ESO Forward Plan FY 18/19

December reporting

21st January 2019

Foreword

Welcome to our quarterly report for December 2018. We have now completed three quarters of this financial year delivering outputs in line with the expectations laid out in our roles and principles. Throughout the year, we are engaging with our stakeholders and driving value for the end consumer.

Some of the key headlines during Q3 are:

- We started to publish our half-hourly forecast of BSUoS at two days ahead giving our customers our view of system costs.
- Our Operability Strategy Report is now available on our website. This shares our current view of the operability challenges faced by the ESO and how these are likely to change in the future.
- We are making progress in delivering the outputs of our future of balancing services roadmaps. We have received 19 expressions of interest in our reactive power service which we will run tenders for Mersey and the South in Q4.
- We launched our review of BSUoS, engaging with 77 individuals in workshops. In our role in Charging Futures we have been asked to lead a balancing services charges taskforce.
- We continue to engage with the distribution network owners (DNOs) on our regional development plans (RDPs). This has included data modelling to understand potential options for treatment of storage at three grid supply points. We investigated how flexibility could be contracted to allow further connections in constrained areas.
- We continue to support the development of whole system operation through thought-pieces on our website and our role in the ENA Open Networks Project.
- We have engaged with Ofgem to agree an approach to funding distribution network owners (DNOs) for their solutions that have been put into the NOA pathfinding projects.

We had feedback that the tables for reporting progress against the plan is helpful. In this report, we have included deliverables promised in the Forward Plan and update documents, and show our progress against these. We welcome feedback on our performance reporting to box.soincentives.electricity@nationalgrid.com.

Louise Schmitz
ESO Regulation Senior Manager

Contents

1.Performance

Principle 1

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

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline/ Exceeding
Improve confidence in our forecasts	Deliver Future Energy Scenarios 2018 Deliver Future Energy Scenarios 2019	Q2	Q2	Delivered, July On track	Baseline
	Publish our Summer Outlook Report	Q1	Q1	Delivered	Baseline
	Publish our Winter Outlook Report	Q3	Q3	Delivered	Baseline
	Develop and publish Regional Carbon Intensity Forecast	Q1	Q1	Delivered	Exceeding
	Mobilisation of demand forecast modelling review	Q4	n/a	Superseded by the following three additional specific energy forecasting deliverables	Baseline
	Implementing new energy forecasting tools, machine learning forecasting models, and cloud based systems	Q2	Q2	Delivered, September	Exceeding
	Increase frequency, granularity and provide underlying assumptions of our energy forecasts	Q4	Q2 2019/20	Delayed from original deadline due to refocus of our priorities to get ready to comply with upcoming European Network Codes	Exceeding
	Provide all energy forecasting data in one location	Q4		On track for Q4, forecasting data is being transitioned to the new site.	Baseline
	Improve monthly BSUoS forecast accuracy and publish new report	Q1-Q4	Q1-Q3	Delivered, June	Baseline
	Half hourly BSUoS forecast	Q3	Q3	Delivered, December	Exceeding
Transparency of balancing costs	Webinars on AS/BS tender results	Q1-Q2	Q1-Q3	FFR webinar was held on the 20 December	Exceeding
	Publish a schedule of Ancillary and Balancing Services events and results for 19/20	Q4			Exceeding

	Publish daily balancing cost and the monthly balancing service summary (MBSS)	Q2	Q1	Continually published	Baseline
	Review Monthly Balancing Services Statement (MBSS) improve granularity and scope of data provided	Q1	Q1	Delivered, April	Baseline
	Improvements to Monthly Balancing Services Summary (MBSS) and FFR Market Information Report (MIR) from customer feedback	Q4		Improve description of service categories, to be included in Q4	Baseline
	Increase granularity of constraint costs and volume data	Q4		Developing a forecasting tool to start publishing Q4	Exceeding
	Publish trades data at near real time	Q1	Q1	Continually published on platform	Baseline
	Develop new 'Market Efficiency' metric to track market competitiveness and intervention by the ESO.	Q4		In development	Exceeding
	Publish tables of the information we publish, with the frequency, granularity, accuracy and avenue of provision.	Q4		In development	Exceeding
Channels for providing information to stakeholders	Hosting of our 'Ops Forum' quarterly	Q1-4		Delivered for Q1-Q3	Baseline
	Publish an 'investor, customer and stakeholder roadmap' to help customers navigate the information we publish	Q4		Draft completed	Baseline
	Commit to providing an FAQ document following each new information item	Q4		Ongoing commitment	Baseline
	Develop a customer data portal for balancing cost data	Q3		Originally scheduled for Q3. On track for Q1 19/20. This has been delayed as we are considering what is the best enduring solution for providing this data.	Exceeding
	Trial new Electricity National Control Centre (ENCC) visit days once every two months alongside Principle 2	Q4		These are being arranged	Baseline

Performance metrics

Metric 1 - Commercial Assessment Transparency

Performance

Month	FFR		Fast Reserve		STOR	
	On time	Right first time	On time	Right first time	On time	Right first time
April	●	●	●	●	n/a	n/a
May	●	●	●	●	n/a	n/a
June	●	●	●	●	●	●
July	●	●	●	●	n/a	n/a
August	●	●	●	●	n/a	n/a
September	●	●	●	●	●	●
October	●	●	●	●	n/a	n/a
November	●	●	●	●	n/a	n/a
December	●	●	●	●	n/a	n/a
YTD	●	●	●	●	●	●

● Published on-time ● Published right first time

● Not published on-time ● Not published right first time

Figure 1 - Metric 1 Commercial Assessment Transparency Performance

Supporting Information

Balancing service assessment results published to the agreed schedule:

- The FFR and Fast Reserve assessment results were published on time in December.
- No STOR results were due to be published this month.

FFR

This month's FFR tender was a long-term tender offering providers the opportunity to win contracts for periods from Jan 19 to Mar 21.

458 tenders were received, made up of 66 non-dynamic and 392 dynamic tenders.

The FFR feedback webinar was held on 20th December. Webex data shows that there were 14 attendees from 11 companies dialled in.

The presentation and the Q&A session has been uploaded onto the ESO's website.

FR

No tenders were received. This is in line with the requirements published in the MIR.

No webinar took place as there were no tenders received.

Metric 2 - BSUoS Forecast Provision

Performance

Month	Percentage on time delivery of half hourly BSUoS forecast	Performance
December	100%	●
YTD	100%	●

Figure 2 - Metric 2 BSUoS Forecast Provision Performance

Supporting information

100% on time delivery of half hourly BSUoS forecast. We are now publishing our half hourly BSUoS forecast on our website. We published this on time every working day in December ahead of the deadline of 08.00 of the day before for Tuesday to Friday and 17:00 Friday for the weekend forecast.

Full details of all metrics are here.

Metric 3 - Trades Data Transparency

Performance

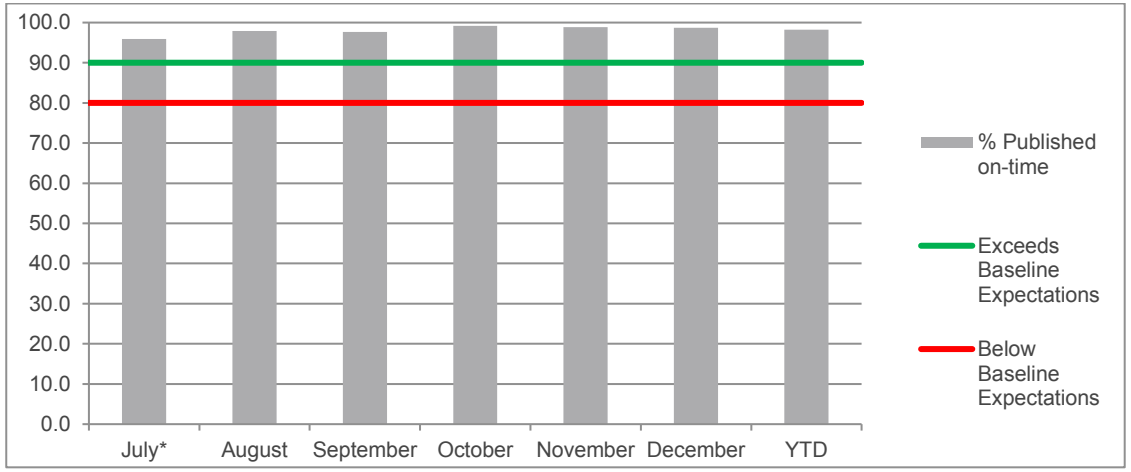

Figure 3 - Metric 3 Trades Data Transparency Performance

*indicates that July performance only shows performance from 16th-31st July

Supporting information

We have been publishing information about our trades on our new web portal since April. Since July we have been able to time stamp the trade allowing us to measure the elapsed time following the trade to its publication. In December 623 trades were published and of these 615 within 10mins of capture which is 98.7%.

Metric 4 - Forecasting Accuracy

Performance

This metric will cover the accuracy of our published DA Demand and Balancing Mechanism Unit (BMU) wind generation forecasts. To access the data that sits behind these metrics please click here.

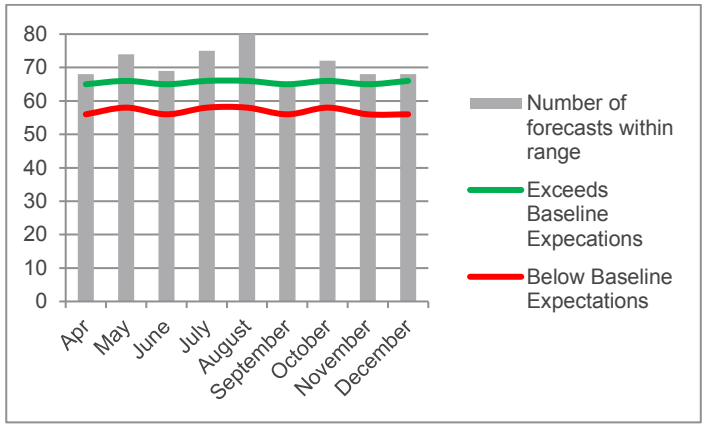

Figure 4 - Metric 4 Demand Forecasting Performance

Day Ahead Demand Forecasting Performance

In December, we met demand monthly accuracy targets 54.8% of the time.

The mean absolute error on Christmas Day at the peak of the day was 330MW. Our extensive preparation led to a good performance.

December is a challenging month for demand forecasting due to Christmas and New Year period. We rely on historic data to lead to good performance. And the last time Christmas Day was a Tuesday and New Year's Eve was a Monday was 2012, when the electricity system was very different from how it is now.

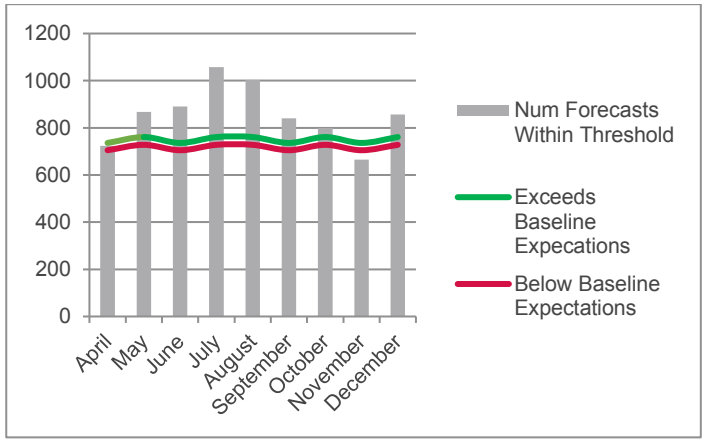

Figure 5 - Metric 4 Wind Forecasting Performance

Wind Balancing Mechanism Unit Forecast Performance

In December, we met wind accuracy targets 57.6% of the time.

The target for this season, December18 – February19 is 5.46%, published on our website.

Wind speeds in December were average. While most half-hour periods had better wind power forecast errors than target, we did see a slightly higher number of large wind power forecast errors during the month.

We are continuing to review our wind power models and plan to implement new cubic spline models for a number of the wind farms shortly. This should bring improvements to the forecasting accuracy at the highest wind speed conditions.

Principle 2

Drive overall efficiency and transparency in balancing, taking into account impacts of ESO actions across time horizons.

Summary table of Deliverables

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline/ Exceeding
Transparency of our requirements and balancing activities	Balancing cost management	2018/19		December: £94.9m Year to date: £839.1m Year to date benchmark adjusted for unavailability of HVDC: £748.7m	Baseline
	Publication of improved Procurement Guidelines, and report, with a framework on our current approach to the procurement of Ancillary and Balancing Services.	Q4		On track, stakeholder workshop held in December with views being incorporated in to the consultation which will be published on our website on the 21st January 2019	Exceeding
	Publication of the Future of ENCC Study, recommendations and scope of future work.	Q2/Q3		Future of the ENCC document to be published in January 2019	Exceeding
Engage with our stakeholders	Successful hosting of our 'Ops Forum' events and expansion of our channels to share information to support wider engagement of market participants and service providers.	Q1-4	Q1-3	Three Operational Forums run in 2019. Feedback has remained positive with over 150 attendees at each event.	Baseline
	Initiation and delivery of the SO IT Forum with terms of reference based on feedback from customers and stakeholders.	Q1	Q1-Q3	We held two SO IT forum as trade stand events. Feedback was positive for both events	
	Consultation on innovation priorities and publication of the 2019/20 ESO Innovation Strategy.	Q2/Q4	Q2	Webinar held on 26 October to consult industry on current innovation strategy and request feedback for 2019-20. Approx. 40 attendees with 66% rating the webinar excellent and 33% good.	Baseline

Solve operability challenges and prepare for the future	Publish Operability Report on challenges, planned activity and stakeholder engagement.	Q3	Q3	Operability report published on 30th November.	Exceeding
	Future GB system security planning	2018/19		Plan in place for delivery of Rate of Change of Frequency and Vector shift relay retrospective change programme. Working with TOs and DNOs to investigate short-circuit levels and its impact on protection and generator stability.	Exceeding
	Embedding of enhanced inertia modelling tools and new inertia measurement capability.	Q4		Tenders received and contract negotiations are underway to deliver solutions. Delivery of a new monitoring service now expected for January 2020	Exceeding
Implement new systems	Deliver new systems capability to enable participation of distributed resources within our balancing markets.	2018/19		In January, a new Distributed Resource Desk will be implemented in the Electricity National Control room. This allows us to optimise small balancing mechanism (BM) units, so they can compete on a level footing with other players. We have completed analysis to understand any potential capacity constraints with any of our operational systems as a result of growth in BM activity. We are also looking to address IT-related barriers to entry	Exceeding
	Deliver new systems capability within the ENCC, specifically PAS (Platform for Ancillary Services)	Q2	Q2	On track. Short term operating reserve (STOR) providers will start to be moved across to the ASDP during Q2 2019	Exceeding
	Significant upgrading of IT systems to prepare for implementation of European network codes.	2019/20		On track for TERRE prequalification and registration in February 2019.	Baseline

Performance metrics

Metric 5 - Balancing cost management

Metric description

This metric measures the total incentivised balancing costs excluding Black Start spend compared with the benchmark. For full details of how this was calculated please see the performance metrics definition document here.

Performance

For monthly breakdown of costs, please refer to the hotspots and the accompanying data tables found here.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
Benchmark cost (£m)	56.9	68.3	90.7	65.2	72.4	57.5	99.6	70.0	79.0	659.5
Benchmark adjusted for WHVDC (£m)	62.6	72.9	102.9	74.3	86.5	71.4	129.1	70.0*	79.0*	748.7
Outturn cost (£m)	56.9	59.4	84.6	78.3	72.2	140.3	145.5	107.6	94.9	839.1

Figure 6 - Metric 5 Balancing Cost Management Performance

*no adjustment needed as WHVDC was in service

Metric performance detail

The main cost driver in December was constraints, contributing 56% of the total costs. Unplanned generator outages meant that additional BM actions, trades and contract have been required to manage Scotland security issues. A significant volume of actions were also required for RoCoF overnight during periods of high wind. Total costs were £19.5m more than the benchmark; however, they were average for the month when compared to the past 5 years. Total incentivised spend for the month was £95m, compared to a 5-year average of £93m. The highest December spend was £106m in 2015/16, and the lowest was £83m in 2016/17.

2nd – Interconnector trades taken to avoid advancing synchronisation of units to fill a 1 hour requirement, saving £185k

2nd – Demand for the minimum was lower than first expected, interconnector trades were taken instead of more costly wind actions for negative reserve.

5th – Additional 1500MW required for 15:00 – 16:00 margin, saving ~£45k

11th – Avoided running additional unit ~£150k

12th – Interconnector trades to avoid running through 2 units and bringing on an additional unit for margin.

13th – Constraint limit increased by 500MW during the morning to avoid constraining wind generation, saving ~£150k

16th – Trades taken on the interconnectors for margin, saving ~£15k

19th – Interconnector trades taken between 15:00 and 16:00 for margin, saving ~£10k

20th – In depth transmission analysis showed that a unit was not required for system security, saving £1.2m

21st – Trades taken on interconnectors to avoid running additional plant for RoCoF.

25th – Analysis proved that unit could be de-synchronised, and not required for system security, saving £1.8m.

25th – Interconnector trades taken between 07:00 and 08:00, saving £12k.

29th – Unit was planned to run through to the physical notification synchronisation at 06:00. The notification was changed to synchronise at 09:00 so unit was left to shut down at 06:00 rather than extending the BOA.

30th – Several units removed their physical notifications overnight, leaving the system inertia lower than expected, trades taken to avoid requirement to run two additional machines.

Principle 3

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

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline/ Exceeding
Promote competition and develop new markets in balancing markets	Standardise the FFR market	Q1	Q1	Standardised seasons and four-hourly EFA blocks were introduced for the May tender	Baseline
	New simplified contract	Q1	Q1	The simplified contract was published as part of the FFR OCP consultation in June.	Baseline
	Publish Restoration Roadmap	Q1	Q1	Published in June	Exceeding
	Publish Reactive Roadmap	Q1	Q1	Published in June	Exceeding
	Understand the journey that potential counterparties go through from first showing interest in the Balancing Services market, through to signing a framework agreement	Q2	Q2	Based on Provider feedback we have developed a Balancing Services Guide. This aims to make things simple and more transparent and is published on the Balancing Services overview page of our website.	Baseline
Grow participation and promote fair access in provision of balancing services	Explore restoration service provision from interconnectors	Q2	Q2	Workshop held on 2 July to begin process of exploring service provision from interconnectors.	Exceeding
	Deliver Roadmap for Restoration service including: • assessing the merits of different procurement models, and agree timeframes in our procurement methodology • Improve metrics to provide more transparency on costs and capacity requirements	Q4	Q3	We launched a consultation on how to competitively procure Black Start Ancillary Services. This included: • Guidance on how to take part in the tender • Technical requirements • Assessment criteria • Revised Black Start service terms. The NIA and NIC projects to explore alternative approaches to Black Start were awarded funding from Ofgem on 30 Nov 2018. Cost and capacity transparency delivered in updated market report.	Exceeding

Publish Thermal Constraints Management information note	Q1	Q2	Published 26 July	Exceeding
Publish Wider Access to the Balancing Mechanism (BM) Roadmap	Q2	Q2	Published 9 August	Exceeding
Detailed auction trial publication	Q1	Q2	Summary published 31st Aug, webinar held on 27th September and published online with Q&A	Exceeding
Deliver a new, highly scalable and flexible dispatch solution for reserve - Phase 1 roll out for Fast Reserve providers	Q2	Q2	Phase 1 complete	Exceeding
Deliver new standardised products for reserve together with simplified contracts	Q2	Q2-Q3	The new simplified standard contract terms for STOR are in use from 21 December and will be in use for Fast Reserve from the 25 March. The new simplified contract terms for STOR and Fast Reserve where shared in the outline change proposal in July and September.	Baseline
Publish and consult industry on exclusivity clauses to improve the ability to stack products	Q2	Q2	We have now published our ESO Balancing Services guidance document. This includes clear information on exactly which products can currently be "stacked". We published our consultation on the 28 September. We were told that providers would like us to be more clear about what the current rules are around multiple services from multiple parties. We have shared these views with the ENA's Open Networks Project 'Flexibility' work stream.	Exceeding
Publish new testing and compliance/performance monitoring policy for response and reserve providers	Q2	Q2	Published on the 30 September	Exceeding
Build and implement a measurement framework that will track the success of ESO in helping potential and	Q3	Q2	Metric proposal published as part of 6-month report, phased implementation and related improvement activities are ongoing.	Exceeding

	existing providers progress through the journey				
	Raise a CUSC modification for removal of Enhanced Reactive Power Service	Q3	Q3	We raised the CUSC modification (CMP305) to remove ERPS. This has moved forward and we are waiting on the decision by Ofgem. If approved, this will remove the need to run a tender every 6 months, for which there are no participants. And support the opportunity for wider reactive power market reform.	Exceeding
	Raise Obligatory Reactive Power Service concerns with CUSC issues standing group	Q3	Q3	Action delivered at CUSC Issues Standing Group (CISG) in December '18. Highlighted general concerns with the service and our ambition to develop markets that better reflect how the network has developed. Industry workshops planned to open the debate about the future role of reactive power and develop more competitive commercial services	Exceeding
	Develop an integrated approach to buying standard and faster-acting frequency response	Q3	Q4	Our plan for the start of a new frequency response product suite has been delayed. This is so we can make sure the document has the full context of the work and next steps. This will now be published in early Q4. We will then engage with our stakeholders to explain the content and inform our next steps.	Exceeding
	Publish an invitation for Expressions of Interest for provision of reactive power services in South Wales	Q3	Q3	We published two Requests for Information in October. These asked for expressions of interest in providing reactive power services in Mersey and South. We got 19 responses across the 2 requests. We told the providers that tenders will run through Q4	Exceeding
	Launch a weekly auction trial for response	Q3	Q4	Off track for delivery in Q3. Recovery plan in place to launch first stage of the trial scheduled for late Q4 with more functionality to follow from June 19 onwards. For more details see the update here.	Exceeding
	Accelerated access for early adopters entering the balancing mechanism	Q2	Q2	October saw the second aggregated provider entered the BM via the improvements made to enable accelerated wider access.	Exceeding
	Grow Power Responsive including annual conference.	Q3	Q3	We hosted our fourth annual Power Responsive conference in June. From 80 delegates at the first annual Power Responsive event in 2015, 350 delegates registered to attend this year.	Baseline

Performance metrics

Metric 6 – Reform of Balancing Services markets

Performance

2018/19 deliverables	Detail	Status
Standardise the FFR market	Standardised seasons and four-hourly EFA blocks were introduced for the May tender	●
New simplified contract	The simplified contract was published as part of the FFR OCP consultation in June	●
Publish Restoration Roadmap	The Restoration and Reactive Roadmaps were published in June	●
Publish Reactive Roadmap	The Restoration and Reactive Roadmaps were published in June	●
Understand the journey that potential counterparties go through from first showing interest in the Balancing Services market, through to signing a framework agreement	Immersion interviews completed	●
Explore restoration service provision from interconnectors	Workshop held on 2 July	●
Publish Thermal Constraints Management information note	Published 26 July	●
Publish Wider Access to the Balancing Mechanism (BM) Roadmap	Published 9 August	●
Detailed auction trial publication	Summary published 31 Aug, webinar held on 27 September and published online with Q&A	●
Deliver a new, highly scalable and flexible dispatch solution for reserve - Phase 1 roll out for Fast Reserve providers	Phase 1 complete	●
Deliver new standardised products for reserve together with simplified contracts	Simplified contract terms have been published in the STOR and Fast Reserve OCPs in July and September; details of standardisation of Fast Reserve is included	●

	in the September OCP. Standardisation of STOR will be superseded by wider reform of reserve services which is coming early 2019	
Publish and consult industry on exclusivity clauses to improve the ability to stack products	Published consultation on the 28 September	●
Publish new testing and compliance/performance monitoring policy for response and reserve providers	Published on the 30 September	●
Build and implement a measurement framework that will track the success of ESO in helping potential service providers progress through this journey	Delivered on time, currently being implemented	●
Grow the Power Responsive campaign, including the annual conference	Ongoing but on track	●
Deliver a new, highly scalable and flexible dispatch solution for reserve - Phase 2 roll out for STOR Providers	Delivery date of Q3 2018 was an early estimate prior to project start; implementing the platform for Fast Reserve during 2018 has allowed us to revise that date with actual experience. Development of dispatch solution for STOR is progressing, rollout is anticipated from Q2 2019/20	●
Develop an integrated approach to buying standard and faster-acting frequency response	Implementation plan for a complete reform of frequency response products has been slightly delayed, due out Q4	●
Launch a weekly auction trial for response	On track to deliver an auction for static response by Q4, with a more complex platform to include dynamic response and complex functionality in 2019/20	●
Raise a CUSC modification for removal of ERPS	Delivered on time	●
Raise ORPS concerns with CUSC issues standing group	On track	●
Publish an invitation for Expressions of Interest for provision of reactive power services in South Wales	Delivered on time	●

Figure 7 - Metric 6 Reform of balancing services markets performance

Metric 7 – New provider on-boarding

Performance

Deliverable	Description	Delivery Date	Update
Feedback Approach	Develop a survey framework for getting feedback from our providers at key points in the journey experience including onboarding, tendering, contracting and query management.	Q4	Feedback is being collected for onboarding and tendering (metric 1). This will be further developed over the coming months. Contracting and query management approach to be developed and refined during Q4.
Online Signposting	Clear signposting to relevant sources of info on the website	Apr-2019	Based on Provider feedback we have developed a Balancing Services Guide. This aims to make things simple and transparent, and will be developed further during Q1. Through our engagements, we learnt that we can become a better buyer of services by changing the on boarding process, and making solutions to the pain-points across the end to end provider experience.
Service Features	Interactive guidance document for each service: • what is it; • what do you need to do to access the market; • tendering assessment requirements; • settlement info.	Apr-2019	
Requirements Checklist	An upfront checklist for: • entry requirements • tendering, • contracting, • settlements, • testing, • reporting, • data and market information.	Apr-2019	

Figure 8 - Metric 7 New Provider on-boarding performance

Metric 8 – Market diversity

Performance

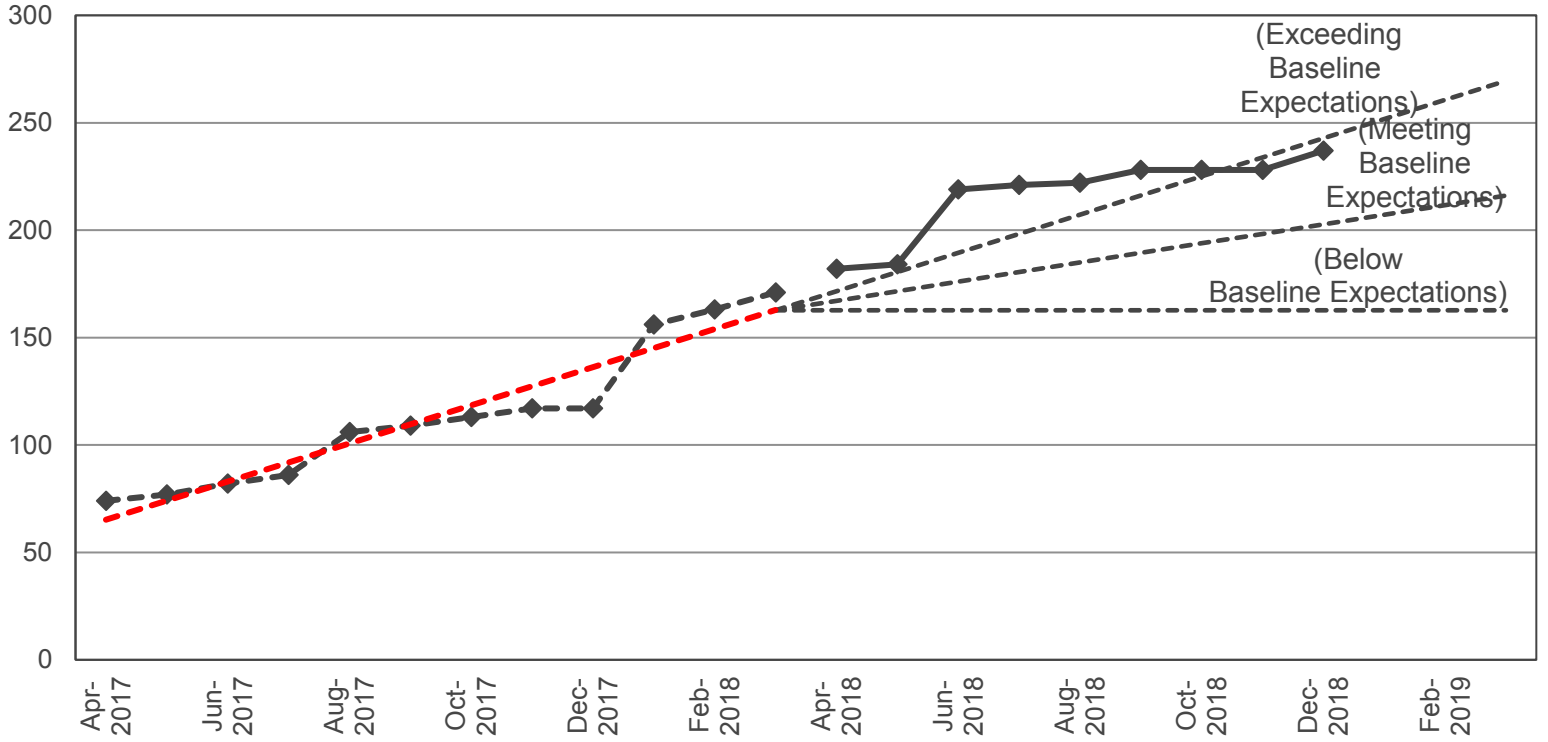

Figure 9 - Metric 8 Market Diversity Performance

Supporting information

This year 48 new units entered FFR, 3 units entered Fast Reserve, 4 units entered the STOR market and 11 units entered demand turn up.

Principle 4

Promote competition in the wholesale and capacity markets

Summary table of Deliverables

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline/ Exceeding
Managing customer profitability	Improved transparency and publication of charging data – Phase 1: Customer access to information.	Q1	Q1	Complete	Baseline
	Improved transparency and publication of charging data – Phase 2: Better forecasting and outturn information and material.	Q3	Q3	In December, we started to publish two new reports. • Half Hourly BSUoS forecast for day+2 to give customers a 48 hour ahead forecast of the BSUoS price. • Daily balancing costs report that breaks down the different categories of costs into sub-categories to give customers a more granular view of the costs that make up BSUoS charges.	Baseline
	Joint Charging and Settlement Forum	Q3	Q3	Helping our customers understand all about our charges in one place held on 16 and 17 October.	Baseline
	Publish Improvement Action Plan	Q3	Q3	Published October	Baseline
	Targeted interventions that enhance our customers' experience of our charging processes on the 'hot spots' they have told us matter to them.	As per improvement plan On track subject to individual developments Our Principle 4 relaunch, and improvement plan above, gives greater transparency of the individual changes we plan to deliver across the remainder of the year. Following feedback, we have focused our deliverables around 3 areas: • I need to understand information and data • I need better access to information and data • I need to understand the onboarding and exit process Deliverables set out in our improvement plan for this quarter are set out below.			
	Improve TNUoS billing reconciliation, forecast and final tariff setting processes.				
	Implement a new charging customer on-boarding process				

	I need to understand information and data: Provide charging seminars and documents	Q3	Q3	We have shared four educational webinars covering TNUoS and BSUoS charges.	Baseline
	I need to understand information and data: Provide charging seminars and documents	Q3	Q3	We have published six new charging guidance documents.	Baseline
Facilitating Code Change	Publish Improvement Action Plan	Q3	Q3	Published October	Baseline
	Improve access to modification working groups with varying locations and technology to enable easier participation	Nov 18	Nov 18	Trialled changing the location of working groups based on where our stakeholders are located. We have had a good response and will continue this method which will promote greater participation, aiding industry resource requirements.	Baseline
	Communicate Manage a Code Change project plan	Q4		Ongoing	Baseline
	Engagement on regulatory horizon project	Q4		• We had discussions with the Grid Code and CUSC panels on a future approach to a Code Manager role and key funding principles. • A webinar (under our RIIO engagement) to ask for feedback on our initial thinking with this work to date. • We note the Energy Codes Review launched by BEIS and Ofgem. We plan to be heavily engaged in this review to help shape the future of codes.	Baseline
Delivering Code Change	Publish energy adequacy and operability updates in the context of EU exit	Q3	Ongoing due to EU Exit process	We continued to work closely with BEIS. Ofgem and wider stakeholders on EU Exit. In Q3, we published • Open letters in November and in December on potential code change related to EU Exit • Operability Strategy Report which includes a short update on EU Exit. We will also give a broader update related to EU Exit early in Q4.	Exceeding
	Comprehensive review of BSUoS	Q3		We held two BSUoS workshops and a webinar in October reaching a total of 77 individuals. We had positive feedback from customers with an average of 88.5% finding the workshops useful and an average satisfaction rating of 8.	Exceeding

				In November OFGEM asked us to start and lead a Balancing services Charges task force under the Charging Futures Arrangement to consider how network users are charged for balancing services. We published a draft terms of reference document and will hold the first Task Force meeting late January. Further details are available on the Charging Futures website.	
	Initiate consideration of changes to the SQSS	Q4	Ongoing	We continue to provide thoughts in this area to provide an update in Q4.	Exceeding
	Update on our thinking on security arrangements for transmission schemes	Q4	Ongoing	We continue to provide thoughts in this area to provide an update in Q4.	Exceeding
Capacity Market Modelling	Consult on our renewables derating method and results	Q4	On track, dependent on BEIS timescales	In Q3, we developed a methodology for calculating de-rating factors for wind and solar if they are allowed to participate in the Capacity Market auctions. We: • benchmarked our approach with other capacity markets around the world; • got the endorsement of BEIS' independent Panel of Technical Experts; • started an industry consultation.	Exceeding
	Consult on our distributed generation derating method and results	Q4			Exceeding
Facilitate and deliver code change under Charging Futures	Deliver Charging Futures Forums that are open to all network users.	Q1,2,4	On track	During Q3 Charging Futures, has supported Ofgem's: • launch of the Targeted Charging Review minded to decision; • request for the ESO to lead the Balancing Services Charges Task Force; • Significant Code Review launch into access and forward looking charges; • Communications via emails, podcasts and organisation of an industry webinar. On track with next Forum scheduled for 2019 and additional communications to be developed supporting planned Ofgem publications.	Exceeding
	Deliver webinars, podcasts and plain English publications under the Charging Futures (CF) Brand. Adapt the content and format in response to the ongoing requirements and preferences of all CF members.	Q1-4	On track		
	Publish a report on Charging Futures. Identify the lessons learned from cross-industry and code engagement.	Q4		On track	Exceeding

Performance metrics

Metric 9 - BSUoS Billing

Performance

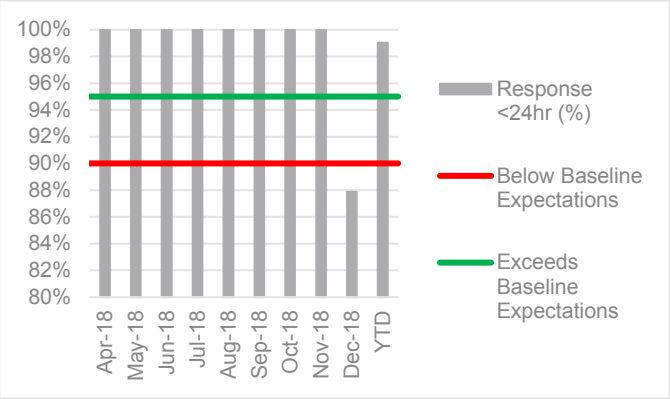

Figure 11 - Metric 9 BSUoS query response time

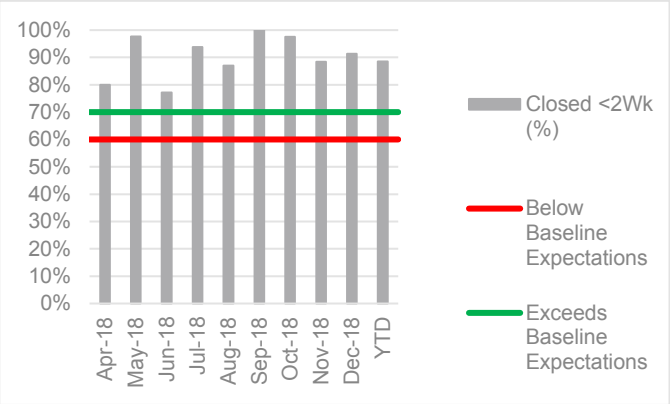

Figure 12 - Metric 9 BSUoS query resolution time

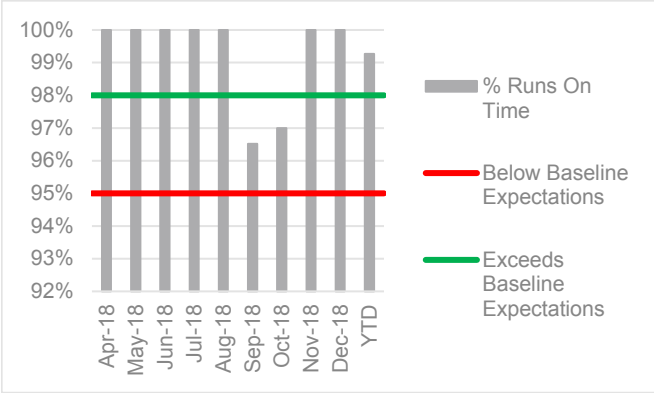

Figure 10 - Metric 9 BSUoS bills timeliness

Supporting information

We closed 23 queries during the month. We received 33 new queries in December, unfortunately for 4 queries we did exceed our 24-hour response target due to staff sickness and reduced staffing over the Christmas period but all 4 were responded to within 2 business days. We received 2 customer survey results following query closure, both rated excellent. (Ratings available are: - Very Poor / Poor / Good / Excellent)

All daily billing runs were completed on the day that they were due.

We sent two circulars to customers:

- on 3 December to give a link to the new half hourly BSUoS forecast and the improvements to the daily balancing costs.
- on 5 December to let them know that we would be publishing an updated BSUoS forecast the next week and the reasons for this.

Metric 10 – Code administrator- stakeholder satisfaction

Performance

The results from 2017/18's Code Administrators Code of Practice stakeholder satisfaction survey were published in October 2018. These results show a significant increase from last year (2016/17) in overall satisfaction from our customers and stakeholders across CUSC (Connection and Use of System Code), Grid Code & STC (System Operator Transmission Owner Code).

Code	2017 (%)	2018 (%)	% change
CUSC	47	65	+18
Grid Code	59	66	+7
STC	57	58	+1

Figure 13 - Metric 10 Code administration stakeholder satisfaction

Metric 11 – Charging Futures

Performance

Charging Futures Forums

There have been no Charging Futures Forums held in Q3. There has been significant preparation for a forum in Q4 which will be reported at the end of year.

Webinar	Score from participants (1-10)	Number of participants	Number of views on demand
Targeted Charging Review: Minded to decision and draft impact assessment consultation	6.8	78	184

Figure 14 - Metric 11 Charging Futures Webinars

Charging Futures Webinars

We facilitated one webinar during Q3 for all network users to hear directly from Ofgem on the content of their Targeted Charging Review minded to position. 78 participants watched the webinar live.

- Our score was an average of 6.8 out of 10 to the question "how much they would recommend the webinars to a friend or colleague."
- Attendees were also asked how well they felt they understood the progress of the Targeted Charging Review; 64% of attendees answered this positively at the beginning of the webinar which rose to 83% at the end.

Quarter	Number of podcasts added	Podcast listens (to all podcasts available)
Q1	3	688
Q2	9	1,586
Q3	2	1,107

Figure 15 - Metric 14 Charging Futures Podcasts

Charging Futures Podcasts

There were 14 podcasts added to the Charging Futures library since April which have enabled network users to develop their understanding of reforms being discussed in industry. These are used by network users that attend the Forum but are also publicly available so that all stakeholders interested in network charging and access arrangements can engage with the reform. In Q3 the new podcasts have focused on sharing the key messages from Ofgem's publications on the Targeted Charging Review and Access and Forward Looking Charges.

Metric 20 - Month ahead BSUoS forecast vs outturn

Month	APE below 10%	APE above 20%
April	●	
May	●	
June		
July	●	
August		
September		●
October		●
November		
December	●	
YTD	4	2
Target	5 or more green months	Less than 5 red months

Figure 16 - Metric 20 Month ahead BSUoS forecast vs outturn

Supporting information

Our forecast was very close to the outturn in December, the error was 1.3%.

Principle 5

Coordinate across system boundaries to deliver efficient network planning and development

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline / Exceeding
Improve our cross-industry collaboration for whole system network planning and development	Publication of the Western Power Distribution and UK Power Networks Regional Development Programme Learnings	Q1	Q1	WPD: Published in June UKPN: Originally scheduled to be published in June; on track for Q4 (UKPN comments received, review to be completed ahead of publishing)	Exceeding
	Begin two new RDPs by publishing a bespoke work plan for each region	Q3	Q3	Three RDPS underway: Dumfries and Galloway (D&G) RDP ongoing. This quarter we developed our IT delivery approach, and supported SPT to engage with their customers at regular stakeholder events. IT requirements are being progressed in a project structure, in the start-up phase. WPD RDP '4' was initiated in September 2018. This quarter, we developed the datasets and ran modelling to understand potential options for treatment of storage at three GSPs. We discussed with WPD how to capture and present case studies on how flexibility could be contracted to facilitate further connections in constrained areas. We discussed how to ensure the proposed treatment of storage as flexible demand is consistent with the interpretation of Engineering Recommendation P2. ENWL RDP ongoing. This quarter, we worked to assess whether operability options might represent a more appropriate way of managing constraints when compared with a traditional asset option (e.g. a new transformer).	Exceeding

Facilitate unlocking of further DER connections through: Implementation of innovative connections contracts that support the roll-out of revised Statement of Works processes on a national basis and the ability for DER to provide transmission constraint management services in our in-flight RDP areas	Q3		UKPN BCAs for relevant South Coast GSPs have contained the necessary provisions since June 2017, and DER connection agreements are being rolled out on that basis. All 8 RDP Offers for the South West were issued to WPD South West late last year, and have since been returned signed.	Exceeding
Facilitate unlocking of further DER connections through: Implementation of new commercial contracts to allow DER to participate in the provision of transmission constraint management services in our in-flight RDP areas.	Q3		Delays have been experienced in technical and commercial workstreams. Expected to extend into 2019-21 period. We are continuing our discussions with DNOs on contract structure and detail for transmission constraint management from DER.	Exceeding
Facilitate unlocking of further DER connections through: Implementation of enhanced systems and ways of working between transmission and distribution to support provision of transmission services by DER	Q3		Delays have been experienced in technical workstream. Work extends into 2019-21 period. We continue to progress through the start-up phase of the IT project to deliver the necessary systems and processes.	Exceeding
Wk24 data exchanges that help establish whether the system is compliant with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS or SQSS) and trigger remedial works if not.	Annual process	Competed in line with code obligations	Following submission of our network planning data to other network operators (by week 42), the formal week 24 data exchange processes have concluded for 2018. We are converting the data into a format suitable for modelling with. This year we introduced a new template-based approach for certain data items, to promote consistency of submissions. This was helpful as it made processing easier and allowed for year-on-year comparisons to be made.	Baseline

Performance metrics

Metric 13 – Whole system – unlocking cross-boundary solutions

Performance

Grid Supply Point (GSP)	MW	Commentary on DER technology types
Bolney	140	10MW of battery storage scheme added in October/December period
Canterbury	21.5	New Gas Turbine scheme added in October to December period.
Ninfield	51.2	All battery storage scheme
Sellindge	0	n/a
Total	212.7	

Figure 17 - Metric 13 Whole system unlocking cross boundary solutions performance

Supporting information

During October to December we contracted 31.5MW of new distributed energy resources (DER) with UKPN. This was made up of a 10MW battery storage and 21.5MW gas turbine scheme. Because of the RDP trials with UKPN, we now have contracted 212.7MW this year. Following this, we carried out further technical studies at Bolney and Canterbury Grid Supply Points and found more capacity at both sites.

We are working with Western Power Distribution to:

- Trial an RDP Appendix G process across their South West area
- Develop RDP principles at GSPs with large battery populations

We are working with Scottish Power Energy Networks to trial an RDP Appendix G across 11 GSPs in South West Scotland.

Principle 6

Coordinate effectively to ensure efficient whole system operation and optimal use of resources

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline / Exceeding
Improve our cross-industry collaboration on whole system	'Whole Electricity System Outcomes' paper	Q2	Paper published in Sept 2018	Link to Paper. Allows us and the industry to understand the areas that need to be considered as we move to a whole system approach.	Exceeding
	ENA Open Networks Future Worlds consultation	Q2	Q2	Received positive stakeholder feedback on the delivery of the consultation. We attended future worlds stakeholder events in Edinburgh and London events. With over 100 stakeholders present the feedback received suggested the consultation is well received.	Exceeding
	Extend Appendix G trial processes	Q4	Ongoing	The Appendix G trial started with UKPN and WPD to improve the application process for connection of embedded generation projects. It has now been rolled out with all remaining DNOs. This trial gives more transparency of the connection capacity available at particular Grid Supply Points. Allowing quicker connection times and reduced costs for connection. This saved many hundreds of individual Statement of Works and many £000s in application fees and processing time, and gives quicker and cheaper connections to the DNOs customers, individual Statement of Works (SoW) application costs £15k. Previously DNOs applied to us each time they received a customer application to connect to their network, they did this through the SoW process which identified any required transmission works. In some areas, the SoW process caused delay to the DNO being able to make connection offers.	Exceeding
	Supporting a new Tertiary connection product that the NGET TO has offered to the market	Q4		These offer the connecting customer a lower cost and quicker connection, but require significant engagement with all DNOs to develop the appropriate technical and commercial solution.	Exceeding

Designing new products for connections	Non-Firm and Restricted access connections	Q4	Q3	In certain congested areas of the network we continued to receive applications for connecting additional generation products. To provide these connections quickly and without triggering the requirement for significant transmission reinforcements, we developed new commercial products that provide access to the market but during restricted time windows. These products meet customers' needs but reduce the cost to the consumer of operating a constrained network.	Exceeding
Enhanced Asset Optimisation	Engage with TOs and DNOs to identify opportunities to achieve more efficient use of existing assets, making use of weather and loading related operational capabilities thereby reducing the need for investment and lowering the volume and cost of balancing actions taken	Q4		Introduced in the October 2018 Principle 6 Update	Exceeding
Cross TO system performance enhancements	Identify areas for process improvement under existing contracts between SO and TOs and lead change programmes to optimise consumer benefits.	Q4		Introduced in the October 2018 Principle 6 Update	Exceeding
Working with stakeholders to design new systems	TOGA replacement	Q3		Extensive stakeholder engagement, ensuring new functionality is customer-led through hosting three customer workshops during July and August 2018 to collect input. Additional progress made in Q3.	Baseline
	TOGA Procurement Event	Q4			Baseline
Improve our services for connected customers	Delivering increased volume and complexity	Q4		The changing use of the network by an increasingly diverse range of connections has increased the level of complexity in daily operation of the network. The developing energy market is resulting in much greater volumes of connection enquiries and applications to connect to both the Transmission and Distribution networks. These challenges have required us to develop changes	Baseline

				to our usual activities. We will find ways to do our day to day operations better and more quickly to maintain the security of the network and meet customers' requirements.	
	Increased connection application volumes and 'Sprint' process	Q4	Ongoing	We continue to use the 'Sprint' approach to the customer offer process to deliver double the volume of connection applications compared with the same period last year.	Baseline
	Connection and Compliance customer engagement	Q4	Ongoing	In the connection offer and connection compliance areas we saw continued improvement in reported customer satisfaction, regularly receiving 8/10 and 9/10 survey responses.	Baseline
	Customer Connection seminars	18/19	Ongoing	Delivered successful Customer seminars in Glasgow and London, attracted over 80 participants at each event receiving excellent feedback. Excellent customer feedback received from October events. Next event planned for March 2019.	Baseline
Improve our cross-industry collaboration on whole system	Network user planning workshops to reduce outage 'churn'	Q2	Q2 and ongoing	We developed and delivered stakeholder events with TOs focusing on outage planning optimisation, addressing the levels of change and creating a more accurate plan to deliver system access for maintenance and connection works.	Baseline
	DNO Operational Liaison	Q4	Ongoing	Quarterly operational engagement workshops with DNOs resulting in improved information sharing, seasonal operating challenges addressed and improved cross network collaboration.	Baseline
Increase and improve our engagement activity across network users	Identify and develop new market tools with all relevant parties to ensure efficient system solutions for operation	Q4		Introduced in the October 2018 Principle 6 Update.	Exceeding
	Demonstrate system operability related challenges to a broader range of stakeholders identifying the scale of the impact we forecast on future operation and providing opportunity for whole system solutions to be developed.	Q4		Some progress made here at DNO Liaison meeting. Customer Seminar in October provided this information. Opportunities are required to extend activity in this area. Plans to include further updates in March Customer Seminars.	Baseline

	Regular engagement with DNOs exists currently to share seasonal data and challenges encountered on networks. We will increase the volume of this engagement and include other network operators as well as large demand customers.	18/19	Ongoing	DNO engagement increased in connection with SGT Tertiary applications. We had a meeting with Electricity Network Futures Groups lead to discuss applications to date. Workshop agreed to take place in January 2019.	Baseline
	Build strong relationships with DNOs and review and develop contractual arrangements and processes to deliver efficient whole system focused outcomes	18/19	Ongoing	Following successful discussions with SPD and SSEN in August, the Appendix G process has suffered a setback. SPD and SSEN expressed further concerns from their legal teams about moving to this approach. Good progress made this quarter with ENWL and NPG.	Baseline
	Increasing our involvement and support of the Open Networks Project	Q4	Ongoing	New projects from ENA for 2019 identified. More representation from ESO to facilitate discussions planned.	Exceeding
	Articulating our thought leadership on Whole Electricity System across a broad stakeholder base	Q4		1-2-1 discussions with ENWL, WPD, UKPN, NPG and SSE(Manweb) regarding tertiary connected generation have taken place with commitment to engage further.	Exceeding

Performance metrics

Metric 14 - Connections Agreement Management

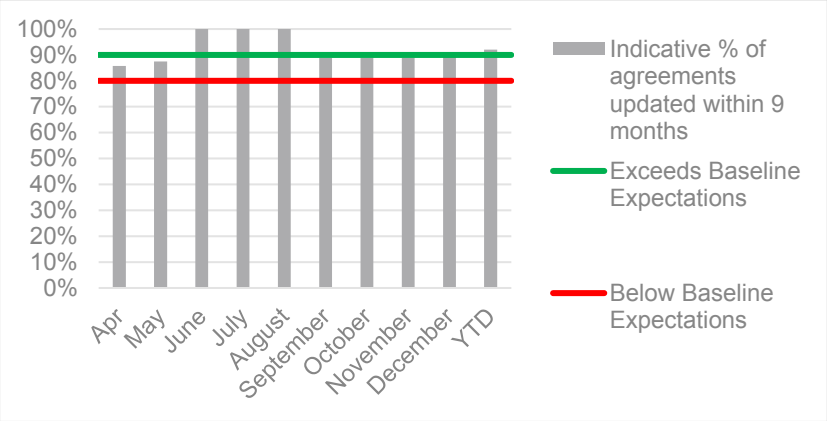

Figure 18 - Metric 14 Connections Agreement Management

Supporting information

We are making good progress with updating connection agreements. We have ten connection agreements that have been identified as requiring updating. Nine of these are making very good progress and six have been issued to the customer. Three of these agreements has been signed by the customer so are now updated. One of the connections agreements that we started working on in April has not yet been issued to the customer and we have escalated this to ensure that the agreement is issued without any further delays. We also intend to continue to engage with the customer to explain the changes within the BCA in detail to facilitate a prompt response from the customer.

Metric 15 - System Access Management

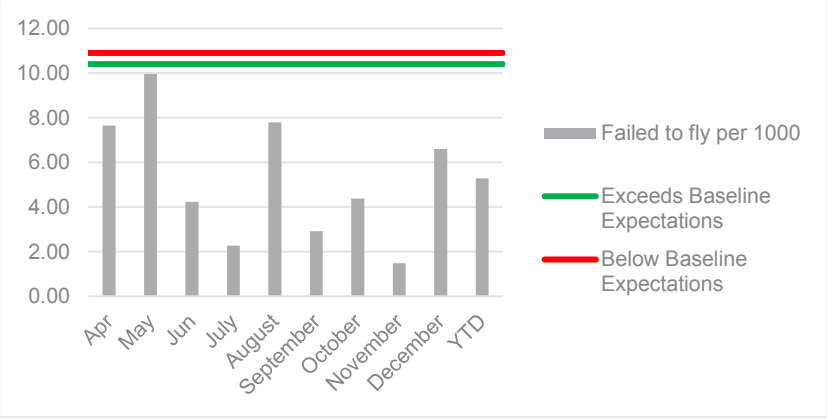

Figure 19 - Metric 15 System Access Management Performance

Supporting information

In December, we had three system access requests that were classified as fail to fly.

Metric 16 – Future GB electricity system security

We published our first operability strategy report in November 2018. This has been well received in industry press and described as 'a very useful overview'. It gives an update on the actions we are taking and our future plans to ensure the system is operable. We are already delivering on the actions we committed to in the report:

- Restoration – our bid for innovation funding to investigate how to deliver black start services from distributed energy resources has been accepted by Ofgem and we are finalising the contracts with our project partners.
- Stability – we have published two System Operability Framework documents describing challenges forecast from changing short circuit levels and our next steps for resolving these challenges.
- Frequency/Thermal – we published an update about project TERRE and improving wider access to the balancing mechanism.
- Voltage - we published a Request for Information for provision of Reactive Power in the South Wales and Mersey regions. The responses have been reviewed and letters detailing next steps have been published.

Metric 21 – Right First Time Connection Offers

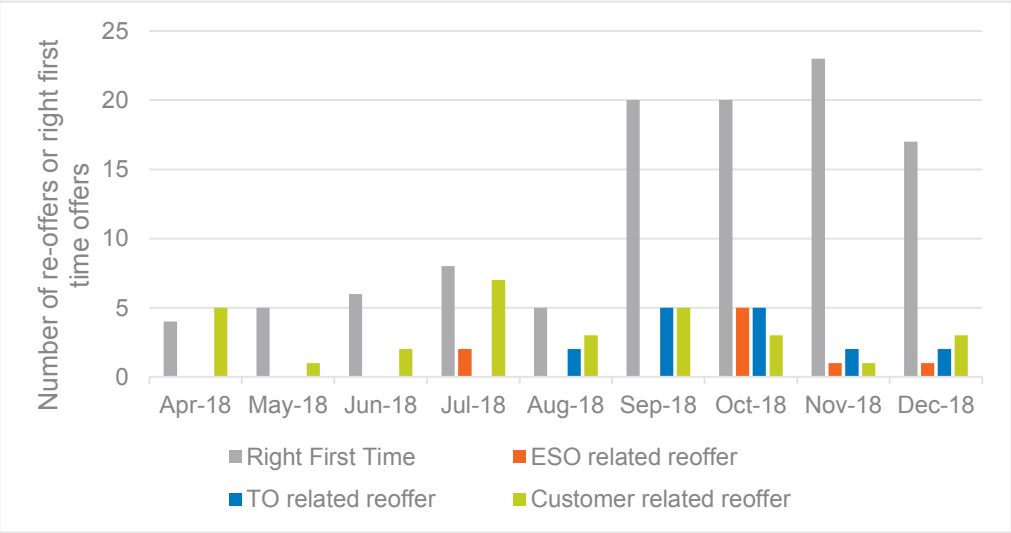

Figure 21 - Metric 21 Right first time connections offers

Performance	
Year to date number of connections offers	153
Reoffer required due to ESO error	9
Year to date percentage of connections reoffers caused by ESO error	5.9%
Exceeds expectations; On target: Below expectations	0-5%; >5-15%; >15%

Figure 20 - Metric 21 Right first time connections offers year to date performance

Principle 7

Facilitate timely, efficient and competitive network investments

Outcome	2018/2019 Deliverable	Target	Actual	Status	Baseline / Exceeding
Improve the Network Options Assessment models and methodologies to support Extending Competition in Transmission (ECIT)	Publication of the NOA methodology.	Q1	Q1	NOA methodology published for consultation in April, final document published in July	Baseline
	Publication of the NOA report	Q4		We have conducted a number of stakeholder meetings with the TOs on the results of the economic analysis. These have been very positively received. We have also run the first of the NOA Committee meetings as part of the governance process of our recommendations. This also ran smoothly and was attended by Ofgem and the TO for their relevant items.	Baseline
	Publication of the 2019 NOA recommendations.	Q4		NOA report on track for Q4	Baseline
	Publication of the Network Development Roadmap consultation and the final Roadmap.	Q1	Q1/Q2	Roadmap consultation published in May, final version in July	Exceeding
	Progress delivery of the pathfinding projects to implement the Network Development Roadmap	Q4		Progress has been limited with focus on writing external reports on the work done to date.	Exceeding
	Agree a route to fund DNO solutions in RIIO-1 and RIIO-2	Q4	Q3	Ofgem have indicated that they are broadly happy with the approach identified for RIIO-1, subject to the specifics of each case. The proposals for RIIO-2 were fed into Ofgem December consultation and will form part of RIIO-2 discussion.	Exceeding
	Publication of the Electricity Ten Year Statement, which includes some of the methodology improvements mentioned.	Q3	Q3	Published November 2018	Baseline

Showing up differently through our ETYS publication	Q3	Q3	We have expanded the needs covered in ETYS, beginning to cover some of the high voltage needs being explored through the pathfinding projects and explored the use of thermal probabilistic analysis for boundary assessment	Exceeding
Publication of the ENA Open Networks approach to whole system investment and operability options across transmission and distribution networks.	Q3	Q3	The report was approved at the ENA Open Networks Work stream 1 and Steering Group meetings in December. It has been published on the ENA Open Networks website.	Exceeding
Increase the scope of the NOA methodology to include non-network solutions.	Q4		Consultation on track for Q4	Exceeding
Improve and develop our modelling capability, further embedding the interconnector modelling and our analysis of offshore networks.	Q1	Q1	NOA interconnector methodology incorporated in overall NOA methodology April (consultation)/ July (final) includes a number of modelling improvements. The NOA for interconnector analysis is almost complete. A range of optimal level of interconnection has been identified, based on the FES 2018. The baseline consists of 4GW plus those with regulatory certainty. Additional markets for interconnection are recommended this year in addition to those from last year. This year improvements to the process also include an assessment on ancillary service analysis, which is currently still underway.	Baseline
Progressing probabilistic year-round assessment to understand how often the network boundaries are exceeded.	Q3-Q4	Q3	We published an initial report on the use of the thermal probabilistic analysis in ETYS. This will be followed up with the remaining analysis and plans to take this approach forward in Q4	Exceeding
Integrate changes in our models and methodology to include analysis of generator connections to the transmission network that are suitable for competition.	Q2	Q2	Delivered in April/July as part of the NOA methodology	Baseline

	This is in addition to the current identification of wider works projects (in expectation of the ECIT policy development to embed the potential for competition in delivery of generation connections).			
	Design developments to the NOA to support the introduction of competition in delivery of the onshore transmission network.	Q4	Ongoing	
	Progressing with the process and methodology development for the high voltage regional network options assessment process.	Q4	Progress has been made in documenting the methodology for the regional high voltage assessment process, using the learnings from the pathfinding project conducted through the ENA Open Networks WS1 Product 1. We are continuing to engage with key stakeholders on its development.	Exceeding

Performance metrics

Metric 12 – Whole system – optionality

2018/19	Non-TO initiated options	Target
Q1	0	3
Q2	5	3
Q3	9	3

Figure 22- Metric 12 Whole system optionality performance

Non-TO initiated options

In Q2 the number of DNO solutions were found through the high voltage pathfinding project.

In Q3 the commercial solutions have been proposed through the NOA 18/19 process

Solving transmission challenges with commercial solutions will incur annual costs compared with transmission assets which are paid for up front during construction. During Q3, we developed a new methodology to compare the cost of commercial solutions alongside asset based solutions in the NOA. We developed four commercial solutions as part of the NOA economic analysis for three areas:

- Anglo-Scottish flows
- East Anglia
- South-East England.

Our aim is to develop solutions for these areas with the market and relevant network companies for them to be available to be assessed for the NOA 2019/20 cycle. The first step is to issue a Request for Information to the market in February once the NOA report has been published.

The high voltage pathfinding project looks at the processes and frameworks needed to manage current and future high voltage challenges in certain regions. This has started for the Pennine, Mersey Ring and South Wales regions.

The Pennine region assessment takes a two-phase approach. Phase 1 explores TO and DNO solutions and Phase 2 will build on the analysis of Phase 1 to include commercial solutions. During Q3, we have found five DNO solutions to compare with the TO solutions. The cost benefit analysis showed that a combination of three TO options and one DNO option would be the most economically efficient solution.

Now the DNO will do more detailed analysis which will consider the DNO specific funding mechanism we have identified and change the estimate to a cost. We have concluded Phase 1 by publishing our findings of the work to-date at the end of 2018 as part of the ENA Open Networks Workstream 1, Product 1 report.

For Mersey Ring and South Wales region assessments, we are looking at inviting commercial solutions as options. We are writing two Requests for Information to improve our understanding about what providers can offer and what their preferences on contracts are. We originally planned to publish in Q3 but this has been delayed and will be published in due course.

Metric 17 – NOA consumer benefit

2018/19	ESO Options	Target	Total Consumer Value
Q1	0	0	£0
Q2	9	1	£0
Q3	10[1]	1	£TBC[2]

Figure 23 - Metric 17 NOA consumer benefit performance

ESO options

We have completed analysis of potential investment options on the future transmission network and have the optimal investment options. Of the nine indicative ESO options reported in Q2, the NOA 2018/19 analysis found seven of these to be optimal.

During Q3, we have developed four commercial options and analysed these. Three of these options were optimal and have therefore been added to the total number of ESO options.

Category	Description	Number of options Q1-Q3	Detail of options
ESO Initiated Options	These are traditional options identified by the ESO and put forward subject to TO agreement (if required)	5	Four of these are thermal rating enhancements which avoid the higher capital cost of replacing conductors. This allows an asset to be operated closer to its physical limits.
ESO Challenged Options[3]	These are additional options that are submitted following efficiency challenges by the ESO	1	We found an alternative option order which allowed some options to be built sooner. This will allow the power flows to be greater and constraint cost lower, earlier.
ESO Collaborative Options[4]	These are options that are developed collaboratively between the ESO and the respective TO following the ESO's technical studies	1	Low cost reduced build options called Power Control. Previously we called these Static Synchronous Series Compensation. These are quick to build and commission and allow greater power flows and reduce constraint cost sooner.
ESO Commercial Options	These are post fault constraint management schemes developed by the ESO	3	We proposed using intertrips which allow the power flows to be greater. These have an operational cost but give the ESO flexibility when to utilise them.

[1] This is subject to NOA committee approval in January 2019
[2] Values are confidential and cannot be shared until the NOA is published at the end of January and will therefore be reported in Q4
[3] We will not include the value of challenged options. We have included here to highlight the role we played in developing these.
[4] We will not include the value of collaborative options. We have included here to highlight the role we played in developing these.

Metric 18 – NOA engagement

Performance

2018/19	Score	Parties	Target
Q1	5	3	N/A
Q2	7.8	3	6
Q3	9*	1	8
Q4	-		8

Figure 24 - Metric 18 NOA engagement performance

Engagement activities

- We received Ofgem's approval of the NOA methodology on 8 October.
- Meetings with the TOs during November and December to explain the NOA results and take any questions and feedback. We had meetings at working level in late November, followed by senior manager meetings in December. This allowed teams to prepare their own material for their senior leaders.
- The NOA Committee met on the 11 December with Ofgem and the TOs attending. The committee is a key part of the NOA process to consider the NOA results and at the second meeting to review any actions arising.
- Weekly teleconference with the TOs

*The score that we've quoted for Q3 is based on a survey of attendees at the TO senior management meeting to present the NOA results in early December. This means that the sample is small and is likely to skewed by the tailored nature of the meetings.

During Q3 we have engaged with TOs, Ofgem and DNOs on the NOA results and the high voltage pathfinding projects.

We continue to raise awareness of our NOA roadmap at:

- Customer seminars in Glasgow and London (around 140 attendees);
- October Electricity Operational Forum;
- bilateral engagements with individual stakeholders and interested parties including Citizens Advice, Energy Systems Catapult and ENTSO-E.

In December, we received some feedback from one party about the NOA webpage and the NOA report 2017/18 that we are following up.

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