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

ESO Operational Transparency Forum

13 Oct 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

ESO Ambition to Facilitate Electric Vehicles – Toby Thornton

Winter Outlook -
Andrew Richards / Daniel Murrant

Questions outstanding from last week

Q: When will you start publishing DC linear data, you stopped after publishing it once.

A: The linear order file is being reviewed as we noticed some anomalies in the file being published. This is under review and will be published once the issue has been resolved. It is still our intention going forward to publish the linear order. We will update the OTF and the Future of Balancing Services subscribers when the data is available.

Q: Is there a published ordering of CCGT switch off in a gas emergency event? Do those holding firm, capacity take precedence over those holding non firm?

No not at the moment. Responding to a gas supply shortage the GSO will take commercial actions first. The RIGSSE project is looking at various options around this.

Link to Network Gas Supply Emergencies website: https://www.nationalgrid.com/uk/gas-transmission/safety-and-emergencies/network-gas-supply-emergencies-ngse

Q: You talk about primary, secondary high requirement. Is the data for that requirement published?

Procured volume is published in MBSS but not the requirement volume

Q: Last week it was mentioned that the issue with SO-SO trades not being submitted to Elexon has been fixed. However, there were no changes in the SF settlement run for the trades across the Irish interconnectors on 9 September. Same with Emergency Assistances w/ RTE and TenneT on 29 August and 6 Sep.

We are reviewing this in our settlements team, thank-you for providing the dates

Questions outstanding from last week

Q: Will you be issuing a new update to the April FRCR report if operating parameters are changing tomorrow?

The FRCR report published previously details the changes for Phase 2: Changes • to allow BMU-only infeed loss risks to cause a consequential RoCoF loss, if the resulting loss can be contained to 49.2Hz and 50.5Hz

https://www.nationalgrideso.com/industry-information/codes/security-and-quality-supply-standards/frequency-risk-control-report

Q: Has the live moitoring of Inertia been integrated as part of FRCR phase 2?

We haven't integrated the Inertia Monitoring as part of FRCR. At present we only have the live monitoring of the Scottish contribution of inertia and, as both products are innovative solutions, we will be assessing the accuracy of the data for a period of time before integrating into our operational tools.

Q: With your BM response costs sky rocketing why are the week ahead FFR auctions being artificially held down so low by your cap prices?

In response to the change in BM costs in recent weeks we are analysing the alternative costs of our actions for our response markets.

Q: On the 09-27 at 15:06 the unit Crossdykes 2 Wind was shut down only to be reactivated at 9999£/MWh 20 seconds later. How can this be?

We are looking into this question and will provide an update at the next forum

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:

Standing item – Margin Update

20th October

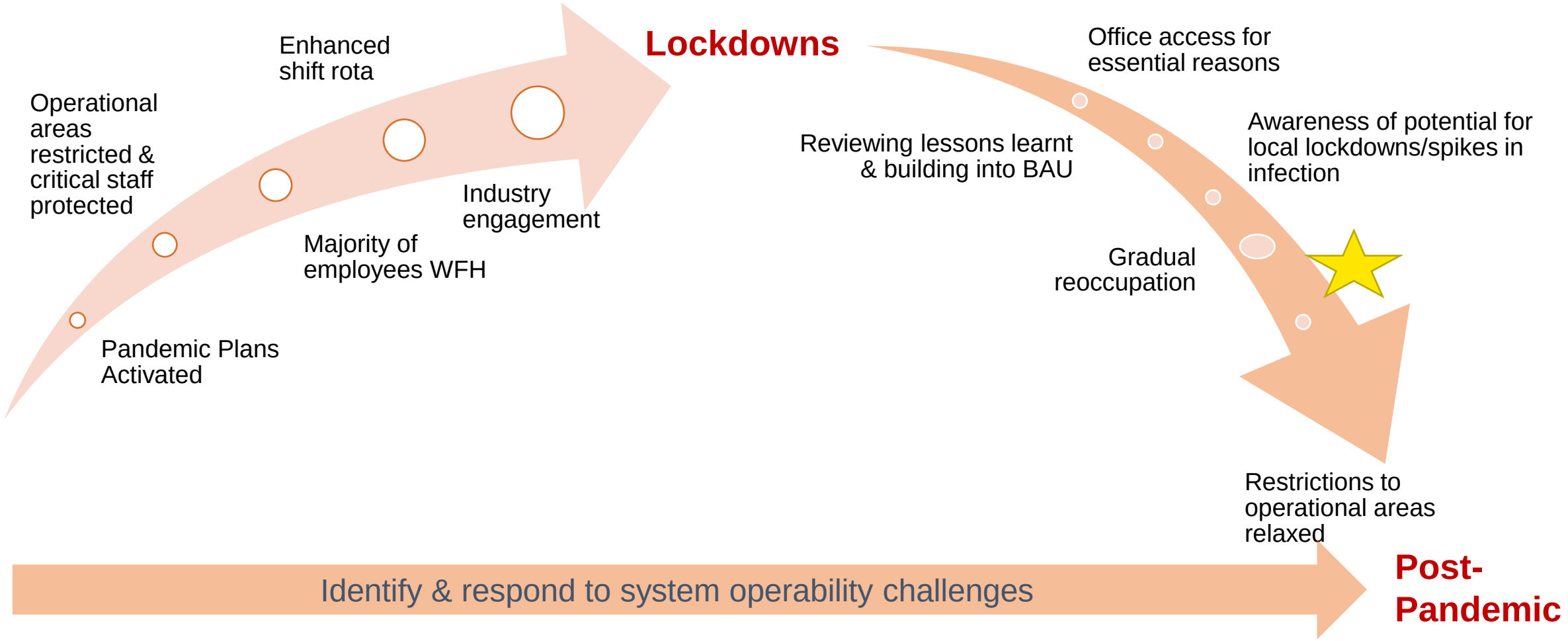
Frequency Risk and Control Report (FRCR)

Transmission Network Before Real Time

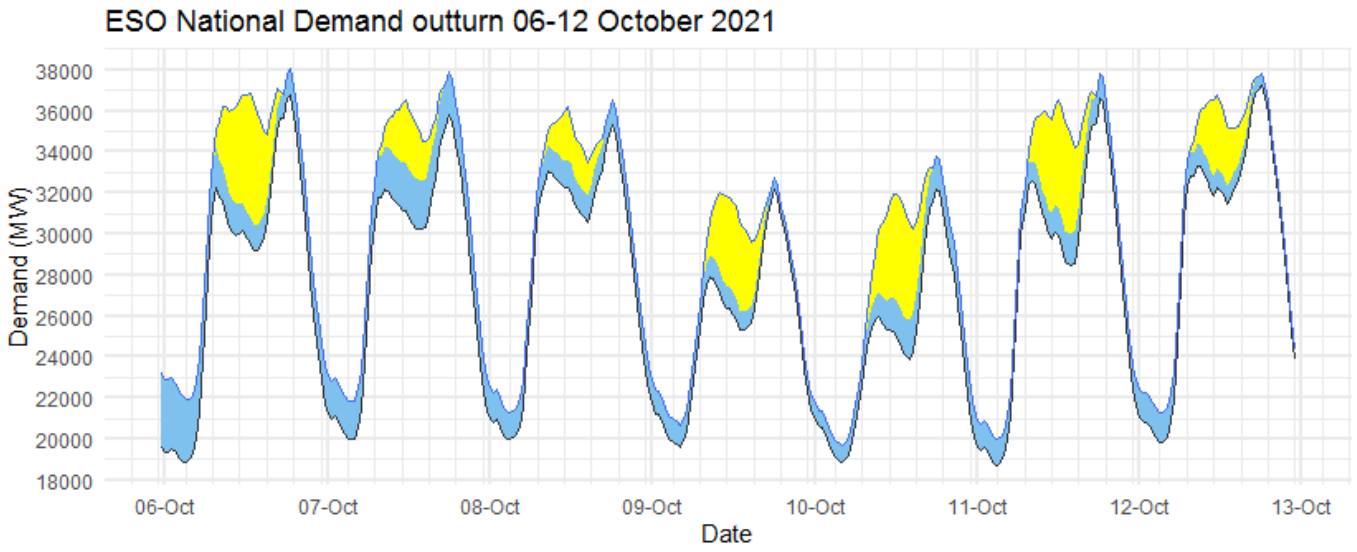
27th October

Carbon Intensity Calculations – previously delayed due to presenter availability

Protecting critical staff to maintain critical operations



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 06		OUTTURN	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	National Demand (GW)	Dist. wind (GW)
06 Oct	Evening Peak	36.6	1.3	36.8	1.3
07 Oct	Overnight Min	20.0	1.9	20.0	1.8
07 Oct	Evening Peak	35.2	2.0	35.8	2.1
08 Oct	Overnight Min	20.2	1.2	20.0	1.3
08 Oct	Evening Peak	34.8	1.0	35.4	1.2
09 Oct	Overnight Min	19.3	0.9	19.6	1.1
09 Oct	Evening Peak	32.7	0.6	32.2	0.6
10 Oct	Overnight Min	18.8	0.5	18.8	0.8
10 Oct	Evening Peak	33.4	0.9	32.2	1.5
11 Oct	Overnight Min	19.4	1.0	18.7	1.3
11 Oct	Evening Peak	37.1	1.0	36.6	1.2
12 Oct	Overnight Min	20.6	1.1	19.9	1.4
12 Oct	Evening Peak	37.1	1.2	37.3	0.6

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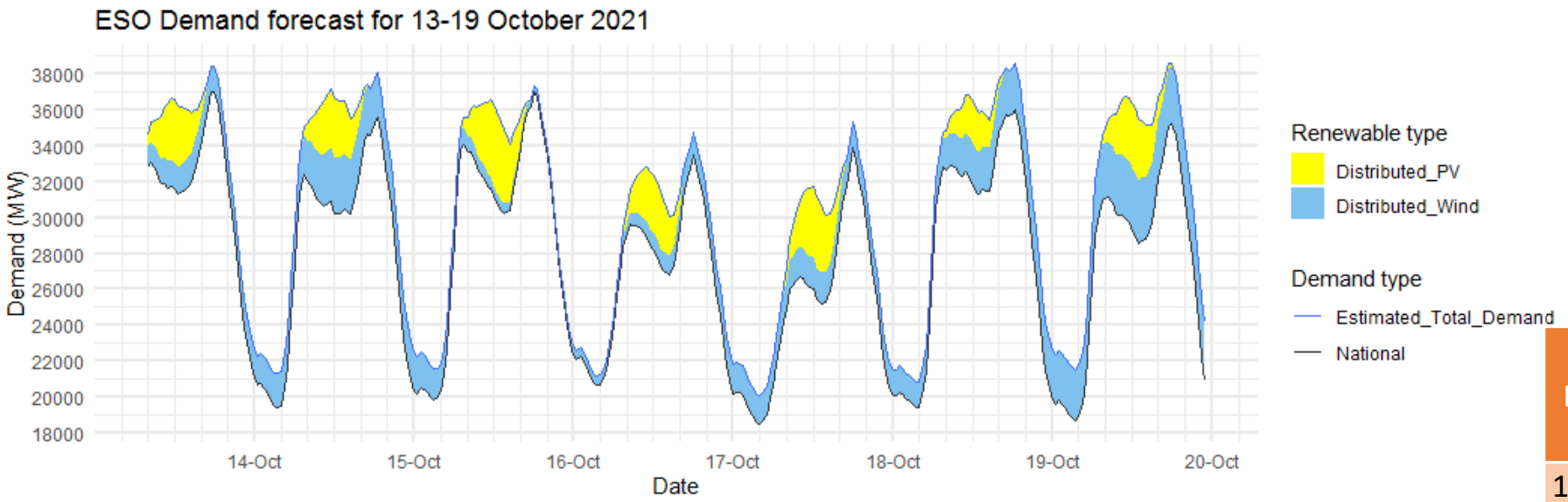
Demand | Week Ahead



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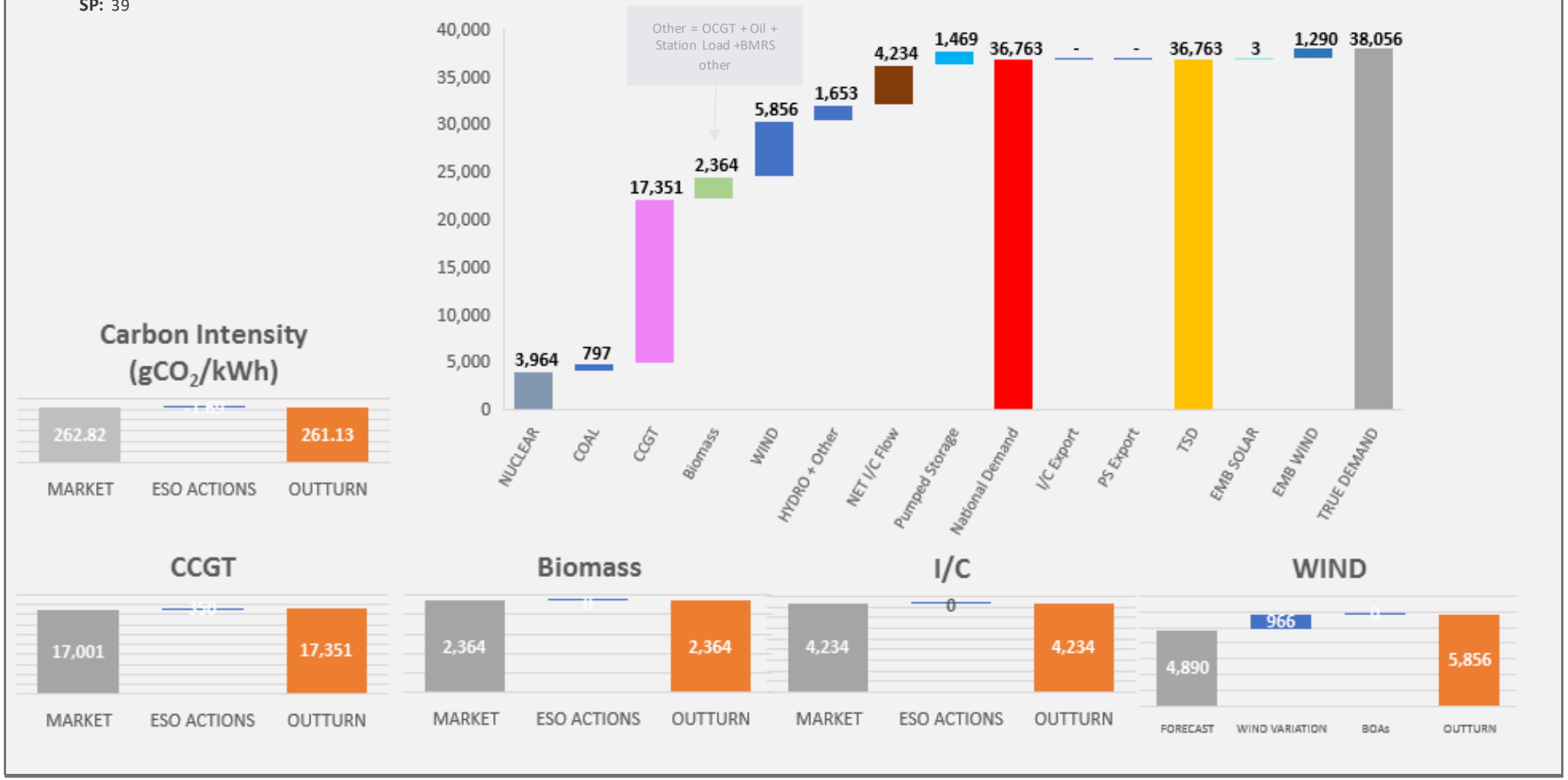
		FORECAST (Wed 13
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
13 Oct	Evening Peak	37.0	1.4
14 Oct	Overnight Min	19.4	1.9
14 Oct	Evening Peak	35.6	2.5
15 Oct	Overnight Min	19.9	1.7
15 Oct	Evening Peak	37.0	0.4
16 Oct	Overnight Min	20.7	0.5
16 Oct	Evening Peak	33.5	1.3
17 Oct	Overnight Min	18.5	1.6
17 Oct	Evening Peak	33.9	1.5
18 Oct	Overnight Min	19.4	1.4
18 Oct	Evening Peak	36.0	2.6
19 Oct	Overnight Min	18.7	2.8
19 Oct	Evening Peak	35.3	3.2

ESO Actions | Wednesday 06 October Peak

Date: 06/10/2021

SP: 39

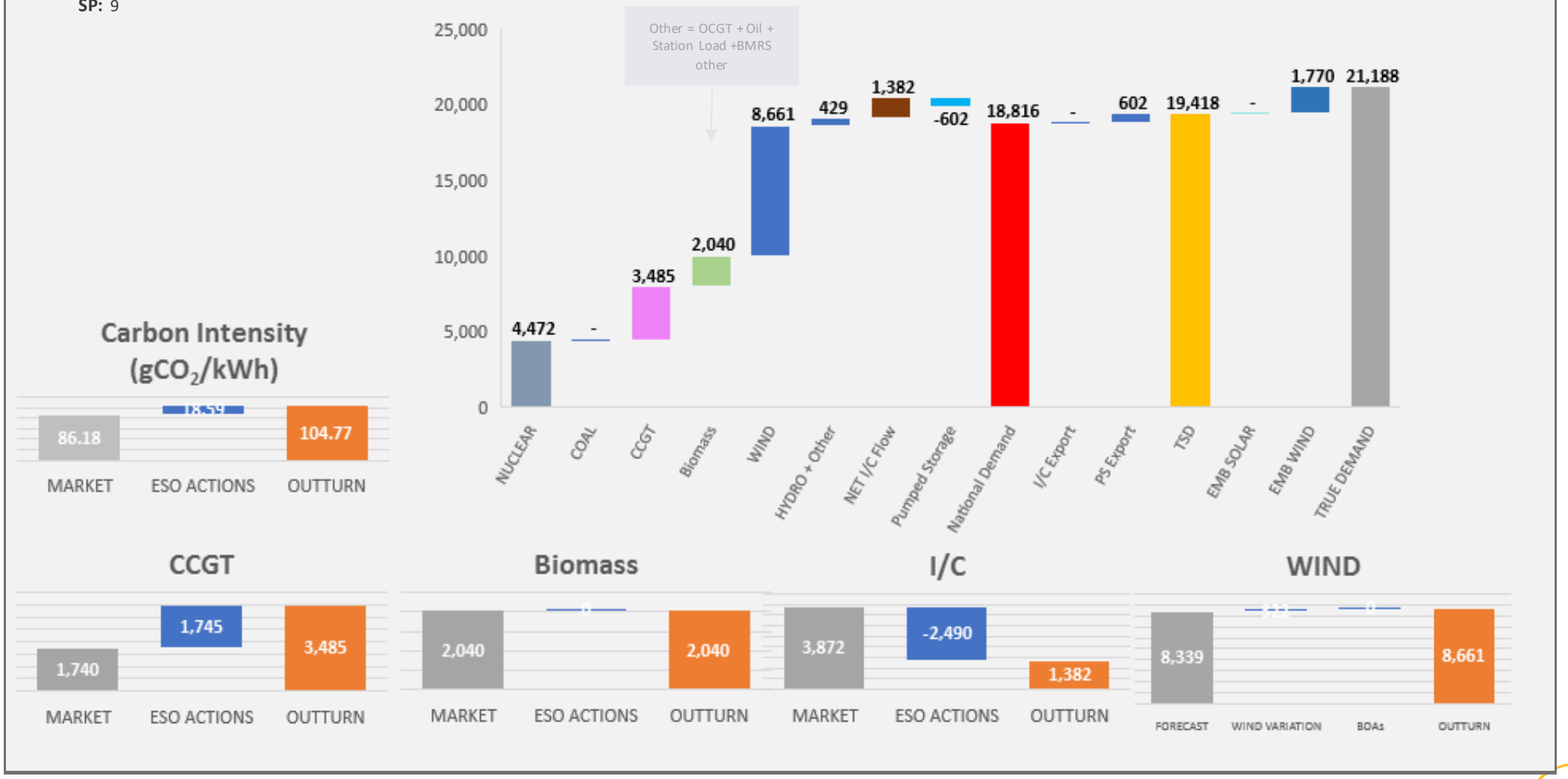


Carbon Intensity data on data portal: https://data.nationalgrideso.com/carbon-intensity1/carbon-intensity-of-balancing-actions

ESO Actions | Monday 04 October Minimum

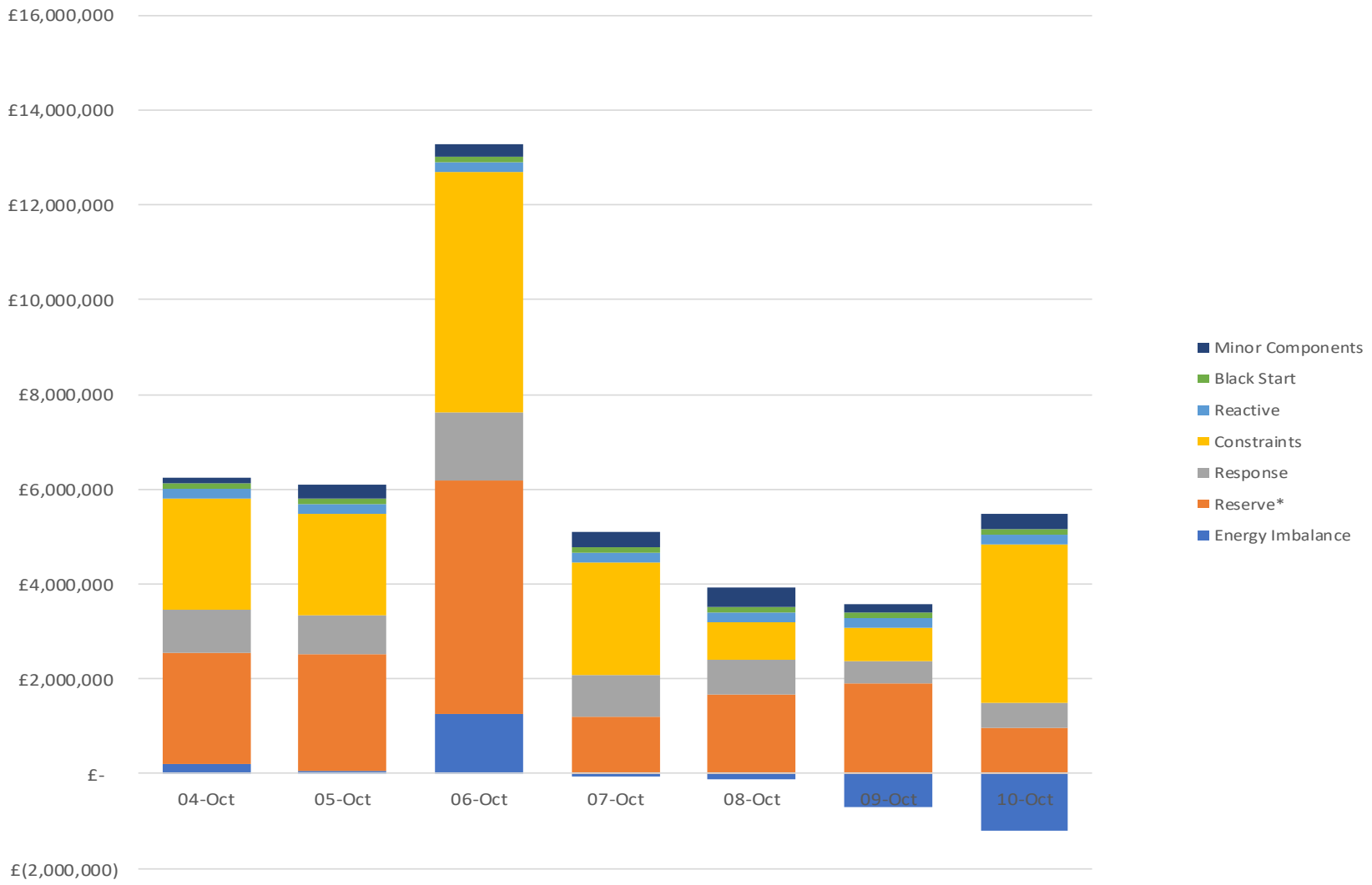
Date: 04/10/2021

SP: 9



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

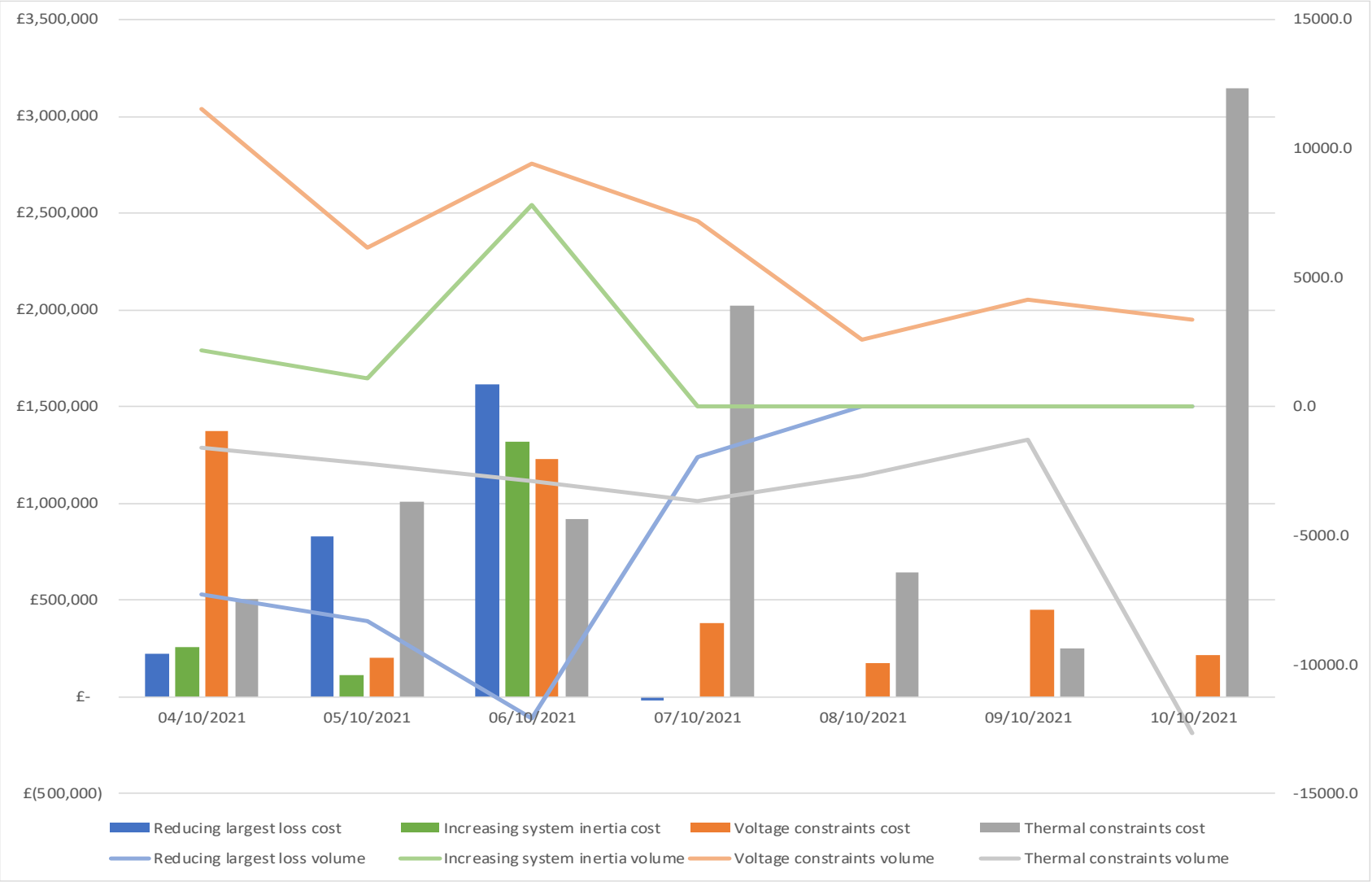
Transparency | Costs for the last week



Constraints

Wednesday 6th October was the highest cost day with high winds overnight falling through the day. The high wind levels led to increased constraint costs overnight to maintain Inertia and Voltage support whilst the uncertainty around the change in wind levels led to increased costs for Reserve and Response.

Transparency | Constraint cost breakdown



Thermal
Actions required throughout the week to manage thermal constraints, particularly in Scotland.

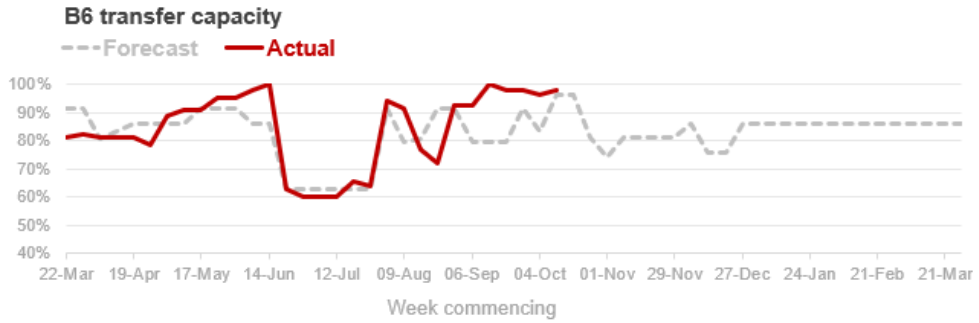
Voltage
Some action required to synchronise generation to meet our voltage requirements throughout the week

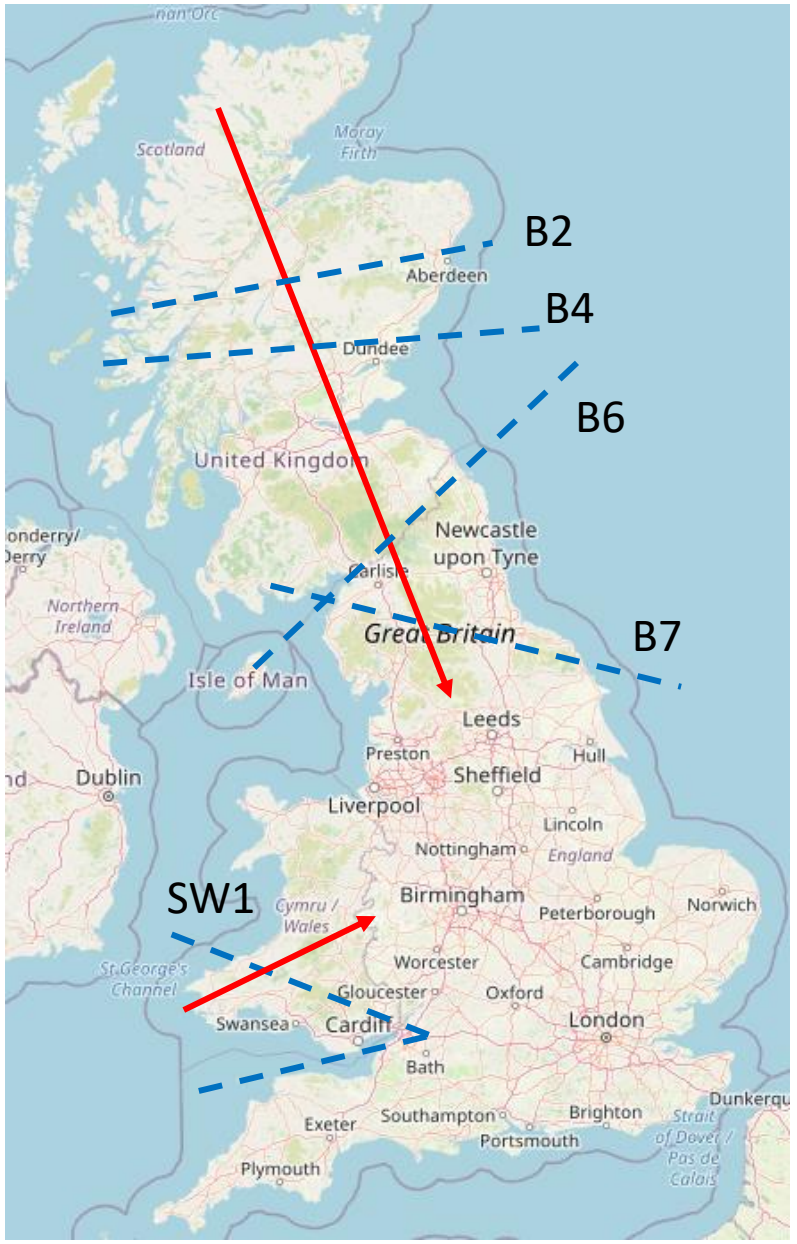
Managing largest loss for RoCoF
Action required to manage largest loss on interconnectors in the early part of the week. Varies due to varied inertia levels on the system and interconnector flows.

Increasing inertia
Intervention required to increase minimum inertia level early in the week with high wind levels displacing conventional generation.

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

Transparency | Constraint Capacity





July 2021

Future Energy Scenarios

Transport

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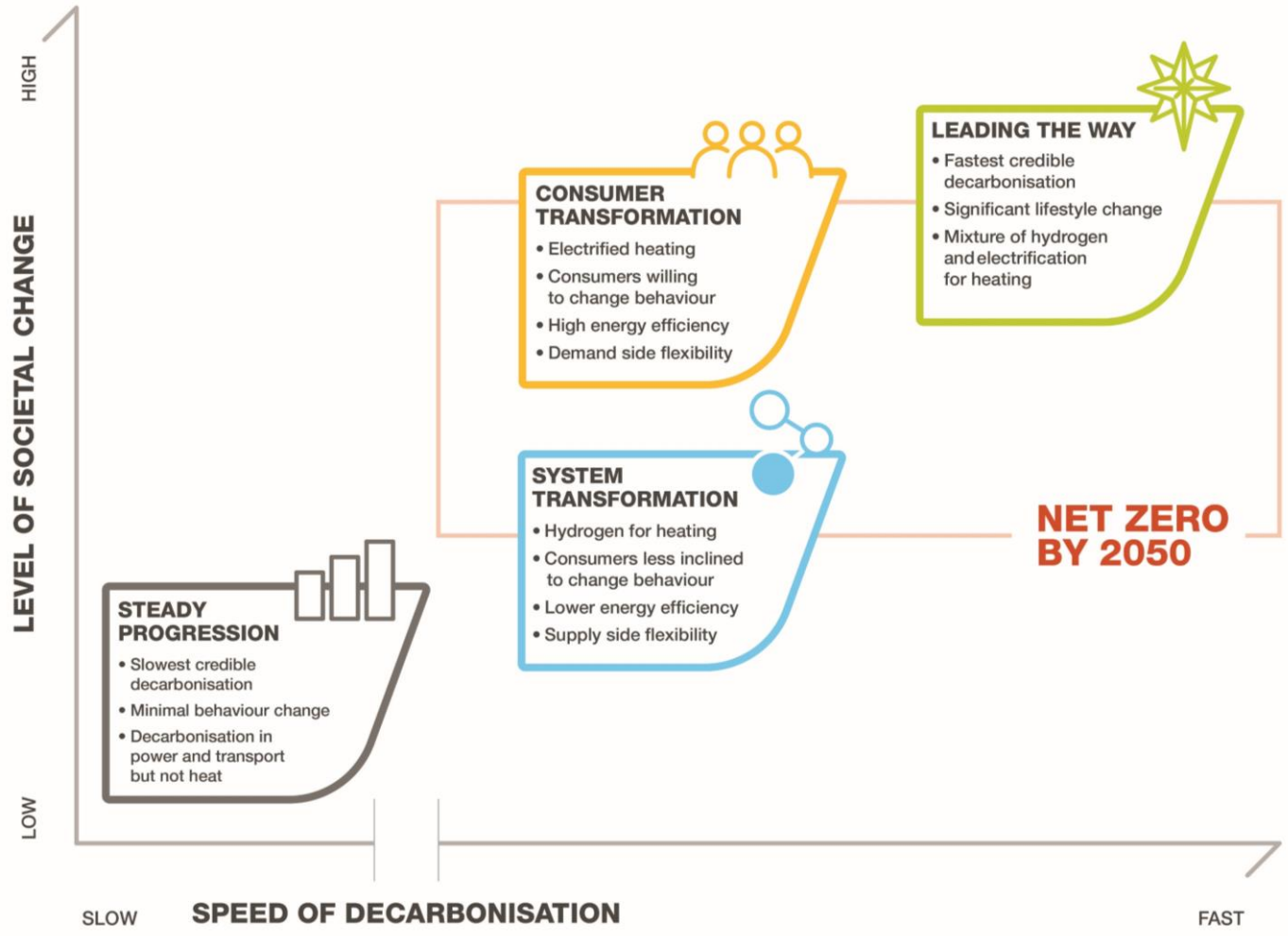
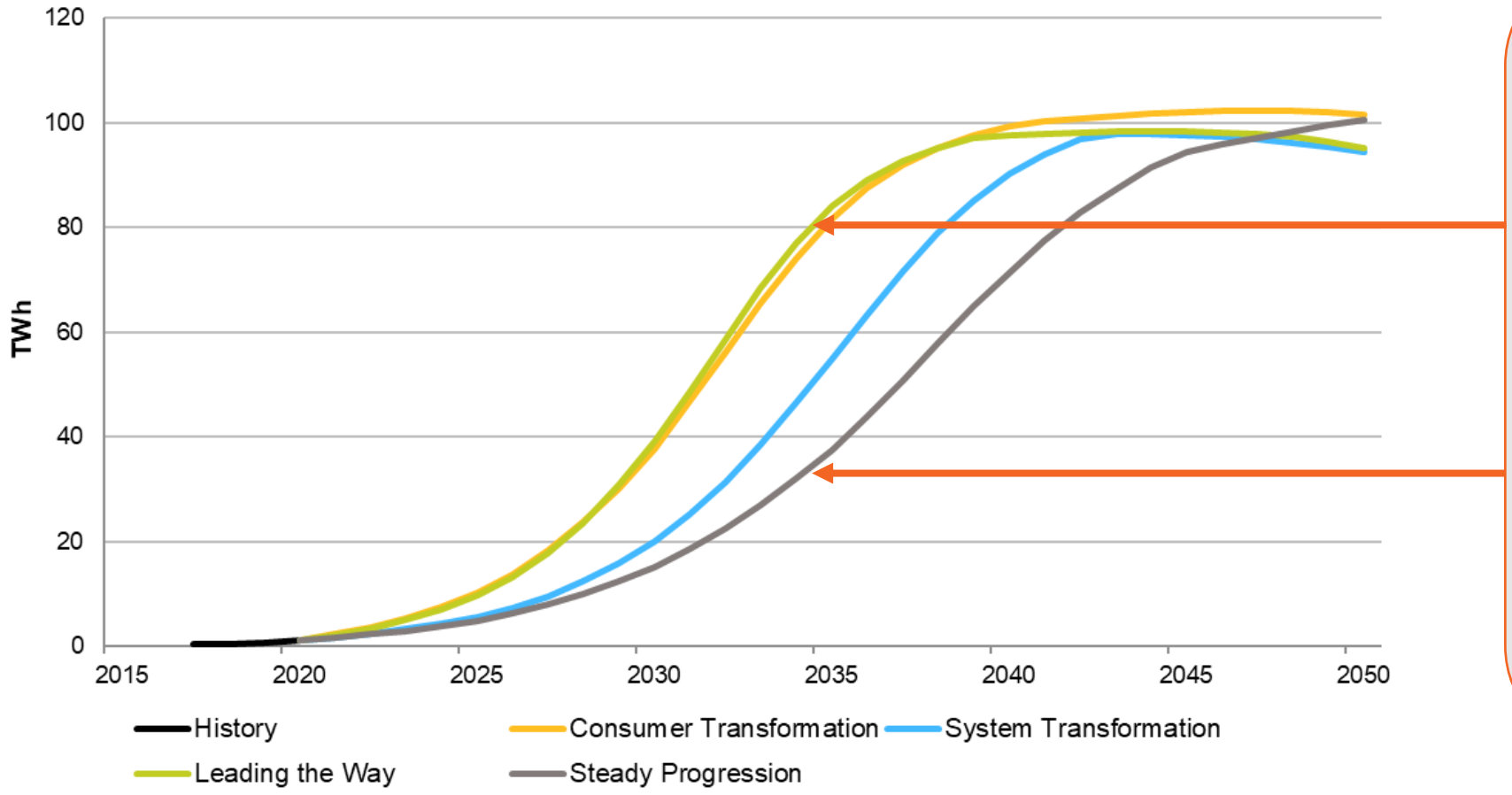
FES 2021 scenario overview



FES scenarios cover a wide range of uncertainty

Energy demand and vehicle efficiency

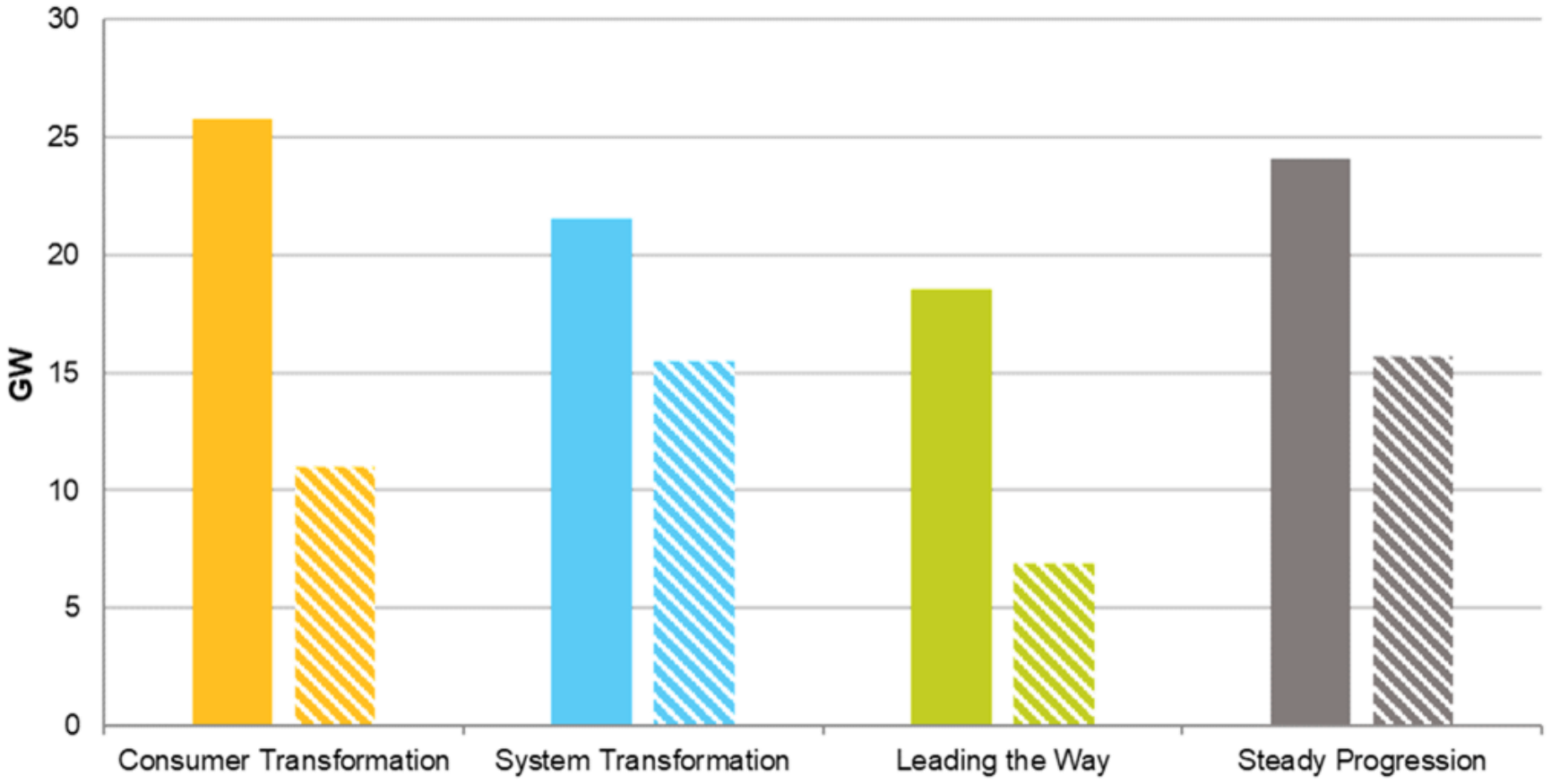
Electric vehicle annual demand

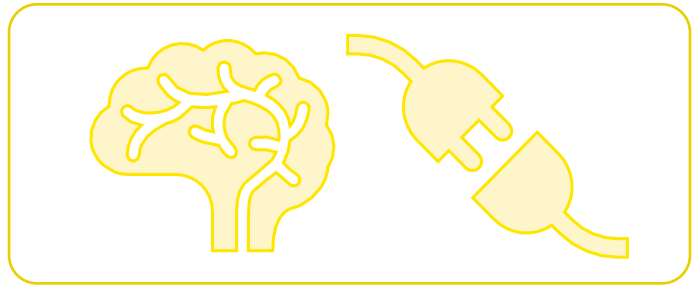


2035: Between 35TWh and 80TWh

Flexibility and engagement in smart charging

Demand from electric vehicles at winter peak in 2050

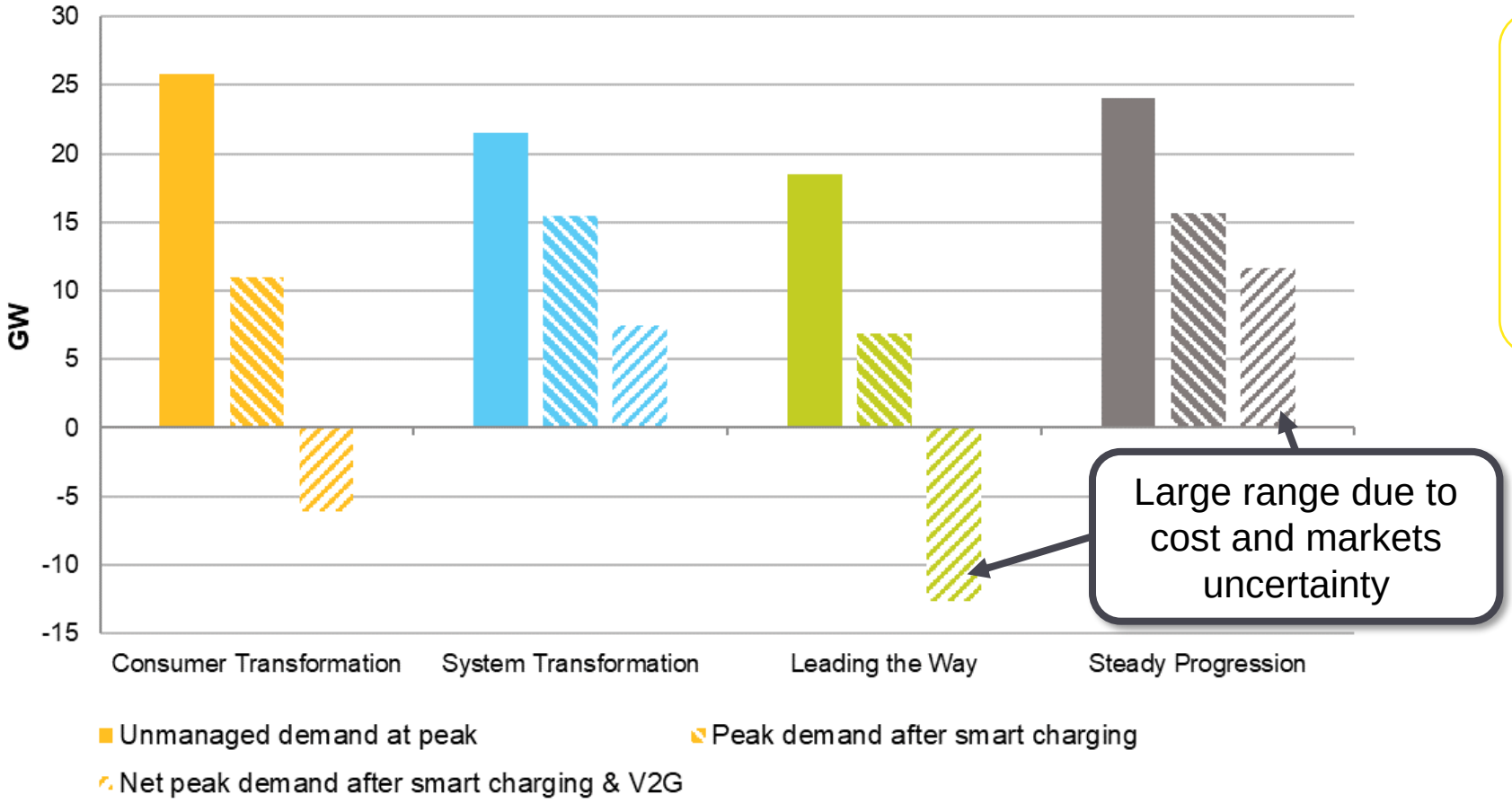


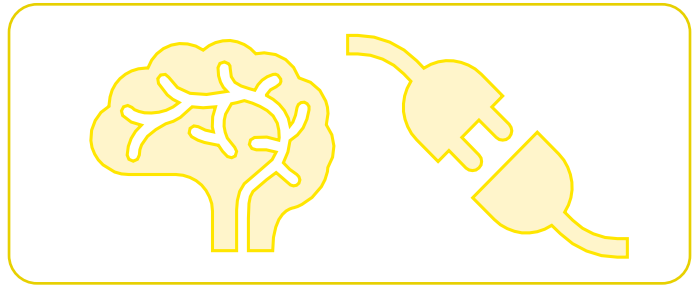


Peak Demand – Smart charging.
60% of electric vehicle demand at peak could shaved by smart charging

Flexibility and engagement in smart charging

Demand from electric vehicles at winter peak in 2050





Peak Demand – Smart charging.
60% of electric vehicle demand at peak could shaved by smart charging

Managing peak demand uncertainty

Many issues to consider within our modelling for peak demand

- Aggregation to GSP/GB level
- Smart charging – Time of Use Tariffs, technology, behaviours
- Risk of just moving the peak, rather than reducing
- Interaction with ‘newly’ electrified heating demand
- Behaviour – grazers and guzzlers (frequency and duration of charging)
- Battery size (frequency and duration of charging)

- Risk is exacerbated at distribution level, hence working collectively

Progress

- Whole system approach to planning – across fuels and networks
- Assessing operational tools
- Behavioural analysis

Managing peak demand uncertainty

Swarming, herding, hunting, and hacking.

Swarming: participants clustering around a signal that just exists (rather than being created for them), like a wholesale price

Herding: participants clustering around a signal that an industry actor created to make them cluster (i.e. the industry actor is the herder), e.g. if a supplier took a position in a market and then tried to back it up by changing the behaviour of some Evs

Hunting: participants chasing a signal, but their chasing it has a big enough effect to cause the signal to move, so they chase the new signal, creating feedback loops and oscillations

Hacking: someone compromises the system and sends deliberately disruptive signals, getting thousands of EVs to all do the opposite of what the system needs

October 2021

Winter Outlook Report

Helping to inform the electricity industry and prepare for the winter ahead

nationalgridESO

Context / Changes to this year's Winter Outlook

- We publish a Winter Outlook Report every year, setting out our view of electricity supply and demand for the winter ahead. We will be providing regular updates at the ESO Operational Transparency Forum.

- This year we've made a number of changes:

  - Report on the daily possibility of tight margin conditions.

  - Credible ranges for the operational margin on a daily basis around the average value.

  - Likelihood of Electricity Margin Notices (EMNs).

  - More detail on "Winter view" and "Operational surplus"

Executive summary / Key messages

Security of supply

System margins remain within the Reliability Standard.

Electricity Margin Notices (EMNs)

It is likely that we will issue margin notices during the winter for market participants to respond to.

These are normal operational tools used to highlight when margins are looking tight ahead of real time and don't indicate that demand will not be met.

Operability

Operability requirements (e.g. voltage and frequency management) remain complex as we move into the winter period.

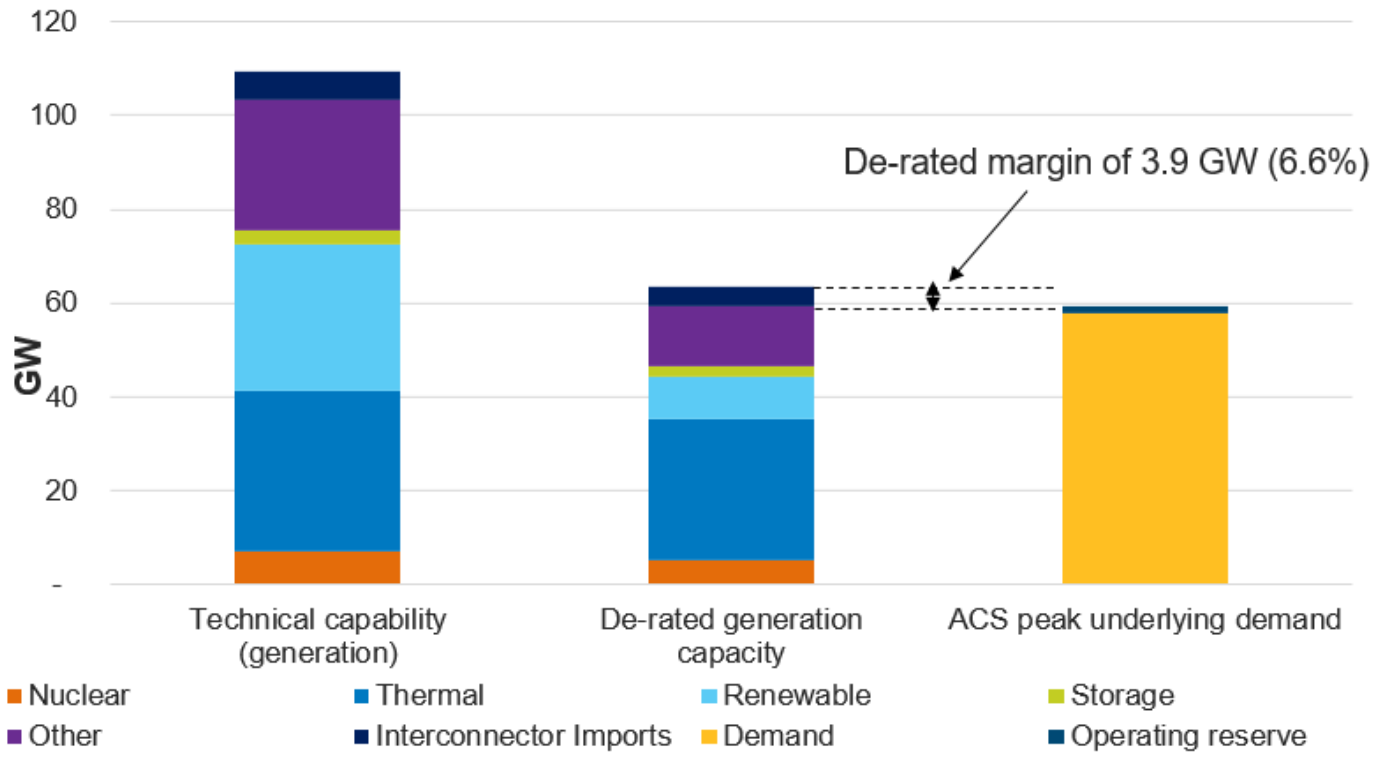
We have existing tools and services to manage anticipated operability challenges across the winter period.

Market Prices

Any tight margin days could see significant price spikes in the Balancing Mechanism. In addition, forward prices are high due to external pressures such as high gas prices.

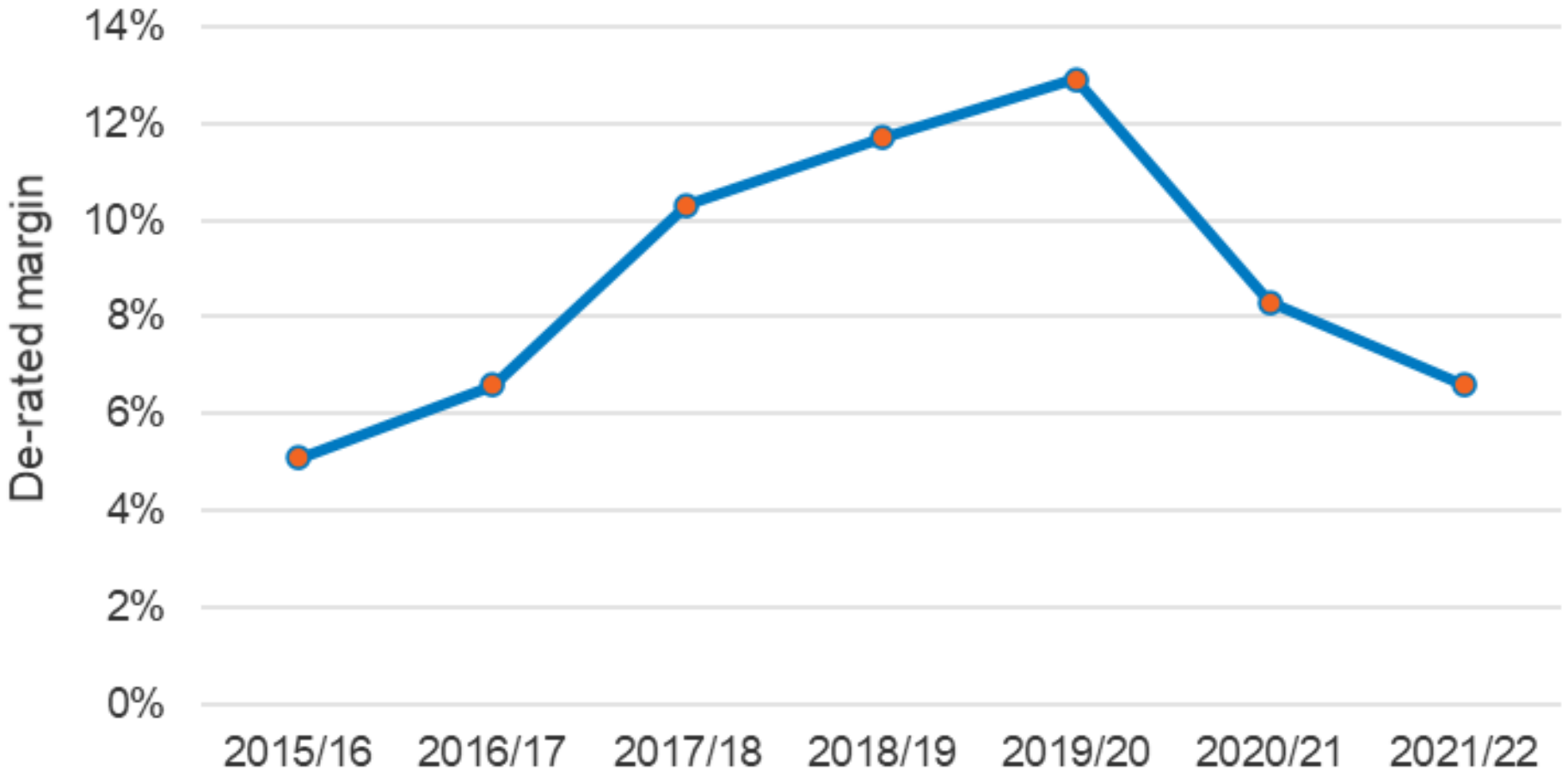
This will increase balancing costs even if the volume of system actions remains consistent with previous winters.

System margins / Winter view



- de-rated margin of 3.9 GW (6.6%) lower than last year but higher than in some recent years
- results in increased base case Loss of Load Expectation (LOLE), although still within Reliability Standard
- This remains the case even in our low case sensitivity, where the de-rated margin is reduced by a further 1.4 GW from the base case

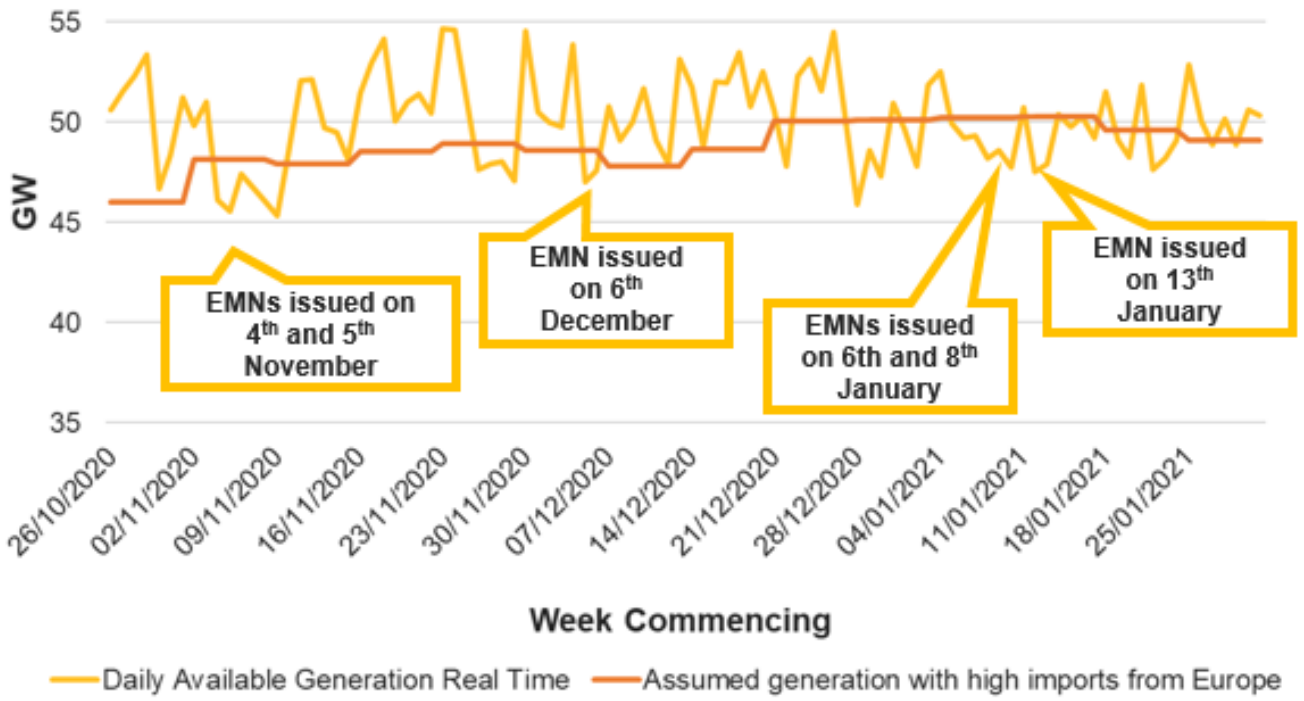
System margins / Winter view



While the de-rated margin this year is slightly lower than last year, it is still higher than the corresponding margin seen in 2015/16 and is the same as in 2016/17.

System margins / Margin notices

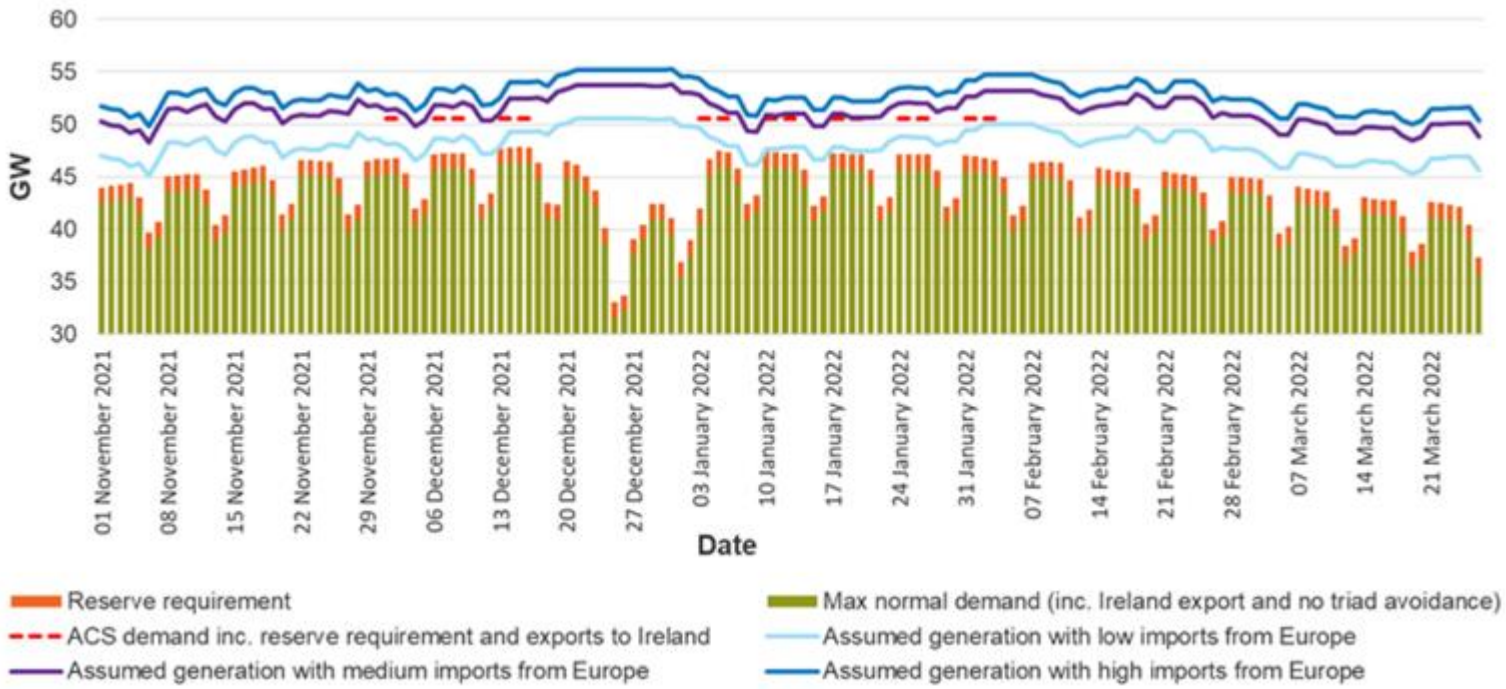
Margin notices are used as a normal operational tool to highlight when margins are looking tight ahead of real-time – they don't indicate that demand will not be met.



- **Electricity Margin Notices (EMNs) based on operational margins which are calculated from transmission system demand and transmission system capacity**
- **Capacity Market Notices (CMNs) based on Capacity Market margins which are calculated from whole system demand and whole system capacity**

Last winter 6 EMNs and 2 CMNs were issued; all were cancelled before real-time as the market responded.

System margins / Operational surplus



Based on stakeholder feedback, this year we produced a more granular view of operational surplus (daily rather than weekly)

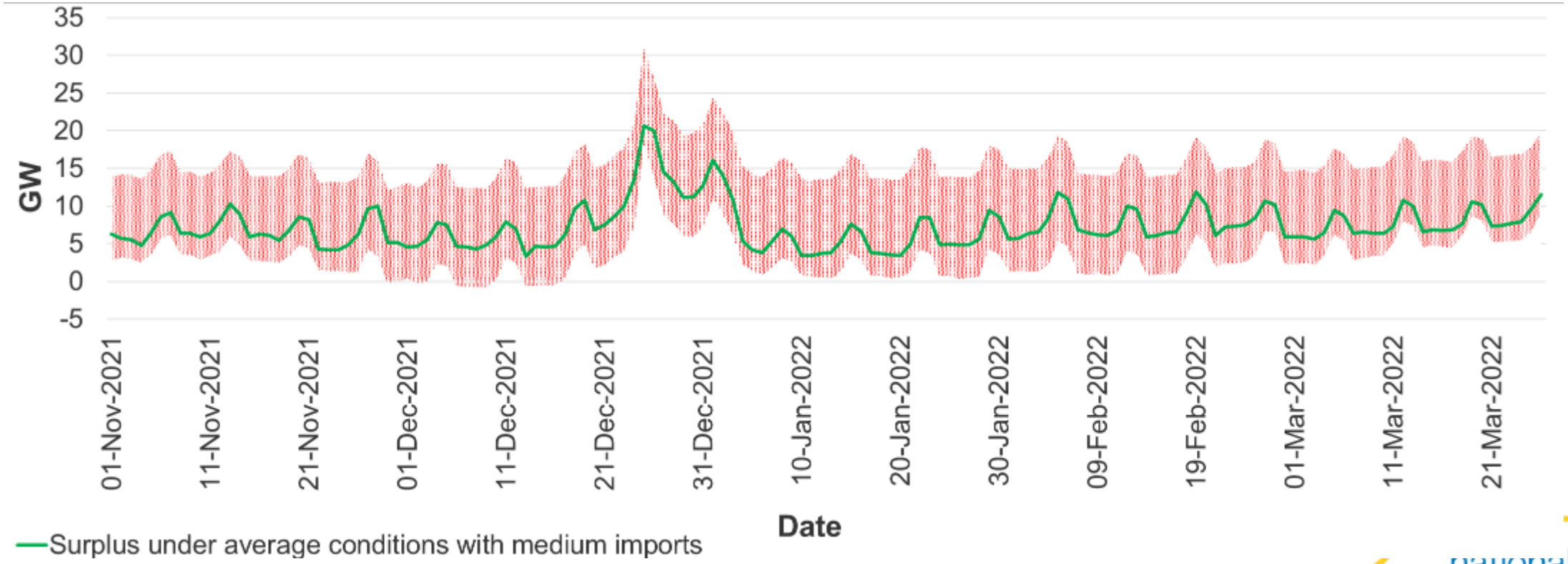
- **sufficient operational surplus for each week of winter 2021/22**

Our operational surplus represents a day-by-day view of the market's current intentions based on market submissions before we take actions. It is a dynamic view that changes throughout winter. We will be providing regular updates at the ESO Operational Transparency Forum.

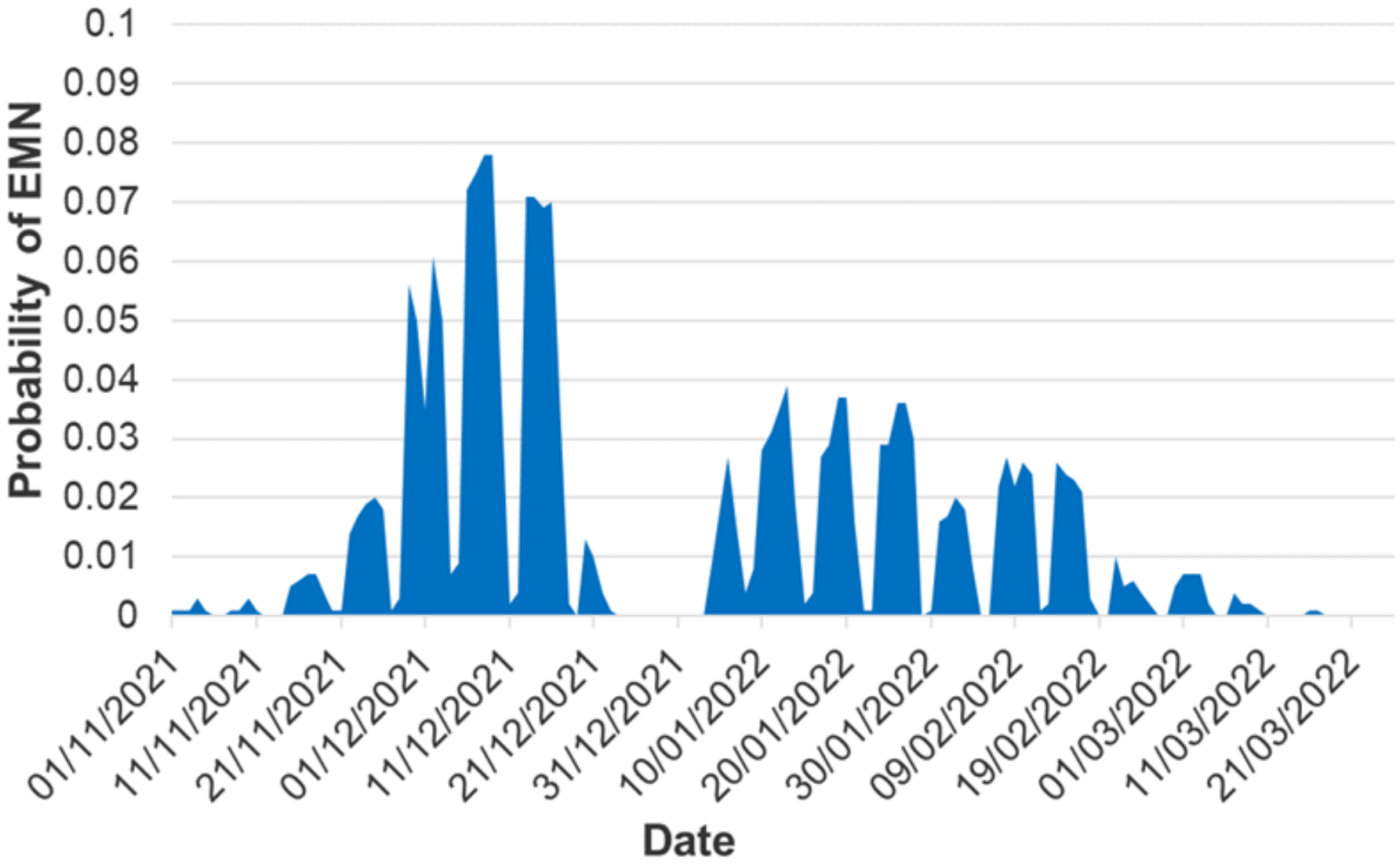
Operational Surplus / Credible range

This winter we expect…

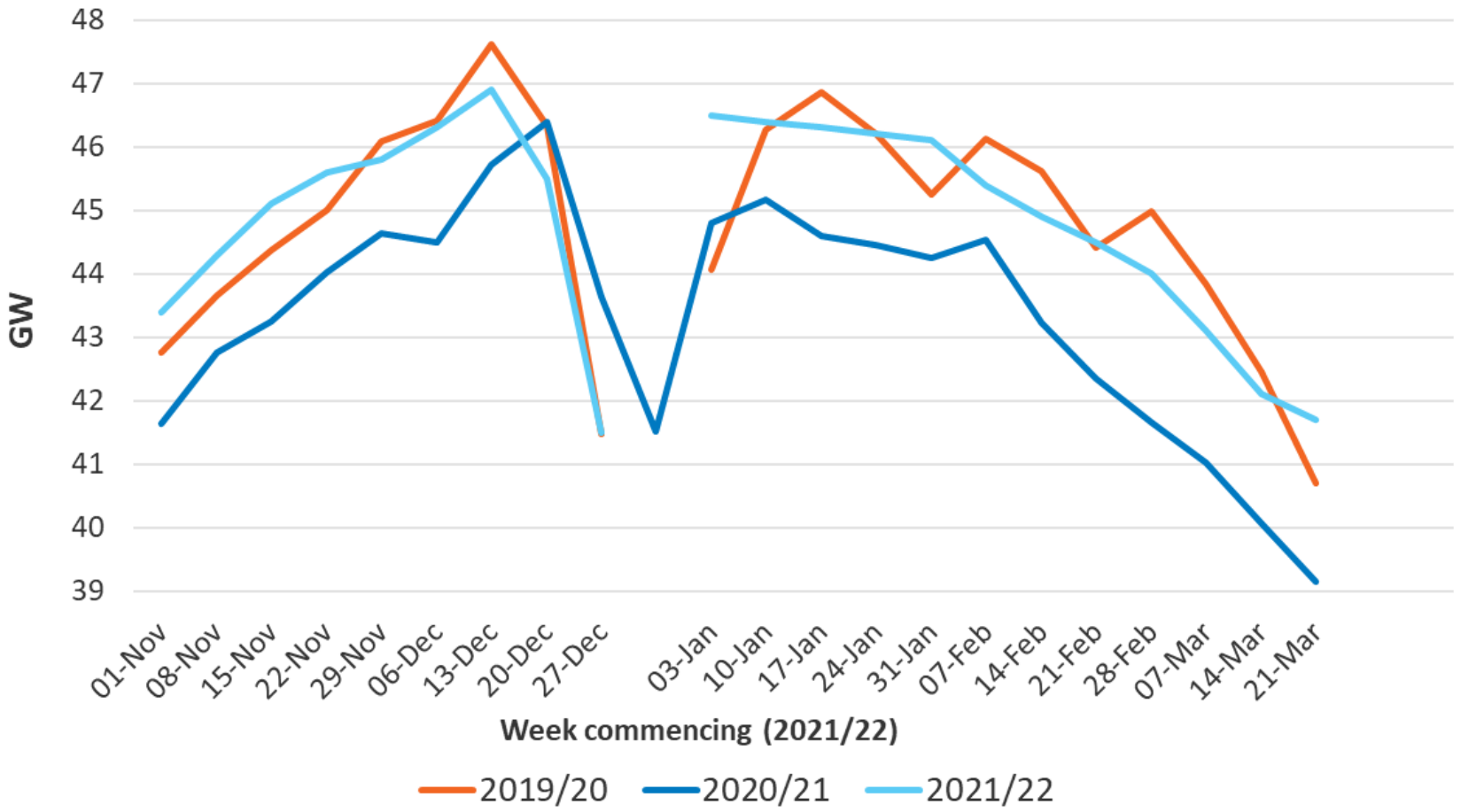
- **sufficient operational surplus throughout winter when routine tools such as margin notices are used**
- **tight margins throughout December to mid-January (excluding the Christmas period).**
- **to issue a broadly similar number of EMNs this winter as last winter (EMNs in winter 2020/21 = 6)**



Operational Surplus / Likelihood of EMNs over winter 2021/22



Demand / Normal peak demand

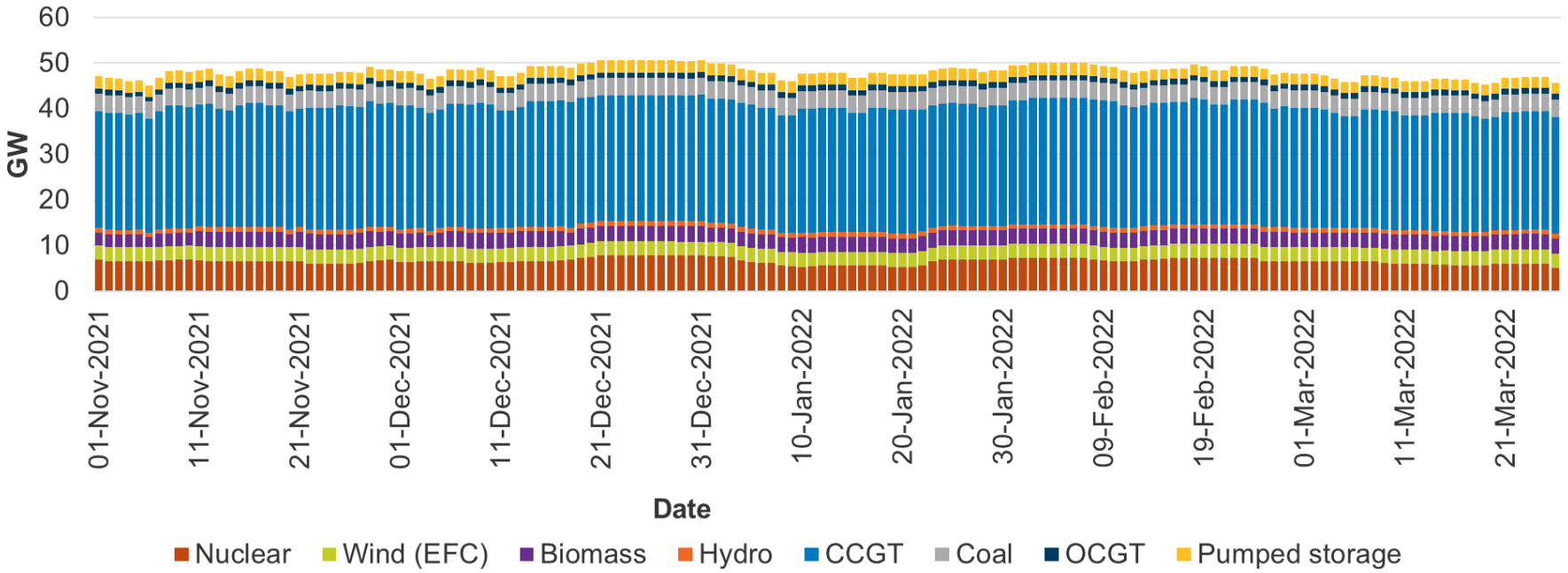


- **weather corrected peak transmission system demand (TSD) 46.9 GW**
- **weather corrected minimum demand 20.7 GW (assuming no interconnector exports overnight)**

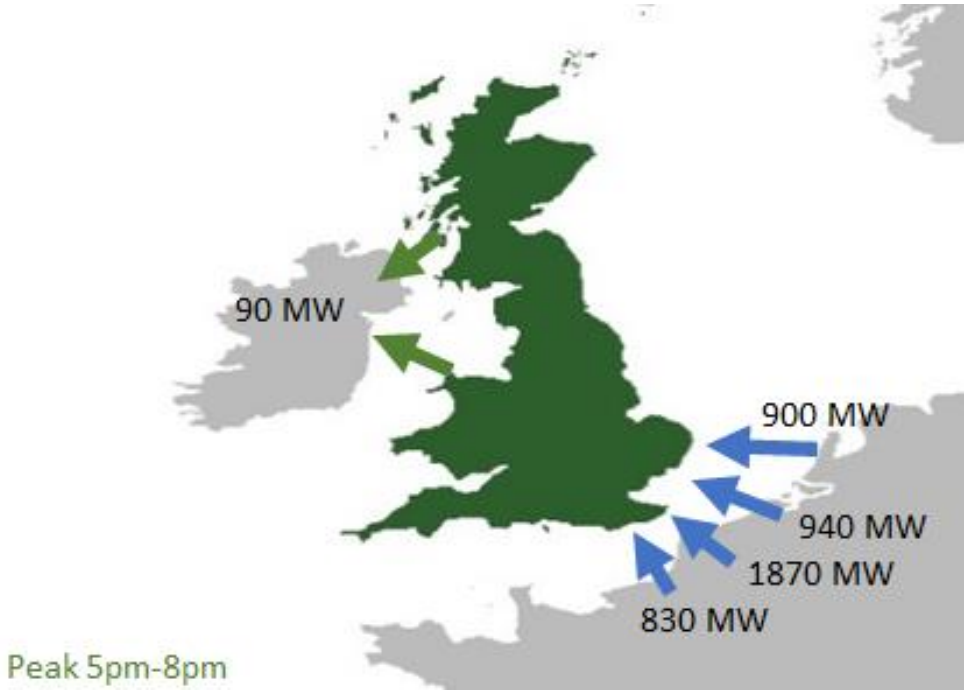
Supply / Daily view

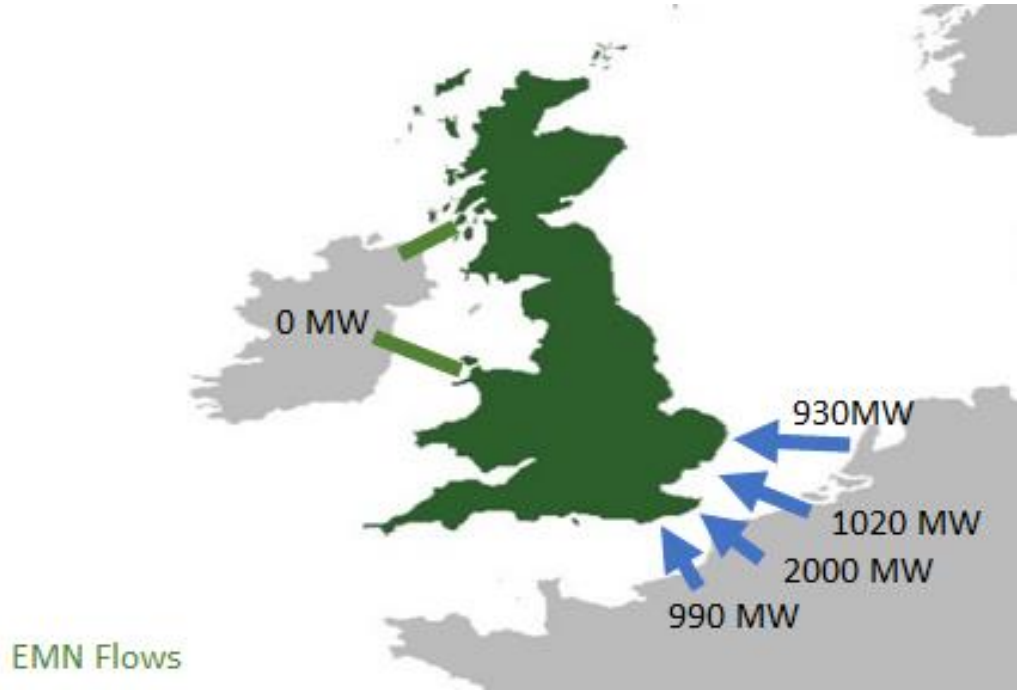
We currently expect sufficient levels of generation and interconnector imports to meet demand throughout the winter, with:

- **slightly more available generator capacity than last year, largely due to more Combined Cycle Gas Turbine (CCGT) and biomass plant being available.**
- **generator reliability to be broadly in line with recent winters**
- **remaining coal-fired generation to potentially run more frequently due to price effects (but for overall levels of coal generation to remain low due to continued reductions in capacity levels).**



Europe and interconnected markets / Overview





Historical flows on the interconnectors for winter 2020/21

Net imports of electricity through interconnectors from continental Europe to GB expected for most of the winter.

Typically, exports of electricity from GB to Northern Ireland and Ireland expected during peak times, but less than we have seen in previous years.

Operability

We have existing tools and services to manage anticipated challenges across our five core areas to maintain operability of the network:

Thermal

- We will continue to work with the TOs to manage access alongside the operability of the network during winter. Transmission capacity across most boundaries are expected to be unrestricted however the B7 boundary may be impacted in high wind conditions.

Voltage

- Managing reactive power and hence voltage levels continues to be challenging during low demand periods, which typically occur overnight at weekends, and at Christmas as the lowest demand period during winter. We will continually monitor our requirements and implement solutions if further action is needed to meet these requirements.

Frequency and Stability

- We're continuing to work with the industry around fault ride-through and Grid Code and STC requirements.
- The implementation of FRCR Policy, delivery of ALOMCP and Dynamic Containment will reduce the scale of intervention the ESO must take in market dispatch through trades and Balancing Mechanism actions to manage the frequency and stability of the system during winter.

Restoration

- Availability of Restoration services is good over winter and will be continuously monitored and actions will be taken if required.


Thanks for
listening

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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