nationalgridESO

ESO Forward Plan 2019-20

Quarterly Report: October- December

21 January 2020

Foreword

Welcome to our quarterly performance report for October - December 2019.

This third quarterly report for the 2019-20 performance year details our performance against our wider metric suite together with an update on our progress against the deliverables set out in our current 2019-21 Forward Plan[1].

We report here on those deliverables which we targeted to complete during Q3 2019-20 and the progress we are making on achieving those deliverables which are due to be completed during Q4 2019-20. We are also reporting on deliverable changes as per our Draft Forward Plan 2020-21[2] and Executive Summary[3]

We are also pleased to report on a number of significant events and achievements, which are listed at the end of each chapter.

Contents

A summary of our monthly and quarterly metrics is shown in Table 1 below.

Metric	Performance	Frequency	Status
Balancing cost management	£126m outturn against £91m benchmark	Monthly	🔴
Information Provision Scorecard	All publications and reports within our control published in full and on time	Quarterly	🟢
Energy forecasting accuracy	Demand forecast error met target; Wind forecast error below target.	Monthly	🟠
Provider Journey Feedback	Tendering survey result was in line with the benchmark	Quarterly	🟠
Reform of Balancing Services Markets	Role 2 performance was 81%; balancing market performance was 64%.	Quarterly	🟠
Code Admin Stakeholder Satisfaction	Average webinar score of 7.7 against the baseline of 7.6	Quarterly	🟢
Charging Futures	Average webinar score of 6.4 against the baseline of 7.3	Quarterly	🔴

[1] https://www.nationalgrideso.com/document/140736/download
[2] https://www.nationalgrideso.com/document/159346/download
[3] https://www.nationalgrideso.com/document/159351/download

Month-ahead BSUoS forecast	10% forecasting error against 10% benchmark	Monthly	●
Whole system- unlocking cross boundary solutions	49MW of DER accepted in Q1	Quarterly	●
System access management	0/1000 cancellations in Dec; 2.43/1000 YTD	Monthly	●
Customer Value Opportunities	7,381GWh of direct savings and 1,038GWh of indirect savings delivered	Quarterly	●
Connections agreement management	100% of agreements updated within 9 months	Monthly	●
Right first time connection offers	90% YTD of Right First Time connections offers determined from ESO related reoffers, against benchmark of 95%	Monthly	●
NOA Enhancing Communication	Actively engaged with stakeholders on NOA, ETYS and NOA for Interconnector; shared information of Network Development Roadmap and gain positive feedback	Quarterly	●

Table 1: Summary of quarterly metrics

You can find out about our vision, plans, deliverables and full metric suite in the Forward Plan pages of our website[4].

We welcome feedback on our performance reporting to box.soincentives.electricity@nationalgrideso.com .

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ESO Regulation Senior Manager

[4] https://www.nationalgrideso.com/about-us/business-plans/forward-plans-2021

Role 1 Managing system balance and operability

Operate the system safely and securely, whilst driving overall efficiency and transparency in balancing strategies across time horizons

Support market participants to make informed decisions by providing user friendly, comprehensive and accurate information

Metric 1 – Balancing cost management

December 2019 Performance

For monthly breakdown of costs, please refer to our balancing costs webpages[5].

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Benchmark cost (£m)	83.2	97.5	75.3	85.6	87.4	96.6	103.3	98.4	91.0	82.6	81.9	81.1	1063.9
Additional cost forecast due to WHVDC fault (£m)	11.3	11.3	1.0	0	0.5	1.0	0	1.5	0	0	0	0	23.5
Benchmark adjusted for WHVDC (£m)	94.5	108.7	76.3	85.6	87.9	97.6	103.3	99.9	91.0	82.6	81.9	81.1	1090.4
Outturn cost (£m)	80.1	60.8	85.3	67.1	104.9	107.4	130.1	86.3	126.0				848 [YTD]

Table 2: Monthly balancing cost benchmark and outturn.

Note that we are including an adjusted benchmark figure due to restrictions on Western HVDC link availability during April, May, June, August, September and November as these events were outside of our control.

To apply seasonality to the monthly benchmark figures, we have apportioned the calculated benchmark for the year (£1063.9m) across the 12 months in the same ratio as our year-ahead monthly BSUoS forecast[6]. Note that outturn cost excludes cost associated with Black Start.

[5] https://www.nationalgrideso.com/balancing-data
[6] https://www.nationalgrideso.com/document/141946/download

Supporting information

December was the second most expensive month of the year so far for balancing costs: with costs out turning above the monthly benchmark. Wind output, particularly Scottish wind output, was extremely high. This was the main cause of the increased costs, which resulted from large volumes of wind generation being restricted due to thermal constraints. Energy Imbalance and Operating Reserve were also expensive; the drivers behind this were the high levels of wind and unpredictability of the interconnector flows (Britned and NEMO have both moved to hourly nomination gates) making the system more complex and difficult to balance. With increased price volatility (the first negative outturn price in the day ahead auction was observed in December), generators are less likely to run long, and therefore, resulting in higher cost on energy balancing. December was also an expensive month for system stability costs, with the increased wind and high levels of interconnector imports displacing conventional generation and reducing system inertia.

Western Link was unavailable for 4 days in early November due to a planned outage, so an uplift was added to the benchmark to reflect this. Balancing costs fell significantly in November from October and outturned £17m below the benchmark. A combination of more benign weather and the restoration of some network capabilities following summer outages led to lower constraint costs. Wind output was 700GWh lower in November than October, with Scottish Wind 340GWh lower, thus reducing thermal constraint costs due to network congestion in Northern England and Scotland. Along with reductions in thermal constraint costs there was also a reduction in RoCoF, Reserve and Reactive costs compared to October, as higher demands led to more synchronous generation running and reducing the amount of balancing actions needed to manage these requirements.

October balancing costs were higher than the benchmark as a result of higher constraint costs due to thermal constraints in the North and South East, which were driven by adverse weather and system outages. Increased volatility on the interconnectors due to higher continental prices also led to an increase in costs for energy balancing.

Metric 2 – Information Provision Scorecard

Q3 2019 Performance

This metric demonstrates our performance in publishing a large range of information in full and on-time.

For monthly breakdown of costs, please refer to our balancing costs webpages[7].

Information Provision	Frequency	Deadline and target	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Overall status
MBSS	Monthly	Each monthly report published by the end of the following month	●	●	●	●	●	●	●	●	●				●
Daily Cost Summaries	Daily	85% of reports produced within 2 working days	●	●	●	●	●	●	●	●	●				●
Trades	Daily	97% of trades published within 1 hour	●	●	●	●	●	●	●	●	●				●
BSUoS Reports	Monthly	Monthly BSUoS report published by the 10th working day	●	●	●	●	●	●	●	●	●				●
Market Information Reports	Monthly	FFR Monthly report published on time (as per schedule) and right first time 100% of the time	●	●	●	●	●	●	●	●	●				●

[7] https://www.nationalgrideso.com/balancing-data

Market Information Reports	Monthly	FR Monthly report published on time (as per schedule) and right first time 100% of the time	●	●	●	●	●	●	●	●	●		●
Market Information Reports	3x/year	STOR market report published on time (as per schedule) and right first time 100% of the time	N/A	N/A	N/A	●	N/A	N/A	●	N/A	N/A		●
Daily BSUoS Forecast	Daily	100% of forecasts published by 08:00 at day ahead stage for Tues-Sat and 17:00 on Fri for Sun & Mon	●	●	●	●	●	●	●	●	●		●
Demand Forecasts	Daily	100% of forecasts published on time. Forecasts published every day no later than 9:15am	●	●	●	●	●	●	●	●	●		●
Wind forecasts	Daily	100% of forecasts published on time. Forecasts published every day no later than 9:15am	●	●	●	●	●	●	●	●	●		●

Table 3: Information Provision Scorecard

For full details of this quarterly metric, see page 24 of our Forward Plan.

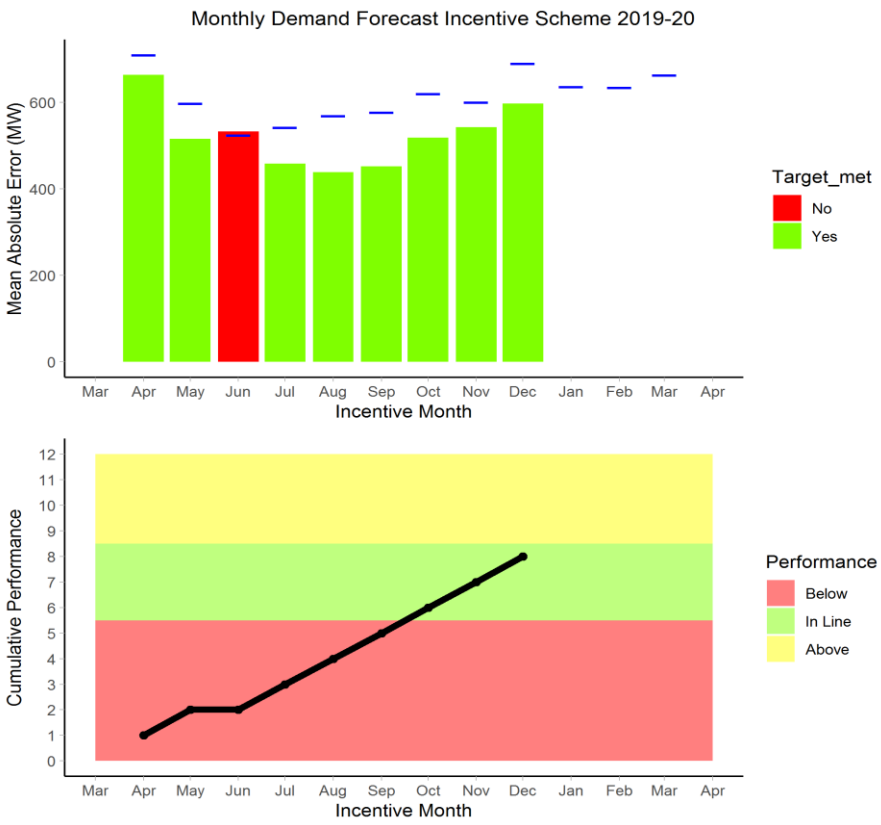
Supporting information

This metric has consistently delivered green for the first three quarters of the 2019-20 performance year. All publications and reports within our control were published in full and on time.

Metric 3 – Energy forecasting accuracy

December 2019 Demand Forecasting Performance

Error! Reference source not found., shows our performance for D ecember as the green histogram against the blue target line.



Supporting information

In December 2019, our day ahead demand forecast performance was better than our target of 691MW. December's MMAE (monthly mean absolute error) was 598MW. This means that, during the 2019-20 Financial Year, we have beaten our monthly target for 8 out of 9 months.

This suggests that we are on track to exceed our target at the end of the year.

The Christmas period is one of the most difficult times to forecast demand. This is because the day of week on which the Bank Holidays fall is a major determinant in the pattern of demands. No Christmas periods since 2013 have exhibited the same pattern as we saw in December 2019. Behaviour over the festive period appears to be changing. As such it was often not possible to gauge the pattern of demand with any real accuracy at the day ahead stage.

Despite these difficulties, our new forecasting models and tools allowed us to increase the day ahead accuracy by 11.4% compared to the previous three Christmas periods.

Performance benchmarks

At the end of the year, we will count how many months we have met our targets and apply the benchmarks:

- Below benchmark: 0-5 months;
- In line with benchmark: 6-8 months;
- Exceeds benchmark: 9-12 months.

December 2019 Wind Generation Forecasting Performance

Figure 1: Wind Forecasting Performance, shows our performance for December as the red histogram, against the blue monthly target.

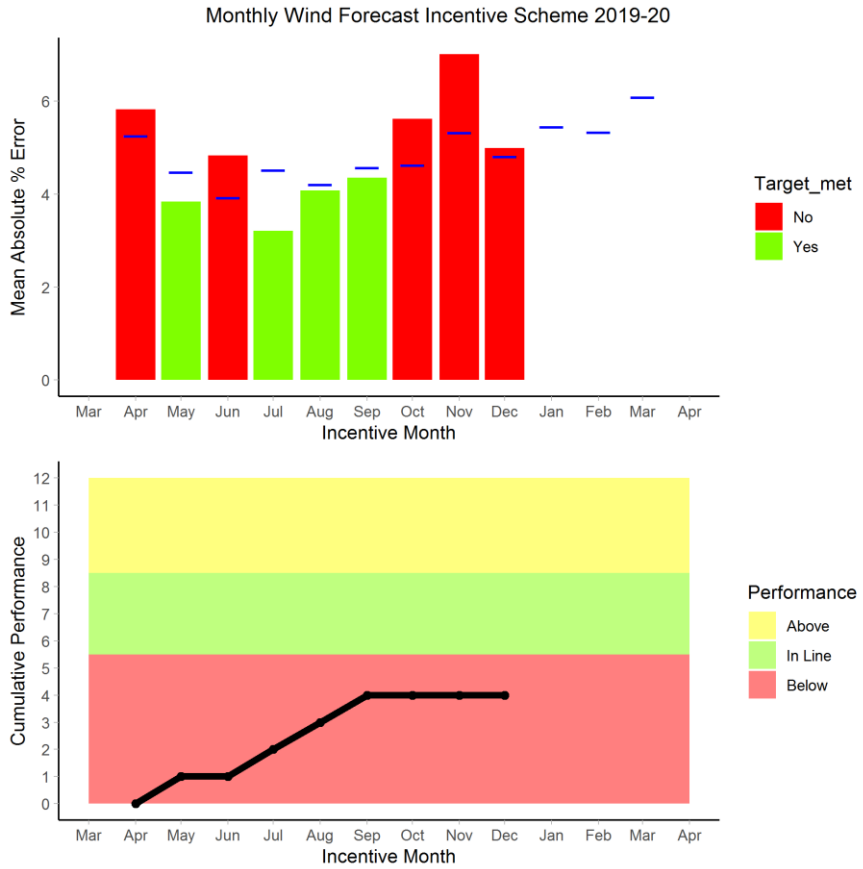


Figure 1: Wind Forecasting Performance

Supporting information

In December 2019, our day ahead wind forecast accuracy was slightly worse than our target of 4.81%. December's MMAPE (monthly mean absolute percentage error) was 4.99%.

The target is based upon the previous three December months, which had relatively low and stable levels of wind. They were not fully representative of the full range of variability and uncertainty of wind generation during the month of December - the World Meteorological Organisation suggests a minimum of 15 years to capture inter-year variability. As such, the target level for December is artificially low.

Large wind power forecasting errors can occur when there is a timing error on the movement of a weather front across areas with high concentrations of wind power, and there were three occasions when this happened in December. We continue to work towards improving the wind power forecasts by monitoring the quality of metering data, refining our power curve models and engaging with our weather providers in the event of large weather forecasting errors. We will also continue to implement lessons learned from investigating the large errors that occurred in November 2019.

Performance benchmarks

At the end of the year, we will count how many months we have met our targets and apply the benchmarks:

Below benchmark: 0-5 months;

In line with benchmark: 6-8 months;

Exceeds benchmark: 9-12 months.

Deliverables

Deliverable	Target delivery date	Revised delivery date	Status
Uninterrupted, safe, secure system operation			
System security metrics	Q4 2019-20	Q1 2020-21	We are proposing that this will form part of our suite of metrics for 2020-21, as part of the Draft Forward Plan for 2020-21, rather than being classified as a deliverable. We will also start to publish this information on our data portal in at the end of January 2020
Procurement Guidelines Process	Q4 2019-20		On track. Currently engaging with stakeholders and moving dispatch of Short-term Operating Reserve (STOR) to the Ancillary Services Dispatch Platform (ASDP).
Transparency of data used by our ENCC in our close-to-real-time decision making			
Publication of operational planning data	Q3 2019-20	Q4 2019-20	A working group has been put in place to ask for stakeholder feedback, therefore this has been pushed back to Q4 2019-20 so we have sufficient time to respond
Future of the ENCC	Q1 2019-20	Q4 2020-21	In order to ensure that this work is valuable to stakeholders, and does not overlap with our other publications, we have sought feedback from external stakeholders in order to ensure that our project meets their needs. We have therefore proposed to defer the delivery date from Q1 2019-20 to Q4 2020-21 as part of the Draft Forward Plan for 2020-21.
Operational Insights			
Insight on balancing decisions taken	Q3 2019-20		This has been completed. More information can be found here: https://www.nationalgrideso.com/balancing-data/voltage-costs
Addressing operational issues			
Electricity Operational Forum	Q2, Q3 and Q4 2019-20 and 2020-21.		Complete to date. We held an Operational Forum in October, and the next one is scheduled for March 2020

Deliverable	Target delivery date	Revised delivery date	Status
ENCC visit days	Q1, Q2, Q3, Q4 2019-20 and 2020-21		Complete to date. This deliverable is now performed monthly rather than bi-monthly.
Roll out of Loss of Mains protection settings	Q4 2019-20	Q4 2020-21	Delivery date has been proposed to be changed from Q4 2019-20 to Q4 2020-21 as part of the Draft Forward Plan for 2020-21 due to the delay for the Distribution-Code 0079 approval. We will publish programme performance measures, including the number of sites where protection setting changes are made, in line with the programme's quarterly assessment cycle.
Upgrade of information systems			
Significant upgrading of IT systems to prepare for European Network Codes	Q3 2019-20		On track.
Frequency and time equipment FATE-3	Q4 2019-20	Q4 2020-21	This has been reprioritised against other work and has been proposed to be delayed to Q4 2020-21 as part of the Draft Forward Plan for 2020-21.
Pi gateway refresh	Q4 2019-20		On track
Power Available	Q3 2019-20	Q4 2019-20	The Power Available Integration Phase 2a remains on track for delivery by the end of Q4 2019-20. However, IT system delivery always comes with some risk during the deploy and test phase, as such, we will keep market participants informed on progress
Interconnector programmes	Ongoing		Intraday changes were delivered on time and to budget. Interconnector owners have requested further intraday changes, which are being assessed.
Insights documents			
Future Energy Scenarios (FES)	Q2-Q4 2019-20 & 2020-21		Complete to date. FES 2020 Framework has been built collaboratively with stakeholders and is currently being finalised. This is to be shared via the Stakeholder Feedback

Deliverable	Target delivery date	Revised delivery date	Status
			Document and takes into account how stakeholder views were sought and considered in developing the framework.
Winter Outlook and Winter Review and consultation	Q3 2019-20 & 2020-21		Completed. Our 2019-20 Winter Outlook Report was published on 10 October. The Winter Outlook is one of our suite of insights documents designed to support the industry by providing useful data and inform future industry planning. The interactive document is supported by a data workbook and can be found on the ESO website here: https://www.nationalgrideso.com/publications/winter-outlook
Operability Strategy Report	Q3 2019-20 & 2020-21		Complete to date. We published our Operability Strategy Report 2020 on 30th December. The report can be found here: https://www.nationalgrideso.com/document/159726/download It is framed around the ESO's 2025 net zero carbon ambition. Key messages from the report include that the ESO will split its new frequency response products between pre and post-fault to allow a more transparent assessment of procured volume against operational requirements. We have committed to engage with industry early in 2020 on the design of the new dynamic frequency response product suite.
Forecasting			
Make energy forecasts more accessible via a dedicated website and Applications Programming Interfaces (APIs)	Q3 2019-20	Q3 2019-20	Completed. All market participants are now able to obtain our half hourly embedded renewable generation forecasting data; Photovoltaics (PV) and wind, through an Automated Programmable Interface (API), supplementing the current e-mail and website services. Using the API, market participants will be able to select the 24 most recent forecasts and obtain them as a JSON or CSV file.

Deliverable	Target delivery date	Revised delivery date	Status
Information access			
Open Data (ESO Data Portal)	Q3 2019-20		Completed. The ESO Data Portal beta version is now live and can be accessed here: https://data.nationalgrideso.com/

Table 4: Role 1 Q3 and Q4 Deliverables

Notable achievements and events this month/quarter

ESO Data Portal

The ESO Data Portal beta version went live on 31 December 2019 and can be accessed here: https://data.nationalgrideso.com/

In addition to being a key deliverable under Role 1 of our current Forward Plan, the portal will also support delivery of the RIIO 2 Business Plan, and will be central to meeting the evolving data best practice guidance from the Energy Data Taskforce. Via the portal we intend to address the feedback our stakeholders have provided regarding the discovery, understanding and consumption of our data, whilst also providing a purpose-built platform to support sharing new datasets.

Outturn Voltage Costs Reporting

To give greater insight on balancing decisions, this monthly report provides outturn system costs for maintaining voltage levels on the network. The map and associated data has been published on the ESO Data Portal and can be found here:

https://data.nationalgrideso.com/constraint-management/outturn-voltage-costs

Role 2
Facilitating Competitive Markets

Ensure the rules and processes for procuring balancing services, maximise competition where possible and are simple, fair and transparent

Promote competition in wholesale and capacity markets

Metric 4 – Provider Journey Feedback

Q3 2019 Performance

This metric measures feedback from four areas.

1. Stakeholder on-boarding.

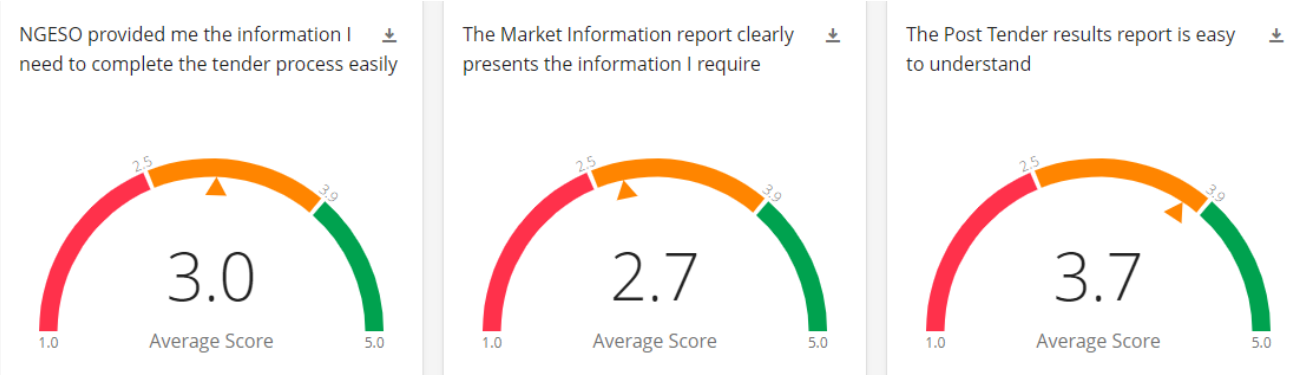
   Since 1 April 2019, surveys have been sent to 17 Providers. To date no responses have been received. Three Reminder triggers have been incorporated to encourage Providers to give feedback and we are highlighting the survey through our discussions with them.

2. Tendering.

   In response to feedback we have received, a number of improvements have been implemented, including:

   - Better access to data: We now publish the post tender results data for our monthly tendered services in Excel format to enable Providers to more easily carry out their own analysis
   - Tender spreadsheets have been simplified to include drop-down menu choices where possible to try and prevent non-compliant bids being submitted
   - We acknowledge that the move from our Ariba e-tender system to Coupa wasn't easy. We are working with our Procurement colleagues to produce a Coupa Guidance document; we are also working to improve the system's functionality to confirm receipt of tenders and send automated emails on tender closing.

December Data:

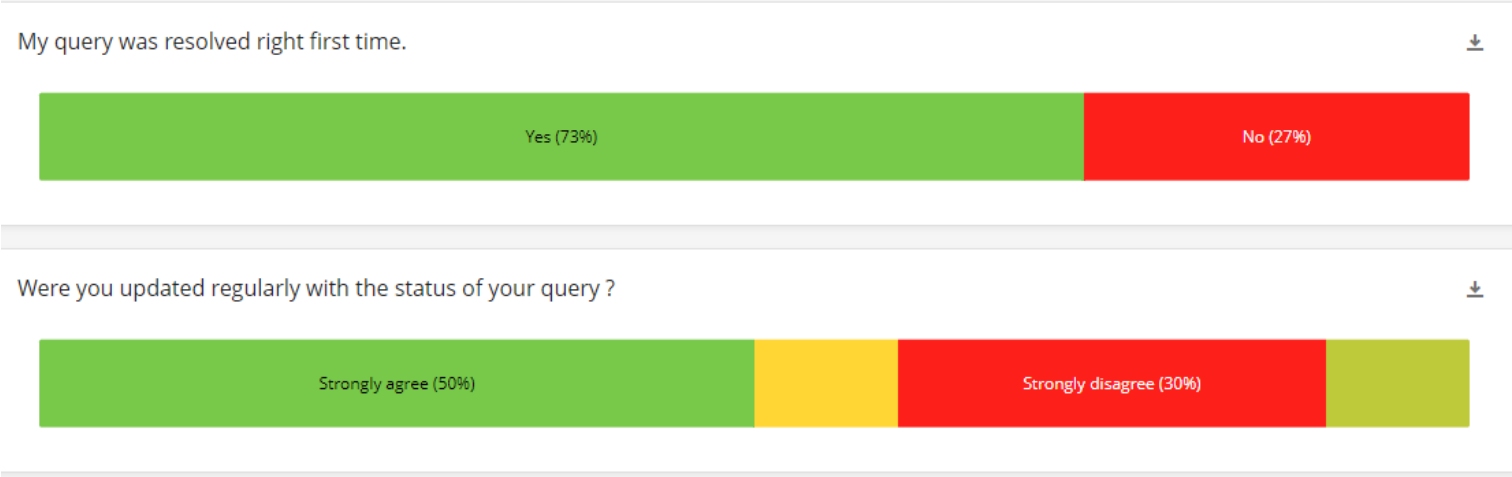


3. Contracting.
   To minimise survey fatigue, this now takes the form of a check-in with Providers prior to their Contract Start to make sure all of the required arrangements are in place.

4. Query Management questions.

   Surveys are being sent as part of our Query Closure process with a summary of responses received to date below, a key area of improvement is to ensure Providers are kept updated with the status of their query.

December 2019



Performance benchmarks

In the absence of any historical data, a benchmark of 2.5 has been chosen. However, we will keep this under review as we start to receive feedback and will revise it as appropriate throughout the Plan period.

Exceeds benchmark: average of 4/5 or above

In line with benchmark: average of 2.5-4/5 or above

Below benchmark: average of less than 2.5/5

For full details of this quarterly metric, including the survey questions, see page 46 of our Forward Plan.

Metric 5 – Reform of Balancing Services Markets

In response to stakeholder feedback at the mid-year ESO performance panel in November 2018, we have developed a metric that covers the removal of barriers to entry for different technologies in different services. This is supplemented by tracking the distribution of balancing services spend across bilateral and open procurement approaches (competitive tenders and auctions) in order to tell the full story. Our intention is to use this metric to communicate progress against a fundamental element of Role 2 deliverables. We would value stakeholders' views on how to articulate this and benchmark progress in the simplest and most transparent manner.

Q3 2019 Performance

Metric Part 1

Deliverable in 2019-20	BM Wind through 2019-20					Embedded wind through 2019-20				
	Current	Q1	Q2	Q3	Q4	Current	Q1	Q2	Q3	Q4
Mandatory Frequency Response (MFR)	●	●	●	●	●	●	●	●	●	●
Commercial Frequency Response (FFR/auction trial)	●	●	●	●	●	●	●	●	●	●
Obligatory Reactive Power Service (ORPS)	●	●	●	●	●	●	●	●	●	●
Reserve Products	Consultations and developments will be made throughout 2019-20 for delivery in future years									
Black Start services	Consultations and developments will be made throughout 2019-20 for delivery in future years									
Balancing Mechanism	●	●	●	●	●	●	●	●	●	●

Deliverable in 2019-20	Solar through 2019-20					DSR through 2019-20				
	Current	Q1	Q2	Q3	Q4	Current	Q1	Q2	Q3	Q4

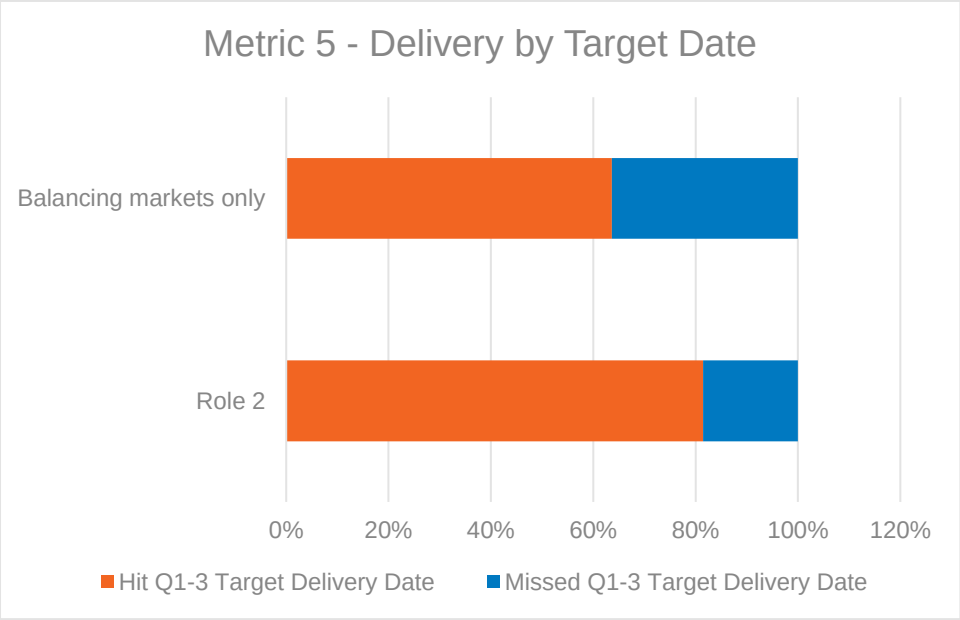
Mandatory Frequency Response (MFR)	●	●	●	●	●	●	●	●	●	●
Commercial Frequency Response (FFR/auction trial)	●	●	●	●	●	●	●	●	●	●
Obligatory Reactive Power Service (ORPS)	●	●	●	●	●	●	●	●	●	●
Reserve Products	Consultations and developments will be carried out throughout 2019-20 for delivery in future years									
Black Start services	Consultations and developments will be carried out throughout 2019-20 for delivery in future years									
Balancing Mechanism	●	●	●	●	●	●	●	●	●	●

● significant barriers to entry with no solution implemented

● interim solution implemented

● enduring solution implemented to enable commercial access

Table 5: Relationship between deliverables and barriers to market participation



Supporting information

The change of status between 'current' and 'end Q4 2019-20' is driven by the expected changes from completing relevant role 2 deliverables. These deliverables have been identified as addressing identified barriers to market participation, however there may not be a direct and immediate effect on the market associated with each one. This is because changes in product design or market structures take time to filter through into changes in participant behaviour, and cannot easily be unpicked from natural variations or the impact of external factors such as regulatory changes.

In Q2, there was a change to the Obligatory Reactive Power Service (ORPS) deliverable. The delivery of improved access to reactive power from non-BM assets has been delayed as a result of the IT challenges experienced by our partners in the Power Potential project, specifically the Distributed Energy Resources Management System (DERMS) in UKPN's control centre. These challenges have delayed the Wave 1 optional trial start to January 2020, and the delivery plan for the Wave 2 full commercial trial is now planned for Q4 2020.

Our performance in meeting the target delivery dates across Role 2 during the period Q1 to Q3 of 2019/20 has reduced from 83% to 81% (26 of 32 hit), which equates to a result of Exceeds Benchmark. Restricting the results to only those Role 2 deliverables relating to balancing products and markets gives a performance that has increased from 57% to 64% (7 of 11 target dates met), which equates to a result of In Line With Benchmark.

Performance benchmarks

The timing of the deliverables is achievable but challenging, particularly for those classed as Exceeding Baseline', and therefore a target of >75% for being above the benchmark has been chosen.

Exceeds benchmark: Completing >75% of deliverables.

In line with benchmark: Completing 50-75%.

Below benchmark: Completing <50% deliverables.

Metric Part 2

This metric measures the direction of travel away from bilateral arrangements, towards open and accessible market opportunities. We have attributed balancing spend to three categories that describe the openness of the procurement approach: Commercial (bilateral contract); Mandatory;

Tendered. On a quarterly basis, information will be presented in a chart for each service that shows cumulative spend broken down into the three categories of procurement approach to provide supporting narrative on our progress.

Data for 2019/20 Q1-Q3 is shown in *Figure 2: Cumulative spend on services per procurement* category. Final figures for balancing services spend are produced at M+1, so these are final figures for March to November 2019, with provisional data for December 2019.

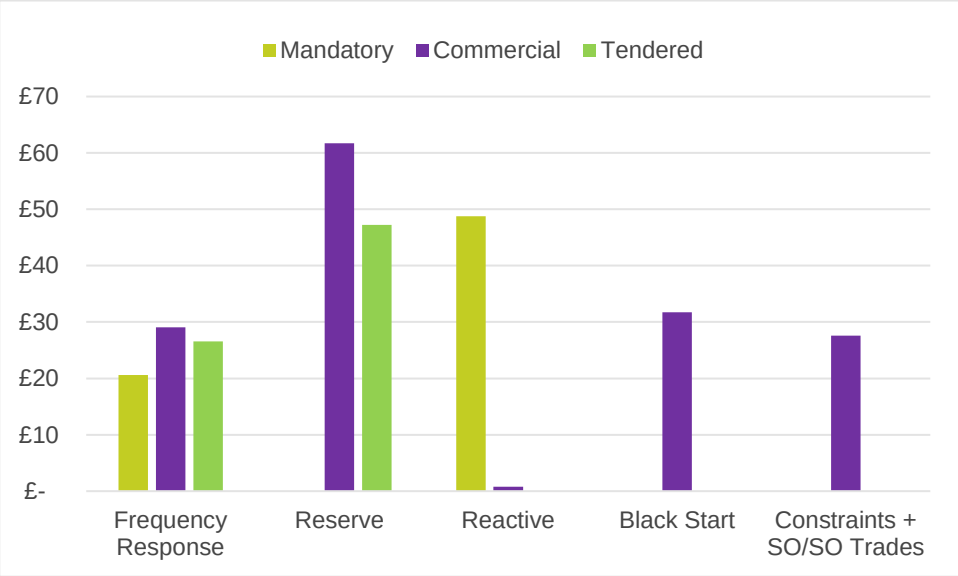


Figure 2: Cumulative spend on services per procurement category in £millions

Performance benchmarks

There are no performance benchmarks set here, as creating an incentive on the ESO to procure in a certain way would limit our ability to deliver our balancing services at the lowest cost to consumers. However, we believe that reporting the information in a regular and transparent way will allow for more open conversations around balancing services procurement and the effect Forward Plan deliverables have on the markets.

Supporting information

Frequency Response: The majority of the costs of commercial frequency response are for Enhanced Frequency Response availability payments, with a small remainder for legacy Frequency Control by Demand Management (FCDM) contracts (up to July), and interconnectors.

Reserve: Tendered Reserve covers Short Term Operating Reserve (STOR) and Fast Reserve tenders, with the commercial reserve being made up of non-tendered reserve payments.

Reactive: This is almost entirely mandatory, with a small amount being commercial payments for synchronous compensation operation by BMUs. Development of market approaches through the Pathfinder projects are progressing.

Black Start: Entirely through commercial arrangements at present. Development of market approaches to restoration continue to move forward.

Constraints & SO/SO trades: Entirely through commercial arrangements at present. Development of markets through the Pathfinder projects are progressing.

For full details of this quarterly metric, including the survey questions, see page 47 - 49 of our Forward Plan.

Metric 6 – Code Admin Stakeholder Satisfaction

Q3 2019 Performance

Year	CUSC	Grid Code	STC
2019	43	46	44
2018	65	66	58
2017	47	59	45

Table 6: Code Administration Cod of Practice (CACoP) – stakeholder satisfaction survey results

Workgroup	Average Score
CMP292	5
GC0123	9
CMP295	7
GC0125	8
CMP280	No responses
CMP281	No responses
GC0127/8	Awaiting response
GC0105	Awaiting response
Baseline	**7.25**

Table 7: Sep -Dec 2019 ESO Code Administrator stakeholder survey performance

Baseline 19/20	SCR webinar Dec 19	CMP311 Consultation webinar	CMP317	CMP315 Introduction webinar	GC0107 Introduction webinar	GC0127/128 Introduction webinar
7.6	7.6	8.2	6.9	7.6	7.7	8

Table 8: Webinar satisfaction performance

Supporting information

CACoP Survey results

We were disappointed in the stakeholder satisfaction results as noted in the mid-year report; we communicated and published a CACoP survey briefing note on our website in November, The sets out an overview of the results, our views and immediate improvement actions. In line with these actions we have piloted the use of executive summaries, we are also started engaging with stakeholders in early January on our proposed new approach for more clear modification reports. In addition, we have put together an internal improvement plan that we are confident is robust and addresses the main issues that our stakeholders have raised. There are many improvement activities scheduled for the coming months that we are looking forward to speaking to our stakeholders about and gathering their views.

Workgroup stakeholder satisfaction

We have continued to survey at the end of each workgroup. The average score was satisfactory for the last year. With the increased amount of modifications raised in January 2020, we will obtain significantly more data in the coming months and hope to receive valuable feedback.

Webinars

Our scores were consistently on or above baseline. Our average webinar score was 7.7 against the baseline of 7.6. We will continue to offer webinars as a way of keeping industry informed.

Performance benchmarks

Exceeds benchmark:

- Increased overall performance across all our three codes (STC/CUSC/Grid Code) in the 2020-21 CACoP survey due to be carried out in spring 2020; benchmarked with our previous scores.
- All exceeding baseline deliverables achieved to plan.

- Stakeholder survey taken periodically throughout the year - Increased overall performance across all our three codes (STC/CUSC/Grid Code); benchmarked with our previous scores.

In line with benchmark:

- Maintained performance across all our three codes (STC/CUSC/Grid Code) in the 2020-21 CACoP survey due to be carried out in spring 2020; benchmarked with our previous scores.
- All baseline deliverables delivered to plan.
- Stakeholder survey taken periodically throughout the year - maintained performance across all our three codes (STC/CUSC/Grid Code); benchmarked with our previous scores.

Below benchmark:

- Decreased performance across all our three codes (STC/CUSC/Grid Code) in the 2020-21 CACoP survey due to be carried out in spring 2020; benchmarked with our previous scores.
- Not all baseline deliverables delivered to plan.
- Stakeholder survey taken periodically throughout the year - decreased performance across all our three codes (STC/CUSC/Grid Code); benchmarked with our previous scores.

For full details of this metric see page 50 of our Forward Plan.

Metric 7 – Charging Futures

Q3 2019 Performance

19/20 baseline	July Forum	September Forum	December Forum
7.3	7.0	7.6	8.1

Table 9: Charging Futures Forums

19/20 baseline	Ofgem led SCR webinar Dec 19	Industry led Non SCR Access Products Dec 19	Active Network Management Webinar May 19	Access Webinar May 19	DUoS & Locational Granularity Webinar May 19	Balancing Services Charges Taskforce Webinar May 19
7.3	5.0	6.8	6.1	6.2	6.3	8.1

Table 10: Charging Futures Webinar Satisfaction

Supporting information

Charging Futures Forums

We have seen a significant increase in the satisfaction score for the December forum, in comparison to the previous ones in the table. We are very pleased with the score of 8.1 and will work with Ofgem to ensure that we continue to deliver forums that meet and exceed our stakeholders' expectations.

Charging Futures Webinars

Our average webinar score was 6.4 against the baseline of 7.3. We have investigated ways of working with content providers and presenters to try to make webinars more useful. In this quarter, we have facilitated other presenters, as well as hosting our own. The results are mixed, which was to some extent expected due to the major announcements from Ofgem around the Targeted Charging Review.

Performance benchmarks

Exceeds benchmark: Average scores from surveys undertaken throughout the year are higher than the baseline score.

In line with benchmark: Average scores from surveys undertaken throughout the year equal the baseline score.

Below benchmark: Engagement scores achieved throughout the year fall below the baseline score.

For full details of this metric see pages 51 - 53 of our Forward Plan.

Metric 9 – Month ahead forecast vs outturn monthly BSUoS

December 2019 Performance

Month	Actual	Month-ahead Forecast	Average Percentage Error (APE)	APE>20%	APE<10%
Apr-19	2.87	3.02	0.05	0	1
May-19	2.48	3.12	0.26	1	0
Jun-19	3.36	3.07	0.08	0	1
Jul-19	2.74	3.23	0.18	0	0
Aug-19	3.97	3.34	0.16	0	0
Sep-19	3.92	3.71	0.05	0	1
Oct-19	3.86	4.02	0.04	0	1
Nov-19	2.56	3.52	0.38	1	0
Dec-19	3.52	3.18	0.10	0	1

Table 11: Month ahead forecast vs. outturn BSUoS (£/MWh) December 2019 Performance:

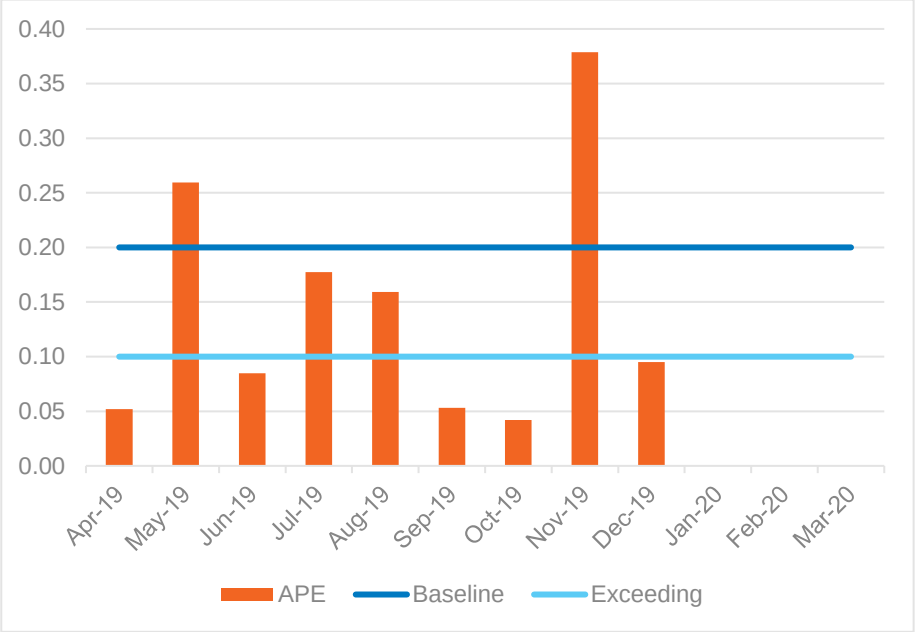


Figure 3: Monthly BSUoS forecasting performance

Supporting information

The Average Percentage Error (APE) for the BSUoS forecast for December was 9.5%. Constraint costs rose from the very low levels observed in November (which were driven by benign weather conditions) to a significantly higher level in December. The network was generally intact with constraint costs being driven by high wind levels as opposed to network outages. The high wind levels also led to increases in Energy Imbalance and Operating Reserve due to unpredictability. The BSUoS volume was consistent with November and this higher volume meant BSUoS costs were lower than across the autumn where constraint costs were high but the lower BSUoS volumes led to higher costs.

Performance benchmarks

Exceeds benchmark: Exceeding is meeting baseline performance and five or more forecasts less than 10% APE.

In line with benchmark: Of the 12 forecasts over a financial year, baseline performance is less than five forecasts above 20% APE.

Below benchmark: five or more forecasts above 20% APE.

Deliverables

Deliverable	Target delivery date	Revised delivery date	Status
Product Roadmaps for Response and Reserve implementation			
Rollout of full functionality in frequency response auction trial	Q3 2019-20		Complete to date. We delivered the second phase of the auction trial with our partners European Power Exchange (EPEXSPOT) on 29 November 2019 and have had seven successful auctions to date. An upward trend in total volume has been seen for Dynamic Low High (DLH), (from ~8,000MW in Dec to around 11,000MW for 10-Jan) and stable volumes for Low Frequency Static (LFS), (around 5,000MW). We continue to see the 100MW cap met in many Electricity Forward Agreement (EFA) blocks, and higher prices than in Firm Frequency Response (FFR), as expected in a new market. Analysis and a review of the first six months, along with a review of the 20MW cap, will be shared externally in Q2 2020-21.
Report on development of new frequency response product suite	Q3 2019-20		Completed. The Response and Reserve Roadmap was published on 3 December 2019 and can be found here: https://www.nationalgrideso.com/document/157791/download
Migration of non-BM Short-Term Operating Reserve (STOR) providers to ASDP	Q2-4 2019-20		On track. We began publishing within year costs for managing voltage levels per region in December 2019 and is updated monthly on our website https://www.nationalgrideso.com/balancing-data/system-balancing-reports We will publish 5 years of historic cost data per region by the end of Q4 2019-20.
Product Roadmap for Reactive implementation			
Communicate reactive power requirements & historic spend	Q4 2019-20		On track. Further transparency on Reactive Power requirements and historic spend will be delivered within Q4 2019-20 which will be in advance of any subsequent work on designing new markets for the product. However, locational requirements will be shared on a discrete basis for any specific market opportunity such as the Network Options Assessment (NOA) pathfinders.

Deliverable	Target delivery date	Revised delivery date	Status
Work with industry to determine future role for reactive power and design more competitive reactive power services	Q4 2018-19 to Q2 2020-21	Proposed to remove	Taking into account all the work going on in the reactive space (Power Potential, Pathfinders, DNO transfer discussions), we believe that it is appropriate to focus on all that is included across these areas of work before considering any significant change to the core Obligatory Reactive Power Service (ORPS) market structure to develop new Reactive Power markets. This deliverable will be replaced by a new one on creating a strategy for reactive once these have delivered. As per our draft Forward Plan 2020-21, we propose to remove this deliverable.
Power Potential trial with UK Power Networks (UKPN)	Q2-Q4 2019-20	Q4 2020-21	We have proposed to move this project to Q4 2020-21 from Q4 2019-20 as part of the Draft Forward Plan for 2020-21. We are continuing to identify whether Distributed Energy Resource (DER) providers embedded within the Distribution network can provide dynamic voltage support to the Transmission network. As there is no precedent for this world class project, this has been a more gradual process to ensure a fit for purpose scheme.
Review learning from Power Potential	Q4 2019-20	Q3 2020-21	This deliverable has been proposed to move to Q3 2020-21 from Q4 2019-20 as part of the Draft Forward Plan for 2020-21. This is since both NGESO and UKPN are focused on the development of essential systems and readiness of Distributed Energy Resource (DER) participants.
Product Roadmap for Restoration implementation			
Develop and evolve a market approach for the procurement of Black Start services	Q4 2019-20		On track.
Power Responsive			
Deliver innovation projects to unlock demand flexibility	Q1-Q4 2019-20		On track. The different projects have progressed as follows: Recorder: work package 1 has been completed with the delivery of a Technology and Governance report. The project is in the final stages of work package 2, which is a Legal and Regulatory report.

Deliverable	Target delivery date	Revised delivery date	Status
			Enhancing Energy Flexibility from Wastewater Catchments through a Whole System Approach: The review of potential flexibility has been completed, the next stage is to model a combined approach. Residential Response: Work package 1 report is being finalised, work packages 2 and 3 are ongoing. The project is looking to attend the upcoming ENA innovation day. Cornwall LEM: We have been buying flexibility through the platform since September, and the trial project is due to conclude participation in March 2020. BEIS Flex competition: We have continued to engage with the successful parties to support their projects and ensure they are aligned with ESO markets. The team also supported the SO Open Innovation Event by providing balancing services expertise to prospective innovation partners.
Power Responsive Stakeholder Engagement	Q1 2019-20 – Q4 2020-21		Power Responsive sponsored the Flexible Power Zone at the two-day EMEX conference in London, hosting a number of Demand Side Response (DSR), DNO and new-technology companies. We also hosted the Flexibility Forum in January, which was attended by over 200 people, and featured presentations on local flexibility developments from 5 of the 6 DNOs.
Wider Access to Balancing Mechanism Roadmap implementation			
Use better technology/systems to improve efficiency of installing communications with BM providers and optimising BMU dispatch	Q4 2019-20		Completed. As part of implementation preparations, NGESO and ELEXON have successfully completed a course of testing with an initial group of market participants, who will create their own web-based Application Programming Interfaces (APIs) to

Deliverable	Target delivery date	Revised delivery date	Status
			provide Electronic Data Transfer (EDT) and Electronic Despatch and Logging (EDL) to NGESO.
Support industry work on providing and delivering against Physical Notifications (ELEXON led) and also support on work on accurate settlement for behind the meter	Q3 2019-20	Q4 2019-20	P375 and P376 are still at Workgroup stage with industry, however they have now been combined by Elexon with P379 (Multiple Suppliers through Meter Splitting) as a result of identified interdependencies between all three modifications.
Intermittent Generation			
Deliver Power Available integration phase 1	Q3 2019-20	Q4 2019-20	Power Available integration phase 1 is scheduled to be implemented end of March 2020.
Publish wider strategy on flexibility from intermittent generation	Q4 2019-20		Internal work is underway, stakeholder feedback will be sought via the Wind Advisory Group set up with Renewable UK and delivery remains on track for Q4 2019-20
Deliver Power Available integration phase 2a	Q4 2019-20		The Power Available Integration Phase 2a remains on track for delivery by the end of Q4 2019-20. However, IT system delivery always comes with some risk during the deploy and test phase, as such, we will keep market participants informed on progress.
Facilitating code change			
Facilitation of pre-modification discussions	Q3 2019-20	Q3 2019-20	Complete. The Code Administration team support pre-modification proposals with subject matter expertise, ensuring that cross code implications are being considered to ensure that scope and defects are correctly identified.
Incorporation of all 14 Code Administrator Code of Practice (CACoP) Principles	Q3 2019-20	Q4 2019-20	Modification has not been raised due to change congestion from other modifications. We will consult stakeholders at TCMF to understand industry's view on the priority of this change and raise the modification in Q4 2019-20 if supported.
Code administrator website	Q4 2019-20		On track. Minor updates to the website have been introduced during the year and we plan to deliver more substantive improvements within Q4. Our plan to deliver this has been

Deliverable	Target delivery date	Revised delivery date	Status
			discussed with modification panel members. Minor updates include ordering of modifications, availability of meeting documents and maintenance of a live cross-code calendar.
Raising potential impact of modifications	Q3 2019-20		Completed. The Code Administration team has sought feedback internally and externally and presented the final version of the Initial Written Assessment to Panel. Feedback has suggested that this document may not be required once the report template has been updated. We are committed to offering an enhanced experience to our stakeholders so we will continue to trial this method to see if it is fit for purpose.
Horizon scanning: strategic	Q3 2019-20		Completed. We have circulated the horizon scan document at the November Panels. This can be found on our website here: https://www.nationalgrideso.com/codes
Transform industry frameworks to enable decentralised, decarbonised and digitised energy markets			
Leadership in the successful transformation of electricity access and charging regime	Ongoing		Ongoing. Ofgem have just published their first working paper, we have been attending all sub-group meetings to assist them to get to this position. We will continue to shape the future of Access & Forward Looking Charges through these sub-groups
Facilitate electricity network charging reform through Charging Futures			
Facilitate electricity network charging reform through Charging Futures 1. Targeted Charging Review 2. Access and Forward Looking Charges SCR 3. Reform of the Balancing Services Charges	Ongoing		Ongoing. The latest Charging Futures Forum received a high score of 8.1 for satisfaction. We will continue to work with Ofgem to provide updates on network charging reform. Please see the Charging Futures website: http://www.chargingfutures.com/
Transform the customer experience for network charging			
Improve understanding of our onboarding processes and streamline to meet our customer needs: Simplify our approach for onboarding customers.	Q3 2019-20		Completed. Our approach to customer onboarding has been simplified by creating updates to guidance documentation on the newly updated charging section of the ESO website which

Deliverable	Target delivery date	Revised delivery date	Status
			can be found here: https://www.nationalgrideso.com/charging . This is in conjunction with our deliverable for redefining our processes to make them more customer centric. This will provide greater clarity and ease in which new customers access key information during the onboarding process. The wider onboarding piece with Ofgem, Elexon and wider industry will begin next year as per our deliverable to establish a 'cross party' approach to onboarding and mapping out whole industry requirements.
Improve understanding of our onboarding processes and streamline to meet our customer needs: Redefine our processes to make them more customer centric.	Q4 2019-20		On track. The implementation of multiple contact emails for customer invoicing through Charging and Billing (CAB) system, is due to be completed by the end of February, addressing a key issue highlighted by customers. The Variable Direct Debit process has been updated and any issues arising from the process have been minimalised.
Introduce new 'new entrant' e-learning on charging	Q4 2019-20		On track. Work is ongoing and the team have made significant headway in completing a wide range of written guidance documents and recorded webinars. The work carried out to date has been mapped out and forms part of the engagement plan put together at the beginning of the year. The Charging forums in October provided a great stage for sharing of information and providing new and existing customers with a better understanding / clarity of our charges. The presentations and workshops from the forum have now been added to the ESO website and contribute towards our suite of training materials.
Making Electricity Market Reform (EMR) easier for participants			
Capacity Market Modelling – facilitating broader participation in the CM to provide security of supply at best value for consumers	Q4 2019-20		In order to fully meet this deliverable a new register of embedded assets is required as sufficient consolidated data points are not available. To date a Distribution Connection and Use of System Agreement (DCUSA) modification has been raised seeking to create the necessary register of embedded assets. We are supporting this modification and are involved in the working group. Current timelines for modification approval are Q4 2019-20, subsequent work will then be required to

Deliverable	Target delivery date	Revised delivery date	Status
			develop a corresponding method. Therefore dependent on when the register is available, full implementation of the method may not be until Q4 2020-21.

Table 12: Role 2 Q3 and Q4 Deliverables

Notable achievements and events this month/quarter

Wider Access go-live

A wider range of technologies and providers have been able to access Great Britain's balancing mechanism market since December following 'go-live' of the BM Wider Access project that included changes to various NGESO systems and processes. As part of an update designed to improve equality of access for providers and boost the real-time flexibility of the system, the ESO is lowering the minimum threshold for taking part in the BM from 100MW to 1MW, opening up the market for small and aggregated units in regional networks to provide power to the grid. Following the market changes by the ESO and ELEXON, these providers will be able to register in the BM as a 'virtual lead party' (VLP), a new type of market participant which can provide balancing services without needing a supply licence or to pay 'Use of System' costs (BSUoS and TNUoS) and create secondary BM units to offer flexibility to the grid. The ESO will be able to accept offers and bids from smaller providers and VLPs as well as large generators, a change that will improve system flexibility, allow more renewable power to contribute to balancing the grid, and bring better value to consumers.

Additional information can be found here:

https://www.nationalgrideso.com/news/national-grid-eso-widens-balancing-market-access-smaller-providers

Roles 3 & 4
Facilitating whole system outcomes and supporting competition in networks

Coordinate across system boundaries to deliver efficient network planning and development	Coordinate effectively to ensure efficient whole system operation and optimal use of resources	Facilitate timely, efficient and competitive network investments

Metric 10 – Whole system- unlocking cross boundary solutions

Q3 2019 Performance

This metric is an assessment of the effectiveness of our whole system actions, measured in terms of their consequences.

The measure is the contracted MW capacity of distributed energy resources (DER) connections as a result of the WPD/ESO collaboration in the South-West Coast region.

Grid Supply Point (GSP)	MW	Commentary on DER technology types
Abham	0	
Alverdiscott	49.9*	*subsequently terminated in same period
Axminster	1.56	PV
Bridgwater	10	Multi technology
Exeter	34.99	Multi technology
Indian Queens	29	Multi technology
Landulph	0	

Taunton	21.86	Multi technology
Total	147.31	

Table 13: DER Connections Released

Supporting information

Levels of new Distributed Energy Resources (DER) in the South West region of Western Power Distribution's (WPD) network covered by Regional Development Programmes (RDP) Grid Supply Points (GSP), has slowed significantly over Q3. Feedback from WPD indicates that this cannot be easily attributed to any particular trend, but it is apparent that the number of projects obtaining planning consent has declined, and the time taken for this consent to be obtained has increased. Several of the GSPs in the South West Peninsula are also experiencing more technical issues that are preventing further capacity for connections. For example, Exeter GSP has now reached all thermal and fault level headroom limits and utilized all options which do not require physical works to increase capacity (such as revised running arrangements). We are currently awaiting an application and technical study data from WPD to enable us to move forward with this site. Other GSPs in the south west have reached limits on the DNO's network which require reinforcement.

For full details of this metric see pages 75 - 76 of our Forward Plan.

Metric 11 – System access management

December 2019 Performance

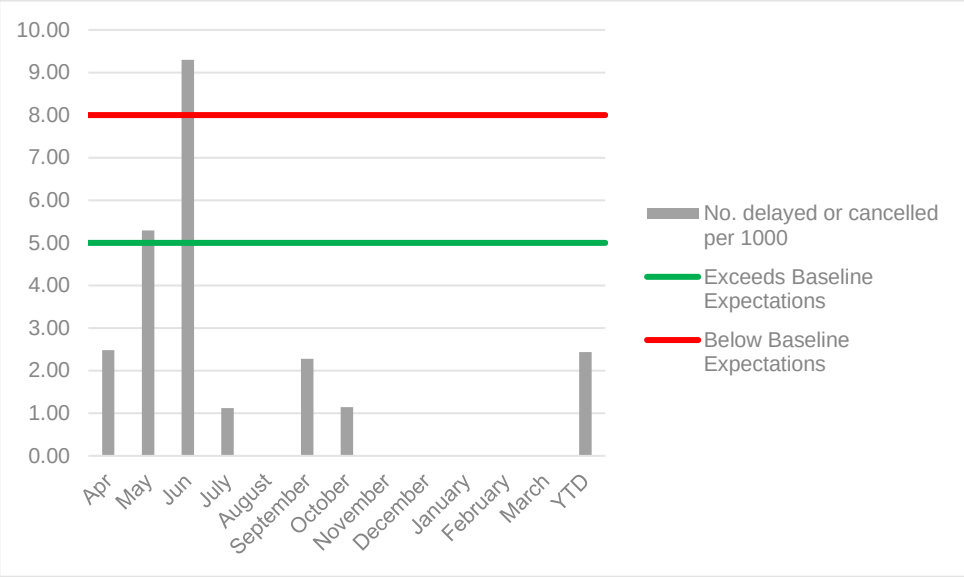


Figure 4: Number of outages delayed by > 1 hour, or cancelled, per 1000 outages

Performance benchmarks

Exceeds benchmark: Less than or equal to 5 per 1,000 outages

In line with benchmark: Between 5 and 8 per 1,000 outages

Below benchmark: More than 8 per 1,000 outages

Supporting information

For December, we are continuing to 'Exceed Expectations' on this metric with 2.43 outage cancellations per 1000 outages, with no outage cancellation occurring in December. The ESO is effectively planning and communicating to all affected stakeholders and customers, ensuring that we continue to maximise access to the transmission system.

Performance benchmarks

Exceeds benchmark: Less than or equal to 5 per 1,000 outages

In line with benchmark: Between 5 and 8 per 1,000 outages

Below benchmark: More than 8 per 1,000 outages

Metric 12 – Customer Value Opportunities

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.

Q3 2019-20 Performance

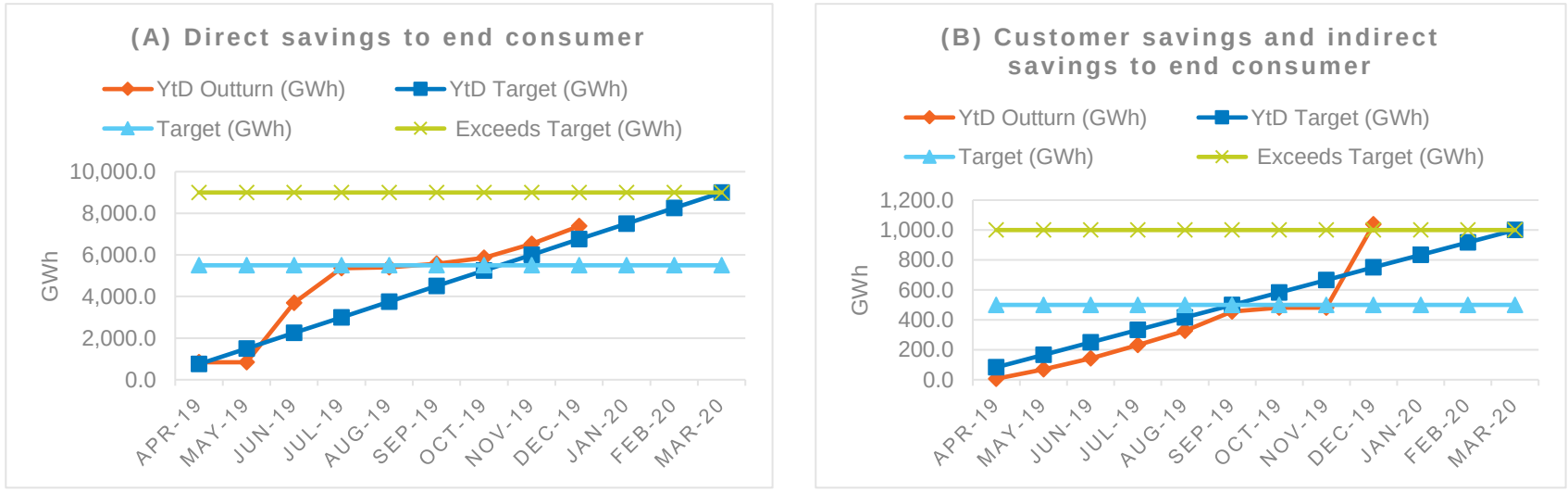


Figure 5: Customer Value Opportunities

Supporting information

Following the success of the metric results last quarter, all teams in Network Access Planning (NAP) have continued to find better ways of doing their work and we continue to challenge outage plans to find savings to benefit the end consumer. NAP has continued to make excellent progress this quarter. To date, we have achieved 7,381GWh direct savings and 1,038GWh indirect savings to the end consumer. We are currently in line with our metric target for direct savings to the end consumer, and exceeding our metric target for indirect savings to the end consumer.

Currently, NAP has identified and recorded more than 95 cases where we have used our engineering expertise and judgment to propose innovative ways of planning system access and gone over and above our network access planning policies and procedures to add value to end consumers and connected customers. The positive spike in "Customer savings and indirect savings to end consumer" graph for the month of December is due to all the customer savings captured in the year ahead plan and finalised at Week 49 (5th December).

As we had already met the customer value opportunities target we set in the 2019-20 Forward plan, we reviewed and re-adjusted our internal target upwards to provide further challenge for the remainder of the year. The revised benchmark will be formally introduced in the next financial year.

Performance benchmarks

The target values for Scotland Outage Planning are set from historic measurements and performance. At this moment, we do not have historical data for the Outage Planning teams who cover England and Wales. Through the year post legal separation from the NG TO we will develop the metric to cover England and Wales. In this first quarter, we have set the targets for the combined GB metric to be twice what the Scotland targets are as a starting point. Given that we have significantly outperformed the target so far, we will consider revising the baseline so that the target is still challenging.

Direct savings to end consumer:

Exceeds benchmark: Greater than 110,000 MWh

In line with benchmark: Between 100,000 MWh and 110,000 MWh

Below with benchmark: Less than 100,000 MWh

Customer savings and indirect savings to end consumer:

Exceeds benchmark: Greater than 220,000 MWh

In line with benchmark: Between 200,000 MWh and 220,000 MWh

Below with benchmark: Less than 200,000 MWh

For full details of this metric see pages 77 - 78 of our Forward Plan.

Metric 13 – Connections agreement management

December 2019 Performance

Number of agreements that need updating	Number of agreements that need updating identified 9 months ago	Number of agreements updated within 9 months	Percentage of agreements updated within 9 months	Status
3	0	3	100%	●

Table 14: Connections agreement management performance

Performance benchmarks

2018-19 performance: = 86%.

Exceeds benchmark: >90% of agreements to be updated within nine months of notification.

In line with benchmark: 80-90% of agreements to be updated within nine months of notification.

Below benchmark: < 80% of agreements to be updated within nine months of notification.

Supporting information

The requirement to update connection agreements arises from a situation where new generation connects, and the ESO needs to amend its arrangements with existing generators connected in that region to ensure that it does not incur unnecessary balancing costs for consumers as a result of restricting generation.

We consider that nine months is a reasonable timeframe for updates of this type to be agreed with customers. So far, we have identified three agreements of this type, signed by the customer in April, July and November respectively. All agreements are within the nine-month timeframe.

We are working to identify where any further changes to connection agreements of this type are required.

Metric 14 – Right first time connection offers

December 2019 Performance

Connections Offers	Results
Year to date number of connections offers	133
Year to date ESO related reoffers	13
Year to date percentage of Right First Time connections offers determined from ESO related reoffers	90%

Table 15: Connections re-offers data

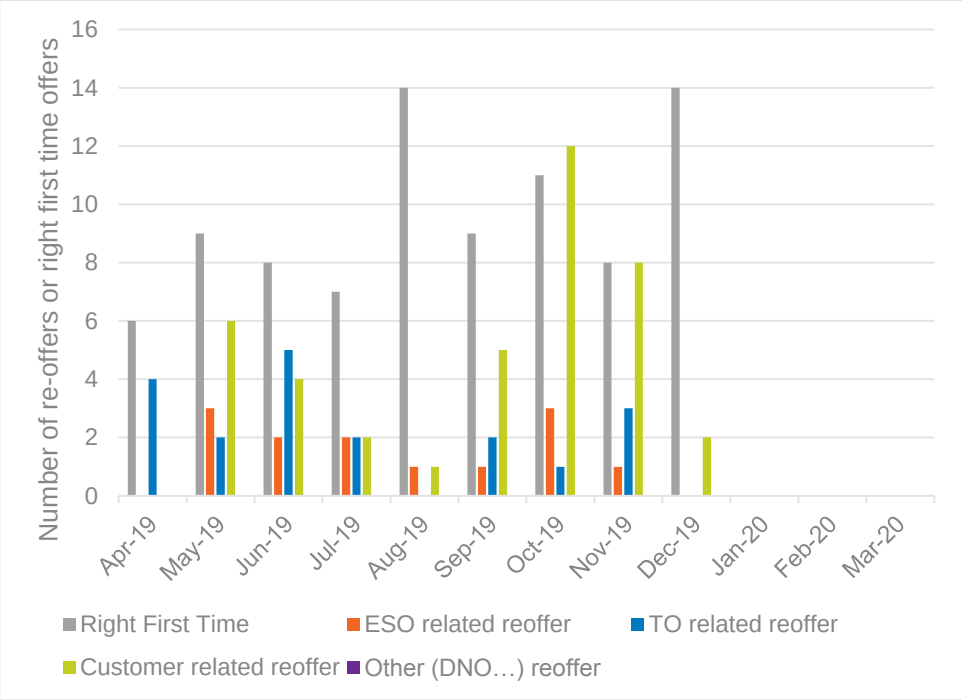


Figure 6: Connections offers monthly performance

Supporting information

There were no ESO related re-offers this month. The year to date Right First Time performance is 90%.

Performance benchmarks

2018-19 performance: = 94%.

Exceeds benchmark: >95% of offers right first time.

In line with benchmark: 95% of offers right first time.

Below benchmark: < 95% of offers right first time.

Metric 16 – NOA Enhancing Communication

Q3 2019 Performance

(For full details of this metric see pages 82 - 83 of our Forward Plan)

Engagement activities

- Workshops for Early Competition on 22 October and 12 November.
- Requests for Information (RFI) published for constraint management pathfinder on 18 December.
- Response to stability RFI published on 20 October.
- Tenders published for short term Mersey voltage (5 November) and stability phase 1 (25 November).
- Electricity Ten Year Statement (ETYS) published on 29 November.
- Engagement meetings held with the TOs about indicative NOA results.
- Our NG ESO Network Capability playlist comprising three videos has had over 600 views.

Figure 7: NOA feedback in December

Feedback in December

On the Network Development Roadmap:

"We think you've done fantastically to have 3 live pathfinder tenders and an RFI out".

- *Generator*

On the NOA:

"The NOA engagement has been good this year. We feel that our views have been taken into account in the various subjects we have been working together on throughout the year".

- *TO*

Performance benchmarks

Exceeding benchmark: Positive stakeholder feedback on the documents and changes we are making to them.

Meeting benchmark: Meets licence obligations. Average stakeholder feedback with clear areas for improvement.

For full details of this metric see pages 82 - 83 of our Forward Plan.

Supporting information

In Q3, analysis has been our key work area for the NOA and NOA for Interconnectors leading to some engagement meetings with stakeholders to discuss the results. The Network Development Roadmap has continued to actively engage stakeholders in Early Competition and the pathfinder projects.

NOA, ETYS and NOA for interconnectors

- We met with the TOs to discuss the indicative NOA results in late November and early December. The meetings are initially at working level, followed by meetings at then senior management level, and timed to help the TOs digest the results.
- We published the ETYS on Friday 29 November 2019 and informed over 900 recipients by email. There have been over 600 downloads to date of the ETYS document.
- We engaged with NOA for Interconnector stakeholders in October regarding the NOA for Interconnector baseline capacity calculation methodology. We outlined our proposed revised methodology, including reasons for change and recommendations. We received feedback from two stakeholders.

Network Development Roadmap

- We have published a number of pieces of information during this period:
  - We published stakeholder feedback on our technical Request for Information (RFI) for the Stability pathfinder on 21 October, including our responses to the feedback. On 5 November, we launched a tender for the Stability Pathfinder Phase 1 (near-term services).
  - We launched the short-term tender for Mersey High Voltage on 14 October. This closed on 8 November and we received options from both transmission and distribution parties.
  - We launched the long-term tender for the Mersey High Voltage Pathfinder on 25 November. Technical submissions were received on 13 December and we have had a significant number of options submitted at both transmission and distribution levels.
  - We published an RFI for the Constraint Management Pathfinder, which, on 18 December seeking feedback from providers of all technology types in the lead up to a webinar on 22 January. This pathfinder is seeking to provide a post fault thermal constraint management service.
- Our monthly newsletter and pathfinder announcements are sent to around 1100 recipients of which typically 300 recipients open the announcement. Information is also available on our website.
- We received positive feedback from one energy services provider who wrote “we think you’ve done fantastically to have 3 live pathfinder tenders and an RFI out”. This recognises the hard work done by the pathfinder virtual teams, which have been working at pace to deliver ground breaking new work.

Early Competition Plan

- Following Ofgem’s May request for an Early Competition Plan we have continued to engage with stakeholders to help develop the plan. We held a further two workshops on 22 October and 12 November, with a total of 16 participants in each. All material is available on our website and was circulated to our wider Early Competition distribution list (around 100 people). We engaged bilaterally with two stakeholders who were unable to attend the workshops, and with the TOs.

Deliverables

Deliverable	Target delivery date	Revised delivery date	Status
Whole electricity system thought leadership			
Whole electricity system learnings	Q3 2019-20	Q4 2019-20	This work has been delayed to better align with Ofgem's position paper on DSO as well as the ENA's work on Innovation gaps. Opportunity will also be taken to link with the 'Innovate with us' call for ideas.
ENA Open Networks project 2019 ESO input – Will play a proactive role in the ENA Open Networks Project including leading the development of a number of products	Q3 2019-20		Completed. Involvement will be included as part of Open Networks End of Year report which is published here: http://www.energynetworks.EYR
ENA Open Networks project 2019 ESO input - Lead the development of the whole energy system workstream of the Open Networks project.	Q3 2019-20		Completed. Involvement will be included as part of Open Networks End of Year report.
Development of a proactive RDP identification process			
RDP identification process	Q3 2019-20	Q4 2019-20	Will be delayed until Q4 2019-20 as efforts have been prioritised on making progress on in-flight RDPs and addressing outstanding issues there. Successful completion of this deliverable is dependent on good progress on the in-flight RDPs.
Pathfinder projects			
Stability pathfinder	Q4 2019-20	Q4 2020-21	On track. Stability pathfinder Phase 1 fulfils the forward plan deliverable. The completion date for this will be Q4 2019-20. For the Stability pathfinder, feedback from the RFI has given us more information on potential providers' time constraints. We have therefore extended our timescales for stability phase 2 to allow more time to run the tender process, to allow providers to participate and evaluate the options. As part of the Draft

Deliverable	Target delivery date	Revised delivery date	Status
			Forward Plan for 2020-21, we have therefore proposed to delay the delivery date of stability phase 2 to Q4 2020-21
Mersey Voltage pathfinder	Q4 2019-20	Q1 2020-21	This project has been proposed to be delayed to Q1 2020-21 as part of the Draft Forward Plan for 2020-21. The delay is due to short term network requirements being given priority as these are required to maintain network compliance. The long-term pathfinder tender was issued on 25 November 2019. The final tender will close at the end of February 2020, and we will be making a final decision on 24 April 2020 to award the tender.
Pennines Voltage pathfinder - Run RFI and then decision to tender market solutions	Q1 2019-20	Q1 2020-21	The notification of Fiddlers Ferry generation closure forced a reprioritisation of resources for voltage assessments from the Pennines to the Mersey area. Hence as part of the Draft Forward Plan for 2020-21, we have proposed to delay the Pennines project from Q1 2019-20 to Q1 2020-21. This has also given us the opportunity to take learnings from the Mersey pathfinder and apply this to the Pennine region.
Pennines Voltage pathfinder - Project recommendations	Q3 2019-20	Q3 2020-21	As part of the Draft Forward Plan for 2020-21, we have proposed for this action to be delayed to Q3 2020-21 as part of a reprioritisation process. This is following on from the Mersey pathfinder so we can take on board and adapt to stakeholder feedback and any further learning from Mersey.
Study Tools			
Voltage needs identification tools/ processes	Ongoing	Q4 2020-21	We have created new processes to identify future voltage needs and placed the detail of this process in our NOA methodology which is consulted upon annually. To enhance these processes and make them more efficient we have begun a Network Innovation Allowance (NIA) project investigating a proof of concept for year-round voltage needs, identification and optimisation tool with Strathclyde university. Although it is still in the early stages the project is progressing well, and its final output is expected Q4 2020-21. This tool will improve our ability to quickly assess GB voltage needs in future years.

Deliverable	Target delivery date	Revised delivery date	Status
Thermal probabilistic assessment tool / process- Initial boundary capability results available	Q3 2019-20		Complete and reported upon within our ETYS 2019 publication which can be found here: https://www.nationalgrideso.com/document/157451/download
NOA: Enhanced communication			
Improve accessibility of the ETYS and NOA publications - Enhancements to information in ETYS	Ongoing		Whilst this is an ongoing action the deliverables for 2019-20 are complete. These included the submission of SRF information on the ESO website as part of the ETYS /NOA process to encourage third party participation in the process. We have reported on probabilistic modelling developments and the improvements made on presenting system needs and we have also shared additional information on system fault levels as part of our ETYS 2019 publication.
Improve accessibility of the ETYS and NOA publications - Provide regular updates and continue engagement	Ongoing		NG ESO publish a monthly newsletter to industry participants on network development including details on ETYS, NOA and pathfinders.
Whole system operability			
Defining roles and responsibility for voltage management across the transmission distribution interface	Q3 2019-20	Q1 2020-21	Proposals have been developed for additional information exchange and action in the planning process. Agreement on some issues is outstanding meaning conclusions are likely to be delayed until Q1 2020-21.
Deeper system access planning			
Deeper access coordination of 1-2 major infrastructure projects to commence in the RIIOT1 period	Q3 2019-20	Q4 2019-20	Process is being implemented across the ESO's Network Access Planning team with customer value being reported quarterly in Metric 12. Target is under continuous review.

Deliverable	Target delivery date	Revised delivery date	Status
Enhanced customer experience			
Transmission Outages, Generation Availability (TOGA) replacement	Q4 2019-20	Q3 2020-21	The project is delivering in an agile way, therefore the substantial details of the low level discussions and requirements are more difficult to validate at a higher level. The requirements can expand in complexity when the design phase and detailed analysis for each release and sprint are completed. We are incorporating requests from the external stakeholders and there may be more changes and feedback through the continued demonstrations through our engagement activity. There is also the desire to include 'regional/ national diagrammatical outage representation'. In addition to this, we have been progressing an OC2 code change to support the ambitions in the Generator Outage And Maintenance Planning (GOAMP) replacement space which is now validating our assumed technical solution for that too. Our previous assessment on Go-Live opportunities did not align with the internal and external views around operational commitments at the time of year and the desire to avoid these timescales. We are now targeting to declare a functional Go-Live date in November 2020 across both Energy Optimization Algorithm for Mobile Sensor Networks (ENAMS) and GOAMP) replacement. This project has therefore been delayed to Q3 2020-21

Table 16: Roles 3 and 4 Q1 and Q4 Deliverables

Notable achievements and events this month/quarter

Constraint Management Pathfinder

On Tuesday 17 December, we released a request for information (RFI) on its proposed operational strategies for the constraint management pathfinder workstream. It proposes either a single location concept above the B6 boundary or a dual location concept, with potential solutions that will need to be above the B6 boundary, or between the B8 and B9 boundaries. We are considering the aggregation of new and existing assets as long as they are located within its specified regions of focus. We have outlined that the further north the service operates, the more constrained boundaries it alleviates and therefore the more beneficial the service is. Responses are requested by 28 February.

Additional information can be found here: https://www.nationalgrideso.com/publications/network-options-assessment-noa/network-development-roadmap

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