

ESO Forward Plan 2020-21

Quarterly Reporting: October - December

—
22 January 2021



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Foreword

Welcome to our quarterly performance report for Q3 2020-21, which covers the period from October to December 2020 (inclusive). This report provides an update on our performance against the metrics and deliverables set out in the 2020-21 [Forward Plan Addendum](#)¹.

Executive Summary: Q3 2020-21

During the third quarter of 2020-21, we have made great progress on many of our Forward Plan deliverables. This has included implementing the new Dynamic Containment product, progressing our Pathfinder projects and Regional Development Programmes, consulting on Early Competition, and providing an increasing amount of transparency around our activities. We were proud to achieve this progress despite the ongoing disruption which COVID-19 has caused to our normal ways of working.

However, we continued to experience uncertainty due to lockdowns associated with the COVID-19 pandemic. This has impacted on our ability to forecast demand, which can be seen in our demand forecasting and Balancing Services Use of System (BSUoS) forecasting performance. Demand levels have remained suppressed, contributing to higher balancing costs. However, as demand levels are higher in winter than summer, we have not experienced the same operational challenges due to extremely low demands that we had seen over the summer. We have therefore taken the opportunity to embed some of the good practices developed over the summer, such as the use of the Short Term Operability Obeya for fast-paced decision making at the appropriate level and the NGESO Operational Transparency forum for communicating effectively with market participants at a rhythm that is appropriate for the pace of change. We have sought to learn lessons from our experience which can be applied to future system operation, emergency planning, and the development of new tools and services.

Prioritising our deliverables as a result of the COVID-19 pandemic

We are continually re-prioritising our deliverables to maximise consumer benefit. A number of our long-term operability projects were delayed as we prioritised work to address last summer's operability challenges. This resulted in some changes to deliverable dates as described in the [Forward Plan Addendum](#)². On a quarterly basis the ESO reviews its plans, major programmes and IT portfolio to support business planning, prioritisation, financial management and decision-making. This is complemented by a regular review of our business priorities in line with the Forward Plan and RIIO-2 Business Plan, taking into consideration the impact of internal and external events such as the effects of COVID-19 lockdown. This is an iterative process led by the ESO Executive Team and gives the opportunity to identify quick wins, discuss cross-ESO dependencies and agree the top five to eight short term priorities. The ESO senior leadership team discuss these priorities regularly prior to them being socialised with the wider organisation. Examples of activities which are currently being considered for inclusion in this list of priorities are developing competitive markets and managing summer operability.

Role 1

Improving transparency and learning lessons from the pandemic

We established the NGESO Operational Transparency forum at the start of the lockdown period in 2020. Following positive feedback from participants, we decided to continue with the regular weekly forum, which have been well received with consistently high feedback scores about the topics covered and the quality of the question responses.

We have published the Electricity National Control Centre (ENCC) Transparency Roadmap³ which gives a clear view on upcoming deliverables and data publications. The roadmap sets out how and when information will be shared, to give greater insight into our requirements and operational decisions.

During this quarter we reviewed our pandemic planning assumptions in light of the COVID-19 pandemic and updated our internal procedures and processes to include the learning to date. This includes measures to ensure the continued protection of our colleagues in critical roles as well as operational learnings in terms of demand under lockdown, further learnings from the summer

operability challenges and, more recently, the challenges experienced with upward margin during high demand scenarios.

Higher balancing costs due to demand suppression and constraint management

Although demand suppression due to COVID-19 has had less of an impact on the operability challenges during the higher demand periods of the year, we have still seen a number of lower than usual minimum demand periods with associated high volume of actions and in turn higher balancing costs. The pandemic has impacted the Transmission Operators' (TOs') outage plans which have been reassessed for socially distant working practices. As a result, a number of long term schemes and outages, originally planned to be carried out during the Summer, have been pushed into the typically windier months of October and November. The resulting combinations of outages required have left some boundary capacities heavily reduced for long periods providing an additional driver to balancing costs.

Several of the heavily constraining outages have involved delivering customer connections or network upgrades. Under the Connect and Manage scheme a commitment was made to connect renewable generation ahead of network upgrades in order to meet renewables targets. The extra capacity of generation was then planned to be managed through the tools available with an associated increase in balancing costs due to the increased volume of constraint expected prior to network upgrade delivery. The outages being taken to deliver the network upgrades are significantly reducing boundary capacity even below the levels already constraining due to Connect and Manage. This leads to additional actions and spend to operate the system.

Balancing costs remain high for this quarter, however as captured in the Customer Value Opportunities metric, we have taken many actions across ESO to increase capacity and reduce overall spend below what it would have been without action. Focus areas are primarily where actions are expected to be required in the short term and commonly include circuit rating enhancements requested from the TOs, innovative optimisations of network configurations and outage alignment.

As an example of the potential scale of these optimisations, a network configuration agreed with the TO in November was used to relieve constraint volume in the Greater Mersey and Snowdon region. This configuration relieved constraint volume completely during tight margin periods and to a large extent in higher wind output scenarios with 600MW increase in the boundary capacity for the duration of the outage period. The network configuration was used for a period of 3 months and gave a saving of up to 1.3TWh of constraint volume (up to approximately £101m).

Managing positive margin challenges

In contrast to the challenges experienced during the first half of the year, Q3 saw the return of positive margin challenges with a number of tight periods managing margins and three Electricity Margin Notices (EMNs) were issued to the market during November and December. Teams within the ESO responded to the change in season quickly so that a sharp focus on high demand operability challenges was in place rapidly following the end of the very low demand periods. We maintained close liaison with key stakeholders throughout and provided information through our transparency forums. The learnings from ways of working developed through the Pandemic have meant that virtual teams are in place to manage current and future operability challenges where identified. Our virtual cross-ESO team remains operational and a key contact point each week where key workstreams are reviewed and actions given as appropriate to ensure the response to the challenges is forward thinking and focused.

Learning lessons from the pandemic

The unprecedented low demands experienced during 2020 offered an insight into potential future operability challenges as we work towards our zero carbon ambition. We have taken some key

¹ <https://www.nationalgrideso.com/document/173131/download>

² <https://www.nationalgrideso.com/document/173131/download>

³ <https://www.nationalgrideso.com/document/182566/download>

operational learnings from this experience, which are set out in our Operability Strategy Report⁴ which we published in December. This includes:

- We introduced the Optional Downward Flexibility Management (ODFM) service to help manage frequency over the summer. This service brought on board a few new providers, whom we will seek to include in the enduring solution we will develop as part of our reserve product reform program
- Over the summer, the ESO took actions to replace zero carbon plant with stability-providing synchronous plant, to manage the risk of disconnecting embedded generation. However, in the future, the outcome of projects such as the Loss of Mains and Stability Pathfinders will reduce the need for operational interventions of this type.
- Over the summer, it was necessary to instruct synchronous generators onto the system to provide reactive power, displacing renewable generation. We are progressing voltage pathfinder projects, which should reduce the need to take such actions in the future: the Mersey voltage pathfinder already contributed to this.
- Due to thermal constraints, we took actions to reduce the zero-carbon generation in Scotland and the North of England. Going forward, our work on the Constraint Management pathfinder will help to find commercial solutions which will help increase the amount of power that can be exported from this area.

Delays and uncertainty implementing project Trans European Replacement Reserve Exchange (TERRE)

We recognise that industry stakeholders had expressed frustration with the delays and lack of certainty in the light of the UK future arrangements with EU following Brexit, and transparency regarding project TERRE implementation. Following Ofgem's open letter to the ESO, in November 2020, we took this feedback on board and convened the GB TERRE Implementation Group to discuss credible scenarios for the UK's future access to EU balancing platforms and GB implementations plans based on these. This group is representative across the industry including Market Participants, Independent Experts, the Channel Region Interconnector Companies, RTE, Ofgem & BEIS. The material from the meetings is available on our website⁵. In January, we reconvened the group following the signing of the UK-EU Trade and Cooperation Agreement, which suggests that the UK will not have access to the EU's balancing platforms and the UK status as a third Country, with the European Commission. This is aligned to one of the scenarios we created, which also includes exploring the costs and benefits of a Replacement Reserve mechanism operating in GB - that is, without cross-border participation. We are currently working with the group to understand how a cost-benefit analysis could be conducted, cognisant of priorities set by BEIS in forming the new arrangements with EC on energy, this will inform the level of effort required across industry and whether there is appetite to proceed. We commit to maintain this transparent and collaborative approach with industry.

Customer value delivered from collaboration with network operators

At the end of the quarter, the National Access Planning (NAP) team in collaboration with our stakeholders (TOs and DNOs) identified and recorded over 140 instances (30% increase from last year) where its actions directly resulted in adding value to the end consumer, and its innovative ways of working facilitated increased generation capacity to the connected customers. For end consumers, this represents 11,683,748 MWh of direct savings and 1,496,020 MWh of indirect savings. In total, we have released 13,179,768 MWh (worth approximately £829m) of extra generation capacity, which would have otherwise been constrained at a cost to the consumer.

Role 2

Release of Dynamic Containment (DC) Service

Dynamic Containment is a fast acting post-fault service to contain frequency within the statutory range of +/-0.5Hz in the event of a sudden demand or generation loss. We launched DC on 1 October 2020 after months of industry engagement, and introduced daily procurement, which is a

⁴ <https://www.nationalgrideso.com/document/183556/download>

⁵ <https://www.nationalgrideso.com/industry-information/balancing-services/reserve-services/replacement-reserve-rr>

significant development in our market reform activities under Role 2. Our initial intention of trialling day ahead procurement in the Response and Reserve Roadmap was for Q1 21/22, which brings us ahead of schedule.

Introducing the new service in soft launch form⁶ allows us to meet delivery milestones quickly, make early developments to the service and collate learnings for further enhancements. The short to medium-term enhancements have been categorised into two delivery waves based on our operational requirements and ambitions to progress at pace to support market growth and increase competition. Planning for further developments to DC follows an extensive consultation with industry with priorities being based on deliverability, value, and stakeholder feedback.

The first wave commenced in November last year, starting with feedback sessions with each of the active DC providers. Early market engagement and feedback helped us to identify and progress quick wins to support growing market participation and market liquidity. We are also focusing our efforts on integrating the new processes and systems associated with introducing a new response service and supporting our Control Centre Operations teams in embedding the service into the operational toolkit. The first consultation post go-live to address early developments and fine tuning was launched recently, and closes at the end of January.

In parallel to the soft launch workstream, the team are also exploring automation options for day ahead procurement for DC; taking our learnings from the weekly frequency response auction trial and working with the Short Term Operating Reserve (STOR) project team who are set to deliver day ahead procurement in line with the Clean Energy Package regulations. The consultation documents can be found on our website.⁷

The learnings from the soft launch of DC and the automation of daily procurement from the STOR project will shape the development timelines of other new services, namely Dynamic Regulation and Dynamic Moderation. We are looking forward to re-engaging with industry on these new response services later this financial quarter.

In response to stakeholder feedback, this quarter we removed the unit and volume caps from the frequency response auction trial⁸. The change was met with positive feedback from active trial participants, and following this change, we saw larger units participating in the trial.

We have provided an update on our Reserve Reform project. We are co-creating reserve reform products with industry, for example engaging with stakeholders at a workshop in December⁹ to introduce the approach that was used to review current reactive power issues and develop future solutions. There were more than 150 attendees and positive feedback was received.

We also held a webinar¹⁰ in December to discuss the Future of Reactive Power and are actively seeking industry views on this topic. The workshop was well attended, with around 100 parties getting involved. Feedback from attendees was very positive, and we will be building on this engagement in Q4 2020-21 through a more formal consultation.

Learning lessons and providing greater clarity on our balancing reforms

We are also considering the learnings and listening to customer feedback received from the Optional Downwards Flexibility Management (ODFM) service we used during summer 2020 and feeding this experience into development of future balancing services. We've put this learning into action with the agile approach we took with the Dynamic Containment project. Feedback from ODFM was that parties were advocates of the speed at which ESO were able to develop and deliver the service. Many participants valued ESO making the step and going live with a service which could be developed and refined, as opposed to waiting until the perfect solution was ready. For Dynamic Containment we shaped this feedback into the design of the go live by adopting a Soft

⁶ <https://www.nationalgrideso.com/document/182176/download>

⁷ <https://www.nationalgrideso.com/events-calendar/ebgl-article-18-mapping-dynamic-containment-and-short-term-operating-reserve>

⁸ <https://www.nationalgrideso.com/balancing-services/frequency-response-services/frequency-auction-trial>

⁹ <https://www.nationalgrideso.com/document/183261/download>

¹⁰ <https://www.nationalgrideso.com/document/182836/download>

Launch project plan. This allowed us to go live earlier with the product and adopt a learning by doing approach with industry on key themes and topics.

We recognise that there are a number of different reforms to balancing services underway, and during Q4 of 2020-21 we will publish a document which “joins the dots” between these different activities. This will build from our Operability Strategy Report which explains the challenges we face in maintaining an operable electricity system, how we are addressing them and how stakeholders can engage. It explains the learnings from the summer and shows how our strategy addresses the challenges we faced. We intend to hold a webinar in March 2021 to give stakeholders the opportunity to discuss these reforms with the ESO’s Markets team.

Role 3

Progressing our Pathfinders

For the Stability Pathfinder Phase 1, procurement of stability contracts has been progressing, with one provider live and several expected to become live in 2021.

In December 2020 we published an update to the FAQs¹¹ for the Stability Pathfinder Phase 2, along with our responses following the publication of the Expression of Interest (EOI)¹² on 30 September 2020. The EOI was seeking short circuit level and inertia services up to 2030. We ran a series of webinars in October and November. The window for sending submissions to this EOI to participate in the later stages of Phase 2 has now been closed.

In 2020 the Network Options Assessment (NOA) methodology was updated to include updates to the high voltage management assessment process. We published the Mersey Voltage Pathfinder Tender results¹³ and the Lessons Learnt report¹⁴ in December 2020. The Lessons Learnt document was shared and discussed with the Energy Networks Association (ENA) Open Networks group, and the learning will be factored into the upcoming Pennines Voltage Pathfinder. Lessons learned were we should be engaging earlier with TO(s) and DNO(s), increasing timescales for technical assessments, simplifying requirements and levelling the playing field. The experience will feed into the future pathfinder tenders, influencing, for example, what will be accepted in the future.

For the Constraints Management Pathfinder, in December we published the information about the post fault generation turn down/ demand turn up service¹⁵.

Progressing our key projects

Our final Phase 3 consultation for Early Competition was launched in December 2020 and pulls together all feedback gathered in phase 1 and 2. It explores both the technical and commercial aspects of an early competition model.

We held the first online FES- Bridging the Gap workshop in October, it was attended by over 130 people. We discussed the peaks and troughs of a decarbonised energy system and how markets, technology and digitalisation can help to achieve our Net Zero target.

Window 5 of the Accelerated Loss of Mains Change Programme (ALoMCP) opened in October. At its conclusion in December, applications had been approved from 5,594 sites (10.7GW of capacity). It is a mandatory requirement that all generators connected to the distribution network must make changes to their relay settings in order to be compliant by 2022 and the successful applications release funding to make the change. The change generators need to make is to relax the settings on the relays that connect their assets to the electricity network This will make generators less sensitive to any network disturbances. 7.6GW of sites have now declared completion of changes, of which 5.5GW has been validated by DNOs. This means our assessment of the vector shift risk has reduced from over 1000MW down to less than 700MW meaning we expect costs associated with vector shift to be zero for 2021-22. This is a great achievement and will highlight the benefits to

¹¹ <https://www.nationalgrideso.com/document/178406/download>

¹² <https://www.nationalgrideso.com/research-publications/network-options-assessment-noa/network-development-roadmap>

¹³ <https://www.nationalgrideso.com/document/182746/download>

¹⁴ <https://www.nationalgrideso.com/document/182751/download>

¹⁵ <https://www.nationalgrideso.com/document/183531/download>

wider industry. The benefits associated with Rate of Change Frequency (RoCoF) risk reduction are expected to be seen progressively over 2021, and actions were implemented in December 2020 to bring this forward as much as possible. Enhanced payment arrangements in place for high priority sites, increased engagement has been initiated, and enhanced risk assessment processes put in place.

Our N-3 intertripping Regional Development Programme (RDP) project with UKPN and NGET went live in the ESO control room in November. We also initiated and led the first joint RDP development meeting held to share learnings and ensure common approaches across RDPs.

A summary of our quarterly metrics and performance indicators covering Q3 is shown in Table 1 below.

Metric/Performance Indicator	Performance	Frequency	Status
Balancing Cost Management	£161m outturn against £126.6m benchmark	Monthly	●
Energy Forecasting Accuracy	Demand forecasting error: 625MW; Wind forecasting error: 5%	Monthly	●
Security of Supply	0 excursions for voltage and frequency	Monthly	●
System Access Management	2.62/1000 cancellations	Monthly	●
Customer Value Opportunities	Exceeding the benchmark with 13,179,768 MWh (approximately £829m) customer value created	Quarterly	●
CNI System Reliability	20 mins unplanned IEMS system outages	Quarterly	N/A
Reform of Balancing Services Markets	Frequency response: 92%	Quarterly	●
	Reserve: 43%	Quarterly	●
	Reactive: 0%	Quarterly	●
	Black Start: 0%	Quarterly	●
	Constraints: 65%	Quarterly	●
Code Admin Stakeholder Satisfaction	8.84 average rating	Quarterly	●
Charging Futures	8.58 average rating	Quarterly	●
Month-ahead BSUoS Forecast	4% forecasting error	Monthly	●
Right First Time Connection Offers	96% first time connection offers	Monthly	●
Customer Connections- Customer Satisfaction	Average score of 7 for Q3	Quarterly	●
Whole System - Unlocking Cross Boundary Solutions	DER connection: UKPN 20MW; WPD 225.1MW	Quarterly	N/A
Future balancing costs saved by operability solutions	£21.3m balancing costs saved by operability solutions	Quarterly	N/A

Capacity saved through operability solutions	Forecasted additional capacity released: WPD N-3 Tripping RDP 600MW in 2020-21; UKPN N-3 Tripping RDP 600MW in 2020-21; WPD MW Dispatch 1300MW in 2022-23; UKPN MW Dispatch 1350MW in 2022-23; SPT GEMS 500MW in 2022-23	Quarterly	N/A
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Table 1: Summary of metrics and performance indicators

- **Exceeding expectations**
- **Meeting expectations**
- **Below expectations**

You can find out about our vision, plans, deliverables and full metric suite in the Forward Plan pages of our website ¹⁶. We welcome feedback on our performance reporting to box.soincentives.electricity@nationalgrideso.com

¹⁶ <https://www.nationalgrideso.com/our-strategy/forward-plan>

A. Role 1 Control Centre Operations

A.1 Role 1 Outturn performance measures and commentary

This section reports our performance against the Role 1 metrics set out in the Forward Plan Addendum.

1A Balancing cost management

December 2020 Performance

The approach we use for measuring our Balancing Costs performance is based on a linear trend in a five-year rolling mean, based on annual Balancing Services Costs (excluding Black Start). In order to meaningfully employ a linear trend, the data points need to handle one-off permanent changes to the system network which would not be captured by the five-year trend. So far, the only change modelled in this way has been the Western Link. We also make adjustments for significant events which we expect to have an impact on balancing costs, whether this is an upwards or downwards adjustment. These are trends which we would not expect to be captured in the 5-year rolling average, because they relate to either new assets or new trends in market behaviour. Additional information regarding balancing costs calculation and benchmark adjustment can be found on our website¹⁷.

Low demand periods are challenging to manage, and the volume of actions required by the ESO to ensure the system remains secure lead to higher costs. During the period where demand is impacted by the COVID-19 pandemic, the ESO's balancing costs spend is expected to be significantly higher than the benchmarks stated here. During this period, we will continue to report our performance in comparison to the benchmark but will focus on providing a detailed narrative which explains the costs we have incurred. We also welcome Ofgem's review of costs incurred over the summer period and will be as transparent as possible with our stakeholders about the actions we have taken.

Please note that the benchmarks were re-calculated in July 2020 to remove the ElecLink adjustor since the interconnector go-live date has been delayed.

	Apr	May	Jun	Jul	Aug	Sep
Benchmark cost (£m)	67.0	48.2	82.6	65.5	102.0	103.7
Additional cost forecast due to WHVDC fault (£m)	0	0	0	0	0	0
Benchmark adjusted for WHVDC (£m)	67.0	48.2	82.6	65.5	102.0	103.7
Outturn cost (£m)	122.4	159.1	135.6	136.0	117.7	135.6
Status						

Table 2: Apr-Sep 2020 Monthly balancing cost benchmark and outturn.

	Oct	Nov	Dec	Jan	Feb	Mar	Total
Benchmark cost (£m)	126.9	82.8	126.6	133.2	142.5	118.3	1199.3

¹⁷ <https://www.nationalgrideso.com/document/166231/download>

Additional cost forecast due to WHVDC fault (£m)	0	0	0	0	0	0	0
Benchmark adjusted for WHVDC (£m)	126.9	82.8	126.6	133.2	142.5	118.3	1199.3
Outturn cost (£m)	142.4	197.4	161.0				1307.2 [YTD]
Status							

Table 3: Oct-Mar 2020-21 Monthly balancing cost benchmark and outturn.

Supporting information

Balancing costs for December were significantly below November, but remained above the benchmark. System operation continued to be challenging and this was reflected in the balancing spend.

Constraints costs were reduced from November with most outages returned to service in the early weeks of December increasing the boundary capacity across the pinch points of the network. High wind levels for large periods of the month meant that some constraints remained active despite being intact, particularly in Northern England and Scotland. Optimisations were used to maximise boundary capacities in the short term.

Periods of tight margins in early December were another key contributing factor to the increased balancing spend. The average margin price for December was over £70/MWh, with increases in reserve and response costs driven by high market prices in periods where energy capacity was scarce.

Performance benchmarks

- **Exceeding expectations:** at least 10% lower than the figure implied by the benchmark.
- **Meeting expectations:** within 10% of the figure implied by the benchmark.
- **Below expectations:** at least 10% higher than the figure implied by the benchmark.

1B Energy forecasting accuracy

December 2020 Demand Forecasting Performance

As outlined in the Forward Plan Role 1 Energy Forecasting Accuracy metric (Metric 1b), the ESO's forecasting performance will be assessed at the end of the performance year. Annual performance targets have been calculated with exceeding, in-line with and below expectations values set out. To allow transparency of our performance during the year, each month we will report an indicative performance for both metrics.

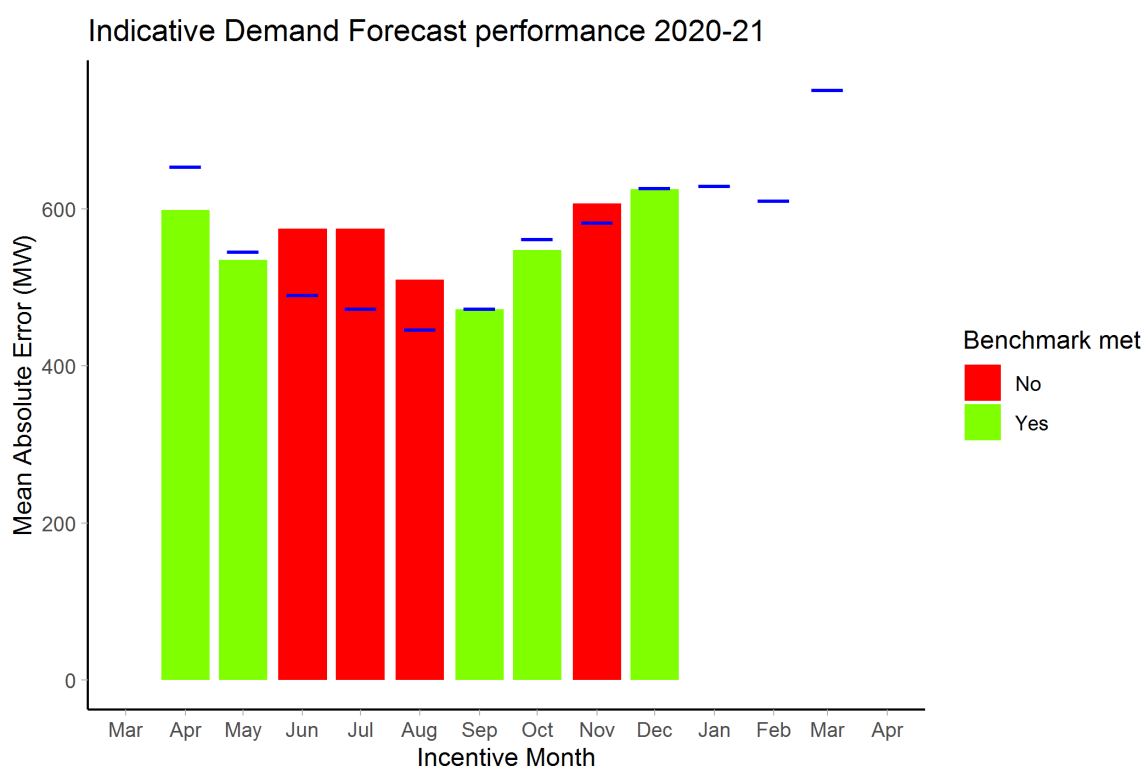


Figure 1: Demand Forecasting , shows our performance for April as the green histogram against the blue target line.

Day ahead demand forecast benchmarks for financial year 2020-21

Month	Benchmark (MW)	Month	Benchmark (MW)
April	654	October	562
May	546	November	583
June	491	December	627
July	473	January	630
August	447	February	611
September	473	March	752

Table 4: Demand Forecasting Benchmarks

Supporting information

DA Demand Indicative Performance for December: 625MW

In December 2020, our day ahead demand forecast indicative performance was within the benchmark of 627MW. December's MMAE (monthly mean absolute error) was 625MW.

Demand forecasting in December was challenging due to a number of factors. The country moved from a National lockdown back into a 3-tiered COVID-19 restriction system, and then back into a more restrictive 4-tier system in late December. These restrictions overlapped with the Christmas period, which in normal times is already one of the most difficult times of the year to forecast demand, due to the differing days of the week on which the Christmas period falls. Further to this, post event triad avoidance estimation shows that the levels of suppression over the darkness peak (DP) are smaller this year compared to previous years. In December volumes of triad avoidance were over-forecasted. The combination of these factors led to significant challenges for demand forecasting, however despite these challenges our MMAE remained within target.

During December, the Christmas period from the 24th to the 31st recorded the highest overall forecast errors during the month. This is consistent with previous years, however outturns also showed a tendency to be higher on average than forecast during this period. This may be due in part to an underestimate of the additional electricity drawn by the greater number of individual households during the Tier 4 restrictions. The Tier 4 restrictions, which affected all sectors of the economy and gradually spread to larger areas of the country, included restrictions on household mixing, which could have contributed to a larger overall level of electricity consumption than forecast.

The time points of the largest absolute errors during the Christmas period were observed to be at the afternoon trough (3B) as well as the darkness peak (DP).

DA Demand Indicative Performance in Q3

Demand forecasting in Q3 has been challenging due to several factors, including COVID-19 regional tiers and lockdowns, changes to the Government rules over the festive period and the Triad season. However, despite these challenges, the mean absolute error was within target for 2 out of the 3 months this quarter.

After 9 months of the scheme, the latest day ahead demand mean absolute error is 560MW. The annual benchmark is 571MW, therefore the performance to date is **in line with expectations** (within 5% of the benchmark).

In October, the country was subject to differing levels of local lockdowns due to the implementation of the 3-tiered COVID-19 restriction system, which was rolled out in phases. In November, demand forecasting was tested due to the country moving into another national lockdown which was different in its nature compared to the first one. The main difference was that educational establishments remained open. This introduced another layer of uncertainty in relation to the demand suppression levels during the second lockdown. Insight from the first lockdown was not directly transferrable as the majority, all but five days, of the first lockdown was in British Summer Time (BST) when demand consumption patterns are different to the ones in late autumn and winter.

Additionally, November is the first month of the 2020-21 Triad season. It was uncertain how COVID-19 impacted demand levels, and what changes to the Embedded Benefits would alter the Triad avoidance volumes and/or historical Triad "behaviour". The experience to date shows that the avoidance level is lower than in previous years (max estimated avoidance level stands at

1.5GW) and that it can occur over a tighter time window, e.g. two Settlement Periods (SP) rather than the typical four to five SPs.

December 2020 Wind Generation Performance

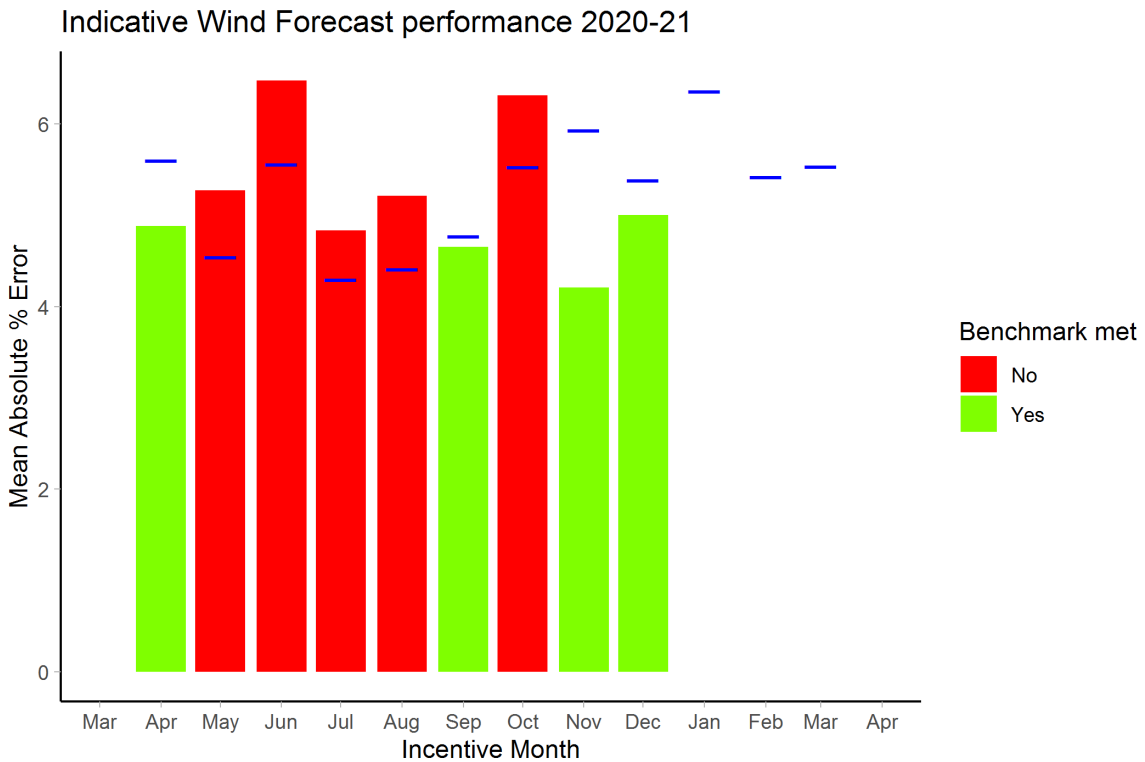


Figure 2 shows our performance this month as the green histogram, against the blue monthly target.

BMU wind generation forecast benchmarks for financial year 2020-21

Month	Benchmark (%)	Month	Benchmark (%)
April	5.60	October	5.53
May	4.54	November	5.93
June	5.56	December	5.38
July	4.29	January	6.36
August	4.41	February	5.42
September	4.77	March	5.54

Table 5: Wind Forecasting Benchmarks

Supporting information

DA Wind Indicative Performance: 5% MMAPE

In December 2020, our day ahead wind forecast indicative performance was within the MMAPE (monthly mean absolute percentage error) target of 5.38%. December's MAPE (mean absolute percentage error) achieved was 5%.

Overall forecasting performance in December was good, with only 2 settlement periods scoring errors greater than 20%. In the first week of the month, on 4 December, a complex weather system with two low pressure areas passed across the UK. This was not well resolved by the weather models, and resulted in percentage errors of 16%. Storm Bella moved over the UK in the last week of December. It brought squally rain showers and turbulent wind conditions. Negative electricity prices only occurred on 27 December for a period of 4 hours. It is not thought that this had an impact on Wind Power forecasting accuracy.

DA Wind Indicative Performance in Q3

Performance of wind forecasting in Q3 was within target for two out of the three months this quarter. After 9 months of the scheme, the latest day ahead wind absolute percentage error is 5.20%. The annual benchmark is 5.27%, therefore the performance to date is **in line with expectations** (within 5% of the benchmark).

Q3 coincides with the seasonal transition from autumn to winter, and can bring with it turbulent weather conditions. The main occurrences of wind power forecasting error are normally caused by named storms passing over the UK. During Q3 there were several named storms: Alex, Barbara and Aiden in October, Zeta in November and Bella in December. In each case small errors in the forecasted path, intensity and shape of the storm system results in large differences in wind speed at the locations of wind farms. This is an aspect on which we are continually working with the Met Office, to improve both the accuracy of forecasts, and the appreciation of the uncertainty that these weather systems bring to our power system.

Throughout the Q3 period we have been working to refine our wind power models using the most recent historical data. This is particularly important for wind farms that are under construction, where the capability and behaviour of a wind farm at the start of the construction period is very different to a wind farm that has completed the construction phase.

Performance benchmarks

- **Exceeding expectations:** Error which is at least 5% lower than the benchmark
- **Meeting expectations:** Error which is within 5% of the benchmark
- **Below expectations:** Error which is at least 5% higher than the benchmark

1C Security of Supply

December 2020 Performance

Quality of service delivered in running the electricity network by providing the number of reportable voltage and frequency excursions that occurred during the previous month, and a total for the year to date.

	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Voltage excursions	0	0	0	0	0	0	0	0	0			
Frequency excursions	0	0	0	0	0	0	0	0	0			

Table 6: voltage and frequency excursions over 2020-21

Supporting information

There were no reportable voltage and frequency excursions between October – December 2020. Our performance was therefore exceeding expectations in Q3.

Performance benchmarks

- **Exceeding expectations:** 0 excursions for both voltage and frequency over 2020-21
- **Meeting expectations:** 1 excursion for either voltage or frequency over 2020-21
- **Below expectations:** More than 2 excursions in total over 2020-21

1D System Access Management

Publishing this metric encourages the ESO to investigate the causes of outage cancellations and amend processes where appropriate to prevent a repeat. We will ensure that we seek to minimise costs across the whole system and all timescales when making a decision to recall or delay an outage on the transmission system.

December 2020 Performance

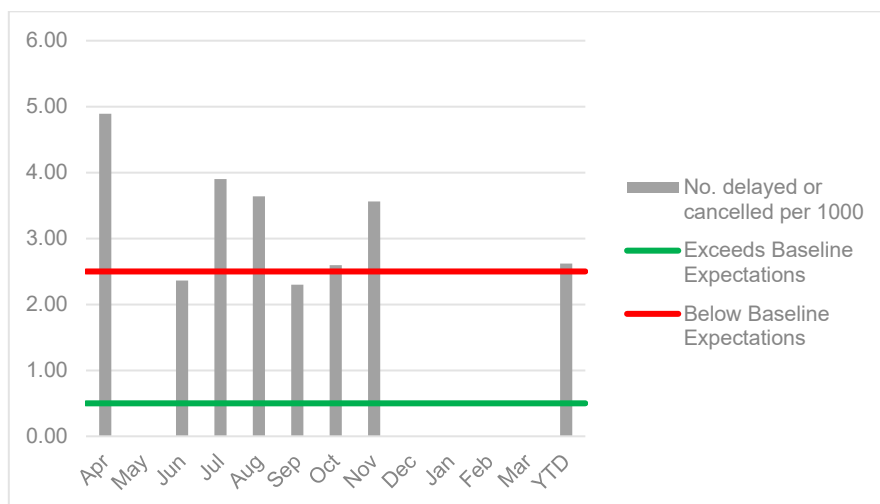


Figure 3: Number of outages delayed by > 1 hour, or cancelled, per 1000 outages

	Number of outages	Outages delayed/cancelled	Number of outages delayed or cancelled per 1000 outages
Apr	409	2	4.89
May	629	0	0
Jun	847	2	2.36
July	769	3	3.90
Aug	824	3	3.64
Sep	870	2	2.3
Oct	770	2	2.60
Nov	842	3	3.56
Dec	524	0	0
Jan			
Feb			
YTD	6484	17	2.62

Table 7: Number of outages delayed by > 1 hour, or cancelled, per 1000 outages

Supporting information

For Q3, the ESO has been able to successfully release 2136 outages with only five cancellations or delays occurring. At the end of Q3, the number of cancellations or delays per 1000 outages is 2.62, which is trending towards the 'Meets Expectation' target of 2.50. Compared with the 2019-20 performance for Q3, this is higher than the 2.43 cancellations or delays per 1000 outages where there was only one event in Q3. The five cancellations or delays were caused by four events in 2020-21.

The first event causing two cancellations or delays occurred in October due to a discrepancy between two databases which had circuit ratings identified by the control room. System conditions on the day identified pre-fault overloading on nearby circuits, and there was uncertainty which database rating system was correct. The ESO made the decision to re-study the outage to ensure there would be no pre-fault overloads and to avoid restricting generation without full analysis. Following an investigation, it was identified that there were new ratings that were not transferred to the other database due to a script error. This has been amended and the process has been reviewed.

The second event occurred in November and was due to an outage identified by the control room which would have caused post-fault generation instability. The outage was aligned with a planned generator shutdown and therefore stability was not considered within planning timescales, as it would have been disconnected from the transmission network. The planned generator shutdown was changed to start at midday the day before the outage was due which was not picked up by planning. Stability was considered by the control room, but following release of the outage it was identified that post-fault generator instability could occur overnight under specific system conditions for voltage management. An Operational Learning Note (OLN) was written which captured the need for further checks when there has been an Electricity Margin Notice issued, which may impact a generator's planned shutdown.

The third event was in November and was a result of a DNO not being agreeable to releasing a Super Grid Transformer (SGT) for switching time to allow the switch out of a circuit. The planning engineer had been liaising with the DNO throughout the week and the request was to be sent officially following completion of our internal outage sanctioning process. As a result, it was believed this outage would be acceptable to the DNO and was sent late afternoon on a Friday. The outage was rejected out-of-hours and was unable to be picked up until Monday morning when it was too late. An OLN was written with corrective measures include determining a cut-off time with the DNO of whether an outage will proceed or not and carefully checking the DNO programme for ESO impacted outages.

The final event for Q3 was in November of which it was identified an unacceptable risk to demand missed by both our planning team and the TO. A maintenance outage was planned at year ahead and embedded within a TO project at this substation to help reduce constraint costs. The project experienced knock-on delays earlier in the year and, as a result, the maintenance was re-sequenced to a different stage of the project and overlapped with another outage that would have put a sensitive demand group at risk to a single SGT fault. This was missed in our planning due to excessive workload in delivery timescales, and the directly connected customers had not been notified. The outage did not proceed and was supported by the TO when made aware of the issue. An OLN was written to identify several corrective measures, and has been shared with the planning teams.

Performance benchmarks

- **Exceeding expectations:** < 1 outage cancellations per 1,000 outages

- **Meeting expectations:** 1 - 2.5 outage cancellations per 1,000 outages
- **Below expectations:** > 2.5 outage cancellations per 1,000 outages

1E Customer Value Opportunities

October – December 2020 Performance

The TOs need access to their assets to upgrade, fix and maintain the equipment. They request this access from the ESO, and we then plan and coordinate this access. This metric will sharpen our focus on creating and capturing added value for the customers and stakeholders as part of the network access process.

We will look for ways to minimise the impact of outages on energy flow and reduce the length of time generation is unable to export power into the network. We will measure the outcome of the metric in terms of avoided MWh lost (or constrained 'off').

This work can benefit end consumers if we spend less managing system constraints and can benefit connected customers (e.g. generators) if the volume of MW and/or duration they are constrained off is reduced (particularly if they have non-firm connections agreements). There are indirect benefits to the end consumer as a result of the direct customer benefits, for example the less time a wind generator is constrained off then the less time it is being prevented from providing low-carbon energy to the system. Another indirect consumer benefit of minimising constrained generation is that it reduces the impact on market liquidity and competition.

Ofgem’s Formal Opinion feedback indicated that some of our metric benchmarks should be more ambitious. We have reviewed the feedback provided by Ofgem and made changes to our benchmarks for this metric to take account of last year’s performance and make the benchmarks more challenging.

The total outturn customer value created from both direct and indirect savings in 2019-20 was 11,518 GWh. We add a 10% increment of 11,518 GWh to work out our baseline of 12,500 GWh. We further stretched this target to 15,000GWh as the benchmark for exceeding expectations.

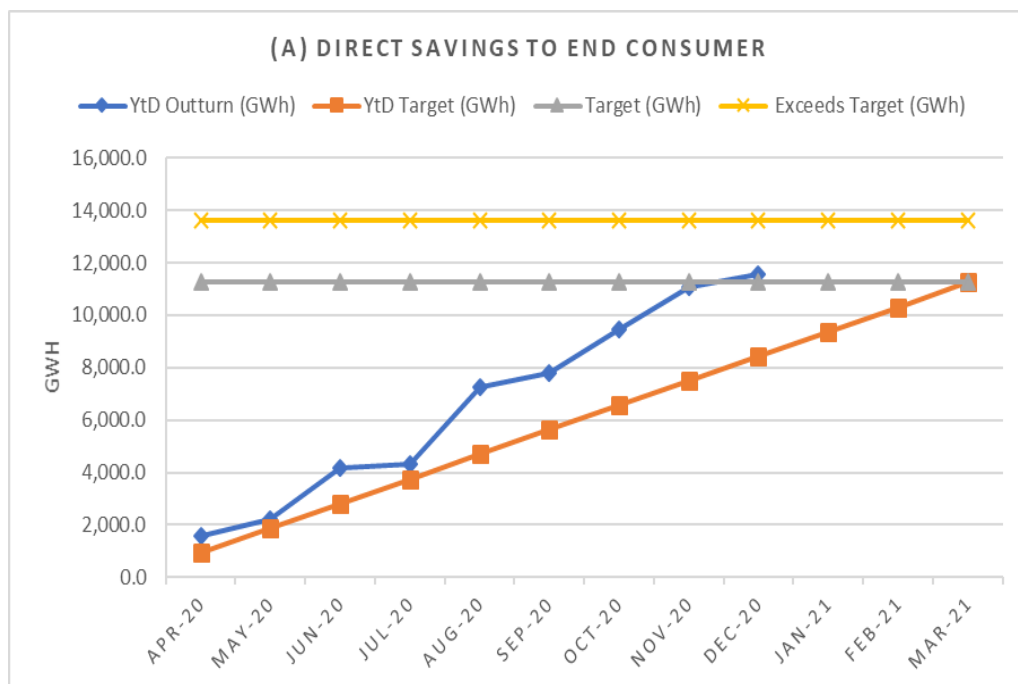


Figure 4: Direct Savings to End Consumer

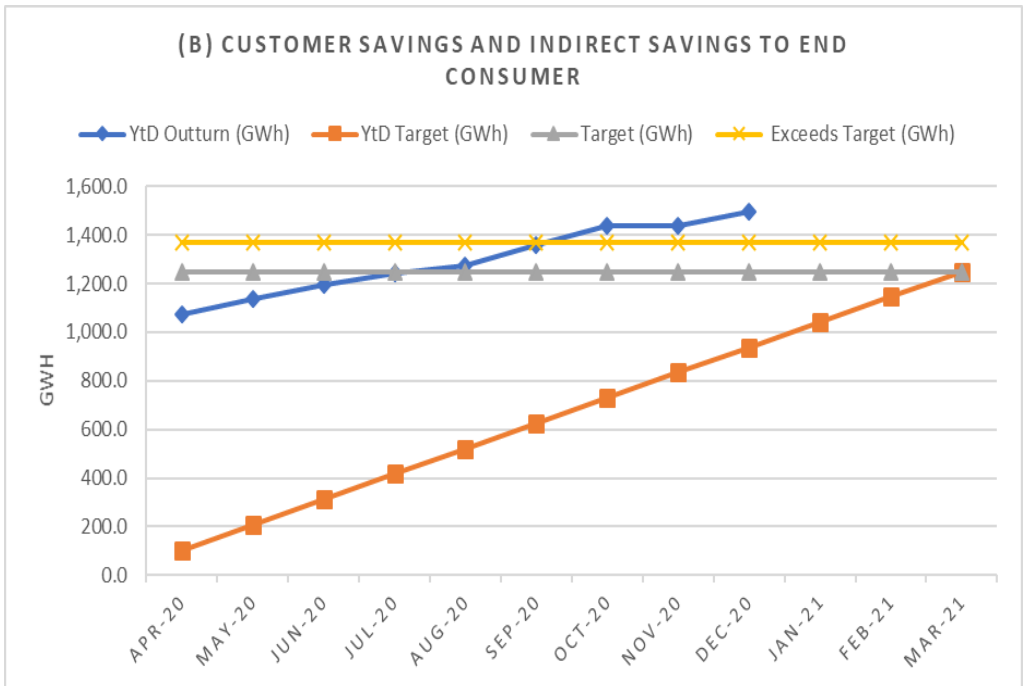


Figure 5: Customer Savings and Indirect Savings to End Consumer

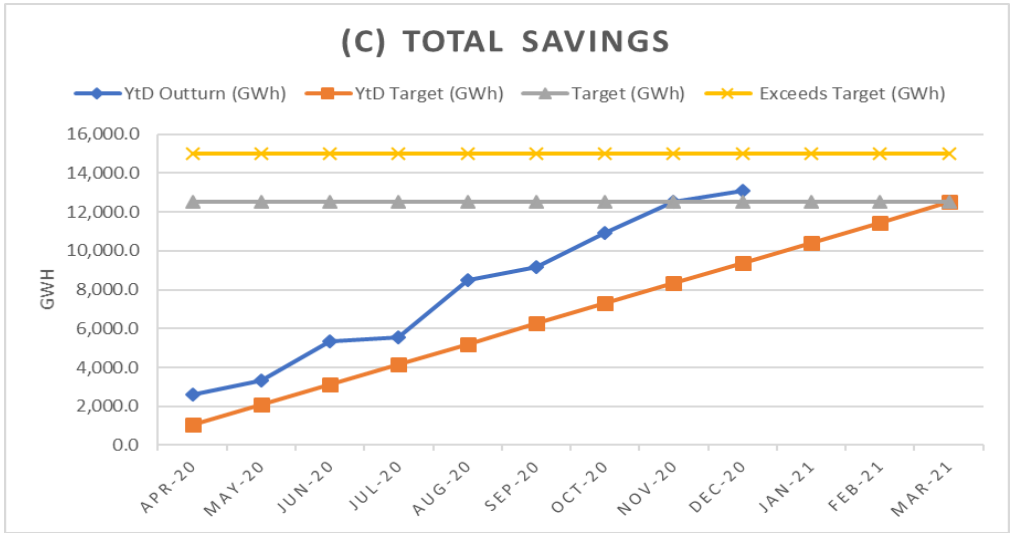


Figure 6: Total Customer and End Consumer Savings

Supporting information

Following Network Access Planning's (NAP) success with the Customer Value Opportunities metric in the first half of 2020, all teams in NAP have continued to improve and find more innovative ways of planning system access to deliver savings and benefit to the end consumer. The NAP team has made excellent progress this quarter, we are currently exceeding our metric target for direct savings to the end consumer (fig. A) and the indirect savings to the end consumer (fig. B). In total, we are in line with the metric benchmark (fig. C). We aim to continue this trend to enable us to reach our stretch target in the next quarter.

At the end of the quarter, the NAP team in collaboration with our stakeholders (TOs and DNOs) identified and recorded over 140 instances (30% increase from last year) where its actions directly resulted in adding value to the end consumer, and its innovative ways of working facilitated increased generation capacity to the connected customers.

For end consumers, this represents 11,683,748 MWh of direct savings and 1,496,020 MWh of indirect savings. In total, we have released 13,179,768 MWh (worth approximately £829m) of extra generation capacity, which would have otherwise been constrained at a cost to the consumer¹⁸.

Performance benchmarks

Total Savings:

- **Exceeding expectations:** Greater than 15,000GWh
- **Meeting expectations:** Total savings between 12,500GWh and 15,000GWh
- **Below expectations:** Less than 12,500GWh

Direct savings to end consumer:

- **Exceeding expectations:** Greater than 13,630 GWh
- **Meeting expectations:** Between 11,250 GWh and 13,630 GWh
- **Below expectations:** Less than 11,250 GWh

Customer savings and indirect savings to the end consumer:

- **Exceeding expectations:** Greater than 1,370 GWh
- **Meeting expectations:** Between 1,250 GWh and 1,370 GWh
- **Below expectations:** Less than 1,250 GWh

¹⁸ We used average values of £78/MWh for wind and £55/MWh for other generation to estimate the cost.

1F CNI System Reliability

October – December 2020 Performance

This is a Performance Indicator to report on unplanned outage minutes, for a subset of the CNI (Critical National Infrastructure) systems, as an indicator of our control system performance. Reporting this on a quarterly basis allows us to establish a suitable benchmark level, ahead of RIIO-2 where it could be used as a metric to measure our performance.

Unplanned CNI System Outages (mins)				
	Q1*	Q2	Q3	Q4
Balancing Mechanism (BM)	0	7	0	
Integrated Energy Management System (IEMS)	10	40	20	

Table 8: Unplanned CNI System Outages

Supporting information

In the first three quarters of this financial year, the BM has experienced 7 minutes of unplanned outages, and the IEMS has experienced 70 minutes of unplanned outages.

In Q1, we had a total outage time of 10 minutes consisting of 1 outage across the systems. In Q2, we had a total outage time of 47 minutes, consisting of 3 outages across the systems. In Q3, we had a total outage time of 20 minutes, consisting of 2 outages across the systems.

In all cases, appropriate measures have been implemented to help monitor the systems and prevent reoccurrence

**Note: Q1 times have been reviewed and revised. Some time reported as outage was found to be a loss of performance or functionality, and not a system outage.*

A.2 Role 1 Deliverables

This section reports on our performance against the deliverable descriptions and dates set out in the Forward Plan Addendum.

October – December 2020 Performance

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Upgrade of information systems			
Widen access to API (Application Programming Interface) System	Q1-Q2 2020-21	Target date met	<p>API Go-Live occurred on 17 September 2020</p> <p>The scaling requirement is an ongoing process to allow a wider range of connections for market participants.</p> <p>The Communication Standard which defines the capacity limits needs to go to the Grid Code panel for approval. Code changes are being progressed to allow for a wider range of connection options.</p>
Expand dispatch facility to handle a large number of small Balancing Mechanism Units, subject to market take-up	Q1-Q4 2020-21	On track	<p>There have been three Virtual Lead Party (VLP) connections. In total, we are in conversations with 24 participants who would like to use the VLP route.</p> <p>We are continuing to ensure our existing systems can handle the future pipeline of new participants.</p> <p>As part of the activities building towards RIIO-2 we are gaining an in depth understanding of the requirements to replace our existing systems to ensure these are adaptable and compatible with the transformation for carbon free operation in 2025. This will ensure efficient IT CAPEX spend across the portfolio of IT work and avoid regret spend. An extensive planning exercise to deliver this transformation is currently underway. In the meantime, we will continue with incremental development, in line with operational requirements.</p>
Interconnector programmes	Ongoing	Ongoing	<p>IT programmes for new interconnectors are progressing in line with interconnectors' expectations. Net Transfer Capacity (NTC) consultation work is ongoing with the interconnector participants, this should be complete by end of 2020-21. Industry engagement on 2025 roadmap is set up in line with stakeholder expectations.</p>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Significant upgrading of IT systems to prepare for European Network Codes	Q3 2020-21	Ongoing	In our open letter of 4 September 2020, we explained we had put the Project Trans European Replacement Reserve Exchange (TERRE) programme on hold until there was greater legal certainty around the UK's access to EU balancing platforms. In November, following Ofgem's open letter, we convened the GB TERRE Implementation Group to bring together interested stakeholders including the ESO, Elexon, interconnectors, market participants, BEIS and Ofgem to discuss TERRE implementation going forward. During November and December 2020, the group devised credible scenarios based on the possibilities for the UK's access to EU balancing platforms, and the ESO presented high-level implementations plans based on these. The UK-EU Trade and Cooperation Agreement (TCA) that was agreed at the end of 2020 suggests the UK will not have access to EU balancing platforms. This is aligned to one of the scenarios we created, which also includes exploring the costs and benefits of a TERRE-like mechanism operating in standalone mode in GB - that is, without cross-border participation. We are currently working with the group to understand how a cost-benefit analysis could be conducted, the level of effort required across industry and whether there is appetite to proceed. As part of our commitment to transparency all material from the group meetings is available on the ESO's website. ¹⁹
Frequency and Time Equipment version 3 (FATE-3) Project	Q4 2020-21	On track	The FATE-3 project has a dependency on new phasor data infrastructure and establishing a connection to Scottish Power Transmission. Our Inertia Monitoring projects also require this, so we have adjusted the timing of the FATE-3 project such that it will be delivered in line with when the new infrastructure is available to use. The new timing also aligns with the availability of new data centres, hence optimises code development for FATE-3.
PI gateway refresh	Q2 2021-22	On track	The PI Gateway project has completed software development with our software

¹⁹ <https://www.nationalgrideso.com/industry-information/balancing-services/reserve-services/replacement-reserve-rr?overview>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			supplier and has all test environments in place.
Platform for Energy Forecasting (PEF)	Q1-Q4 2020-21	On track	New version of Strategic Roadmap published on 25 June 2020 ²⁰ . 2-14 DA Demand Forecast being published on the Data Portal ²¹ as of 23 September 2020.
Technology Advisory Council (formerly Design Authority)	Q3 2020-21	Target date met	We held our first Technology Advisory Council meeting on 18 December 2020. Members are from a diverse range of organisations. We engaged the ESO RIIO-2 Stakeholder Group (ERSG) to seek their feedback on the remit of the group. This includes representatives from energy networks, market participants and service providers, technology and transformation experts and academia. The agenda and minutes from the first meeting will be published on our website.
Improving information access	Q4 2020-21 - Q4 2025-26	On track	The timescales we are working to are: <ul style="list-style-type: none"> • Digital and Data Strategies were delivered in December 2020 • Data Roadmap and Investment Plan – Q4 2020-21 • A draft Data and Analytics Systems Architecture has been developed and will be further refined by Q4 2020-21
Transmission Outages, Generation Availability (TOGA) replacement	Q3 2020-21	Q4 2020-21	Our original proposal was to implement a full electricity Network Access Management System (eNAMS) solution by 30 November 2020. Throughout October 2020 the Agile project has carried out a deep-dive analysis on Minimum Viable Product (MVP) Deliverability & Status to conclude that go-live with full eNAMS functionality is not possible for the following reasons: <ul style="list-style-type: none"> • As part of on-going refinement of stakeholder requirements, the project has identified new "user stories" which require further development; • User acceptance test has taken longer than planned due to the complexity of the system and users' availability. The project has undertaken a re-planning exercise and concluded a phased release

²⁰ <https://data.nationalgrideso.com/backend/dataset/b290ba7c-8076-4122-9e83-de723e1e5425/resource/6573bd88-c17c-41d8-b4d1-6ae89d796e40/download/ngeso-pef-energy-forecasting-strategic-roadmap-june-2020-update.pdf>

²¹ <https://data.nationalgrideso.com/demand/2-14-days-ahead-national-demand-forecast>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			<p>approach in order to mitigate the risk associated with a big-bang release.</p> <p>Key dates for the phased eNAMS releases are:</p> <ul style="list-style-type: none"> • w/c 30 November - Pilot release of some eNAMS functions; (Pilot release completed on 9 December) • w/c 1 February 2021 - soft release of eNAMS; • w/c 22 February 2021 - Final release of eNAMS and Go-Live <p>Build is in progress for the Generator Availability & Margin Analysis (eGAMA) System. Due to the complex nature of the solution and delays in industry engagement, and to avoid non-compliance with the Grid Code change associated with this change, the project team has proposed a revised go-live date of 18 March 2021. This revised date has been agreed and approved by Elexon and is awaiting approval by both the BSC and Grid Code panels.</p>

Transparency of data used by our ENCC in our close-to-real-time decision making

More clarity of operational decision making	Q2-Q4 2020-21	On track	<p>Machine readable version of the System Operating Plan (SOP) went live on 30 September 2020.</p> <p>The Super Stable Export Limit (SEL) tool has been created and publication has gone live. P399 will feed into this deliverable. A Trading transparency webinar was held and feedback from this has been reviewed.</p> <p>Industry were updated at the Ops Forum in November and a further update was provided at the Operational Transparency Forum on 9 December. We have now started to publish our historic trades between 2015 and November 2020, Interconnector (IC) requirements and auction results, and balancing services contract enactment data.</p> <p>We intend to start publishing skip rate (now referred to as Despatch Transparency) data and a supporting methodology under our Forward Plan deliverable "Data to support better understanding our dispatch decisions". Our plan is to publish Dispatch Transparency data by the end of Q4 2020-21, but in advance of this, we will be engaging with industry about the format of the published data and methodology used to acquire this data. We are regularly presenting at the ESO Operational Forum on this topic and plan to engage further with market through the ESO Operational Transparency Forums. The</p>
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Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			<p>methodology is due to be shared by the end of January 2021.</p> <p>The Dispatch Transparency publication will provide details on the reasons actions were taken out of price merit, which will therefore support understanding system needs and how the market operates.</p> <p>Weekly Electricity Operational Transparency Forums are being held to improve the transparency of operational decision making and increase stakeholder engagement virtually under the COVID-19 pandemic.</p>
Publishing the BMU ID for trades	Dependent on P399 code change	Ongoing	<p>This is being covered by the P399 modification, and impacts all cash out files such as Trading, Non-BM Short Term Operating Reserve (N-BM STOR), and Non-BM Fast Reserve (N-BM FR).</p> <p>The modification went back out for consultation on 8 December 2020, and responses due by 22 December. The responses and the Draft Modification report were presented to the Modification Panel on 14 January 2021.</p> <p>An Ofgem decision is expected in March, and the deadline to have the change implemented is November 2021.</p> <p>Recommendation from the Balancing and Settlement Code (BSC) panel is that the party IDs are not published prior to the BSC change which is likely to be in November 2021.</p>
Support access for Intermittent Generation			
Deliver Power Available integration phase 1	Q1 2020-21	Target date met	Power Available (PA) phase 1 has been completed.
Deliver second phase of Power Available integration	Q3 2020-21	Q4 2020-21	<p>In order to provide industry with a view of how balancing service frameworks will evolve, we are producing a “wider strategy for flexibility from intermittent generation” mini-report as part of our 2019-21 Forward Plan commitments. The strategy will cover current opportunities for intermittent generation and focus on opportunities for wind.</p> <p>Delays in implementing Phase 1 have caused a knock-on impact to the delivery of Phase 2. Phase 2 delivery has been impacted by the change pipeline in the Balancing Mechanism (BM) and is expected to be delivered in Q4 2020-21.</p>
Implement State of Energy signal	Q3 2021-22	On track	Project will build upon Power Available, and the impact analysis has been delayed as a result of COVID-19, hence any delays to

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			Power Available will have a knock on effect. Impact Assessment will commence in Q4 2020-21 with go-live in Q3 2021-22.
Whole system operability			
Inertia measurement	Q2 2020-21 (first supplier)	Target date met	<p>The first supplier GE's inertia metering system is live and has been demonstrated using test data. The TOs are working to provide live BMU data which will allow us to further tune and operate the system. An additional delay with comms issues within the TO is delaying the first region (Scotland) although it is anticipated that data will be available by the end of January 2021 and inertia monitoring to being available by March 2021 for Scotland.</p> <p>Interfaces for the data required for GE Inertia forecasting have been tested and data is being made available to the Forecasting system. The data is being validated and will enable the Inertia Forecasting machine learning algorithm to start training, enabling Inertia Forecasting to go live in April 2021.</p> <p>As the new tools are embedded, we will evaluate them against our existing techniques: this will allow us to assess the benefit of the new tools.</p> <p>Second supplier, Reactive Technologies' system is planned to go live in August 2021 (Q2 2021-22) following a slightly longer than planned tender process for the modulator. Work started on the modulator design and build along with site works.</p>
	Q1 2021-22 (second supplier)	Q2 2021-22	
Product Roadmap for Restoration implementation			
Deliver competitively tendered black start contracts	Q1-Q2 2021-22	On track	<p>South West/Midlands tender: On Monday 9 November we announced contracts with six providers for Black Start services. The six contracts, five of which are new, total £84 million with each bid offering commercial benefits compared to other bidders and Black Start options.</p> <p>Historically - dates for tender reviewed with participants in light of COVID-19, amendments made to procurement timelines and service commencement date. Early delivery has been incentivised.</p> <p>Northern tender: Procurement timeline amended following consultation with providers. This may impact on commencement dates for contracts. The revised contract award date is 20 April 2021 (delayed due to COVID-19 and following a consultation with all Tender Participants).</p>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			South East: On track - We have received internal approval for our strategic approach for the South East tender and shared our plans with Ofgem in our August monthly catch up. Work due to start in Q2 2021-22.
Electricity Operational Forum and stakeholder engagement			
Electricity Operational Forum	Changed format and delivered throughout the year.	On track	Weekly ENCC webinars are being held to maintain stakeholder engagement while social distancing measures are in place and have been well received by industry. An online version of the Operational Forum was held in November.
ENCC visit days	Changed format and delivered throughout the year.	On track	Weekly ENCC webinars are being held to maintain stakeholder engagement while social distancing measures are in place

A.3 Role 1 Notable events

Technology Advisory Council

On Friday 18 December 2020 we launched the Technology Advisory Council, previously referred to as Design Authority, along with stakeholder representation from networks, markets, technology companies, academia and consumer groups. This advisory group will shape the ESO digital strategy and provide input and accountability into the delivery of our RII0-2 plans, including our Balancing and Network Control transformations and markets ambitions.

Electricity National Control Centre (ENCC) Transparency Roadmap

On Thursday 10 December 2020 we published our ENCC transparency roadmap²² which details the steps being taken to increase the transparency of our operational decision making and the data flows used to inform those decisions. It highlights the data we plan to share with our stakeholders, when and how.

New record high for wind output

On Friday 18 December 2020 the ESO reported a new record high for wind output. Wind generation reached 17.3GW between 1pm-1.30pm on the day, beating the previous record of 17.1GW set on 2 January 2020 owing to windy weather conditions. New wind capacity has continued to commission under the Contracts for Difference scheme throughout 2020.

²² <https://www.nationalgrideso.com/document/182566/download>

B. Role 2 Market development and transactions

B.1 Role 2 Outturn performance measures and commentary

This section reports our performance against the Role 2 metrics set out in the Forward Plan Addendum.

2A Reform of Balancing Services Markets

October – December 2020 Performance

This metric encourages us to provide a high-quality service to our stakeholders as well as visibility, transparency and engagement. The reform of balancing services markets should increase competition and lower prices.

Performance is measured using metrics such as total spend and total volume procured. Where possible, we will look to include average market price paid. The measures will be by service area rather than individual market. The data for each measure is split into two categories: competitively procured or competitive bilateral.

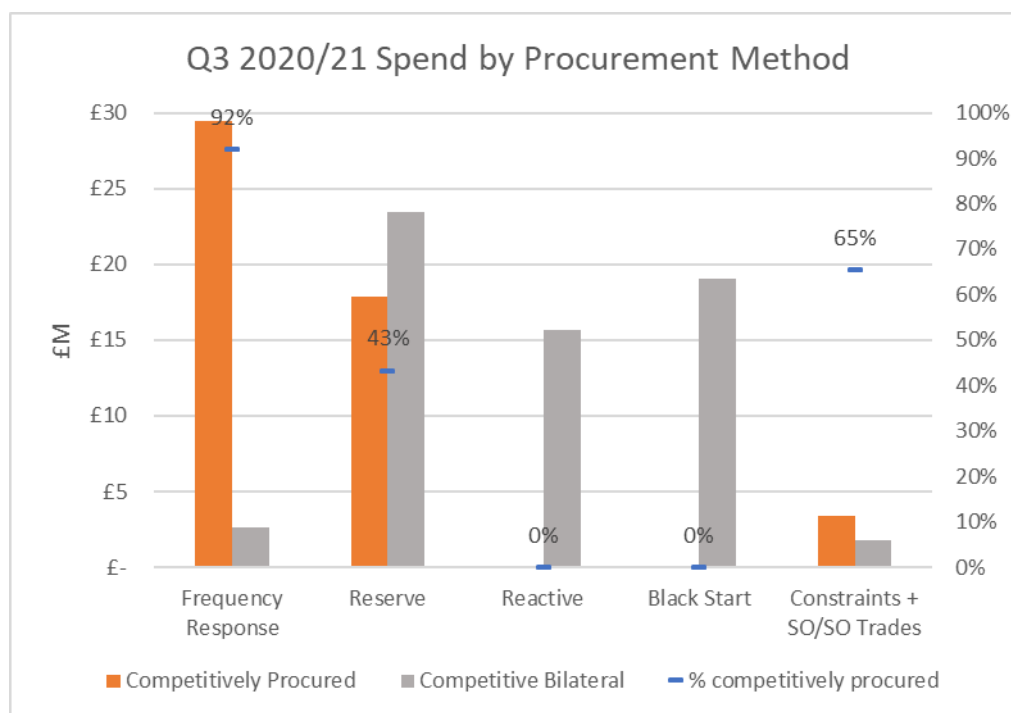


Figure 6: Cumulative spend on services per procurement category in £millions

Service	2019-20 %	Target % for 2020-21	Actual % for Q3 2020-21	Performance
Frequency Response	81%	85%	92%	●
Reserve	43%	55%	43%	●

Reactive	0%	5%	0%	●
Black start	0%	10%	0%	●
Constraints	0%	10%	65%	●

Table 9: Percentage of total spend, and total volume procured through open and competitive market

Supporting information

Frequency response – Meeting expectations for Q3. Over the quarter we have seen several changes to the frequency response markets which have affected the amount spent. Notably, we have removed the unit and volume caps in the auction trial, and also launched the first of our new suite of frequency response products (Dynamic Containment, DC), both of which have resulted in increased spend in competitive markets. The introduction of DC also resulted in a higher clearing price for dynamic response in the auction trial, as some participants moved into the new market.

Average clearing price £/MW/h (weekly auction trial):

	Q1	Q2	Q3
Dynamic	6.29	5.84	8.76
Static	5.30	4.10	4.12

Average clearing price £/MW/h (Dynamic Containment):

Q3
17.0

Reserve – Below expectations for Q3. We have seen a small increase in spend on competitive markets in Q3, but otherwise a similar pattern to the rest of 2020-21.

Average market prices: Whilst the STOR and Fast Reserve markets are suspended, there are no average market prices available. For optional Fast Reserve instructed within day, average utilisation price is:

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
£/MWh	84	57	51	48	48	64	67	72	84

Reactive – Below expectations for Q3. We ran the first round of industry engagement on the future of reactive power in December 2020 to capture feedback to further analyse the gaps and co-create the solution with industry.

Black start – Below expectations for Q3. Following the Expression of Interest (EOI) that was launched in February 2019 for services in the SW & Midlands, we launched a second competitive event with an EOI in August 2019 for services in the Northern Region. We are intending to develop the market approach further and plan to launch a further competitive event in Q2 2021-22 for services in the South-East region. We awarded contracts from the tender for SW and Midlands in November 2020, however these will not commence until 2022 and therefore we are unlikely to meet expectations in this area in 2020-21.

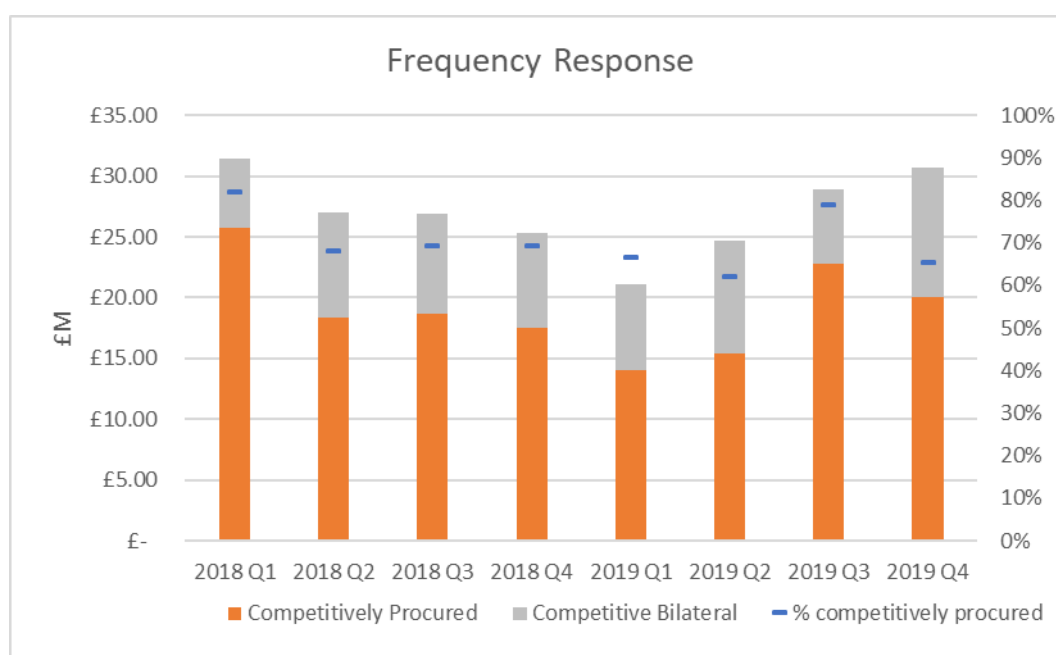
Constraints – Exceeding expectations for Q3. The expiration of the Sizewell bilateral contract has reduced the competitive bilateral spend to nearly zero, with the competitively procured spend continuing as a result of the Mersey Short Term Pathfinder tender, which will continue to run until 1 April 2021.

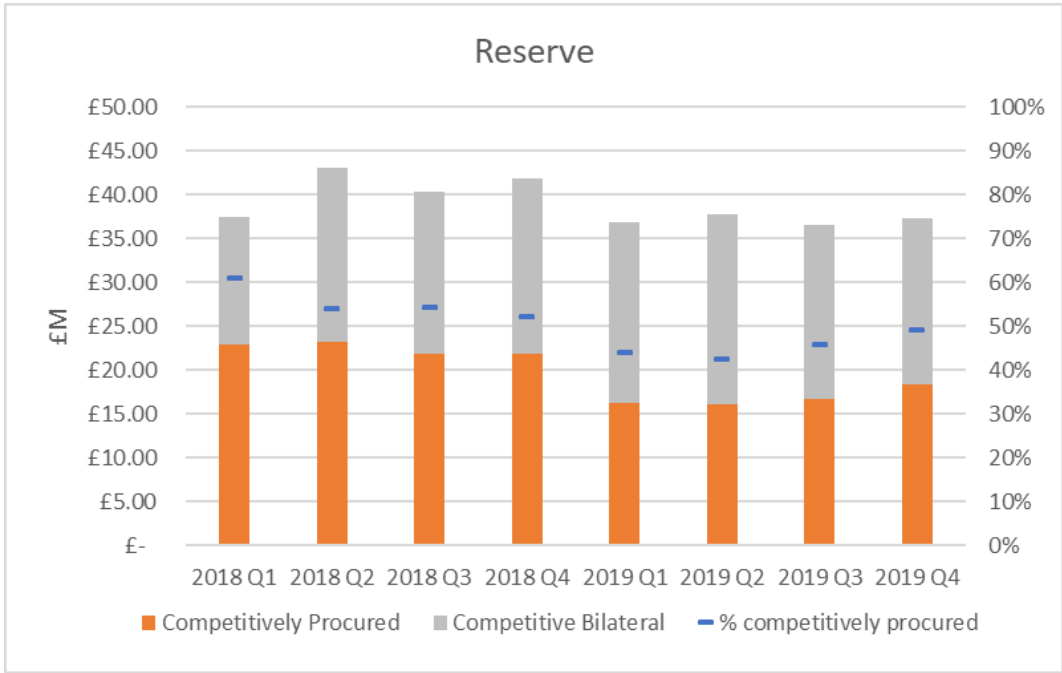
Performance benchmarks

	Exceeding expectations	Meeting expectations	Below expectations
Frequency response	95% or above	Above 75% and less than 95%	75% or less
Reserve	60% or above	Above 50% and less than 60%	50% or less
Reactive	15% or above	Above 0% and less than 15%	0%
Black start	20% or above	Above 0% and less than 20%	0%
Constraints	20% or above	Above 0% and less than 20%	0%

Historical data

The following figures show the metric calculated using historical information. This is provided as context for the current metric. Only frequency response and reserve are included, as the other services have no regular competitive marketplaces.





2B Code Admin Stakeholder Satisfaction

October – December 2020 Performance

As code administrator, we have a central role in making the development of technical and commercial codes a transparent and accessible process. Improved performance in our code administration function enables all network users to contribute more effectively to future arrangements.

ESO Code Administrator Stakeholder Survey Performance

Workgroup	Month surveyed	Average rating
CMP324/325	June 2020	9.33
CMP334	June 2020	8
CMP337/338	June 2020	9.5
CP345	June 2020	9
CMP313	June 2020	7
CMP317/327/339	July 2020	8.67
CMP350	August 2020	8
CMP335/336	September 2020	10
CMP 343/340	September 2020	10
2020-21 Average rating		8.84
2019-20 Average rating		7.34

Table 10: Workgroup Satisfaction Performance

Supporting information

For Q3 we did not have any workgroups concluding. This is consistent with activity being undertaken where there is a significant amount of important modifications which are part way along their journey. We anticipate more data in the following quarter where some of these will have concluded. For clarity, we have shown data from April 2020 to December 2020 to present a fuller picture.

Due to COVID-19, Ofgem made the decision to cancel the annual CACoP survey in 2020. As code administrator, we have a central role in making the development of technical and commercial codes a transparent and accessible process. We were also keen to understand what our customers think of the improvements we have made as a direct result of the 2019 CACoP survey feedback. We have therefore commissioned a research agency to carry out a survey in a similar format to CACoP, and look forward to sharing the data and learnings in the next quarter.

Performance benchmarks

- **Exceeding expectations:**
 - CACoP – Performance above 5% of the average stakeholder satisfaction score across all code administrators for the 2020 CACoP survey, across all our three codes.
 - ESO led stakeholder surveys – increased performance by at least 5% above our baseline score.

● **Meeting expectations:**

- CACoP - Performance (within +/-5%) of the average stakeholder satisfaction score across all code administrators for the 2020 CACoP survey, across all three of our codes.
- ESO led stakeholder surveys – Maintain performance within 5% of our baseline score. Our baseline performance is based on average survey scores taken for the 2019-20 period. These results and baseline score are set out in the benchmark calculations section of our Forward Plan Addendum²³.

● **Below expectations:**

- CACoP – Performance below 5% of the average stakeholder satisfaction score across all code administrators for the 2020 CACoP survey, across all our three codes.
- ESO led stakeholder surveys – performance below our baseline score by at least 5%.

²³ <https://www.nationalgrideso.com/document/173131/download>

2C Charging Futures

October – December 2020 Performance

Charging Futures supports network users by giving them opportunities to learn about the changes, and to contribute to how future arrangements work. Surveys are conducted following Charging Futures Forums and webinars with their attendees.

The baseline score for 2020-21 is the average feedback score received throughout the performance year 2019-20, not including survey results for webinars where the main content is not led by National Grid ESO.

The 2020-21 baseline stakeholder satisfaction score is 7.8. Thus, the exceeding expectation benchmark is 8.3, as reported in the Forward Plan addendum.

Charging Futures Forum scores 2020/2021

Event	Month	Secretariat Score
Charging Futures Forum, morning session	December	9.1
Charging Futures Forum, afternoon session	December	9
2020-21 Average rating		8.58
2019-20 Average rating		7.8

Table 12: Charging Futures Forum scores 2020/2021

Supporting information

The latest Charging Futures Forums in December 2020 received scores of 9.1 & 9. We are pleased with both results, as they are higher than the scores received in the previous quarter. We will ensure all feedback will be used for future meetings where we hope to meet stakeholders' expectations.

We are pleased to report that overall, the secretariat score is classified as "exceeding expectations".

- **Exceeding expectations:** Performance above 5% of the average stakeholder satisfaction score based on 2019-20 performance
- **Meeting expectations:** Performance within +/-5% of the average stakeholder satisfaction score based on 2019-20 performance.
- **Below expectations:** Performance below -5% of the average stakeholder satisfaction score based on 2019-20 performance.

2E Month ahead forecast vs outturn monthly BSUoS

BSUoS forecasts are important to our stakeholders, although we note that our ability to forecast BSUoS is impacted by factors outside of our control. BSUoS costs are factored into the wholesale price of energy charged by generators, and therefore a forecast is vital for those parties when working out where to price their generation.

Due to the volatility in the comparison of our month ahead forecast with the outturn, we report the percentage variance so there can be large swings in accuracy. This metric does not just look explicitly at the volatility, but at the number of occurrences outside of a 10% and 20% band.

December 2020 Performance

Month	Actual	Month-ahead Forecast	APE	APE>20%	APE<10%
April-20	4.77	3.69	23%	1	0
May-20	6.24	3.87	38%	1	0
June-20	5.17	7.18	39%	1	0
July-20	4.78	5.56	16%	0	0
Aug-20	4.18	5.61	34%	1	0
Sept-20	4.75	5.16	9%	0	1
Oct-20	4.27	4.24	1%	0	1
Nov-20	5.60	3.50	38%	1	0
Dec-20	4.12	3.97	4%	0	1
Jan-21					
Feb-21					
Mar-21					

Table 11: Month ahead forecast vs. outturn BSUoS (£/MWh) Performance

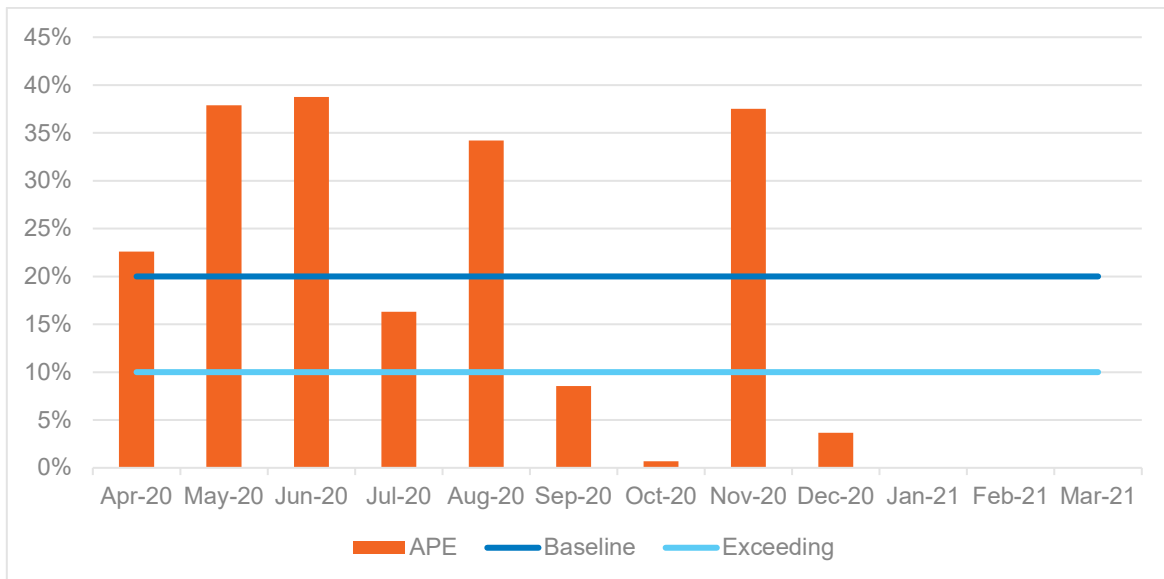


Figure 7: Monthly BSUoS forecasting performance

Supporting information

The outturn BSUoS for December was significantly lower than November. This was driven by a reduction in constraint costs from November with outages returning to service and overall demand levels increasing following the November lockdown period. Balancing Costs in December were largely driven by constraint costs. These were primarily incurred managing the Scotland export thermal constraints which were intact (with no outages) for the majority of the month.

Performance benchmarks

- **Exceeding expectations:** Less than 5 out of 12 monthly forecasts are above 20% Absolute Percentage Error, and 5 or more forecasts less than 10% Absolute Percentage Error
- **Meeting expectations:** Less than 5 out of 12 monthly forecasts are above 20% Absolute Percentage Error
- **Below expectations:** 5 or more out of 12 monthly forecasts above 20% Absolute Percentage Error

B.2 Role 2 Deliverables

This section reports on our performance against the deliverable descriptions and dates set out in the Forward Plan Addendum.

October – December 2020 Performance

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Product Roadmaps for Response and Reserve implementation			
Implement the first new frequency response product	Date is being revised ²⁴	Completed Q3 2020-21	<p>We took the decision to approach the delivery of Dynamic Containment (DC) in a learn-by-doing style, similar to the weekly auction trial. We launched Dynamic Containment²⁵ in soft form on 1 October 2020 and at the same time we began trialling daily procurement of the service.</p> <p>We published a document in early December outlining our progress to date, and our plans for the next quarter for continuing the development of Dynamic Containment.</p>
Consult on future frequency response products	Q4 2020-21	Ongoing	The learnings from the soft launch of Dynamic Containment (DC) shape the development of Dynamic Moderation (DM) and Dynamic Regulation (DR). The next step in frequency response reform is to further develop DC, both in terms of volume procured and the systems and processes behind the service. Our intention is to begin engaging with industry on DM and DR in Q4 2020-21.
Report on auction trial	Q2 2020-21 (Status update on the success of auction trial) Q3 2020-21 Trial separate procurement of LF and HF services	Target date met Q2 2021-22	<p>We published the report on the auction trial²⁶ in September 2020.</p> <p>We previously committed to trialling day ahead procurement under the auction trial. Due to operational requirements we brought forward day ahead procurement with the delivery of Dynamic Containment. Similarly, we have already split DC into Low Frequency (LF) and High Frequency (HF); we are currently reviewing this milestone for the auction trial and look forward to engaging with auction trial and DC participants in the coming months.</p>

²⁴ Following the publication of the Addendum, the revised date was not publicised before the deliverable was completed

²⁵ <https://www.nationalgrideso.com/document/182176/download>

²⁶ <https://www.nationalgrideso.com/balancing-services/frequency-response-services/frequency-auction-trial>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Market design and implementation plan for reformed reserve products	Q4 2020-21	On track	We have restarted engagement on the design of the new suite of reserve products through a virtual co-creation workshop on 9 December 2020. We had 100 participants and gathered views on aspects of the project including Product Design, Market Design, Performance Monitoring, and Communications through virtual whiteboarding. This will feed back into the initial product proposal, which we will consult on in early 2021.
Support development and implementation of Pan-European replacement reserve standard products	Q1-Q4 2020-21	On track	After leaving the European Union we now have a Trade and Cooperation Agreement with our EU partners. As part of this we are now awaiting letters from BEIS to explain the next steps on Trans European Replacement Reserve Exchange (TERRE) and Manually Activated Reserve Initiative (MARI). We will fully engage once the letters have been issued.
Product Roadmap for Reactive implementation			
Publish our strategy for the future of reactive power	Q3 2020-21 - Q2 2021-22	On track	We have introduced the approach that is being used to review and develop 'Future of Reactive Power', the first round of industry engagement was completed which includes meetings with individual stakeholders and a webinar, to share what the reactive power issues are and the current observations/learnings from existing projects such as Pathfinders, Power Potential, and network boundary transfer. Our aim is to capture the external feedback to further analyse the gaps and co-create the solution with industry in a collaborative way moving forward.
Power Potential trial with UKPN	Q3-Q4 2020-21	On track	The Power Potential trials, which commenced on 15 October, continue and will run through until March 2021. Essential learning will be collected through both the optional (wave 1) and market (wave 2) trials prior to project closure this year. Wave 1 technical trials finished on 10 December and Wave 2 market commenced on 6 January 2021 and will run to 28 March 2021.
Power Responsive			
Deliver innovation projects to unlock demand flexibility	Q2 2020-21	Target date met	The Residential Response NIA Project has now concluded, and we are supporting United Utilities in the delivery of their NIA project

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			looking at wastewater catchment assets, which is due to finish in Q4 2020-21.
Improving the way we facilitate code change			
Incorporation of all 14 Code Administrator Code of Practice (CACoP) Principles	Ongoing	Ongoing	Two modifications were raised in March 2020 to facilitate the 14th CACoP principle; sandboxing. Due to congestion from high priority modifications, they were given a low priority. The modification will proceed in line with Panel's decision on where it sits in terms of a priority against other modifications. We anticipate that this will not be progressed with any urgency at this stage. We therefore do not have any control over the speed in which it progresses.
Customer focussed communications	Q1 2020-21	Target date met	The email subscription tool has now been implemented. The first Code Administrator Annual report ²⁷ has also been published on our website in direct response to stakeholder feedback asking us for more transparency.
Onboarding process for new industry parties	Q2-Q3 2020-21	Target date met	The first stage is now complete. The ESO Code Administration team has now created a new onboarding page on the ESO website. This was created in direct response to feedback that told us that new industry parties often found it hard to navigate the complexities of the code change process. We have provided simple, easy to read information and clearly signposted where stakeholders can find more information. In addition to this, we wanted to give new parties additional help and so we will be looking to host virtual training in the near future.
Improving industry confidence in ESO Code Governance	Q1-Q4 2020-21	On track	The ESO Code Administration team has taken on feedback from industry that told us it needed more confidence in us. Since then, we have made our critical friend process more robust. We have undertaken many other improvement activities to help us better facilitate the code change process to be more transparent. Most recently, we created a new process for the Panel to prioritise modifications. We feel examples like this where we can provide the right tools and guidance, truly demonstrate one of the ways we are improving industry confidence.

²⁷ <https://www.nationalgrideso.com/document/172316/download>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Facilitate electricity network charging reform through Charging Futures			
Facilitate electricity network charging reform through Charging Futures 1. Targeted Charging Review (TCR) 2. Access and Forward Looking Charges Significant Code Review (SCR) 3. Reform of Balancing Services Charges	Q1-Q4 2020-21	On track	We continue to offer a programme of accessible events for parties to learn and contribute to electricity charging reform that our stakeholders have come to expect. Despite COVID-19 we hosted our second virtual forum via webinars in July and the second Balancing Services Charges Task Force published its final report ²⁸ in September 2020. Most recently, we hosted two Charging Futures webinars that received high stakeholder satisfaction scores. Average secretariat score of 9.05 and average event score of 8.4.
Transform the customer experience for network charging			
Publications and guidance of the impact of charging reform to our customers	Q3-Q4 2020-21	On track	There are a number of uncertainties underlying the charging regime such as RIIO-2 parameter resets and Targeted Charging Review (TCR) implementation. The Transmission Network Use of System (TNUoS) five-year view (2021-22 to 2025-26) ²⁹ was published on 31 August 2020, which has implemented the TCR changes. To help the industry understand the potential impact from some of the uncertainties, we have also provided five sensitivity analyses. A further update on TNUoS tariffs for 2021-22 ³⁰ was provided in November 2020 and will be finalised in January 2021. We will publish several guidance documents on TCR, following Ofgem's decision on the relevant CUSC modifications. We are also planning on hosting a Charging Forum in February for the industry to attend, where we will be providing key updates relating TCR and signposting / providing relevant guidance material.
Introduce new 'new entrant' e-learning on charging	Q1-Q4 2020-21	On track	Following the publication of the Transmission Network Use of System (TNUoS) five-year view, we hosted a webinar on 23 September 2020 to go through the report and analysis with a focus on the new charging methodologies. 70 industry parties attended.

²⁸ <http://www.chargingfutures.com/media/1477/second-balancing-services-charges-task-force-final-report.pdf>

²⁹ <https://www.nationalgrideso.com/document/176486/download>

³⁰ <https://www.nationalgrideso.com/document/181866/download>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Improve the digital customer experience for TNUoS, BSUoS and Connection Charging Data; including improvements to existing NGESO billing system to improve user experience	Q1-Q4 2020-21	On track	<p>The average score for the webinar was 8.6/10. We have published the recorded webinar, Q&A and additional analysis requested in the webinar on our website³¹.</p> <p>The recorded webinar for Connection Charging has been scheduled for Q4 2020-21. Recorded webinars for Balancing Use of System (BSUoS) have been rescheduled for Q4 2020-21 which would cover the BSUoS Targeted Charging Review (TCR) changes taking effect in April 2021.</p> <p>Due to COVID-19, the priorities have been to assist the industry via two support schemes - Transmission Network Use of System (TNUoS) scheme and Balancing Use of System (BSUoS) scheme (CMP345/350). As such, we have experienced delays in the optioneering work. To ensure the timely delivery of the regulatory changes, it is decided to implement the Targeted Charging Review (TCR) changes in the existing Charging and Billing System. We endeavour to complete the option investigation for the systems by Q4 2020-21. With the implementation of the new ESO Data Portal³² for the wider ESO, key data and information related to BSUoS, TNUoS and Connection Charging have been reworked and improvements to accessibility/functionality have been made. With these changes, industry and interested parties now have the ability to create direct connections to published TNUoS tariff data through the Data Portal Application Programming Interface (API) function, allowing for real-time data updates.</p>
Establish a 'cross party' approach to onboarding, mapping out whole industry requirements:	Q1-Q4 2020-21	On track	<p>We held an initial discussion with Elexon to align the objectives in Q1 2020-21. Following lockdown and challenges on industry party resource, it is anticipated that it will take longer to complete the exercise than originally thought. However, we are still aiming to deliver by Q4 2020-21. Further discussions with Elexon will commence in January 2021. Where a plan and next steps will be drawn up to understand what information is/isn't available, who does/should it sit with, what</p>

³¹ <https://www.nationalgrideso.com/charging/transmission-network-use-system-tnuos-charges>

³² <https://data.nationalgrideso.com/>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			can be improved and how these can/should be aligned.
Transform industry frameworks to enable decentralised, decarbonised and digitised energy markets			
Implement Targeted Charging Review (TCR) decision in conjunction with DNOs.	Q1-Q4 2020-21	On track	Following Ofgem's decision on CMP334 and CMP317/327, the ESO is preparing follow on modifications to be raised over Q4 2020-21 as outlined in Ofgem's decision letters.
Supporting the Access Significant Code Review (SCR)	Q3 2020-21 and ongoing	Target date met	We have provided Ofgem with all the necessary modelling and information for their cost benefit analysis to be undertaken. We continue to support the Access Subgroup through the creation of papers on focus areas for Ofgem.
Lead code modifications	Q3-Q4 2020-21	On track	<p>The codes team have progressed all code modifications relating to the Targeted Charging Review (TCR) and Significant Code Review (SCR). Changes relating to Balancing Use of System (BSUoS) charges and Transmission Network Use of System (TNUoS) generation charges, as a result of the TCR, have also been approved. We await Ofgem's decisions on the remaining demand changes.</p> <p>The zoning modification has recently been approved by Ofgem. Ofgem have published their BSUoS taskforce response and as a result we will work with industry to raise changes to develop the arrangements in this space.</p> <p>In terms of other code changes, some progress will be made in the remainder of this performance year, however, due to the TCR and other industry code congestion it is unlikely that other modifications will conclude in the timescales we originally stated. We expect some of these to move into RIIO-2 and be concluded within 2021-22.</p>
Balancing Services Charges Task Force	Q2 2020-21	Target date met	The Balancing Use of System (BSUoS) taskforce has now concluded and the report ³³ published and sent to Ofgem. The taskforce's conclusions support removing BSUoS charges from generators to be paid 100% by final demand and recommend that the charge is fixed in advance by the ESO to remove risk premia from consumer bills. Ofgem have now

³³ <http://www.chargingfutures.com/media/1477/second-balancing-services-charges-task-force-final-report.pdf>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Capacity Market Modelling - Cross-border participation in capacity markets	Q1-Q4 2020-21	On track	<p>published their response and we are engaging with them on the next steps.</p> <p>ENTSO-E have a mandate to develop the methodology under Regulation (EU) 2019/943 as part of the Clean Energy Package, which will help facilitate direct participation of cross-border capacity in the capacity market. We are participating in the ENTSO-E Task Force to play a leading role in developing the methodology. The impact of COVID-19 presents a risk that could lead to the ESO needing to commit resources to other work priorities that would reduce our involvement in the ENTSO-E work.</p> <p>ACER have issued a consultation³⁴ on the participation of cross-border capacity in capacity mechanisms, which ran until 9 August 2020. They published the decision on their website³⁵ on 22 December 2020. We are currently reviewing the details of this, also considering the potential impact of the UK-EU future trading arrangements but don't expect this to result in significant changes to our modelling, which was already well-aligned.</p>
Capacity Market (CM) Modelling – facilitating broader participation in the CM to provide security of supply at best value for consumers.	Q1-Q4 2020-21	On track	<p>ESO has been supporting a Distribution Connection and Use of System Agreement (DCUSA) Change Proposal referred to as DCP350 to create a register of embedded assets. This was approved by the DCUSA panel in May 2020 and by the Authority on 1 July 2020. The first version of the data was published in July 2020. We intend to use this data to improve our modelling of embedded generation for the capacity market, which may lead to a change in how we determine de-rating factors. The impact of COVID-19 presents a risk that could lead to ESO needing to commit resources to other work priorities that could lead to this work being delayed. As the capacity market modelling follows an annual process, any delay would be 12 months to coincide with the next annual cycle.</p> <p>We are now assessing the data in the Embedded Capacity Registers and combining it with the metered hourly output data we had already acquired from Electralink. We will</p>

³⁴ <https://www.acer.europa.eu/Media/News/Pages/ACER-consults-on-cross-border-participation-in-capacity-mechanisms.aspx>.

³⁵ <https://www.acer.europa.eu/Media/News/Pages/ACER-decides-on-common-rules-for-cross-border-participation-in-electricity-capacity-mechanisms-.aspx>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			consider the appropriateness of calculating capacity market de-rating factors using alternative methods based on this data in Q4 2020-21. Any changes will be subject to industry consultation in 2021.
Delivery of the Power Responsive initiative			
Support coordination of Distributed Energy Resource (DER) engagement on flexibility developments	Q1-Q4 2020-21	On track	COVID-19 has delayed a lot of development work and made workshops more challenging, which has delayed some of the work. However, we went ahead with the first engagement session at the Steering Group on 5 June 2020 with the Regional Development Plan (RDP) team. We are working with Everoze to deliver the Annual Report for 2020, and they will be contacting selected providers to get detailed views to feed into the report. We are also continuing to work with Piclo and Electron local market trials.
Power Responsive Stakeholder Engagement	Q1- Q4 2020-21	On track	We have been developing alternative virtual content to physical events, starting with the Summer Insights Series ³⁶ , which was a series of industry podcasts concluding with a panel session Q&A. We have progressed with virtual events such as the Major Energy Users' Council (MEUC) webinar session on 14 October 2020, and the Energyst Event in November. The next event will be the Steering Group in January 2021.

³⁶ <http://powerresponsive.com/summer-insights-2020-industry-podcasts/>

B.3 Role 2 Notable events

GSR027: Review of the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS) Criteria for Frequency Control

This Security and Quality of Supply Standards (SQSS) modification was progressed through a workgroup and approved by Ofgem before Christmas addressing an action from the Energy Emergencies Executive Committee (E3C) and Ofgem final reports into the power outage of 9 August 2019. It puts in place a transparent process through which a periodic Frequency Risk Control Report (FRCR) can be developed to demonstrate value to end consumers in achieving an agreed level of security of supply. As the first step towards this, the methodology that will be used to develop the FRCR is currently being consulted on and was presented in a webinar on 6 January 2021. The first version of the FRCR is required to be submitted to Ofgem for approval on 1 April 2021, to align with the licence changes which are anticipated to bring the new version of the SQSS into effect.

Dynamic Containment and Short-Term Operating Reserve (STOR) Electricity Balancing Guideline (EBGL) consultation

We commenced with the formal industry consultation³⁷ for the new Short-Term Operating Reserve (STOR) day ahead procurement on 17 December 2020. This consultation will run in parallel with the Dynamic Containment (DC) consultation and is required in accordance with Article 18 of Electricity Balancing Guideline (EBGL).

The STOR consultation covers the changes to the existing STOR service, and the introduction of daily auctions for one day contracts, to be implemented from 1 April 2021. The consultation introduces a suite of documents that form the new contract framework, which are aligned to the recent DC service contracting framework. After reviewing all the formal responses and industry feedback, the ESO are not proposing any changes to the Article 18 mapping and are targeting “quick win” changes to the service to improve market participation and to enable faster market entry. The consultation for both services will run until 21 January 2021.

We have previously engaged with industry to share the key requirements for moving STOR to day ahead. We have also held webinars and provided various other updates through the last few months, including providing a FAQ document. We held sessions with parties actively delivering DC to gather early learning and development areas. In addition to this we have also been meeting with investors, potential providers and parties. On 3 December 2020 we published our Soft Launch Development Plan³⁸ which outlined the intention to align the DC consultation with the STOR work.

Reactive Power Reform webinar

The industry webinar was held on 11 December 2020 to introduce the approach that was used to review current reactive power issues and develop future solutions. There were more than 150 attendees and 53 questions were raised throughout the webinar. Positive feedback was received from attendees. They thought the webinar was ‘informative’ and ‘were happy to work very closely with National Grid to shape future procurement’. Webinar attendees also raised many specific questions and comments covering different aspects relating to the issues, and the desired state from their perspective. By collaborating with industry, this will help us to understand the gaps and assist in developing a solution.

³⁷ <https://www.nationalgrideso.com/events-calendar/ebgl-article-18-mapping-dynamic-containment-and-short-term-operating-reserve>

³⁸ <https://www.nationalgrideso.com/document/182176/download>

Reserve Reform webinar

The Reserve Reform project aims to deliver a standardised suite of upward and downward reserve product(s) that work holistically with new frequency response products and reserve replacement products Trans-European Replacement Reserve Exchange (TERRE) and Manually Activated Reserve Initiative (MARI), and can be procured at day ahead through an auction held on the Single Market Platform from March 2022.

We are co-creating this product with industry and hosted a workshop on 9 December 2020 to communicate the need for reserve, and the ESO's drivers when designing a product suite and market. We also wanted to understand the industry's needs and drivers, share ideas to facilitate co-creation of a new reserve product suite and identify common themes and areas for further investigation. The workshop was well attended, with around 100 parties getting involved in brainstorming ideas virtually. Feedback from attendees was very positive, and we will be building on this engagement in Q4 2020-21 through a more formal consultation.

C. Role 3 System insight, planning and network development

C.1 Role 2 Outturn performance measures and commentary

This section reports our performance against the Role 3 metrics set out in the Forward Plan Addendum.

3A Right First Time connection offers

December 2020 Performance

This metric measures whether the ESO aspects of connection offers were correct the first time they were sent out to customers.

Connections Offers	Results
Year to date number of connections offers	255
Year to date ESO related reoffers	11
Year to date percentage of Right First Time connections offers determined from ESO related reoffers	96%

Table 12: Connections re-offers data

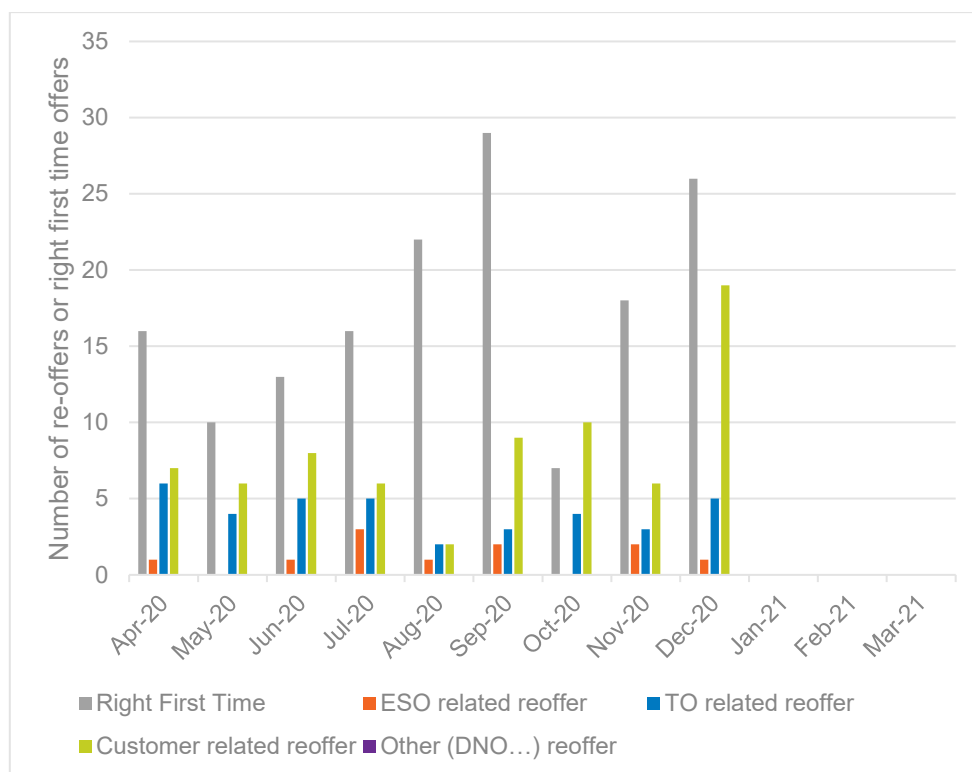


Figure 8: Connections offers monthly performance

Supporting information

December Performance

We saw 47 offers returned in December, 21 of which were subject to a re-offer. There was one recorded ESO related re-offer on contracts signed in this period, due to a reference correction in the definition sections. For Q3, we are still meeting our target at 96% Right First Time.

Q3 Performance

This third quarter has seen a steady volume of connection offers, peaking around Christmas and the trend is expected to increase in January and February. Connections continue to be high, as pathfinder and offshore wind related applications continue to be popular. Right first time remains at acceptable levels, as the implemented control processes appear to be working.

Performance benchmarks

- **Exceeding expectations:** 100% of connection offers Right First Time (excluding those where the error was not due to the ESO)
- **Meeting expectations:** 95-99.9% of connection offers Right First Time (excluding those where the error was not due to the ESO)
- **Below expectations:** Less than 95% of connection offers Right First Time (excluding those where the error was not due to the ESO)

3C Customer Connections- Customer Satisfaction

October – December 2020 Performance

Supporting information

During Q3 the Connections team has received its first responses from the CSAT surveys sent out in Q2. The average score across the responses for Q3 is 7. Key themes that have come out of customer responses include improvement areas around query response, more joined up working with NGET and DNOs, and the speeding up of processes. Going into Q4 and forwards into RII02 we are actively conducting reviews of our processes and systems to increase efficiency, to enable contract managers to focus on customer relationships and query response. During Q3 we have updated the Connections website pages with more information on the connections process as well as an FAQs and Glossary section – this should enable customers to self-serve information more easily and reduce queries into the ESO. Q4 will also see more collaborative working with TOs to mitigate the risk around siloed working, there are already “working together” sessions set up with more to follow. The Connections team will also continue throughout Q4 with the customer QualTrics surveys focussing on the detail of the Connections process.

Performance benchmarks

- **Exceeding expectations:** Score out of 10 of 8.2 or more
- **Meeting expectations:** Score out of 10 between 7.8 and 8.2
- **Below expectations:** Score out of 10 of 7.8 or below

3D Whole System, Unlocking Cross Boundary Solutions

October – December 2020 Performance

This Performance Indicator is an assessment of the effectiveness of our whole system actions, measured in terms of their outputs. This indicator measures the changes to contracted Distributed Energy Resources (DER) in each of the Regional Development Programmes (RDP) regions for this quarter, as a result of the UKPN/ESO collaboration in the South East Coast region and the WPD/ESO collaboration in the South West region.

Q3 2020 Performance (UKPN)

Grid Supply Point (GSP)	MW	Commentary on DER technology types
Bolney	20	1 new DER (Solar)
Canterbury	0	No change
Ninfield	0	No change
Sellindge	0	No change
Total	20	

Table 13: Contracted MW capacity of UKPN DER connections

Q3 2020 Performance (WPD)

Grid Supply Point (GSP)	MW	Commentary on DER technology types
Abham	16	One site – all PV
Alverdiscott	32	All PV
Axminster	49.9	Thermal plant (gas)
Bridgwater	0	No new DER
Exeter	0	No new DER
Indian Queens	117.2	11MW Wind, 8MW Battery only, 40MW of PV and 58.2MW of mixed PV/Battery sites
Landulph	0	No New DER
Taunton	20	Battery
Total	225.1MW	

Table 14: Contracted MW capacity of WPD DER connections

Supporting information

UKPN

Additional DER was added at Bolney, but not large volumes. Applications received from UKPN for three of the four Grid Supply Points (GSPs) are seeking additional capacity. There are multiple UKPN offers for additional DER in flight at the current time, and the expectation is that the Q4 position will see a rise in DER capacity at the relevant GSPs.

WPD

Levels of new embedded connections between Q1-Q2 became extremely static, mainly due to the impact of COVID-19 on resourcing and procurement timelines. Q3 has seen a slight upturn in this trend, and an increase in multi technology sites to maximize efficiencies. WPD feedback still sees COVID-19 impacting on connecting generation, with many now pushing back dates of connection. Localized GSP specific reinforcement requirements are still deterring connections, however, WPD are now looking at alternative solutions at these sites to speed up connection times, such as more extensive Active Network Management (ANM) schemes.

3E Future balancing costs saved by operability solutions

October – December 2020 Performance

This is a Performance Indicator to demonstrate the consumer benefit of implementing new operability tools such as Stability, Frequency, Constraint Management Services and Loss of Mains.

Year	Annualised cost through RIIO 2
Counterfactual Spend (£m)	76.9
Contract cost for Stability Pathfinder phase 1 (£m)	54.7
Savings due to Stability Pathfinder phase 1 (£m)	8.7
Contract cost for Voltage Pathfinder Mersey Ring (£m)	1.0
Savings due to Voltage Pathfinder Mersey Ring (£m)	12.6
Total savings (£m)	21.3

Table 15: Future balancing costs saved by operability solutions

Supporting information

We successfully released commercial service contracts under Stability Pathfinder phase 1 and the Mersey Voltage Pathfinder, and as a result, we expect future balancing costs savings in the next few years. The saving was estimated based on the counterfactual spend forecast if no new operability solution was brought in, we then annualise the figure through the contract length based on the assumption that all contracts will be delivered on their contractual dates. However, if there is any delay to those dates, we may need to update those annual figures.

In our 2019-20 Forward Plan publication in March 2020, we included a balancing cost saving forecast from the Loss of Mains protection change programme. COVID-19 has impacted the programme's delivery assurance process in the first quarter. Activity has resumed with new safe working practices, so far 5,594 applications have been approved from electricity generation sites, for a total of 10.7GW of generation capacity. We are evaluating the impact on balancing costs following those operational changes, and will provide an update in the end of year incentives report.

For the above projects (Stability Pathfinder and Voltage Pathfinder), the counterfactual spend is the forecast cost of balancing the system based on the forecast of future system conditions such as those contained within the Future Energy Scenarios (FES) and other relevant market intelligence information, if no new commercial solution were implemented. After introducing the new commercial solutions through an open market tender, that counterfactual spend would disappear, but there would be additional contract costs relating to the payment for the service providers who deliver those new commercial solutions, so the savings are calculated as the difference between the counterfactual spend and the contract cost.

3F Capacity saved through operability solutions

October – December 2020 Performance

The Regional Development Programmes (RDPs) are taking a whole system view of the required transmission network capacity. As such, we monitor the progress of both transmission and distribution connections to ensure the RDP is delivered and capacity released when needed. Changes in the total DER contracted background will be monitored and reported through this indicator to ensure current RDPs are being progressed in line with the system need. This indicator will also report on new RDP areas where work has been progressed throughout each quarter to provide new whole system solutions.

The required network capacity needs to be sufficient to cover a range of credible system backgrounds accounting for the operations of both transmission and distribution connected parties. In some areas of the network, where there are multiple transmission connected parties, there may be a much higher capacity required than just that needed to manage DER volumes.

WPD N-3 Intertripping

Year	2020-21	2021-22	2022-23
Forecast Connected DER Capacity (MW)*	1900	2100	2500
Baseline Transmission Capacity (MW)**	1700	2300	2300
Additional Transmission Capacity Released (MW)	600	N/A	N/A

*This figure is based on 100% connection of Forecast DER Connected Capacity, with no load factors applied.

**Transmission Network Capacity if no RDP solution in place.

Supporting information

There have been ~200MW of new acceptances across the WPD south west RDP area which are forecast to connect from April 2022 onwards. We will continue to monitor the progress of these projects against the available transmission capacity and seek to develop any additional operational solutions, where necessary.

We have worked closely with NGET over the last quarter to ensure that the remaining transmission outages required to complete the N-3 delivery with WPD, and SSE-N are planned. We are currently working through how the latest COVID-19 restrictions may impact project delivery, however, we now estimate that the outstanding work will be completed by November 2021. In addition, we are assessing whether the delivery of any early, incremental capability will provide an overall cost benefit to the ESO, although we do not currently anticipate any operational issues as a result of the estimated project delivery date.

UKPN N-3 Intertripping

Year	2020-21	2021-22	2022-23
Forecast Connected DER Capacity (MW)*	1500	1600	1750

Baseline Transmission Capacity (MW)**	1700	2300	2300
Additional Transmission Capacity released (MW)	600	N/A	N/A

*This figure is based on 100% connection of Forecast DER Connected Capacity, with no load factors applied.

** Transmission Network Capacity if no RDP solution in place.

Supporting information

We have seen some minor changes against the forecast connected DER capacity in the UKPN area over the last quarter however, it is anticipated that several new in-flight offers are likely to be accepted in Q4.

The N-3 capability with UKPN was successfully delivered in November 2020, with some remaining project tasks on track for completion by the end of January 2021. We are expecting to commission the first DER onto the scheme throughout January which will expand the suite of tools available operationally and potentially enable further outage requests to be placed throughout the remaining winter months.

WPD MW Dispatch

Year	2020-21	2021-22	2022-23
Forecast Connected DER Capacity (MW)*	1900	2100	2500
Baseline Transmission Capacity (MW)**	2600	2600	2600
Additional Transmission Capacity released (MW)	N/A	N/A	1300

*This figure is based on 100% connection of Forecast DER Connected Capacity, with no load factors applied.

** Transmission Network Capacity if no RDP solution in place.

Supporting information

There have been ~200MW of new acceptances across the WPD south west RDP area which are forecast to connect from April 2022 onwards. We will continue to monitor the progress of these projects against the available transmission capacity and seek to develop any additional operational solutions, where necessary.

The ESO is now working with several DNOs to cocreate a set of commercial options to fulfil the appropriate system needs cases across the MW Dispatch project areas. We have already held a number of joint sessions with DNOs to develop these options further and will be seeking to finalise these arrangements prior to consulting with DER on the proposals. Once feedback has been incorporated, we will begin IT work to deliver each of these options in turn.

In addition, we are jointly producing a set of documentation detailing the intended commercial arrangements in RDP areas, which we will be looking to publish in Q4 2020-21.

UKPN MW Dispatch

Year	2020-21	2021-22	2022-23
Forecast Connected DER Capacity (MW)*	1500	1600	1750
Baseline Transmission Capacity (MW)**	5100	5100	5100
Additional Transmission Capacity released (MW)	N/A	N/A	1350

*This figure is based on 100% connection of Forecast DER Connected Capacity, with no load factors applied.

** Transmission Network Capacity if no RDP solution in place.

Supporting information

We have seen some minor changes against the forecast connected DER capacity in the UKPN area over the last quarter however, it is anticipated that a few new in-flight offers are likely to be accepted in Q4. As a result, the ESO is now considering options on how best to accommodate this increase in DER connections, in conjunction with additional transmission-connected parties.

The ESO is now working with several DNOs to cocreate a set of commercial options to fulfil the appropriate system needs cases across the MW Dispatch project areas. We have already held several joint sessions with DNOs to develop these options further and will be seeking to finalise these arrangements prior to consulting with DER on the proposals. Once feedback has been incorporated, we will begin IT work to deliver each of these options in turn.

In addition, we are jointly producing a set of documentation detailing the intended commercial arrangements in RDP areas, which we will be looking to publish in Q4 2020-21.

SPT – Generation Export Management Scheme (GEMS)

Year	2020-21	2021-22	2022-23
Transmission & Distribution Forecast Connected Generation Capacity (MW)*	1800	2000	2250
Baseline Transmission Capacity (MW)**	1800	1800	1800
Additional Transmission Capacity released (MW)	N/A	N/A	500

*This figure is based on 100% connection of Forecast Connected Capacity on to the transmission and distribution networks, with no load factors applied.

** Pre-GEMS deployment. Baseline Transmission Capacity accounts for diversity in generation output.

Supporting information

The total forecast connected generation has altered slightly due to changes in the overall dates of connection for certain parties.

A final Technical Specification for the GEMS system has now been provided, and the project is currently finalising requirements before moving into the procurement phase for the GEMS system. The ESO is also now working with SPT to re-evaluate the options to provide network capacity beyond the GEMS system, in line with the recommendations made in the original Strategic Wider Works assessment and an increase in connection applications in the region.

C.2 Role 3 Deliverables

This section reports on our performance against the deliverable descriptions and dates set out in the Forward Plan Addendum.

October – December 2020 Performance

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Whole system operability			
Lead the of Loss of Mains Protection setting programme	Q2 2020-21 and ongoing	Ongoing	Over 10.7GW of generation at 5,594 sites is now engaged in the programme, with changes already made at 4,052 sites, a combined capacity of 7,557MW. The programme is on track to address risks associated with Vector Shift (VS) protection in line with expectations and our forecast expenditure on Vector Shift Risks for 2021-22 is now zero. The benefits associated with Rate of Change Frequency (RoCoF) risk reduction are expected to be seen progressively over 2021 and we have taken action to bring this forward as much as possible, with enhanced payment arrangements in place, increased engagement and enhanced risk assessment. COVID-19 restrictions impacted on delivery and engagement rates at the beginning of 2020-21 but are having much less of an effect at this time. Programme priorities have been agreed for the next 18 months and efforts continue to bring more distributed generators into the programme.
Address actions raised in the E3C report into the GB Power Disruption Event of 9 August 2019	Q1 2020-21	Target date met	We progressed and completed NGENSO actions identified by the Ofgem and E3C reports following the power outage of 9 August 2019, including completing an internal audit, conducting a review of the current Limited Operational Notification (LON) and Grid Code derogation processes, and implementing the improvements identified by these reviews. As agreed, we have raised Grid Code modification GC0141 which is now under industry process, and SQSS modification GSR027 on frequency standards which has been approved by the Authority and is now proceeding through the licence modification process.
Implement approach for efficient reactive power flows between networks	Q4 2020-21	Paused	This work was indirectly impacted by changes in working arrangements brought about by COVID-19 and has since been de-prioritised relative to other higher value deliverables (e.g. voltage pathfinder) where workload has ramped up. The scope of the work has since been reviewed and will be revisited in 2021-22.
Defining roles and responsibility for voltage	Q3 2020-21	Paused	This work was indirectly impacted by changes in working arrangements brought about by COVID-19

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
management across the transmission-distribution interface.			and has since been de-prioritised relative to other higher value deliverables (e.g. voltage pathfinder) where workload has ramped up. The scope of the work has since been reviewed and will be revisited in 2021-22.
Pathfinder projects			
Stability pathfinder	Q2 2021-22	On track	<p>We launched the Stability Pathfinder Phase 2 Request for Information (RFI) on 17 June 2020 and held a webinar on 25 June 2020. The recording and FAQ document were made available on our website. We published an RFI summary feedback and next steps on 19 August 2020, which included a timeline for Phase 2 tender process. Expression of Interest (EOI) was published on 30 September 2020 seeking short circuit level and inertia services up to 2030. We have run a series of webinars in October and November 2020. All publications can be found on our website.³⁹</p> <p>Milestones for Phase 2 of the Stability Pathfinder are as follows:</p> <ul style="list-style-type: none"> • Q2 2020-21 Invitation for Expressions of Interest which was published in September • Q3 2020-21 Publish draft commercial terms which was published in October • Q4 2020-21 Commence technical feasibility studies which will be in Feb-Mar 2021 following EOI outcome • Q4 2020-21 Publish final commercial terms. <p>The Network Options Assessment (NOA) methodology was updated in July 2020, in line with our licence obligation which incorporated any lessons learnt from Phase 1 which was completed in January 2020. We will publish a further update to the NOA methodology next year, incorporating learnings from the Stability Pathfinder Phase 2.</p>
Mersey Voltage pathfinder: Project recommendations	Q1 2020-21	Target date met	On 22 May 2020 the ESO awarded 9-year contracts ⁴⁰ for static voltage support in the Mersey region to PeakGen (200 MVar Reactor) and Zenobe (40 MVar of reactive capability from battery storage). These contracts are worth a total of £8.67m and are due to commence from April 2022. This pathfinder is the first time that we have directly compared market solutions to a TO network asset build approach for a long-term transmission level requirement. An update

³⁹ <https://www.nationalgrideso.com/research-publications/network-options-assessment-noa/network-development-roadmap>

⁴⁰ <https://www.nationalgrideso.com/document/169751/download>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			<p>to the tender results⁴¹ and lessons learnt report⁴² has been published on 11 December 2020.</p> <p>We are finalising the procurement strategy for short-term Mersey voltage needs from April 2021 following the EOI.</p> <p>We are reflecting on the lessons learned from the Mersey events in preparation for the next target voltage region.</p>
Pennines Voltage pathfinder	Q2-Q4 2020-21	On track	<p>The next voltage Network Options Assessment (NOA) Pathfinder tender, targeting the Pennine area has been delayed. This was originally expected to be launched in w/c 30 November and a further update will now be given in January 2021. This delay will allow additional time to qualify the requirements for what is a complex region to model with a high level of interactivity across sub-regions. We will also be seeking to simplify what we are asking for as well as provide additional site-specific information for network owners in line with lessons learned from the Mersey event. We are also clarifying some questions about TO interaction and participation as well as some wider strategic challenges that the NOA Pathfinder process has identified as a result of the “learn by doing” approach that we have adopted.</p>
Constraint Management Pathfinder	Q1-Q2 2020-21	Target date met	<p>We will be tendering for the Constraint Management Pathfinder following the Request for Information (RFI)⁴³ we conducted in February 2020.</p> <p>We have identified a wide range of different ways participants could provide this solution and determined that the best course of action is for the first tender is to focus on short term issues. We will do this by looking at participants that are already connected to the transmission system and apply the results of the RFI in a different approach to resolve network constraints</p> <p>Following on from this we have also announced further details on the service design, how participants will be able to take part and a timeline of the overall process. We are hoping for participants to engage with us and let us know what their thoughts are on this service This can be found on our website.</p> <p>We are continuing to assess the impact of resolving SCOTEX i.e. allowing more flows across one</p>

⁴¹ <https://www.nationalgrideso.com/document/182746/download>

⁴² <https://www.nationalgrideso.com/document/182751/download>

⁴³ <https://www.nationalgrideso.com/research-publications/network-options-assessment-noa/network-development-roadmap>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
			boundary and understanding the impact on the subsequent constraint's boundaries
Early Competition			
Early Competition plan setting out implementation for models.	Q1-Q4 2020-21	On track	We launched our Phase 3 Consultation ⁴⁴ on 4 December 2020. This is open for 10 weeks, closing 15 February 2021 and sets out our near final proposals for models of early competition. This was supported by a launch webinar on 15 December with further Q&A sessions planned for late January / early February 2021. Proposals have been further developed taking stakeholder feedback from our Phase 2 consultation and further engagement workshops. To encourage higher feedback rates, we have placed additional focus on expanding our audience reach, utilising our stakeholder challenge group and other ESO and industry events to highlight the consultation.
NOA: Enhanced communication			
Improve accessibility of Electricity Ten Year Statement (ETYS) and Network Options Assessment (NOA) publications	Ongoing	Ongoing	As a result of feedback we have received, this year we intend to make it clearer how the content for both publications applies to our stakeholders. We are also intending to reach new stakeholders and make the publications accessible and relevant to them by trying to answer the "so what?" question. We have published the Electricity Ten Year Statement (ETYS) online and have replaced the single document with an interactive web version. Our stakeholders can provide feedback directly to us via the website which means we can seek to respond quickly. We can also learn from what interests our stakeholders using this approach and provide them with more relevant information in future publications.
Regional Development Programmes (RDPs)			
Development of commercial arrangements for Transmission Constraint Management (TCM) service from DER	Q2-Q4 2020-21	On track	Bilateral meetings continue to be held on a regular basis with SP Energy Networks (SPEN), Western Power Distribution (WPD) and UK Power Networks (UKPN). These are supplemented with joint monthly meetings to ensure aligned processes are developed. We are currently working with the DNOs to draft summary project material that would cover all Regional Development Programmes (RDPs) and provide guidance to Distributed Energy Resources (DER). This is expected to be published in Q4 2020-21

⁴⁴ <https://www.nationalgrideso.com/news/our-early-competition-phase-3-consultation-has-launched>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Co-ordinated DER inter-tripping functionality for transmission fault management. Including completion of work with WPD and UKPN	Q2-Q4 2020-21	On track	<p>The remainder of the outstanding project activities for the UK Power Networks (UKPN) N-3 project are on track to be completed by the end of January 2021.</p> <p>We are continuing work to deliver the new Inter-Control Centre Communication Protocol (ICCP) links with both WPD and SSE-N. Whilst the remaining outages for the delivery of this capability with WPD and SSE-N have been planned, we are working with NGET to determine if any incremental functionality can be bought online earlier in 2021. NGET are currently awaiting a response from the equipment supplier and a further update will be provided once known.</p>
Develop the Generation Export Management Scheme (GEMS) in South West Scotland to manage transmission constraints	Q2-Q4 2020-21	On track	<p>The ESO is continuing the development of the Joint Operating Procedure with SPD in preparation for their Active Network Management (ANM) roll-out early this year.</p> <p>SP Transmission (SPT) are now finalising their internal documentation in preparation for the GEMS procurement activity, which the ESO will support where required. In addition, internal work is progressing at pace to develop the various commercial arrangements for Distributed Energy Resources (DER), whilst also collaborating with several DNOs to ensure a consistent approach across both GEMS and the MW Dispatch projects on the south coast.</p>
Whole System thought leadership			
Support BEIS and industry in developing a strategy for clean heat.	Q1-Q4 2020-21 and ongoing	Ongoing	<p>We met BEIS in November 2020 and plan to meet again in early 2021.</p> <p>We continue to discuss whole energy system matters with the system operation teams in National Grid Gas Transmission (NGSO) in the context of our ongoing stakeholder engagement on energy policy. No formal project will be taken forward in 2020-2021 as our teams are focused on understanding the long-term direction of the ESO in the context of the Ofgem review of system operation and the anticipated Energy White Paper.</p> <p>We published a thought piece⁴⁵ about the implications for system operation of clean heat pathways on 16 November and held a webinar to get industry feedback on the thought piece on 8 December.</p>

⁴⁵ <https://www.nationalgrideso.com/news/decarbonizing-heating-net-zero-energy-system>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Active engagement in the development of DSO and co-ordinated flexibility markets including cross-sector considerations	Q3 2020-21	Target date met	ESO has provided significant input into the Open Networks DSO implementation plan ⁴⁶ , which was published on 1 July 2020. The ESO continues to be actively involved in the work of Open Networks and is involved in the development of the 2021 work programme and End of Year report. We have led the delivery of the final flexibility procurement processes 2020 deliverable (WS1A P2) and the whole system CBA 2020 deliverable (WS4, P1).
Network value assessment tools			
Voltage needs identification tools/ processes.	Q4 2020-21 and ongoing	Ongoing	Developed Historical Data Mining Tool and completed initial view on potential next priority regions for high voltage assessment. Initial outcome of voltage needs identification process was published at the end of June 2020.
Enhanced customer experience			
Continue to work with Customers and Network Owners to understand the requirements and scope of a system wide single platform to provide online account management and connection application functionality	Ongoing, due to be completed in 2022	Ongoing	Discussions with Customers and Stakeholders regarding scope of Portal completed in January 2020. We did intend to engage on further discussions to identify functionality, but the TOs have accelerated their portals and have now physically launched them. From the products the TOs have launched and the work we did with industry last year, we now know what is required from the ESO portal. The next phase of the ESO portal development will now be after the start of RII0-2, subject to funding.
Insights documents			
Operability Strategy Report	Q3 2020-21	Completed Q4 2020-21	Report published January 2021 ⁴⁷
FES: Bridging the gap to net zero	Q3-Q4 2020-21	On track	Three external webinars were held at the end of November to share preliminary results from our working groups looking at markets, technology and data and digitalisation in relation to managing peaks and troughs. The webinars were an opportunity for challenge and review with external stakeholders and their feedback will be incorporated into our final report, due to be published March 2021.

⁴⁶ <https://www.energynetworks.org/electricity/futures/open-networks-project/dso-implementation-plan.html>

⁴⁷ <https://www.nationalgrideso.com/document/183556/download>

Deliverable	Target delivery date (from Forward Plan Addendum)	Actual delivery date	Status
Summer Outlook	Q1 2020-21	Target date met	Report published April 2020 ⁴⁸ .
Winter Outlook	Q3 2020-21	Target date met	Report published October 2020 ⁴⁹
Winter Review and consultation	Q1 2020-21	Target date met	Report published June 2020 ⁵⁰
Future Energy Scenarios (FES)	Q2-Q3 2020-21		Report published July 2020 ⁵¹ . The Launch conference for stakeholders was shifted to a virtual event online. This year we have designed the FES report to be digital first, reducing our environmental footprint and making the overall length of the document 25% shorter, whilst including broader analysis and new sections on whole system flexibility not previously covered by FES.

⁴⁸ <https://www.nationalgrideso.com/document/167541/download>

⁴⁹ <https://www.nationalgrideso.com/document/178126/download>

⁵⁰ <https://www.nationalgrid.com/uk/gas-transmission/document/131756/download>

⁵¹ <https://www.nationalgrideso.com/document/173821/download>

C.3 Role 3 Notable events

Early Competition Plan – Phase 3 consultation

Our Phase 3 consultation⁵² was launched on Friday 4 December 2020 and will be open until 15 February 2021. This consultation is our final consultation for early competition, our initial consultation was published in July 2020. Our Phase 3 consultation pulls together all feedback gathered in phase 1 and 2 and further explores both the technical and commercial aspects of an early competition model. We also set out suggested roles and responsibilities of parties and a first indication of the timescales for implementation. The consultation will seek stakeholder views to further refine the end to end model for early competition ahead of final submission of the plan to Ofgem in April 2021.

With the aim of increasing awareness of our consultation, and ensuring our stakeholders understand our proposals we held a webinar on Tuesday 15 December 2020 where we provided a verbal overview of the consultation.

Constraints Management Pathfinder

Following our announcement on the decision to tender at the end of Q2 2020-21, on 22 December we published⁵³ the information about the post fault generation turn down/ demand turn up service. We have included an overview of the service, requirements and a timeline to provide more information on the service.

⁵² <https://www.nationalgrideso.com/news/our-early-competition-phase-3-consultation-has-launched>

⁵³ <https://www.nationalgrideso.com/document/183531/download>

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