nationalgridESO

Draft Forward Plan 2020-21

December 2019

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Role 1

Control Centre operations

A. Role 1 Control Centre operations

A.1 Vision and Strategy

In this role, we are focussing on our ability to operate the system safely and securely, whilst driving overall efficiency and transparency in balancing strategies across time horizons. To ensure we can continue to operate the system securely and economically in the future, we will develop our operability strategy concentrating on the five key areas of Frequency, Stability, Voltage, Thermal and Restoration.

Our ESO Mission is to enable the transformation to a sustainable energy system and ensure the delivery of reliable, affordable energy for all consumers. Success in 2025 looks like:

- An electricity system that can operate carbon free
- A whole system strategy that supports net zero by 2050
- Competition everywhere
- The ESO is a trusted partner

We articulate below how our activities under Role 1 will help us to achieve these goals.

An electricity system that can operate carbon free

Many of our activities under Role 1 contribute to developing an electricity system that can operate carbon free. For example, we are progressing a number of interconnector programmes, which will integrate electricity interconnectors into our operational systems, giving improved visibility and controllability. We are also working on a strategic forecasting solution, which will improve the quality of our wind and demand forecasts. We are excited to develop a first-of-a-kind system to measure inertia. These improvements in our systems will allow us to be more confident in our operational decisions and operate the system with an ever-reducing proportion of fossil-fuel generation.

Competition everywhere

We are also working towards the objective of Competition Everywhere. Under Role 1 we will deliver competitively tendered Black Start contracts allowing non-traditional providers to participate in tenders and publish operational planning data to support the functioning of an efficient market for balancing services.

The ESO is a trusted partner

We will become a Trusted Partner for industry, engaging with our stakeholders at events such as the Operational Forum and Electricity National Control Centre (ENCC) visit days. By publishing more operational data, we will increase transparency, and support market participants to make informed decisions by providing user friendly, comprehensive and accurate information. We will collaborate proactively with Distribution Network Operators, giving deeper access co-ordination of major infrastructure projects.

A.2 Consumer benefits

A.2.1 How our Role 1 deliverables benefit consumers

The table below illustrates how our high-level deliverables in Role 1 benefit consumers, focussing on the following aspects of consumer benefit:

- Improved safety and reliability
- Reduced environmental damage
- Lower bills than would otherwise be the case
- Improved quality of service
- Benefits for society as a whole

In 2020-21 we are going to deliver…	Benefitting energy consumers this year…	…and in the future
Uninterrupted, safe, secure system operation	Today's energy consumers benefit from having a reliable electricity supply: this is valuable for society as a whole. Our proposed security of supply metrics will demonstrate to stakeholders the quality of supply that we are providing.	Having confidence in a secure energy supply for years to come is beneficial for society as a whole, as it enables long-term investments to be made.
Transparency of data used by our ENCC in our close-to-real-time decision making	Stakeholders have specifically requested more transparency of ENCC actions. In publishing operational planning data, we are allowing stakeholders to make better informed decisions, leading to a better functioning market which will eventually lead to lower bills than otherwise would be the case.	Transparency of ESO decision making, and a clear direction of travel for the future of the ENCC, will give stakeholders confidence that the market is functioning correctly, encouraging more new entrants and driving increased competition.
Electricity Operational Forum and stakeholder engagement	In helping stakeholders to understand our business and seeking to understand theirs, we provide them with an improved quality of service, and enable them to provide timely and accurate information to the end consumer.	If stakeholders better understand our operations, it will give them improved confidence in their business models and make them more willing to participate in more markets, driving increased competition for balancing services in the future which should place downwards pressure on consumer bills.
Upgrade of information systems	Improved IT infrastructure contributes to safe and reliable operation, optimises the dispatch process to minimise cost, and enables us to provide stakeholders with the information they require.	More accessible IT systems encourage non-traditional participants to enter the market, leading to increased competition for balancing services and downward pressure on prices.
Whole system operability	As Distribution Network Owners transition to become Distribution System Operators, the whole electricity system becomes fundamentally different in its nature, and the ESO can no longer make assumptions about how distribution networks will operate. Co-ordination between networks at different voltage will avoid conflicting balancing actions being taken, which will minimise balancing costs and maintain security of supply. The ability to measure inertia will contribute to improved reliability, and allow the ENCC to optimise its holding of reserve, as it will have more confidence in the system requirements. This may lead to reduced spending on reserve holding.	The ability to measure inertia will give more confidence in the level of renewables which can be accommodated. This could lead to less conventional generation being run to increase inertia, leading to reduced environmental damage and lower balancing costs than would otherwise be the case. It will also allow for the optimisation of real-time operation, service procurement and network development.

In 2020-21 we are going to deliver…	Benefitting energy consumers this year…	…and in the future
Deeper system access planning	Working more efficiently with network stakeholders (leading to fewer outage cancellations and less re-work) will lead to a more efficient use of time for both the ESO and network licencees. ESO, TO and DNO costs will eventually be met by end consumers as BSUoS, TNUoS and DUoS charges.	Deeper system access planning will enable the best use to be made of the existing transmission and distribution infrastructure. This will allow customers to connect to the system more quickly, as we may be able to release additional capacity, or avoid unnecessary network build (which also leads to lower bills and a reduced environmental impact). We will improve how we work with our network stakeholders to provide them with an improved quality of service, leading to a more efficient use of resources. Improved outage planning facilitates the timely delivery of projects, which may either reduce balancing costs in the long run (if the project resolves a system constraint), connect a customer earlier (increasing competition) or allow for maintenance activities to be performed (improving safety and reliability).
Product Roadmap for Restoration Implementation	We will work closely with our stakeholders to give them visibility of the opportunities which are available.	The delivery of competitively tendered Black Start contracts will lead to increased competition, which will place downwards pressure on prices. It will also encourage non-traditional providers to offer Black Start services, which will enable us to operate a carbon free network securely, contributing to reduced environmental damage. Diversifying the portfolio of generation which can provide Black Start services contributes to improved system security, which benefits society as a whole.

A.3 Role 1 deliverables

We have revised our deliverables in Role 1 to ensure that we are focussing our resources in the areas which best deliver value for consumers. We have also mapped the deliverables from the original Role 1 (Managing system balance and operability) to the new Role 1 (Control Centre operations), meaning that some deliverables move between role areas.

In this role area, we are focussing on five key aspects of operability: Frequency, Stability, Voltage, Thermal and Restoration.

In the table below, we have identified our priority deliverables for this role.

A.3.1 Role 1 deliverables

Deliverable	Target delivery date
More clarity of operational decision making (priority)	Q4 2020-21
Improve dispatch facility to handle a large number of small Balancing Mechanism Units (priority)	Q4 2020-21
Deliver competitively tendered black start contracts	Q2 2020-21
Future of the ENCC	Q4 2020-21
Electricity Operational Forum	Q2, Q3 and Q4 2020-21
ENCC visit days	Q1-Q4 2020-21
Roll out of Loss of Mains protection settings	Q4 2020-21
Interconnector programmes	Ongoing
Project for Energy Forecasting (PEF) (priority)	Q3 2020-21
Control capability development	Q4 2020-21
Inertia measurement	Q2 2020-21
Deeper access coordination of 1-2 major infrastructure projects to commence in the RIIO-1 period	Q4 2020-21

A.3.2 Changes to our Role 1 deliverables

We have added new deliverables relating to the publication of operational planning data, as stakeholders have told us that they would value more insight into our operational decision making. We also plan to improve our dispatch facility to handle a large number of small Balancing Mechanism Units which should lead to lower balancing costs than would otherwise be the case. We have changed the dates of deliverables to reflect our revised work plan (for example the Loss of Mains protection work is delayed due to awaiting the anticipated Distribution-Code 0079[1] approval).

[1] https://www.bjre.co.uk/wp-content/uploads/2019/08/DC0079-OFGEM.pdf

A.3.3 New Role 1 deliverables

Deliverable	Target delivery date	Description	Reason for adding deliverable
Transparency of data used by our ENCC in our close-to-real-time decision making			
More clarity of operational decision making	Q4 2020-21	We receive data from Balancing Mechanism providers which are used by the ENCC to make decisions. We will engage with stakeholders to find out what data is valuable to them and how we could best provide this. Alongside this we will share complementary analysis and insight of how we make decisions based on this data and we will support stakeholders in understanding this data. We will continue engaging with stakeholders and industry throughout the year to ensure we are delivering beneficial data.	We will build on the experiences of the data introduced in 2019-20 and where appropriate add, clarify and build on the transparency of our decision making.
Upgrade of information systems			
Improve dispatch facility to handle a large number of small Balancing Mechanism Units	Q4 2020-21	We plan to deliver a modernisation to increase advice accuracy for dispatch actions in the four-hour-ahead to real time window.	By updating and improving on the algorithm and software, this will increase advice accuracy and benefit consumers.
Product Roadmap for Restoration implementation			
Deliver competitively tendered black start contracts	Q2 2020-21	Contract with successful parties in the tenders for black start services in multiple areas.	We plan to deliver competition in black start services.

A.3.4 Cancelled Role 1 deliverables

Deliverable	Previous target delivery date	Description	Reason for removing deliverable
Uninterrupted, safe, secure system operation			
System security metrics	Q4 2020-21	We will publish metrics that demonstrate our compliance with the security and quality of supply standards.	We are proposing that this will form part of our suite of metrics for 2020-21, rather than being classified as a deliverable

A.3.5 Role 1 deliverables from 2019-21 Forward Plan

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
Transparency of data used by our ENCC in our close-to-real-time decision making			
Future of the ENCC	Q4 2020-21	As part of our wider transparency, education and operability work, we will continue with our work on the Future of the ENCC to outline and inform on the operational challenges we manage.	In order to ensure that this work is valuable to stakeholders, and does not overlap with our other publications, we have sought feedback from external stakeholders in order to ensure that our project meets their needs. We have therefore deferred the delivery date from Q1 2019-20 to Q4 2020-21.

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
Electricity Operational Forum and stakeholder engagement			
Electricity Operational Forum	Q2, Q3 and Q4 2020-21	This stakeholder event takes place three times a year to provide operational information.	
ENCC visit days	Q1-Q4 2020-21	Monthly open door to market participants to the ENCC to learn about system operation.	This deliverable is now performed monthly rather than bi-monthly.
Addressing Operational Issues			
Roll out of Loss of Mains protection settings	Q4 2020-21	Run four tender rounds throughout 2019 and 2020 Review methodology.	Delivery date has changed from Q4 2019-20 to Q4 2020-21 due to the delay for the Distribution-Code 0079 approval. We will publish programme performance measures, including the number of sites where protection setting changes are made, in line with the programme's quarterly assessment cycle
Upgrade of information systems			
Interconnector programmes	Ongoing	Continued integration of interconnectors into operational systems.	
Project for Energy Forecasting (PEF)	Q3 2020-21	Deliver strategic forecasting solution.	EFS (Energy Forecasting System) is our current forecasting system which is gradually being replaced by the PEF, which will deliver a strategic cloud-based machine learning system.
Control capability Development	Q4 2020-21	Develop new cross industry process for delivering control capability during RIIO-2, including, IT System development.	
Whole system operability			
Inertia measurement	Q2 2020-21	Implement a first of a kind tool to measure system inertia in real-time and use it to optimise real-time operation, service procurement and network development.	The date of this deliverable has been amended from Q1 2020-21 to Q2 2020-21. We are working with two suppliers to develop this innovative technology; however we have experienced programme delays due to issues with integration with existing systems.
Deeper system access planning			
Deeper access coordination of 1-2 major infrastructure projects to commence in the RIIO-1 period	Q4 2020-21	Identification of 1-2 major infrastructure projects to commence in the RIIO-1 period that could deliver value through deeper access planning. Develop enhanced ways of working with network organisations and other connected parties to better facilitate efficient project delivery. This to include consideration of the costs of system operation, customer impacts, as well as project delivery costs.	

A.4 Role 1 performance metrics

A.4.1 Current Role 1 metrics and performance indicators

We have reviewed our existing suite of metrics for Role 1 and considered whether they continue to provide useful information for our stakeholders. In our review we have considered whether there is merit in introducing any of the RIIO-2 metrics or performance indicators in the last year of RIIO-1.

As a result of the new role structure set out by Ofgem, some metrics will move between role areas: this is specified further below. The current metrics for Role 1 are:

- Metric 1: Balancing cost management (monthly)
- Metric 2: Information provision scorecard (quarterly)
- Metric 3: Energy forecasting accuracy (monthly)

In this section, we present each of the existing metrics, and discuss whether they should be retained for 2020-21.

As benchmarks are required for our metrics, we have also included some Performance Indicators, which are measures for which it is not appropriate to set a benchmark. For each Performance Indicator, we explain why a benchmark cannot be set.

Metric 1: Balancing cost management

We have measured and reported on balancing costs for several years. This continues to be an important indicator of our performance, and by continuing to measure it we seek to show a trend of ongoing improvement despite an increasingly challenging environment.

Although stakeholders support the need for a balancing cost metric, they have expressed concerns about the approach to calculating the benchmark, and the adjustment factors that are used. We recognise that the calculation of a balancing cost benchmark is a challenging topic, as the calculation of a more accurate counterfactual would involve extensive modelling which would be opaque to stakeholders, whereas a simple rolling average does not correctly capture the complexities of operating the system and the evolution of the generation mix.

We are currently working on designing an improved balancing cost metric for RIIO-2, which might address some of these challenges. Subject to our finding an appropriate method, we could also produce a short-term forecast of balancing spend, taking into account contributing factors such as significant transmission outages, demand levels and weather conditions. We could then report our performance against this forecast. As part of our RIIO-2 engagement, we will consult stakeholders on the design of this forecast, and once a process is agreed we will consider implementing a similar forecasting process for 2020-21.

The metric is currently reported monthly and is impacted by our following deliverables:

- Product Roadmaps
- Forecasting
- Addressing operational issues.

It compares our current balancing spend against historic trends, incorporating adjustments for significant cost drivers. The benchmark only includes cost drivers that are identified at the beginning of the year; a benchmark for expected balancing costs is derived from the application of a linear trend through five-year moving averages of historic balancing cost (excluding Black Start). We use historical data to develop a baseline of costs. By applying a historical dataset that essentially reflects a broad range of operational situations, we can capture a sufficient number of observations that the ESO has encountered to establish a baseline for costs. The scheme takes annual balancing costs from the past 10 years. From 2017-18 onwards the outturn data is adjusted to account for the effect of the Western Link, to increase these figures into line with the pre-Western Link figures. A sequence of five year rolling means is calculated from these adjusted values for the periods 2010/11 to 2014/15, 2011/12 to 2015/16, ..., 2014/15 to 2018/19. The line of best fit through the five data points consisting of the five-year rolling means using least squares regression is constructed. This is used to project the trend forward to the required forecast year. The Western Link is currently the only permanent change. When fully operational this should reduce costs by £136.4m. For the years 2017-18 and 2018-19 we adjust by what we consider to be the benefit of the Western Link in those years: £3.24m and £19.46m respectively. The ESO informed Ofgem of what the benefit of the Western Link would be when fully operational. However, in the years 2017-18 and 2018-19 the link was only partially available, so we have had to estimate the benefit it brought, and use these estimates to bring the costs for those years into line with the pre-Western Link years, in order to establish the trend.

In recognition that there are a number of foreseeable fundamental drivers that might impact balancing costs but which historical costs might not reflect, we will also include additional adjustments. The foreseeable fundamental

drivers for 2020-21 are shown in the table below. The anticipated impact of these drivers on yearly balancing costs will be included in the final 2020-21 Forward Plan, which we will publish in March 2020.

Balancing cost driver	Description
Eleclink	Once the ElecLink interconnector is commissioned, it is expected to make both import and export constraints in the South East of England more difficult to manage. Some of these constraints are due to the availability of generation in the south east corner of the network.
IFA2	The connection of the IFA2 interconnector is expected to contribute to additional constraint issues

The result of the linear trend model, without the one-off adjustments is £939.8m. This will be corrected for the adjustment factors described above: these figures will be included in the final 2020-21 Forward Plan which we will publish in March 2020.

Table 1 – Balancing costs 2010-18

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total balancing spend (£m)	540.5	796.5	786	851.1	824.8	849.2	873	940	1139.3

We will consider publishing a spreadsheet on our website to increase stakeholders' visibility of how balancing cost benchmarks are calculated.

We propose to retain the existing balancing costs metric for 2020-21. The benchmark for expected balancing costs will continue to be calculated in the same way.

Metric 2: Information Provision Scorecard

This metric is reported quarterly to measure our Forecasting and Operational insights deliverables. It demonstrates whether we have published particular data items relating to our balancing activities. Many of the publications described in the Information Provision Scorecard are also required by our licence.

We have received feedback from some stakeholders that the frequency of this metric (which is currently quarterly) means that it is not useful, as it relates to data which is published much more frequently: stakeholders would contact the ESO directly to obtain any information which is missing, and do not find a historic scorecard of what has been published to be helpful.

We therefore propose to remove this metric for 2020-21.

Metric 3: Energy forecasting accuracy

We have reported on forecasting accuracy for a number of years; this represents the importance of forecasting, and the value our stakeholders place on this being correct. By continuing to report our performance, we seek to show a trend of continuous improvement despite an increasingly challenging environment.

This metric is reported on a monthly basis and measures the accuracy of our demand and wind forecasts. For both types of forecast, a target mean average error (in MW) is set for each month. The annual performance is then assessed by counting the number of months for which the target was met.

It is widely accepted that accurate demand and wind forecasts are useful to the ESO in operating the system, and where forecasts are provided to stakeholders this can help them to balance their own position, resulting in fewer residual balancing actions. It is therefore logical to retain some form of metric for forecasting accuracy so we can measure our forecasting deliverable.

We have received feedback from some stakeholders that the target should relate to the mean average error across the year as a whole, rather than the number of months for which the target is met. We therefore considered introducing an additional yearly target, however we felt that it would cause confusion to have two different yearly targets, and it would be preferable to retain the existing metric structure which allows for meaningful performance tracking on a monthly basis.

Accordingly, we are proposing to continue with the same methodology for calculating the day-ahead demand forecast accuracy and day-ahead BMU generation forecast accuracy.

For day-ahead demand forecast accuracy, we will therefore continue to use the same methodology for calculating the target for each month: the average monthly mean absolute error (MW) over the last three financial years:

(2017-18, 2018-19, 2019-20). At the time of writing not all the outturn data is available for the financial year 2019-20; these figures are marked as provisional (there is an asterisk next to the MW number) and will be revised when the data is available. The day-ahead demand forecast targets achieved by following this methodology are set out in the table below:

Table 2 – day ahead demand forecast targets for financial year 2020-21

Year	Target (MW)	Month	Target (MW)
April	654	October	583
May	546	November	603
June	491	December*	644
July	473	January*	599
August	447	February*	620
September	471	March*	664

For wind generation forecast accuracy, we will continue to use the same methodology for calculating the target for each month: this is the average monthly mean percentage error (%) calculated by considering the past three financial years (2017-18, 2018-19, 2019-20). At the time of writing not all the outturn data is available for the financial year 2019-20; these figures are marked as provisional (there is an asterisk next to the % target) and will be revised when the data is available.

Table 3 – BMU wind generation forecast targets for financial year 2020-21

Year	Target (%)	Month	Target (%)
April	5.47	October	5.27
May	4.26	November*	5.2
June	4.22	December*	5.31
July	3.98	January*	5.98
August	4.12	February*	5.52
September	4.49	March*	5.91

We therefore propose to retain the existing metric for 2020-21.

A.4.2 RIIO-2 metrics and performance indicators for Role 1

Our December RIIO-2 Business Plan sets out our proposed metrics for RIIO-2. As part of RIIO-2 we have also proposed a number of performance indicators to sit alongside these metrics. The performance indicators provide a wider view of the ESO performance, but are not proposed as formal RIIO-2 metrics because they are items over which the ESO may not have direct control, or measurement can be challenging with a risk of duplicate reporting.

For each RIIO-2 metric or performance indicator, we have considered whether it should also be introduced for 2020-21. Our considerations for each metric are outlined in the sections below.

The set of metrics and performance indicators we have proposed in our RIIO-2 business plan for Role 1 are:

- Balancing cost management

- CNI system reliability
- Day ahead demand forecasting accuracy
- Security of supply
- Delivery of zero carbon operability ambition
- Number and type of parties tendering for restoration services

Balancing cost management

The ESO typically spends around £1 billion per year balancing the electricity system. This ultimately gets passed onto consumers' bills. It is therefore important we continue to efficiently manage balancing costs with due regard to system security. In RIIO-2 we will measure the ESO's spending on electricity system balancing actions, excluding black start, which is subject to a separate cost disallowance incentive, and produce a day-ahead balancing cost benchmark, with post-day analysis, to provide transparency around control centre actions and drivers of balancing cost.

This is a continuation of our current balancing costs metric, which we are proposing to retain for 2020-21 as described above.

CNI system reliability

This RIIO-2 metric will measure our ability to accurately forecast and deliver planned outages for key critical national infrastructure (CNI) systems, and minimise unplanned outages to these systems. Many of our systems, including our core situational awareness, scheduling and dispatch tools, are defined as CNI systems. An outage or failure of these systems can have significant cost and system security consequences. Given this, it is important we measure and report on the health of our CNI systems.

In RIIO-2 we propose to consider the outages of our CNI systems (for example our network control, scheduling and dispatch tools). The measure would be time of planned outage accuracy ± time of unplanned outages. In other words, we would be measured to accurately forecast and deliver planned outages, and minimise unplanned outages. We consider an unplanned outage to be an early or late conclusion of a planned outage, or an outage that was not planned (for example due to system failure).

As the minimisation of unplanned CNI system outages is a key priority, we propose to start reporting on some aspects of this in 2020-21, focussing on reporting unplanned outages for a subset of the CNI systems (the Integrated Energy Management System (IEMS) and Balancing Mechanism (BM). We propose to report this as a Performance Indicator (i.e. without a benchmark level) on a monthly basis. This would allow us to establish a suitable benchmark level, ahead of RIIO-2 where it could be used as a metric to measure our performance.

Day ahead demand forecasting accuracy

As part of the RIIO-2 business plan, we have proposed a metric for forecast accuracy for demand and wind. The ESO produces and publishes forecasts of National Electricity Transmission System Demand and wind generation (Balancing Mechanism Unit (BMU) generators) at various timescales ahead of real time (for example week-ahead and day-ahead). These are used by both the ESO and market participants, and it is important they are the best possible and timely. We note that wind generation will become increasingly difficult to forecast as more generators co-locate storage on site, and output from wind farms becomes dependant on the generators' commercial strategy.

In RIIO-2, we will measure day-ahead demand forecast accuracy using both the monthly mean absolute error and annual mean absolute error.

This is a continuation of our existing Energy Forecasting metric, which we will proceed to publish in 2020-21 as described above.

Security of supply

In our RIIO-2 business plan, we have proposed a Security of Supply metric. This will measure the quality of service that we deliver in running the electricity network by the number of voltage and frequency excursions that take place, and will be reported on a monthly basis. This data is currently reported in the National Electricity Transmission System Performance Report[2] (as mandated by licence condition C17) on an annual basis.

Security of supply is measured with reference to system voltage and frequency where we will report the number of occasions that we are outside of the permitted operational limits, as set out below. We will report on a monthly basis, the number of frequency and voltage excursions that have been incurred for the previous period and a total for the year to date. This will include details of an investigation into the reasons why the excursion took place, the size of the excursion and the relative size to the nominal limits.

[2] https://www.nationalgrideso.com/insights/transmission-performance-reports

Voltage excursions

The Electricity Safety, Quality and Continuity Regulations 2002 permit variations of voltage not exceeding 10 per cent above and below the nominal at voltages of 132kV and above and not exceeding 6 per cent at lower voltages. Any voltage excursions in excess of 15 minutes must be reported. The Grid Code reflects these limits, and imposes a further constraint for the 400kV system in that voltages can only exceed +5 per cent for a maximum of 15 minutes. Consumers may expect the voltage to remain within these limits, except under abnormal conditions e.g. a system fault outside of the limits specified in the Security and Quality of Supply Standards (SQSS). Normal operational limits are agreed and monitored individually at connection points with customers to ensure that voltage limits are not exceeded following the specified credible fault events described in the SQSS.

Frequency excursions

The Electricity Safety, Quality and Continuity Regulations 2002 permit variations in frequency not exceeding 1 per cent above and below 50Hz (a range of 49.5 to 50.5Hz). Any frequency excursions outside these limits for 60 seconds or more are required to be reported. The electricity system is normally managed such that frequency is maintained within operational limits of 49.8 and 50.2Hz. Frequency may, however, move outside these limits under fault conditions or when abnormal changes to operating conditions occur. Losses of generation between 1320MW and 1800MW are considered abnormal and a maximum frequency change of 0.8Hz may occur, although operation is managed so that the frequency should return within the lower statutory limit of 49.5Hz within 60 seconds.

Table 4 – Voltage and Frequency excursions

	2014-15	2015-16	2016-17	2017-18	2018-19
Voltage excursions	6	0	0	3	2
Frequency excursions	0	0	0	0	0

In RIIO-2 we have proposed a target of zero excursions for both voltage and frequency, in line with the SQSS. This is ambitious, given the historic data. We will use the criteria set out in the National Electricity Transmission System Report to determine which excursions to report.

As we believe that this metric is a key indicator of the quality of supply we provide to our customers, we propose to introduce it for 2020-21 including the target of zero.

Delivery of zero carbon operability ambition

Our ambition is to be able to operate a zero carbon system by 2025. Our RIIO-2 business plan sets out a range of milestones that the ESO will achieve to in order to enable this. In RIIO-2, we propose to measure the progress and delivery of these milestones in order to provide visibility to the energy industry.

As this metric tracks the progress of key deliverables relating to the RIIO-2 period, we do not propose to introduce it for 2020-21.

Number and type of parties tendering for restoration services

We have proposed a metric for RIIO-2 which will track the absolute number of different parties providing restoration services.

Although we are transitioning away from bilateral contracts towards market-based arrangements, with a service due to go live next year which results from a local competitive approach, all contracts which are currently live are bilateral. It takes a significant amount of time for Black Start contracts to go live, due to the requirement for providers to build their technical capability once they have been awarded a contract. As such, we do not expect any additional competitive black start contracts to go live during RIIO-1, and there is therefore no benefit introducing this metric early. We therefore do not propose to introduce this metric for 2020-21.

We expect to open the Design Authority to external stakeholders during 2020-21. This is a body that will guide and assure the future design strategies and principals the ESO is planning. Once the Design Authority is introduced, we will seek stakeholder feedback to ensure that it is working well. As this will not yet be in place in April 2020, we do not propose to introduce this metric for 2020-21.

A.4.3 Proposed Role 1 metrics for 2020-21

Our proposed metrics for Role 1 are therefore:

- Balancing cost management
- Energy forecasting accuracy
- CNI system reliability

We also propose the following performance indicator, for which no target is set:

- Security of supply.

Role 2

Market development and transactions

B. Role 2 Market development and transactions

B.1 Vision and Strategy

Under Role 2, we set out our vision for how balancing services will evolve into the future, setting out our product roadmaps for Response and Reserve, and Reactive Implementation. We also highlight the role we play, through increased modelling, in facilitating broader participation in the Capacity Market to provide security of supply at best value for consumers. This will define the direction of travel toward more competitive procurement of balancing services and security of supply, consistent with our ambition to achieve competition everywhere by 2025. We will also focus on our role in transforming industry codes and frameworks, becoming a trusted partner for stakeholders and facilitating the transition to the energy system of the future.

Our ESO Mission is to enable the transformation to a sustainable energy system and ensure the delivery of reliable, affordable energy for all consumers. Success in 2025 looks like:

- An electricity system that can operate carbon free
- A whole system strategy that supports net zero by 2050
- Competition everywhere
- The ESO is a trusted partner

We articulate below how our activities under Role 2 will help us to achieve these goals.

An electricity system that can operate carbon free

Many of the markets we are developing as part of Role 2 will enable renewable and other new types of provider to better participate in balancing services: for example we will undertake several activities to widen access to the Balancing Mechanism, and we are moving procurement closer to real time as part of the frequency response auction trial. We are also leading on the numerous changes to industry codes and frameworks which will be needed to allow this transition to take place. Our Electricity Market Reform (EMR) team will develop a modelling methodology to enable cross-border participation in capacity markets, as part of the Clean Energy Package. These activities will improve our ability to operate the system carbon free.

Competition everywhere

Role 2 is closely linked to our Competition Everywhere ambition. Our product roadmaps will implement new balancing markets, and reform our existing ones to help facilitate the energy transition, and we are working to widen access to the Balancing Mechanism. We are transforming industry frameworks through our involvement in the Targeted Charging Review and leading the Balancing Services Charges Task Force, which will enable a decentralised, decarbonised and digitised energy market.

The ESO is a trusted partner

We will continue to engage proactively with our stakeholders as part of Power Responsive, bringing together industry and energy users to work together in a co-ordinated way, and making it easier for industrial and commercial businesses to get involved in Demand Side Response. This, along with transforming the customer experience for network charging, will help support our ambition to be a trusted partner to stakeholders across the industry by 2025.

B.2 Consumer benefits

B.2.1 How our Role 2 deliverables benefit consumers

The table below illustrates how our high-level deliverables in Role 2 benefit consumers, focussing on the following aspects of consumer benefit:

- Improved safety and reliability
- Reduced environmental damage
- Lower bills than would otherwise be the case
- Improved quality of service
- Benefits for society as a whole

We note that Role 2 mainly relates to forward-looking market development, and as such many of the benefits associated with these deliverables will be realised in future years. We are confident that we have put forward a set of deliverables which will benefit consumers in years to come.

In 2020-21 we are going to deliver…	Benefitting energy consumers now…	…and in the future
Product roadmaps for response and reserve, product roadmaps for reactive implementation	This provides a high-quality service to our stakeholders, giving them visibility of how these products will develop in the future and how all our developments fit together, giving them a view as to the future opportunities to participate in new markets.	These documents set out how the markets will evolve in the future, driving increased competition leading to lower bills than would otherwise be the case. In many cases, we are starting to procure these products from non-traditional sources, reducing our dependency on conventional generation which will lead to reduced environmental damage.
Delivery of the Power Responsive initiative	We will continue to engage with our stakeholders, providing them with an improved quality of service, and the information they want.	We are developing a programme to increase and focus feedback and interaction with the demand side community on our balancing services developments, which will ensure a coordinated approach to balancing service procurement across transmission and distribution, delivering a more efficient and economic use of resources leading to reduced costs for the end consumer.
Improving Balancing Mechanism Access for Virtual Lead Parties	The State of Energy signal will give the ENCC better visibility of assets such as batteries, giving control engineers the information they need to operate the system securely and economically. Bulk dispatch functionality will make it easier to dispatch smaller BMUs, increasing market competition which will lower costs for consumers, and diversifying the market which will bring benefits for society as a whole.	Widening access to the Application Programming Interface (API) system and streamlining the process for Balancing Mechanism (BM) registration will lower barriers to entry for providers in the BM, leading to increased competition which will place downwards pressure on prices.
Support access for Intermittent Generation	Our work to integrate intermittent generation into market frameworks will lower barriers to entry in our markets, increasing competition and lowering prices.	Our reforms in this area will facilitate greater participation from low carbon forms of generation; enable the transition to net zero and increase competition to reduce costs to end consumers.

In 2020-21 we are going to deliver…	Benefitting energy consumers now…	…and in the future
Facilitating Code Change	By taking an active role as code administrator, we can ensure that stakeholders receive the information they need, and workshops are designed to make the best use of industry time.	Well-signalled, clear and timely changes to industry codes will facilitate the market reforms which are necessary to transition to a world where we can operate carbon free. They will also increase competition, and ensure that charges are levied on the party which is best placed to bear them, leading to better outcomes for society as a whole.
Transform Industry Frameworks to enable decentralised, decarbonised and digitised energy markets	We will run workshops effectively, making best use of industry time and providing our stakeholders with the information they need.	Our leadership in the transformation of electricity access and charging will result in a fair distribution of network charges, bringing benefits for society as a whole.
Facilitate electricity network charging reform through Charging Futures	We will facilitate this important piece of work, providing a high quality of service to our stakeholders.	An efficient, well-designed framework would result in lower bills than would otherwise be the case. It would also fairly distribute network charges between different parties, which would benefit society as a whole.
Transform the customer experience for network charging	We will provide a high quality of service to our customers, allowing them to provide timely and accurate information to end consumers.	We will improve our approach to onboarding new suppliers, leading to increased competition and more choice for future consumers.
Making Electricity Market Reform (EMR) easier for participants	By making EMR easier for participants, we will provide an improved quality of service to our stakeholders.	As part of our Capacity Market Modelling deliverable, we will investigate improved modelling that may include various technology types and cross-border participation in the Capacity Market. Improving the effectiveness of the scheme would provide security of supply at best value for consumers, resulting in lower bills than would otherwise be the case.

B.3 Role 2 deliverables

We have revised our deliverables in Role 2 to ensure that we are focussing our resources in the areas which best deliver value for consumers. We have also mapped the deliverables from the original Role 2 (Facilitating competitive markets) to the new Role 2 (Market development and transactions), meaning that some deliverables move between roles.

In the table below, we have identified our priority deliverables for this role.

B.3.1 Role 2 deliverables

Deliverable	Target delivery date
Implement the first new frequency response product (priority)	Q1 2020-21
Consult on future frequency response products (priority)	Q1 2020-21
Publish our strategy for moving Optional Fast Reserve products into more competitive procurement (priority)	Q1 2020-21
Publish our strategy for the future of reactive power (priority)	Q3 2020-21
Support coordination of Distributed Energy Resource (DER) engagement on flexibility developments	Q1-Q4 2020-21
Produce plan for widening access to API (Application Programming Interface) system (priority)	Q1 2020-21
Implement State of Energy signal (priority)	Q3 2020-21
Full integration of bulk dispatch functionality (priority)	Q4 2020-21
Customer focussed communications (priority)	Q1 2020-21
Onboarding process for new industry parties (priority)	Q2 2020-21
Improving industry confidence in ESO Code Governance (priority)	Q1-4 2020-21
Raise Targeted Charging Review (TCR) modifications	Q4 2020-21
Lead code modifications	Q3-Q4 2020-21
Balancing Services Charges Task Force	Q1 2020-21
Facilitate Code Management	Q4 2020-21
Capacity Market Modelling - Cross-border participation in capacity markets	Q4 2020-21
Report on auction trial	Q2 2020-21
Market design for reformed reserve products	Q4 2020-21
Implementation of Pan-European replacement reserve standard products	Q1-Q4 2019-21
Implement approach for efficient reactive power flows between networks	Q4 2020-21
Power Potential trial with UKPN	Q4 2020-21
Review learning from Power Potential	Q3 2020-21
Power Responsive Stakeholder Engagement	Q4 2020-21
Deliver second phase of Power Available integration project	Q3 2020-21
Facilitate electricity network charging reform through Charging Futures	Q4 2020-21
Publications and guidance of the impact of charging reform to our customers	Q4 2020-21
Introduce new ‘new entrant’ e-learning on charging	Q3 2020-21
Improve the digital customer experience for TNUoS, BSUoS and Connection Charging Data; including the introduction of a new NGESO billing system	Q4 2020-21
Establish a ‘cross party’ approach to onboarding, mapping out whole industry requirements	Q4 2020-21
Capacity Market Modelling – facilitating broader participation in the CM to provide security of supply at best value for consumers	Q4 2020-21

B.3.2 Changes to our Role 2 deliverables

We have added new deliverables in response to stakeholder feedback. We plan on providing further information so stakeholders can gain more understanding of the direction of travel of key products. This includes Product Roadmaps and improving our code administration performance. We intend to act on stakeholder feedback, particularly concentrating and improving on our Code Administrator Code of Practice (CACoP) survey.

Role 2 contains a number of significant longer-term market reform programmes. Where we have received stakeholder feedback on deliverables in the previous performance year, this has been reflected in our new Forward Plan. In updating our deliverables, we have added new deliverables to provide additional milestones relating to the Product Roadmaps, so that our stakeholders know what to expect. We have also included a new Capacity Market Modelling deliverable relating to the implementation of the Clean Energy Package.

We have removed two deliverables relating to reactive power and added in an alternative deliverable which will take into account the learnings from the Power Potential and Pathfinder projects.

B.3.3 New Role 2 deliverables

Deliverable	Target delivery date	Description	Reason for adding deliverable
Product Roadmaps for Response and Reserve implementation			
Implement the first new frequency response product	Q1 2020-21	Commercially procure the Dynamic Containment product.	Following on from the frequency response strategy, this is the first step towards successful implementation of the new product.
Consult on future frequency response products	Q1 2020-21	Consult with the industry on the design of future frequency response products beyond Dynamic Containment.	Through our consultations this will inform the industry on the next stages of frequency response implementation, and follows on from the 2019-20 deliverables.
Publish our strategy for moving Optional Fast Reserve products into more competitive procurement	Q1 2020-21	Strategy outlining how we will increase competition in the provision of reserve services.	This deliverable is a key step towards meeting the ESO ambition of creating 'Competition Everywhere'.
Product Roadmap for Reactive implementation			
Publish our strategy for the future of reactive power	Q3 2020-21	Strategy outlining how we will look to integrate learnings from all reactive power projects (pathfinders, Power Potential, DNO boundary investigations) to create a coherent plan for the development for the future of reactive power.	To build on our 2019-20 deliverable, we will seek to determine the future role for reactive power and design more competitive reactive power services.
Delivery of the Power Responsive initiative			
Support coordination of Distributed Energy Resource (DER) engagement on flexibility developments	Q1-Q4 2020-21	Facilitate constructive dialogue between the demand side community and ESO subject matter experts in the development of flexibility products and markets.	To build on our 2019-20 deliverable of stakeholder engagement and innovation projects, moving closer to introducing a whole system flexibility programme.
Improving Balancing Mechanism Access for Virtual Lead Parties (previously known as Wider Access to Balancing Mechanism Roadmap implementation)			
Produce plan for widening access to API (Application Programming Interface) system	Q1 2020-21	Deliver a plan which sets out proposals and timescales for widening access to the web based API and any associated code and policy modifications which will be required to facilitate this.	To allow providers choice of which communications system they use, and improve the provider experience.

Deliverable	Target delivery date	Description	Reason for adding deliverable
Implement State of Energy signal	Q3 2020-21	Define and implement a state of energy signal from limited-energy assets into the Control Room.	This deliverable will give the Control Room visibility of the remaining energy in limited-duration assets, such as batteries.
Full integration of bulk dispatch functionality	Q4 2020-21	Fully integrate the current interim process for bulk dispatch of Balancing Mechanism Units (BMUs) into control room systems.	To reduce our manual processes and support the control room to instruct smaller BMUs.
Facilitating code change			
Customer focussed communications	Q1 2020-21	Ensure all communications to our stakeholders are accessible and useful; launching newsletters and an email subscription tool. We will produce our own Code Administrator annual report, outlining key results for the financial year and providing our stakeholders with a comprehensive commentary on our performance.	Customer feedback and CACoP survey shows this should be an area of focus for us to improve on to benefit consumers.
Onboarding process for new industry parties	Q2 2020-21	We will create a new on-boarding process for stakeholders to enable them to understand who the Code Administration team is, how they can be involved in the modification process and how to upskill. This will be fully interactive and ensure there is a wealth of material in one place on our website for our stakeholders to engage with. We will also ensure new stakeholders know who their point of contact is within the team.	Customer feedback and CACoP survey shows this should be an area of focus for us to improve on to benefit consumers.
Improving industry confidence in ESO Code Governance	Q1-4 2020-21	Incremental improvements to our service to meet and exceed the expectations of network users while delivering consumer benefit. These will include: • Better articulating ESO's role as Code Administrator in facilitating the change process, enabling all parties to contribute to change and maximizing the delivery of consumer benefit in Q1 2020-21 • Improvements in how our reports are written, with an ambition to adopt Plain English principles. Reaching a wider audience and better informing them of the changes being developed. This is ongoing for 2020-21 • Reaching a wider audience during 2020-21 and better informing them of the changes being developed • Continuing to develop the Trusted Partner role to industry; providing Horizon Scanning for our Panels and enhancing the Critical Friend role throughout 2020-21.	Customer feedback and CACoP survey shows this should be an area of focus for us to improve on to benefit consumers.

Deliverable	Target delivery date	Description	Reason for adding deliverable
Transform industry frameworks to enable decentralised, decarbonised and digitised energy markets			
Raise Targeted Charging Review (TCR) modifications	Q4 2020-21	Raise and implement Connection and Use of System Code (CUSC) modifications to support the TCR.	In order to prepare for TCR implementation, which is expected in 2021-23, three modifications have been raised for the TCR, and we have proactively been engaging with DNOs, Elexon and industry to create a delivery plan for the TCR. This has been bilaterally, and through webinars and workgroups which will continue into 2020-21.
Lead code modifications	Q3 - Q4 2020-21	Leading and implementing code modifications on key areas, such as: • Removing distortions between co-located and single technology sites; • Re-design Transmission Network Use of System (TNUoS) generation zones • BSUoS changes, subject to the second balancing services taskforce outcome.	The aims of these modifications are to remove distortions in charging between co-located and single technology sites; provide stability and clarity over what the longer-term TNUoS tariffs will be, and therefore reduce price risks for generators; and prepare for the delivery of the ESO RIIO-2 Business Plan in respect of changes to BSUoS in RIIO-2.
Balancing Services Charges Task Force	Q1 2020-21	Publication of the second ESO-led balancing services charges task force final report	After the success of the first, Ofgem has asked the ESO to lead a second balancing services charges task force. This will inform the future direction of BSUoS. Our aim will be to deliver the terms of reference in a timely and high-quality manner with industry stakeholders.
Capacity Market Modelling - Cross-border participation in capacity markets	Q4 2020-21	Development of a modelling methodology to calculate available capacity for cross-border participation in capacity markets on a consistent basis across Europe. We will be demonstrating our progress with the following milestones: • ENTSO-E (European Network of Transmission System Operators) Task Force begins in Q1 2020-21 • The draft methodology will be developed in Q2 2020-21 • ENTSO-E consultation will be in Q3 2020-21 • The methodology will be finalised in Q4 2020-21.	The Clean Energy Package requires ENTSO-E to develop a methodology to calculate the maximum capacity for cross-border participation in capacity markets. The ESO will be taking a leadership role in developing the methodology in line with the ENTSO-E plan.

B.3.4 Cancelled role 2 deliverables

Deliverable	Previous target delivery date	Description	Reason for removing deliverable
Product Roadmap for Reactive implementation			
Commence implementation plan to enable rollout of new approach to competitive reactive power services	Q3 2020-21	Improved reactive power service that promotes competition where possible and enables economic and efficient procurement.	Until we have determined and agreed a strategy for reactive power procurement, which takes into account learning from Power Potential and the Pathfinders, we feel it would be inappropriate to commit to a specific date for a commercial reactive power market.
Work with industry to determine future role for reactive power and design more competitive reactive power services	Q4 2018-19 – Q2 2020-21	Industry engagement through webinars, consultations and workshops as appropriate to explore options to improve reactive power services and refines these to arrive at an approach that can be implemented.	Taking into account all the work going on in the reactive space (Power Potential, Pathfinders, DNO transfer discussions), we believe that it is appropriate to focus on all that is included across these areas of work before considering any significant change to the core Obligatory Reactive Power Service (ORPS) market structure to develop new Reactive Power markets. This deliverable will be replaced by a new one on creating a strategy for reactive once these have delivered.

B.3.5 Role 2 deliverables from 2019-21 Forward Plan

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
Product Roadmaps for Response and Reserve implementation			
Report on auction trial	Q2 2020-21	Status update on the success of trial, learnings from the first six months and how these are informing future developments.	
Market design for reformed reserve products	Q4 2020-21	Deliver a proposal for reformed reserve products, including detail of how they will interact with both new frequency response products, spin gen and pan-European Standard products (Trans European Replacement Reserve Exchange (TERRE) and Manually Activated Reserves Initiative (MARI) as well as other elements of Electricity Balancing Guideline (EBGL) and the recast Electricity Regulation and a plan for implementation.	This work is now expected to be delivered in Q4 2020-21, rather than Q1 2019-20. Modelling of new response products is ongoing. We are also considering the reserve design in light of how the new pan-European Standard product TERRE will be used, and what the impact of wider access will be on the makeup of the Balancing Mechanism. We will be progressing reformed reserve products once we have more clarity on these areas.
Implementation of Pan-European replacement reserve standard products	Q1-4 2019-21	Support development and implementation of Pan European standard products (TERRE and MARI) to allow Great Britain parties to participate.	A number of TSOs, including NGESO, were granted a derogation against the original target implementation date of December

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
			2019. The implementation date is no later than 30 June 2020.
Product Roadmap for Reactive implementation			
Implement approach for efficient reactive power flows between networks	Q4 2020-21	Having worked with network owners to design a whole system approach to managing reactive power flows between networks, implement that approach.	This work is expected to be delivered in Q4 2020-21, rather than Q2 2020-21. We have worked collaboratively with the DNOs over the past 12 months to identify the characteristics of reactive transfers at the transmission-distribution interface. We are continuing to assess the effectiveness of different solutions at that interface. As such, further work is required to understand what a whole system approach to reactive power management would look like, and how it may be implemented.
Power Potential trial with UKPN	Q4 2020-21	Innovation project in partnership with UKPN aiming to create a new reactive power market for DER and generate additional capacity on the network.	The project has been moved to Q4 2020-21 from Q4 2019-20 and is currently scheduled to commence in Q4 2020-21. This has proven to be more challenging than initially expected for what is a world first project to identify whether DER providers embedded within the Distribution network can provide dynamic voltage support to the Transmission network.
Review learning from Power Potential	Q3 2020-21	Learnings to inform whether to procure reactive power services from DER and if so, how to do so in partnership with DNOs.	This deliverable has been moved to Q3 2020-21 from Q4 2019-20 as both NGESO and UKPN are focused on the development of essential systems and readiness of Distributed Energy Resource (DER) participants.
Delivery of the Power Responsive initiative			
Power Responsive Stakeholder Engagement	Q4 2020-21	Promote industry developments for demand side flexibility and facilitate feedback to shape ESO deliverables through a range of engagement activities. These will include conferences, working groups, webinars, consultations, editorials, training sessions and reports.	
Support access for Intermittent Generation			
Deliver second phase of Power Available integration	Q3 2020-21	Phase 2b of Power Available (PA) is a continuation of the existing PA project to integrate the PA signal into the Control Room to enable greater use of wind for Mandatory Frequency Response (MFR). This will improve wind forecasting and response optimisation by blending PA with weather forecasts to provide a real time measure of output for wind units.	
Facilitate electricity network charging reform through Charging Futures			
Facilitate electricity network charging reform through Charging Futures	Q4 2020-21	Facilitate reform of arrangements across the whole electricity system by communicating with all users of the electricity system and creating	

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
1. Targeted Charging Review 2. Access and Forward Looking Charges SCR **3.** Reform of the Balancing Services Charges		opportunities for all users to learn, ask and contribute to reform. This will include: • Regular Forums • Webinars • Podcasts • Summary notes • Charging Futures website.	
Transform the customer experience for network charging			
Publications and guidance of the impact of charging reform to our customers	Q4 2020-21	Significant reform to the charging arrangements are expected over the 2019–21 timeframe. The Charging Futures project helps to facilitate industry input and guide users through reform. Complementary to Charging Futures, we will provide extra guidance on how this will affect users' charges in understandable, real terms.	
	Q3 2020-21	Provide industry with regular updates on the changes and impact that TCR will have to processes and deliverables, and ensure that guidance and publications fall in line.	
Introduce new 'new entrant' e-learning on charging	Q3 2020-21	Developing and roll-out further training such as webinar, workshops in addition to publishing guidance documents to help all parties understand charging methodologies, in particular the new TNUoS methodologies introduced through TCR. We aim to complete the following milestones: • Q1 2020-21 we plan to publish an updated webinar for connection charges • Q2 2020-21 we intend to publish an updated webinar for BSUoS charges • Q3 2020-21 we plan to develop workshops on the topics selected by the customers as part of the Charging Forum event • Q4 2020-21 we expect to publish an updated webinar for TNUoS charges with a focus on new charging methodologies introduced by TCR.	
Improve the digital customer experience for TNUoS, BSUoS and Connection Charging Data; including the introduction of a new NGESO billing system	Q4 2020-21	We are investigating options for updating our systems, and have a clear drive to put customer functionality at the heart of any new products. Our intent is to deliver the following objectives: • Q1 2020-21 we aim to complete the review of the current systems, data requirements and the information we currently provide externally, taking into account the TCR decisions. • Between Q2 – Q3 2020-21 a scope and plan will be outlined, we will look to develop the required changes throughout, by revisiting our scope and seeking feedback to ensure delivery is fit	

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
		for purpose and meets expectations, both internally and externally. • By Q4 2020-21 we will be looking to enter the implementation phase Please note, the above plan will be heavily impacted by the TCR and the required modifications. All planned updates will factor in the requirements outlined in our findings as we progress with implementing the required changes.	
Establish a 'cross party' approach to onboarding, mapping out whole industry requirements	Q4 2020-21	Work with other industry stakeholders such as ELEXON and Ofgem to provide a joint-up onboarding guidance document, mapping out the industry requirements and obligations. In Q1 2020-21 we plan to agree the approach and scope for the joint-up onboarding guidance with ELEXON By Q2 2020-21 we aim to engage with customers seeking their feedback and suggestions on the onboarding process In Q3 2020-21 we intend to begin drafting the guidance documents During Q4 2020-21 we will finalise and publish the guidance, incorporating the finalised new TNUoS and BSUoS charging methodologies.	
Making Electricity Market Reform (EMR) easier for participants			
Capacity Market (CM) Modelling – facilitating broader participation in the CM to provide security of supply at best value for consumers	Q4 2020-21	Investigate the various sources of technology type and capacity data that would enable a robust method to be developed and implemented into the future. Dependent on investigation improved methodology developed.	This deliverable has moved from Q4 2019-20 to Q4 2020-21. In order to fully meet this deliverable, a new register of embedded assets is required as sufficient consolidated data points are not available. To date a Distribution Connection and Use of System Agreement (DCUSA) modification has been raised seeking to create the necessary register of embedded assets. We are supporting this modification and are involved in the working group. Current timelines for modification approval are Q4 2019-20 subsequent work will then be required to develop a corresponding method. Therefore dependent on when the register is available, full implementation of the method may not be until Q4 2020-21.

B.4 Role 2 performance metrics

B.4.1 Current role 2 metrics

We have reviewed our existing suite of metrics for Role 2, and considered whether they continue to provide useful information for our stakeholders. We have also considered whether there is merit in introducing any of the RIIO-2 metrics or performance indicators in the last year of RIIO-1.

The current metrics for Role 2 are:

- Metric 4 – Provider journey feedback (quarterly)
- Metric 5 – Reform of balancing services markets (quarterly)
- Metric 6 – Code admin stakeholder satisfaction (quarterly)
- Metric 7 – Charging futures (quarterly)
- Metric 8 – Year ahead BSUoS vs outturn annual BSUoS (annual)
- Metric 9 – Month ahead forecast vs outturn monthly BSUoS (monthly)

In this section, we present each of the existing metrics, and discuss whether they should be retained for 2020-21.

Metric 4 – Provider journey feedback

This metric measures our feedback from stakeholders concerning four key points identified in the provider journey; Onboarding, Tendering, Contracting and Query Management. This metric drives focus on consumer needs, such as lowering costs, reducing barriers to entry, as well as facilitating the transition to a low carbon network. We report this metric on a quarterly basis and it measures the outcome of our provider experience deliverable. We send out three surveys with questions rated on a scale of 1-5, with 1 for strongly disagree and 5 for strongly agree. We send these surveys for Onboarding, Tendering and Query Management. This is then measured against a benchmark of 2.5, which was chosen in the absence of any historical data. For Contracting, this now takes the form of a check-in with Providers prior to their Contract Start to make sure all required arrangements are in place.

Some stakeholders have told us that this is a relevant metric, however we need to provide more clarity around how the overall score for the metric is calculated to enable them to comment on its ambition and provide greater justification for the benchmarks chosen. However, we note that response rates have been low, and therefore this metric does not provide a meaningful measure. For 2019-20 we have had zero responses for Onboarding from 15 people surveyed, and 31 responses for Tendering from surveying 156 people. For Query Management there have been 12 responses, however we do not have a record of the number sent out as it is a link included in our replies. We have received more valuable stakeholder feedback from publishing documents and holding events. We also believe that the stakeholder sections of our mid-year and end-of-year reports are more useful than this metric in giving a representation of the stakeholder feedback that we receive.

We therefore propose to remove this metric for 2020-21.

Metric 5 – Reform of balancing services markets

Part 1:

This quarterly metric shows how significant the barriers to participation in different markets for different technology types are, and when we are expecting those barriers to be addressed as a result of our deliverables. In some markets, a technology type will have no difficulty in gaining access and participating; these are marked as green. In some markets, it is not possible to participate due to technical or commercial restrictions; these are marked as red. Other markets may still have restrictions in place, but we have worked to develop interim or manual processes to facilitate participation whilst we work on permanent solutions; these are amber.

The intention of this metric is to illustrate how the ESO is working to lower barriers to entry for different types of provider, and show when we have either achieved or missed our targets. It is effectively providing the “so what” for each one of our deliverables. For example, once the specific deliverables under “Improving Balancing Mechanism Access for Virtual Lead Parties” are delivered in Q4 2019-20, the RAG status for “Balancing Mechanism” for all non-BM technologies will move from red to amber.

We note that this metric tracks the completion of particular deliverables under Role 2 which remove barriers to participation in different markets. The same information could be obtained from the Plan Delivery sections of our quarterly, mid-year and end-of-year reports, where we provide commentary on the deliverables which were due to be completed in this period.

We also note that this metric is not always clearly interpreted by stakeholders, and does not form part of our RIIO-2 proposals.

We therefore propose to remove this metric for 2020-21, as the information contained within it will be provided elsewhere in our reporting.

Part 2:

This quarterly metric measures the direction of travel away from bilateral arrangements towards open and accessible market opportunities. For each service; Frequency Response, Reserve, Reactive, Black Start and Constraints, we will report the cumulative spend broken down into two categories of procurement approach: Competitively Procured or Bilateral. Previously we reported on three categories (Mandatory, Commercial, and Tendered), however this gives a misleading picture of the competitiveness of our markets, as some commercial products had been tendered initially, and some mandatory services are not competitively procured.

Competitively procured includes all regularly held markets open to prequalified providers, such as Mandatory Frequency Response (excluding repositioning payments made through the BM), Firm Frequency Response (FFR), Short Term Operating Reserve (STOR), Fast Reserve, the Auction trial, etc. It also includes any procurement that involved an open and competitive tendering process, such as Enhanced Frequency Response, Black Start Competitive Procurement Events, Pathfinders, etc. Bilateral includes any procurement which was undertaken through competitive negotiation between NGESO and third parties, and any optional services which are instructed under a bilateral framework agreement.

Stakeholders welcome the inclusion of this metric, however they did not agree with our previous justification for not setting performance benchmarks. We therefore propose to set performance benchmarks for 2020-21, in line with the benchmarks set for RIIO-2.

Table 6 – Balancing services

	Current % through open and competitive procurement (Q2 2019-20)	Proposed 2020-21 Target
Frequency response	81%	85%
Reserve	43%	50%
Reactive	0%	5%
Black start	0%	10%
Constraints	0%	10%
Frequency response	81%	85%

This metric currently shows the spend in each market, and we have received feedback from stakeholders that historic data, and data showing volumes, would also be of interest. We have observed that the introduction of more competitive approaches into these markets have driven down the price, and therefore historic data may indicate that less money is being spent in tendered markets. Publishing volumes is not always straightforward, as many of these services (such as frequency response) are not a standard product, however we will investigate this for future reporting. Introducing an additional table showing the market price in each market, which would be accompanied by a supporting commentary, would provide a more complete picture of the situation. Stakeholders have sought clarification of the meaning of mandatory frequency response: this is now explained in the metric description above.

For 2020-21, we therefore propose to publish the updated metric with the two new categories showing the spend in each market (along with how it compares to the benchmark), and also publish the market price in each market.

Metric 6 – Code admin stakeholder satisfaction

This is a quarterly metric that monitors our performance against our Facilitating Code Change and Transforming Industry Frameworks deliverables, which enable all network users to contribute more effectively to future arrangements. We measure our performance by issuing Code Administration Code of Practice (CACoP) and stakeholder surveys as well as delivery of outputs benchmarked with our previous scores.

Although we were disappointed in our CACoP survey scores from 2019, we have taken on board valuable stakeholder feedback as part of this process. Retaining this metric would measure whether we have resolved stakeholders' concerns in this area.

We propose to retain this metric for 2020-21.

Metric 7 – Charging futures

Charging Futures will help realise benefits to the end consumer by stimulating competition and facilitating an expanding market by reducing barriers to entry for new customers. This will lead to greater choice and enhanced service for consumers. We will also be managing a complete and collaborative cross-system change process by allowing the industry to fully understand how a new charging and access regime can drive the most efficient use of the network, while recovering costs fairly for consumers. Our role as lead secretariat for Charging Futures allows us to exhibit our proactive stance in helping the industry to best engage with charging reform. Our performance should be judged on how well we can enable the industry change process.

We have committed to three engagement objectives to best support measuring our performance for delivering electricity network charging reform through Charging Futures:

- Learn about electricity network charging across the whole system today, and how it could change in the future
- Regularly ask charging and regulatory experts questions related to upcoming reform
- Be able to contribute through the differing stages of reform

This metric is reported on a quarterly basis and benchmarked on the average feedback scores received throughout the performance year 2018-19, the baseline score was identified as 7.3 (on a score from 1-10).

We propose to retain this metric for 2020-21. To maintain consistency, we will continue to use the same benchmark to measure our performance.

Metric 8 – Year ahead BSUoS vs outturn annual BSUoS

This metric compares the BSUoS forecast made at the start of the financial year against outturn using the concept of an Absolute Percentage Error (APE). An annual BSUoS forecast is vital for those parties seeking to price long-term products; such as electricity suppliers providing fixed price supply contracts to domestic consumers. The better the forecast, the lower the risk premia that needs be added to the supply contract and as a result this lowers the cost for the end consumer.

Stakeholders felt that this metric is not ambitious enough. They would like to better understand what we are trying to demonstrate with these measures by explaining what steps are needed to improve BSUoS forecasts and why this is a challenging initiative: this is outlined below.

We have recently introduced a new model for BSUoS forecasting, however improvements beyond this would require significant investment: given that BSUoS may be fixed in the future it would not be efficient to invest further in improvements to forecasting.

We note that our ability to forecast BSUoS is impacted by factors outside of our control, such as unplanned transmission outages. However, we recognise that BSUoS forecasts are important to our customers, and as such we will continue to measure our performance in this area, and provide justifications for where the outturn level differs from the forecast. The performance benchmarks are set as follows:

- Exceeds benchmark: under 10% APE.
- In line with benchmark: proposed baseline target is less than 20% APE.
- Below benchmark: greater than 20% APE

We propose to retain this metric for 2020-21, and will focus on providing justifications where the outturn level differs from the forecast. We propose to maintain the same set of benchmarks as previous years, so that it is possible to compare our performance with previous years. We also note that, regardless of the existence of these benchmarks, we will strive to forecast BSUoS as accurately as possible ahead of time, and closer to real time we will endeavour to keep balancing costs as low as possible.

The BSUoS forecast for 2020-21 will be included in the final version of this Forward Plan, as it will be produced in March 2020 using the latest information available.

Metric 9 – Month ahead forecast vs outturn monthly BSUoS

This metric is reported monthly and measures the absolute percentage error in BSUoS forecasting for each month. The performance benchmarks are set as follows:

- Exceeds benchmark: less than 5 out of 12 monthly forecasts are above 20% APE, and 5 or more forecasts less than 10% APE
- In line with benchmark: Less than 5 out of 12 monthly forecasts above 20% APE
- Below benchmark: 5 or more out of 12 monthly forecasts above 20% APE

There is significant volatility in the comparison of our month ahead forecast with the outturn. If we examine the percentage variance, then 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. We propose to maintain the same set of benchmarks as previous years, so that it is possible to compare our performance with previous years. We also note that, regardless of the existence of these benchmarks, we will strive to forecast BSUoS as accurately as possible ahead of time, and closer to real time we will endeavour to keep balancing costs as low as possible.

BSUoS forecasts are important to our stakeholders, although we note that our ability to forecast BSUoS is impacted by factors outside of our control. We propose to retain the same performance benchmarks, so that any trends in our performance can be easily tracked.

Our monthly BSUoS forecasts are published on our website six weeks ahead of the month to which they refer.

We propose to retain this metric for 2020-21.

B.4.2 RIIO-2 metrics and performance indicators for role 2

Our December Business Plan sets out our proposed metrics for RIIO-2. As part of RIIO-2 we have also proposed a number of performance indicators to sit alongside these metrics. The performance indicators provide a wider view of the ESO performance, but are not proposed as formal RIIO-2 metrics because they are items over which the ESO may not have direct control, or measurement can be challenging with a risk of duplicate reporting.

For each RIIO-2 metric or performance indicator, we have considered whether it should also be introduced for 2020-21. Our considerations for each are outlined in the sections below.

- Proportion of balancing services procured through competitive means
- Electricity Market Reform (EMR) decision quality
- Electricity Market Reform (EMR) demand forecast accuracy (Accuracy of T-1 and T-4 peak demand forecast)
- Code Administrator Code of Practice survey
- Consumer value savings from Code modifications (performance indicator)

Proportion of balancing and ancillary services procured through competitive means

We will measure the proportion of balancing services procured competitively. This will promote consumer value by ensuring we buy the optimal volume of balancing services at the lowest cost.

This metric is aligned to our ambition to create competition everywhere and shows the total spend per market and the proportion spent in the three categories; Mandatory, Commercial (other bilateral arrangements) and Tendered (open, competitive markets) volumes. This is consistent with our existing metric 5 part 2 (reform of balancing services markets), so continuing to publish our existing metric will provide continuity as we move towards the RIIO-2 period.

Electricity Market Reform (EMR) decision quality

The higher the number of participants in Capacity Market auctions, the more effective these auctions will be. We support applicants through the prequalification process for the auctions, including through our single markets portal that we are currently in the process of developing. At the same time, we make sure that applications meet the standards, set by Government and Ofgem, to ensure fairness and minimise delivery risks. The quality of our decision-making is key to promoting high levels of participation in auctions that are efficient.

As Electricity Market Reform is subject to a separate incentive mechanism for the RIIO-1 period and does not contribute to the Forward Plan incentives, we propose not to introduce this metric during RIIO-1.

Electricity Market Reform (EMR) demand forecast accuracy

We aim to optimise the volume of capacity procured in the Capacity Market during RIIO-2 through more accurate forecasts of peak demand, which is used by the Secretary of State to determine the volume of capacity to procure. Over-forecasting leads to unnecessary capacity, increasing the cost to consumers, while under forecasting leads to either more capacity needing to be procured later (potentially at a greater cost) or risks security of supply. We are also proposing a metric on the accuracy of both the T-1 and T-4 peak demand forecasts.

As Electricity Market Reform is subject to a separate incentive mechanism for the RIIO-1 period and does not contribute to the Forward Plan incentives, we propose not to introduce this metric during RIIO-1.

Code Administrator Code of Practice survey

We administer the following codes:

- Connection and Use of System Code (CUSC)
- Grid Code
- System Operator-Transmission Owner Code (STC)

We aim to improve the quality of the service we provide as code administrator. A higher quality of service will help our customers be more efficient, and in turn help them to deliver benefits to consumers. It will also remove barriers for smaller parties to be able to participate in the codes process, thus promoting competition. We propose that we continue to be measured using a Customer Satisfaction Score (CSAT) which is aligned with the other code administrators' surveys as part of the Code Administrator Code of Practice (CACoP) process. This survey will be reported separately to our ESO Customer and Stakeholder satisfaction survey metric as it follows a separate survey process which aligns to the CACoP process.

This matches our current metric 6 (Code Admin stakeholder satisfaction), so retaining our existing metric for 2020-21 will provide continuity as we move towards the RIIO-2 period.

Consumer value savings from Code modifications (performance indicator)

This metric assesses the benefit of implementing code modifications against a defined counterfactual. This relates to the code manager role which we have set out as part of our RIIO-2 business plan, where we are proposing to take a more strategic role in driving forward those code modifications which bring the greatest benefit for consumers.

As such, we do not propose to introduce this metric during 2020-21.

B.4.3 Proposed metrics for 2020-21

Our proposed metrics for Role 2 are therefore:

- Reform of balancing services markets – spend and market price in different markets
- Code admin stakeholder satisfaction
- Charging futures
- Year ahead BSUoS vs outturn annual BSUoS
- Month ahead forecast vs outturn monthly BSUoS.

Role 3

System insight, planning and network development

C. Role 3 System insight, planning and network development

C.1 Vision and Strategy

Our deliverables under Role 3 reflect a clear direction of travel towards our 2025 ambitions. Our ESO Mission is to enable the transformation to a sustainable energy system and ensure the delivery of reliable, affordable energy for all consumers. Success in 2025 looks like:

- An electricity system that can operate carbon free
- A whole system strategy that supports net zero by 2050
- Competition everywhere
- The ESO is a trusted partner

We articulate below how our activities under Role 3 will help us to achieve these goals.

An electricity system that can operate carbon free

Our activities under Role 3 will bring us a step closer to being able to operate the system carbon free. For example, by contracting with Distributed Energy Resources (DER) for balancing services, and progressing the Stability Pathfinder, we will be able to procure essential system services from non-traditional providers, reducing our reliance on conventional generation. Our insights documents such as the Future Energy Scenarios will explore the different energy pathways and will feed into an assessment of which investments would be needed under each scenario: this will allow for recommendations to be made as part of the Electricity Ten Year Statement (ETYS) and Network Options Assessment (NOA) documents to enable the network to accommodate carbon-free operation.

A whole system strategy that supports net zero by 2050

As part of our whole system thought leadership, we will support BEIS and Ofgem in building a fuller understanding of the potential pathways to reaching net zero by 2050. This will involve collaborating with network companies and wider industry to explore the future uncertainties in decarbonisation. We will use events, bilateral meetings, and publishing thought pieces and analysis to stimulate debate and find consensus on actions that need to be taken across industry. In producing the Future Energy Scenarios, particularly our “FES: Bridging the gap to net zero” work, we will consider the uncertainty highlighted in our FES scenarios and explore and actions required for decarbonisation of the whole system.

Competition everywhere

Under Role 3, we are encouraging increased participation from stakeholders as part of our Competition Everywhere goal. Our focus on the Pathfinder projects and developing the Network Options Assessment will increase the options for system constraints to be addressed by non-traditional solutions, and will allow new parties to bring forward their ideas. Our work on facilitating balancing services from Distributed Energy Resources (DER) will bring increased competition to the market, driving down prices.

The ESO is a trusted partner

We are also working towards our ambition of becoming a trusted partner: working closely with our stakeholders and taking on board their feedback is a key element of our pathfinder projects. As part of our Regional Development Programmes we work closely with distribution network operators and other local stakeholders. We are developing a customer connections portal, giving customers increased visibility of the progress of their connection application. We also engage extensively as part of producing our Insights documents, and we are working hard to improve the accessibility of the Electricity Ten Year Statement and Network Options Assessment publications.

C.2 Consumer benefits

C.2.1 How our role 3 deliverables benefit consumers

The table below illustrates how our high-level deliverables in Role 3 benefit consumers, focussing on the following aspects of consumer benefit:

- Improved safety and reliability
- Reduced environmental damage
- Lower bills than would otherwise be the case
- Improved quality of service
- Benefits for society as a whole

We note that Role 3 relates mainly to long-term activities, and therefore most of the consumer benefits associated with its deliverables will not materialise until several years in the future. However, we believe that the deliverables we set out in this Forward Plan are the right areas of focus to drive significant benefits for future consumers.

In 2020-21 we are going to deliver…	Benefitting energy consumers now…	…and in the future
Whole electricity system thought leadership	We will work with industry to co-ordinate the different approaches which are being taken to resolve regional issues, ensuring that consumers do not incur unnecessary costs. For example, we will work with distribution networks to resolve voltage issues, contributing to improved reliability, and avoiding unnecessary spend.	Our work on the ENA open networks project will mean that markets and infrastructure build can be optimised across different voltage levels, leading to reduced environmental damage and lower bills than would otherwise be the case. Our work on Clean Heat will find a way to reduce the environmental damage associated with heating, and will bring benefits for society as a whole by ensuring that consumers can heat their homes in an affordable and sustainable way. This is increasingly important as we move towards a low-carbon world.
Ongoing Regional Development Programmes	The Regional Development Programmes use whole system thinking to resolve regional issues. These programmes avoid the unnecessary restriction of capacity, for example unlocking distributed energy resources to manage transmission constraints in Scotland, and allowing more photovoltaic generation to connect and generate in the South West. This allows for a higher proportion of generation to come from renewable sources, contributing to reduced environmental damage, and lowering balancing costs by minimising the effect of transmission constraints.	As more renewable generation is built, and the UK seeks to meet its climate change targets, automated dispatch capability for generation in highly constrained areas will allow more renewables to connect to the system in the absence of network investment, contributing to reduced environmental damage and increased competition.
Pathfinder Projects	Pathfinder projects are about “learning by doing”, and we are actively engaging with our stakeholders to find new commercial solutions as alternatives to transmission build, to resolve issues such as stability and voltage. This transparency is new for those participants who historically have not been able to provide solutions to transmission issues and improved information provision is a key enabler to get involved.	As the pathfinder projects progress, we will find the most economic way to operate a low-carbon system, contributing to lower bills than would otherwise be the case, and reduced environmental damage where the need for infrastructure build can be reduced. Seeking alternative solutions to transmission build is also expected to be more cost-effective.
Study tools	Improved study tools will allow the ESO to carry out multiple permutations of system studies, rather than just studying for system peak. This improved visibility is necessary as the network becomes more complex, and contributes to improved reliability, and confidence in our decision-making.	Improvements to study tools will give us more confidence in our system studies, contributing to increased system security, and meaning that we can spend less on balancing costs and reserve products than would otherwise be the case.

In 2020-21 we are going to deliver…	Benefitting energy consumers now…	…and in the future
NOA enhanced communication	We will provide an improved quality of service to our stakeholders, providing them with the information they need and enhancing their opportunities to engage with us.	Improved communication should lead to more high-quality submissions to the NOA processes, as those submitting options will have a better picture of the system need which they are trying to address, especially as we consider a wider range of system issues. Making the process more accessible in this way should result in increased competition, and therefore lower bills than would otherwise be the case. By doing this we will engage with more participants who can potentially offer solutions to meet transmission needs and in so doing drive competition.
Insights documents	We will engage extensively as part of the development of these documents, providing a valuable service by ensuring that high-quality conversations take place between stakeholders, and our analysis is reflective of industry's view of the future.	These documents feed into long term network planning, ensuring that bills remain as low as possible, and environmental damage is minimised as infrastructure will only be built where necessary.
Early competition	We will develop a model for Early Competition in consultation with our stakeholders, providing a high-quality service and designing a model which will maximise the potential consumer benefit.	The implementation of Early Competition will benefit future consumers by allowing for alternative options to be considered and the most economic one selected, contributing to lower bills than would otherwise be the case. Running the competition at an early stage will also give the opportunity for innovation, as the chosen solution will not be constrained by planning permission already being in place. An early competition also gives continuity between the consenting process and the eventual construction of the project, providing a better service to our stakeholders.

C.3 Role 3 deliverables

We have revised our deliverables in Role 3 to ensure that we are focussing our resources in the areas which best deliver value for consumers. We have also mapped the deliverables from the original Roles 3 & 4 (facilitating whole system outcomes and supporting competition in networks) to the new Role 3 (System insight, planning and network development), meaning that the insights documents now fall into Role 3. Deliverables relating to outage planning have moved from Role 3 to Role 1.

In the table below, we have identified our priority deliverables for this role.

C.3.1 Role 3 deliverables

Deliverable	Target delivery date
Support BEIS and industry in developing a strategy for clean heat	Ongoing
FES: Bridging the gap to net zero	Q3-Q4 2020-21
Early Competition plan setting out implementation for models (priority)	Q4 2020-21
Whole electricity system learnings publication	Q3 2020-21
Commercial contracts for balancing services from DER	Q4 2020-21
Enhanced systems to facilitate balancing services from DER	Q1 2021-22
Automated dispatch capability for generation in highly constrained areas	Ongoing
Stability pathfinder (priority)	Q3 2020-21
Mersey Voltage pathfinder: Project recommendations (priority)	Q1 2020-21
Pennines Voltage pathfinder: Project recommendations (priority)	Q3 2020-21
Constraint Management Pathfinder (priority)	Q1 2020-21.
Voltage needs identification tools/ processes	Ongoing
Improve accessibility of ETYS and NOA publications (priority)	Ongoing
Develop a system wide single platform to provide online account management and connection application functionality	Ongoing
Summer Outlook	Q1 2020-21
Future Energy Scenarios	Q2-Q3 2020-21
Winter Outlook	Q3 2020-21
Winter Review and consultation	Q1 2020-21
Operability Strategy Report	Q1 and Q3 2020-21
Lead the of Loss of Mains programme Protection setting (priority)	Q3 2020-21

C.3.2 Changes to our role 3 deliverables

In this role, we continue to focus on the Pathfinder Projects, developing the Network Options Assessment, and the Regional Development Programme projects.

In updating our deliverables, we have added deliverables to reflect new areas of work which have emerged (such as Early Competition), and changed the dates of some deliverables to reflect our revised work plan (such as the dates of the pathfinder projects which we have revised to take on board learnings from the earlier pathfinder projects).

C.3.3 New role 3 deliverables

Deliverable	Target delivery date	Description	Reason for adding deliverable
Whole electricity system thought leadership			
Support BEIS and industry in developing a strategy for clean heat	Q1 and Q3 2020-21 Ongoing	Advise on the implications of clean heat pathways for the operation of the gas and electricity systems. Develop a fuller understanding of how we would operate the transmission networks under different clean heat pathways; working with the gas system operator, consulting with industry and publishing thought pieces.	This sets out how we will work towards our ESO ambition of a whole system strategy that supports net zero by 2050.
Insights Documents			
FES: Bridging the gap to net zero	Q3-Q4 2020-21	Taking the key messages from the 2020 Future Energy Scenarios, identify and progress the actions that need to happen to meet the net zero target. This work will be informed by feedback from the 2019-20 performance year of our FES: Bridging the gap to net zero project.	We plan to publish this document which will set out our path towards the Net Zero target, in line with the ESO mission. Stakeholders will be kept engaged through newsletters directing them to publications as the project moves forward.
Early Competition			
Early Competition plan setting out implementation for models	Q4 2020-21	Further supporting our ambition of competition everywhere, throughout 2020-21 we will be developing an Early Competition Plan. This follows on from Ofgem's ask in the May RIIO-2 Sector Specific Methodology Decision and their further letter. Through the year we will be building on our December update on the Early Competition Plan, continuing to collaborate with stakeholders on the detailed development of the shortlisted models. This will involve workshops and engagement events carried out throughout the year.	The Early Competition Plan will facilitate competition to meet system needs from parties delivering asset based solutions in addition to non-network solutions. Models will be designed to work both pre and post any Competitively Appointed Transmission Owner (CATO) legislation. During the course of the project we will be exploring whether delivery of any elements can be accelerated to maximise consumer value.

C.3.4 Role 3 deliverables from 2019-21 Forward Plan

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
Whole electricity system thought leadership			
Whole electricity system learnings publication	Q3 2020-21	Update on 2019-20 deliverable as to how our initiatives and innovation projects are supporting whole electricity system thinking and identifying potential new areas of work.	This is now expected to be delivered in Q3 2020-21 rather than Q2 2020-21 reflecting the delayed delivery date of the 2019-20 'Whole electricity system learnings publication' deliverable. This was pushed back from Q2 2019-20 to Q4 2019-20 to better align with industry initiatives (including Ofgem's work on DSO) and ESO publications including draft 2020-21 Forward Plan and RIIO-2 final business plan.
Ongoing Regional Development Programmes			
Commercial contracts for balancing services from DER	Q4 2020-21	Implementation of new commercial contracts to allow DER to participate in the provision of transmission constraint management services in our in-flight RDP areas.	
Enhanced systems to facilitate balancing services from DER	Q2 2021-22	Implementation of enhanced systems and ways of working between transmission and distribution to support provision of transmission services by DER, including DER MW dispatch capability between NGESO, DNOs and DER.	An agreement on the commercial strategy is fundamental to developing the technical dispatch solution. There is a risk that the date could slip for this deliverable if agreement isn't reached with each respective DNO. The target delivery date has therefore been amended from Q1 2020-21 to Q2 2021-22.
	Q4 2020-21	Inter-tripping of DER for transmission fault management.	There are some project risks associated with the delivery of the necessary Inter Control Communication Protocol (ICCP) link and the required TO outages. The delivery date has been delayed from Q1 2020-21 to Q4 2020-21.
Automated dispatch capability for generation in highly constrained areas		To development and implement the Generation Export Management Scheme (GEMS) in South West Scotland to manage transmission constraints using large volumes of additional transmission connected renewable generation in an economic and efficient way by delivering the following:	
	Q4 2020-21	Inter-tripping of DER for transmission fault management.	

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
	Q1 2022-23	Implementation of GEMS in accordance with agreed plan.	Design and implementation is currently underway. The proposed 'go-live' date of GEMS is planned for Q1 2022-23, in line with customer connection agreement dates. Completion of detailed design and procurement processes for necessary ESO and TO systems will be our main activity throughout 2020-21.
	Ongoing	Development of suitable interface with DNO Active Network Management scheme in South-West Scotland to incorporate efficient despatch of embedded generation for transmission constraint management.	There are two phases to the DNO ANM roll-out in South West Scotland. Phase 1 'go-live' will likely commence from Q4 2020-21 and will trial certain data exchange and service conflict principles. Phase 2 (suitable interface with GEMS) will commence from Q1 2022-23, with an extended roll-out into 2023.
Pathfinder projects			
Stability pathfinder	Q3 2020-21	Assessing a range of commercial and network solutions to meet system stability needs. When we refer to stability in this context we are talking about the stability of frequency, voltage and the ability of a network user to remain connected to the system during normal operation, during and after a fault. We will develop and test processes to define requirements of transmission system stability needs, focussing on dynamic volts, inertia and fault levels as an indication of system stability requirements. We will develop and test processes to obtain and evaluate options to meet the requirements set out through technical and economic assessment. We will develop a methodology for inclusion in the NOA methodology for 2020-21.	For the Stability Pathfinder, feedback from the RFI has given us more information on potential providers' time constraints. We have therefore extended our timescales to allow more time to run the tender process, for providers to participate and evaluate the options. Completion is now expected to be in Q3 2020-21, rather than Q1 2020-21.
Mersey Voltage pathfinder: Project recommendations	Q1 2020-21	Conduct post tender evaluation through NOA based criteria and assessment to determine the best combination of asset and commercial solutions for meeting the regional high voltage needs. This will develop the necessary contract arrangements to facilitate participation by new and existing providers.	This project has been delayed to Q1 2020-21 as short term requirements have been given priority as these are required to maintain network compliance. The long-term pathfinder tender was issued on 25 November 19. The final tender will close at the end of February 20, and we will be making a final decision on 24 April 20 to award the tender.
Pennines Voltage pathfinder	Q3 2020-21	We will continue the high voltage project in the Pennine region to also consider market based solutions, include commercial solutions and further develop the necessary funding mechanisms to facilitate the participation of DNO solutions.	The notification of Fiddlers Ferry generation closure forced a reprioritisation of resources for voltage assessments from the Pennines to the Mersey area. Hence we have delayed the Pennines project from Q1 2019-20 to Q1 2020-21. This has also given us the opportunity to take learnings from the Mersey pathfinder and apply this to

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
			the Pennine region. The expected delivery date for Project recommendations will therefore be postponed to Q3 2020-21 from Q3 2019-20.
Constraint Management Pathfinder	Q1 2020-21	The aim of this project will be to provide a commercial product based around constraint management. We will analyse the impact of constraint services in an attempt to alleviate network congestion, reduce balancing costs, and deliver greater value to Great Britain consumers as the electricity network evolves.	We will complete the RFI stage of the Constraint Management pathfinder during Q1 2020-21, and then taking into account the results received from the RFI we will make a decision as to whether it is cost-effective to run a tender process, and if a tender is deemed to be cost-effective then its design will depend on the feedback received as part of the RFI process.
Study tools			
Voltage needs identification tools/ processes	Q4 2020-21	Document and test voltage needs identification tools / processes for inclusion in the NOA methodology. Identify up to three areas for further evaluation.	The three areas identified are: • Historical Data Mining Tool to be developed and tested in Q1 2020-21 • Initial view on potential next priority region(s) for high voltage assessment planned for Q1 2020-21 (dependent on delivery of Data Mining Tool) • Output for Network Innovation Allowance (NIA) project and investigating a proof of concept for year-round voltage needs identification and optimisation tool scheduled for Q4 2020-21
	Ongoing	Continuous improvement of the tools & processes.	
NOA: Enhanced communication			
Improve accessibility of Electricity Ten Year Statement (ETYS) and Network Options Assessment (NOA) publications	Ongoing	We will enhance the information that is provided on system needs to allow a wider audience to better understand needs and propose solutions to meet them. We will continue to engage with stakeholders on the development of capabilities and implementation of the Network Development Roadmap. Publication of needs to the market through RFI packs, which are supported by webinars. Enhancements to information in ETYS, to include requirements for a wider set of system needs and more detail on existing system needs. Provide regular updates to stakeholders on the progress of pathfinding projects and continue engagement with impacted stakeholders through mechanisms such as the ENA Open Networks project.	

Deliverable	Delivery date	Description	Changes since 2019-21 Forward Plan
Enhanced customer experience			
Develop a system wide single platform to provide online account management and connection application functionality	Ongoing, due to be completed in Q3 2022	Detailed scoping of tool to provide a visual and live update for customers on the progress of their connection application.	Feedback suggested that a single coordinated solution covering applications in all parts of the GB network would provide the greatest value. We will continue to develop specification and design for this tool to enable build during RIIO-2.
Insights documents			
Summer Outlook	Q1 2020-21	Provides our view of the electricity system for the upcoming summer.	
Winter Outlook	Q3 2020-21	Provides our insights on security of supply for the upcoming winter for electricity.	
Winter Review and consultation	Q1 2020-21	Provides our insights on security of supply for the upcoming winter for electricity.	
Future Energy Scenarios	Q2-Q3 2020-21	Provides our range of credible scenarios for the future of energy to support the planning of the Great Britain transmission system. In Q2 we will produce the FES publication, hold the FES conference, and publish a call for evidence. In Q3 we will run FES workshops.	
Operability Strategy Report	Q1 and Q3 2020-21	Provide a view of current and future operability challenges, to help inform stakeholders' investment strategies, and commercial and operational plans.	
Whole system operability			
Lead the of Loss of Mains programme Protection setting	Q3 2020-21 Ongoing for 2020-21	Review and update the methodology for how we intend to procure balancing services from Distribution Network Owners (DNOs) to enable RoCoF and vector shift changes. Lead the Accelerated Loss of Mains programme and provide assurance of value for money via quarterly performance reporting.	Programme commenced in October 2019.

C.4 Role 3 performance metrics

C.4.1 Current metrics for roles 3 & 4

We have reviewed our existing suite of metrics for Roles 3&4, and considered whether they continue to provide useful information for our stakeholders. We have also considered whether there is merit in introducing any of the RIIO-2 metrics or performance indicators in the last year of RIIO-1. Our proposals are below, and we welcome your feedback which we will use to shape our final Forward Plan for 2020-21. As a result of the new role structure set out by Ofgem, some metrics will move between role areas: this is specified further below.

The current metrics for Roles 3&4 are:

- Metric 10 – Whole System, Unlocking Cross Boundary Solutions (quarterly)
- Metric 11 – System Access Management (monthly)- this will move to Role 1
- Metric 12 – Customer Value Opportunities (quarterly)- this will move to Role 1
- Metric 13 – Connection Agreements Management (monthly)
- Metric 14 – Right First Time Connection Offers (monthly)
- Metric 15 – NOA consumer benefit (annual)
- Metric 16 – Enhancing Communication (quarterly)

We have reviewed stakeholder feedback to assess whether the existing suite of metrics continues to be useful. In this section, we present each of the existing metrics, and discuss whether they should be retained for 2020-21.

As benchmarks are required for our metrics, we have also included some Performance Indicators, which are measures for which it is not appropriate to set a benchmark. For each Performance Indicator, we explain why a benchmark cannot be set.

Metric 10 – Whole System, Unlocking Cross Boundary Solutions

This is reported on a quarterly basis and is designed as a measure of the effectiveness of the systems, contracts and processes we implement in 2019-21, as measured by new capacity contracted at distribution level. We are unlocking additional generation connections through the new ways of working we are putting in place. Without our new ways of working, the generation wishing to connect would have to wait for network reinforcements to be completed before being able to connect, which could be years in the future. We have established new commercial arrangements, between three parties (ESO, DNO, generators), instead of the traditional bilateral arrangements. We also have put technical arrangements in place to manage power-flow congestion across network boundaries. Our work with DNOs helped to identify commercial and operational solutions that enable access to be provided to new embedded customers more quickly than previous methodology allowed, this has resulted in increased volumes of low carbon generation connecting to the network.

This metric measures the outcomes of the deliverables relating to the Regional Development Programmes (RDP) and the Proactive RDP Identification Process, and demonstrates the volume of Distributed Energy Resources (DER) which have been connected, which should lead to savings in infrastructure costs (avoiding or deferring the need to build additional assets to cope with further DER connections), and reduce balancing costs by promoting competition in the provision of balancing services. Assessment of the ESO's performance is on an ex-post basis, using the level of DER MW that have signed contracts to connect to the distribution networks; and a narrative setting out how we have established the conditions under which these new connections have been made possible.

Stakeholders believe measuring the volume of additional DER connected is a suitable metric and is relevant to the work undertaken in relation to this role. Most stakeholders welcomed this metric, with some calling for it to be expanded to include volumes that have been enabled by the RDPs, and volumes contracted to participate in transmission constraint management.

We propose to retain this measure as a Performance Indicator for 2020-21. This is classified as a Performance Indicator rather than a metric: it is not appropriate to set a target, as we cannot accurately predict the extent of participation in the process, as it is a trial process which relies on DNOs volunteering to take part. We will continue to report on south-east and south-west England, and we may increase the areas covered by our reporting as we have moved both Northern Powergrid (NPG) and Electricity North West (ENWL) into the Appendix G process and this is allowing for increased volumes of embedded generation in their networks too. We are therefore proposing this measure as a Performance Indicator for 2020-21.

Metric 11: System Access Management

This metric is reported on a monthly basis and measures the outcomes of:

- Deeper outage planning
- Transmission Outage and Generator Availability (TOGA) replacement.

The cancellation of outages is important from both a consumer and stakeholder perspective, as planned outages allow for the timely progression of TO and DNO network reinforcement projects, many of which will resolve system constraints or improve safety and system reliability when completed. Cancellation of outages can also result in network companies standing down contractors, a cost which will eventually be met by the end consumer.

This metric is useful in driving down the number of planned outages that are delayed by more than an hour or cancelled by the ESO in the control phase due to process failure. It encourages the ESO to investigate the causes of outage cancellations, and amend processes where appropriate to prevent a repeat. We will continue to cancel system access requests where needed, but this number should be as low as possible to avoid unnecessary costs for external stakeholders, and the ESO's costs in re-planning these requests. This measure is a count of the number of outages out of every 1,000 delayed by more than an hour, or cancelled within day. We have reviewed the current targets and believe they should be lowered further to be more ambitious, as our current performance is 3.68 outage cancellations per 1000 outages, this is based on eight months of data. Therefore, the benchmark has been updated to a baseline target of 5 outage cancellations per 1,000 outages, with an exceeding target of 3 outage cancellations per 1000 outages.

Stakeholders requested the inclusion of this metric in RIIO-2, as it measures an aspect of system operation which is important to them. Although some have argued that reducing outage cancellations is a baseline activity, publishing this metric drives a particular focus on this area where the ESO has real potential to drive consumer benefit by enabling the timely progression of planned outages. However, it is important to note that our overall focus remains on optimising overall system costs, rather than solely on minimising changes to planned outages.

We propose to retain this metric for 2020-21. We note that under the new role areas set out by Ofgem, in 2020-21 this metric may form part of Role 1.

Metric 12: Customer Value Opportunities

This performance metric also measures the outcomes of:

- Deeper outage planning
- Transmission Outage and Generator Availability (TOGA) replacement.

It is reported on a quarterly basis and captures the BSUoS and customer savings from the following ESO activities:

- Coordinating with the TO to calculate the cost benefit analysis of outage requests
- Minimising the duration of outages requested by the TO
- Moving outages in coordination with the TO using the System Operator-Transmission Owner Code Procedures (STCP) 11-4
- Accepting and planning additional high value outages received within year,
- Optimising outage placement including nesting of outages,
- Proposing alternative solutions to the TO such as temporary connections for generation affected by long outages
- Changing outages within year using STCP 11-3
- Reassessing system capacity.

This aims to measure the performance of our network access planning process in transmission outage optimisation by capturing direct and indirect savings to the end consumer.

The metric targets are split into direct and indirect savings to the end consumer. The direct savings to the end consumer are those that are tied to BSUoS cost savings, while the indirect savings are those that positively affect our customers (such as generators and DNOs) and ultimately give benefit to the end consumer. The target values for Scotland Outage Planning are set from historic measurements and performance. When this metric was originally introduced, we did not have historical data for the North and South Outage Planning teams which cover England and Wales. However, throughout the 2019-20 performance year, post legal separation from NGET TO, we have developed a benchmark target of 7000 - 11 000GWh with an exceeding target of >11000GWh for 2020-21. This was calculated using the limited data we have now obtained to include England and Wales, and to take into account that we have so far outperformed our targets for 2019-20 by 10%.

This metric helps us to create valuable opportunities for customers and the whole system by going over and above our network access planning policies and procedures. We perform innovative actions to increase boundary capabilities for generators and DNOs by not constraining off energy, in doing this we also allow more renewable energy onto the system. When we do, this results in savings in BSUoS costs which should lead to lower bills for the end consumer.

Some stakeholders have also found it difficult to assess the value of the metric, as it is measured in units of energy rather than value. They have requested further clarity on how and why benchmarks have been set (which we have provided above), and the relative consumer benefits associated with exceeding a target. Presently we believe continuing to report this metric in units of energy is more beneficial, as it gives a more accurate representation rather than providing a monetary calculation based on assumptions.

Stakeholders requested the inclusion of this metric for RIIO-2, and therefore we will continue to publish it in 2020-21, although we note that there are some aspects of this metric where NGESO is not able to fully affect the performance levels: we will describe this in the narrative that supports the metric.

We therefore propose to retain this metric for 2020-21. We note that under the new role areas set out by Ofgem, in 2020-21 this metric may form part of Role 1.

Metric 13 – Connection Agreements Management

This metric was introduced in response to a backlog of connection agreements which needed to be updated to reflect the new circuit names created as a result of connecting wind farms to radial circuits. If these connection agreements were not updated promptly, the conditions under which existing wind farms cannot generate would not be correctly represented in the connection agreement, meaning that the ESO may incur unnecessary costs in constraining off these wind farms under certain outage conditions. Updating the agreements promptly has ensured that the circuit configuration is correctly represented in the connection agreement, avoiding unnecessary constraint costs being incurred by consumers. Nine months was deemed to be a reasonable target for these agreements to be updated, noting the time taken to process them and the fact that the customer is not obliged to sign.

This metric is reported monthly and measures how long it takes from the point of notification for these agreements to be updated. It seeks to drive efficient and effective management of existing connections contracts by measuring the percentage of contracts of this type which are updated within nine months of the ESO being notified of the need for update.

Stakeholders have commented that they do not see the relevance of this metric to the deliverables in Role 3, and they do not understand why updating 90 per cent of agreements within nine months is challenging. Further, we note that the backlog of agreements requiring an update of this type has now been reduced, with only three agreements being eligible for inclusion in the metric in the 2019-20 Mid-Year Report. The low volumes mean that the metric is no longer a meaningful measure, however it has achieved its objective in encouraging the ESO to focus on clearing this backlog of connection agreements. We will continue to monitor this internally to ensure that similar issues do not materialise in the future.

We propose to remove this metric for 2020-21, as due to the low volume of eligible connection agreements it is no longer a meaningful measure.

Metric 14 – Right First Time Connection Offers

This metric demonstrates our progress towards achieving our Enhanced Customer Experience deliverable by measuring the quality of a customer's connection offer on a monthly basis using a right first time measure. The right first time metric will report all connection offers signed within a calendar month and identify if a 'reoffer' has been made. (i.e. the offer was not right first time and needed rework) and what the root cause for the rework was. The benchmark for this metric is 95% of offers right first time. Any reoffers directly attributable to the ESO will impact the performance of the metric. Any rework driven by a TO or driven by a customer change to requirements during the process will be excluded from the metric performance but reported for information only.

Stakeholders value this metric and requested its inclusion in RIIO-2. However, some stakeholders did not feel that this metric was sufficiently ambitious. In order to address this, we will continue to publish data to show the volume of connection offers we are processing, to put our performance into context. The benchmark was previously amended from 90% to 95%, which we believe is an ambitious target given the volume of new connections, many of which require a bespoke agreement. We propose to maintain this benchmark for 2020-21, so that performance can be compared between years.

We therefore propose to retain this metric for 2020-21, with the same benchmark levels.

Metric 15 – NOA consumer benefit

This metric is reported on an annual basis and measures our Pathfinder projects, Study tools and NOA deliverables. There is significant value to the consumer in the ESO undertaking the NOA process. Running the NOA process is a business-as-usual deliverable, but the extent to which we seek alternatives to TO-led solutions exceeds baseline activities.

We will measure the value delivered by undertaking the NOA by analysing the increase in constraint costs which we would expect to incur if none of the options in the optimal path were proceeded for one year. This will highlight the importance of delivering the ESO determined optimal solution at the correct time according to our analysis. We do not believe it is appropriate to have a target against this as the value is very dependent on the level of network investment which is required, which can vary significantly over time and is not something which the ESO can directly control.

We propose targets around elements over which the ESO has control. This is in the options which are put into the NOA process and are recommended as part of the optimal paths. We will continue to publish a metric counting the options which are submitted as part of the NOA process, categorising options into the following categories:

- ESO exclusive options
- ESO collaborative options
- TO exclusive options

The targets are applicable to the annual NOA publication. For continuity, we propose to retain the same targets as the 2019-21 Forward Plan around these categories as follows:

- Exceeding baseline: The % of ESO exclusive and ESO collaborative options is >12% of the total number of options in the optimal path or the value is >4% of the overall consumer benefit.
- Meeting baseline: The % of ESO exclusive and ESO collaborative options is between 10% and 12% of the total number of options in the optimal paths and the value is between 3% and 4% of the overall consumer benefit.
- Below baseline: The % of ESO exclusive and ESO collaborative options is below 10% of the total number of options and the value is below 3% of the overall consumer value.

For the Pathfinder projects, we will measure the value created by each project: this would be the difference between a reference solution (such as a conventional transmission build solution) and the solution which is successful in the tender process. We note that where a conventional solution is eventually successful, this figure will be zero, but the process gives us confidence that we have chosen the best solution.

We propose to retain this metric for 2020-21 as stakeholders welcome this metric and find it valuable.

Metric 16 – Enhancing Communication

This metric also measures Pathfinding projects, Study tools and NOA: enhanced communication deliverables on a quarterly basis. This comprises of online surveys available for all of our Network Planning publications. This includes the NOA methodology, results of any pathfinding projects, the ETYS and the NOA. Our current surveys seek scores for stakeholder satisfaction on the document overall and the quality and relevance of the information contained within them.

We have found that this metric has significant overlap with the stakeholder interactions which are described in the Stakeholder Evidence section of our mid-year and annual reports. We therefore propose to remove this metric for 2020-21.

C.4.2 RIIO-2 metrics and performance indicators for Role 3

Our December Business Plan sets out our proposed metrics for RIIO-2. As part of RIIO-2 we have also proposed a number of performance indicators to sit alongside these metrics. The performance indicators provide a wider view of the ESO performance, but are not proposed as formal RIIO-2 metrics because they are items over which the ESO may not have direct control, or measurement can be challenging with a risk of duplicate reporting.

For each RIIO-2 metric or performance indicator, we have considered whether it should also be introduced for 2020-21. Our considerations for each are outlined in the sections below.

- Consumer value savings from the Network Options Assessment (NOA)
- Right First Time
- Future balancing costs saved by operability solutions
- Capacity saved through operability solutions
- Customer value opportunities
- System access management

- Proportion of ESO data shared (cross-ESO metric)
- Customer and Stakeholder Satisfaction (cross-ESO metric)
- NOA participant mix
- Customer connections- stakeholder satisfaction

Consumer value savings from the Network Options Assessment (NOA)

In RIIO-2 we propose to measure consumer value savings (£ million) annually to demonstrate that our NOA process drives economic and efficient outcomes from planning, development and investment in the network. In this context, consumer value is the value gained by following our independent NOA process. This is a continuation of the current NOA consumer benefit metric, which we will retain for 2020-21.

Right First Time

As the number of connection applications increases, there is an increasing demand on the connections processes. It is important to stakeholders that we continue to offer high quality connection agreements, therefore we have proposed a 'right first time' metric within our RIIO-2 business plan. This measures the quality of our connection offers, with errors reported as a percentage of the total number of connection offers. This is a continuation of our existing metric, right first time connection offers, which we will retain for 2020-21.

Future balancing costs saved by operability solutions

We will reduce balancing costs through implementing new approaches to operating the electricity networks. Measurement will be based on balancing costs savings through delivering transformational activities for each year, it will include, but not be limited to, five main operability constraints categories (thermal, frequency, voltage, stability and black start).

Savings will be quantified in accordance with a methodology designed to capture a reasonable view of the savings which can be ascribed to an individual initiative. There is a risk of double counting using this process (i.e. the same saving being claimed by multiple projects) which will vary by initiative. Where there is potential for duplication, the extent of this risk will be captured for each initiative that is assessed. There is also a risk that savings are over- or under-estimated because the counterfactual market response is by definition unknown. This is a known feature of any forecasting and these effects will be factored into the assessment methodology. This will measure the savings in balancing costs that have been achieved through our new operability approaches. We would measure this through an outturn vs. forecast calculation, with the forecast to be taken at a specified time. The implementation of new operability tools will help to reduce the cost of managing the network, which ultimately will mean increased value for consumers. The value of specific deliverables measured will be categorised under the operability constraint categories (Thermal, Frequency, Voltage, Stability, Black Start). As this measures anticipated cost savings in future years, there is no overlap with the balancing costs metric which measures balancing costs within year.

We propose to include this measure as a performance indicator (i.e. without a benchmark) for 2020-21: this will allow us to establish a baseline level which can be used as a benchmark for RIIO-2.

Capacity saved through operability solutions

We will measure the capacity unlocked by our network operability processes. These create space for more participants, including renewable generation, to access energy markets by optimising the use of infrastructure. The increased competition will lead to a more diverse market, resulting in a potential reduction in consumer bills and reduction of carbon emissions.

Measurement will be based on two quantities:

- Reduced infrastructure costs as a result of avoiding or deferring the need for additional assets to cope with further renewable connections;
- The monetised value of carbon reductions achieved from the Regional Development Plans

This metric will be measured quarterly with an annual review. We will be able to monitor our progress over time and track the impact of key actions, such as changes in systems, policies and service procurement. The data will be derived from an assessment of a network investment counterfactual and by using a standard value of carbon reduction for each MW of capacity released. These will be reported separately.

We propose to include this measure as a performance indicator (i.e. without a benchmark) for 2020-21; this will allow us to establish a baseline level which can be used as a benchmark for RIIO-2.

Capacity saved through our access planning actions

Our Network Access Planning team works with transmission owners to plan outages, and with generators to plan and optimise outages. The planners add value for end consumers and connected customers by using their expertise and judgment to propose innovative ways of planning outages, and by going beyond our network access planning policies and procedures.

We will measure customer value created through innovative ways of working with TOs and DNOs to release capacity across the whole electricity system, but exclude the monetary value created for customers. Examples include creating savings from the Network Access Policy (NAP) challenge and review paper process; identifying and facilitating opportunities for outages; re-evaluating system capacity; reducing outage duration; optimising the outage plan to reduce constraint costs; aligning outages with customer maintenance; facilitating alternative solutions for lengthy outages that impact customers; and aligning outages with generator shutdowns. This will demonstrate that we are establishing a zero carbon network and improving our service. This also results in savings to BSUoS charges, which should lead to lower consumer bills.

This metric is equivalent to our existing Customer Value Opportunities metric, which we will continue to publish in 2020-21. We note that under the new role areas set out by Ofgem, in 2020-21 this metric may form part of Role 1.

Number of short notice changes to planned outages

A trade association fed back the importance of the system access management metric that was included in our Forward Plan 2019-21 in driving positive behaviours for industry in network outages. This metric aims to drive down the number of planned outages that are delayed by more than an hour or cancelled by the ESO in the control phase due to process failure. This should drive us to investigate the reason for cancellations and put in place changes into the process where appropriate to prevent a repeat occurrence of the outage change. We are proposing to continue our target identified in the Forward Plan 2018-19 of less than 5 changes per 1000 outages.

This metric is equivalent to our existing System Access Management metric, which we will continue to publish in 2020-21. We note that under the new role areas set out by Ofgem, in 2020-21 this metric may form part of Role 1.

Proportion of ESO data shared (cross-ESO metric)

This is a measure of shareable ESO data made available in machine readable format over an agreed timeframe. Data would be prioritised by industry stakeholders. This is a key metric, which is aligned to our RIIO-2 proposals around Open Data, and provides visibility of what ESO data is made available.

As a key enabler of this metric will be the introduction of the data platform, which will provide a view of the data we will obtain and thus provide the functionality to support sharing data efficiently, we do not we propose to introduce this metric for 2020-21.

The RIIO-2 metric will also include an IT Delivery performance indicator, which will measure the quality and cost of the delivery of the IT proposals in the ESO's RIIO-2 business plan. As such, it is not relevant to introduce it for 2020-21.

Customer and Stakeholder Satisfaction (cross-ESO metric)

This is a measure of the overall customer and stakeholder satisfaction from ESO processes and interactions.

This will include our Design Authority stakeholder satisfaction performance indicator, where we will work with industry as part of a new cross-sector design authority where stakeholders will be able to contribute to the design of new systems, ensuring that they meet future market needs. We expect to open the Design Authority to external stakeholders during 2020-21. Once the Design Authority is introduced, we will seek stakeholder feedback to ensure that it is working well. As this will not yet be in place in April 2020, we do not propose to introduce this measure for 2020-21.

We also plan to introduce a SSAT survey in RIIO-2 which would help to inform how the NOA methodology develops in the future. This is of a similar nature to the information which we currently publish as part of the Enhancing Communication metric, which we will continue to publish as part of the stakeholder section of our mid-year and end-of year reports for 2020-21.

As there are already several measures of stakeholder satisfaction across the different role areas, we do not propose to introduce any additional stakeholder satisfaction metrics for 2020-21.

NOA participant mix

This RIIO-2 performance indicator counts the options which are submitted as part of the NOA process, categorising options into ESO exclusive options, ESO collaborative options, and TO exclusive options.

This is a continuation of part of the NOA consumer benefit metric, which we will retain for in 2020-21.

Customer connections - customer satisfaction

In RIIO-2, we will measure the customer and stakeholder satisfaction for key processes, including customer connections, to our control. We are proposing a periodic customer satisfaction (CSAT) measure for our customers. This measure will be reported on a quarterly basis.

As this metric will provide a useful indication of the quality of our processes, we are planning on introducing this metric in 2020-21, reporting on a quarterly basis with a benchmark of 8 (out of a score of 1 to 10).

C.4.3 Proposed metrics for 2020-21

Our proposed metrics for Role 3 are therefore:

- System Access Management
- Customer Value Opportunities
- Right First Time Connection Offers
- NOA consumer benefit
- Customer connections- stakeholder satisfaction

We also propose the following performance indicators, for which no targets are set:

- Whole System, Unlocking Cross Boundary Solutions
- Future balancing costs saved by operability solutions
- Capacity saved through operability solutions

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