nationalgridESO

ESO Forward Plan FY18/19

August reporting

21st September 2018

Executive summary

Contents

August was a productive month. As we come close to the half way point of this year's regulatory framework, Ofgem's Formal Opinion and your ongoing feedback continue to underpin how we are changing and improving the delivery of our 18/19 Forward Plan and maximising value for consumers.

In this month's report, we include more detail on how this feedback is changing and improving our approach, and our workplans for Principles 1, 4, 5 & 6. In Principle 4, we thoroughly reviewed our plans and the consumer value that we think we can unlock. Alongside this monthly report, we've relaunched an improved plan for this Principle, more detail can be found here. We will share relaunches for Principle 5 and 6 at our customer seminar on 3rd October, we hope you can see some of this improved clarity coming into August's report. We have reviewed our vision for Principle 1, and use this month's report to test some emerging ideas.

Alongside relaunch work for the 2018/19 Plan, we also kicked off work on next year's Forward Plan. We started by looking out to 2030, and refreshing our view on where consumer value could be unlocked, and how the ESO can contribute. We want to hear and get help from all our stakeholders as we start shaping our plans (for RIIO2 as well as next year's Forward Plan, everything needs to be joined up!); our first event is on the 28th September (you can sign up here), please join the conversation.

And finally, we couldn't resist giving you a sneak preview of what September has delivered. We are excited and proud to introduce our new visual identity for the ESO, this month's report is using our new branding and colours. This new identity marks an important milestone as we make it clear who we represent and distinguish ourselves from the rest of the National Grid Group. In addition, we have launched a new website (www.nationalgrideso.com) and alongside our NGESO Control Room twitter page, we launched NGESO twitter (@ng_ESO) and LinkedIn accounts. Ahead of legal separation in April 2019, you will begin to see us behave differently, acting more independently whilst continuing to keep consumers at the heart of our plan and decision making.

Your Feedback is Essential

We hope that you've started to see some changes. If you have or if you haven't, please do tell us what you think of our progress so far, and also, specifically on this report: Does it provide useful information? The right level of detail? Is it clear and accessible? Please provide feedback on this report or any element of the ESO Forward Plan and incentives to this email address box.soincentives.electricity@nationalgrid.com or fill in our survey here.

Principle 1

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

Long term vision and consumer value

The goal is an electricity transmission system where the ESO maximises the market's competitiveness and efficiency for the ultimate benefit of consumers. Through accurate forecasts and transparent and accessible information, we are seeking to facilitate efficient investment planning and operational decisions. All market participants need to understand what to build, where and why, they need to be informed of future opportunities, strategies and services, and have the best view of pricing and availability. We expect to potentially unlock medium consumer value in the range of £15-£30 million in the short term[1].

Our deliverables for Q2 2018

Outcome	2018/19 deliverables
The Three Barriers	This month we are introducing our 'Three Barriers' which will help us to work toward our vision. This has lead us to the concept of a 'Market Efficiency' metric to track market competitiveness and intervention by the ESO. We are also planning to publish our 'baseline' information provision, what we plan to change, and the future ideal state.
Carbon Intensity Forecast	The Carbon Intensity forecast is an example of exceeding our baseline for information provision. It provides user-friendly, comprehensive and accurate information that helps stakeholders make informed short term and long term decisions. This month we have been working to productionise the systems to deal with the increased number of customer using the service.
The FES	The Future Energy Scenarios is an example of great baseline information provision and customer engagement. The annual report and seminars stimulate debate and help inform the decisions that shape the future energy system. This month we launched the Future Energy Scenarios 2019: Call for Evidence through a new online consultation.

Our key baseline activities

We support market participants by providing information which helps them forecast system needs and likely market outcomes. This is done by:

- The publication of our requirements for balancing services together with the outcomes of the tenders for these services
- The publication of a forecast of BSUoS outturn per month
- The publication of wind generation and demand forecasts
- Reporting of trades to the market
- Running events and maintaining multiple communication channels to share this information and intelligence with market participants and stakeholders
- Using our technical expertise, modelling and analytical capability to stimulate debate and support long-term decisions through publications such as Future Energy Scenarios, Market Outlooks, insight publications and the Electricity Capacity Report.

[1] See Pages 38 – 40 here for details https://www.nationalgrid.com/sites/default/files/documents/Performance%20Metrics%20Definition.pdf

Principle 1 ‘Relaunch’

Taking on-board feedback, this month we refreshed our vision for Principle 1. Our vision is to provide the information market participants need to make better informed decisions, this in turn should result in improved market efficiency and competitiveness and a reduction in ESO interventions. This leads us to the concept of a ‘Market Efficiency’ metric to monitor progress against our vision, and could help assess the effectiveness of individual actions in meeting our goal. We are working on a first draft of the metric and will provide details on the proposal with an implementation plan in the January issue of the report.

With regard to metrics 3 and 4 we have heard that the feedback that these are not measuring us exceeding baseline expectations well, and as part of the relaunch will be revisiting these metrics to reflect this feedback.

To help set our objectives we established our ‘Three Barriers’ which enables us to achieve our vision; they are:

- The range of information that met past needs will not be sufficient (or may be superfluous) to meet future needs.
- The frequency and accuracy of information provision was right for the past, but is not fit for the future.
- There are too many avenues of information provision which create a complexity barrier to achieving the vision.

To understand our baseline, we will list explicitly what was shared in the past by the ESO, the accuracy and frequency of the information, and the information provision avenues. Then to understand the change required, and develop our objectives, we will set out the full spectrum of what the market would need to function perfectly without intervention. Following an internal audit, we will publish tables of the information we publish, with the frequency, granularity, accuracy and avenue of provision. The tables will show the different states to help us and our stakeholders understand where we have come from; where we are now, our deliver plan, and the ideal future state.

We will use the plan-do-check-act cycle of continuous improvement to ensure that we drive towards our vision. We will assess what has been difficult, straight forward, or easier than expected. This continuous review will make sure that we know where we are on the journey and whether our plan and vision is still the right one.

We welcome market participants’ views on the ‘Three Barriers’ and the lists of baseline and future information provision, and will review and supplement our plans based on stakeholder feedback.

Over the next few weeks we plan to audit the many sources of information that we currently provide, to develop tables showing ‘baseline’, current, planned, and ‘ultimate ends’. We will use the audit information to build a picture of our plans, and compare them against our vision and our ‘Three Barriers’. We will seek feedback

from our customers on the plan and vision at the Electricity Operational Forum in October[2].

Performance this month

This month we refreshed our vision for Principle 1, presented our three 'Three Barriers' and our plan for manging our journey towards our vision. We have also been working to productionise the Carbon Intensity Forecast, which was developed alongside our partners to meet the needs of customers now and in the future in an easily accessible way. We launched the Future Energy Scenarios (FES) 2019: Call for Evidence through a new online consultation that will provide more opportunity for a wide range of stakeholders to send us their initial feedback and intelligence.

Meets Baseline Performance

FES

Following the publication of our FES 2018 publication, more detail of which can be found in our July reporting[3], in August we launched the FES 2019: Call for Evidence online consultation. This is a new engagement approach, to provide more opportunity for a wide range of stakeholders to send us their initial feedback and intelligence.

The FES is an example of leading-edge work that is part of our baseline information provision. We run a year-round process working closely with our stakeholders to deliver the annual report and seminars. It is widely acknowledged as the industry-leading publication on future energy trends; it is intended to identify a range of credible scenarios across gas and electricity on a GB-wide basis. These scenarios stimulate debate and help inform the decisions that shape the future energy system. To include the best possible data for its scenarios, the SO consults widely; this year's report includes feedback from 430 different organisations. In particular, the scenario framework was changed this year to reflect changes in the cost of renewables and the growth in decentralised energy, following extensive engagement and testing with our stakeholders.

[4]This year we have included a formal call for evidence[5] process to complement our workshops and one-two-ones as our stakeholder base has grown significantly. So far, we have received 45 responses; it is due to close on 28 September. We are also having more targeted workshops e.g. EVs, Heat and working in partnership with the Scottish and Welsh Governments to extend our reach on a regional basis.

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[2] https://www.nationalgrideso.com/balancing-services/transmission-operational-forum

[3] https://www.nationalgrideso.com/sites/eso/files/documents/ESO%20July%20Monthly%20Reporting_3.pdf

[4] https://www.nationalgrideso.com/sites/eso/files/documents/ESO%20July%20Monthly%20Reporting_3.pdf

[5] http://fes.nationalgrid.com/engagement/

Exceeds Baseline Performance

Carbon Intensity Forecast

We have worked in partnership with the Environmental Defence Fund Europe, University of Oxford Department of Computer Science and WWF, to develop the world's first Carbon Intensity forecast with a regional breakdown. The forecast uses state-of-the-art Machine Learning and sophisticated power system modelling to forecast the carbon intensity and generation mix of 96+ hours ahead for each region in Great Britain.

The Carbon Intensity Forecast is aligned to our 'Three Barriers' and moves us closer to our vision for Principle 1, exceeding our 'baseline' for information provision. It provides user-friendly, comprehensive and accurate information that helps stakeholders make informed short term and long term decisions related to CO_2 emissions.

The data is available in a free to access API (application program interface) which makes it easy for customers to seamlessly download and use the data. We have provided clear and concise documentation so that developers can easily integrate the data into stakeholder systems. We believe this is the first API introduced by the ESO and sets the standard for data streams in future. The system was delivered quickly and a flexible way, delivering a minimum viable product working closely with stakeholders and responding to their feedback. We are currently in the process of productionising the system, to provide a robust service to the increased number of users. In August, there was 2.9m data requests delivered to our stakeholders through the website API.

Principle 1 Metrics

Metric 1. Commercial Assessment Transparency

Metric Description

This metric measures the publication of Ancillary Services/Balancing Services (AS/BS) tender assessment decisions to a published schedule. This is for Firm Frequency Response[6] (FFR), Short Term Operating Reserve[7] (STOR), and Fast Reserve[8]. The tender assessment runs monthly for FFR and Fast Reserve, and three times a year for STOR. Fast Reserve and FFR tenders are run monthly and STOR tenders are run three times a year. Other tenders are run when required.

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
YTD	●	●	●	●	●	●

● Published on-time ● Published right first time

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

Table 1 Metric 1 Commercial Assessment Transparency Performance

Supporting Information

- The FFR and Fast Reserve assessment results were published on time and right first time in August. No STOR results were due to be published this month.
- This month's FFR tender was for month ahead delivery only. 59 tenders were received, made up of 24 non-dynamic and 35 dynamic tenders.
- Alongside the routine tender for Fast Reserve, we ran an ad-hoc tender for a two-week period in September where we have a requirement due to plant outages. We received 28 tenders for our routine Fast Reserve tender in the August and nine tenders for the ad hoc requirement in September. The assessment took place according to the agreed timetable and the results were made available on time and right first time.

[6] https://www.nationalgrid.com/uk/electricity/market-operations-and-data/system-balancing-reports
[7] https://www.nationalgrid.com/uk/electricity/balancing-services/reserve-services/short-term-operating-reserve-stor?market-information
[8] https://www.nationalgrid.com/uk/electricity/balancing-services/reserve-services/fast-reserve?market-information

Webinars

- The schedule of webinars, dial in details and access codes are published on our website.
- The Fast Reserve webinar was held on 21st August. WebEx data shows that 12 attendees dialled in. A WebEx poll was used during the webinar to capture feedback. Unfortunately, we have experienced some technical difficulties with WebEx disconnecting unexpectedly, which resulted in the loss of the feedback responses. Attendees were contacted post the webinar and a survey sent out. Responses were submitted from 3 participants. The feedback received on the usefulness of the information available regarding the tender results and the webinar and was positive. We are investigating the reasons for the closing out of the webinar.
- The FFR feedback webinar was held on 22nd August. WebEx data shows that there were 11 attendees dialled in. A WebEx poll was used during the webinar to capture feedback. Unfortunately, we have experienced some technical difficulties with WebEx disconnecting unexpectedly, which resulted in the loss of the feedback responses. We are investigating the reasons for the closing out of the webinar. In addition to the usual feedback on the assessment results, we once again provided a detailed overview of the tender submission sheet, with an explanation of the information and format that should be entered in order to ensure a compliant tender is submitted.

Metric 2. BSUoS Forecast Provision

Metric Description

We will develop a new methodology for a half-hourly total BSUoS cost forecast. The forecast will be published on the National Grid website. The measure will count the number of forecasts published during the agreed reporting period. In addition, we will publish a document describing at high level the main methodology that the forecasting process uses. The measure is the daily delivery, Monday to Friday, of a day ahead half-hourly BSUoS cost forecast by 08:00, and on Friday by 17:00 a half-hourly forecast for the coming Sunday and Monday. Performance will be measured from Q3 2018/19, following deployment and testing of the new BSUoS forecasting system in Q1/Q2 2018/19.

Performance

We will start measuring the delivery of the daily BSUoS forecast in Q3. The Modelling and Insight team are developing a more granular day ahead forecast, planned to be completed by the end of Q2.

Metric 3. Trades Data Transparency

Metric Description

We have invested in a new platform which will allow trades information to be published within one hour of it being available. The aim is to carry out seven-days-a-week publication of trades information within the targeted frequency of one hour. The target is to publish 80-90% of all trades data within one hour of capture in the first year of deploying this new system.

Performance

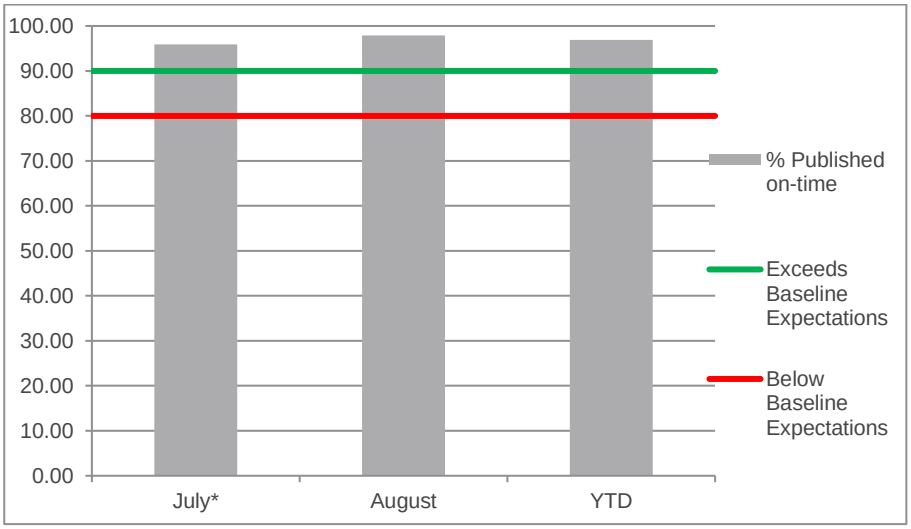


Figure 1 - Metric 3 Trades Data Transparency Performance

Supporting information

In August, the ESO successfully published 97.9% of its trades within 10 minutes of capture.

Metric 4. Forecasting Accuracy

Metric Description

The day ahead (DA) Demand forecast accuracy will be calculated daily for the following forecasting points to align to market electricity trading blocks: overnight minimum, daytime peak, daytime minimum and evening peak. The performance of each forecasting point will be measured by comparing the forecast error (MW) to pre-defined targets (MW) for the four forecasting points.

The day ahead BMU wind forecast accuracy will be calculated for each settlement period (half hour) and will be based on: first run settlement metering data (in MW) and half hour BMU wind forecasts (in MW) excluding Bid Offer Acceptance (BOA). The incentive performance will be measured half-hourly by comparing percentage mean absolute error to pre-defined seasonal targets percentage.

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.

Demand Forecast

ESO Energy Forecasting team in partnership with Met Office have increased weather forecast feeds by 50% from 4 to 6 times per day. Primarily an additional weather forecast feed for day-ahead forecasts. This has and will continue to contribute in improving forecasting accuracy at all time scales.

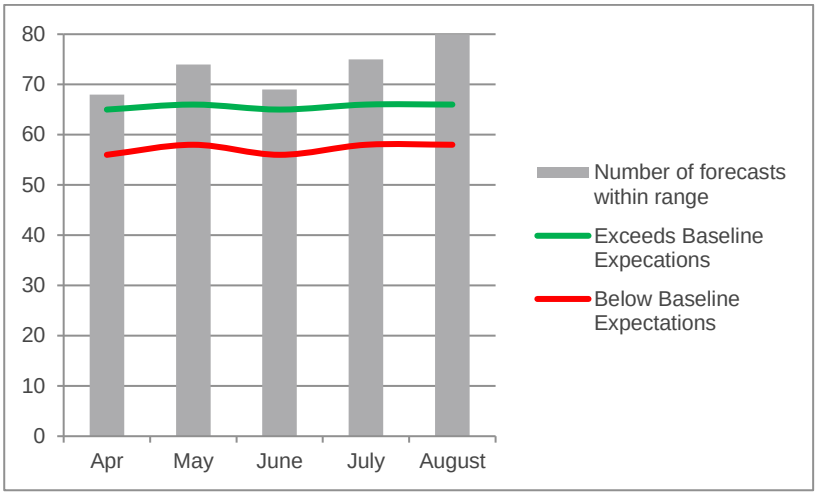


Figure 2 - Metric 4 Demand Forecasting Performance

In August 2018, the Energy Forecasting Team (EFT) achieved a day-ahead (DA) demand forecast performance above our baseline expectation. To achieve this, the EFT met demand monthly accuracy targets 64.5% of the time. Targets have been set to deliver a 5% reduction in error, on a monthly basis, against the average of the monthly performance from the last three years.

August experienced a further breakdown from the warm and stable weather that had established during the first part of the summer. During the month, the weather returned to more normal conditions for this time of the year. On average, temperature, rainfall and sunshine had values average or just below normal values for this time of the year. This lead to lower and more intermittent PV generation compared to the previous three months.

The August Bank Holiday did not experience the same fair weather as the previous two Bank Holidays, but this did not result to major changes in behaviour and forecast errors were relatively small.

Contributions to our performance against the DA demand forecast metric was driven mainly by the delivery of 2 additional weather forecasting feeds, the implementation improved the demand forecasting processes, and the relatively stable weather conditions.

Wind Forecast

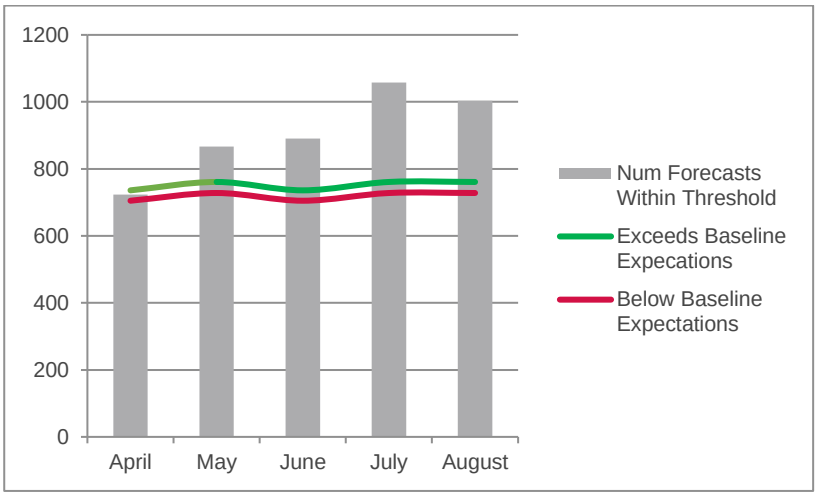


Figure 3 - Metric 4 Wind Forecasting Performance

In August, the Energy Forecasting Team (EFT) achieved a DA Wind BMU performance on this metric in line with exceeds baseline expectation. To reach this outcome, the EFT delivered wind BMU monthly accuracy targets 67.4% of the time. Targets have been set to deliver a 5% reduction in error, on a monthly basis, against the average of the monthly performance from the last three years.

In August, the prevalence of high pressure over the UK resulted in consistent low wind speeds compared to the monthly average.

Contributions to performance against this wind forecast metric was driven mainly by delivering a major wind model update at the end of July, increased weather forecasting feeds, and relatively stable weather conditions.

The energy forecasting team is continuing to review wind models to potentially bring another major update in third quarter.

Principle 2

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

Long term vision and consumer value

For this principle, our vision is that we drive overall efficiency and transparency in balancing, taking into account impacts of its actions across time horizons.

We expect to potentially unlock very large consumer value of greater than £50 million in the short term.[9] In the long term, this area will become a major contributor to consumer value.

Our deliverables for Q2 2018

Outcome	2018/19 deliverables
Develop our information portals and events	• Successful hosting of our Electricity Operational Forum event and expansion of our channels of information dissemination to support wider engagement of market participants and service providers • Kick off and delivery of the SO IS Change Forum

Performance this month

During August, we have continued to make incremental savings in Balancing Spend. Taking on board the feedback from the first IS Change Forum, we continue our preparations for the next forum. We have made strong progress towards the publication of our first Operability Report and have started a fundamental review of the Procurement Guidelines.

Meets Baseline Performance

Commissioning of the Western HVDC link started in August and was fully loaded to 2.4GW on 2 September. Unfortunately, an issue arose on a cable section and it has been taken out of service for further investigation. We are assessing the impact this could have on planned constraint costs in the coming weeks and our upcoming BSUoS forecasts in the BSUoS report to take account of this change.

We began gathering questions and ideas for the refresh of the innovation strategy and priorities for 2019-20 to identify additional areas needing innovative solutions and changes in priority. Externally we carried out widespread communication of our SO Network Innovation Allowance (NIA) annual report, providing updates for all current NIA and Network Innovation Competition (NIC) projects, which link directly to our current Innovation Strategy.

Our key baseline activities

• We operate the system in real time from of Electricity National Control Centre (ENCC)

• We run all the systems, processes and tools to deliver secure, economical and efficient dispatch of the system.

• We assess the notified market information for generation

• We continuously optimise generation schedules to achieve overall system and demand balance

• We run integrated operational, commercial and network planning teams to optimise the use of the system today;

• Alongside this we develop an integrated approach to identify the challenges that the ENCC will face, and the solutions we will use in the near-future.

[9] See Pages 38 – 40 here for details https://www.nationalgrid.com/sites/default/files/documents/Performance%20Metrics%20Definition.pdf

We have heard your feedback that we need to be clearer on Electricity Balancing System (EBS), at the IS Change Forum on 15th October we will talk to you about what EBS set out to achieve and where we are today. Ahead of the forum we will publish the discussion materials to allow you to prepare any questions you may have. You can sign up for the event here.

Following the success of the first IS Change Forum on the 4th July we are preparing for the next event which is scheduled for the 15th October. Based on positive and supportive feedback from the first event this will again be run alongside the Electricity Operational Forum and will follow a trade stand approach. Also in response to feedback we will have an increased number of stands covering a wider range of systems, and more representatives from each project to facilitate greater levels of detailed discussions. The Platform for Ancillary services (PAS) project, which is delivering change to non-Balancing Mechanism Balancing Services systems will be running a breakout session after the Operational Forum to discuss specifics associated with the migration away from the SRD system currently used to dispatch STOR.

We have continued to support the implementation of European Network Codes, with subject matter expert representatives contributing to the relevant implementation projects.

Exceeds Baseline Performance

Our first Operability Report is due in Q3 which will provide an update on actions we have taken, and our future plans, to deliver an operable system. Further information on the Operability Report can be found in the Forward Plan Performance Metrics Definition 2018/19 document[10]. Using feedback we received from industry on our System Needs and Products Strategy (SNaPS) publication we have developed a consistent structure to be applied to each of the five key focus areas of the report to ensure it is simple to read and clear for our stakeholders. This first report is on track for publication by 14 December 2018.

A fundamental review of Procurement Guidelines has started with internal workshops to bring together customer feedback and shape the structure and content of an improved document. We expect to be exploring the priority areas for change with industry in a webinar ahead of the external C16 workshop in October.

The web-based Ancillary Services Dispatch Platform (ASDP)[11] has gone live and is ready to dispatch non-BM Fast Reserve. One provider has completed testing and will be dispatched from ASDP from mid-September. We have started business logic coding to include Short- Term Operating Reserve (STOR) on the ASDP. This is the first step of an important journey in delivering access to the BM for distributed generation.

Balancing Mechanism Actions

Further to a query we received on actions that we have taken in the Balancing Mechanism, it has become clear that more information could be provided to the market to be able to understand the reasons behind the actions that we take. We are confident that we

[10] See Pages 30-31 here for details https://www.nationalgrideso.com/sites/eso/files/documents/Performance%20Metrics%20Definition.pdf

[11] https://www.nationalgrideso.com/sites/eso/files/documents/ESO%20July%20Monthly%20Reporting_3.pdf

have been economic and efficient in the actions that were taken and we will seek to address this as part of our information provision under Principle 1. We are continuing to make progress in preparation for the next IS change forum and the operability reports.

Principle 2 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 the details of our performance please see the principle 2 summary. For monthly breakdown of costs please refer to the hotspots and the accompanying data tables found here.

	April	May	June	July	August	YTD	Full year
Benchmark cost (£m)	56.9	68.3	90.7	65.2	72.4	353.4	843.52
Outturn cost (£m)	56.5	59.0	85.8	77.8	72.1	351.1	

Table 2 - Metric 5 Balancing Cost Management Performance

Metric Performance Detail

During August, we achieved this spend on balancing cost through:

- 3rd August- Trades enacted on interconnectors to provide negative reserve. This was more economic than the alternative actions of wind bids and two shifting BM plant
- 8th August- Trades enacted on interconnectors to provide negative reserve. This was more economic than the alternative actions of delaying the synchronisation times of BM units
- 11th August- Trade enacted on interconnector for margin – benefit against delaying desynchronisation of unit at £70/MWh
- 12th August- Super SEL contracts enacted – benefitted reduced negative reserve costs
- 19th August- Hydro plant run to provide level of power flows needed for Western HVDC commissioning – long term consumer benefit
- 20th August- Constraint limit reassessed and increased to allow access to additional margin units (mitigated additional cost)
- 21st August- Reconfigured transmission network to facilitate HVDC commissioning – long term consumer benefit
- 23rd August- When demand was higher than forecast, and wind was shortfalling, interconnector trades for margin delivered benefit against alternative units priced at £84 and £90/MWh
- 24th August-. Using situational learning from an earlier shift-team, the number of machines being run for voltage support in the south central region was reduced, saving £0.2m in costs.
- 25th August- Units traded on to increase inertia level for ROCOF, The alternative was reducing the largest loss through further BM actions on gas unit and wind units saving £1m

26th August – Continued offline analysis of an outage allowed a constraint period to be reduced by 2.5 hrs, saving £0.1m

- 29th August- A generator load test was due to occur during a high wind period – negotiations took place to reduce the output from unit during test – this avoided a localised NRAPM and reduced wind bid volume for constraints

  A trade was enacted on the interconnector for 2 hours which avoided a 5 hour BM action

Principle 3

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

Long term vision and consumer value

Our key baseline activities

To devise and run the processes to procure system balancing and ancillary services, we settle and report on the outturn of ancillary services contracts. We also support new and existing providers to help them participate in the ancillary and balancing services markets and tenders. We employ a schedule of open tenders to purchase a variety of products and services.

Our vision for this Principle is to have simple, fair transparent rules for procuring balancing services to maximise competition where possible. In our Forward Plan, we described how we will use this to facilitate new business models and technologies into the market to deliver a distributed, smart, flexible electricity system.

We expect that by promoting competition and developing new markets, together with increasing participation in balancing services markets, we can potentially unlock consumer value in the short term[12]. In the long term, flexible markets are one of the keys to releasing maximised value.

Our deliverables for Q2 2018

Outcome	2018/19 deliverables	
Grow participation and promote fair access in provision of balancing services	• 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 2nd July
	• Publish Thermal Constraints Management information note	• Published 26th July
	• Publish Wider Access to the Balancing Mechanism (BM) Roadmap	• Published 9th August
Promote competition and develop new markets	• Detailed auction trial publication	• Summary published 31st Aug, webinar arranged for end of Sep
	• Deliver a new, highly	• Phase 1 complete

[12] See Pages 38 – 40 here for details https://www.nationalgrid.com/sites/default/files/documents/Performance%20Metrics%20Definition.pdf

in balancing services	scalable and flexible dispatch solution for reserve - Phase 1 roll out for Fast Reserve providers	
	• Deliver new standardised products for reserve together with simplified contracts	• STOR OCP published, FR being progressed
	• Publish and consult industry on exclusivity clauses to improve the ability to stack products	• Due in Q2
	• Publish new testing and compliance/performance monitoring policy for response and reserve providers	• Due in Q2

Lessons Learned

We engaged widely with the market via multiple platforms (Account Managers, Operational and IS Forums) to publicise the opportunities that the Ancillary Services Dispatch Platform (ASDP) facilitates. However, feedback from market participants around announcements on new market entrants facilitated by (ASDP) could be clearer to ensure the market understands the open, fair and transparent processes that have been followed to allay any misconceptions or concerns on the process followed.

Performance this month

Our stakeholders told us that our balancing services were not accessible to all providers, that they were complicated and not fit for the future. They also told us that they needed better signposting of our plans to help them make informed decisions. In August we delivered and exceed against our baseline expectations by taking direct action to address this feedback; we improved accessibility for new non-traditional entrants to the Fast Reserve (FR) market and Balancing Mechanism (BM) publishing a Wider Access Roadmap and saw the first participant enter the BM via our accelerated programme, steps were taken to address product complexity with the conclusion of the modified Short Term Operating Reserve (STOR) outline change proposal (OCP) and we published an update on our ambitious auction trial to better signpost our thinking and help the market to plan. These actions support our drive of increasing participation and competition through increased transparency, reduced barriers to entry and ultimately unlock consumer value in these markets now and in the future.

Meets Baseline Performance

Reducing barriers to entry and increasing competition through access to markets and revenue streams is key to lowering costs for end consumers. No new units entered the FFR market this month, due to it being a short term only tender. A STOR tender round was not held, as these only take place three times per year. However, the battery unit which successfully tested for Fast Reserve (FR) last month entered the FR tender and was awarded a contract. This is the first FR contract award for a battery asset which is really exciting as it demonstrates that our efforts to diversify the balancing markets are leading to the introduction of new entrants and technology types. This is great news for market participants, particularly as the FR market has historically been perceived as having high barriers to entry given the 50MW minimum entry size and ultimately end consumers as increased competition will help reduce costs.

Accelerated wider access

Accelerated Wider Access is focused on access through the Supplier Volume Allocation route, which sees suppliers register additional Balancing Mechanism (BM) units that can aggregate multiple sites across a GSP group area. To facilitate this new type of unit within the balancing mechanism the ESO have developed the suitable industry contracts to ensure that participants follow this route do so under the same standards as other embedded participants who follow the more established entry routes.

Accelerated access will offer both industry and the ESO opportunities to develop operational processes around how aggregated units deliver and function. As we see new types of unit entering the market there are a number of challenges this presents to the ESO. The early learning and operational experience will be invaluable to shaping and developing our wider access systems and operational protocols for Project TERRE and Wider Access implementation.

In line with metric 8 we continue to track above the number of new providers required to exceed expectations against last year's benchmark, which is very positive. We look forward to seeing continued growth and diversification in the markets in the coming months, as actions from the Provider journey work we have undertaken are developed into deliverables that will improve the provider experience, increase transparency and support new market entrants all of which will unlock additional consumer value via increased competition.

Short Term Operating Reserve (STOR) outline change proposal (OCP)

We continue to work towards standardising products for reserve together with simplifying contracts and we will be publishing the FR OCP in early September. The modified STOR OCP closed on the 30th August, to which there was only 1 response from industry. There were 8 responses to the original STOR OCP which were all largely supportive of the proposed changes. Experience from previous deliverables has taught us the need to signpost change as early as possible to the market to reduce uncertainty and enable ability to invest to meet the future needs of the system in the most efficient and economic way for the end consumer. We will continue to engage as we develop the proposals for the Detail Change Proposal (DCP) which is next stage of the change process.

Exceeds Baseline Performance

Balancing Mechanism (BM) Wider Access Roadmap

Stakeholders told us that improving access to our markets for all providers was key and in particular that Wider Access to the Balancing Mechanism has been flagged by industry participants as a key area to revenue stacking and ensuring a level playing field across all technology types and sizes to unlock value to the end consumer. The ESO set out plans under the Forward Plan to deliver wider access to the balancing mechanism alongside Project TERRE by the end of 2019. We recognised this value to both industry and the end consumer and have put forward an initiative coined Accelerated Wider Access that aims to utilise existing industry routes to market whilst rapidly developing certain work streams to facilitate entry ahead of the broader, wider access plans which were committed under the forward plan.

Developments in the wider BM access space have moved rapidly and have become of increased interest to stakeholders in the past few months. On 9th August, we published an additional roadmap on wider access to the BM to ensure that all interested stakeholders had equal access to information on upcoming developments in this space.

We held a launch webinar event for the roadmap for over 125 attendees on 23rd August and received positive feedback during an in-webinar poll. The following questions baselined against product roadmaps were asked and we received approximately 43 responses (5=high, 1=low):

- How satisfied are you with the pace of delivery of the developments outlined in the Wider BM Access Roadmap? Score 3.5 (baseline 3.3)

- How satisfied are you that the changes outlined in the Wider BM Access Roadmap will address current barriers to entry and facilitate access to these services? Score 3.5
- The content of the Roadmap is clear and understandable? Score 3.6
- How satisfied are you with the level of engagement on the developments outlined in the Wider BM Access Roadmap? Score 3.5 (baseline 3.6)
- We also received free-text feedback on what stakeholders would like to see next in this area.

Publishing the roadmap not only provides equal access to information but provides a starting point for market participants to begin conversations about what wider access means for them. The success of the roadmap will ultimately be measured in having a more informed stakeholder community and an increased interest in BM access.

In terms of specific deliverables relating to roadmap feedback so far, stakeholders have told us that the roadmap is great start but they would like more detail on deliverables, particularly in the IT space and for us to provide further clarity on how arrangements will work for Virtual Lead Parties. We will provide more information to stakeholders on these in the coming months.

First Aggregated Balancing Mechanism Unit Enters BM under Accelerated Wider Access

Our work in this area has already paid off with Limejump pro-actively engaging with the ESO to become the first party to enter the balancing mechanism with aggregated BMUs. Following supporting the provider to install all the necessary communication platforms the ESO and Limejump were in a position to enable go live of the units. At this stage the code modification GC0097 which would enable aggregated dynamic data to be submitted which has previously prevented such units entering the BM was yet to be approved.

To maintain traction with accelerated wider access we supported Limejump in submitting a derogation to the grid code on a time limited basis to ensure the units could go-live whilst industry await the outcome of GC0097. As a result of this support and compliance to industry frameworks and processes we could facilitate the first aggregated BMU going live in the BM. A demonstration of how we listened to feedback and sought to make things simple for providers.

It is early days and both the ESO and Limejump are still learning but we have received positive feedback on the work we have done to enable and support accelerated access to the BM; Erik Nygard, Limejump CEO, provided the following feedback:

> *"We have really been impressed with the pace that you have been able to work to help support us through this. This is truly a great example of innovative collaboration in a dynamic and changing energy landscape! This is great for competition within the BM and is another step towards a sustainable energy future. Again thank you from everyone here at Limejump."*

The learning points from the Limejump go-live will also inform our engagement with the other providers who are all at different stages in their aspiration to enter the BM under accelerated wider access. This has been a complex and ambitious example of how we have listened to stakeholder feedback and are working with multiple providers to increase access, participation and competition to create the liquid, competitive markets that will deliver value for the end consumer. We expect to have the second successful party go live in October 2018. Not only will this offer greater dispatch optionality but also provide real time metering for embedded demand/generation volume that is mainly un-seen to the control room.

As part of the registration and connection process we are currently in the process of developing a new online based platform for providers to submit their operational metering data. This new system delivers value to consumers as it will offer a more economical solution for both the ESO and external parties to submit the necessary data for BM participation. The recently established IS Change Forum has communicated these plans, allowing both new and existing providers to register interest in this work alongside the wider IS projects that are underway to facilitate Project TERRE and Wider Access.

We are proud to see the first tangible deliverables out the back of the Wider Access Roadmap already coming to life and provides industry the confidence that not only are we are moving at good speed in this area but that we are committed to the wider access plans when there is increased uncertainty around the exit from the European Union. We hope that this confidence will support industry in a period of considerable uncertainty and change. Addressing feedback that better forward views and increased transparency helps the market invest to meet the future needs of the system and facilitate the most efficient use of assets to reduce costs to the consumer.

Closer to Real Time Procurement – Auction Trial Update

Over 68% of respondents to our System Needs and Product Strategy consultation were positive or very positive about trialling alternative procurement approaches. The trial will help to drive value for the end consumer and benefit market participants by reducing barriers to entry, maximising the efficient utilisation of all assets and increasing competition.

Contractual discussion with our preferred supplier for the auction platform are progressing well, and we are expecting to sign the contract in September.

We published a letter to the industry on 31st August outlining the detail of the trial and inviting parties to a webinar at the end of September where we will go through the specifics in more detail. This will allow parties to ask questions and provide feedback on all aspects of the project.

The estimated go live date for the project has been pushed back to June 2019, however we are working with our preferred supplier to identify time savings in the development process and what interim or early access can be provided.

Principle 4

Promote competition in the wholesale and capacity markets

Principle 4 Relaunch

The future of our energy system is digital, decentralised, decarbonised and democratised. Our future markets need to evolve to provide the enabling architecture that will realise value for the end consumer.

Earlier this year in our Forward Plan, we set out the case for change and a plan for the important we as the NGESO have to play in facilitating competition in these future energy markets.

Since publishing the Forward Plan we've listened to our customers and stakeholders, who told us to be more ambitious and we have taken this feedback on-board and today have published our Principle 4 Relaunch document[13] that introduces our new stretching ambition and the key enabling activities to unlock consumer value through competitive markets now and in the future. It also articulates our lessons learnt and our next steps to facilitate efficient, competitive markets that deliver value for the end consumer; this includes new deliverables and metrics which show how we are thinking more widely and have responded to stakeholder feedback

We believe that successful businesses operating in competitive markets, with simple, transparent rules deliver value for the end consumer. This relaunch presents our commitment to this principle and a refreshed view on our commitment to facilitating more competitive markets.

Long term vision and consumer value

Please see the relaunch document for further information and we look forward to engaging with stakeholders on our new ambition and deliverables, this can be found here.

Our deliverables for Q2 2018

Outcome	2018/19 deliverables
Facilitate the development of the code and charging framework	• Deliver Charging Futures (CF) Forums that are open to all network users. • Deliver webinars, podcasts and publications under the CF Brand • The ESO will have a stronger voice in the next stages of Charging Futures, helping to ensure that changes are designed, delivered and implemented successfully • Publish an agreed Code Administrator improvement action plan for 18/19
We shape the outcomes of the	• Deliver a stakeholder communication strategy to provide industry readiness for the

Our key baseline activities

We are the code administrator for a number of codes and processes that govern the electricity markets:

• We ensure that the rules of participation and the commercial arrangements for using the system are clear, fair and promote competition

• We are the administrator for the BSUoS and Transmission Services Use of System Charges (TNUoS).

• We collect TNUoS charges on behalf of the Transmission Owner and offshore transmission owner companies, and distribute these funds.

• We are the EMR delivery body and we administer the running of the capacity mechanism auctions.

• We are a part of the European body for Transmission System Operators, ENTSO-E.

[13] https://www.nationalgrideso.com/sites/eso/files/documents/Principle%204_Relaunch.pdf

regulatory frameworks to provide value and mitigate risk for consumers	implementation of EU Network Codes

Performance this month

This month we have delivered against our business as usual commitments both in terms of facilitating code change and in communication and supporting our customers with current and future changes.

Meets Baseline Performance

During August, we have continued to deliver against our communication plan which helps our stakeholders to learn about, shape and manage European Network Code implementation in GB. The videos are mainly aimed at parties which are connected to the transmission system and, are therefore entering into connection agreements with the ESO. These have been set out to help stakeholders establish if they are required to comply with the European Connection Codes. By improving the transparency and accessibility of requirements we facilitate broad market participation giving longer term consumer benefits.

The Connection and Use of System Code (CUSC) modification to facilitate the recovery of the ESO incentive income through BSUoS was approved by the Authority in August. This was welcomed by our customers because visibility of the incentive income to them is key to mitigating price shocks enabling more robust pricing in wholesale, balancing and retail markets.

As mentioned in our quarterly report, in our role as Code Administrator for Grid Code and CUSC we drove forward a process which allows the Code Panels to make decisions on code modification prioritisation. We have had positive feedback from the Authority on the process and purpose of code prioritisation which we are facilitating through Code Panels and continued during August meetings. It stated

> *"We note that the recent code prioritisation exercise carried out at the Grid Code Review Panel was done with general consensus amongst Panel members. We support the Panel taking a more strategic approach to code development, particularly taking into account the volume of change happening in the market. We also support the prioritisation of modifications relating to SO Separation and EU network code requirements and would like to stress the importance of these modifications being progressed to schedule."*

In August three CUSC modification proposals were rejected by Ofgem in line with ESO positioning. One looked to restrict stacking of revenue streams in ancillary markets a clear detriment to the purpose of Principle 3; one enables the recovery of incentive income through BSUoS and the final one looked to introduce an ex-post

Lessons learnt

As code administrator, we are working with Code Panels to facilitate a code prioritisation. This process is one of continuous learning as we embed the processes into standard Panel discussions. We have learned that being transparent about this process to our customers is critical. As a result, we are continuing to work with Panels on a Prioritisation Guidance document which once agreed to by Panel members will be published to our customers.

charging arrangement to maintain compliance with the EU cap on generator charges. ESO position in alignment with Ofgem is a strong indication that the way in which we discharge our obligations in forming views on change proposals is moving into the direction of demonstrating consumer benefit.

Exceeds Baseline Performance

In August, we facilitated a Grid Code derogation for a market participant and NG ESO enabling BM participation ahead of the approval of the TERRE modifications for Grid Code and BSC, as detailed under Principle 3, this is the first aggregated unit admitted to the market. This process is an existing feature of the Grid Code governance arrangements and was delivered through effective collaboration with our customer and Ofgem. It demonstrates how with a strong combined purpose it is possible to be more innovative in our approach.

We have continued to be deliver podcasts under the Charging Futures (CF) brand. Over the summer there has been a podcast mini-series providing alternative views and positions on Ofgem's consultation. The podcasts have been listened to over 716 time and the series included 7 guest speakers representing network users. The improved accessibility and transparency of requirements, facilitates broad market participation giving longer term consumer benefits. This activity goes beyond our historic routes for engagement and consultation and has opened up industry change processes to parties that are both current and future customers which whom we may not have previously met with.

Principle 4 Metrics

Metric 9. BSUoS Billing

Metric Description

These metrics measure the quality of the billing process in response and resolution time of BSUoS billing queries alongside the timeliness of those bills.

Performance

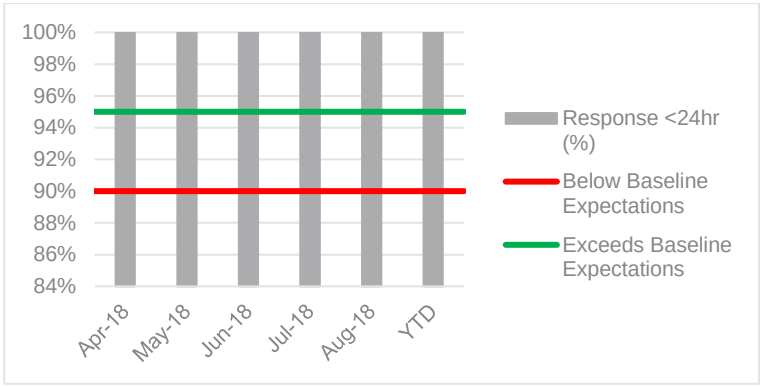


Figure 4 - Metric 9 BSUoS query response time

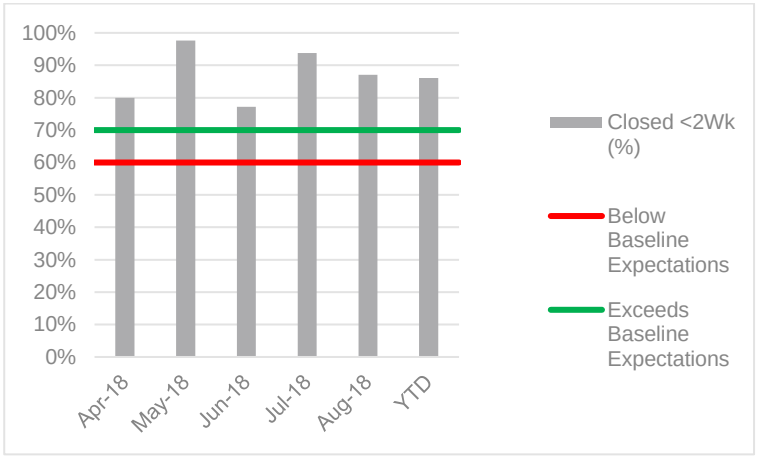


Figure 5 - Metric 9 BSUoS query resolution time

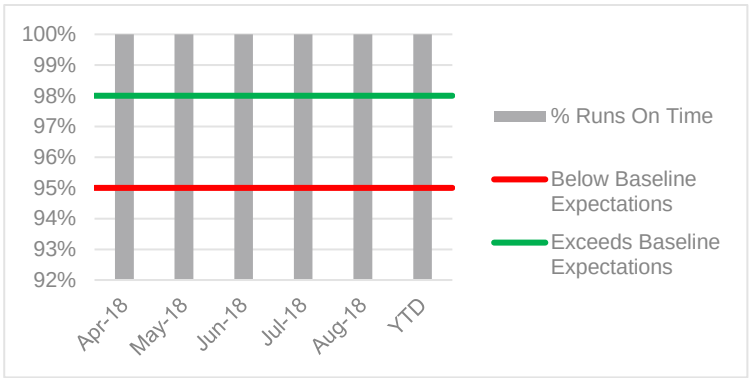


Figure 6 - Metric 9 BSUoS bills timeliness

Supporting information

- We issued a charging circular at the start of August due to an issue on our website that was affecting availability of BSUoS data, the issue was resolved promptly (within 24 hours) and we emailed data out to customers requesting it as an interim solution.
- We issued a charging circular to all BSUoS customers to update them on the revised Final Reconciliation recovery values for 2017/18 following an agreed change to the BSIS value. This was sent to our distribution list of 670 email addresses that have registered to receive BSUoS related news and information. The circular was also published on our website here
- We issued a circular to BSUoS and TNUoS customers to invite them to our Customer Charging and Settlement seminar being held on the 16th/17th October 2018 and opened registration for this event.
- We received 10 customer survey results following query closure all with a rating of excellent.
- After each BSUoS query/complaint is closed we issue a survey asking *"How would you rate the service that you have received*?" In August, we received 10 responses all with a rating of excellent. (Ratings available are: - Very Poor / Poor / Good / Excellent)
- All billing runs took place on time and no individual runs were delays.

Principle 5

Coordinate across system boundaries to deliver efficient network planning and development

Long term vision and consumer value

Our long-term vision for network planning and development is that, to design the network we need by 2030, we will be working seamlessly with the DNOs, through new markets and using new processes, to explore all possible solutions for meeting transmission system needs, with these being optimised alongside distribution system needs to deliver best value for consumers – regardless of asset ownership boundaries.

Through cross-industry collaboration on efficient network planning and development, and continual improvements to our transmission network development publications, we expect to potentially unlock large consumer value between £30 million and £50 million in the short term[14]. In the long term, whole system sits at the heart of releasing consumer benefits.

Our key baseline activities

We facilitate efficient transmission network investment planning and development by:

- Working with the DNOs to facilitate connection of new users to the distribution networks.
- Collating, managing and modelling transmission system data.
- Identifying and publishing future transmission system needs.
- Supporting efficient development and investment in the transmission network through the Electricity Ten Year Statement (ETYS) and the NOA.

Our deliverables for Q2 2018

Outcome	2018/19 deliverables
Develop a whole system approach to meeting regional transmission needs	• Publish the results of the two NOA pathfinding projects and a plan to update the NOA methodology
Improve our cross-industry collaboration for whole system network planning and development	• Begin two new RDPs by publishing a bespoke work plan for each region • Implementation of new commercial contracts to allow DER to participate in provision of transmission services in our in-flight RDP areas

Performance this month

In August, we continued to deliver our current RDPs whilst establishing the foundations for further RDPs this continues to see us taking a whole system approach to planning and operating electricity networks. Whilst doing this, we continue to deliver our baseline activities as set out by the Grid Code Planning Code.

Meets Baseline Performance

Our baseline activities to ensure coordination across system boundaries to deliver efficient network planning are set out in the Grid Code Planning Code[15], and revolve around the exchange of data between network companies to assess the security and safety

[14] See Pages 38 – 40 here for details https://www.nationalgrid.com/sites/default/files/documents/Performance%20Metrics%20Definition.pdf

[15] https://www.nationalgrid.com/sites/default/files/documents/05_PLANNING_CODE_I5R25.pdf

of the transmission system at the interface with Network Operators for both operational and investment planning purposes.

The purpose of these processes is to establish whether the system is compliant with the National Electricity Transmission System Security and Quality of Supply Standard (commonly referred to as the NETS SQSS or SQSS) and trigger remedial works if not. TO/SO/DNO investment planning consists of a loop of exchanging data between the parties. Key dates of the process are:

- Week 17: National Grid makes an official request to DNOs for data including single-line diagrams for networks, agreed access periods and times of minimum/maximum GB demand.
- Week 24: DNOs submit requested data to National Grid (DNOs may delay this by week 28)
- Week 42: National Grid submits transmission network data to other network operators
- Week 6: National Grid confirms compliance with SQSS

The week 42 model provided to DNOs by National Grid is used to produce the week 24 data submission for next year.

August covers engineering weeks 31 to 35, which includes the period when we are checking submissions and liaising with data owners to address queries.

Our baseline activities to ensure coordination across system boundaries to deliver efficient network development are set out in the NOA methodology. The 2018/19 methodology, submitted to Ofgem for approval on the 2nd July, references activities we are undertaking to develop a more 'whole electricity system' approach, which are covered in more detail in our Network Development Roadmap. However, as of now, distribution system options to enhance regional transmission system capabilities are not considered a baseline activity.

Lessons Learned

Upon reflection, the approach to specifying the requirements of the DER transmission constraint service, set within the end to end business process, should have been done sooner. We have continued to be challenged by the need to balance our 'design by doing' ethos with the processes necessary to secure delivery.

Exceeds Baseline Performance

Our Regional Development Programmes are ground-breaking collaborations with DNOs that take a whole-system approach to planning and operating electricity networks. They represent a step-change in the way we work together, compared with our baseline obligations, and enable us to tackle existing and future operational challenges in new ways.

During August, we have continued to work with DNOs to deliver activities under our first two RDPs and to embed plans for RDPs three and four. These activities are based on enhanced modelling techniques that go beyond the requirements currently contained within the Grid Code Planning Code; providing us with a deep understanding of the capability of the transmission and distribution networks on a 'whole electricity system' basis.

During August, working relationships continue to be positive, and we are in the early stages of plan formation with SP Energy Networks (SPEN). Our meetings with Western Power Distribution (WPD) to discuss a possible RDP have been positive, containing wide ranging discussion on the nature of the issues, possible routes to tackle them, and a high-level plan. The next steps involve distilling the

discussion into realistic deliverables that can form the basis of a plan.

Bilateral Connection Agreements (BCAs) to allow distributed energy resources (DER) to provide transmission constraint management services are being finalised for sign off in the WPD area. These are already rolled out for UK Power Networks (UKPN).

Electricity North West (ENW) and Northern PowerGrid (NPG) have submitted options to manage high-volts as part of the Pathfinding project. These now will be compared with the cost of a TO solution and previous options submitted to UKPN. We worked closely with DNOs to ensure the requirement was clearly-articulated; and that the DNO options were specified to a sufficient level of detail. Alongside this the initial cost benefit analysis (CBA) comparing asset solutions with generator provided MVArs is complete. This produced results of generators being more effective at some locations and assets at other locations. The next step is now to compare what is the optimum TO and DNO solution to find the overall best options. The engagement process has been complex, but with clear project milestones and continued discussion about progress we have been able to keep on top of project timelines.

We have continued to discuss with the DNOs the system and process changes to the enable transmission constraint management by DER. Progress is being made but there are further questions to be answered. DNOs which are further through this process are keen to understand how their new systems will interface with our balancing systems and processes – we are working to deliver the necessary clarity to allow them to progress with their system developments. Alongside this, the balancing services contract structure and detail for transmission constraint management for DER remains under discussion, as we seek to establish rights and obligations that meet our needs whilst also enabling the deployment of DSO characteristics to better understand service capability. This needs to happen before we can further engage with DER on service provision.

Principle 6

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

Long term vision and consumer value

The evolution of whole system operation and optimal use of resources begins now with finding new approaches to optimising whole system operation.

We want to be an ESO who coordinates effectively to ensure efficient whole system operation and optimal use of resources; improves our cross-industry collaboration on whole system; implement learning from our major innovation projects and improves the service and information for new connection applications.

Under this Principle we expect to potentially unlock medium consumer value in the range of £15-£30 million in the short term[16]. This area is one where the main consumer value will be achieved in the long term. Actions that we take with the industry now are central to the ability to unlock vast financial future savings

Our deliverables for Q2 2018

Outcome	2018/19 deliverables
Improve our cross-industry collaboration on whole system	• Publishing our high level thoughts on the benefits of a whole system approach and how the ESO is evolving in response to the changing energy landscape. • Leading the consultation process with stakeholders on future DSO commercial and technical arrangements (Open Networks consultation on Future Worlds) including hosting webinars and presenting at stakeholder events. • Playing a pivotal role in the delivery of ENA Open Networks project.
Improve the service and information for new connection applications	• Scoping of the new TOGA system and issuing a procurement ITT for the new system.

Performance this month

During August we have been active in our engagement with the ENA Open Networks consultation on Future Worlds as wells as with the DNOs about the Appendix G process. We have engaged widely with our customers and stakeholders about the TOGA refresh.

Our key baseline activities

We ensure efficient transmission system operation and optimal use of resources by:

• Planning and optimising outages of the transmission network to allow connections and asset maintenance.

• Six-monthly engagement with all DNOs to share the future seasonal challenges faced by the transmission system and discuss approaches to coordination and collaboration across networks to resolve these challenges.

• Developing and maintaining the TOGA model.

• Modelling and analysing the transmission system to identify future operability challenges.

• Informing market participants and our stakeholders about future operability challenges for the transmission system by developing and publishing the System Operability Framework.

• Innovating to find cost-effective technical and commercial solutions to operability issues.

• Facilitating the connection of new users to the transmission system and managing connection contracts.

[16] See Pages 38 – 40 here for details https://www.nationalgrid.com/sites/default/files/documents/Performance%20Metrics%20Definition.pdf

Appendix G Process

This is a new process between the DNOs and the ESO whereby 50MW block of capacity is released at a time to the DNO. This allows the DNOs to manage connection requests within that 50MW range from potential embedded customers without having to submit multiple applications to the ESO. This benefits the ESO, DNOs, their customers and consumers. For the ESO it is able to pre-authorise a certain capacity to the DNO, the DNO is able to release capacity to their customers more quickly which is also a benefit for their customers. All of this allows the progression of the decarbonisation agenda which benefits the consumer.

Meets Baseline Performance

By the end of August, we have now engaged with all of the DNOs about the Appendix G process. The team has worked closely with the DNOs that are not yet part of this and this is a positive step forward. We have also directly worked with Energy North West (ENWL) to drive a quicker connection offer for an embedded battery storage provider. This approach was possible as a consequence of the work between the ESO and the DNOs as part of the appendix G process and this has led to the active discussion of areas on their network where they want to develop an RDP.

During July and August significant progress was made on the development of the TOGA replacement tool. TOGA is the existing system that provides an interface between National Grid ESO and all users of the transmission system it enables users to meet their Grid Code and STC obligations by facilitating the exchange of information regarding transmission outage planning and generator availability. In our Forward Plan, we stated our intent to develop a replacement TOGA system, we committed to work with customers and stakeholders during the development of the replacement tool to ensure the final design meets the needs of all users. Over the summer, we held three workshops designed to help scope the requirements of the new system. Over 40 customers and stakeholders representing 20 companies attended the workshops and were given the opportunity to share their experiences of the current system and provide information on the capability requirements for the new system. Customers who were not able to attend the workshop are being provided with information from an ‘event findings’ pack and a virtual feedback event has been offered. Customer feedback will be followed up in October and further working groups have been offered. A project progress update will be communicated in December.

Exceeds Baseline Performance

After having led the successful delivery of the Open Networks Future Worlds consultation will worked with the ENA in the development and delivery of its stakeholder engagement plan. We hosted and presented at the first event, an industry webinar, and have prepared material and presented at the subsequent stakeholder events in London and Edinburgh; appearing on stakeholder panels at both events. Feedback to the consultation has been positive so far and we will be working closely with the ENA and its other members to understand formal responses when it closes in September.We have also been actively involved in other Open Networks deliverables including participating in the panel to choose consultants for the Future Worlds Impact Assessments.

We have also increased engagement with DNOs and their customers. The ESO has received connection applications, that if granted with result in changes to some existing DNO connection assets. We have increased our engagement with the DNOs to ensure they are kept informed and are able to contribute to the solution. We were initially slow to engage the DNOs in this space but have increased this work in response to feedback. This is an opportunity for us to show how we can lead on whole system related subject areas.

Principle 6 Metrics

Metric 14. Connections Agreement Management

Metric Description

The GB transmission system is constantly under change as TOs build new assets. We need to ensure that the relevant contracts for the affected generators are then updated to reflect this change. Some agreements permit us to curtail generation under certain circumstances at no cost but if an agreement is not up to date and the generation requires curtailment we may need to instruct this through a Bid Offer Acceptance (BOA).

Ensuring that connections agreements are up to date to reflect changes to the transmission network gives us more options to ensure the system can be run safely and securely and potentially saves BSUoS cost when we would need to pay to curtail generation.

Performance

This metric is a nine-month process so we will only report the final metric from January onwards. For the interim we will use this indicative metric to show our progression towards full delivery. This indicates the percentage of milestones completed on schedule in any given month in the process. This allows us to drive performance in this area and keep our stakeholders informed of an indication of our performance.

During August, nine out of the nine milestones due were completed. There are currently nine connections agreements that require updating following notification since April 2018. Of these, six are making very good progress and are well ahead of schedule and four have been issued to the customer. Our year to date performance is 95% of milestones have been achieved.

Our performance in this area has improved since the start of April due to changes in internal processes and making use of a different source of information which we receive earlier. This has helped us identify which BCAs (Bilateral Connection Agreements) will require updating once we receive notification from the TO of changes to the network. This new process has allowed us to progress changes to these BCAs in preparation for when we receive the notification from the TO. These changes have been cascaded to the teams involved and are continuously monitored using internal processes based on LEAN methodology.

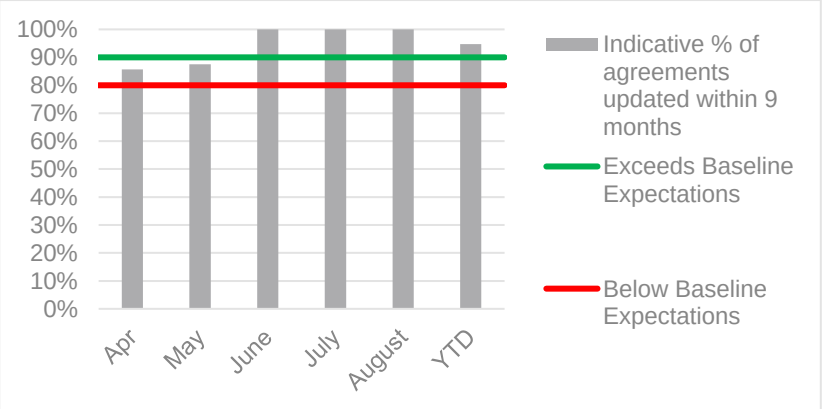


Figure 7 - Metric 14 Connections Agreement Management

Metric 15. System Access Management

Metric Description

We direct the flow of electricity over the transmission system in real time whilst the TOs own the assets through which electricity is transferred. To ensure that these assets are maintained, the TOs ask us for access to their assets. When the system access requests are formally submitted, we undertake due diligence on these requests and, if secure and economic, they are accepted into the master outage plan in the Transmission Outage Generation Availability (TOGA) database before 15:30 at DA. These outages are then reassessed in the control phase (within day) before the asset is switched out to make sure it adheres to policy[17]. When a system access request has been accepted into the plan, TOs, DNOs and generators will act on the assumption that it will go ahead. Sometimes these requests are delayed or even cancelled within day for a variety of reasons from unforeseeable weather conditions to faults on the system to planning process failures. These cancellations can lead to higher network costs.

Performance

In August, we had six system access requests that were classified as fail to fly. That is those system access requests that have been cancelled or delayed by more than one hour from where they were planned or one hour after requested by the TO within the control phase that can be attributed to us. Each of these instances is internally investigated using root-cause analysis tools and learnings from these are communicated to the relevant teams using operational learning notes. These are a tool used to investigate the cause of the process failure and communicate the findings to the relevant teams.

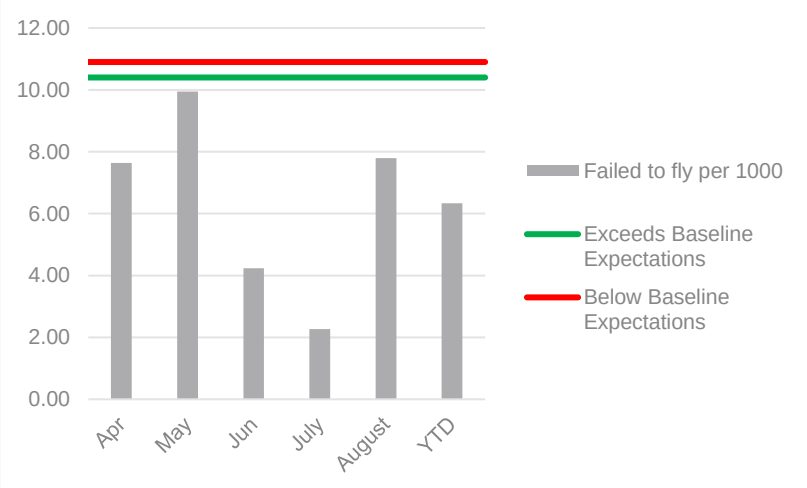


Figure 8 - Metric 15 System Access Management Performance

[17] GBSQSS-GB Security and Quality of Supply Standard

Principle 7

Facilitate timely, efficient and competitive network investments

Long term vision and consumer value

For this Principle, our vision is to work to maximise competition in delivery of network investment and build new tools allowing the market to explore alternative solutions to meet transmission system needs.

Work that supports the outputs under this Principle will provide long term benefits in improving competition in efficient network investment by providing better engagement and facilitating more participation. Through this we expect to potentially unlock large consumer value in the range of £30 million to £50 million in the short term[18].

Our deliverables for Q2 2018

Outcome	2018/19 deliverables
Maintain and improve the quality of our insight publications	• Deliver the finalised Network Development Roadmap • Submit NOA methodology to Ofgem for approval • Commence technical studies as part of ETYS and NOA • Progress delivery of the pathfinding projects to implement the Network Development Roadmap

Performance this month

We have refreshed our stakeholder engagement plan following the completed consultations on the NOA methodology and Network Development Roadmap. This is to ensure we continue to engage at the right level of frequency and detail with relevant stakeholders and ensure smooth implementation of the outputs of the Network Development Roadmap.

Meets Baseline Performance

During August work to deliver the Electricity Ten Year Statement (ETYS) and Network Options Assessment (NOA) has been progressing. We have started to carry out the boundary studies which are required for both ETYS and NOA. These studies determine the incremental boundary capability benefit for each of the options submitted into the NOA process. As part of this there have been interim challenge and review sessions to provide ongoing monitoring of progress and quality of the studies between the SO and the TOs. The sessions have been positive and so far have identified two SO led options for submission in the NOA. Some of

Our key baseline activities

We facilitate efficient transmission network investment and planning, and help to identify investments suitable for competition by:

• Identifying future transmission system needs under the Future Energy Scenarios.

• Publishing the future transmission boundary requirements in the ETYS, informed by the Transmission Owners.

• Delivering SO-led analysis to identify extra solutions across TO boundaries and alternatives to network investment.

• Modelling and analysis to identify the most economical and efficient solutions to meeting future transmission system needs.

• Running the NOA committee review and publication of the NOA recommendations about efficient network investment to meet identified transmission system needs.

• Identifying projects from the NOA recommendations that meet the criteria for competition.

[18] See Pages 38 – 40 here for details https://www.nationalgrid.com/sites/default/files/documents/Performance%20Metrics%20Definition.pdf

the inputs to this process have been delayed and we are investigating contingency options to get this work back on track.

We have received positive feedback from Ofgem on the NOA methodology, particularly regarding the survey which was set up to enable stakeholders to respond to the NOA for Interconnectors section of the methodology. This has allowed us to capture some valuable feedback to the methodology. We are currently awaiting approval of the methodology.

Exceeds Baseline Performance

Our work to implement the commitments in the Network Development Roadmap is going well. Phase 1 of the high volts pathfinding project has involved working with DNOs on establishing the modelling, processes, interactions and data exchanges. This is progressing well, and a modelling approach has been developed which is delivering results. Our analysis is suggesting distribution network solutions are technically credible in certain situations. The next step is to compare the costs of the TO and DNO solutions to come out with a recommendation.

Following constructive engagement with SP Transmission (SPT) in July, we have had a constructive strategic conversation with Scottish Hydro Electric Transmission (SHET), where we understood each organisation's position on a number of key strategic issues going forward. Engagement through the ENA Open Networks Project has been positive with constructive conversations on longer term models for investment planning and progress of the pathfinding projects. Our more proactive approach to engagement during this month has resulted in some more constructive relationships and engagement. We have also been focusing on how we can ensure we can continue this across all our stakeholders, and communicate in a way that is most helpful for them.

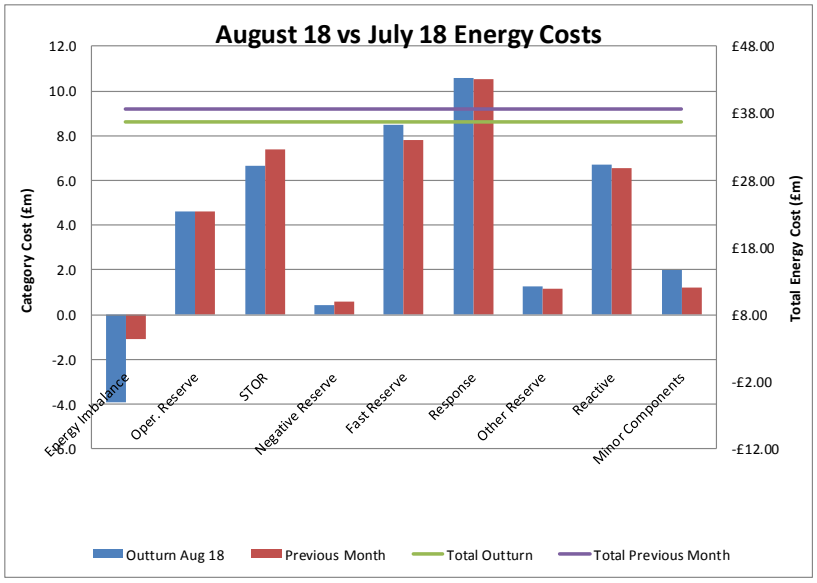
A

Balancing Cost Hotspots

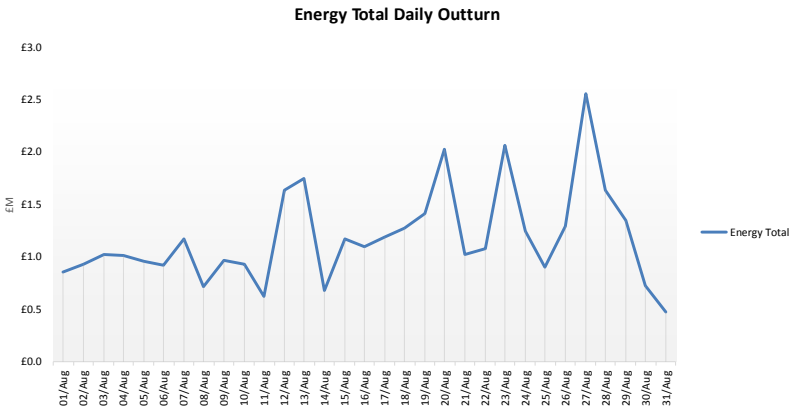
August Hotspots

Energy Costs

Energy costs (including energy imbalance) for August 2018 out-turned at £36.7m, with a decrease from the previous month outturn of £2.0m. The average daily energy spend for this month was £1.2m. Fast Reserve was £0.6m higher than its value recorded the past month, and was the only category cost that showed an increase compared to July 2018. The Energy Imbalance and STOR decreased of around £2.8m and £0.8m respectively, all the others categories showed little variance.



Energy Total Daily Outturn

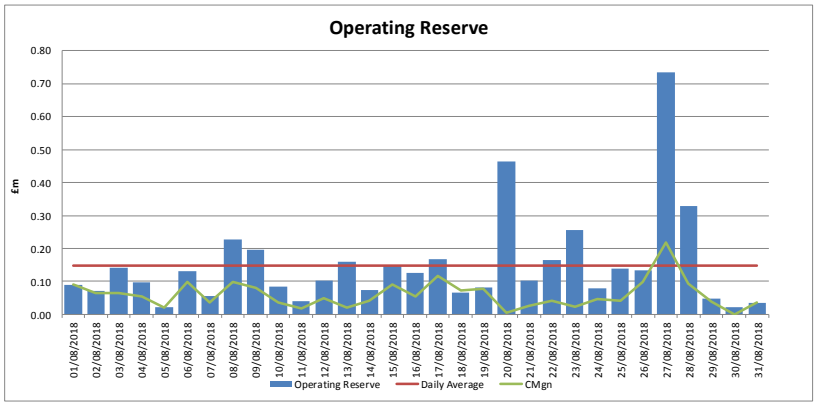


Daily Energy costs remained below £2.0m for most of the days in August 2018. Energy costs above £2.0m were recorded on Thursday 23rd, and Monday 27th peaking at £2.1m and £2.6m respectively. On Monday 27th, long periods of short market and the sudden unavailability of a generator were the main drivers behind this high cost day, impacting especially on the Operating Reserve and Frequency Response spend, which recorded in both cases the highest daily costs for this month. Thursday 23rd was another day characterised by long periods of a short market, especially over the

peak hours when up to 1000MW were traded on the interconnector for positive margin.

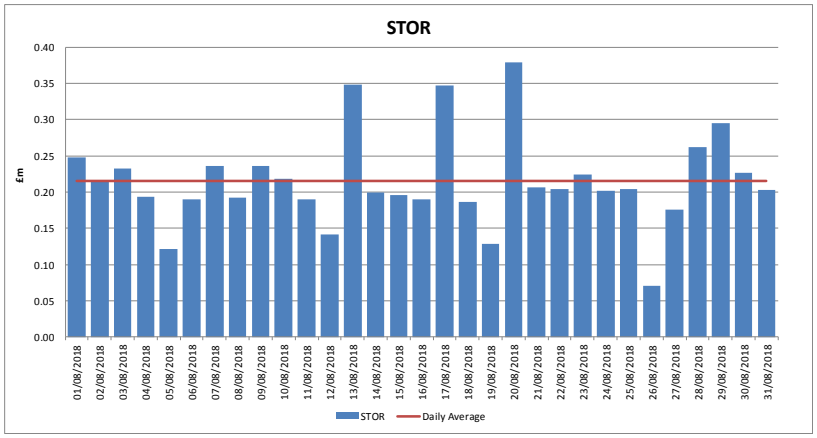
Operating Reserve

Operating Reserve out-turned at £4.6m showing no variance from July 2018. The highest daily cost for this category was recorded over the Bank Holiday weekend, with a spend of £0.7m on Monday 27th. This was mainly because overnight, when the demand was low, despite the long market, the margin requirement was not met by the market and so we traded on units as well as buying in the BM in order to meet the requirement. The traded units delivered consumer value over taking those actions in the BM. Another high cost day for this category was Monday 20th with a spend of around £0.5m. These costs incurred mainly between the morning and the afternoon, when the market was short, accepted offer prices were in excess of £100/MWh, and were in part due to the high output of PV generation which reduces the volume of conventional generation contributing to the margin requirement.



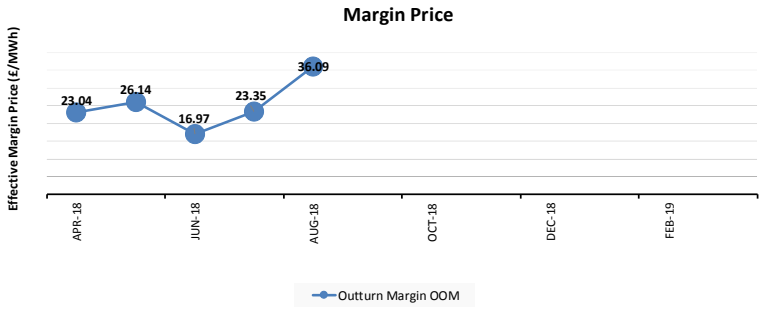
STOR

STOR cost for August 2018 was £6.7m compared to £7.4m in the past month. Daily costs for this category remained below or around £0.2m for most of the days, except for Monday 13th, Friday 17th and Monday 20th when daily cost peaked at circa £0.35m. Demand forecast errors and non-conventional generation volatility were the main drivers behind the deployment of significant volume of STOR over those days.



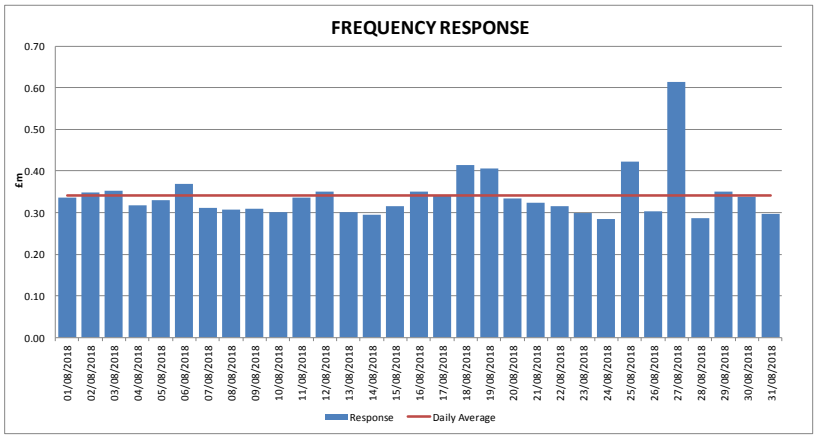
Margin Price

The average margin price in August 2018 increased from the past month out-turning at £36.09/MWh.



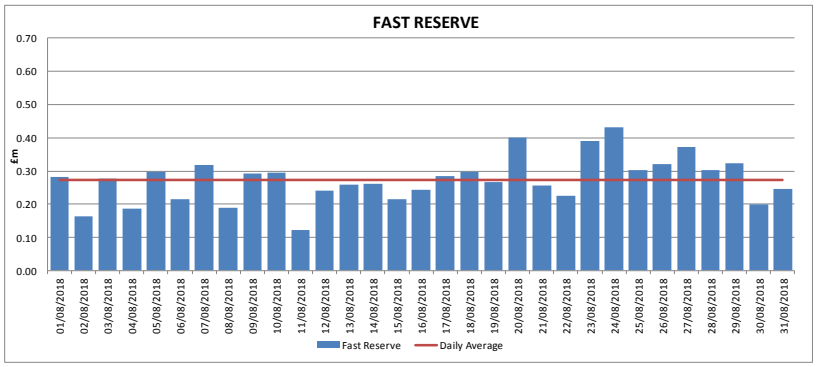
Frequency Response

Frequency response in August 2018 out turned at £10.6m showing little variance from last month. Response costs are largely ancillary costs (~85%) with the rest being incurred in the BM, positioning units so they can provide a response service. The movement in day to day outturn reflects the level of response held in control room based on system conditions. Overall costs were lower for the month due to stable weather conditions meaning additional levels of response were not required to the levels seen in previous months. The highest cost was recorded on the Bank Holiday Weekend when, on Monday 27th the spend for this category was of £0.62m; between the afternoon and late evening additional primary, and high response was held for risk mitigation.



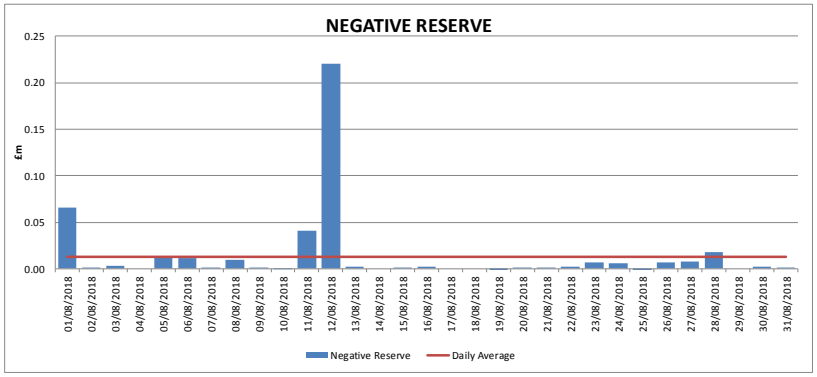
Fast Reserve

Fast reserve out turned at £8.95m, which is an increase of £0.6m from July 2018 costs. Throughout the month, the average daily cost was below £0.3m and the ancillary costs made up circa 86% of the total costs, most of which is incurred on the SpinGen service. Arming the service delivers consumer value over procuring reserve in the BM (Operating Reserve).



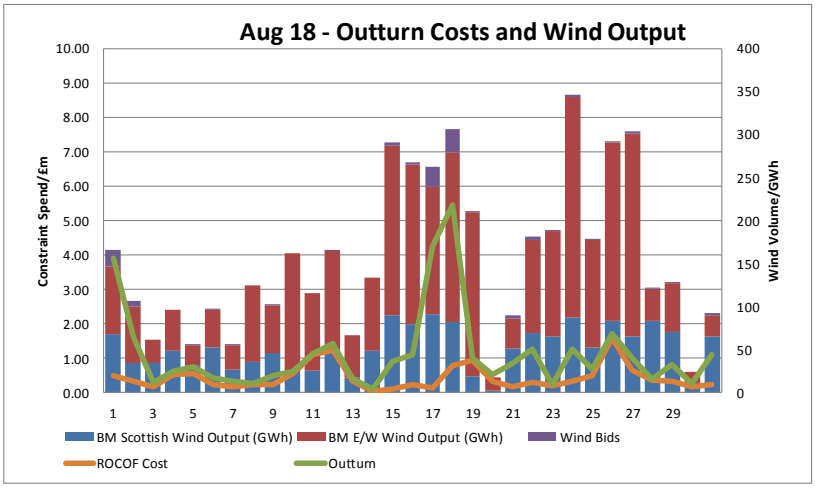
Negative Reserve

Negative Reserve out-turned at £0.4m, which is £0.2m lower than previous month. The costs for this category were nil for most of the days in August 2018. The most relevant high spend day was Wednesday 12th, recording a cost of around £0.2. This was mainly due to multiple trades on the interconnectors were enacted to provide additional reserve at times of low demand, particularly overnight, as the high wind levels were reducing the reserve provided by the market. Trades on interconnectors for RoCoF reason delivered consumer value against Negative Reserve.



Constraints Costs

The total constraints cost for August 2018 was £35.4m; £10.4m for England and Wales, £1.1m for Cheviot, £1.0m for Scotland, £9.0m for Sterilised Headroom, £13.5m on ROCOF, and £0.3m on Ancillary Services costs.



The graph above shows the daily outturn costs and the portion made up by RoCoF. It also shows output levels of BM wind and volume of wind bids (including trades) to indicate the extent to which wind output drives constraint costs.

During August 2018, the constraint daily costs was below or around £1.0m for most of the days. Friday 17th and Saturday 18th, were the most expensive days with costs peaking at around £4.3m and £5.4m respectively. These two days were characterised by sustained high wind levels in both Scotland and North of England coupled with outages in the North (including Western HVDC), causing power flow restrictions on the network boundary between England and Scotland. This scenario required significant volumes of bids and trades on wind generation and BM actions on hydro units, from Friday afternoon throughout Saturday morning. Another high cost day was Wednesday 1st, with a spend of around £3.9m. In this case, planned key outages combined with high wind level were the main drive behind the high constraint costs.

RoCoF

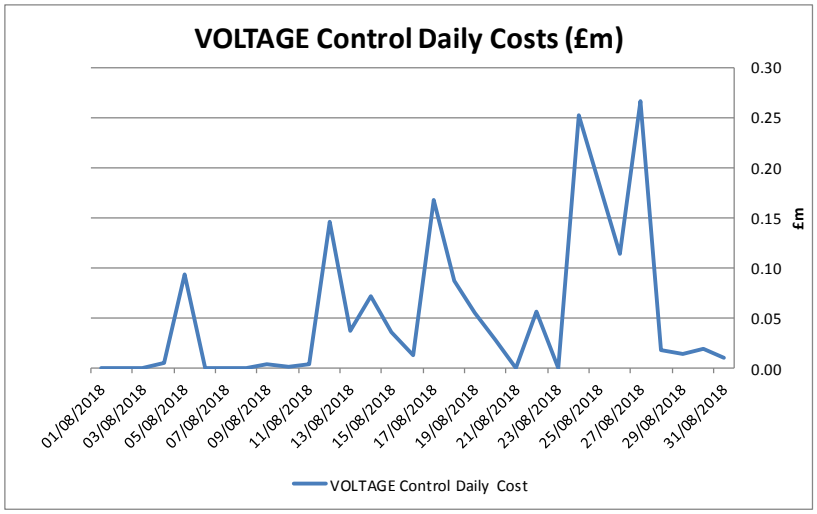
The RoCoF outturn was £13.5m, which is £1.4m higher than costs recorded in July 2018. The highest daily cost for RoCoF incurred over the bank holiday weekend, when cost peaked at nearly £1.6m on Sunday 26th August. Another high cost day for this category, was Sunday 12th with a spend of around £1.2m. Both days were characterised by low demand, and large volumes of trades supported by BM actions, were taken on the interconnectors and on generating units throughout the 24hours to limit the largest generation loss on the system.

Voltage

These costs relate to the buying of energy, in order to access the voltage capability on the generating units. The costs for voltage are reported in the Reactive Power category.

Voltage costs in August 2018 out-turned at around £1.7m to deliver 124.2GWh of energy with voltage supporting capabilities, of which over 75% of volumes were solved with forward trading.

NW England incurred most of the spend (30%) to access voltage units.



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