nationalgrid

Electricity System Operator (ESO) Forward Plan

FY18/19: April Report

This document is structured in the following sections:

Executive summary: high level summary of the performance per principle

Section 1 Progress Update per Principle: the per principle summary of progress

Section 2 Progress Update per Metric: for each metric this document provides the performance each month alongside some description of the performance.

Executive summary

'Our long-term vision is for an Electricity System Operator (ESO) which thinks across networks, plays a more active part in the energy system and helps to shape frameworks for markets. In our own role, we will be transparent in our decisions and actions and promote increased use of markets in place of bespoke bilateral action. Alongside this, we will also continue to run the electricity system safely, securely, sustainably and efficiently.'

April was our first month delivering the 2018/19 Electricity SO Forward Plan under a new incentives scheme, designed to maximise the creation of additional consumer value across *everything* that the Electricity SO does. It's a transformative scheme, very different from the previous Balancing Services Incentives Scheme (BSIS). It reinforces our commitment to become a more independent Electricity SO (separating from the Electricity Transmission Owner), it's going to take time for us to completely reframe the way that we deliver against our seven Principles; but we've made a good start this month.

In the April progress report you'll see we've started some completely new things. Work went in to designing our IS User Group[1], the first meeting is scheduled to align with our Electricity Operational Forum in July; we put the finishing touches to our Network Development Roadmap ahead of industry consultation that will engage a whole new audience with network investment; and we finalised a new approach to DNO provision of transmission services that showcases whole electricity system thinking, great transmission and distribution collaboration and will drive real savings for consumers when we launch later in the year.

Also, in parallel to our regular outputs for April, we introduced some new approaches to getting feedback that will help make these and other valued outputs even more valuable. Our Electricity Operational Forum gave us insights into market participant awareness of the information and data that we provide today. Using on-the-spot polls, and immediate feedback we got some great baselines on how we are performing today and how much our stakeholders know (or don't know!) about what we already produce. We will be working this feedback into our plans, and using it to improve our deliverables across many of the Principles.

One month into the new scheme, some things haven't changed, or haven't changed enough yet. Our 2018/19 Forward Plan was a first effort at planning and driving the Electricity SO's activity differently – and Ofgem's Opinion on our Plan was a good opportunity for us to see where there is still work for us to do. These discussions over April helped us to see that we need a clearer articulation of some of our deliverables, and our long term vision – particularly in our work on Whole Electricity System activity across Principles 5 and 6. We also heard the call to be even more ambitious in our vision for Principle 4, to make sure that all our metrics measure stretching outcomes, and to have a coherent approach to engagement – that allows all our stakeholders to engage with our work, and share their views on how we are delivering against our Plan.

As we start to address this feedback, we'll keep all our stakeholders updated through this monthly report.

[1] A forum for increased visibility of our IS projects that affect the industry

A glossary was produced as part of the Forward Plan and can be found here.

Your feedback is essential

We hope that you've started to see some changes already. 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.

Section 1 Progress Update per Principle

This section sets out the vision for each Principle and key activities plus provides a progress update on key developments and insights in April.

Principle 1: Support market participants to make informed decisions by providing user-friendly, comprehensive and accurate information

Long Term Vision & Consumer Value

For this Principle our vision is to be a transparent ESO who provides accurate information to help market participants make investment decisions and facilitate the transition towards balancing across shorter timescales. We are committed to improving the "user experience" in everything we do.

By improving confidence in our forecasts, increasing transparency of our balancing actions and providing more comprehensive information accessible to all, we expect to potentially unlock medium consumer value in the range of £15-£30 million in the short term.

Our Deliverables for Q1 2018

Outcome	2018/19 Deliverables
Improve confidence in our forecasts	• Commence new BSUoS monthly report • Information provision innovation – publish carbon intensity • Publish Summer Outlook Report
Increase transparency of our balancing decisions	• Deliver a schedule of webinars and events relating to the Ancillary and Balancing Services (AS/BS) Tenders
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

Progress This Month

We delivered all of our regular outputs in April, including the Electricity Operational Forum, a number of webinars and the Summer Outlook report. Details of our webinars are provided in section 2.

By using on the spot polls and feedback at the Forum we learned a lot about what market participants think and understand, about how to find market information on our website (we scored 6/10) and how many people monitor the trades publication website (a majority did not know of its existence).

This is a good baseline, as well as a helpful steer on where we need to take action to make more visible what we already do, as well as improve our channels.

We also prepared for an event that will be hosted in May at the House of Lords on one of our Forward Plan deliverables, 'Information Provision Innovation', which maps regional carbon intensity.

We understand it is desirable to understand the stakeholder response to our events and publications and are going to build this into our reports through the year.

It is very early stages with the new arrangements under this Principle. Performance metrics which support Principle 1 are largely tracking in line with and above expectations. The detail of performance can be found here.

Principle 2: Drive overall efficiency and transparency in balancing, taking into account impacts of ESO actions across time horizons

Long Term Vision & 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. In the long term, this area will become a major contributor to consumer value.

Our Deliverables for Q1 2018

Outcome	2018/19 Deliverables
Improve confidence in our forecasts	• Consultation on innovation priorities and publication of the 2019/20 ESO Innovation Strategy • Publication of a new monthly BSUoS report
Increase transparency of our balancing decisions	• Delivery of our schedule of webinars and events relating to the Ancillary and Balancing Services Tenders
Develop our information portals and events	• Successful hosting of our Electricity Operational Forum events and expansion of our channels to share information to support wider engagement of market participants and service providers

Progress This Month

At the Electricity Operational Forum, we provided our regular update on balancing costs and BSUoS forecast. We highlighted to stakeholders the potential impact that the WHVDC fault could have on future BSUoS charges.

In terms of balancing costs in April 2018, total outturn was £54.2m, and the central benchmark cost was £56.9m, delivering an efficiency of £2.7m. Constraint spend exceeded benchmark by £2m (due to WHVDC being unavailable) but savings were made against the other cost categories. This is further explained in section 2.

One of the outcomes we want to achieve under this Principle is to deliver a significant upgrade of IT systems to prepare for European network codes. The timescales associated with delivering these changes to our systems and processes are challenging for us and the industry. We established a Design Authority this month to ensure we are doing the right things and are set up for success.

The change in how we manage the system is accompanied by significant changes to our IS systems and those of the wider industry. We have some industry meetings for specific IS projects but there is no overarching forum for considering the change in a holistic manner. We have received feedback from industry participants that they would appreciate increased engagement on our IS projects. As mentioned at the Electricity Operational Forum, we are setting up an IS User Group to provide increased visibility of our IS projects that affect the industry, you will have ability to assess/influence operational impacts and industry parties can better coordinate their own associated change initiatives.

We worked closely with the DNOs to resolve a constraint in the southern part of the network. We ran a joint procurement exercise with the DNOs to implement changes to protection equipment of some embedded generators which should result in substantial avoided system constraint costs across the summer.

We also published a video 'Innovate with the System Operator' describing why innovation is important to us and consumers and sets out how other parties can get involved to work with us'. This can be found on our website here: https://www.nationalgrid.com/uk/investment-and-innovation/innovation/system-operator-innovation

The deliverables for this Principle are at an early stage of development but on track. The performance metrics which support Principle 2 are largely tracking in line with expectations. The detail of performance can be found here.

Principle 3: Ensure the rules and processes for procuring balancing services maximise competition where possible and are simple, fair and transparent

Long Term Vision & Consumer Value

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 very large consumer value in the short term. In the long term, flexible markets are one of the keys to releasing maximised value.

Our Deliverables for Q1 2018

Outcome	2018/19 Deliverables
Promote competition and develop new markets in balancing services	• Publication of information on real-time trading activity • As set out in the Products Roadmap, standardise the FFR product structure and simplify the contract • Publish roadmaps on the development of markets for voltage, constraints and black start

Progress This Month

At the Electricity Operational Forum, we engaged a wide range of stakeholders on delivery of our Product Roadmap for Response and Reserve and work to improve balancing services and markets. In addition to a productive question and answer session, stakeholders told us they were reasonably satisfied with pace of delivery (3.3/5) and level of engagement (3.6/5) on the Product Roadmap for Response and Reserve but with plenty of room to improve. It is a similar story with satisfaction with pace of work to improve balancing services and markets (3.3/5). We are committed to engaging with stakeholders in an agile way throughout the year to shape our approach and hold us to account for progress.

There has been good progress across the key deliverables. The Roadmaps for Restoration and Reactive Power are on track for publication at the end of May alongside a guidance note on Thermal Constraints. Publishing the detailed auction design by the end of June remains the key immediate risk but there is a plan in place and close communications with the preferred provider to mitigate.

Stakeholders told us that we need to have a better forward view of all of the changes that are coming into the balancing markets. In response to this and the feedback from the Electricity Operational Forum, we will be providing monthly 'newsletter style' updates via the Future of Balancing Services webpages to increase transparency and provide timely progress updates. The first update will be live on the website in May. We are also committed to delivering wider access to the Balancing Market (BM) and stay on track to deliver Project TERRE.

Many of our stakeholders told us that wider access to the BM is a high priority issue for them. In advance of enduring solutions being developed through wider access code modifications through the delivery of Project TERRE at the end of 2019, we have been approached by a number of parties on access to the BM via the supplier route. We are now working on guidance for all market participants on interim routes to market, and sharing with industry some of the challenges and ways we hope to overcome them. We are planning to publish a Balancing Mechanism Access Roadmap this summer. This is in addition to deliverables in our Forward Plan.

There are no Metrics due for publication this month.

Principle 4: Promote competition in the wholesale and capacity markets

Long Term Vision & Consumer Value

We are committed to enabling the transformation towards a smarter, more flexible energy system. This will enable us to maximise the full potential that a greater diversity of technologies, market participants and business models can deliver for the consumer. We will continue to build on our ability to lead cross-industry engagement and will expand on initiatives such as Charging Futures and Power Responsive, bringing together a range of stakeholders helping industry to navigate the strategic challenges and reduce the barriers to participating.

We expect to potentially unlock large value between £30 million and £50 million in the short term. In the long term driving towards an efficient framework which supports the widest potential industry where every consumer can participate is a large undertaking and is fundamental to realising those future £8 billion of savings[2].

Our Deliverables for Q1 2018

Outcome	2018/19 Deliverables
Continual improvement of network charging processes	• Improved transparency and publication of charging data – Phase 1: Customer Access to information • Provide additional information to support the Electricity Capacity report
Facilitate the development of the code and charging framework	• Deliver Charging Futures Forums that are open to all network users • Deliver webinars, podcasts and plain English publications under the Charging Futures (CF) Brand

Progress This Month

This month stakeholders and Ofgem gave us feedback on our longer term vision and we have decided to change it. We are going to develop this and build an updated long term vision into our reports through the next months.

We contacted customers to understand their experiences of the code modification journey and had limited response from them. We believe this to be due to the sheer volume of change which is going on in industry at this time and the significant amount of engagement they must receive from us.

As a result we are taking a more personal approach to engage directly and discuss our request with them – the aim of this is to help ensure we get the stakeholder engagement we feel we need in order to deliver a step change in our code administration function, but also that our customers better understand the ask from them need not be onerous or time consuming.

[2] See the National Infrastructure Commission's 'Smart Power' Report for further detail on the future £8 billion savings.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/505218/IC_Energy_Report_web.pdf

Also, in our role as Technical Secretariat we prepared for the next Charging Futures Forum (CFF) which takes place on the 23rd May and have an agenda in place that responds to feedback received at previous forums.

Principle 5: Coordinate across system boundaries to deliver efficient network planning and development

Long Term Vision & Consumer Value

The vision for this Principle is to develop ourselves as an ESO who facilitates the move to a low-carbon grid and joins up the way we design and run the network across transmission and distribution. This will ensure decisions are made efficiently across all networks, speeding up connections and reducing the investment needed in networks counterparties.

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

Our Deliverables for Q1 2018

Outcome	2018/19 Deliverables
Maintain and improve the quality of our insights publications	• Publish the Network Development Roadmap consultation and final Roadmap
Improve our cross-industry collaboration for whole system network planning and development	• Publication of the Western Power Distribution (WPD) Regional Development Programme Learnings

Progress This Month

This month stakeholders and Ofgem gave us feedback on our longer term vision and to tie it to a more holistic strategy. We are going to bring this out more clearly and build an updated long term vision into our reports through the next months.

The metrics identified within this principle will be reported on a quarterly basis. The deliverables describe activities that are in progress but will not be completely delivered until later in the year. The Regional NOA Pathfinding projects are progressing as are new commercial contracts for DER.

Principle 6: Coordinate effectively to ensure efficient whole system operation and optimal use of resources

Long Term Vision & 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. 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 Q1 2018

Our focus this quarter is to lay the foundations for the deliverables that will be achieved in Q2 and Q3.

Progress This Month

This month stakeholders and Ofgem gave us feedback on our longer term vision and to tie it to a more holistic strategy. We are going to bring this out more clearly and build an updated long term vision into our reports through the next months.

For this Principle, the performance metrics are all in place and reporting mechanisms established with leads within our Business. Good progress has been made in most deliverables to enable Q2 and Q3 outputs.

Principle 7: Facilitate timely, efficient and competitive network investments

Long Term Vision & 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.

Our Deliverables for Q1 2018

Outcome	2018/19 Deliverables
Improve the Network Options Assessment (NOA) models and methodologies to support Extending Competition in Transmission	• Publication of the NOA Report and methodology • Publication of the Network Development Roadmap consultation and the final Roadmap • Incorporate Interconnector methodology within the NOA Report

Progress This Month

We published the NOA methodology consultation at the beginning of April. We have consolidated the methodology for interconnectors into the NOA methodology as well. We have engaged with the Transmission Owners and ran a workshop for interconnector developers on the consultation and will provide an update in our next report.

At the Electricity Operational Forum in April, we unveiled plans for our Network Development Roadmap consultation, proactively engaging a new audience on what we are doing to expand our processes to consider non-asset and distribution solutions to meet Transmission network needs. Our proposals were well received but perhaps unsurprisingly we learnt that very few people in this audience were aware of our proposals to develop our network planning processes. Engagement with a much wider stakeholder group will be a priority for our work in this area this year and a number of events are already in train for May.

The preparatory work on the Network Development Roadmap consultation was carried out during April and due to be published in early May and stakeholder engagement is now taking place to promote the document and gather feedback.

Section 2 Progress Update Per Metric

This section provides a progress update on the Metrics for this month, including consumer benefit, stakeholder feedback, metric description, performance and supporting information.

Metric 1. Commercial Assessment Transparency

ESO role	Principle
Managing system balancing and operability.	1. Support market participants to make informed decisions by providing user-friendly, comprehensive and accurate information.

Consumer Benefit

To deliver consumer benefit through the reduction in costs due to efficient market facilitation and data transparency. This will lead to increased ancillary services market participation.

Stakeholder Feedback

We are striving to meet stakeholder needs which they have expressed as wanting the information as soon as possible.

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[3] (FFR), Short Term Operating Reserve[4] (STOR), and Fast Reserve[5]. 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

The FFR and Fast Reserve results were both published on time and right first time for the month of April. Data is not presented for STOR as there was not a STOR tender during this period.

Table 1 - Metric 1 Performance

Month	FFR		Fast Reserve		STOR		Key:
	On time	Right first time	On time	Right first time	On time	Right first time	• Published on time • Not Published on time • Published right first time • Not published right first time
April	•	•	•	•	N/A		
YTD	•	•	•	•	N/A		

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

Supporting Information

a. **Balancing service assessment results published to the agreed schedule:**
   - A DTU tender was ran in late February/early March 2018. The tender closed on 16th March, with results due to be published no later than 13th April. The assessment of tenders took place from 19th March and the results were made available on 12th April, one business day ahead of time.

b. **Deliver schedule of webinars covering Ancillary and Balancing Services Tenders decisions**
   - A webinar was held on 25th April to discuss the FFR assessment results; this was the first time that the webinar was opened to any party, having previously been restricted to only those parties with a signed framework agreement.
   - The schedule of webinars, dial in details and access codes are published on National Grid's website here: https://www.nationalgrid.com/sites/default/files/documents/FFR%20Feedback%20calendar_0.pptx
   - The presentation and the Q&A session materials for the webinar are shared on the National Grid website here: https://www.nationalgrid.com/sites/default/files/documents/FFR%20Webex%20%28TR%20100%29%20-%20EXT..pdf. A survey was sent out shortly after to capture feedback.
   - The presentation and Q&A materials session on Standardisation & Simplification of FFR are shared on the National Grid website here: https://www.nationalgrid.com/sites/default/files/documents/FFR%20simplification%20update.pdf
   - An update on the progress made against the improvement plan for tendered services was given at the Operational Forum on 24th April; materials from the forum can be found on the National Grid Website here: https://www.nationalgrid.com/sites/default/files/documents/02_Transparency%20Update_24Apr18.pdf.

Metric 2. BSUoS Forecast Provision

ESO role	Principle
Managing system balancing and operability.	1. Support market participants to make informed decisions by providing user-friendly, comprehensive and accurate information.

Consumer Benefit

To reduce costs to consumers through better functioning markets due to market participants having to include lower risk premia in their submitted Balancing Mechanism (BM) bid/offer prices to compensate for the uncertainty and volatility of daily and per settlement-period Balancing Services Use of System (BSUoS) costs.

Stakeholder Feedback

Stakeholders have told us that a granular forecast of BSUoS would help them make better informed balancing decisions.

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 of a more granular day ahead forecast, planned to complete by the end of Q2.

Metric 3. Trades Data Transparency

ESO role	Principle
Managing system balancing and operability.	1. Support market participants to make informed decisions by providing user-friendly, comprehensive and accurate information.

Consumer Benefit

To lower costs for consumers due to improved transparency for market participants, resulting in more informed decision-making by participants, and those participants holding lower risk premia associated with this activity.

Stakeholder Feedback

Industry has explicitly asked for greater frequency of trades data publication, highlighting that delay introduces increased risk in their decision-making. 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. During our Operational Forum the majority of stakeholders did not know about this new development, and this shows there is more work to be done.

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

We will be trialling the system in Q1 2018/19 and then will measure publication performance as detailed here from Q2 2018/19 onwards. We will trial the implementation of a weekly report detailing the timestamping of the data through April and May 2018, which will then become the mechanism of reporting the performance.

Supporting information

- The trades web portal is active and can be accessed here: https://trades.nationalgrid.co.uk/ this allows increased frequency of publication to trades to within an hour of a trade being enacted.
- We are now developing a solution which will add a time stamp to the trade so allowing us to measure the elapsed time following the trade to its publication.
- This solution will be trialled and tested during Q1 to then start reporting in Q2.
- We participated in the Operational Forum on the 24th April to continue to raise the profile of this service to industry.

Metric 4. Forecasting Accuracy

ESO role	Principle
Managing system balancing and operability.	1. Support market participants to make informed decisions by providing user-friendly, comprehensive and accurate information.

Consumer Benefit

To lower costs to consumers through improved transparency of data and actions to improve market participants' understanding, leading to more efficient markets.

Accurate forecasts will allow market participants to better adjust their generation/ consumption positions ahead of real time. This will result in fewer actions taken by our Control Room – and therefore less consumers' money spent – to balance the electricity system.

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.

1 Demand Forecast

In April, the Energy Forecasting Team (EFT) achieved a DA Demand performance on this metric in line with exceeds baseline expectation. To reach this outcome, the EFT achieved demand monthly accuracy targets 57% 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. For example: April's error target was created from April's performance 2015, 2016 and 2017. These were averaged and then a reduction of 5% applied.

A challenging backdrop existed for demand forecasting in April. Temperatures were generally lower than average, but punctuated by a very warm spell. Demand patterns were like those of winter, changing to patterns seen typically in summer and then back to winter again. The forecasting models had to cope with the unseasonal weather patterns, and the further impact of human behaviour influenced by the unseasonal weather. Despite this a reduction of 5% in historic error targets was achieved.

Factors which drove performance:

- Updating Demand Forecasting models for British summer time 2018;
- Reviewed/updated solar power forecasting model in preparation for upcoming summer period;

- Developed automated energy forecasting KPIs in Tableau to monitor forecasting performance;

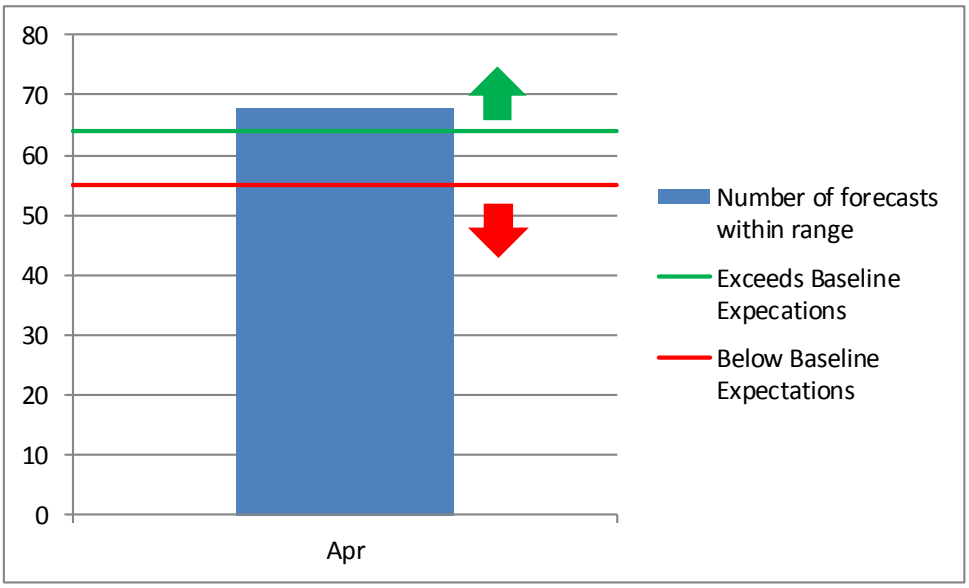


Figure 1 - Metric 4 Demand Forecast Performance

2 Wind Forecast

In April, the Energy Forecasting Team (EFT) achieved a DA Wind BMU performance of "In line with Expectations". To reach this outcome, the EFT delivered wind BMU monthly accuracy targets 50% 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. For example: April's error target was created from April's performance 2015, 2016 and 2017. These were averaged and then a reduction of 5% applied. Contributions to performance against this wind forecast metric was delivered by the following:

- Development of our wind models. We have started analysing/validating Cubic SPLINE models for BMU Wind power forecasting.

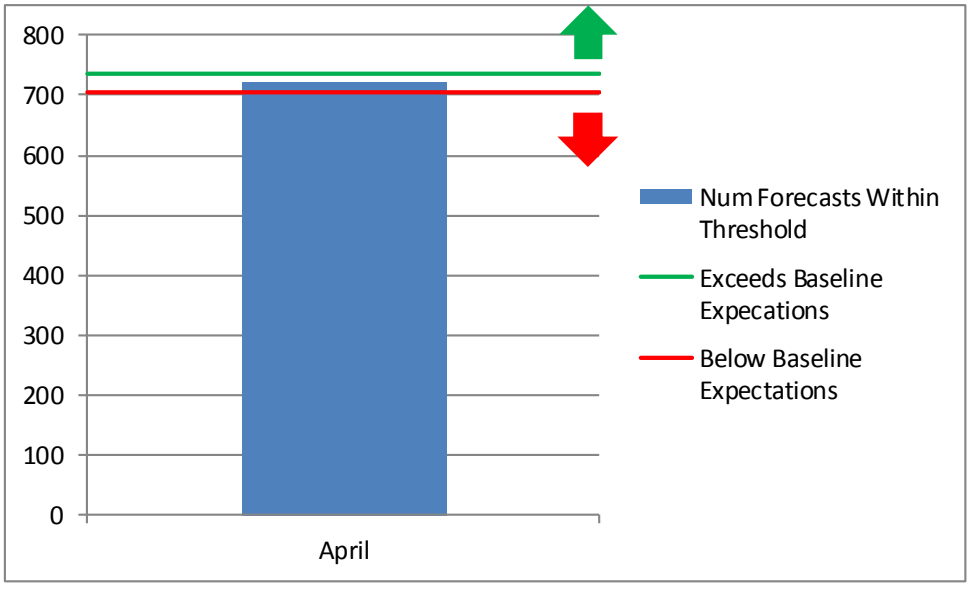


Figure 2 - Metric 4 Wind Forecast Performance

Supporting Information

- **Customers/Stakeholders.** In April EFT met with:
  - Met Office to share future plans to improve weather and energy forecasting
  - Sheffield University to kick off the Sheffield Solar Phase 3 Innovation project
  - EDF to share forecasting improvement plans and gather valuable customers' feedback to include in EFT annual plans
- **Innovation.**
  - Sheffield solar Phase 3 NIA project was successfully started
  - Met Office solar radiation NIA project successfully extended to deliver value to PV forecasting.

Metric 5. Balancing Cost Management

ESO role	Principle
Managing system balancing and operability.	2. Drive overall efficiency and transparency in balancing, taking into account impacts of the actions across time horizons.

Consumer Benefit

Reducing balancing spend by embracing opportunities to reduce requirements or find lower-cost options/better ways to meet system needs. A new, simple, transparent balancing cost metric: a cost benchmark for balancing spend (excluding black start) will drive the us to focus on delivering consumer benefit. We will look to save consumers money by finding new ways to reduce balancing requirements and also employ increasingly efficient procurement strategies which take account of long-term and short-term outcomes.

Performance

	Apr	YTD	Full year
Benchmark cost [6](£m)	56.9	56.9	843.52
Outturn cost (£m)	54.2	54.2	

Table 2 - Metric 5 Performance

Supporting information

To find the cost breakdown per category please click here.

The Balancing Costs Hotspots

Constraint cost- cost that is incurred to ensure the flow of electricity over the transmission system takes account of system congestion requirements which can be broken down into three categories: thermal, voltage and stability constraints.

Energy cost- cost that is incurred to ensure that that demand is balanced by supply and to ensure the security and quality of the electricity supply across the transmission system.

In April 2018 energy costs were £28.8m, at a daily resolution those days with highest cost were characterised by a short market particularly in high demand periods. Constraint costs for April 2018 was £20.9m. The remaining cost was attributable to RoCoF cost which was £4.5m.

The daily Balancing Cost Control Board provides a feedback loop for actions taken by the ENCC the previous day, discussing best practice, new initiatives and corrective actions. Total daily balancing costs are closely monitored and key cost saving initiatives are tracked against a target. Key cost areas monitored on the Control Board are: frequency response, reactive power, voltage machine synchronisation, reserve and balancing actions.

[6] Benchmark cost refers to the central benchmark number which has a +-£10million range

- In April 2018 we spent £1.6m less on reactive power than April 2017, and in 2017/18 we reversed the upward trend in reactive power costs, with the lowest reactive volume requirement since 2013/14. This was achieved by the close monitoring and the additional focus provided by the Balancing Costs Control Board.
- The cost of voltage machine synchronisation is £1.8m less than April 2017, due to the Control Room's focus on voltage actions.
- For tendered Fast Reserve, we have reduced firm holding costs by around 20% in April compared with 2017, delivered through increased competition from new non-BMs providers.
- We have reviewed the frequency response requirements and contracted more FFR compared with 2017, optimising the amount of contracted response against the mandatory market. This has reduced response costs for April 2018.
- The Network Access Planning and Commercial teams have worked closely with the transmission owners to optimise the outage plan and aligned costly outages with low wind periods, which has minimised the impact of Western Link HVDC being out of service.
- The Western Link HVDC has been on outage through April, and this has increased the cost of managing constraints. The outturn cost of managing constraints is £2m above the benchmark for April. The benchmark figure of £843m for the year assumes that the HVDC is in monopole operation in April.
- We estimate the cost impact of HVDC being on outage compared with mono-pole operation in the benchmark is around £3m for April.

  These waterfall style diagrams have been used previously to enhance performance discussions with Ofgem. We want to share these now with our stakeholders in the same format. This approach is still in development and we would value input in terms of what is helpful in explaining our performance to our stakeholders.

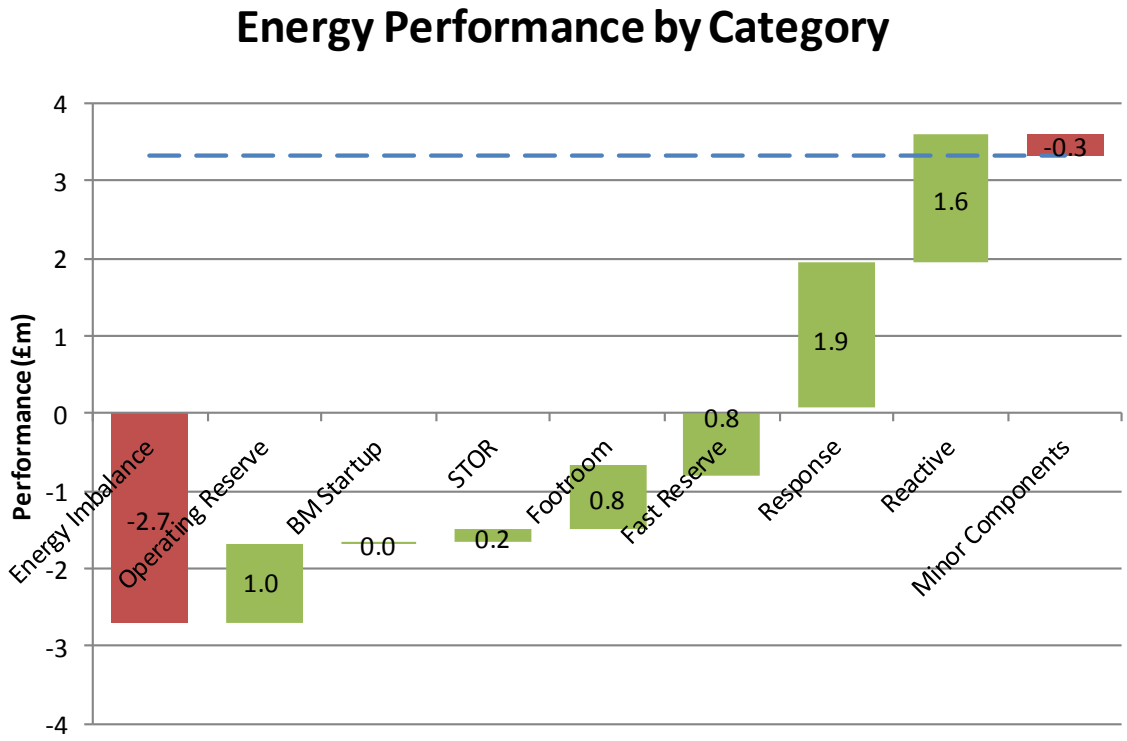


Figure 3 – Metric 5: Energy Performance by Category

This shows the performance of the individual categories for energy, the outturn when compared with the benchmark.

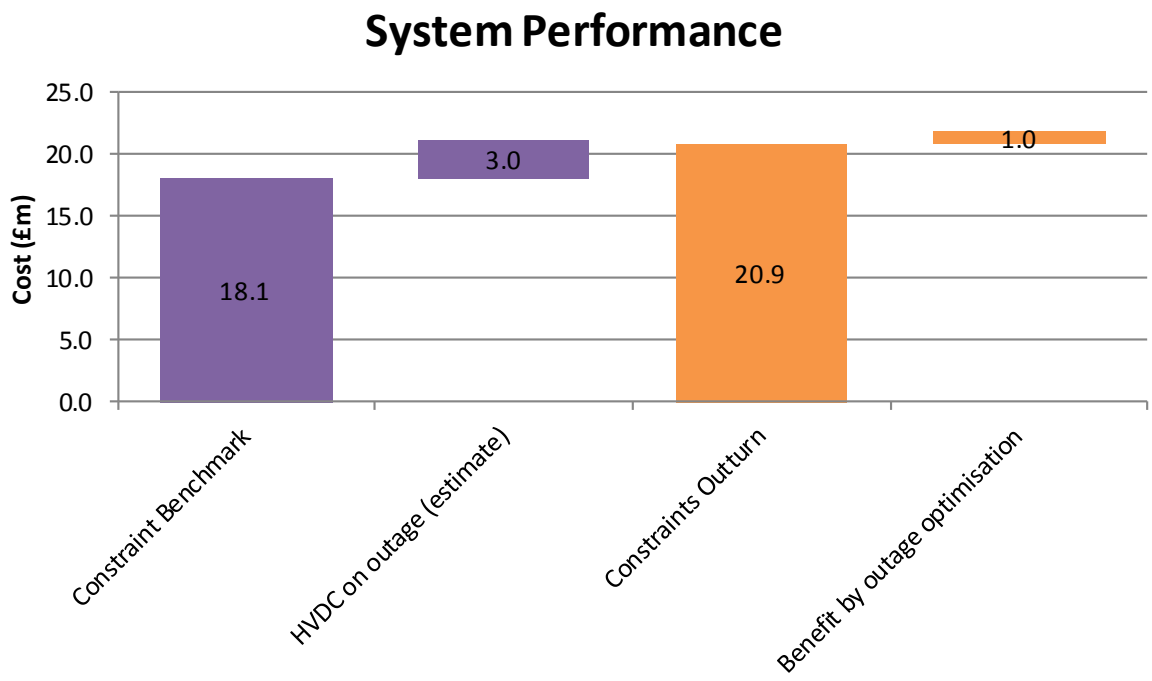


Figure 4 - Metric 5: System Performance

In purple this shows the benchmark cost for constraints and the potential increased cost likely to be incurred due to HVDC being on outage during April. In orange this shows the total outturn cost for constraints and the benefit derived from outage optimisation that was required due to HVDC being out of service.

Metric 9. BSUoS Billing

ESO role	Principle
Managing system balancing and operability.	4. Promote competition in wholesale and capacity markets.

Consumer Benefit

Reducing the risk premia added to bills caused by uncertainty around bills.

Stakeholder Feedback

We are responsible for billing BSUoS parties for the cost of balancing the system. Customers have told us that BSUoS bills are important in managing their profitability. There are two aspects of BSUoS billing that are important to customers: good quality and timeliness. The prime focus of the Billing team in the coming year is to improve the quality of the BSUoS bills.

Metric Description

This metric measure the quality of the billing process is response and resolution time of BSUoS billing queries.

Performance
BSUoS query response time:

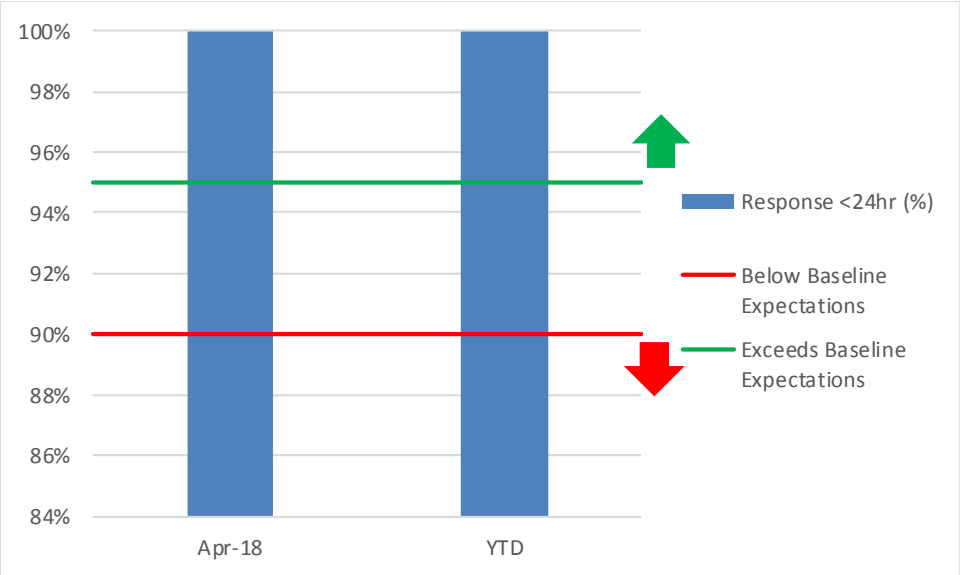


Figure 5 - Metric 9 BSUoS query response time

BSUoS query resolution time:

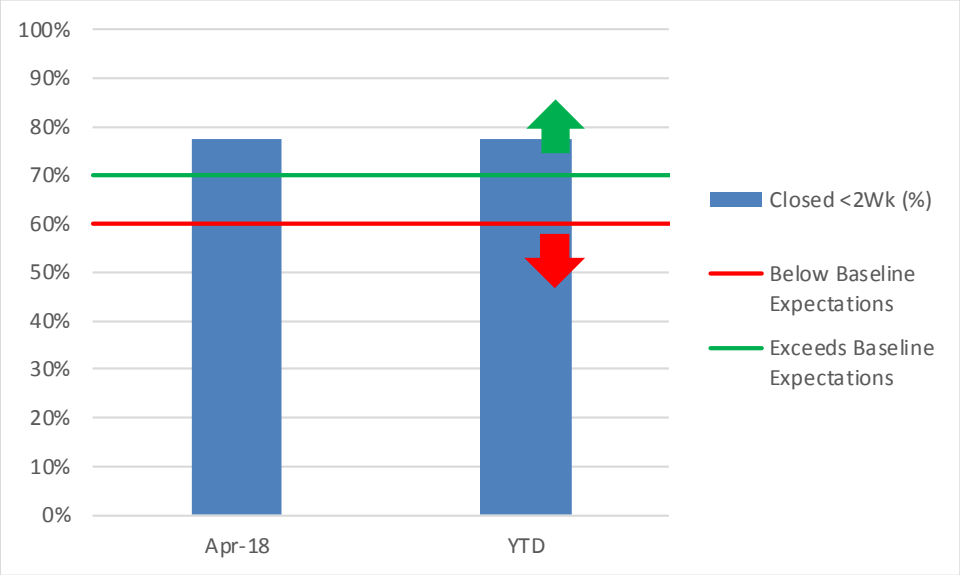


Figure 6 - Metric 9 BSUoS query resolution time

BSUoS billing timeliness:

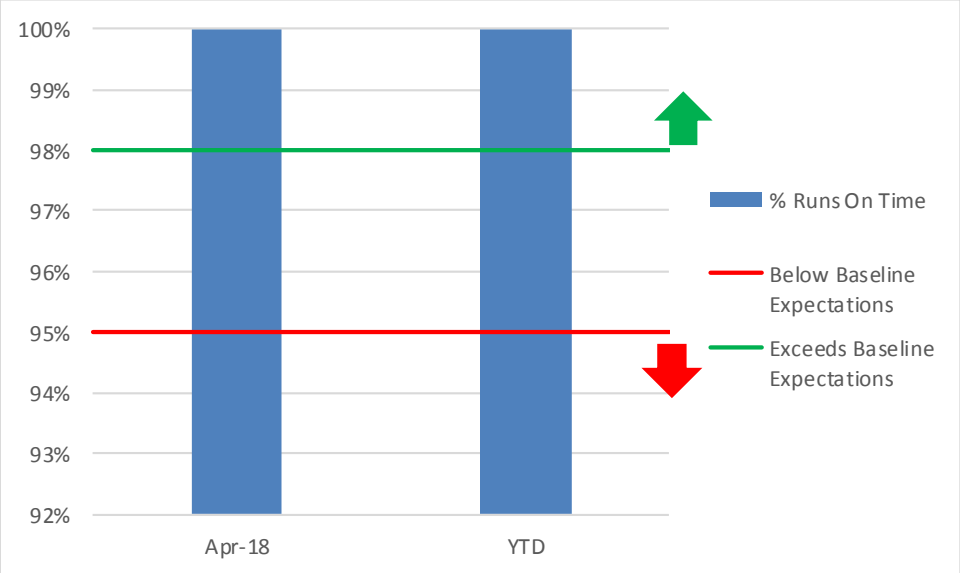


Figure 7 - Metric 9 BSUoS Billing timeliness

Supporting information:

- No suspended billing runs in April means 3 concurrent months of no suspended runs, the first time we have achieved this.
- We held a webinar on the 18th April to advise customers on how the new incentive would be billed through BSUoS, with 26 attendees signed up. The presentation materials for this webinar can be found on the National Grid Website here: https://www.nationalgrid.com/sites/default/files/documents/2018-19%20Incentive%20Recovery%20Webinar%20-%20Post%20Event%20Slidepack%20.pdf
- We advised customers that further communication would occur prior to starting the recovery of the incentive as some details were yet not finalised.

- We issued communication to our BSUoS and Operational Forum distribution lists (Over 1,100 email addresses) to advise them of the Western HVDC link downtime.

Metric 14. Connections Agreement Management

ESO role	Principle
Facilitating whole system outcomes	6. Coordinate effectively to ensure efficient whole system operation and optimal use of resources.

Consumer Benefit

By ensuring that we have access to the appropriate commercial options following changes to the transmission network to maintain its operation of the transmission system will allow us to reduce balancing cost.

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 9-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.

In April, seven agreements were identified that potentially required updating with the aim of having them signed by Jan 2019 at the latest. Of the seven agreements, six were progressed within a few days of notification. Three of the seven agreements were updated and issued to the contract managers on the 27th of April well ahead of schedule.

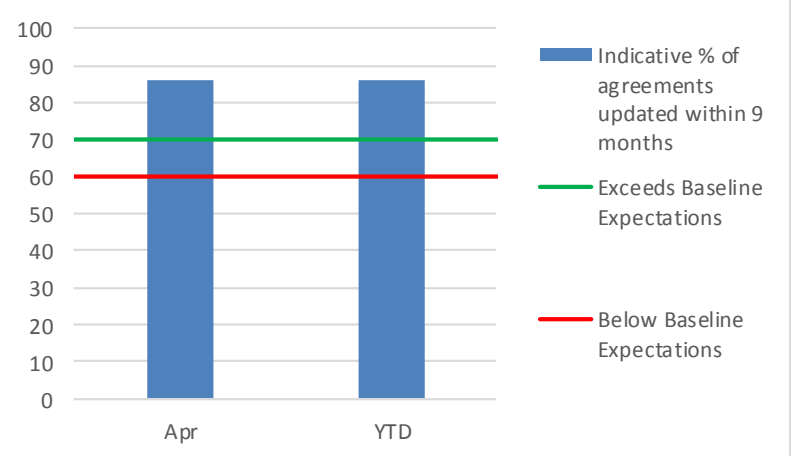


Figure 8 - Metric 14 Performance

Metric 15. System Access Management

ESO role	Principle
Facilitating whole system outcomes	6. Coordinate effectively to ensure efficient whole system operation and optimal use of resources.

Consumer Benefit

We aim to reduce unnecessary network and balancing costs by improving the system access request planning process.

Metric Description

We, as the ESO, 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[7]. 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 April, 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 an one hour after requested by the TO within the control phase that can be attributed to us. Each of these instances is internally investigated and learnings from these are communicated to the relevant teams.

During April the number of the system access requests which were cancelled was fewer than the target for the month.

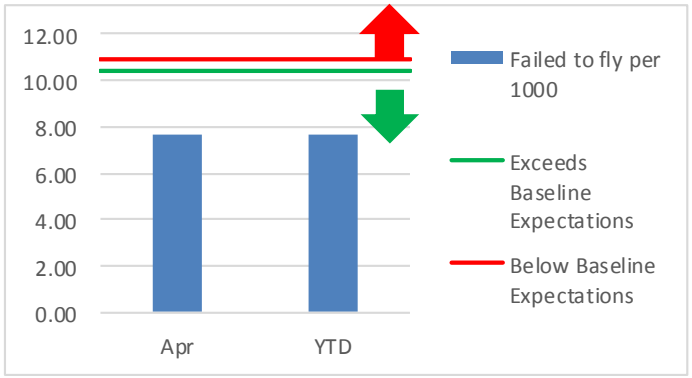


Figure 9 - Metric 15 Performance

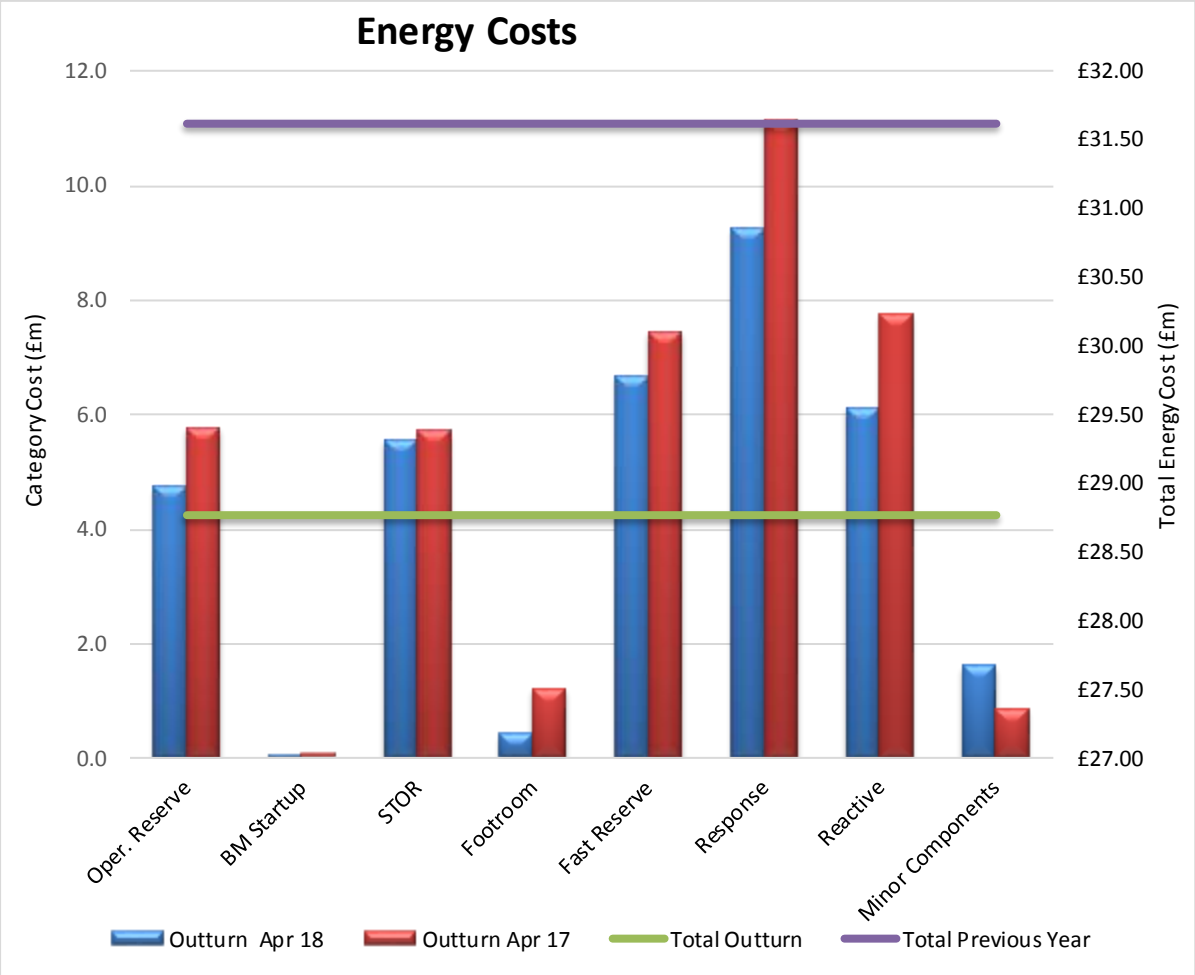
[7] GBSQSS-GB Security and Quality of Supply Standard

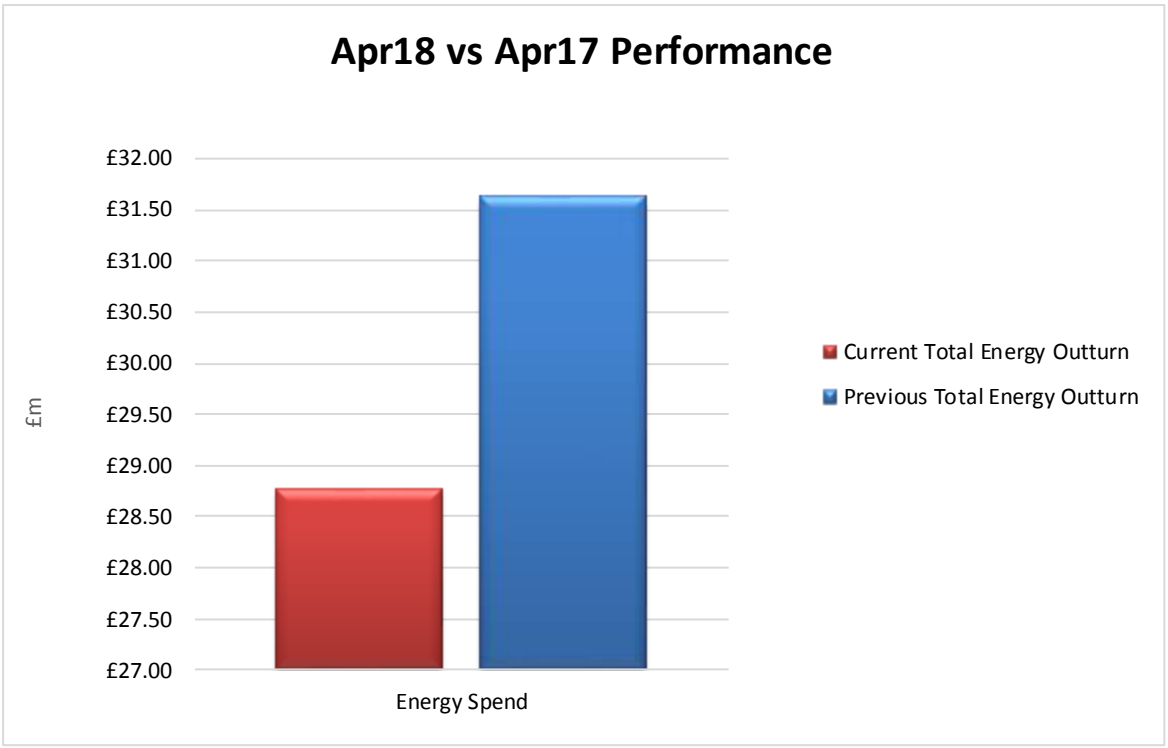
Balancing Costs Hotspots

Energy Costs

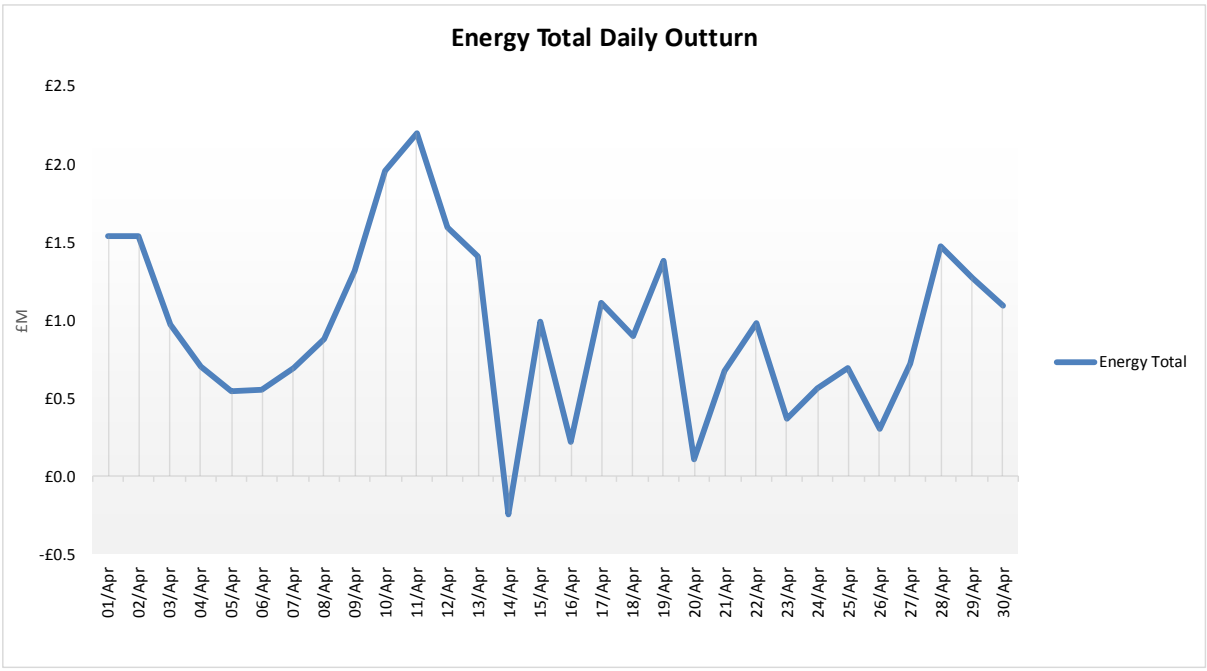
Energy cost (including energy imbalance) for April 2018 outturned at circa £28.8m, which is a decrease from April 2017 of circa £2.9m. Average daily energy spend was £0.96m.

With respect to last year's April costs, Frequency Response showed a decrease of nearly £1.9m, Reactive decreased of circa £1.6m, and Operating Reserve decreased of around £1m. All the others category costs showed little variance from April 2017.





Energy Total Daily Outturn



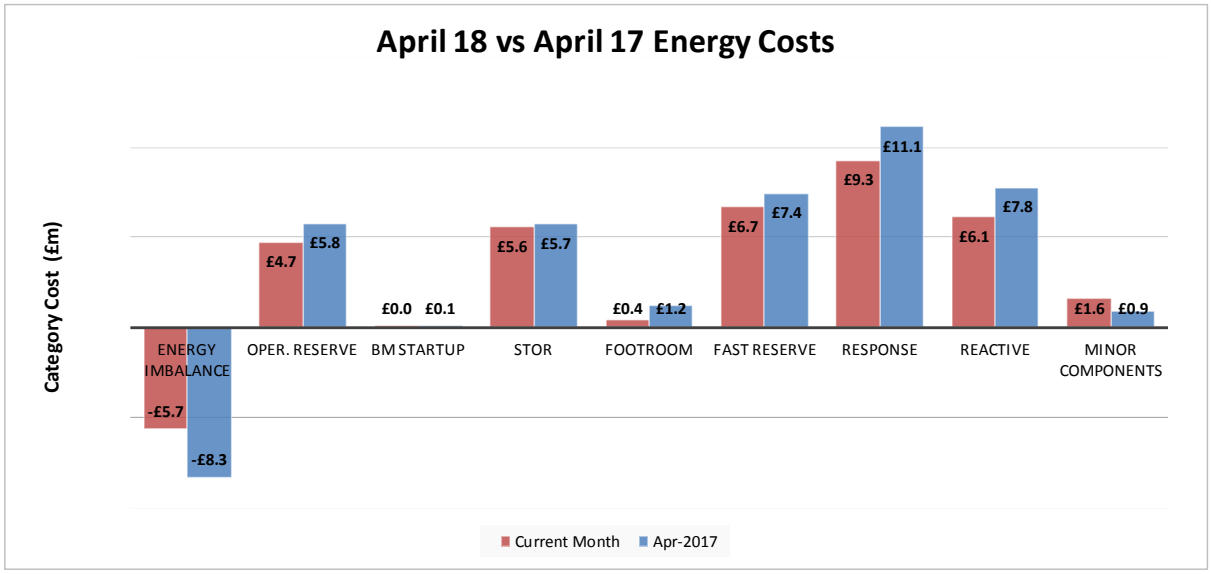
Daily Energy costs remained below or around £1.5m for most of the days during April. On Tuesday 10th and Wednesday 11th April 2018, costs peaked at circa £1.96m and £2.20m respectively.

Both days were characterised by a prevailing short market (where supply is not enough to meet demand), particularly over periods of high demands. High volumes of STOR, Operating Reserve, Fast Reserve and Frequency Response were deployed to account for significant wind forecast shortfall that was consistently present throughout the day and overnight, with a spend on these category costs that was around £1m on each day.

On Tuesday 10th, the wind generation shortfall was over 2GW with the peak error being around 2.5GW. As a consequence, up to 330MW of STOR was run in the morning and up to 550MW in the evening. In addition, hydro units were utilised until additional units were synchronised. On Wednesday 11th, this scenario was exacerbated by solar generation outturning up to 1.4GW below the forecasted level, and by some generators becoming unavailable.

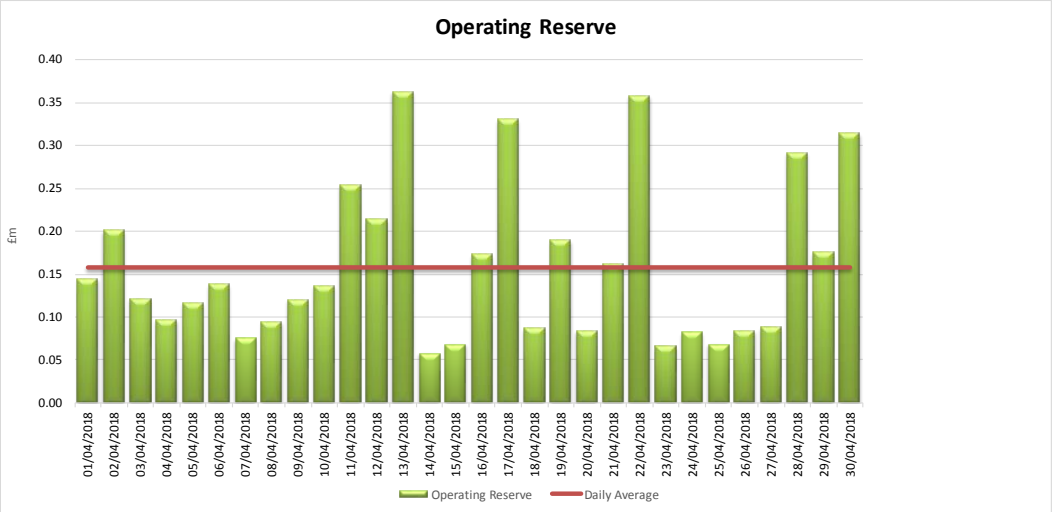
It is noticeable that on Saturday 14th the costs were negative due to the energy imbalance.

Energy Costs Breakdown



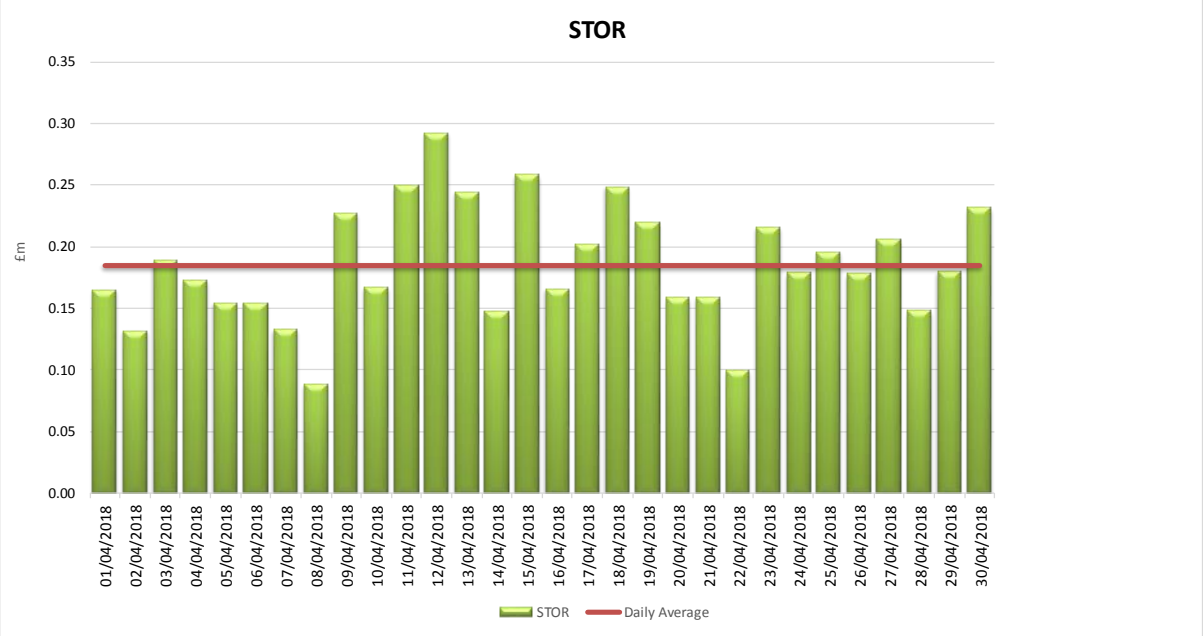
Operating Reserve

The Operating Reserve outturned at £4.7m showing a decrease from April 2017 of £1m. The daily spend for this category cost remained below or around £0.25m on most days except for Friday 13th and Tuesday 22nd when costs peaked at circa £0.36m. Others relevant high costs days were Friday 17th and Wednesday 30th.



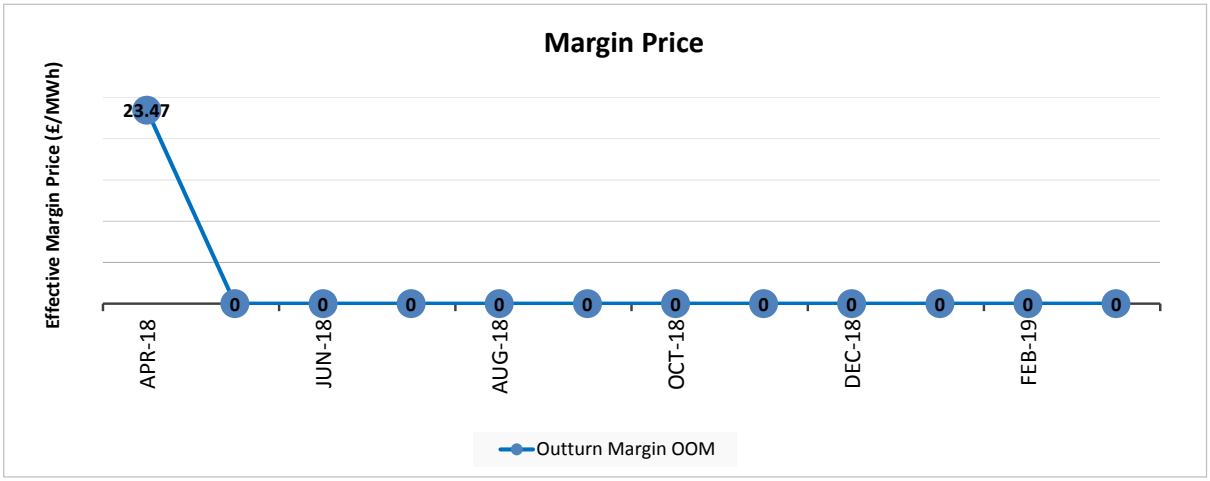
STOR

STOR cost for the month of April 2018 was £5.6m, which is a £0.2m decrease from April 2017. The average daily spend was of £0.19m. Thursday 12th was the most expensive day for STOR this month with a cost of £0.29m. The main driver behind the spend on STOR during this month, were short market over periods of high demand and fluctuating wind output, requiring dispatch of STOR units to manage system shortfalls.



Margin Price

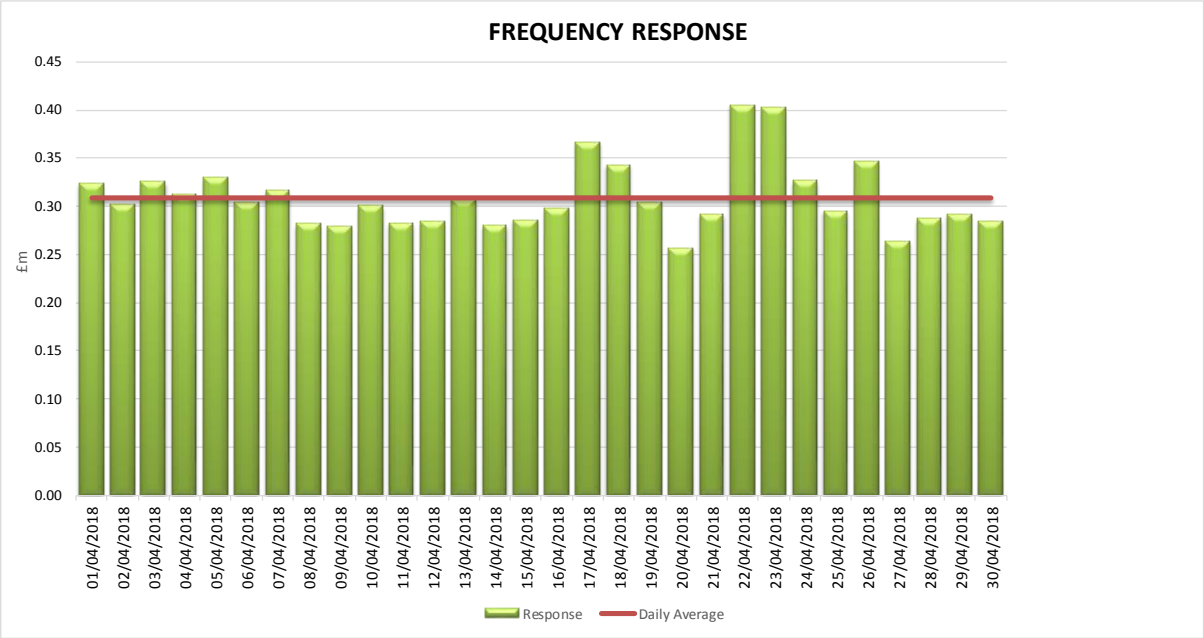
The margin price in April 2018 outturned at £23.84/MWh with an utilised volume of 167.6GWh. A comparison with last year figures shows an increase in volume of 47.2GWh, and a nearly halved price, since last April 2017 figures outturned at £44.62/MWh.



Frequency Response

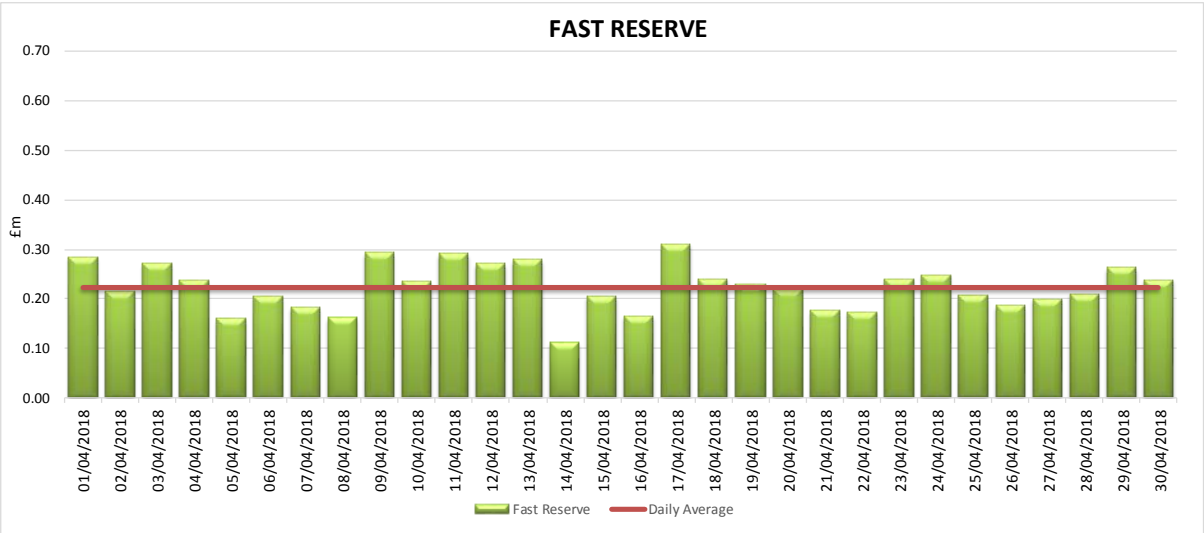
Frequency response in April 2018 outturned at £9.3m showing a decrease from last year

April's cost of £1.9m. The average daily spend was £0.31m. Monday 23rd recorded the highest daily cost for this category which was £0.40m.



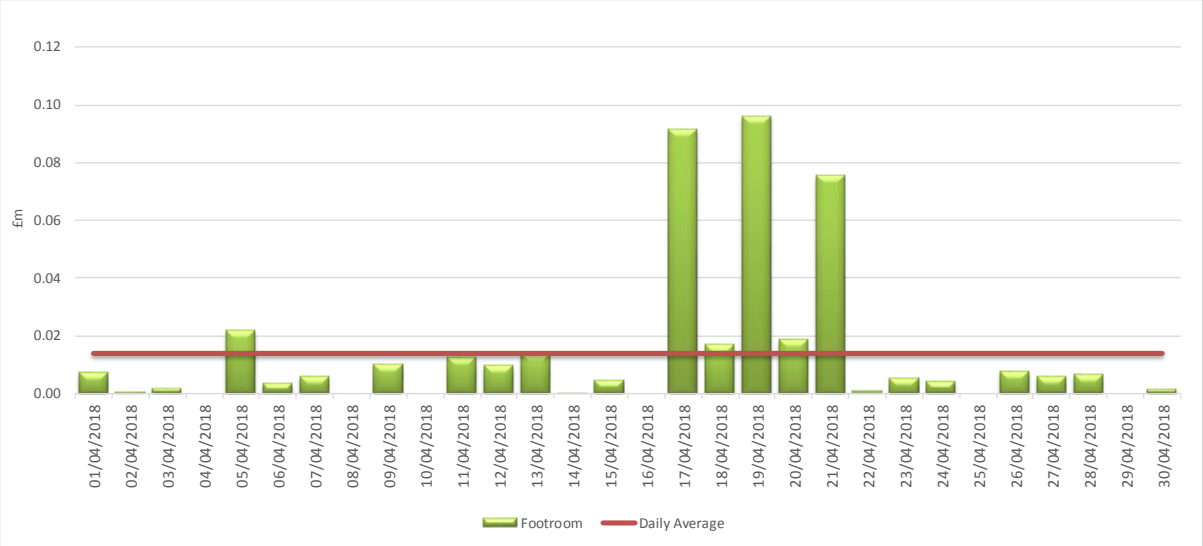
Fast Reserve

Fast reserve out turned at £6.7m, which is a decrease of £0.8m from April 2017 costs. Throughout the month the average daily costs was around £0.23m.



Footroom

Footroom outturned at £0.4m, which is a decrease from April 2017 cost of £0.8m. The spend for this category cost was below £0.02m for most days. The highest costs were recorded during the third week of the month, peaking on Thursday 19th at nearly £0.1m. High volume of interconnectors trades undertaken in support of downward regulation issues was the main driver behind high cost days on foot room.

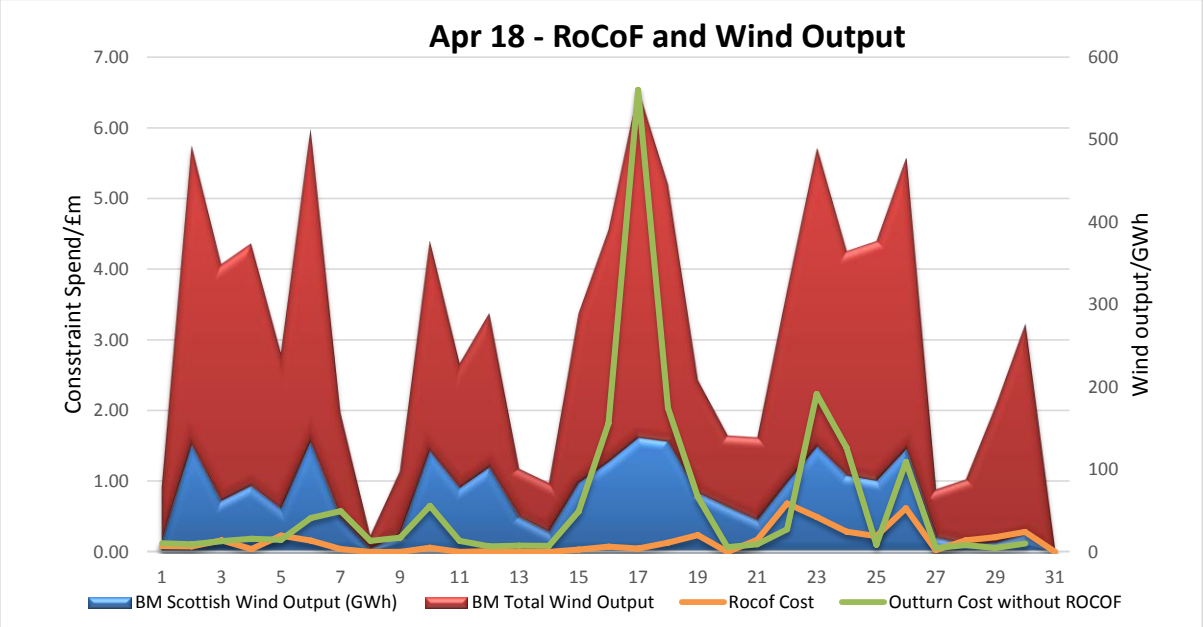


Constraints Costs

The total constraints cost for April 2018 was circa £20.9m. This is an increase of around £2.8m with respect to last year's April constraints cost. The average cost per day was approx. £0.7m.

The outturn for ROCOF cost was £4.5m, £1.3m lower than the cost recorded in April 2017 for this category.

The breakdown of the constraints outturn cost in April 2018 was: £7.3m for England and Wales, £0.4m for Scotland, £13.2m for Cheviot, and £0.0m for Sterilised headroom.



The graph above shows the daily outturn costs and BM wind to indicate the extent to which wind output drives constraint costs.

Total wind volume in the BM outturned at around 6118.5GWh. This is 1605GWh higher than April 2017 and in line with the higher constraint outturn cost.

The most expensive day in April 2018 was Tuesday 17th when the daily spend was £6.54m. During this day, the combination of high wind levels across the system and the fault outage of the Western Link HVDC, were causing power flow restrictions in the north of Scotland and on the network boundary between Scotland and England. A large volume of BM actions and trades, throughout the 24 hours, were undertaken to solve the network constraints.

Others high cost days were Wednesday 18th April with daily cost around £2.03m, and Monday 23rd with daily costs of £2.23m.

RoCoF

RoCoF action costs outturned at around £4.5m, £1.25m lower than costs recorded in April 2017 for this category. The volume in April totalled 120.22GWh. Over 86% of RoCoF actions were solved with trade actions, the remaining were solved with BM actions.

Voltage

Voltage costs outturned at £0.58m. Last year April costs for this category were £2.44m.