Forecasting and Markets for increasing renewables in uncertain times

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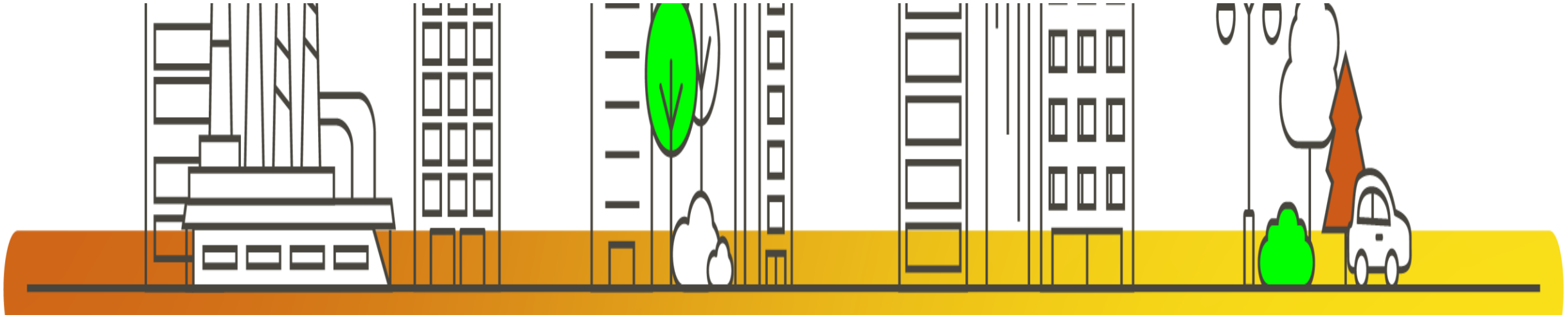
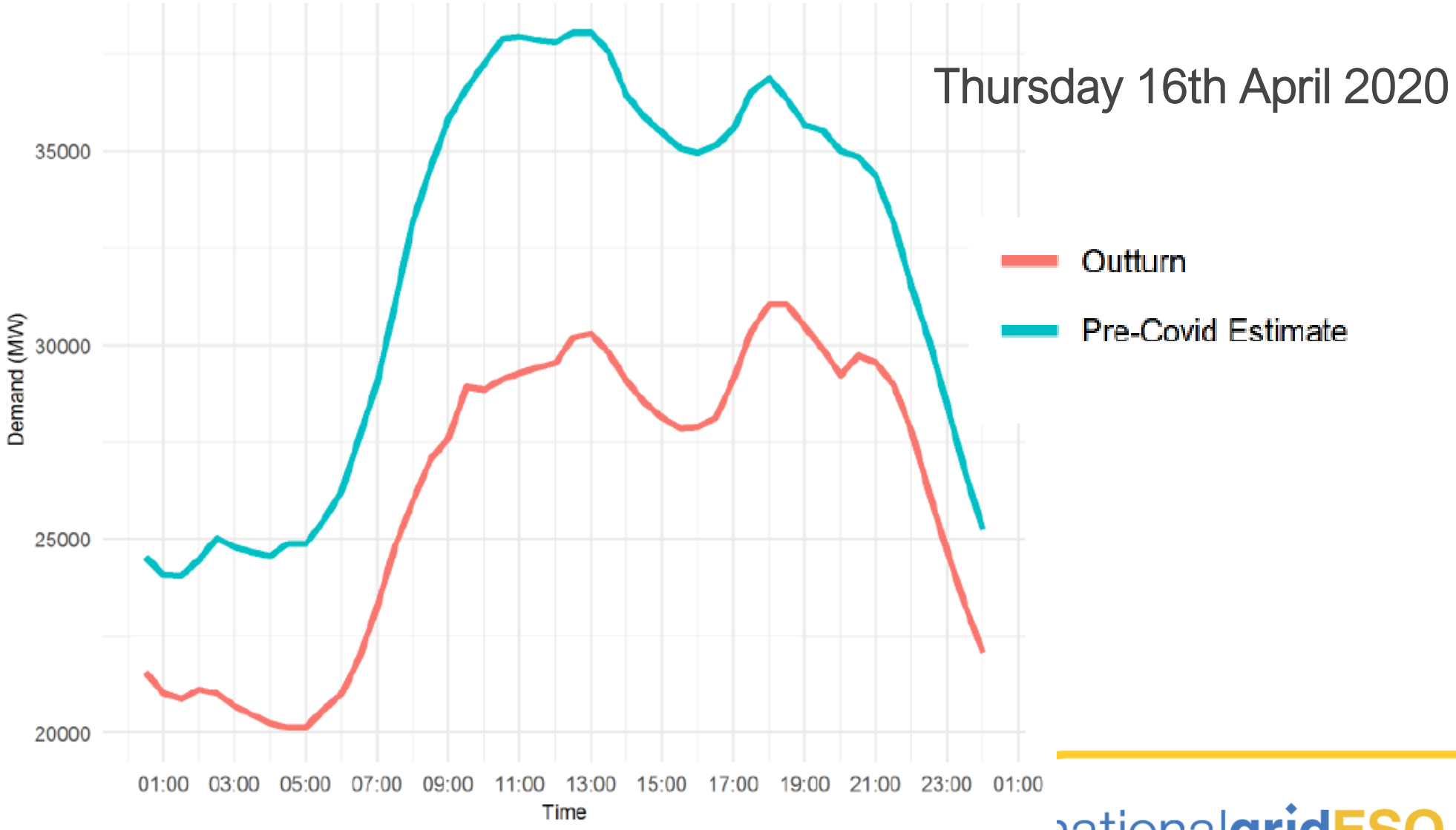
In light of COVID-19, we set out our key priorities:

- **Keep our people safe and protect their wellbeing** – making sure we have enough staff to carry out critical functions

- **Keep the lights on** – including coping with periods of low demand due the current season and UK lockdown



Impact of COVID19 on the shape of electricity demand



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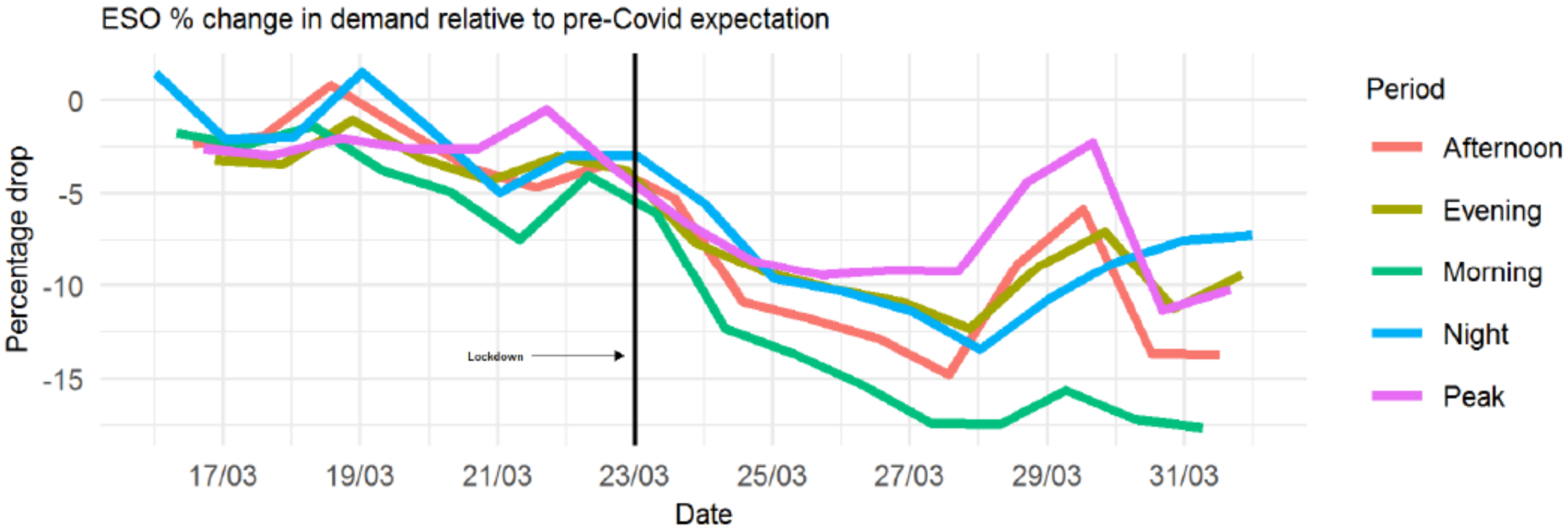
Impact of COVID19 on the level of electricity demand

View at the end of March



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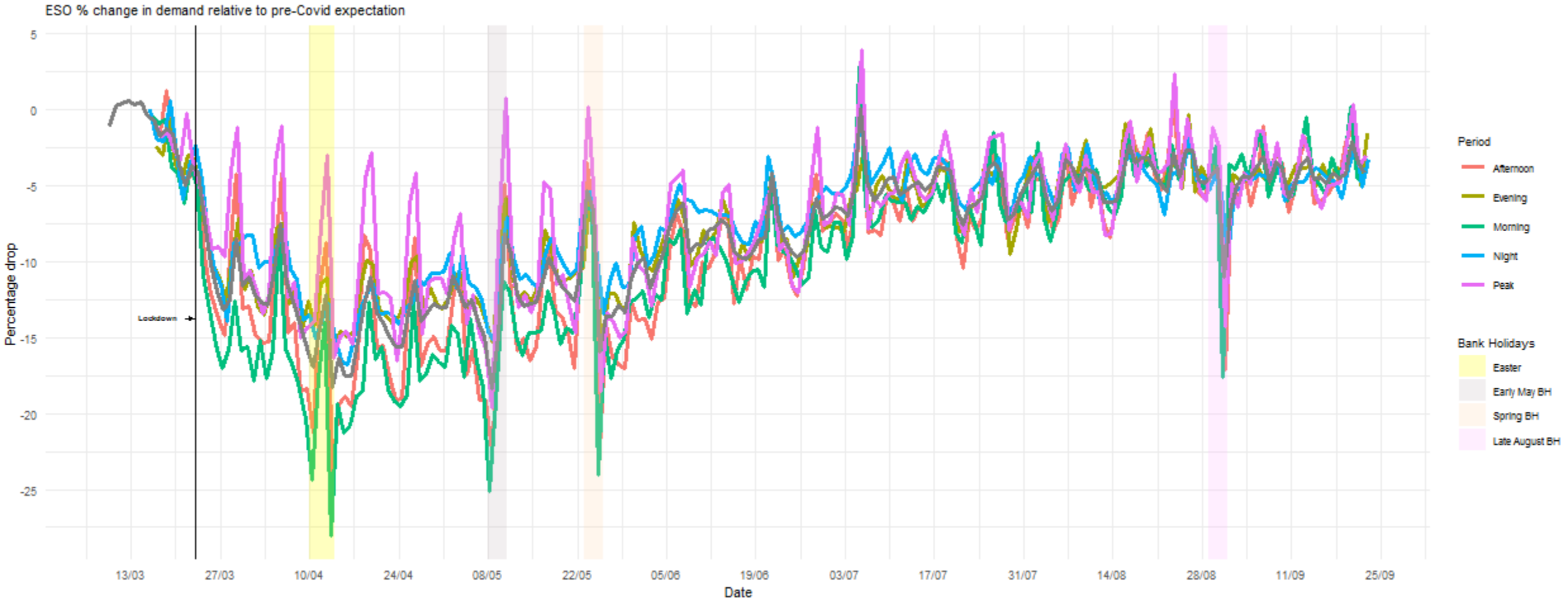
Impact of COVID19 on the level of electricity demand

View late September



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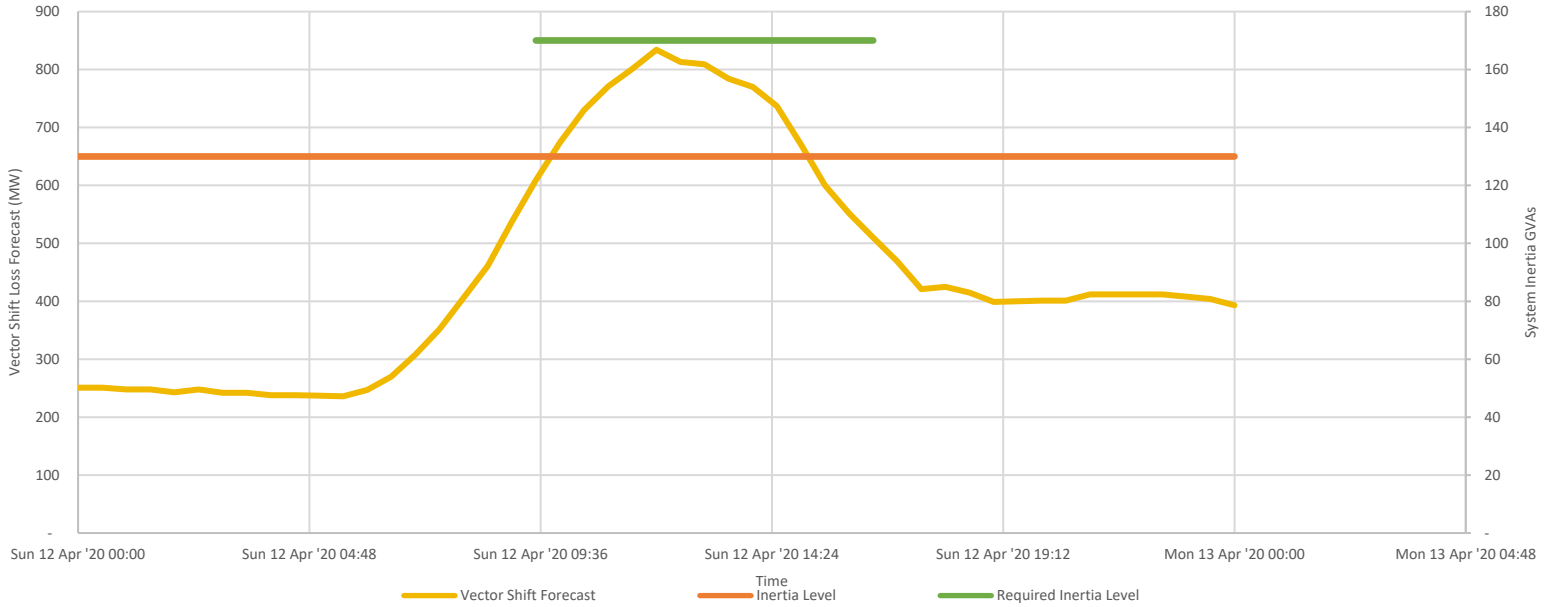
Operating the Power System during a Global Pandemic

What demand is expected?	What is needed to operate the Power System?	What will the market deliver? Is more (or less) required?	Does it all fit?	What other action may be needed?
• Expected • Extremes • Volatility • Certainty	• Voltage • Stability • Thermal • Frequency • Restoration	• Available capacity • Prices • Provision of balancing services	• Sufficient demand • Technical specification of specific generation	• …….

Focus on Easter Monday | Managing Afternoon Minimum



Rate of Change of Frequency relays are set to activate from 0.125 Hz/s.

There is up to 700 MW of DER which could be lost due to a RoCoF greater than 0.125Hz/s

We can calculate for a given loss size the amount of inertia required to prevent the relays from activating – The RoCoF trigger level. We ensure that losses greater than this value are effectively managed

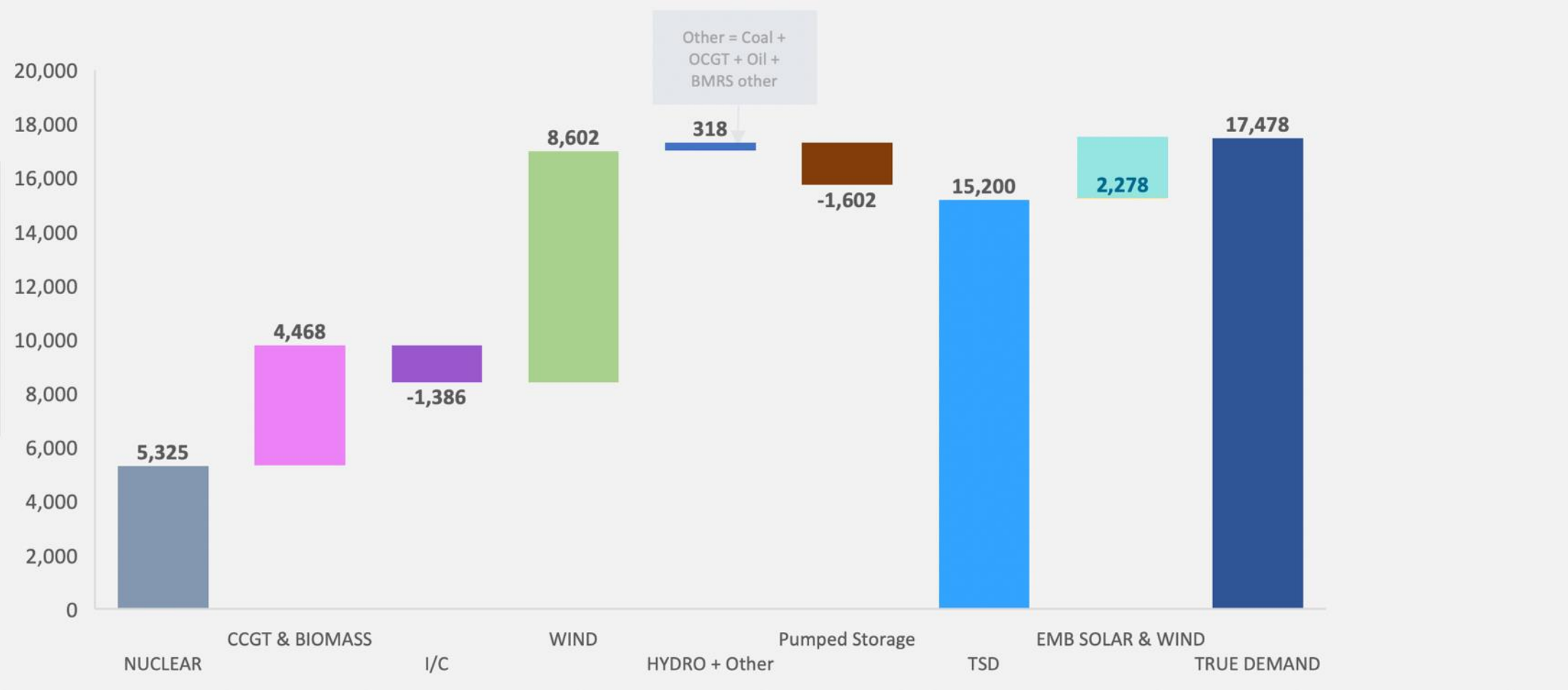
The Vector shift relays can activate for a transmission fault.

The above graph shows the vector shift forecast and the inertia levels from Sunday

From this we can see over the morning and afternoon we ran an additional 17 units worth of inertia (blue line to yellow line) to ensure that a transmission fault and subsequent Vector Shift loss did not cause the activation of the RoCoF relays and cause a larger loss and a potential frequency deviation.

Operating the Power System during a Global Pandemic

Managing a minimum period



*The numbers on these graphs are for indicative purposes only.

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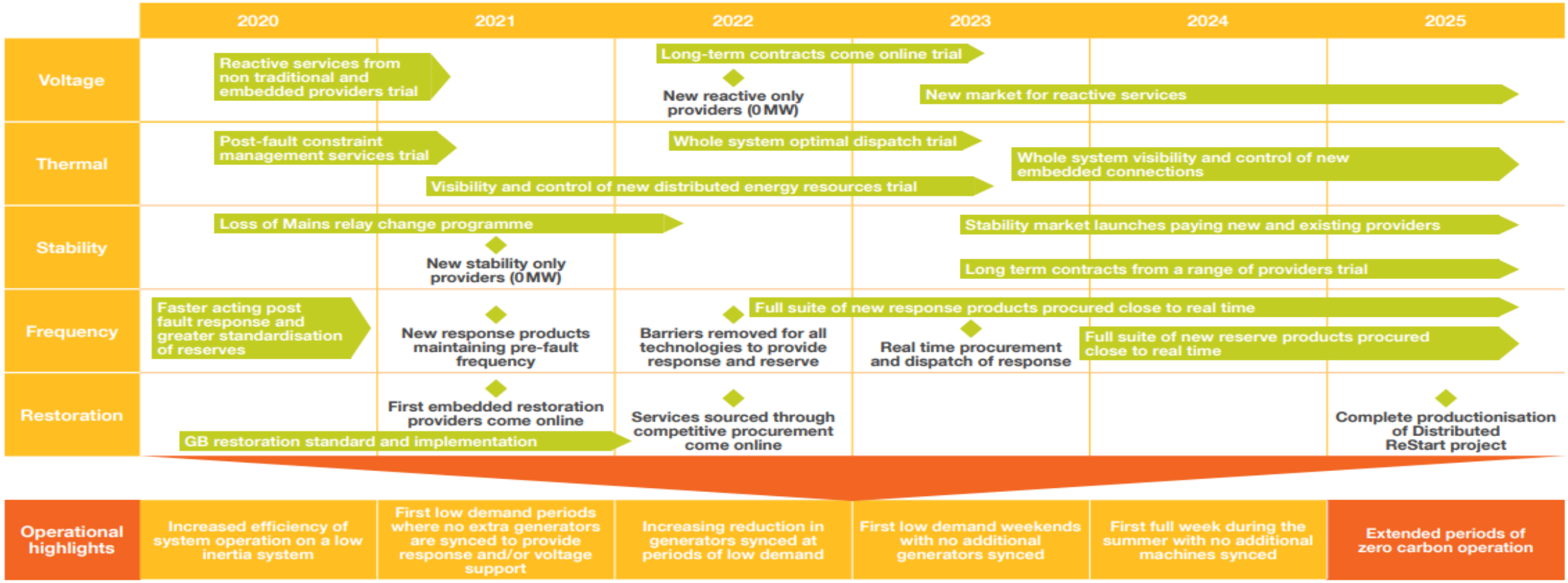
Operating the Power System during a Global Pandemic

What demand is expected? | What is needed to operate the Power System? | What will the market deliver? Is more (or less) required? | Does it all fit? | **What other action did we take?**

- Sought additional flexibility from industry participants, increasing volume of generation with a SuperSEL contract
- Augmented ongoing collaboration with BEIS, Ofgem and network owners, sharing thinking
- Developed and launched a new product – ODFM which has enabled over 4GW of new entrants to the market to support the most critical points
- Ensured continued flexibility with a contract with EdF to reduce the output of Sizewell
- Provide code clarity in relation to last resort Emergency Instructions through the Grid Code Modification GC00143
- Supported CUSC change CMP350 to defer up to £100m of costs from 20/21 to 21/22
- Developed a series of trials to unlock greater flexibility from batteries via the Balancing Mechanism
- Sought third party assurance of all processes and actions

Looking to the Future…..

We are aiming to be able to operate carbon free by 2025



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Success

In 2025 looks like:

An electricity system that can operate carbon free

A whole system strategy that supports net-zero by 2050

Competition everywhere

The ESO as a trusted partner

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Thank You

We are passionate about driving the energy transition and helping GB achieve it’s net-zero target.

We are keen to work closely with others in the industry so that we can continue to deliver clean, green, reliable and affordable electricity to all.

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