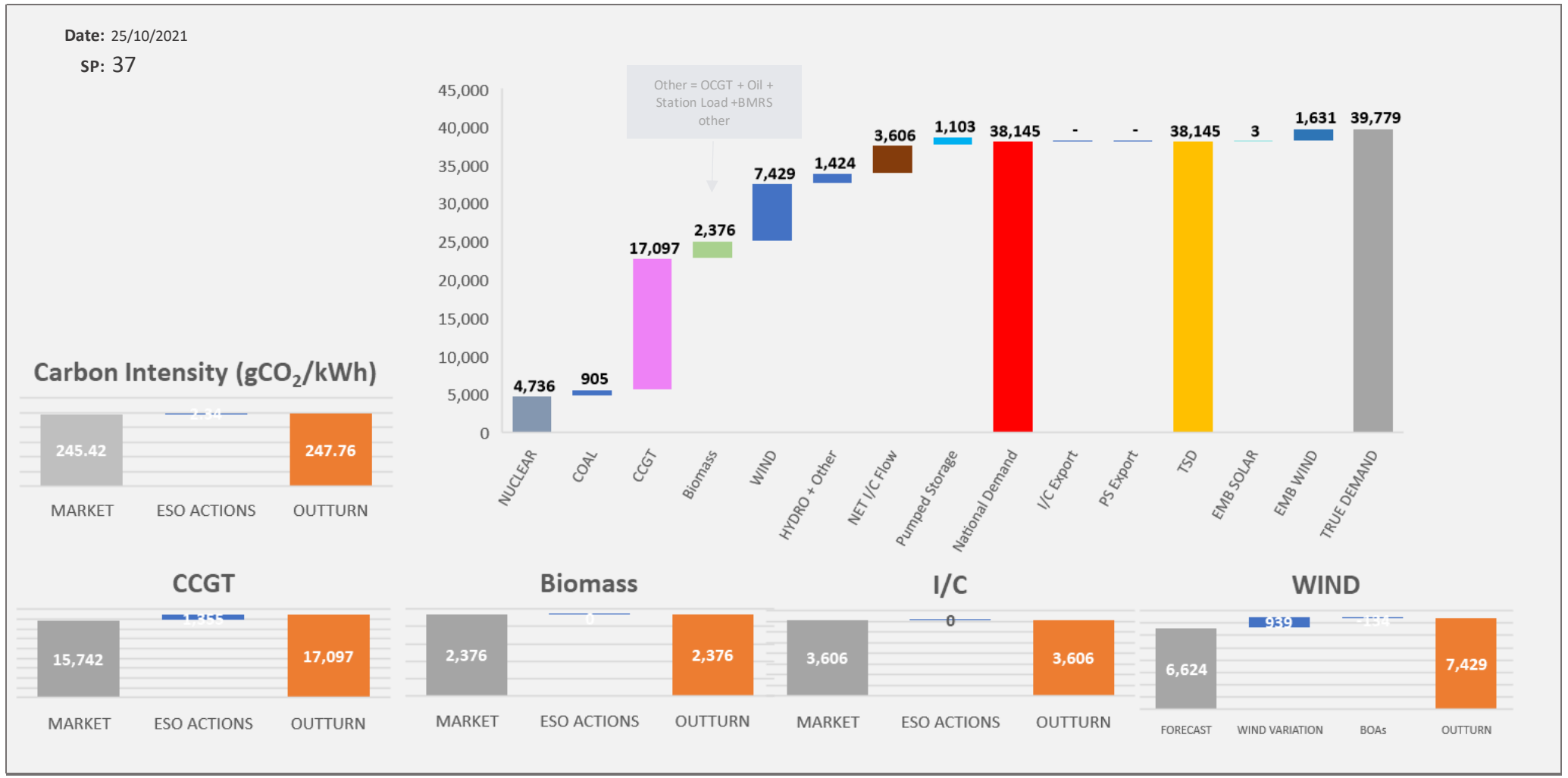
		FORECAST (Wed 03 Nov)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
03 Nov	Evening Peak	41.2	2.2
04 Nov	Overnight Min	21.3	2.3
04 Nov	Evening Peak	42.1	1.8
05 Nov	Overnight Min	24.1	1.6
05 Nov	Evening Peak	40.9	1.5
06 Nov	Overnight Min	21.5	2.3
06 Nov	Evening Peak	34.7	3.8
07 Nov	Overnight Min	18.7	3.6
07 Nov	Evening Peak	36.4	3.1
08 Nov	Overnight Min	21.9	1.7
08 Nov	Evening Peak	41.9	1.8
09 Nov	Overnight Min	22.1	2.2
09 Nov	Evening Peak	41.2	2.2

ESO Actions | Monday 25 October Peak

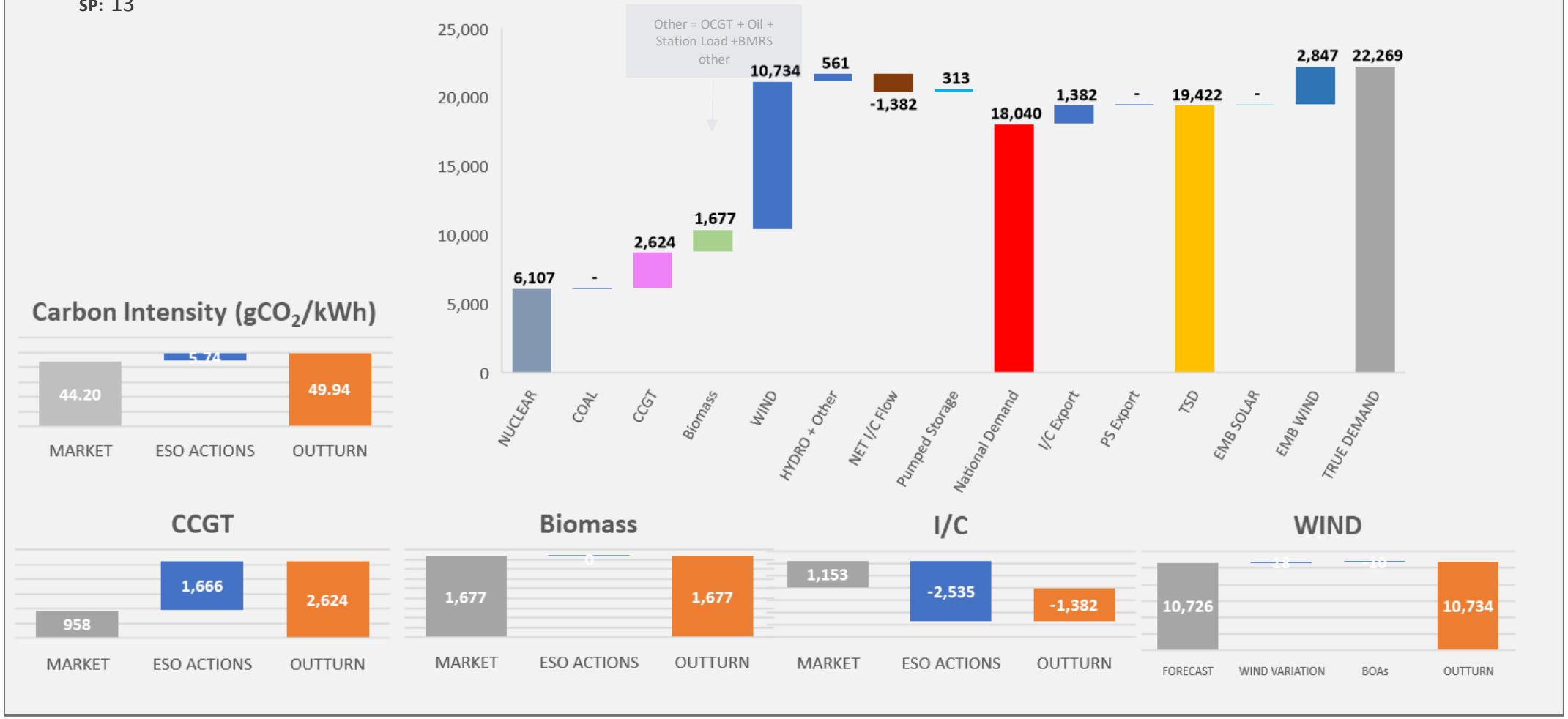


Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Sunday 31 October Minimum

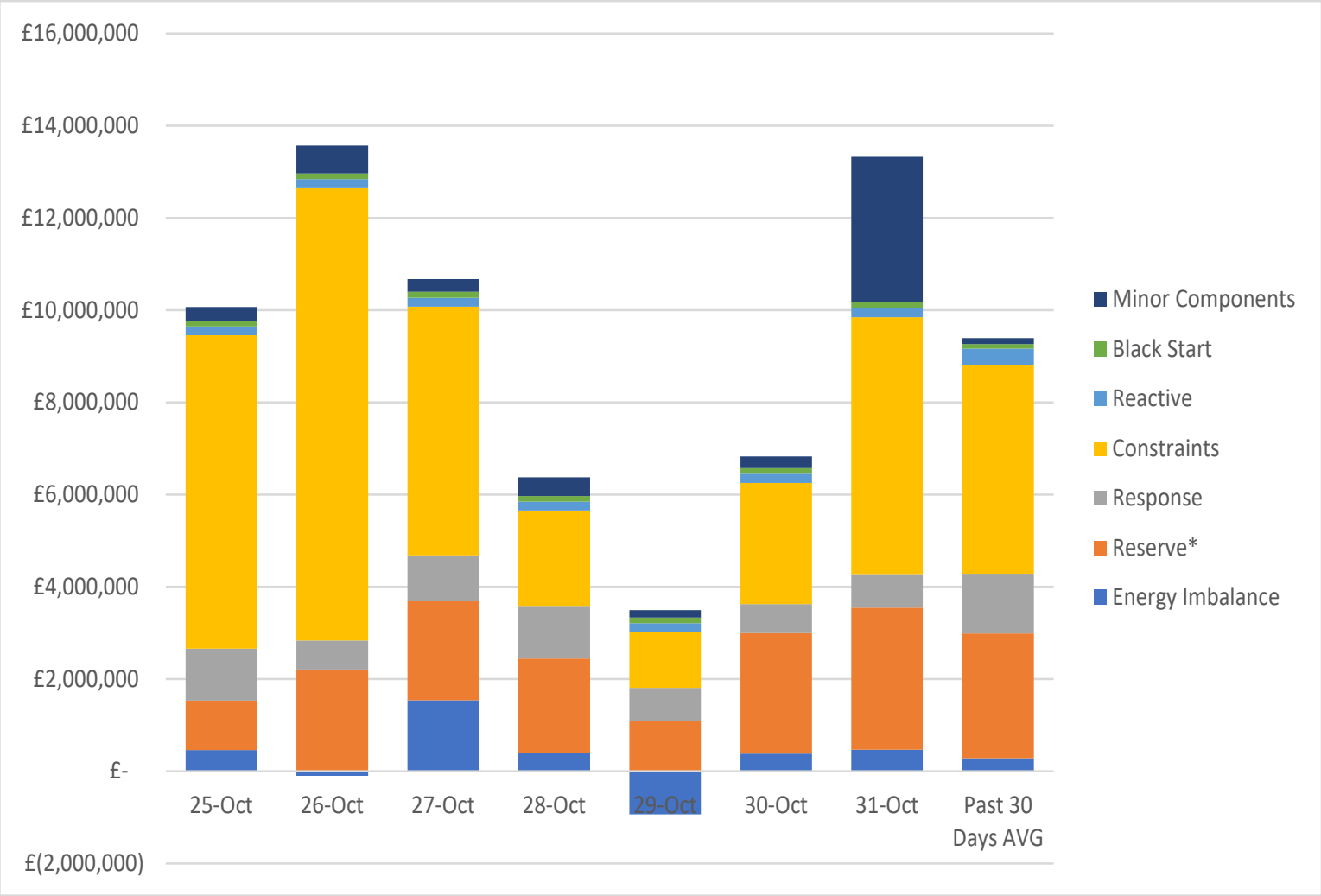
Date: 31/10/2021

SP: 13



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

Transparency | Costs for the last week



Tuesday 26th and Sunday 31st October were the most expensive days with daily spend of nearly £14m in both cases.

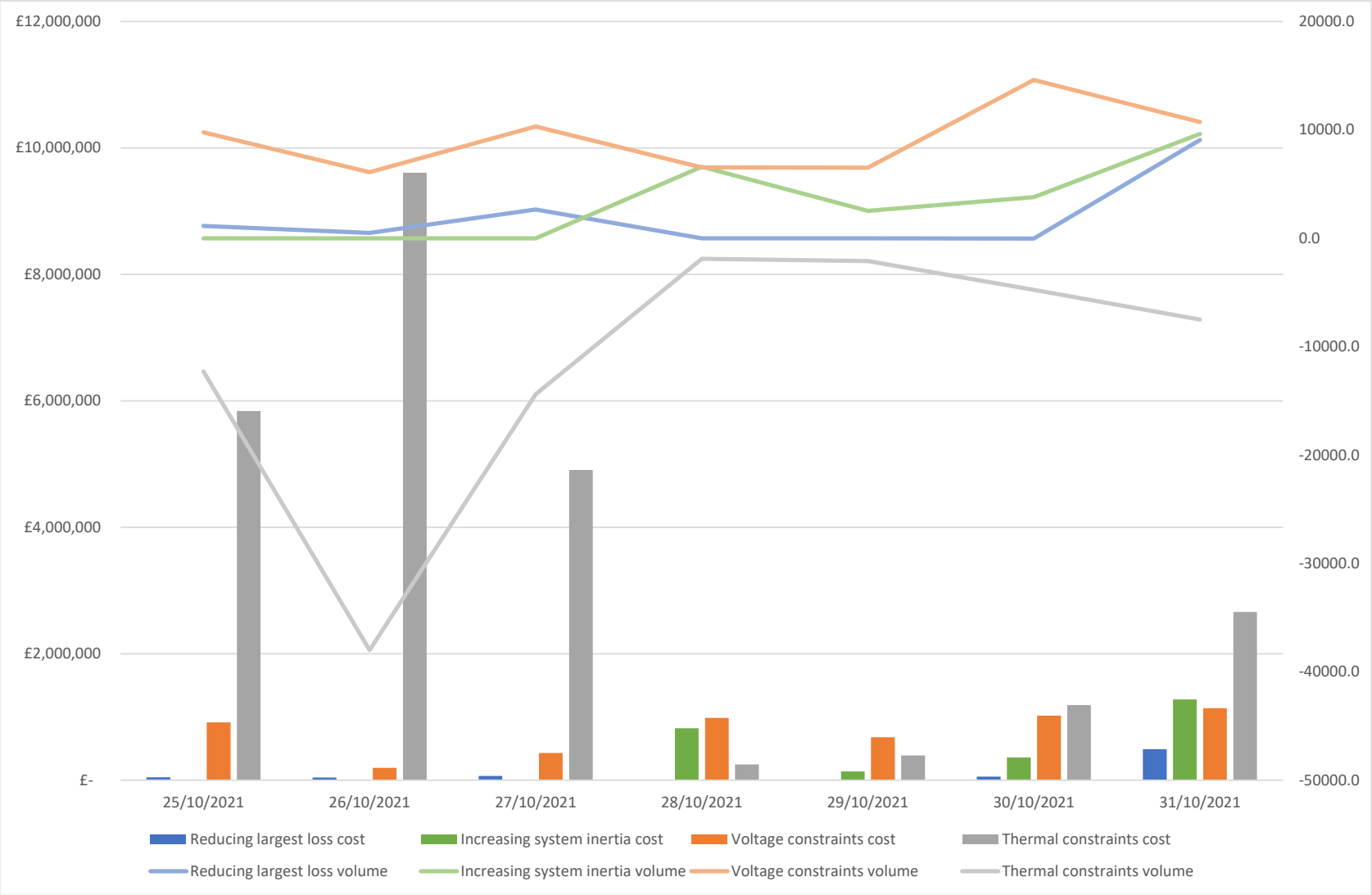
Sunday 31st was 25 hours long due to clock change

Constraints actions were the main drive for the high spend days. Prevalently windy weather over the first three days of the week and Sunday as well. This was requiring high volume of BM actions to buy off generation in Scotland to manage thermal constraint.

Other category costs were relatively stable throughout the week

Past 30 Days Average added

Transparency | Constraint cost breakdown



Thermal
Between Monday and Wednesday, high volume of actions required to manage thermal constraints, particularly in Scotland.

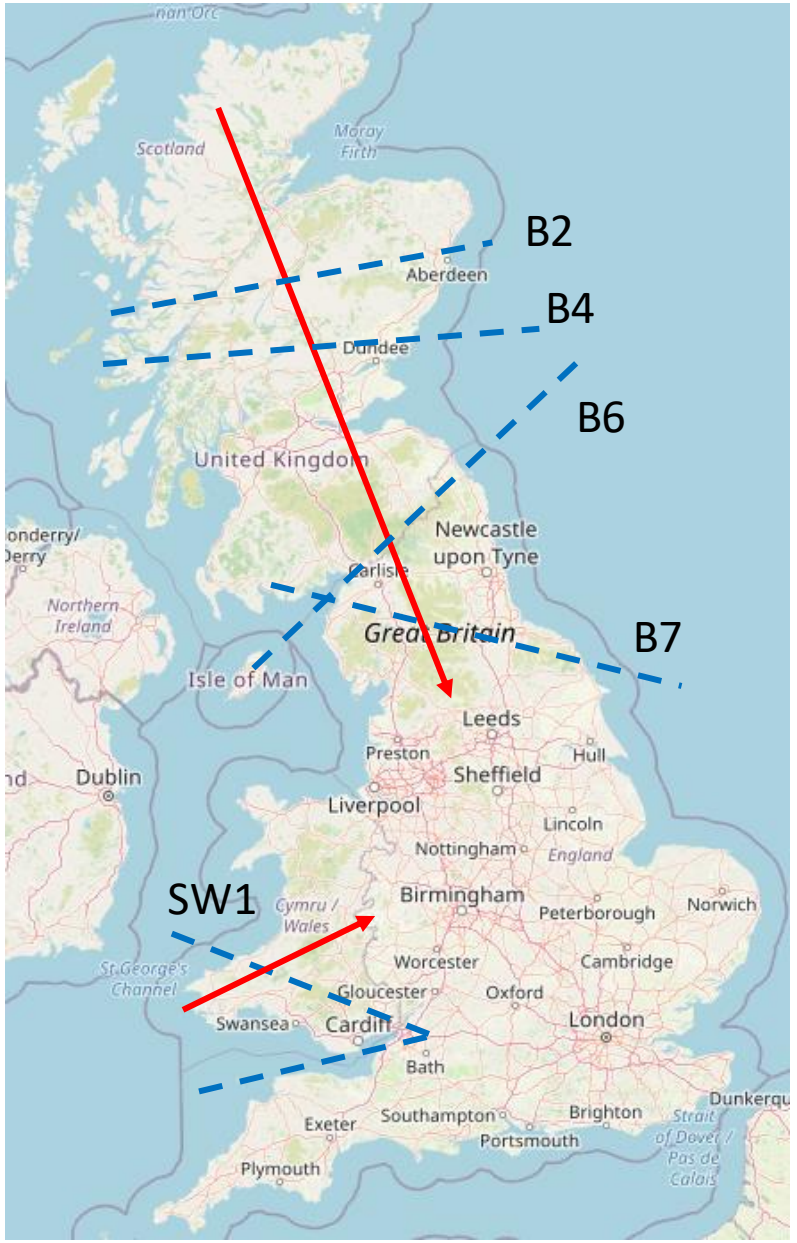
Voltage
Action required to synchronise generation to meet our voltage requirements throughout the week

Managing largest loss for RoCoF
action required to manage largest loss on interconnectors on Sunday.

Increasing inertia
Intervention required to increase minimum inertia between Thursday and Sunday

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

Transparency | Constraint Capacity



Operational Margins:

OTF

3 November 2021

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Operational Margins: week ahead

From 4 November to 10 November

Operational margins measure the situation in the Control Room before operational tools are utilised to ensure enough generation.

Margins are adequate for next 7 days.

Driven by high wind generation and returning conventional plant.

We hope that, if margins are low, generators could respond by changing outage plans.

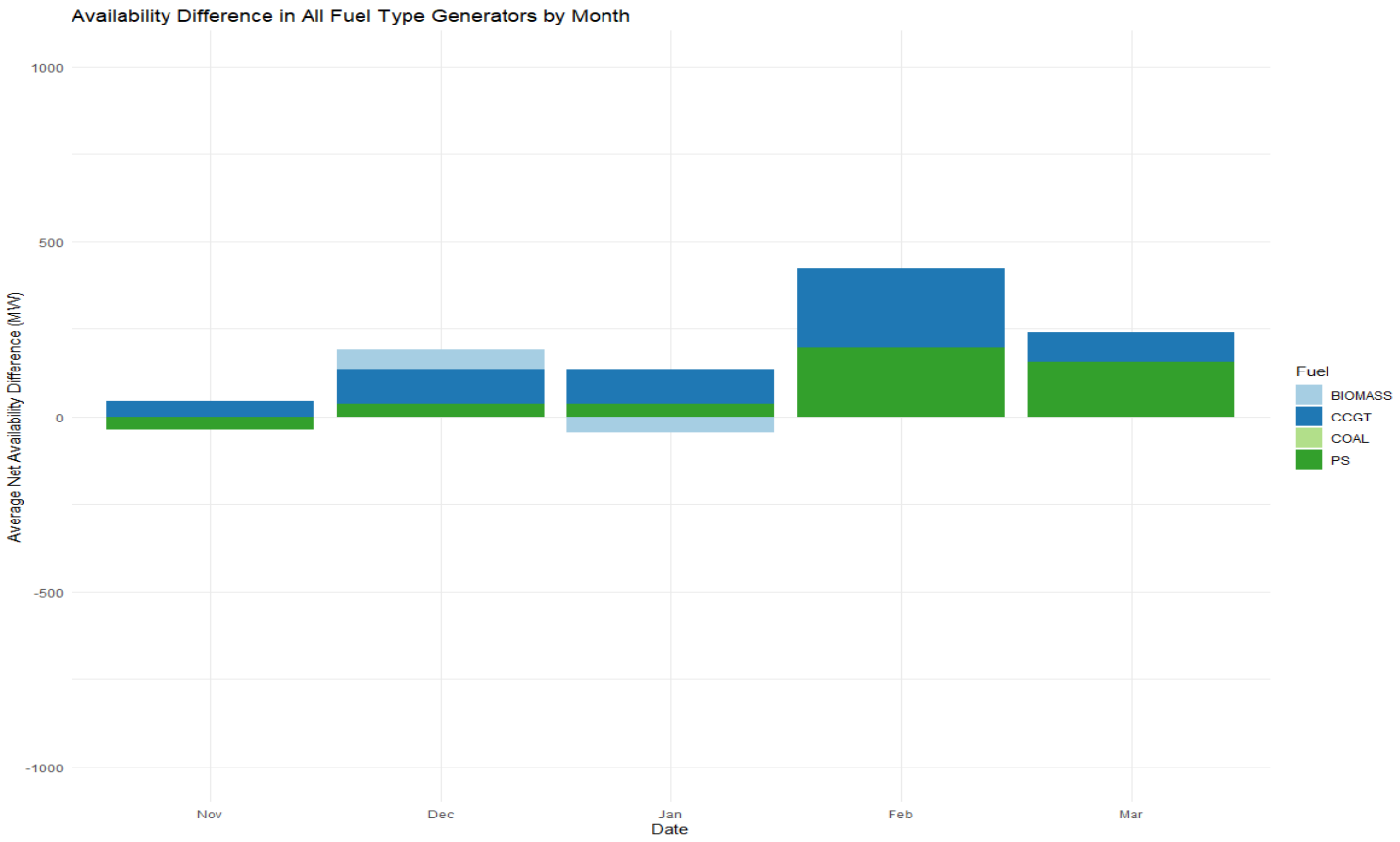
Day	Date	Notified Conventional Generation (MW)	Forecast Wind (MW)	Forecast Interconnector Availability (MW)	Forecast Peak Demand (MW)	Forecast Surplus (MW)
Thu	04/11/2021	42076	8804	1900	43251	4785
Fri	05/11/2021	42411	5191	1900	41255	3655
Sat	06/11/2021	41975	14977	3900	35782	17145
Sun	07/11/2021	43030	14247	3900	37651	16265
Mon	08/11/2021	44779	6512	3900	41454	8466
Tue	09/11/2021	44973	9918	3900	41629	11423
Wed	10/11/2021	44953	9350	3900	43085	9358

The table above shows the input table into the model, but the model is more complex than a simple sum.

Operational Margins: change in generator availability

Delta from 11 Oct to 01 Nov

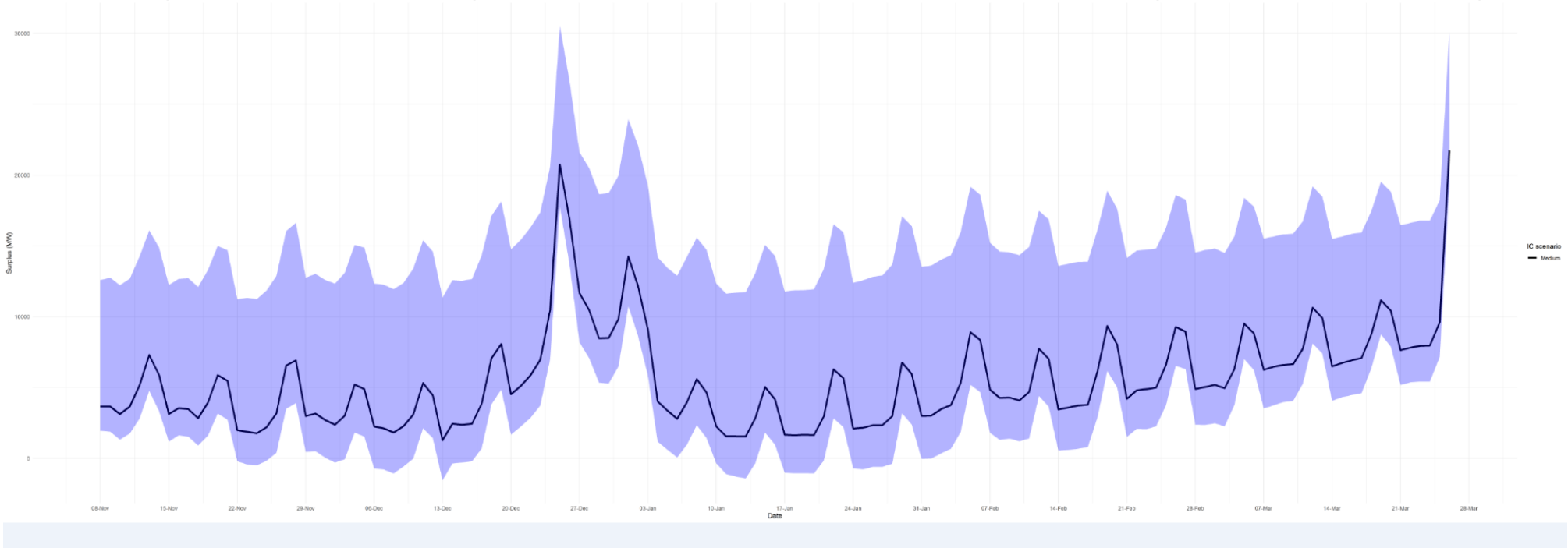
Total generator availability has increased by up to 500MW across all winter months



Operational Margins: Credible scenario range

Data as of 01 Nov

Operational margins measure the situation in the Control Room before operational tools are utilised to ensure enough generation.
They indicate the likelihood that such tools might have to be utilised.
Tools range from the issuing of market notices, to discussions with generators to change outage plans.



Lower margin periods are possible from the end of November to end of January, excluding the Christmas period.

Digitalised Whole System Technical Code
October/November 2021

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Digitalised Whole System Technical Codes (WSTC) Webinar

Purpose of this discussion

1. To share and discuss the high level scope of the consultation paper
2. To signpost additional opportunities to engage with the digitalised WSTC project

Introduction

Refer to consultation section 2: Introduction

The digitalised WSTC project seeks to digitalise and consolidate or align technical codes through an industry-led approach.

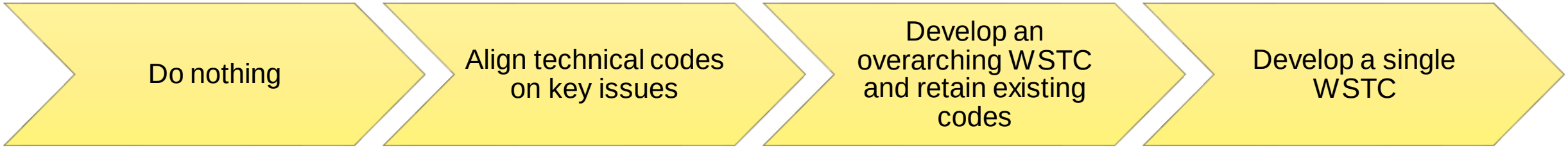
- The Ofgem/BEIS Energy Codes Reform recommends code simplification and consolidation
- Stakeholder feedback is that the technical codes are lengthy, overly complex, and are structured differently across Transmission and Distribution – creating a barrier to market participation and difficulty in navigation
- This ambition was supported by stakeholders and Ofgem as part of the ESO RIIO2 business plan
- NGESO has consulted at various industry forums since June 2021 to gather initial input on the scope, objectives and approach for this consultation and the wider project. The information gathered from the engagements at these forums has been used to inform this consultation.

Q1. What challenges do you have with using the technical codes?

Q2. Where there are challenges, please provide examples of areas where you would like to see change.

Potential Solutions

Refer to consultation section 3.1: Whole System Consolidation or Alignment



Q3. Are there further advantages and disadvantages of the potential solutions above?

Q4. Which of the issues identified in section2, (or by yourself in answer to Q1) would be addressed by each of the solution options?

Q5. Are there additional potential solutions for whole system alignment which could deliver value?

Potential Solutions

Refer to consultation section 3.2: Digitalisation

Q6. Are there additional potential solutions for digitalisation would could deliver value?

Q7. Which of the potential solution(s) for digitalisation do you see as providing the most benefit?

Q8.What risks and/or opportunities do you see in digitalising codes in parallel to work on code alignment, potential consolidation, and the Energy Codes reform programme? Please also share your views on how best to mitigate these risks.

Q9. Do you think the digitalised codes should be legally binding or for guidance only? Why?

Potential Solutions

Refer to consultation section 3.4: Work that can progress independently of the ECR outcome

Simplification & rationalisation of Distribution Code (& ERECs) and Grid Code separately

Identifying areas where the Distribution Code (& ERECs) and Grid Code can be aligned

Digitalising the Distribution Code (& ERECs) and Grid Code separately

Inclusion of SQSS in the Grid Code

Inclusion of P2/7 in the Distribution Code

Q10. Do you see value in progressing these work packages independently of the ECR and do you think they should be progressed?

Q11. Are there other opportunities that could be considered?

Potential Solutions

Refer to consultation section 3.5: Delivery of Solutions

Whole system alignment independent of ECR

a) Deliver modifications through existing governance process
b) Detailed recommendations for alignment delivered later, as part of ECR implementation

Code consolidation/alignment or creating new codes

a) Develop recommendations & input to the BEIS/Ofgem ECR
b) Postpone until ECR outcome

Digitalisation of codes

Digitalisation of

a) Grid Code only
b) Distribution Code (& ERECs) only
c) Grid Code and Distribution Code (& ERECs) separately
d) Grid Code and Distribution Code (& ERECs) together
e) Wait for BEIS/Ofgem ECR decision on consolidation

Q12. Stakeholders have articulated that there is strong interdependence between options in whole system consolidation or alignment (section 3.1), digitalisation (section 3.2) and the delivery of solutions (section 3.5). Do you have a preferred combination of these solutions that you see as delivering the best value considering the issues implementing the solutions? Please provide a rationale for your response.

Q13. Are there other aspects of the project delivery where you see risks and opportunities to mitigate these?

Key Benefits

Refer to consultation section 4: Key benefits

More efficient resource requirements for a connection journey

Increased market participation across the whole system

Encouraging innovation in the market

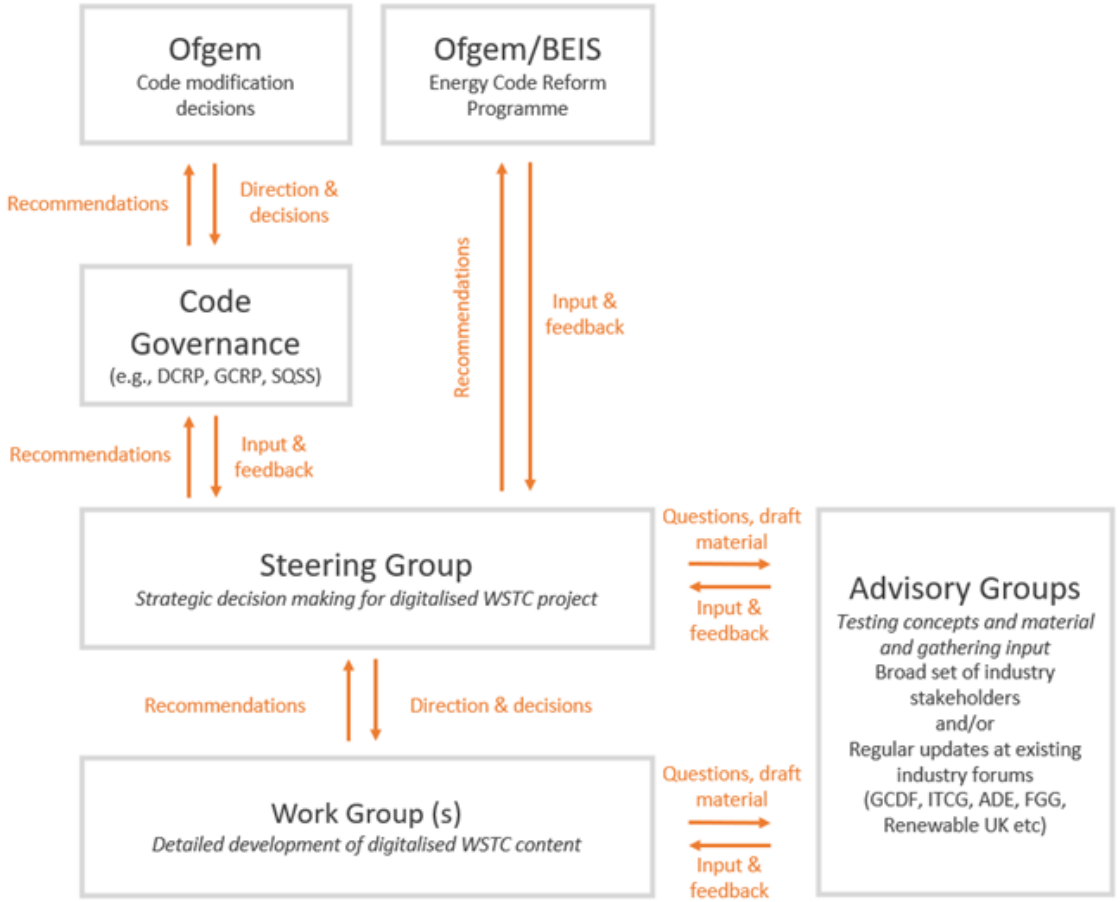
User-friendly technical codes

Streamlined implementation of changes across the whole system

Q14. Do you agree with the key benefits outlined above and can you see other benefits resulting from this project?

Project Governance

Refer to consultation section 5.1: Decision Making



Q15. Do you think that the proposed governance structure will enable delivery of the project? Would you change any aspects? If so, why?

Q16. Which elements of the project would you, or your organisation, like to be involved in? If so, please state in which capacity, and provide a short description of the perspective and value you would bring to the project?

Q17. What principles should apply when forming membership and ways of working for the various project groups?

Project Governance

Refer to consultation section 5.2: Proposed Terms of Reference – Steering Group

Membership	Frequency	Responsibilities

Q18. What are your views on the proposed Terms of Reference for the Steering Group?

Q19. Do you have further views on how best to include all relevant perspectives in the governance of the project?

Q20. How do you think the steering groups should make decisions, particularly if there is not consensus?

Project Governance

Refer to consultation section 5.3: Stakeholder Engagement

During Consultation:	During Project Execution:
Webinars	Webinars, Website & Email

Q21. What are your views on the proposed stakeholder engagement? Is there more that can be done to ensure effective stakeholder engagement?

Q22. Would you like to attend the webinars? If so, please leave your contact details in your feedback.

Q23. Would you like to request a regular update from the project at your forum? If so, please leave contact details of your forum in your feedback.

Project Governance

Refer to consultation section 5.4: Schedule

	Milestone	Date
Consultation	WSTC Consultation 1 issued to industry	27/09/21
	Webinars	05/10/21, 11/10/21, 20/10/21, 02/11/21, 05/11/21, 10/11/21
	WSTC Consultation 1 closes	12/11/21
	First proposed Steering Group meeting	Before 17/12/21

Q24. What are your views on the proposed schedule?

How to Provide Feedback

Consultation Issued: 27th September 2021

Respond By: 12th November 2021

Contact Us

You can get the consultation document and response proforma here.

You can send your consultation responses to our email address: box.WholeSystemCode@nationalgrideso.com

You can subscribe to our mailing list here.

Webinars within the WSTC Consultation window

There will be regular webinars to explain the consultation and enable you to ask questions and provide feedback. (Repeat sessions – attend one)

- Tuesday 5 October, 11:00 – 12:00 (Click here to join the meeting)
- Monday 11 October, 10:00 – 11:00 (Click here to join the meeting)
- Wednesday 20 October, 10:00 – 11:00 (Click here to join the meeting)
- Tuesday 2 November, 14:00 – 15:00 (Click here to join the meeting)
- Friday 5 November, 10:00 – 11:00 (Click here to join the meeting)
- Wednesday 10 November, 14:00 – 15:00 (Click here to join the meeting)

If you have any further questions, please contact the team at box.WholeSystemCode@nationalgrideso.com

Voltage Oscillations in Scotland

David Gregory

3rd November 2021

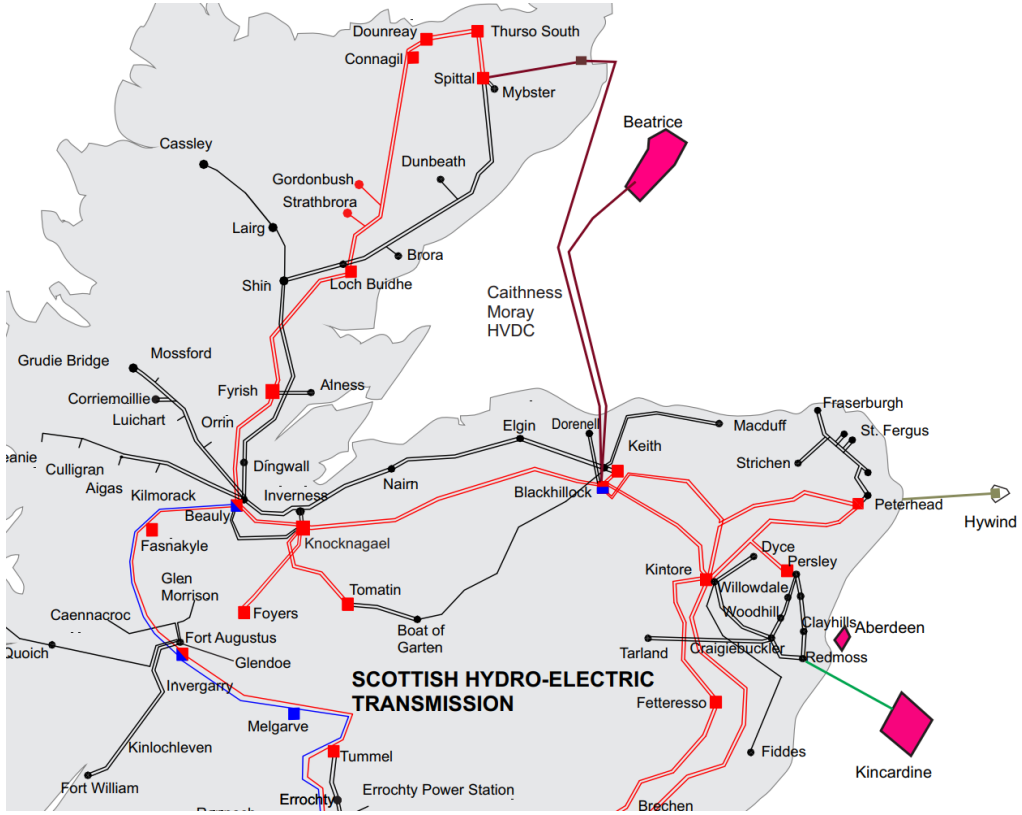
nationalgridESO

Background

- On 24/08/2021 severe voltage disturbances were observed on the SSEN-T and SPEN transmission systems.
- Major disturbance lasted 20-25 seconds on two occasions, approx. 30 minutes apart
- Investigation of available data suggests:
  - The oscillations with the largest magnitude were in the north of Scotland
  - The oscillations had a frequency of ≈8 Hz
- Some Users tripped off during the disturbances

What's being done?

- Short term operational advice provided, focussing on system strength
- We need to understand nature of oscillations and their source:
  - Data requested from Users (see next slide)
  - Working group convened with ESO and TO representatives to investigate events in more detail, aiming to:
    - Investigate the underlying drivers for the oscillations
      - EMT modelling of the supergrid network in the north of Scotland
      - Analyse events to explore underlying system behaviours
    - Investigate and recommend remedial actions that can be explored further with Licensees and/or Users as appropriate
    - Assess suitability of alternative screening techniques for use in operational timescales



Data requested

- To assist with the investigations, and to help identify potential triggering events or conditions, Users in Scotland were asked to provide:
    - Metering data at the times of the oscillations
    - Any alarms or actions from protection systems that may have taken place during the events
    - Other SCADA alarms or events that indicate abnormal or unusual operating conditions during the events
    - Their network configuration including number of turbines in service
    - Any change in state of plant, such as turbines being taken in or out of service
    - Any available fault recorder traces
    - Any controller tuning or framework updates carried out in the preceding months
- These can help in the modelling and analysis work to identify and assess potential triggers

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Autumn Markets Forum

Building upon the events we held in March and June this year, we will be holding our next Market Forum on **Thursday 18th November.** Join us for an update of how the ESO is developing new and existing markets to enable the transition to net zero.

The event will be a one day interactive forum with the following sessions:

Welcome and Introduction 10:00 – 10:15

An introduction to the event and overview of what will be discussed during the day.

Sign up here

Net Zero Market Reform 13:00 – 14:30

Key challenges identified from our case for change modelling and how these influence the next phase.

Sign up here

Markets Roadmap: what next? 10:45 – 12:15

Latest news on current Market developments and the longer term Roadmap.

Sign up here

Energy Code Review 15:00 – 16:00

Insights into BEIS/Ofgem Energy Code Reform work and the ESO's thinking.

Sign up here

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

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

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

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