

ESO Forward Plan 2020-21

Monthly Reporting - May

19 June 2020



Foreword

Welcome to our monthly performance report for May 2020. Each month we report on a subset of metrics, which have data available at monthly granularity. This report provides an update on our performance and metrics against our deliverables set out in the 2020-21 Forward Plan¹.

When we published our 2020-21 Forward Plan in March 2020, we were aware that many of our activities in the coming year would be impacted by COVID-19, but it was too early to set out the precise details of this impact. We have already communicated some changes to the industry via our website² and regular webinars, but over the coming weeks we will pull together our latest view of the changes that will be required to our deliverables. At the end of June we will publish a Forward Plan Addendum, which sets out our latest view of what we will deliver, and where possible takes account of the feedback we received from Ofgem in its Formal Opinion³. COVID-19 is an unprecedented situation and we are proud of how the ESO has worked hard to respond quickly to changes and industry needs in an agile way. This report contains some of the achievements we have made.

We now report our progress against our deliverables on the [Forward Plan tracker](#)⁴ which is updated monthly on our website. However, please note that this monthly report, and the associated Forward Plan tracker, are based on the original 2020-21 Forward Plan as published on the ESO website on 30 March 2020.

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

Contents	
Foreword	2
Role 1 Control Centre operations.	3
Role 2 Market development and transactions	8
Role 3 System insight, planning and network development.. ..	15

Metric	Performance	Status
Balancing cost management	£161m outturn against £48.4m benchmark	●
Energy forecasting accuracy	Demand forecast error target was met; Wind forecast error target was met.	●
Security of Supply	0 excursions for voltage and frequency	●
System access management	0/1000 cancellations	●
Month-ahead BSUoS forecast	38% forecasting error	●
Right first time connection offers	98%	●

- Exceeding expectations
- Meeting expectations
- Below expectations

Table 1: Summary of monthly metrics

You can find out about our vision, plans, deliverables and full metric suite in the [Forward Plan pages](#) of our website⁵. We welcome feedback on our performance reporting to box.so incentives.electricity@nationalgrideso.com



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¹ <https://www.nationalgrideso.com/document/166441/download>
² <https://www.nationalgrideso.com/keeping-lights-throughout-coronavirus>
³ https://www.ofgem.gov.uk/system/files/docs/2020/05/ofgem_formal_opinion_2020-21.pdf
⁴ <https://www.nationalgrideso.com/document/162046/download>
⁵ <https://www.nationalgrideso.com/our-strategy/forward-plan>

Role 1 Control Centre operations

1A Balancing cost management

May 2020 Performance

The approach we use for measuring our Balancing Costs performance is based on a linear trend in a five year rolling mean, based on annual Balancing Services Costs (excluding Black Start). In order to meaningfully employ a linear trend, the data points need to handle one-off permanent changes to the system network which would not be captured by the five-year trend. So far, the only change modelled in this way has been the Western Link. We also make adjustments for significant events which we expect to have an impact on balancing costs, whether this is an upwards or downwards adjustment. These are trends which we would not expect to be captured in the 5-year rolling average, because they relate to either new assets or new trends in market behaviour. Additional information regarding balancing costs calculation and benchmark adjustment can be found on our website⁶.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Benchmark cost (£m)	67.0	48.4	83.6	71.3	102.6	104.5	127.8	83.7	127.5	134.1	143.3	122.1	1215.9
Additional cost forecast due to WHVDC fault (£m)	0	0	0	0	0	0	0	0	0	0	0	0	0
Benchmark adjusted for WHVDC (£m)	67.0	48.4	83.6	71.3	102.6	104.5	127.8	83.7	127.5	134.1	143.3	122.1	1215.9
Outturn cost (£m)	122.0	161											282.3 [YTD]
Status													

Table 2: Monthly balancing cost benchmark and outturn.

⁶ <https://www.nationalgrideso.com/document/166231/download>

Supporting information

Balancing Costs for May were up significantly from April and well above the benchmark as May is normally a relatively low cost month. Balancing costs were roughly £40m higher than April with almost the entire difference being made up of constraint costs. Low demands due to COVID-19 coupled with the two bank holidays in May drove increases in RoCoF, Thermal constraints and Ancillary Service constraints. National Grid ESO took proactive action to manage costs and ensure system security across the low demand periods through the introduction of the ODFM service and a contract with Sizewell to reduce their output. The late May Bank Holiday in particular saw sustained periods of exceptionally low levels of demand which combined with high winds and drove a requirement for a large volume of actions to secure the system with high costs incurred over this period.

Performance benchmarks

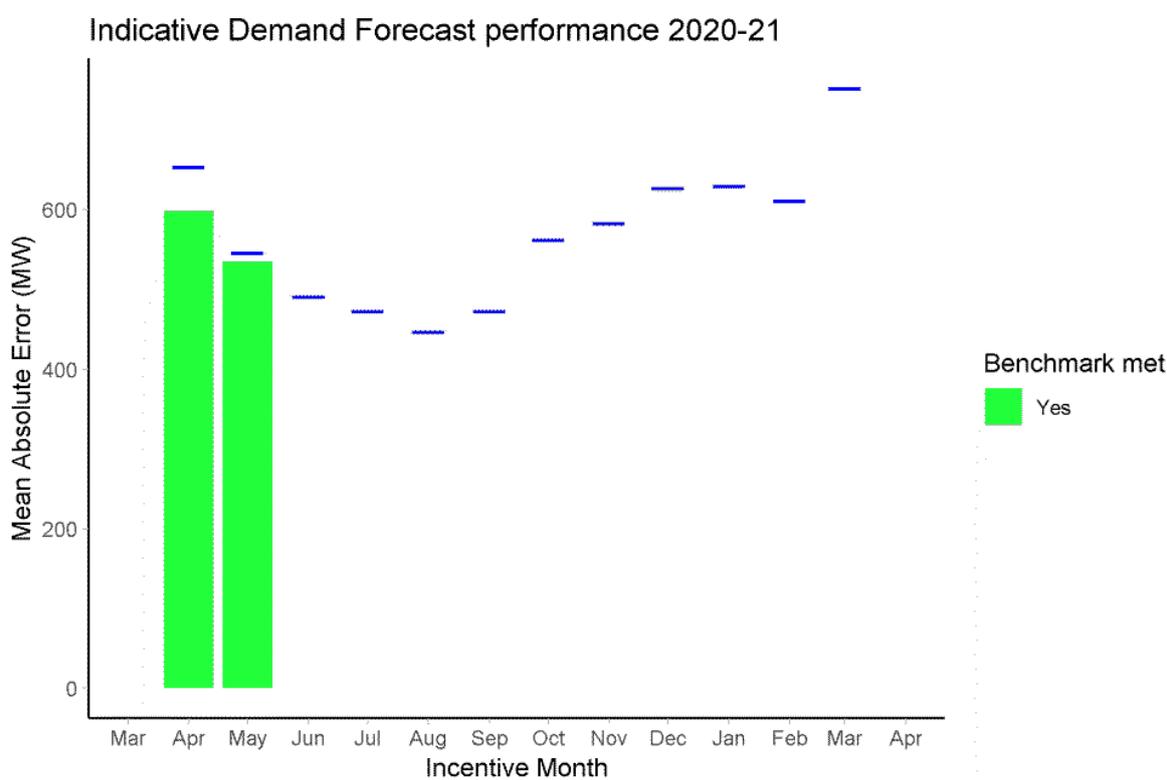
- **Exceeding expectations:** at least 10% lower than the figure implied by the benchmark.
- **Meeting expectations:** within 10% of the figure implied by the benchmark.
- **Below expectations:** at least 10% higher than the figure implied by the benchmark.

1B Energy forecasting accuracy

May 2020 Demand Forecasting Performance

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

April 2020 is the first month in the Forward Plan 2020-21 for which the indicative performance has been assessed.



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

Day ahead demand forecast benchmarks for financial year 2020-21

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

Table 3: Demand Forecasting Benchmarks

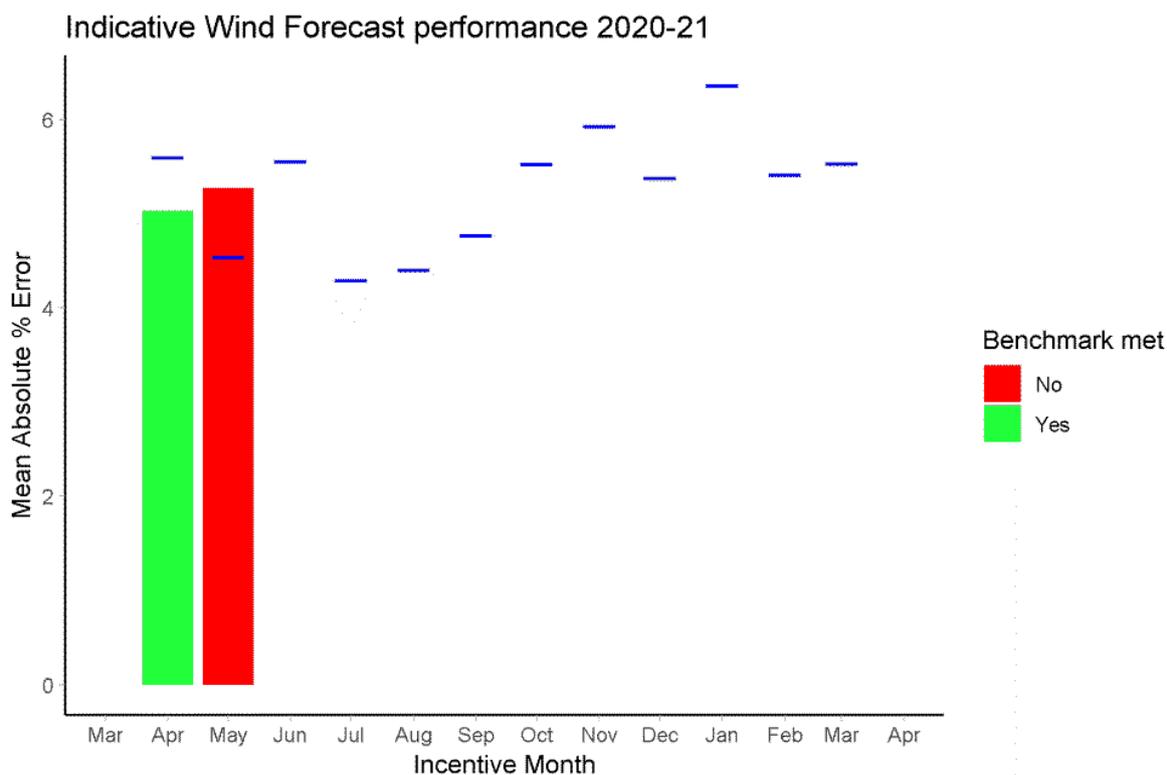
Supporting information

Day Ahead Demand Indicative Performance: 535MW

In May 2020, our day ahead demand forecast indicative performance was within the benchmark of 546MW. May's MMAE (monthly mean average error) was 535MW⁷ and 537MW⁸.

Increased uncertainty around the impact of the COVID-19 persisted. With people staying at home their responses to the weather are more pronounced compared to "normal" times. Hence the element of the underlying demand that is driven by the human behaviour is more impactful during the pandemic and less predictable. Even with these challenges, ESO managed to outperform the indicative performance benchmark.

May 2020 Wind Generation Performance



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

⁷ Accounting for the ODFM service

⁸ Not accounting for the ODFM service

BMU wind generation forecast benchmarks for financial year 2020-21

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

Table 4: Wind Forecasting Benchmarks

Supporting information

Day Ahead Wind Indicative Performance: 5.27%

In May 2020, our day ahead wind forecast indicative performance were within target of 4.54%. May's MMAPE (monthly mean absolute percentage error) was 5.27%.

May started off unfavourably with thunder storms in the North Sea influencing wind power output there and causing increased error. Forecasting accuracy remained good until the VE Day Bank Holiday when atmospheric instability and a cold front moving across Scotland caused forecasting errors greater than 10% during that time. From 22 May to 24 May a cold front moved across the UK and brought considerable windy weather over the second May Bank Holiday weekend. Some of the forecast errors can be explained by the negative market prices that occurred during the low demands. For wind farms that have a Contract for Difference (CfD) financial arrangement they respond to periods of negative market price by switching off. This is the correct behaviour according to market conditions, but it is not taken into account in our forecast accuracy calculations. Hence it shows up here as a very large prolonged forecast error ranging between 15% and 40%. It is likely that we will see this in future months when very low electricity demand coincides with very high wind output to cause negative market prices.

Performance benchmarks

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

1C Security of Supply

May 2020 Performance

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

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

Table 5: voltage and frequency excursions over 2020-21

Supporting information

There were no excursions on both voltage and frequency. Our performance was therefore exceeding expectations in May.

Performance benchmarks

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

1D System Access Management

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

May 2020 Performance

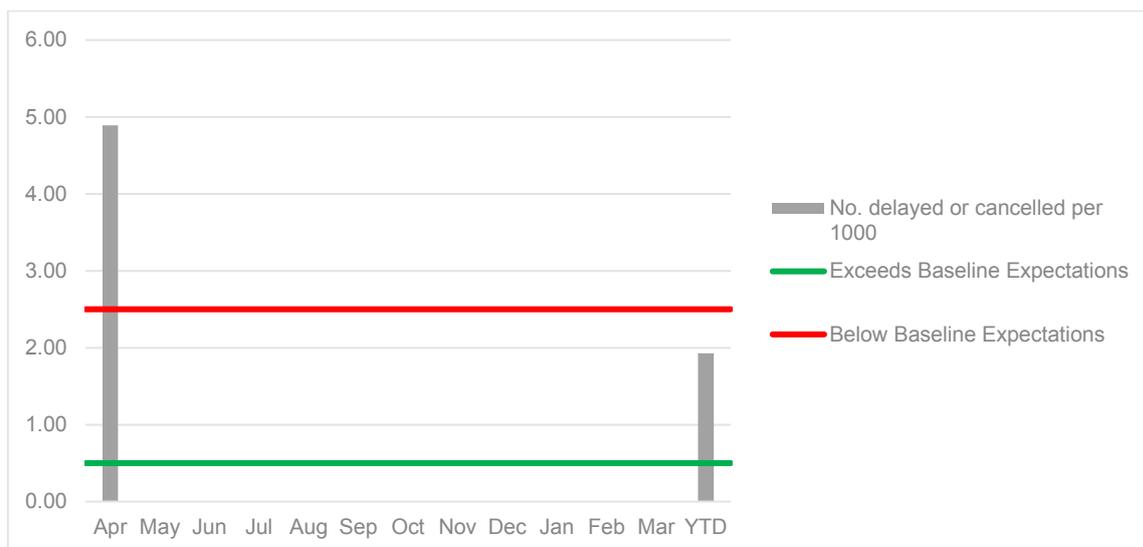


Figure 3: Number of outages delayed by > 1 hour, or cancelled, per 1000 outages

	Number of outages	Outages delayed/cancelled	Number of outages delayed or cancelled per 1000 outages
Apr	409	2	4.89
May	629	0	0
Jun			
July			
Aug			
Sep			
Oct			
Nov			
Dec			
Jan			
Feb			
YTD	1038	2	1.93

Table 6: Number of outages delayed by > 1 hour, or cancelled, per 1000 outages

Supporting information

For May, the number of cancellations per 1000 outages dropped to 1.93, which is within our 'Meets Expectations' target of 2.50 cancellations or delays per 1000 outages. There was an increase of 220 outages this month, totalling 629 for May due to the government guidance on resuming works within the construction industry, but no outages were cancelled or delayed by NGESO due to process failure.

Although new practices to meet the 'social distancing' measures specified by the government remain in place, there has been a steep increase in the volume of requested outages as the TOs look to reinstate projects into the plan for this year. The ESO has successfully engaged with the TOs, via a monthly managerial call, and DNOs to regularly ensure that there is effective communication in re-planning work that was initially postponed, and prioritising outages returning into the plan.

The outage plan from Year Ahead has been significantly disrupted and many major schemes were postponed earlier in the year due to COVID-19, this has meant a large volume of outage requests have flooded in to resume works based on the government guidance resuming work on the construction industry. As we can only assess the volume of outages based on our resourcing, we need discuss with the TO/DNOs to prioritise outages to ensure we can process these accordingly and allocate our resource at high priority works

Performance benchmarks

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

Notable events this month

Trial of storage Balancing Mechanism Units (BMUs) for reserve service

From Monday 18 May, we started to investigate how flexibility from storage Balancing Mechanism Units can be used in the Balancing Mechanism. We have been working with Arenko on the operational arrangements to secure upward or downward reserve ahead of time using battery storage BMUs. The trial aims to use underutilised assets to help the Control Room manage the unprecedented levels of low demand due to the COVID-19 crisis.

Power Available implementation

On 19 May we integrated the Power Available (PA) signal from over 90 renewable generators into our control systems and processes. PA is a live data feed available to our control room engineers which tells them what the potential maximum power output of a wind generator is at a given time and in given conditions. They can then compare this to the generator's current operating output. Our control systems can then accurately calculate the response and reserve capability held on each generator, enabling them to compete with other generation technologies to provide real time response and reserve services. Historically our control room has had limited visibility of the response and reserve potential of intermittent generators.

Role 2 Market development and transactions

2E Month ahead forecast vs outturn monthly BSUoS

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

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

May 2020 Performance

Month	Actual	Month-ahead Forecast	APE	APE>20%	APE<10%
April-20	4.74	3.69	0.22	1	0
May-20	6.24	3.87	0.38	1	0
June-20					
July-20					
Aug-20					
Sept-20					
Oct-20					
Nov-20					
Dec-20					
Jan-21					
Feb-21					
Mar-21					

Table 8: Month ahead forecast vs. outturn BSUoS (£/MWh) Performance

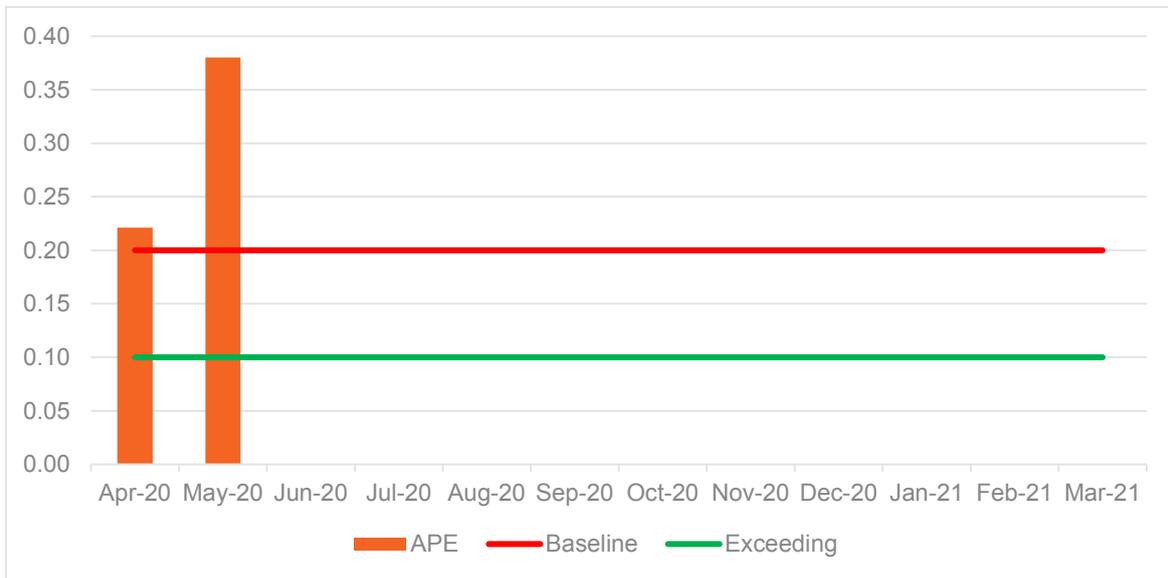


Figure 4: Monthly BSUoS forecasting performance

Supporting information

BSUoS costs outturned significantly higher than forecast for May, therefore we were below expectations. BSUoS was much higher than forecast, however the forecast was produced in early April when the effects of the COVID-19 lockdown were still unknown. A combination of some high wind periods and very low demands exacerbated by the two bank holiday weekends drove constraint costs very high for the month. Following our work to implement new services and better understand the implications of the lockdown on our costs, we published an additional forecast in early May to provide a better view to the market on expected cost and BSUoS levels.

Performance benchmarks

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

Notable events this month

Optional Downward Flexibility Management

Due to the current pandemic, lower demands on the transmission system were forecast for the summer period. We have therefore implemented an Optional Downward Flexibility Management (ODFM) Service. This is a service which allows the ESO to access downward flexibility that has not previously been accessible in real time and expands our ability to control output from providers we cannot currently access through the Balancing Mechanism, and the Platform for Ancillary Services. From the start of May, when the Service Terms were first published, the ESO has contracted with providers for a total of over 3,700MW of capacity and the service has been utilised over both Bank Holiday weekends.

Grid Code change GC0143: Last Resort Disconnection of Embedded Generation

This urgent Grid Code modification was progressed from start to finish in a record breaking six days. This modification was needed to clarify that the ESO can, as a last resort and when all other commercial alternatives have been exhausted, issue emergency instructions to DNOs to disconnect embedded generators to control a situation, as has been encountered recently, of exceptionally low demand periods with limited generation running through the balancing mechanism. The modification was raised on 30 April and approved by Ofgem on 7 May in time for the bank holiday on 8 May. In fact, no emergency instructions have been necessary to date, as the new Optional Downwards Flexibility Management service has allowed commercial options to be used. The modification has a sunset clause of 25 Oct 2020 and an enduring solution will now be progressed using normal industry processes in time for Spring 2021.

Sizewell generator contract

As part of a series of additional tools to address reduced demand, in early May we signed a 'one off' fixed term contract with EDF to reduce output from Sizewell B nuclear power station in Suffolk. The contract runs in parallel to our other existing balancing tools such as the Balancing Mechanism and the recent Optional Downward Flexibility Management (ODFM). The one-off contract is a more cost efficient and secure outcome for consumers compared to daily payments to EDF to reduce output via the balancing mechanism. To further protect consumers, the contract is time limited and is split into a number of stages with associated 'break points' to ensure we continue to assess the cost / benefit of the contract.

The signing of the agreement is a real success for the ESO during this time of very low electricity demand and is the culmination of lengthy and very collaborative joint negotiations with the EDF team.

While the contract is commercially sensitive, we have agreed through joint discussion with EDF to share some reassurance on costs with the industry, and we have shared the range of costs in the order of £15 - £25m for the initial stage. For the second stage from 19 June to 10 August, should we extend, we forecast it will cost in the range £15 - £25m dependent on outturn market prices.

Role 3 System insight, planning and network development

3A Right First Time connection offers

May 2020 Performance

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

Connections Offers	Results
Year to date number of connections offers	47
Year to date ESO related reoffers	1
Year to date percentage of Right First Time connections offers determined from ESO related reoffers	98%

Table 9: Connections re-offers data

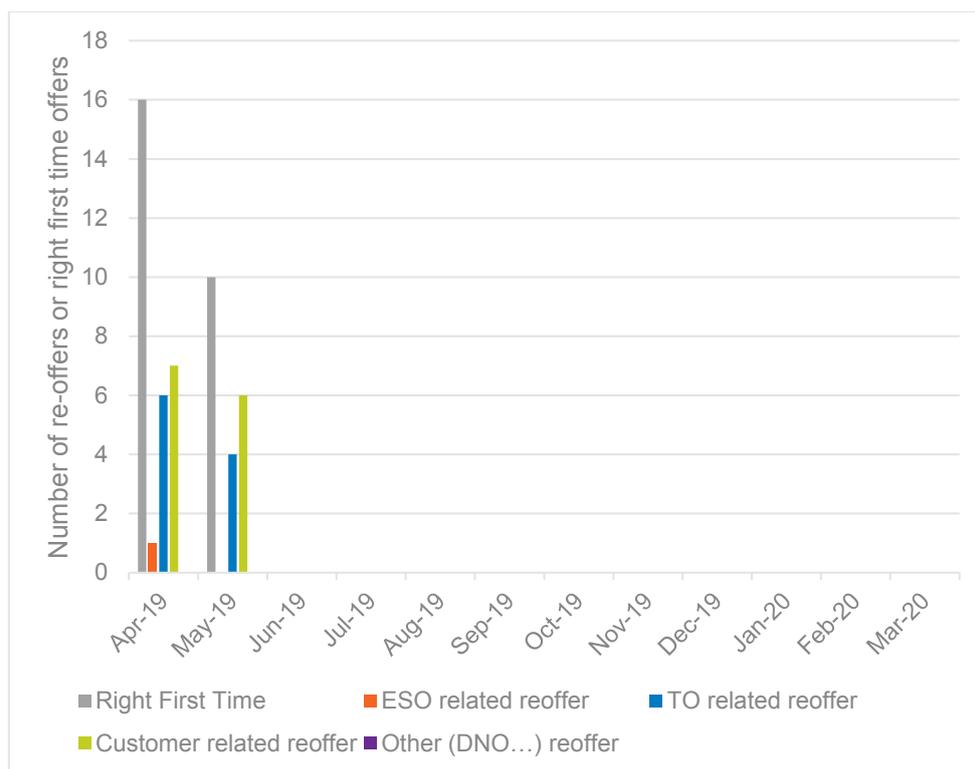


Figure 1: Connections offers monthly performance

Supporting information

We saw 20 offers returned in April, 10 of which were subject to a re-offer. There were no ESO related re-offers on contracts signed in this period, which means that we are meeting our target at 98% Right First Time.

Performance benchmarks

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

Notable events this month

Early Competition engagement

In the early competition project team, we have been engaging with stakeholders to get their views on how an early competition model could work. This has entailed 31 workshops being held between 4 May to 19 May covering the end to end process and allowing stakeholders to feed into the development of the model. We had originally predicted doing face to face workshops over a couple of days, however COVID-19 has meant we have needed to flex our approach. The workshops were split into nine bitesize sessions which were then repeated at various times over the two and a half weeks to enable us to be flexible to stakeholder's work situations. We've had positive feedback from those stakeholders who were able to attend. Next steps for the team are publishing the data on our website and creating three podcasts about the sessions. Our consultation document will be published on 3 July and we will hold sessions around this time to enable stakeholders to directly ask questions and provide feedback.

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