

ESO Operational Transparency Forum

27th Oct 2021

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

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

Carbon Intensity Calculations
Powerloop Project Update

Questions outstanding from last week

Q: Is it possible to download an excel/csv of the constraint capacity information from the portal? There is not a link on the slide similar to the constraint costs breakdown.

A: We don't publish the constraint capacity limits <https://data.nationalgrideso.com/search?q=day+ahead+constraint+limits>

Q: Why was NSL showing as 700MW in OC2 for the next 3 years for a number of days last week

A: (PMC) - NSL tripped on Saturday evening, Oct 16th (20:27) whilst carrying 700MW import due to a problem with Pole 1. It returned in monopolar mode on Pole 2 at midnight. The physical capacity was capped @ 700MW to reflect the Pole 1 fault. Pole 1 has subsequently returned to service.

Q: The daily balancing costs reports for the 10th, 14th and 16th are missing from your website. Can they be uploaded please?

A: **Thank you for this – these have now been uploaded and should be available.**

Q: In the October BSUoS forecast, costs for September are £261m compared to £306m in the II data as of October 11. What accounts for the circa £44m difference?

A: The II BSUoS data always contains a forecast element due to the time lag in which some of the cost data is received. The SF data for September has now been published and is much closer to the number in the BSUoS Forecast report. Please note there will always be some difference in the figures due to the time at which the data is captured.

Q: Regards winter margins, should battery margin effectively be zero considering the low duration of energy and the likelihood they will all be contracted into frequency services? The Nov ffr results would imply you will be several hundred mw below your margin estimate already

A: In assessment of margins for winter we use REMIT data as our source of generation availability. No battery units are included in this data, so effectively we are setting battery contribution at zero.

Questions outstanding from last week

Q: How do returning assets (from outages) get treated when you calculate DRM? Are generic long term average de-rating factors used, or do you take a more bespoke (realistic short term) view to account for lower start up reliability?

A: In our short-term processes we use fuel-type specific de-rating factors based on long-term data, based on lead time, and do not explicitly make allowance for units returning. Possible risks associated with difficulties in returning after outage are dealt with in the Control Room by making engineering adjustments based on Control Engineer's knowledge of characteristics of individual units. However, in the credible range analysis presented here, we are not using derating factors. Instead, we are using (long-term) breakdown rates and repair/recovery rates to simulate potential patterns of total availability.

Q: Do SO-SO trades with EirGrid/SONI affect the system balance in GB?

A: European Network Code Emergency & Restoration Article 14 states "Upon request from a TSO in emergency state, each TSO shall provide through interconnectors any possible assistance to the requesting TSO, provided this does not cause its transmission system or the interconnected transmission systems to enter into emergency or blackout state." So, this does impact the system balance – but my understanding is that following reconciliation the GB balancing costs are adjusted to reflect the total cost of operating the system (so less the SO Trade info as this is funded from the receiving SO)

Q: Why only use REMIT - what is the point of paying CM plant if all the smaller plants do not count towards margin?

A: The planning view of margins that is presented in the Winter Outlook report does use Capacity Market plant, and reports on the final margin position once Capacity Market units are taken into account. The view presented here is the operational view, designed to inform us about what the situation looks like before the ENCC take any actions to increase generation over what the market is providing, and before and Capacity Market notices are triggered. This gives us insight into how the winter will feel from an operational viewpoint.

5 x questions not answered – we will be getting back at a later date

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.

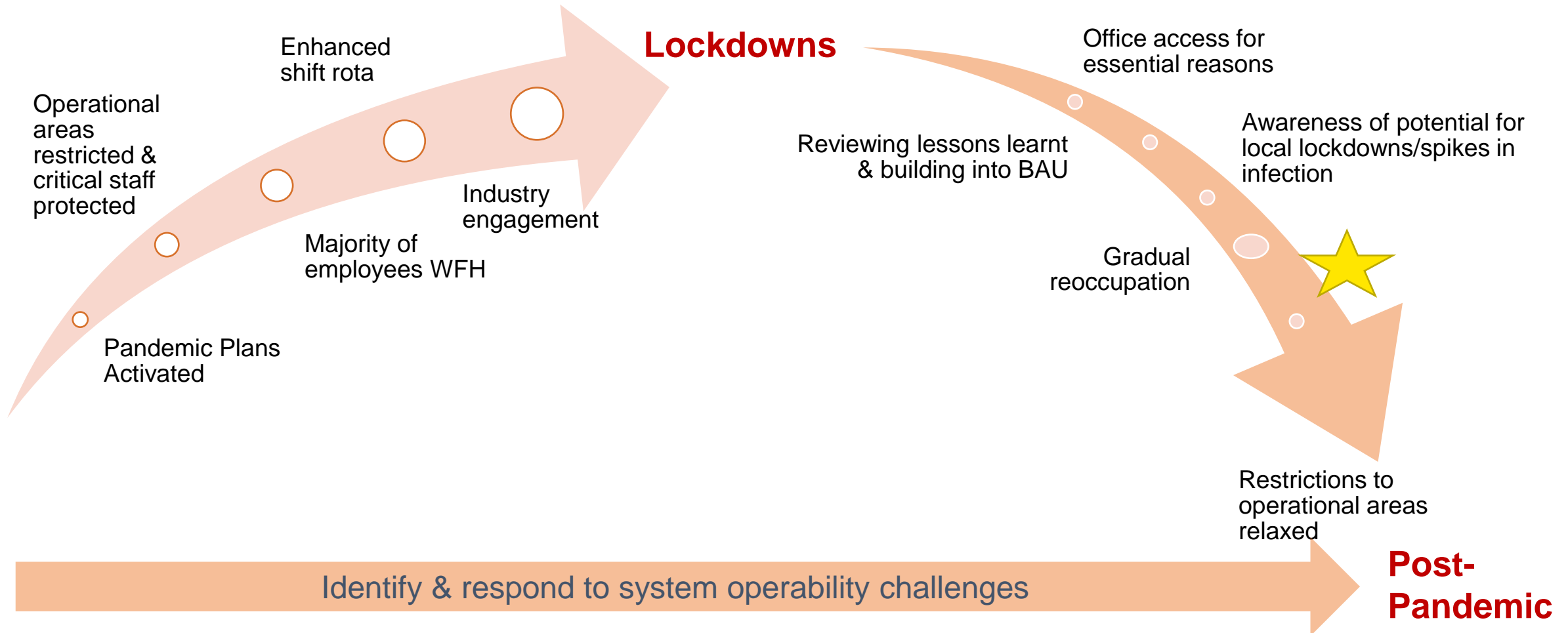
We have the following deep dives planned:

3rd Nov

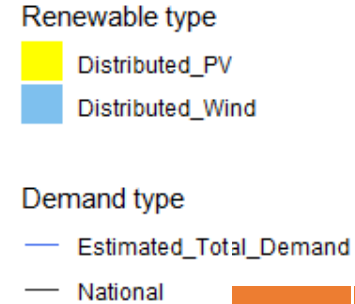
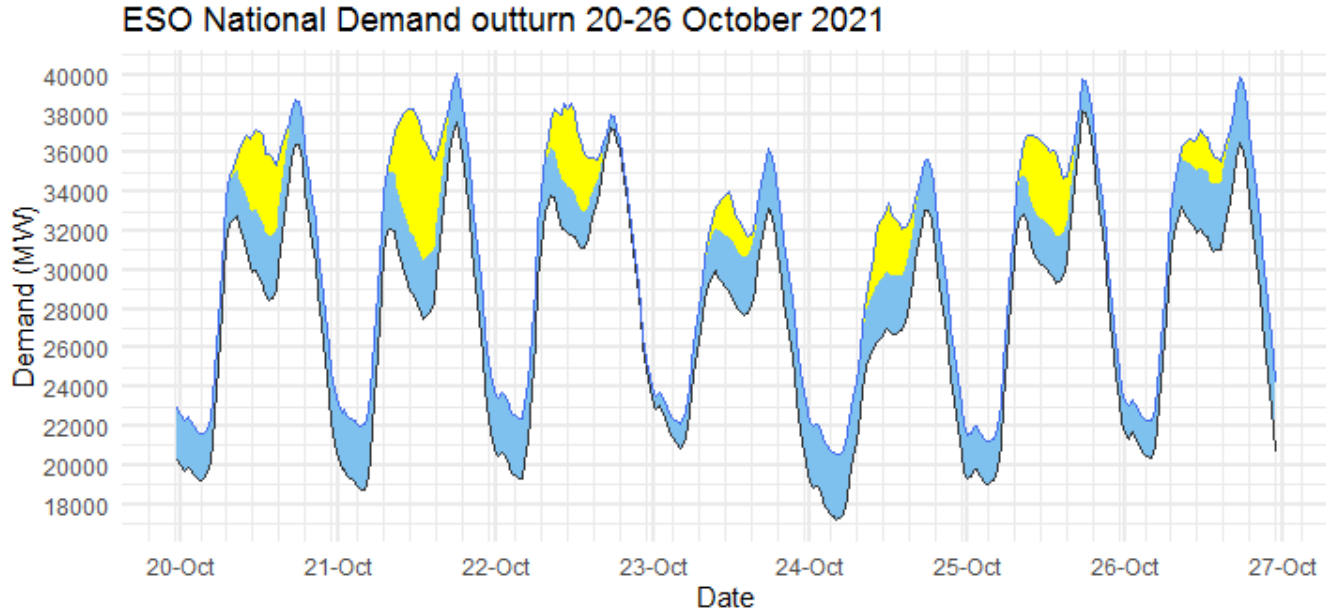
Digitised Whole System Technical Code

Scotland Voltage Oscillations

Protecting critical staff to maintain critical operations



Demand | Last 7 days outturn

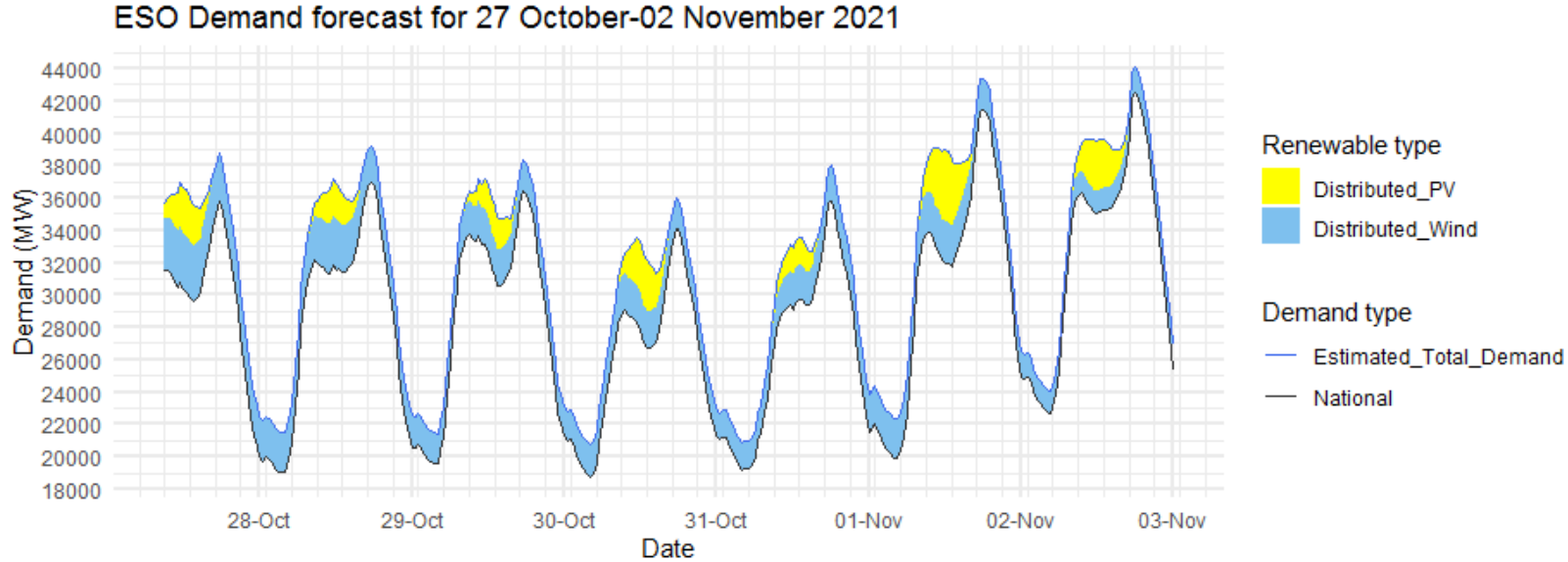


The black line (National Demand) is the measure of portion of total GB customer demand that is supplied by the transmission network.

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 20)		OUTTURN	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)	National Demand (GW)	Dist. wind (GW)
20 Oct	Evening Peak	37.3	2.2	36.5	2.3
21 Oct	Overnight Min	18.4	3.4	18.7	3.3
21 Oct	Evening Peak	38.5	2.8	37.6	2.5
22 Oct	Overnight Min	19.9	3.1	19.3	3.1
22 Oct	Evening Peak	37.8	1.3	37.2	0.7
23 Oct	Overnight Min	20.8	1.4	20.9	1.2
23 Oct	Evening Peak	32.9	3.2	33.2	3.0
24 Oct	Overnight Min	17.8	2.9	17.2	3.3
24 Oct	Evening Peak	34.3	2.3	33.1	2.5
25 Oct	Overnight Min	19.3	2.3	19.1	2.2
25 Oct	Evening Peak	37.9	2.3	38.1	1.6
26 Oct	Overnight Min	20.4	2.4	20.4	1.9
26 Oct	Evening Peak	36.4	3.2	36.5	3.4

Demand | Week Ahead



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

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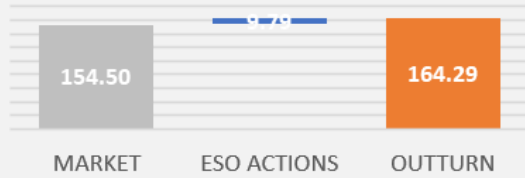
		FORECAST (Wed 27 Oct)	
Date	Forecasting Point	National Demand (GW)	Dist. wind (GW)
27 Oct	Evening Peak	35.8	3.0
28 Oct	Overnight Min	19.1	2.4
28 Oct	Evening Peak	37.0	2.2
29 Oct	Overnight Min	19.5	1.9
29 Oct	Evening Peak	36.5	1.9
30 Oct	Overnight Min	18.7	2.0
30 Oct	Evening Peak	34.1	1.8
31 Oct	Overnight Min	19.2	1.7
31 Oct	Evening Peak	35.8	2.2
01 Nov	Overnight Min	19.9	2.4
01 Nov	Evening Peak	41.4	2.0
02 Nov	Overnight Min	22.7	1.3
02 Nov	Evening Peak	42.5	1.5

ESO Actions | Thursday 21 October Peak

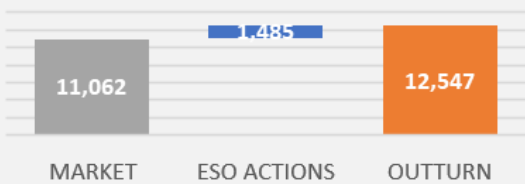
Date: 21/10/2021

SP: 38

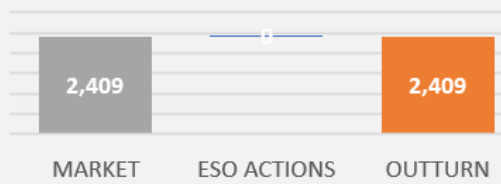
Carbon Intensity (gCO₂/kWh)



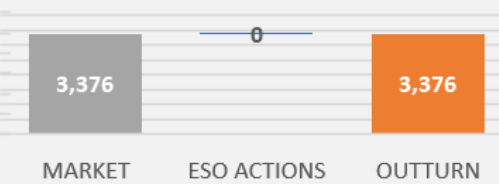
CCGT



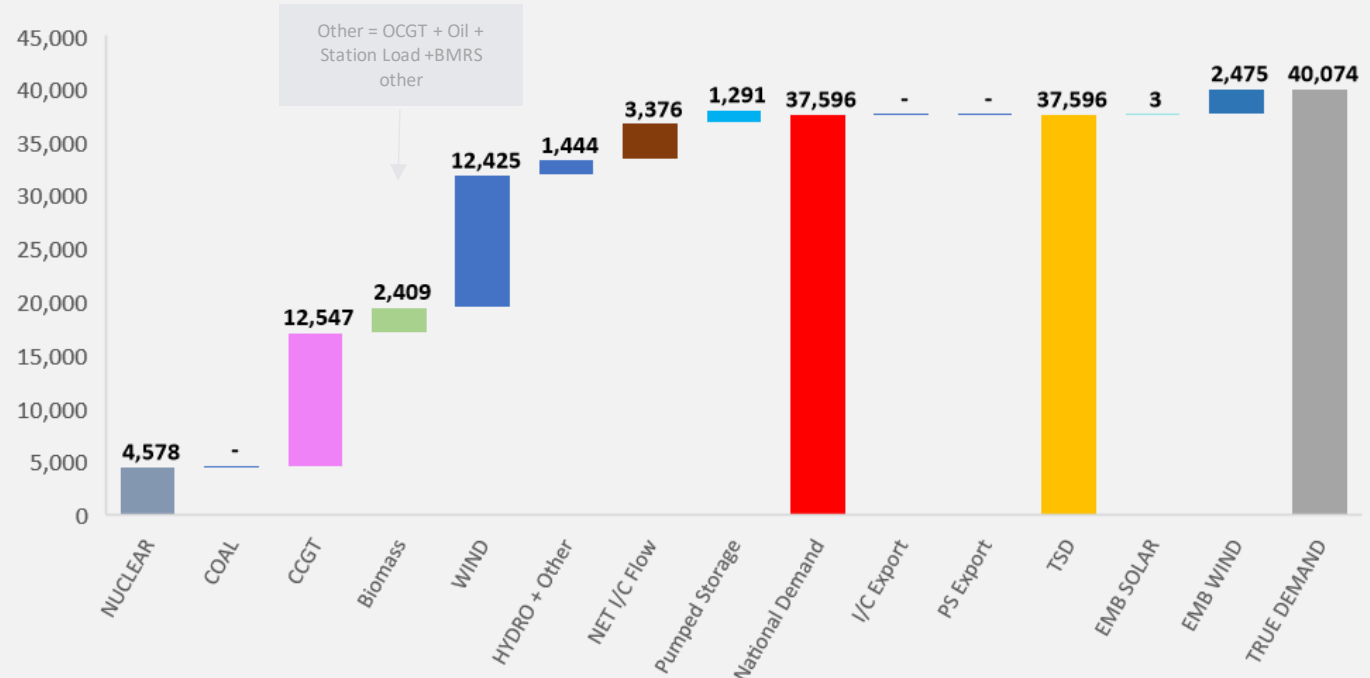
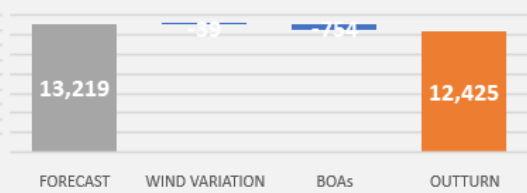
Biomass



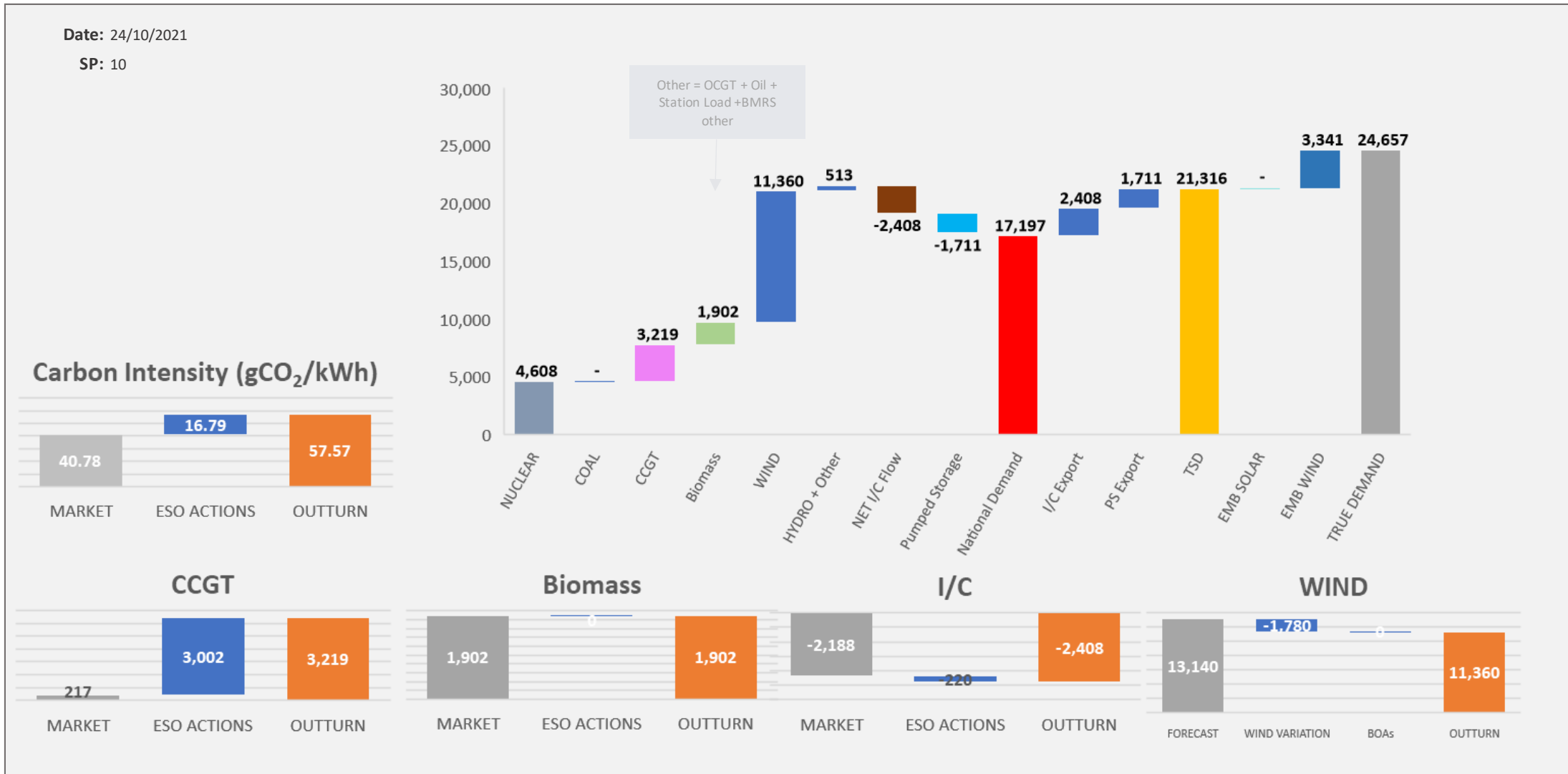
I/C



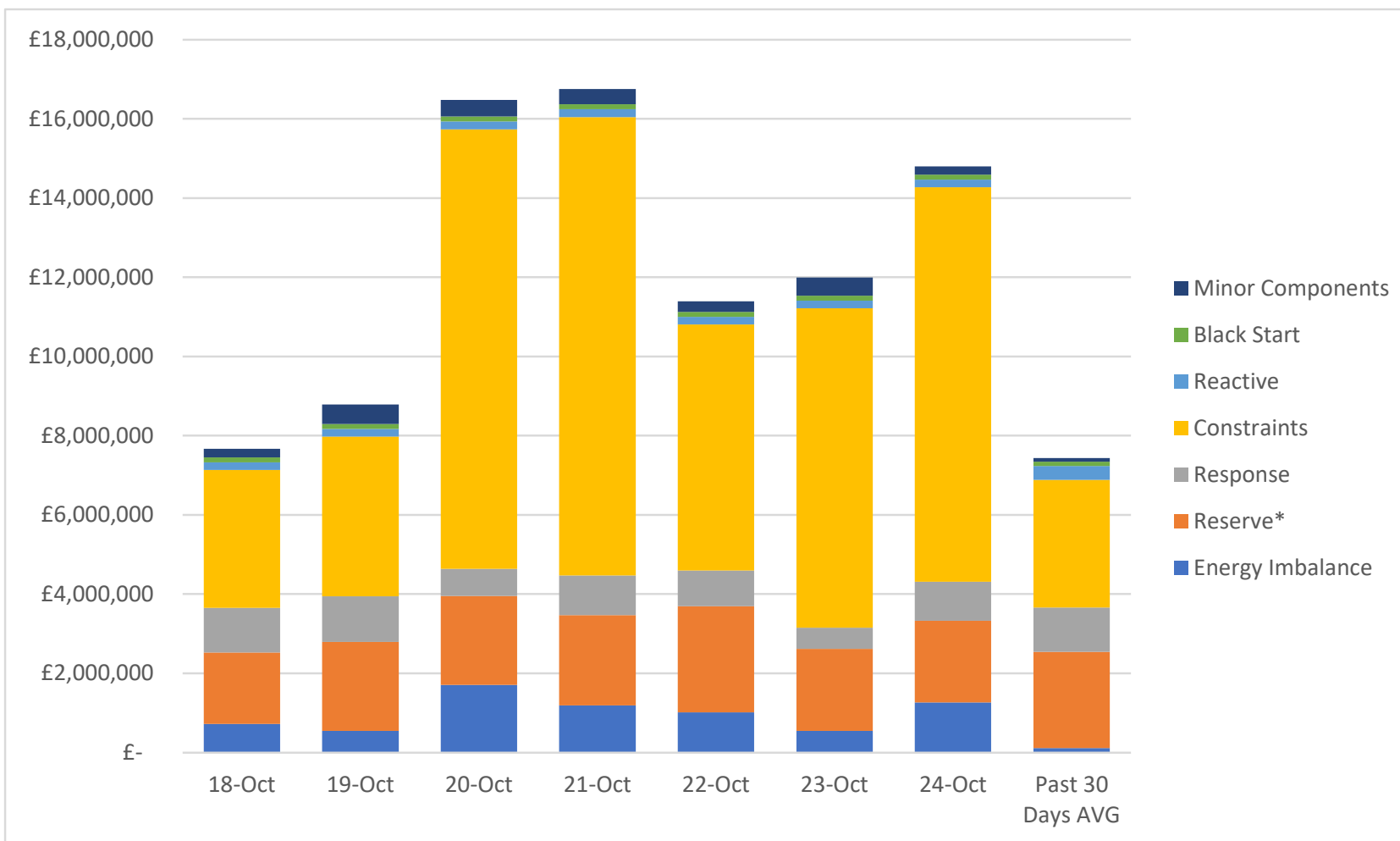
WIND



ESO Actions | Sunday 24 October Minimum



Transparency | Costs for the last week



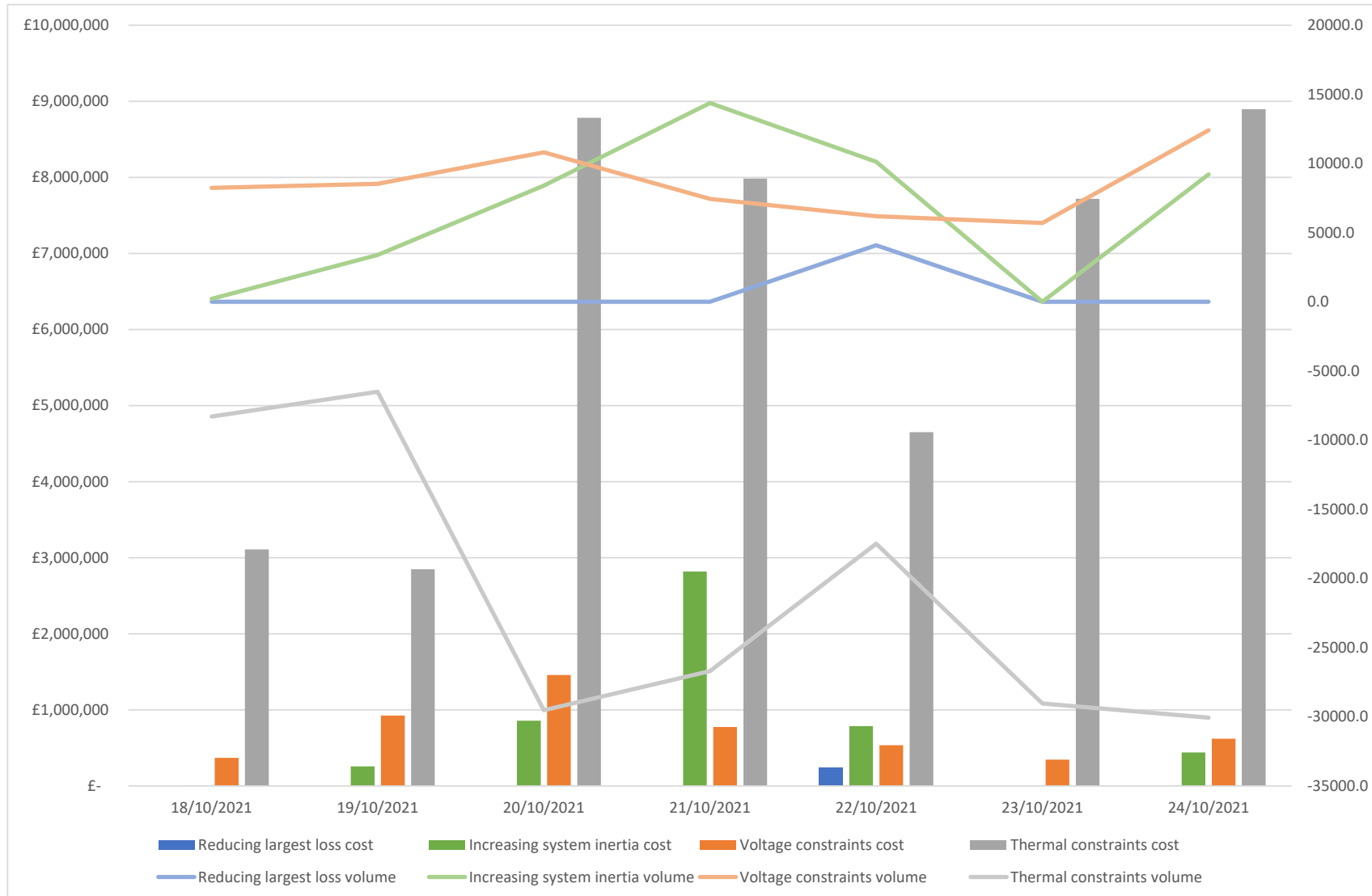
Wednesday 20th and Thursday 21st and Sunday 24th were the highest cost days for the week.

Constraints actions were the main drive for the high spend days. Prevalently windy weather during the week 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 Wednesday and Sunday, large volume of actions required to manage thermal constraints, particularly in Scotland.

Voltage

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

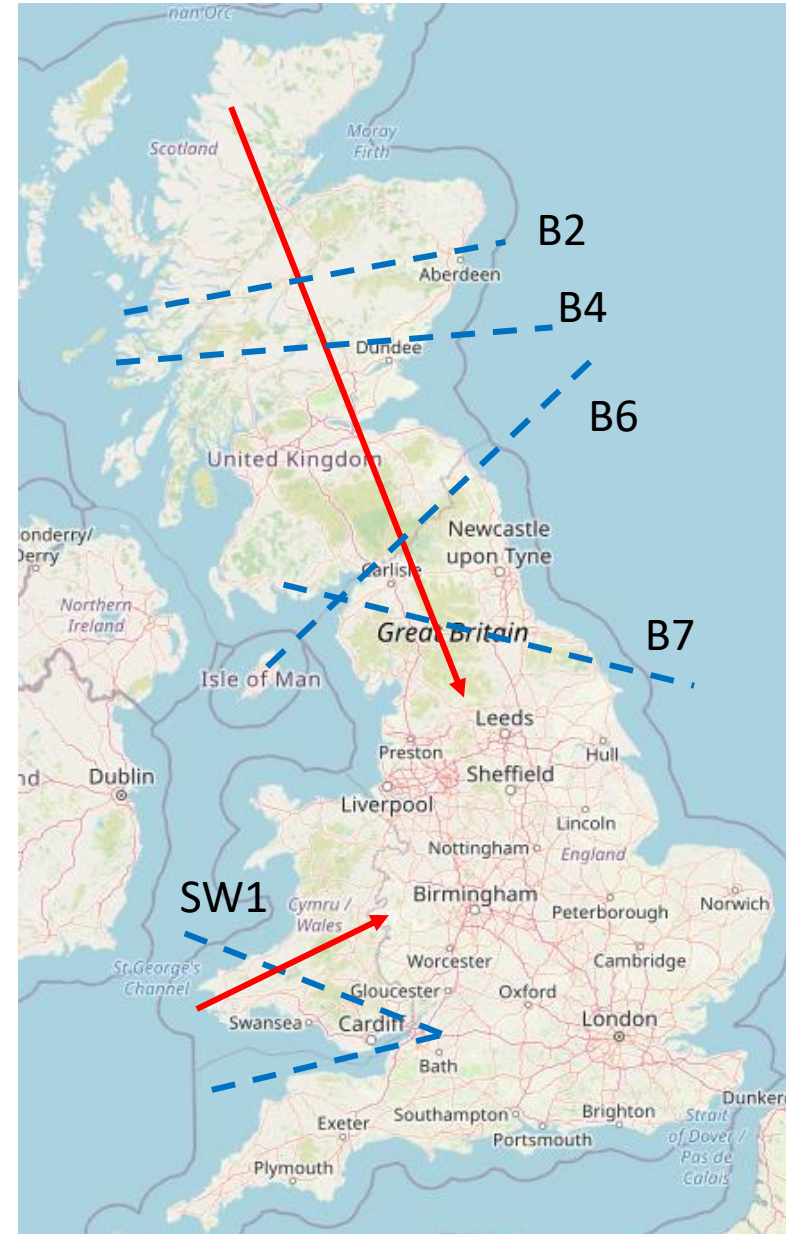
Managing largest loss for RoCoF
action required to manage largest loss on interconnectors on Friday.

Increasing inertia

Intervention required to increase minimum inertia level on some days, particularly on Thursday

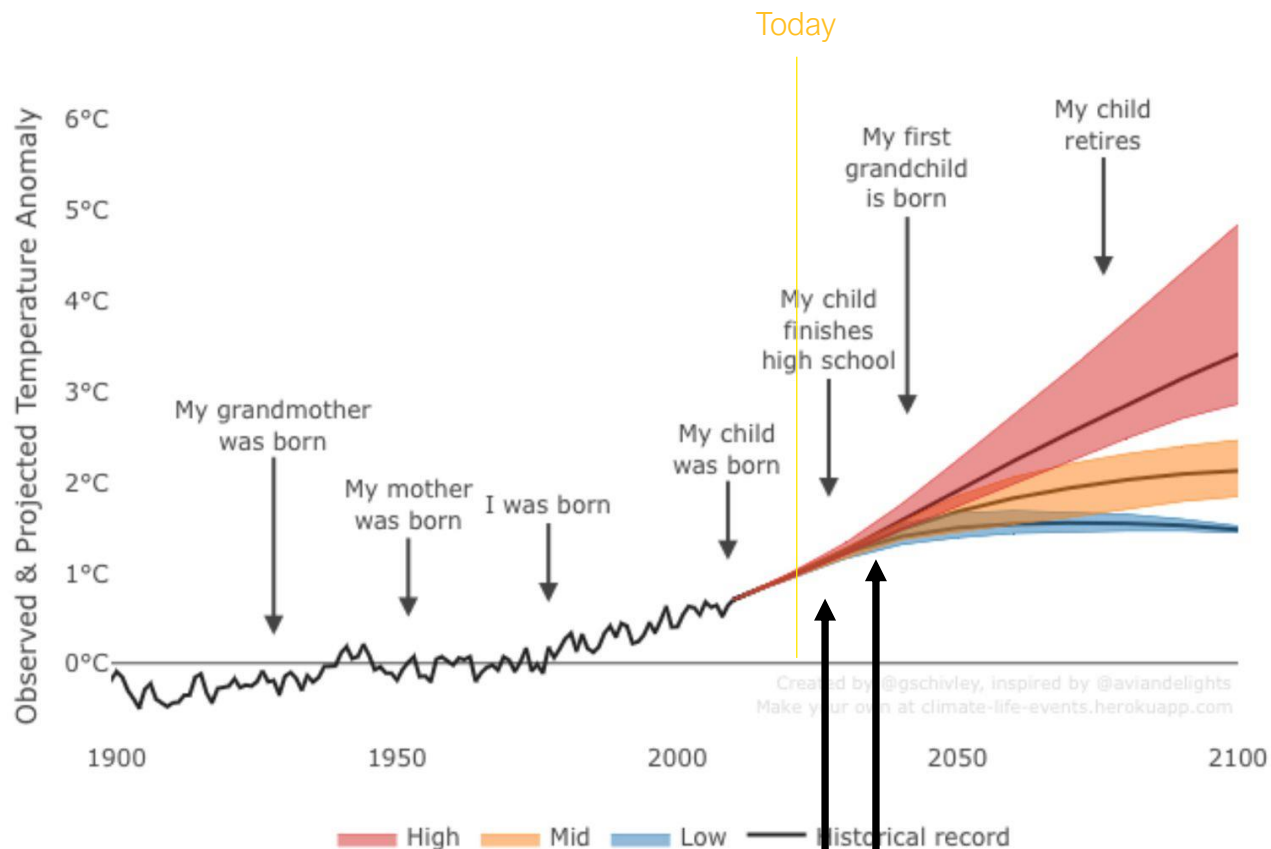
<https://data.nationalgrideso.com/balancing/constraint-breakdown>

Transparency | Constraint Capacity





The Carbon Intensity of Electricity



James Kelloway

Energy Intelligence Manager – National Grid ESO

Born at 334 parts per million

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nationalgrid

nationalgridESO

Past The Impact of Carbon on The Climate



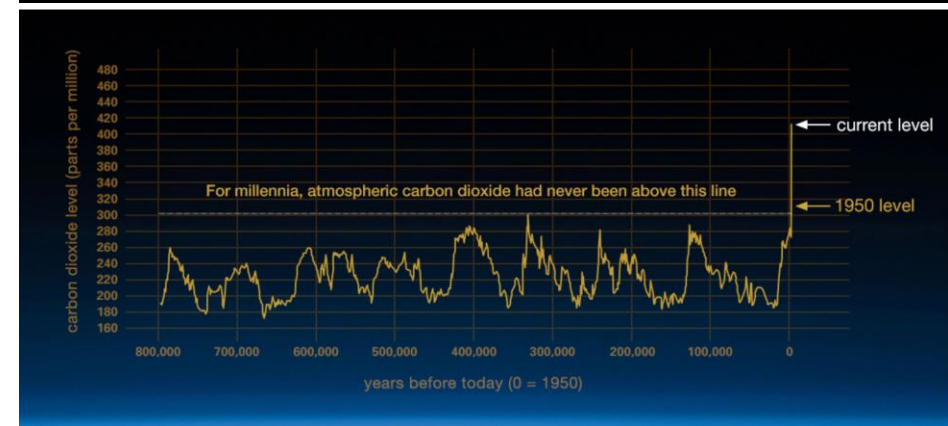
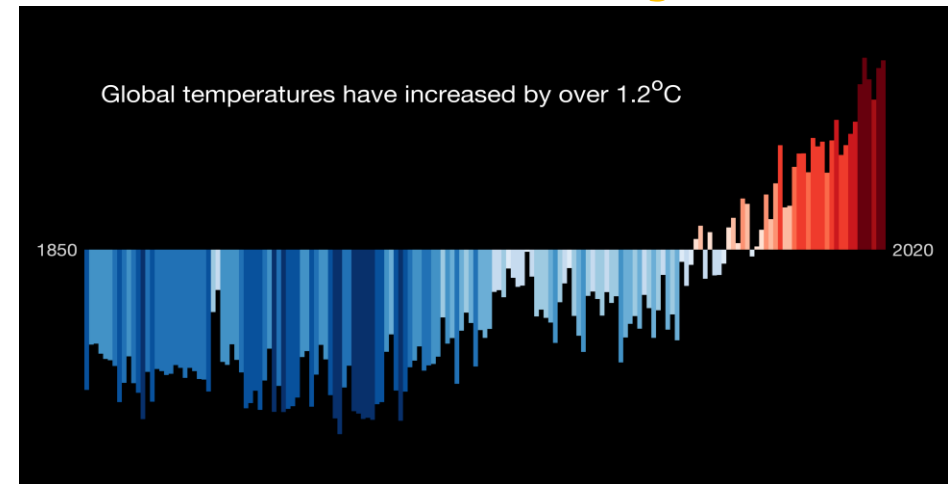
1912

COAL CONSUMPTION AFFECT- ING CLIMATE.

The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth and to raise its temperature. The effect may be considerable in a few centuries.

The Braidwood Dispatch and Mining Journal (NSW : 1888 - 1954) / Wed 17 Jul 1912

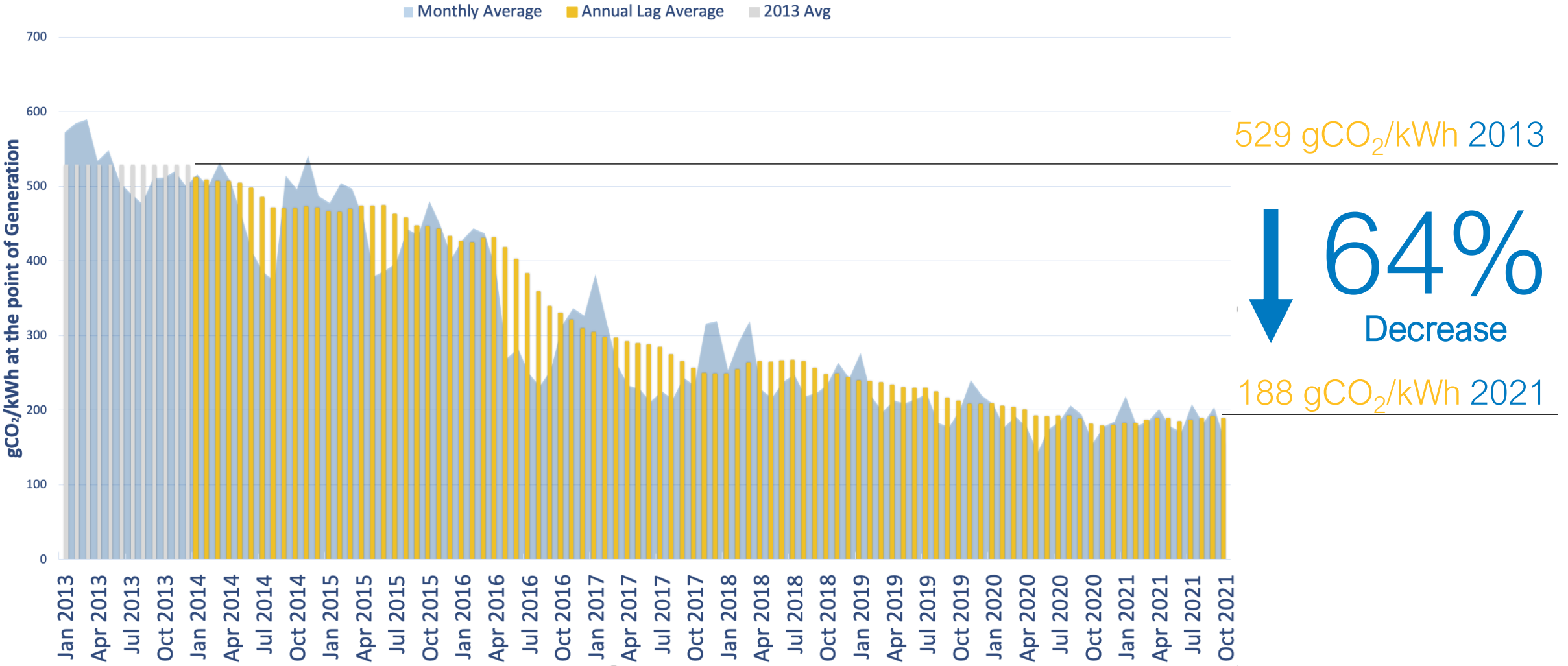
Present Day



<https://showyourstripes.info>
climate.nasa.gov

Past Carbon Intensity in GB

Monthly and 12 Month Rolling Average GB Carbon Intensity 2013 to 2021 YTD



529 gCO₂/kWh 2013

↓ 64%
Decrease

188 gCO₂/kWh 2021

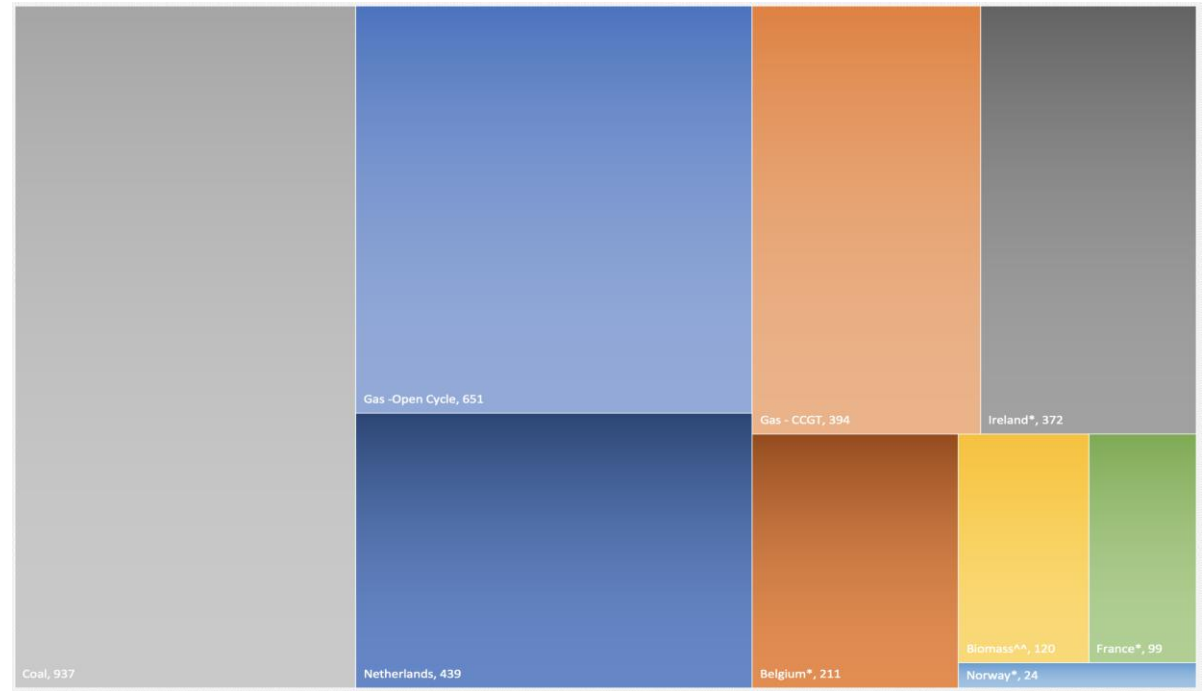
Background Each Generation Type has different carbon consequences

Hydro, Solar, Storage, Nuclear, Tidal & Wind, release zero CO₂ at the point of generation.

Carbon based fuels and sources emit CO₂ but not all equally.

Some are far more carbon intensive than others.

Interconnectors that allow energy to be imported or exported vary depending on the source country.

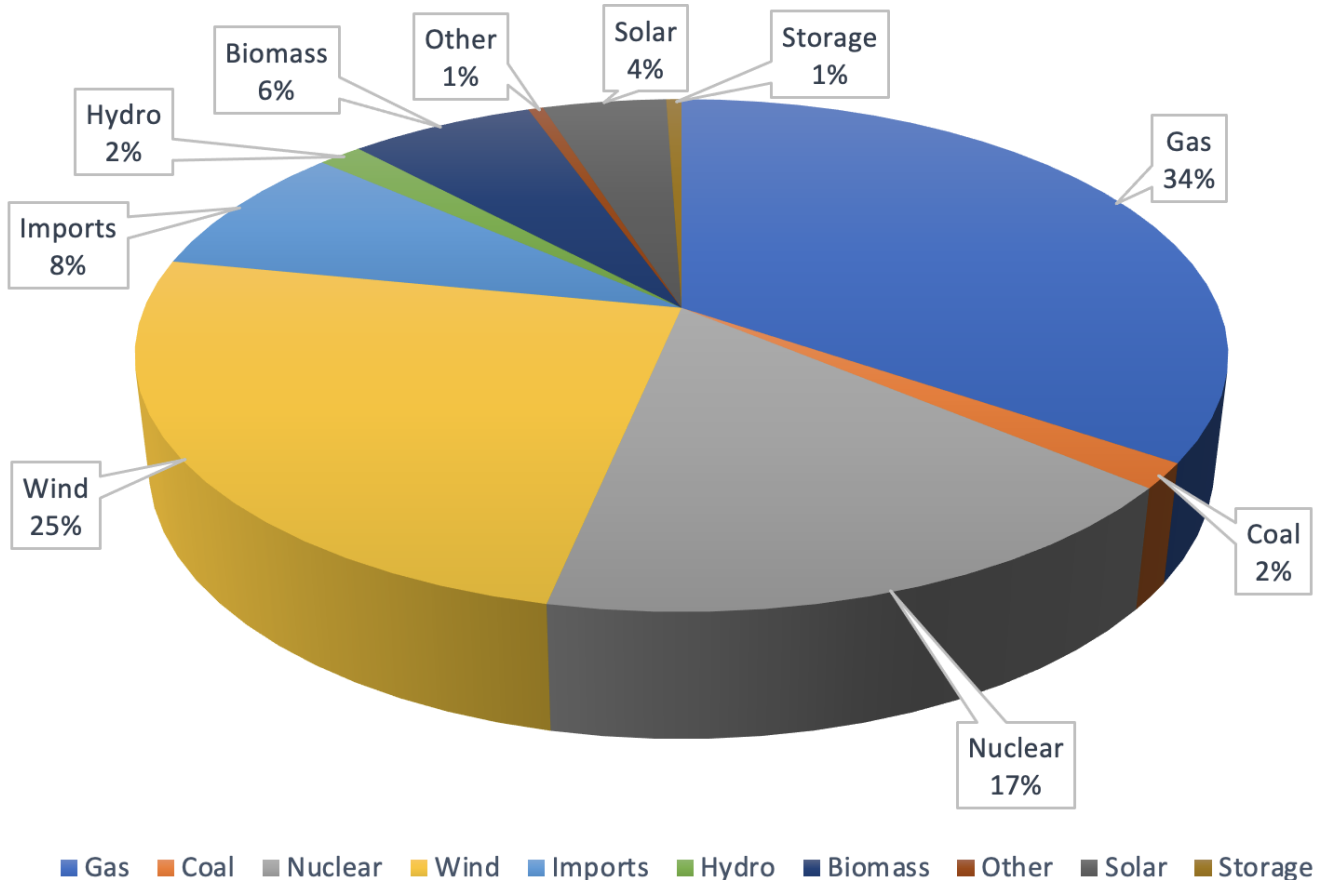


*Snapshot on 25th Oct 2021 11am (ElectricityMap.org) – interconnectors to different countries can flow in both directions and the carbon footprint varies constantly depending on the source country.

^^ Biomass can vary significantly depending on supply chain – here 120gCO₂/kWh is assumed inline with carbonintensity.org.uk

Present What Makes Our Electricity in GB?

GB Generation 2021 YTD*



51.5%



48.5%



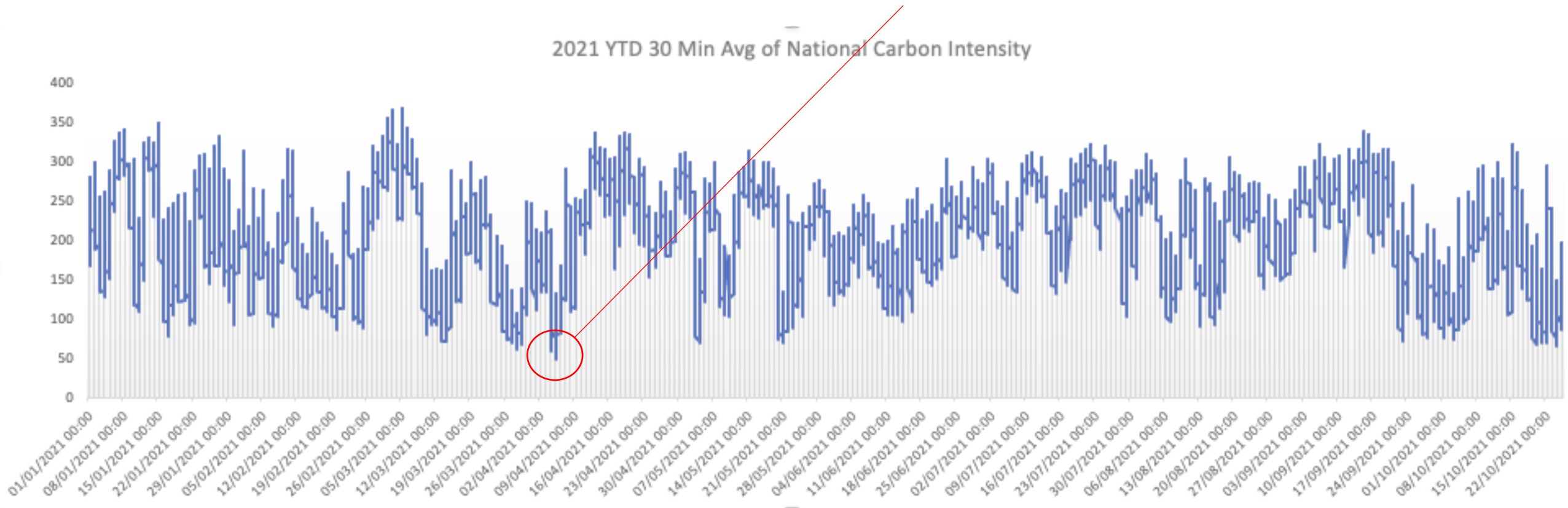
This cocktail mix changes every second & is managed 24/7 by the ESO's Control Room depending on many factors including demand, weather & markets



Past Carbon Intensity in GB

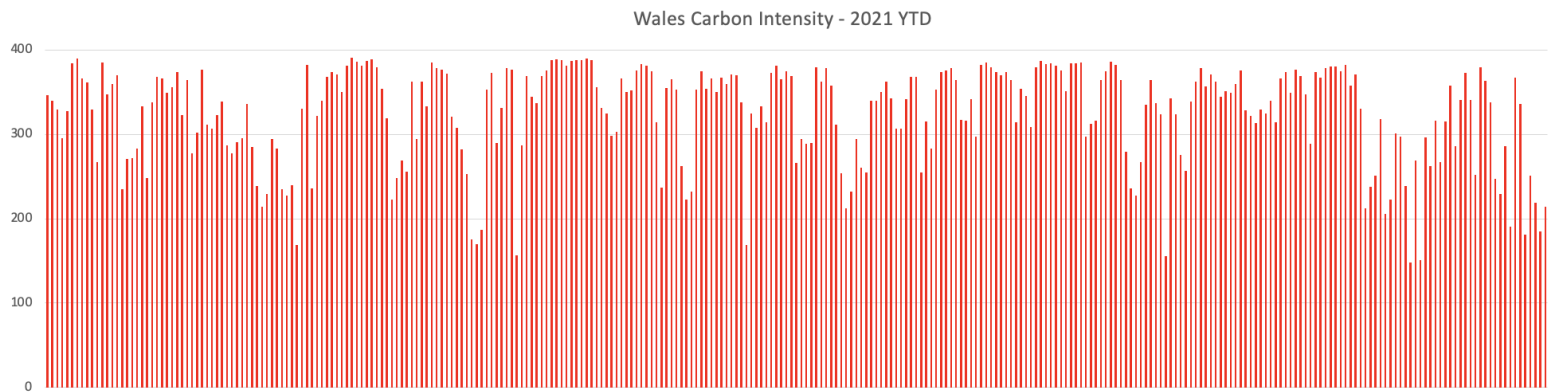
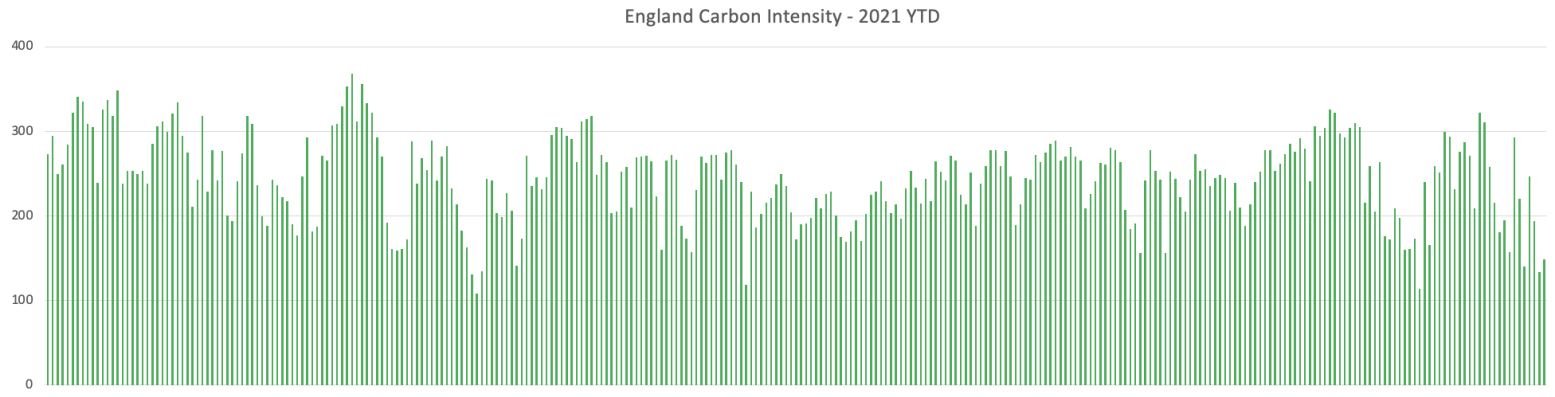
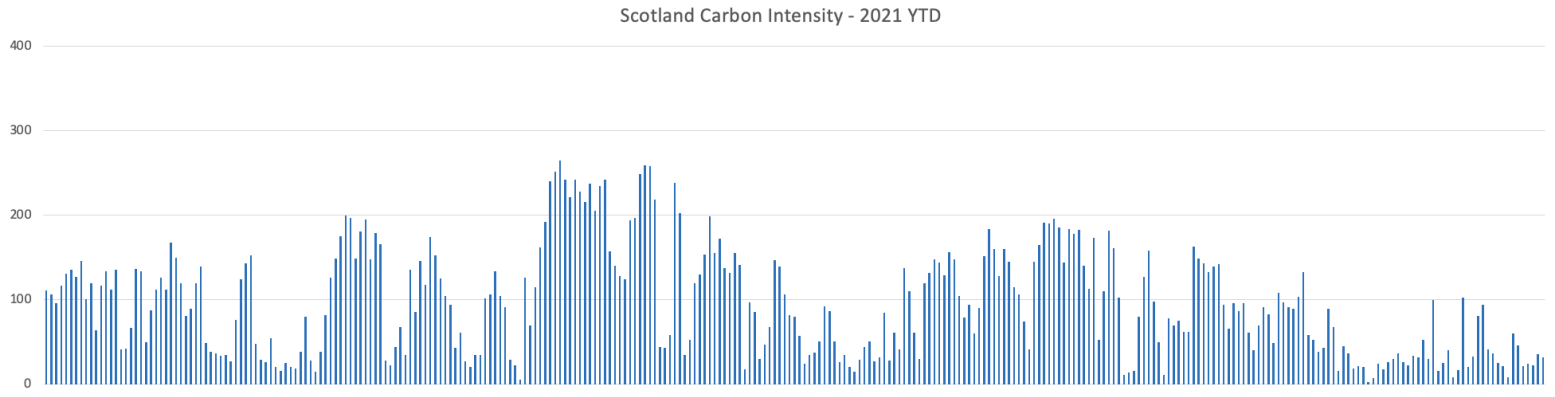
The amount of carbon varies depending on what makes the electricity. In reality this changes second by second.

The record low in April across GB for a 30 minute period was 39 gCO₂/kWh.



Past Regional History

Carbon Intensity varies by Region

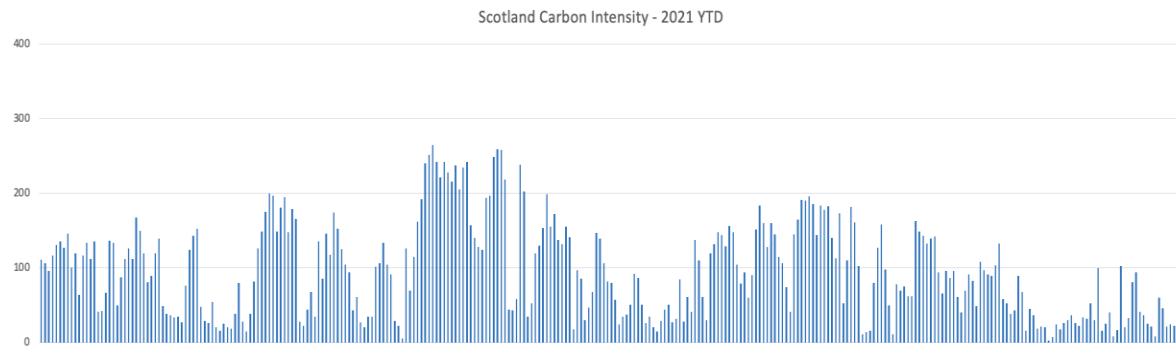


Past Regional History

In 2021* Scotland has been running at

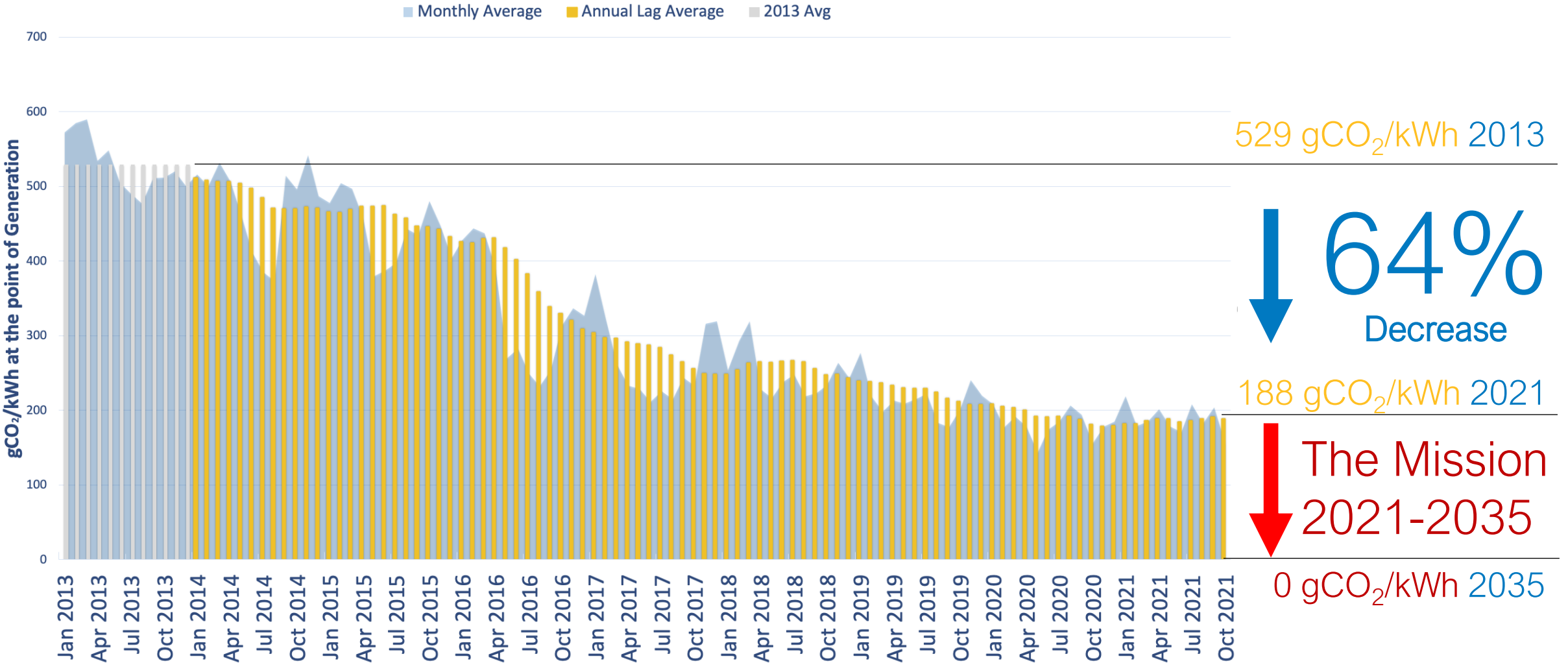
- 0 gCO₂/kWh for 25.5 hours across 22 episodes
- 23rd September 2021 saw 5 hour period with Scotland constantly at 0 gCO₂/kWh
- ≤ 5 gCO₂/kWh for 609 hours or just over 25 days

Scotland is a net exporter of renewable energy to England and Wales



Past Carbon Intensity in GB

Monthly and 12 Month Rolling Average GB Carbon Intensity 2013 to 2021 YTD



Power loop Project Update

Trial: Facilitating pathway to EV participation in the Balancing Mechanism

National Grid ESO is collaborating with the Powerloop Project, run by Octopus Electricity Vehicles and Octopus Energy.

130+ EV's using bi-directional charging technology are participating

Learning by doing approach will gain experience in the process and understand the potential blockers.

Trial which simulates the process of pre-qualification and registration of Vehicles to Grid (V2G) assets. Assessment against the Virtual Lead Party (aggregated assets) market route

Investigation of how dispatch of V2G assets would interact with Balancing Mechanism

These activities will provide evidence for a closure report (written by the Powerloop Project) which will document findings

Link to Octopus EV blog: [Click Here](#)

Energy Trading – Data Transparency

Decommissioning of existing trade reporting website

Due to the work that has been completed on the NG ESO data portal the upcoming trades weblink <https://trades.nationalgrideso.com/> will be decommissioned on **31st October**.

Instead, the information can be found on the NG ESO data portal with a whole host of other data sets.

[ESO Data Portal: Upcoming Trades - Dataset | National Grid Electricity System Operator \(nationalgrideso.com\)](#)

A redirect will be in place.

Please ensure that any automated processes are updated to reflect this change in information provision.

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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