nationalgridESO

ESO Draft Forward Plan for Consultation

April 2019 – March 2021

11 January 2019

Our Draft Forward Plan 2019-21

We publish this draft Forward Plan 2019-2021 to begin a consultation with stakeholders. It sets out how our activities will deliver consumer benefit over the next two years as we work towards our long-term vision.

We invite stakeholders to discuss, comment and challenge our plan as part of a consultation to help inform our final Forward Plan in March and our plans for RIIO-2, which we will be publishing later in the year.

Contents

Structure of document

In this Forward Plan, we set out an overarching view of how our activities will best deliver consumer benefit working towards our long-term vision and per principle articulate:

- A summary of our long-term vision,
- How our activities will deliver consumer benefit now and, in the future,
- An ambitious plan of work that we intend to deliver in 2019-20 and 2020-21,
- Performance metrics to track delivery against our core roles for 2019-20,
- Our stakeholder engagement approach.

Your input is needed

We publish this plan for discussion with stakeholders, ensuring that we are focusing our activities to deliver most value for consumers. We invite stakeholders to respond to our consultation by 14 February 2019, and ask the following questions across all principles:

1. Do you have any comments on whether our plans are heading in the right direction to meet current and future market needs?
2. Please give us your view on whether we are targeting the right activities, for example those that will deliver most benefit for consumers?
3. We present in our plan, how our activities will meet and exceed baseline expectations between 2019-21 (see page 5 for definition of exceeding baseline expectations), do you have any comments on this?
4. Do you agree that our metrics will allow us to track our performance as we deliver against our plans?

Forward Plan Consultation Event

On the 22 January, we will be holding an interactive workshop for stakeholders to review and challenge our Forward Plan. We will consider the feedback from this workshop as well as your written consultation responses, to inform development of our final 2019-21 Forward Plan to be published in March. It is vital that we receive your input on our priorities and activities for the 2019-21 period and beyond to ensure we are doing everything we can to drive efficient outcomes for energy consumers. Please register for the event here.

Fintan Slye

Director of UK System Operator

Please send your consultation response to box.soincentives.electricity@nationalgrid.com; unless you ask us not to, we will publish responses on our website alongside the final Forward Plan in March 2019.

Introduction

Our mission

Our Forward Plan has been shaped by our mission:

We keep the lights on and the gas flowing round the clock for GB energy consumers; we play an essential role in enabling the transition to a more sustainable energy future.

Therefore, we believe that:

- We deliver value for consumers first and foremost, while also ensuring that we build and maintain trusted partnerships with our customers and stakeholders.
- We influence the energy debate positively with our independent perspective.
- Through using markets, data and networks in new way across gas and electricity, we help move GB towards a more reliable, affordable and sustainable energy world.
- An incentivised for-profit model ensures we deliver the best long-term outcomes for consumers, society and the GB economy.

Delivering consumer benefit

Our mission highlights that delivery of consumer benefits is our top priority and while we don't have direct contact with consumers, they benefit from our activities in five ways:

Improved safety and reliability

We will continue our focus on system balancing and security at optimum cost in line with the expectations that Government, the regulator and the consumer have of us. The on-demand provision of electricity is a fundamental part of our modern life must be continuously attended to with the utmost importance by our control centre and supporting functions. We also look further ahead, to ensure we can operate the system in the future, as it rapidly transforms with low-carbon, intermittent, non-synchronous[1] and distributed generation sources.

Improved quality of service

Over recent years we have transformed our approach to engage deeply with all our stakeholders, listening to what they want from us, and delivering on that where we can, and where we cannot, explaining why. This rich stakeholder input has shaped how we do things and put much more of a focus for us on why and how we can improve our quality of service. Improved service quality ultimately benefits the consumer due to interactions in the value chains across the industry being more seamless, efficient and effective.

Lower bills than would otherwise be the case

We lower consumers' bills by contributing to the decrease in Balancing Services charges and Transmission Network Use of System charges (BSUoS and TNUoS, respectively) which are levied on suppliers and transmission-connected generators. We optimise across BSUoS and TNUoS linking our balancing decisions with our Network Options Assessments (NOA) so that in the long term the economic and efficient outcomes are being driven when planning, developing and investing in the network. Nearer to real time we manage BSUoS by focusing on controlling, reducing, and optimising our spend on balancing and operating the system. These charges flow through to the consumer bill from suppliers. Therefore, any reduction of this significant cost (approximately £1bn of BSUoS and £3bn of TNUoS per annum) will benefit the consumer.

[1] Generation which doesn't synchronise with system frequency

Reduced environmental damage

Great Britain has committed to reducing its CO_2 emissions year on year, and as the ESO we are at the centre of the transition to a low-carbon electricity system. We therefore support new providers and technologies to enter and compete in the existing and new markets basing our decisions on the technical capabilities of providers. We also work innovatively to design novel solutions which ensure the system can operate safely and securely both now and in the future with large levels of intermittent and non-synchronous generation running. We are committed to being 'technology neutral', as market participants already have environmental costs priced into their products and services, for example through carbon price levies. We will not choose to procure from providers based on the fuel they use to generate power.

Benefits for society as a whole

We are at the centre of an energy revolution, driven by Great Britain's need to severely limit CO_2 emissions in the coming years. We operate the GB electricity system, facilitating the supply of energy between generators and suppliers. We ensure that energy is available on-demand at all times, including other obligations such as being able to re-start the system in event of a failure, and taking necessary steps to prevent such a failure in the first instance.

Preparing for the future

We must continually evolve to ensure we can provide secure supply of electricity in a fast-changing world in a way that is both sustainable and affordable. As the ESO, we sit at the heart of the nation's electricity system, tackling some of Great Britain's most pressing electricity challenges, continually looking to unlock additional consumer benefits.

The level of decarbonisation, decentralisation and digitalisation that we are seeing in the energy industry to date is unprecedented; it has gone beyond expectations in terms of the speed and size of transformation expected. Since 2010, we have seen a 400 per cent increase in all renewable capacity, three times more distributed capacity connected and deployment of technologies and innovative service offerings helping provide greater choice to consumers as to how they interact with their energy requirements. We expect to continue this path as we transition to a more decentralised, low carbon energy system.

In this context, our role is changing rapidly and to prepare for the future we have been making changes to our structure. From April 2019, we, as the ESO, will be a new standalone business within National Grid, legally separate from all other parts of the National Grid Group. We will have our own Board, and staff will be physically separate from all other parts of National Grid. This will provide the right environment to deliver a balanced and impartial ESO that can realise real benefits for consumers as we transition to a more decentralised, decarbonised electricity system.

In addition, throughout 2018 we have designed and implemented our new operating model. This process looked at the outcomes we need to achieve as a business and how we can deliver these in the most efficient, safe and effective way for the benefit of our customers. Our new organisational design builds on our strong operational and engineering capability to include focus on customer, regulatory, modelling, future markets and commercial skillsets. Our core functional pillars are: Strategy & Regulation, to set the direction of the business; Future Markets, to drive change across the energy markets and Operations, to operate our system securely and efficiently.

Together, our legal separation and operating model ensures we are set up in a way that enables us to operate safely and efficiently today and continue to meet the challenges of the future.

Our Forward Plan

Our Forward Plan articulates how we are responding to this change, ensuring that we deliver best value for consumers today and in the future, delivering better practices, business models and technologies that support this transition. It sets out how these commitments allow see us deliver against our core roles, whilst also going beyond to deliver additional benefit for consumers.

Our roles

As the ESO, we operate the National Electricity Transmission System in Great Britain and we play four roles:

1. **Managing system balancing and operability.** Ensuring a safe and reliable electricity system is, and always will be, our number one priority. The GB electricity transmission system is one of the most reliable in the world. We aim to maintain this reliability as cost-effectively as possible, as we move to a low-carbon power grid.
2. **Facilitating competitive markets.** We are driving the development of competitive market places for the balancing services we need as the ESO. We also support competition in the energy market by playing our part as an administrator and code party to ensure charges, codes and governance frameworks are fit for purpose. We are also the EMR Delivery Body and play an active role in the facilitation of the capacity market. Across these markets, we aim to enable competition by minimising barriers, supporting innovation and balancing investment risks for counterparties.
3. **Facilitating whole system outcomes.** The move to a low-carbon grid means we are seeing significant growth in connections to electricity distribution networks as well as new electricity transmission connections. Our aim is to help join up the design and operation of the network across transmission and distribution. This will ensure decisions are made efficiently, speeding up connections and reducing capital investment.
4. **Supporting competition in networks**. We work to facilitate competition in electricity transmission network investment, and build new tools allowing the market to explore alternative solutions to meet transmission system needs.

Within our four roles, seven principles provide more detail on what we do.

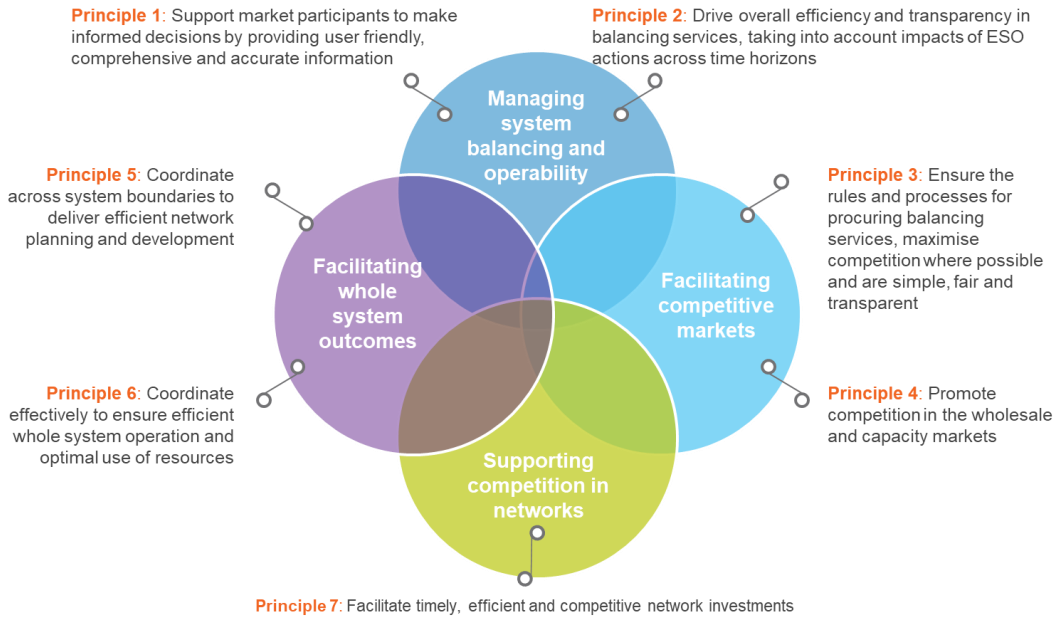


Figure 1 outlines how we will deliver against our core roles to deliver undertake continuous improvements and changes to our processes and outputs to ensure that we maintain the standards of an efficient and competent system operator[2] and deliver value for consumers. Figure 2 presents how across the four roles our activities in 2019 to 2021 will unlock additional consumer benefits by exceeding baseline expectations. Further detail on how we will unlock this value can be found within the principle delivery section with the associated detailed deliverables and performance metrics.

What does exceeding baseline expectations mean?

Ofgem's ESO Reporting and Incentives Arrangements document defines exceeding as *'clear and tangible evidence of the ESO taking new steps within that year to deliver better practices, business models and technologies that would not normally be expected by an efficient and competent system operator. These steps should lead to material improvements in the ESO's performance and unlock additional consumer benefits.'*

2 https://www.ofgem.gov.uk/system/files/docs/2018/03/esori_arrangements_guidance_document.pdf

1.

Executive Summary

Figure 1 – Exceeding baseline expectations 2019-21

We are going to deliver these exceeding outputs in 2019-21:	Benefiting energy consumers in 2019-2021 through:	Benefiting energy consumers in the future through:	
Uninterrupted, safe and secure system operation	Building and consolidating all ESO efforts to ensure that there is ongoing access to power at times of consumer choice whilst managing down expected increases in balancing costs.	In the decarbonised, decentralised and digitalised world, our consumer outcome of access to power at times of consumer choice whilst managing down expected increases in balancing costs remains our focus.	
Managing system balancing costs • **Addressing operational issues: RoCoF and vector shift changes** • **Transparency around data used in the ENCC and short-term decision making**	Creating awareness of current and future operability challenges, informing short-term investment strategies, and commercial and operational plans resulting in: • Safe and reliable system in the future as it rapidly transforms with low-carbon, intermittent, non-synchronous and distributed generation sources • Lower BSUoS costs than would be otherwise through optimising our spend on balancing and operating the system.	Creating awareness of future operability challenges, informing long-term investment strategies, and commercial and operational plans resulting in: • Safe and reliable system in the future as it rapidly transforms with low-carbon, intermittent, non-synchronous and distributed generation sources • Lower bills for end consumers by reducing TNUoS by ensuring the most economic options are chosen when planning, developing and investing in the network • Supporting the low carbon transition results in new providers and technologies to enter and compete in existing and new markets	
Operability reports and information			
Energy forecasting	Supporting electricity market participants to make more informed short-term decision-making in terms of operation and pricing decisions delivering better functioning markets. Better forecasts with less uncertainty benefits our control room as less uncertainty means less contingency is needed, which means lower spend on those products.	Supporting electricity market participants to make more informed, long-term decision-making resulting in lower bills for end consumers by reducing TNUoS by ensuring the most economic options are chosen when planning, developing and investing in the network	
Information access: data portal			
Reforms of balancing services: implementation of roadmaps	Maximising competition through reduced barriers to entry for our response and reserve products to enable the transition to a decentralised low carbon energy system	Using the learnings from our response and reserve products across our products to enable the transition to a decentralised low carbon energy system supporting the ambition of competitive, transparent and accessible markets maximising competition via closer to real-time procurement	

Wider Access to BM roadmap Implementation	Enabling new non-traditional participants into the Balancing Mechanism increasing our Control Room's access to efficiently use the products its needs lowering costs to consumers and supporting the transition to a low-carbon electricity system	Increasing participation in the Balancing Mechanism helping us to manage operability challenges maximising competition through reduced barriers to entry ultimately leading to lower BSUoS costs than would be otherwise and supporting the transition to a low-carbon electricity system	
Provide thought leadership on electricity network charging reform through Charging Futures **Transform Industry Frameworks to enable decentralised, decarbonised and digitalised energy markets**	Creating a step change of industry engagement helping to deliver complex change across the industry allowing all parties to participate in the discussion ensuring that focussed stakeholder engagement on the most important topics for today and the future.	Laying foundations for a governance model which works for a large number of market participants, allowing sufficient pace of change whilst maintaining investor confidence increasing competition and supporting the low carbon transition.	
Enable broader participation in the Capacity Market	Ensuring there is adequate generation provision to meet demand at the right price.	Ensuring there is adequate generation provision to meet demand at the right price	
Commercial contracts for balancing services from DER **Enhanced systems to facilitate balancing services from DER** **Whole system data exchange** **Whole electricity system thought leadership** **Whole system operability**	Developing a better understanding of the capabilities of the whole system allowing us to operate and plan the system more economically. Developing new commercial contracts and control systems for DER to provide services to meet transmission needs will increase visibility and controllability of renewables and DER. Initial benefits should be realized through the increased market participation that results from facilitating DER connections, and enhanced visibility and controllability which will allow it to participate in markets for energy and network services. This will increase liquidity and lead to lower prices for energy and services than would otherwise have been possible.	Enabling more DER connections. As more DER connections and market participation are facilitated greater price benefits should be seen in energy and services markets and the costs of operating the system should also be positively impacted. Developing a better understanding of the capabilities of the whole system should facilitate getting the most out of existing infrastructure	
Pathfinder Projects		Facilitating a wider range of solutions competing to meet transmission network needs should drive down the cost	

		of operating the system and reduce network development costs.	
Study tools		Transforming our modelling capability to be able to plan for network conditions that are most costly under the transformed energy landscape. All energy resources including renewables and DER will be able to connect more easily and cheaply and when connected will be able to compete in local and national energy and services markets.	

Figure 2 - Meeting baseline expectations 2019-21

We are going to deliver these baseline outputs in 2019-21:	Benefiting energy consumers in 2019-2021 through:	Benefiting energy consumers in the future through:	
Uninterrupted, safe and secure system operation **Upgrade of information systems**	Building and consolidating all ESO efforts to ensure that there is ongoing access to power at times of consumer choice whilst managing down expected increases in balancing costs.	In the decarbonised, decentralised and digitalised world, our consumer outcome of access to power at times of consumer choice whilst managing down expected increases in balancing costs remains our focus.	
Insight documents	Supporting market participants to make more informed market decisions and enabling consumers to make informed consumption decisions.	Supporting market participants to make informed and robust investment decisions being made, leading to optimum markets, network development, and system operation costs resulting in lower bills for end consumers by reducing TNUoS by ensuring the most economic options are chosen when planning, developing and investing in the network.	
Electricity Operational Forum and stakeholder engagement **Operational insights**	Creating awareness of current and future operability challenges, informing short-term investment strategies, and commercial and operational plans resulting in: • Safe and reliable system in the future as it rapidly transforms with low-carbon, intermittent, non-synchronous and distributed generation sources • Lower BSUoS costs than would be otherwise through optimising our spend on balancing and operating the system.	Creating awareness of future operability challenges, informing long-term investment strategies, and commercial and operational plans resulting in: • Safe and reliable system in the future as it rapidly transforms with low-carbon, intermittent, non-synchronous and distributed generation sources • Lower bills for end consumers by reducing TNUoS by ensuring the most economic options are chosen when planning, developing and investing in the network • Whilst remaining technology neutral, supporting the low carbon transition results in new providers and technologies to enter and compete in the existing and new markets	
Power Responsive	Reducing barriers to market entry for non-traditional providers creating more competitive markets through enabling demand-side flexibility and more efficient product procurement and usage of products ensuring we	Further implementing the learnings from innovation projects that look to understand the role of smaller scale assets and technology innovation to reduce barriers to	

	are procuring the right products at the right time to lower costs.	entry for non-traditional providers and maximising opportunities for accessible and competitive markets.	
Intermittent Generation	Increasing the number of options and market participants available to our control room allow intermittent generation to participate more effectively in balancing markets reducing bills.	Further increasing the number of options and market participants available to our control room allow intermittent generation to participate more effectively in balancing markets reducing bills.	
Enhanced provider experience	Implementing a self-service approach delivering greater transparency, real-time data visibility and online contract management ensuring we are procuring the right products at the right time, to lower costs.		
Facilitating code change	Working with industry to ensure codes keep pace with the rapidly changing energy generation and supply landscape so that industry can operate efficiently and effectively.	Transparent, simple and accessible codes framework lowering bills through enabling better functioning markets and supporting new entrants which stimulates competition.	
Transform the customer experience for network charging	Removal of barriers to market entry, greater provision of more data and information which will lower bills through greater market participation and competitiveness.	Further removal of barriers to market entry, greater provision of more data and information which will lower bills through greater market participation and competitiveness.	
Enhanced customer experience		Lower constraints management and network development costs through identification of efficient operability solutions, reduced build options on the network lowering TNUoS and system able to securely accommodate changing energy supply and demand patterns.	
Enhanced communication of Network Options Assessment (NOA)		Facilitating a wider range of solutions competing to meet transmission network needs should drive down the cost of operating the system and reduce network development costs.	

2. Principle Delivery Sections

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

Long-term vision

For this principle, our vision is to be a transparent ESO providing accurate information to help market participants make investment decisions and facilitate the transition towards balancing across shorter timescales. We are committed to improving the user experience in everything we do. Alongside this we want to improve confidence in our forecasts, increase transparency of our balancing actions and provide more comprehensive information which is accessible to all.

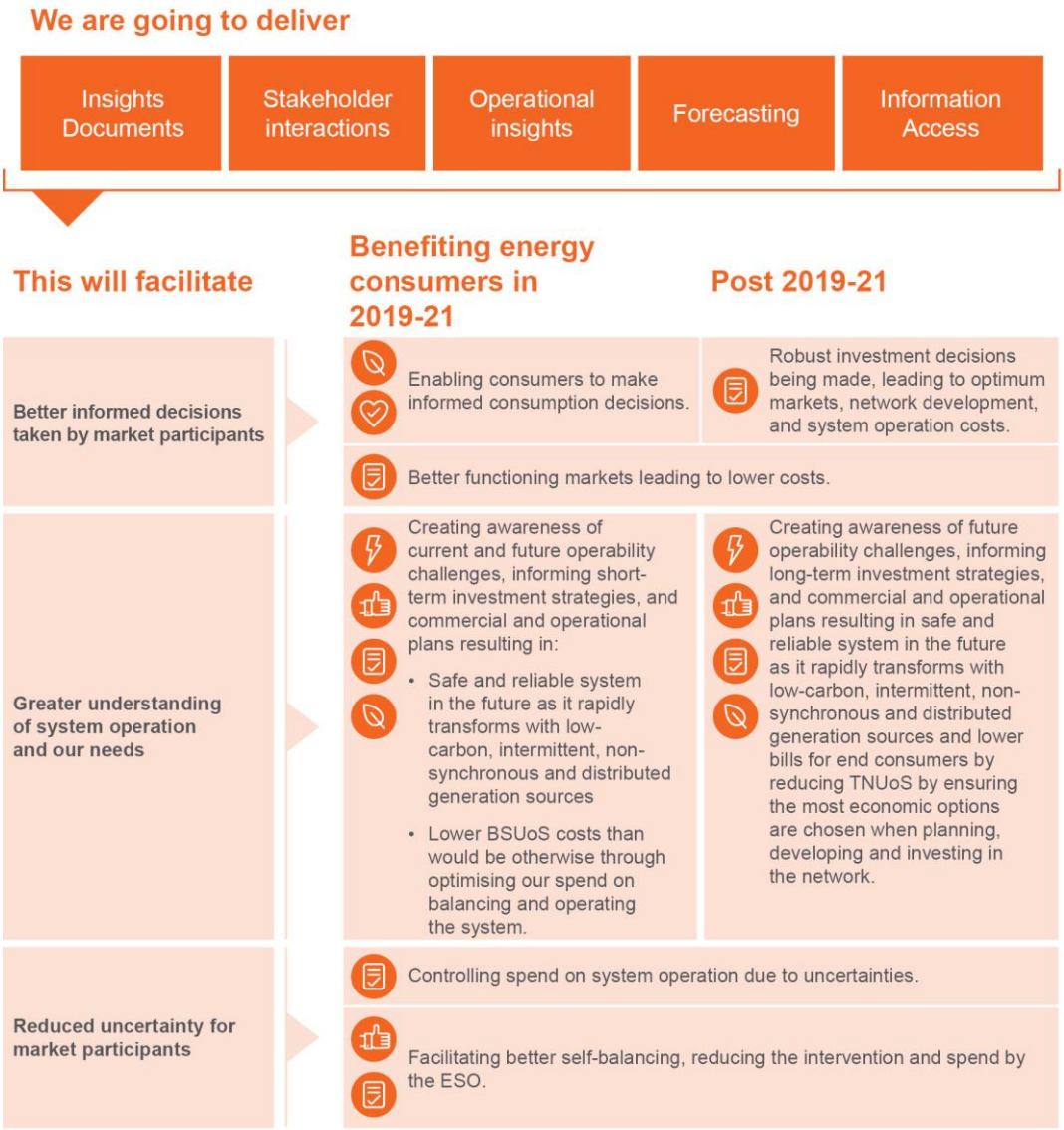
Delivering consumer benefit

Our aim is to reduce the end-consumer bill through enabling better functioning and more competitive markets. We can lower BSUoS costs through this principle by working to drive down the price we pay for balancing services due to better functioning and more efficient markets. We do this through focusing on the information we provide to the market participants, to achieve the following outcomes:

- The range of information available will be sufficient to meet current and future needs,
- The frequency and accuracy of information provision is fit for the future,
- There are the right number of avenues of information provision.

This focus will benefit markets in operational timescales, but will also help enable investment decisions which can increase market competitiveness, deliver new generation which assists with system reliability, and reduce environmental damage where the new generation is low-carbon.

Principle 1 benefits under 2019-21 Forward Plan



Activities and deliverables 2019-21

Over the next two years we will focus on five areas to deliver these outcomes: insight documents; stakeholder interactions; operational insights; forecasting and information access. This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Insights documents

Sitting at the heart of Great Britain's electricity system, we are able to share our unique view on system operation and our insight into markets, providing analysis across the short and long-term energy landscape through our insight publications. During the year, we publish the Future Energy Scenarios (FES), Summer Outlook and Winter Outlook reports and engage with stakeholders through workshops and events to share our insights. This helps market

Consumer benefit outcome

participants make better informed decisions around their participation in the market and investment strategies, ultimately creating better functioning markets.

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Summer Outlook	Provides our view of the gas and electricity systems for the upcoming summer.	Summer Outlook: Q1 2019-20 & 2020-21	Meeting baseline
FES	Provides our range of credible scenarios for the future of energy to support the planning the GB transmission system.	FES: Q2 2019-20 & 2020-21 FES conference Q2 2019-20 & 2020-21 FES call for evidence: Q2 2019-20 & 2020-21 FES workshops Q3 2019-20 & 2020-21	Meeting baseline
Winter Outlook and Winter Review and consultation	Provides our insights on security of supply for the upcoming winter for gas and electricity.	Winter Review and Consultation Q1 2019-20 & 2020-21 Winter Outlook: Q3 2019-20 & 2020-21	Meeting baseline

Stakeholder interactions

We will engage with industry through high-visibility events such as the Electricity Operational Forum, providing market participants with the opportunity to interact with us face-to-face. We hope this will enable the industry to gain better understanding and insight into what we are doing and why. This will enhance their competitive positions increasing market efficiency. Our proposed stakeholder visits to our sites will also allow this rich interaction between us and market participants.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Electricity Operational Forum	This stakeholder event takes place three times a year to provide operational information.	Q2, Q3 and Q4 2019-20 and 2020-21	Meeting baseline
Electricity National Control Centre (ENCC) visit days	An open door to market participants to the ENCC to learn about system operation.	Bi-monthly open door visits in Q1, Q2, Q3, Q4 2019-20 and 2020-21	Meeting baseline

Operational Insights

Acting on stakeholder feedback, we are planning to make available new information, for example regarding transmission capacity limitations and congestion. This will enable more efficient and effective outage planning and system access co-ordination between us and network operators. This in turn supports providers in offering services to the ESO and reducing the cost of balancing that would otherwise be the case.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Insight on balancing decisions taken	Sharing our insight on balancing actions and produce a map of outturn system costs for voltage and thermal constraint costs by region or constraint boundary. In addition, we will build on the Daily Balancing Costs report and MBSS.	Costs for thermal constraints per region: Q2 2019-20. Costs for voltage constraints per region: Q3 2019-20.	Exceeding baseline
Insight on constraint boundaries	Publish day ahead information on constraint boundaries to share the limit and the expected flow at day ahead.	Q2 2019-20	Exceeding baseline

Additional insight on trades

We would like to share additional information on our trading activity. We would like to explore what additional information would be valuable to the market, what benefit it would bring and how it could make the market function better. We are looking for your feedback on what your priorities are in terms of further information. We will then take these requests and build a programme of work that best satisfies the needs of the market.

Forecasting

Our continued focus on the timeliness, relevance, and accuracy of demand, wind generation and solar generation forecasts benefits the consumer in different ways. It contributes to the short-term decision-making of market participants through operational and pricing decisions delivering better functioning markets. Better forecasts with less uncertainty also benefits our Electricity National Control Centre (ENCC), as less uncertainty means less contingency and lower spend on those products. Our carbon-intensity forecasts are enabling the end-consumer to directly make decisions about their energy consumption based on the generation-mix predicted to dispatch in short term.

Consumer benefit outcome

We will deliver an Energy Forecasting Strategy roadmap describing how we will explore and employ innovative technologies such as machine and deep learning techniques to improve the accuracy of our key forecasts. We will increase the frequency of our forecasts to support electricity market participants to make efficient system balancing decisions ahead of real time.

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Publish Forecasting Strategy Project roadmap	High level plan of the new forecasting strategy project deliverables.	Q1 2019-20	Exceeding baseline
Publish half-hourly photovoltaic (PV) forecasts to market, 24 times a day	Increase the number of published PV forecasts from 2 to 24 times every day (an update every hour).	Q1 2019-20	Exceeding baseline
Publish four additional wind forecasts to the market	Increase the number of published wind forecasts from 4 to 8 per day.	Q2 2019-20	Exceeding baseline
Publish an additional Day-Ahead demand update at 12:00pm every day	Provide an additional day ahead demand update at 12:00pm every day following the 9:15pm daily update.	Q2 2019-20	Exceeding baseline
Make energy forecasts more accessible via a dedicated website and Applications Programming Interfaces (APIs)	Rationalise channels used for sharing energy forecasts and provide definitions of data published.	Q3 2019-20	Exceeding baseline

Information access

We will reduce the effort needed to access our information by developing a user-friendly self-service information portal, providing the information stakeholders want on-demand. This can increase the efficiency of processes and decision making taken by our stakeholders. Increased efficiency in the decision-making and transactions between parties in the electricity market should ultimately benefit consumers through cost control and reduction.

Consumer benefit outcome

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Open Data	We will create a definition for shareable data. We are committed to a programme that delivers all of this shareable data to market participants using the right pathway. We want to make our channels for sharing data with market participants clearer and more accessible. As an	Data explorer page on website: Q1 2019-20	Exceeding baseline
		New data portal: Q3 2019-20	Exceeding baseline

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
	interim stage, we will produce an explorer page to direct users to the locations of the data. We will then move our data from these locations to be shared using the right pathway.		

How we will measure our performance in 2019-20

Metric 1 - Information provision scorecard

We publish data and information to the market on a regular basis; some required by our licence or code obligations and others as our commitments to the market. We will use a scorecard to summarise the information provision per quarter to show that we are continuing to provide the information needed by the market. This will include:

Information provision	Frequency of provision
Monthly balancing services summary	Monthly
Daily cost summaries	Daily
Trades	Daily
BSUoS reports	Monthly
Market information report and webinars	Monthly
Daily BSUoS forecast	Daily
Demand forecasts	Daily
Wind forecasts	Daily

Metric 2 – Firm Frequency Response (FFR) information provision improvement metric

Consumer Benefit

We will improve the information we provide to market participants who participate in the long term FFR tender rounds to reduce the number of tenders received where we have no requirement and increase the liquidity in the periods when we do have a requirement. Increasing the competition in the market will lower costs for consumers.

Context

We will improve our support of market participants who tender into the long term FFR market by improving our information provision including sharing which periods we have a requirement and the channels we use to communicate. We believe this will reduce the number of tenders for periods when there is no requirement. This will save time for market participants, potentially increasing competition during the times when we have a requirement.

Metric

During this year, our performance has improved from more than 70% of tenders received being for periods when we have no requirement to less than 50% of the tenders being for periods when we have no requirement. To measure this outcome, we will measure the percentage of dynamic tenders that are submitted for periods when we do not have a requirement.

Performance Benchmarks

Exceeds benchmark: Less than 40%

In line with benchmark: Between 40-50%

Below benchmark: Greater than 50%

Metric 3 – Energy forecasting accuracy metric

Consumer Benefit

We are working in strategic areas to improve our energy forecasting accuracy. This will support market participants to manage their generation and consumption ahead of real time and therefore reducing the number of actions that we need to take to balance the system. This will result in less consumer money spent to balance the electricity network.

Metric

To measure our performance, we will use the monthly forecasting accuracy of our day ahead demand forecast and day ahead Balancing Mechanism Unit (BMU) wind forecast. To do this, we will use the following steps:

1. Create the monthly and seasonal targets based on the average forecasting error over the past three financial years.
2. Compare each monthly forecasting accuracy with the predefined target to identify whether we have achieved our target for the month.
3. Count the number of months where we have met the target and compare it to a pre-set scale defining the success criteria.

Managing and forecasting the electricity system is becoming more and more difficult. This is mainly due to the growth of distribution connected generation, change in customers' behaviours and additional penetration of technologies such as batteries and smart meters. For this reason, we believe that, in order to achieve an annual performance in line with expectations, the metric should deliver at least five months with improved forecasting accuracy compared to the same months over the last three financial years.

This means that during the year we would have improved forecasting accuracy for at least 5 out of 12 months. At the same time, we strive to improve our forecasting accuracy across the whole year to provide added value to market participants and consumers.

Performance Benchmarks

Exceeds benchmark: 0-4 months

In line with benchmark: 5-7 months

Below benchmark: 8-12 months

Principle 2
Drive overall efficiency and transparency in balancing services, taking into account impacts across time horizons

Long-term vision

For this principle, our vision is to drive overall efficiency and transparency in balancing, taking into account impacts of our actions across time horizons. Looking to 2030, we need to find the optimum way of carrying out balancing and operability actions in a low carbon, decentralised and digitalised world. We will act as residual balancer, taking actions needed to balance and operate the system efficiently, ensuring stable balancing costs amongst a world of change.

As energy resources connected across the system change, this presents new questions on how to best operate it. It presents a new and widening range of potential providers, connecting across transmission and distribution. We must match the outcomes we need to deliver with the services offered by the growing market. This will be coordinated through systems fit for the future which have been developed transparently. To achieve this, we will maintain our sharp focus on costs of balancing and operating the system safely and securely. We will support integration of new and existing resources by enhancing our existing IT systems and delivering new ones as needed. We will share our thinking on where changes may be needed to balancing services and codes. We will listen to our stakeholders to ensure we benefit from their experience and ideas as we form our views.

Delivering consumer benefit

We continue to provide the most important consumer benefit of all through this principle, which is balancing the system to keep it operating safely and securely at optimum cost 24/7; this is invisible to the end consumers. The continuing decarbonisation and decentralisation of generation combined with changes in how energy is being consumed and required infrastructures changes to support would increase in balancing cost spend without intervention.

Our activities in this principle aim to reduce the total consumer bill through focusing on both short-term and long-term operational perspectives in delivering overall benefit to the consumer whilst managing down the expected increase in balancing costs. Focusing on short-term operations, we will provide more comprehensive information for market participants including balancing product and service providers. They will be able to use this information to offer market products which are a better fit with system requirements. These market products will align better to the services that we need, where we need them, and when we need them driving price competition.

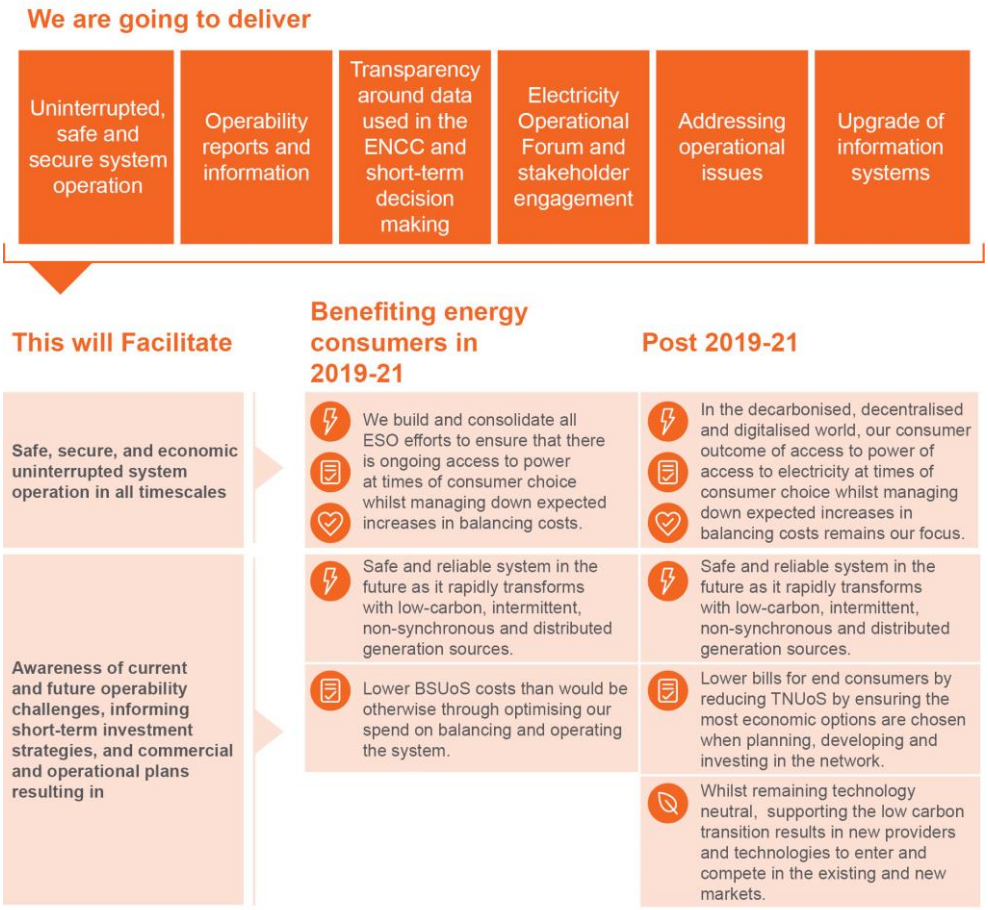
Focusing on the longer term, we continue to use our engineering expertise to identify future operability challenges well in advance and communicate this to industry. We will accompany this with proposals for how to address challenges from both technical and market perspectives. This will give advance signals to potential solution providers, so that we can be well placed to secure the system at optimum cost, and avoid becoming a ‘distressed purchaser’ for operational scenarios which could have been foreseen.

Our spend to operate and balance the system is paid through the BSUoS levy on suppliers and transmission-connected generators. Focusing on the areas above will drive down BSUoS costs to be lower than would otherwise be the case. The high-level outcomes we are targeting can be summarised as:

- Better informed stakeholders and market participants, leading to more efficient procurement by the ESO

- More granular and optimal ESO decision-making, resulting in the procurement of the most effective products and services
- Safe, secure, and economic uninterrupted system operation in all timescales

Principle 2 benefits under 2019-21 Forward Plan



Activities and deliverables 2019-21

Over the next two years we will focus on seven areas to deliver these outcomes:

- Uninterrupted, safe, secure system operation;
- Operability reports and information;
- Transparency of data used in ENCC and close-to-real-time decision making;
- Electricity Operational Forum and stakeholder engagement;
- Addressing operational issues;
- Balancing cost management;
- Upgrade of information systems.

This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Uninterrupted, safe, secure system operation

We operate the system in real time and running systems and processes to ensure secure, economic and efficient dispatch of the system.

At real time, we are focused on the secure, efficient and transparent operation of the power system which must consider the safe and secure operation of the network in perfect harmony with the balancing of energy supplies across that network. Our work starts several years ahead of time. In those timescales, detailed work tends to be either network focused or energy balance focused, with regular tie-in points to ensure both are coming together beautifully.

From a network perspective, the NOA Committee discusses both the future requirements of the network including options to deliver them and the impact on the system of the option implementation. Where work is required, we explore how to implement solutions.

The Year Ahead access plan looks at how the required outages can be secured; at this point the priority is on securing the network against the expected range of generation and demand backgrounds, and looking at optimal placement considering the information available on generation outages. Once the outage plan is firm (within year timescales) we explore additional optimisation of outage placement, assessing the balancing costs associated with each and looking at how best to manage those costs. This may be via trades, via contracts or indeed leaving it to the BM where there are a number of generation actions which could resolve the issue.

Turning to the Energy Balancing side, our work on the System Operability Framework (SOF) picks up from the FES and our Network Options Assessment (NOA), the services that we require to manage the power system. These requirements, added to the insights we receive from stakeholder feedback, inform the work to reform and procure the services that we require.

We continue to reform our requirements, bringing together the question of operating the power system with balancing of energy, from several years out, as the year ahead outage plan is formed and the plan is then refined within year. Requirements will also identify critical outages on the system, which could limit our ability to access a particular set of services, or perhaps would change the largest loss on the system. Regular and disciplined check points ensure that we understand the challenges of securing the power system, the tools required and available and have plans in place for the most efficient management of the system, looking year and season ahead. Approaching real time, these plans become more granular. Approaching real time (within month), the network and energy streams of work are brought closer together so that the ENCC operate to a single, secure, efficient and optimised plan.

Operability reports and information

Our forward-looking operability reports and studies of potential scenarios of future system operation allow us to identify challenges ahead of time. We present our findings and insights to industry, proactively working together to develop optimum technical and commercial solutions. This provides us sufficient time to assess different options to deliver the best outcome for the consumer.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Operability Strategy Report and updates	Report providing stakeholders with a clear view of current and future operability challenges, informing their own investment strategies, and commercial and operational plans. We continually act to ensure the electricity transmission system is	Q1 and Q3 2019-20 & 2020-21 Specific programmes of work which are shared in the Operability Report may	Exceeding baseline

	operable in real time and out to 2030. The changes to balancing and ancillary services markets that are required to do this efficiently are laid out in our Product Roadmaps. Alongside these we are producing a six-monthly Operability Report to share our current view on challenges across different operability topics. It outlines work already taking place to address these gaps and provides a review of the previous six month's activities as well as a plan for future work.	result in extra deliverables and will be described against the appropriate principle.	

Transparency around our data used in our Electricity National Control Centre (ENCC) and close-to-real-time decision making

Consumer benefit outcomes

Our stakeholders have told us that they could operate more effectively in their provision of services to us if they had a better understanding of our balancing services requirements close to dispatch timescales, and had access to data upon which the ENCC bases its decisions. Therefore, with stakeholders, we are looking at what data we can share publicly without prejudicing the market and commercial confidentiality. As part of this, we will look to publish more explicit requirements. These requirements should stimulate the market to provide the solution and reduce our use of commercial trading and contracting tools. This work should lead to more effective targeted products and solutions, enhancing competition and driving down costs.

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Publication of operational planning data	Currently, we receive data from balancing mechanism providers which are used by the ENCC to make decisions. In Q1 2019-21, 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 using webinars.	Beginning in Q1 2019-20 engage with stakeholders	Exceedng baseline
Future of the ENCC	We will continue with our work on the future of the ENCC as set out in our approach to thinking document. We will deliver the outputs outlined in this document and the roadmap which will be published during Q1 2019-20.	Publish 12 operational challenges: Q1 2019-20 Publish roadmap: Q1 2019-20	Exceeding baseline

Electricity Operational Forum and stakeholder engagement

Consumer benefit outcomes

We will engage with industry through high-visibility events, such as the Electricity Operational Forum, providing market participants with the opportunity to interact with us face-to-face. We hope this will enable the industry to gain better understanding and insight into what we are doing and why and enhance their competitive positions with other providers. Our proposed demonstrations to stakeholders of how we dispatch balancing services will also allow this rich interaction between us and market participants. This improved engagement should aid understanding, leading to more technically superior and cost-effective products, and more efficient transactions.

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Electricity Operational Forum	This stakeholder event takes place three times a year to provide operational information.	Q2, Q3 and Q4 2019-20 and 2020-21.	Meeting baseline

Addressing operational issues

Consumer benefit outcomes

In parallel with managing on-going operability challenges through commercial mechanisms (e.g. protecting the system from Rate of Change of Frequency (RoCoF) events), we will pursue technical and engineering solutions to address these issues. For example, we will address a root cause of the RoCoF issue by managing changes to affected DER protection systems, which should reduce the magnitude of the problem, and result in us spending less on commercial actions to manage it.

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Roll out of Loss of Mains protection settings	We will publish a methodology for how we intend to procure balancing services from Distribution Network Owners (DNOs) to enable RoCoF and vector shift changes.	Publish methodology Q1 2019-20	Exceeding baseline
	We will run four tender rounds throughout 2019-20.	Run four tender rounds during 2019-20	Exceeding baseline
	Review methodology	Review methodology Q4 2019-20	Exceeding baseline

Upgrade of information systems

We continue to work with all our stakeholders to ensure the design and capability of our information systems and IT can cope with the changing needs and demands placed upon it. The pipeline includes upgrades to the Energy Forecasting System (EFS), development of the Ancillary Services Dispatch Platform (ASDP), and changes to systems to comply with the latest European Network codes. These changes will ensure we can operate the system efficiently and effectively.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or exceeding baseline expectations
Frequency and time equipment FATE-3	Improvements to Frequency monitoring tool.	Q4 2019-20	Meeting baseline
Ancillary services dispatch platform (ASDP)	Moving dispatch of Short term operating reserve to ASDP.	Q2 2019-20	Meeting baseline
Significant upgrading of IT systems to prepare for European Network Codes	Significant upgrading of IT systems to prepare for European Network Codes.	Q3 2019-20	Exceeding baseline
Pi gateway refresh	Upgrading of systems to transfer data from Scottish TOs.	Q4 2019-20	Meeting baseline

How we will measure our performance in 2019-20

Metric 4 – Balancing cost management

Consumer Benefit

We will continue to use this metric to highlight our performance on controlling balancing cost spend and the size of the BSUoS levy. The continuing decarbonisation and decentralisation of generation combined with changes in how energy is being consumed would have, without intervention, caused a significant increase in balancing cost spend. We have been and will continue to be focused across the organisation on finding and delivering both step-change and incremental improvements in what we do to deliver savings for the consumer through controlling, reducing and optimising this cost.

Context

We will continue our focus on system balancing and security for an optimum cost in line with the expectations that Government, the regulator and consumers have of us. The on-demand provision of electricity is a fundamental part of our modern life but must be continuously attended to with the utmost importance by the ENCC and supporting functions.

Metric

A new simple benchmark for expected balancing costs will be derived from the application of a linear trend through five year moving averages of historic balancing cost (excluding Black Start), beginning with the rolling mean for 2009-2013 to 2013-17. We intend to use historical data to develop a baseline of costs. By applying a historical dataset that intrinsically reflects a broad range of operational situations we can capture a sufficient number of observations that the System Operator has encountered to establish a baseline for costs.

The historical data produces a benchmark for 2019-20 of £1018.7m

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 adjustments for these foreseeable fundamental drivers this year are:

HVDC availability

Availability of the Western HVDC Link will continue to have a downward impact on the rolling average, reducing the constraint spend we would anticipate for managing flows from Scotland into England.

We forecast a reduction in balancing spend of £136.4m

South East reinforcement work

We anticipate higher costs in operating the system caused by the unavailability of transmission assets in the South East of the network. This will be for 12 weeks and is to deliver reinforcements recommended by the Network Options Assessment (NOA) process. These reinforcements are required to provide increased capability on the network and optimise costs across TNUoS and BSUoS for the anticipated increased power flows driven by more interconnection.

We forecast an increased balancing spend of £60m to manage transmission network flows during this work.

RoCoF and Vector Shift

A programme of work is planned to start in 2019-20 to change the settings of existing RoCoF relays and replace Vector Shift relays. A recent modification to the Distribution Code requires all generators to have completed this work by 2022 to be compliant. With balancing costs rising year on year with the increasing levels of asynchronous generation, there would have been a system risk driven by these relay settings. So, to mitigate this, we have been proactive in work with all the DNOs to agree an accelerated change programme to curtail these costs earlier.

The costs associated with this are split into two areas firstly we forecast an increased balancing spend of £100m, in line with DC0079 forecasts, to manage the frequency of network for RoCoF risk, and secondly an additional £10m for direct payments to generators to change their settings as part of the accelerated RoCoF change programme.

Other drivers

During 2018-19 we have incurred additional costs in maintaining a safe and secure system. We have identified that the following further cost risks may continue into next year which may form part of further adjustments as they become clearer

- Scottish security during 2018-19: we have incurred significant unforeseeable additional cost due to generator outages in Scotland. We have needed to arrange contracts with different generators and take significant actions in the balancing mechanism to maintain system security. We currently anticipate that these generators will return from outage in 2019-20.
- The Capacity Market was suspended during 2018-19. This could lead to generators increasing their prices in the balancing market during periods where margins are short, in turn leading to an increase in balancing costs in 2019-20.

Performance Benchmarks

Five year rolling average	Savings from HVDC	South East reinforcement increase	RoCoF increase in cost	Benchmark 2019-20
£1018.7m	(£136.4m)	£60m	£110m	£1052.3m

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

Long-term vision

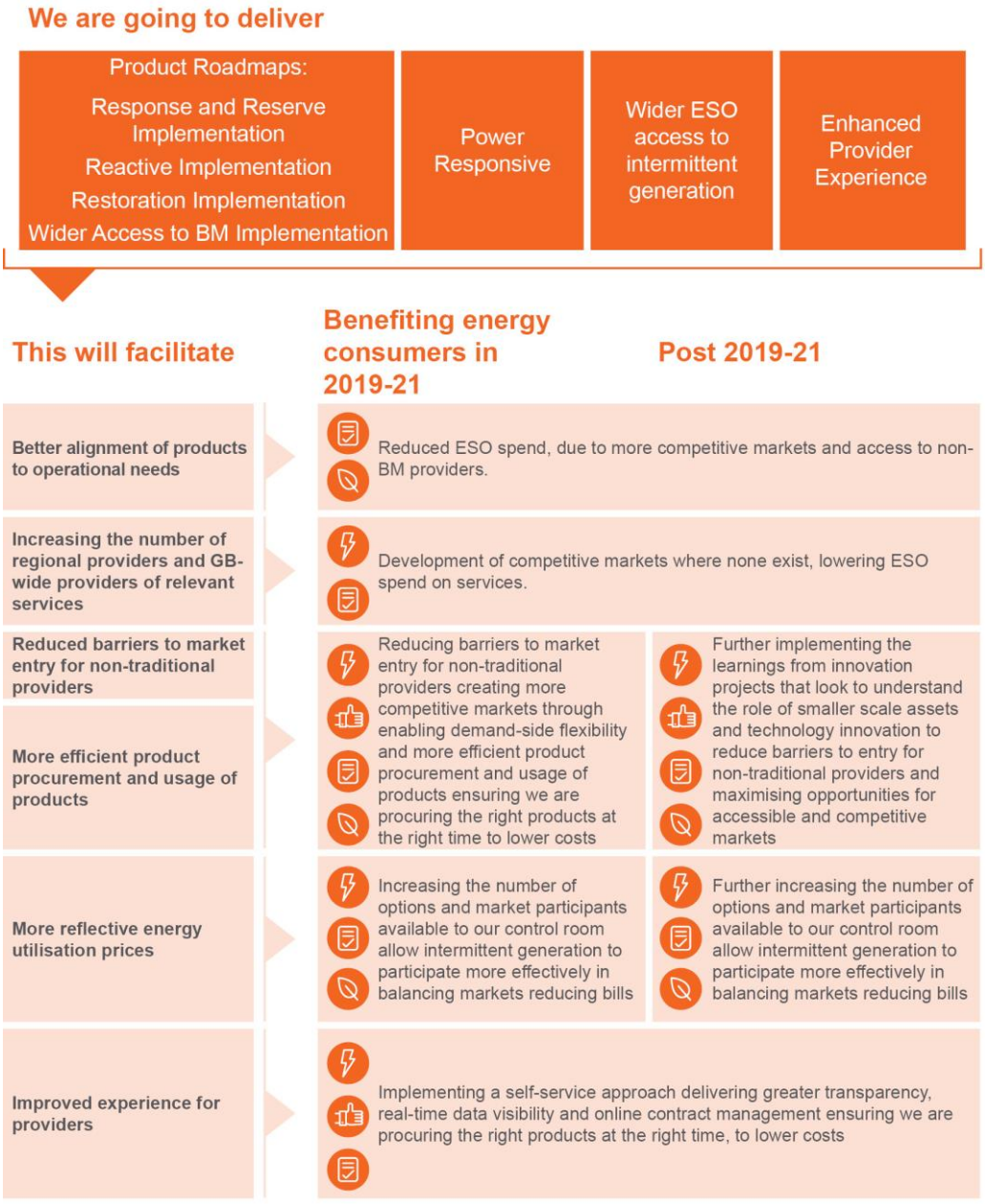
Our vision for this principle is to ensure that the rules and processes for procuring balancing services are simple and transparent to maximise competition. This will facilitate the entry of new business models and new technologies into the balancing and ancillary services markets. This enables us to access a greater level of flexibility through a set of coherent markets for balancing and operability that ensures the whole electricity system runs in the most efficient way, benefiting consumers. Our ambition is to support this transition and work hand in hand with the innovators so that together we can deliver a distributed, smart, flexible electricity system.

Delivering consumer benefit

Our aim is to develop our markets and services to improve transparency, remove barriers to entry, increase competition and meet our operational needs at the lowest cost to the end consumer. We will do this by creating liquid, closer to real time markets for balancing and operability that reduce the balancing costs that flow through to consumer bills. We will do this by giving stakeholders a forward view and the clarity necessary for investor confidence by detailing the steps we will take by when, to create these liquid, closer to real time markets.

We can enable lower balancing costs through this principle by working to drive down the price we pay for balancing services. We do this through maximising competition and creating and developing markets for the products we need to operate the system.

Principle 3 benefits under 2019-21 Forward Plan



Activities and deliverables 2019-21

Over the next two years we will focus on several areas to deliver these consumer benefit outcomes:

- Product roadmaps for responses and reserve implementation
- Product roadmap for reactive implementation
- Product roadmap for restoration implementation
- Power Responsive
- Wider access to BM roadmap implementation
- Intermittent generation
- Provider experience

This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Product roadmaps for response and reserve implementation[3]

Consumer benefit outcome

We are fundamentally reviewing and reforming our response and reserve products to align with future operability needs and EU standard products. We will deliver an auction platform for procurement of frequency response, work we started in 2018-19. These actions will lead to more efficient and competitive markets.

Through our Platform for Ancillary Services (PAS) project, we are delivering a system for non-BM service providers of balancing products to communicate directly with us. The Ancillary Services Dispatch Platform (ASDP) uses web Application Programming Interface (API) data feeds to send metering and availability data to, and receive dispatch instructions from, our ENCC. All these actions will result in lower spend on services than would otherwise have been the case.

Frequency response

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Rollout of full functionality in frequency response auction trial	Second stage of auction trial, introducing dynamic primary & secondary products, linked bids and conversion factors.	Q2 2019-20	Exceeding baseline
Report on development of new frequency response product suite	Update on product development following modelling, analysis and stakeholder feedback	Q4 2020-21	Exceeding baseline
Report on auction trial	Status update on the success of trial, learnings from the first six months and how these are informing future developments	Q1 2021-21	Exceeding baseline

3 https://www.nationalgrideso.com/sites/eso/files/documents/Product%20Roadmap%20for%20Frequency%20Response%20and%20Reserve.pdf

Reserve

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Market design for reformed reserve products	Communicate and engage on proposal for reformed reserve products	H1 2019-20	Exceeding baseline
	Implementation plan for the new reserve product suite published	Q4 2019-20	
Report on our plan for retaining standard products	Paper outlining which specific products we are retaining, supported by cost benefit analysis.	Q1 2019-20	Meeting baseline
Start migration of non-BM Short-Term Operating Reserve (STOR) providers to ASDP	Through the PAS project we will start moving non-BM (typically smaller-scale) STOR providers from historic systems into the new ASPD platform, which will be integrated with control room systems.	Q2 2019-20	Meeting baseline
Implementation of Pan-European replacement reserve standard products	Support development and implementation of Pan-European standard products to allow GB parties to participate	Delivery throughout 2019-21	Meeting baseline

Product roadmap for reactive implementation[4]

We are working to reduce barriers to entry through increasing the transparency of our reactive power procurement and cost of our actions; increasing the numbers of providers in a region (trialling contracts in South Wales) and across Great Britain; designing more competitive services in conjunction with industry; learning from the Power Potential project how DER can offer reactive services and how that is priced; and working with DNOs on Grid Code change to define efficient reactive power flows between networks.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Communicate reactive power requirements & historic spend	Per region, to be clear about what we need in short, medium and long term and confidence levels of requirements, alongside historic voltage costs to increase transparency of spend on voltage actions.	Q2 2019-20	Exceeding baseline

4 https://www.nationalgrideso.com/sites/eso/files/documents/National%20Grid%20SO%20Product%20Roadmap%20for%20Reactive%20Power.pdf

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Implement approach for efficient reactive power flows between networks	Having worked with network owners to design a whole system approach to managing reactive power flows between networks, implement approach.	Q2 2020-21	Exceeding baseline
Work with industry to determine future role for reactive power and design more competitive reactive power services	Industry engagement that explores options to improve reactive power services and refines these to arrive at an approach that can be implemented.	Q4 2018-19 – Q2 2020-21	Exceeding baseline
Commence implementation plan to enable rollout new approach to competitive reactive power services	Improved reactive power service that promotes competition where possible and enables economic and efficient procurement.	Q3 2020-21	Exceeding baseline
Power Potential trial with UK Power Networks (UKPN)	Innovation project in partnership with UKPN aiming to create a new reactive power market for DER and generate additional capacity on the network.	Q2 – Q4 2019-20	Exceeding baseline
Review learning from Power Potential	Learnings to inform whether to procure reactive power services from DER and if so, how to do so in partnership with DNOs.	Q4 2019-20	Meeting baseline

Product roadmap for restoration implementation[5]

Consumer benefit outcomes

We will develop new approaches to system restoration (also referred to as Black Start capability). We will work with industry to understand how different technologies and providers to those traditionally deployed for this purpose could satisfy the technical requirements. In parallel, we will develop a market approach for the procurement of these services. This work will benefit the consumer as we develop competitive markets where previously none existed, and is also likely to enable low-carbon generation sources and DER to compete.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Alternative Approaches to Restoration	Undertake a Network Innovation Allowance (NIA) project to understand the capability of 'non-traditional technologies', such as wind, solar, battery storage, electric vehicles (EVs), industrial and commercial Demand Side Response (DSR) to contribute to a Black Start.	Q1 2019-20	Exceeding baseline

5 https://www.nationalgrideso.com/sites/eso/files/documents/National%20Grid%20SO%20Product%20Roadmap%20for%20Restoration.pdf

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
	Commence our Network Innovation Competition (NIC) project, Black Start from DER to look at the concept of being able to restart the electricity system at the distribution level, rather than the transmission level.	2019-2020	Exceeding baseline
Develop and evolve a market approach for the procurement of Black Start services	We have identified a region where we will trial this approach and will launch an Invitation to Tender (ITT).	Q1 2019-20	Exceeding baseline
	A feasibility study process inviting Black Start service providers who have met the minimum technical requirements to proffer commercial proposals. Where possible we will identify other regions where we can run a market mechanism such as the South-East.	Q4 2019-20	Exceeding baseline

Greater Transparency

- We will continue to engage with the industry and provide information on Black Start costs through the Monthly Balancing Services Summary (MBSS) report.
- We will, through our Black Start strategy and Black Start procurement methodology, explain the restoration approach and the procurement strategy in the short, medium and long-term. Where there is an opportunity to amend our restoration approach or create a market mechanism, we shall consult and publish any changes or requirements on the Future of Balancing Services website.

Power Responsive

We are promoting industry development of demand side flexibility; identifying and unlocking barriers to entry to maximise opportunities for accessible, competitive markets resulting in lower bills and improved security and reliability of supply.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Deliver innovation projects to unlock demand flexibility	Work with industry stakeholders to understand the role of smaller scale assets and technology innovation in unlocking greater flexibility, to identify and unlock barriers to entry and maximise opportunities for accessible, competitive markets	Q1-Q4 2019-20	Exceeding baseline
Power Responsive Stakeholder Engagement	Promote industry developments for demand side flexibility and facilitate feedback to shape ESO deliverables through a range of engagement activities.	Q1 2019-20 – Q4 2020-21	Meeting baseline

Wider access to Balancing Mechanism roadmap implementation[6]

We are engaged in a spectrum of activities to enable greater participation in the BM, including: how providers move from non-BM to BM contracts; reducing time and cost of technical connection to the BM; systems for dispatch of aggregated BMUs; work to improve data from aggregators to us, and better settlement data. Wider access to the BM will promote competition and provide the ENCC with greater access to efficiently use the products it needs. This will lower cost to consumers, improving quality of service and contributing towards reducing environmental damage.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Clearer accession requirements for BM participation and enable aggregated BMU participation in balancing services	Ensure clear and proportionate arrangements to tie parties into relevant GB codes and for BM obligations in the provision of BM ancillary services.	Q1 2019-20	Meeting baseline
Use better technology/systems to improve efficiency of installing communications with BM providers and optimising BMU dispatch	Improved and clearer communications system requirements: • Testing and improvements of IS solutions • Final IT user specifications available to industry • Wider access go live	Delivery throughout 2019-20	Meeting baseline
Support industry work on providing and delivering against Physical Notifications (ELEXON led) and also support on work on accurate settlement for behind the meter	Provide a mechanism for aggregated BMUs to submit accurate predicated generation profiles (PNs) and provide a way to accurately determine how much energy an aggregated BMU has delivered at their connection point to the distribution system.	Q3 2019-20	Meeting baseline

Intermittent Generation

Power available is an operational metering signal received from Power Park Modules (e.g. Wind) that combines live weather readings with plant capability to provide a dynamic, real-time indication of maximum potential output. We will increase the number of options and market participants available to the ENCC by developing the technical concept of generation power available signals; integrating this signal/data into product definitions, control and settlements systems, and processes. This allows intermittent generation to participate more effectively in ancillary/balancing services, lowering cost to consumers and improving quality of service.

Consumer benefit outcomes

6 https://www.nationalgrideso.com/sites/eso/files/documents/Wider%20BM%20Access%20Roadmap_FINAL.pdf

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Raise code modification to apply Power Available consistently across technical & commercial codes	Power Available, Maximum Export Limit (MEL) and De-Load need consistent application across technical and commercial codes to facilitate accurate settlement and imbalance reporting	Q1 2019-20	Meeting baseline
Publish Power Park Module signal best practice guide	Functional description of best practise for Power Park Modules submitting Power Available to supplement technical codes	Q2 2019-20	Exceeding baseline
Deliver Power Available integration phase 1	Integration of Power Available into energy calculations to improve control room visibility of Power Park Modules returning from BOAs and high-wind shutdown	Q3 2019-20	Exceeding baseline
Publish wider strategy on flexibility from intermittent generation	Long-term vision and next steps for increasing flexibility from intermittent generation	Q4 2019-20	Exceeding baseline
Deliver Power Available integration phase 2	Integrate Power Available into response and settlement calculations to facilitate use of wind units for Mandatory Frequency Response (MFR)	Q1 2020-21	Exceeding baseline

Provider experience

Consumer benefit outcomes

We are working to offer an efficient experience for providers through development of a self-service approach. This will deliver greater transparency, reduced reliance on account management, online contract management, real-time data visibility, accessible supporting documentation and feedback collection. This focus creates more efficient and effective interactions and transactions between ourselves and providers. This will benefit consumers by helping to ensure we are procuring the right products at the right times in the most competitive and efficient way, controlling the BSUoS costs which are ultimately funded via the consumer bill.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Feedback approach	A survey framework for getting feedback from our providers at key points in the journey including onboarding, tendering, contracting and query management which will complement current metrics. This is then used to inform process improvements.	Q1 2019-20	Meeting baseline
Improved online resources	Clear signposting to relevant sources of information on our website; interactive guidance document for each balancing service; and checklist of entry requirements for each service to support providers in understanding their eligibility to participate	Q1 2019-20	Meeting baseline

How we will measure our performance in 2019-20

Metric 5 - Provider Journey Feedback

Consumer Benefit

Lowering costs for consumers by driving us to focus on providers and potential providers to reduce barriers to market entry, increasing liquidity in Balancing Services markets. This will also benefit consumers through facilitating the transition to a lower carbon network.

Context

We have made commitments to reform the Balancing Services markets, opening them to new providers. The end to end provider journey has been mapped and key points identified which are onboarding, tendering, contracting and query management.

Metric

Feedback score from the four key points identified in the provider journey:

1. Onboarding Survey Questions
    1.1. I found it easy to find the information I needed?
    1.2. I was provided with information of sufficient quality to enable me to make an informed decision?
    1.3. What can we do to improve the accessibility of our information? (Free comments box)

Tendering

    1.4. What type of participant are you?
    1.5. I have the information I need to understand Firm Frequency Response tender results. On a scale of 1-5, with 1 for disagree and 5 for agree.
    1.6. On a scale of 1-5, with 5 being the most useful how would you rate the usefulness of the Firm Frequency Response results webinar?
    1.7. What can we do to improve transparency of the Firm Frequency Response tender results?

Contracting

Query management

(Questions 1 & 2 are rated on a 5-point scales: strongly agree to strongly disagree)

Performance Benchmarks

Exceeds benchmark: average of 3.5/5 or above

In line with benchmark: average of 2.5 or above

Below benchmark: average less than 2.5

Metric 6 - Reform of balancing services markets

Consumer Benefit

Removing barriers and facilitating the entry of non-traditional providers into balancing markets will result in:

- Lower bills than would otherwise have been the case through driving more competitive prices from service providers.
- Reduced environmental damage both now and in the future through increasing market opportunities for low carbon technologies.
- Unlock additional revenue streams for service providers.

Context

Within our product roadmaps for frequency response and reserve, restoration and reactive power we outlined deliverables that will deliver equitable markets for each service by removing unnecessary barriers to entry and introducing more open procurement methods.

In response to stakeholder feedback at the mid-year ESO performance panel in November 2018, we have developed a metric that covers the removal of barriers to entry for different technologies in different services and is supplemented by tracking the distribution of balancing services spend across bilateral and open procurement approaches (competitive tenders and auctions) in order to tell the full story.

Our intention is to use this metric to communicate progress against a fundamental element of Principle 3. We would value stakeholders' view on how to articulate this and benchmark progress in the simplest and most transparent manner.

Framework

Part of our role as market facilitator is to work with parties to develop efficient markets so that they, ultimately, better serve consumers. The activity that is under way to develop balancing markets is on a scale far beyond that normally undertaken. It involves working with more stakeholders than ever before to understand their businesses and open up value propositions for them. We are working hand in hand with stakeholders in an incredibly fast-developing market, addressing barriers to entry and tackling new issues. The issues we are tackling are complex and we need to find the right pace to keep up with this market but also continue to make sure the system operates safely.

Through our product roadmaps, we have committed to reforms to our Balancing Services markets that are essential in enabling the ESO to facilitate the transition to a smart, flexible, low carbon electricity system.

Metric

Metric part one:

This metric will measure how reforms are facilitating the entry of non-traditional providers into balancing markets. We will map service provider technology types against current services and the accessibility of these services has been categorised into three groups:

- Red – significant barriers to entry with no solution implemented
- Amber – interim solution implemented
- Green – Interim solution implemented to enable commercial access

Metric part two:

This metric will measure the direction of travel away from bilateral arrangements, towards open and accessible market opportunities. We have attributed balancing spend to three categories that describe the openness of the procurement approach:

- Commercial (bilateral)
- Mandatory
- Tendered

On a quarterly basis information will be presented in a chart for each service that shows cumulative spend broken down into the three categories of procurement approach to provide supporting narrative on our progress.

Performance benchmarks

Metric part one:

The change of status between 'current' and 'end Q4 2019-20' is driven by the expected changes from completing Principle 3 deliverables.

Deliverable in 2019-20	BM Wind through 2019-20					Embedded wind through 2019-20				
	Current	Q1	Q2	Q3	Q4	Current	Q1	Q2	Q3	Q4
Mandatory Frequency Response (MFR)	●	●	●	●	●	●	●	●	●	●
Commercial Frequency Response (FFR/auction trial)	●	●	●	●	●	●	●	●	●	●
Obligatory Reactive Power Service (ORPS)	●	●	●	●	●	●	●	●	●	●
Reserve Products	Consultations and developments will be made throughout 2019-20 for delivery in future years									
Black Start services	Consultations and developments will be made throughout 2019-20 for delivery in future years									
Balancing Mechanism	●	●	●	●	●	●	●	●	●	●

Deliverable in 2019-20	Solar through 2019-20					DSR through 2019-20				
	Current	Q1	Q2	Q3	Q4	Current	Q1	Q2	Q3	Q4
Mandatory Frequency Response (MFR)	●	●	●	●	●	●	●	●	●	●
Commercial Frequency Response (FFR/auction trial)	●	●	●	●	●	●	●	●	●	●
Obligatory Reactive Power Service (ORPS)	●	●	●	●	●	●	●	●	●	●
Reserve Products	Consultations and developments will be made throughout 2019-20 for delivery in future years									
Black Start services	Consultations and developments will be made throughout 2019-20 for delivery in future years									
Balancing Mechanism	●	●	●	●	●	●	●	●	●	●

Exceeds benchmark: Completing >75% of deliverables, and the shift in service accessibility, would constitute the metric exceeding the benchmark.

In line with benchmark: Completing 50-75% deliverables, and the associated shift in service accessibility, would constitute the metric being inline with the benchmark.

Below benchmark: Completing <50% deliverables would constitute below the benchmark.

Principle 4
Promote competition in the wholesale and capacity markets

Long-term vision

Our vision and commitment under this principle is to work alongside our stakeholders to embrace the opportunities created by a decentralised, digital and low-carbon future energy system. We will facilitate the evolution of the markets, providing thought leadership and insight to unlock the full potential that a greater diversity of technologies, market participants and business models can deliver for the consumer.

Delivering consumer benefit

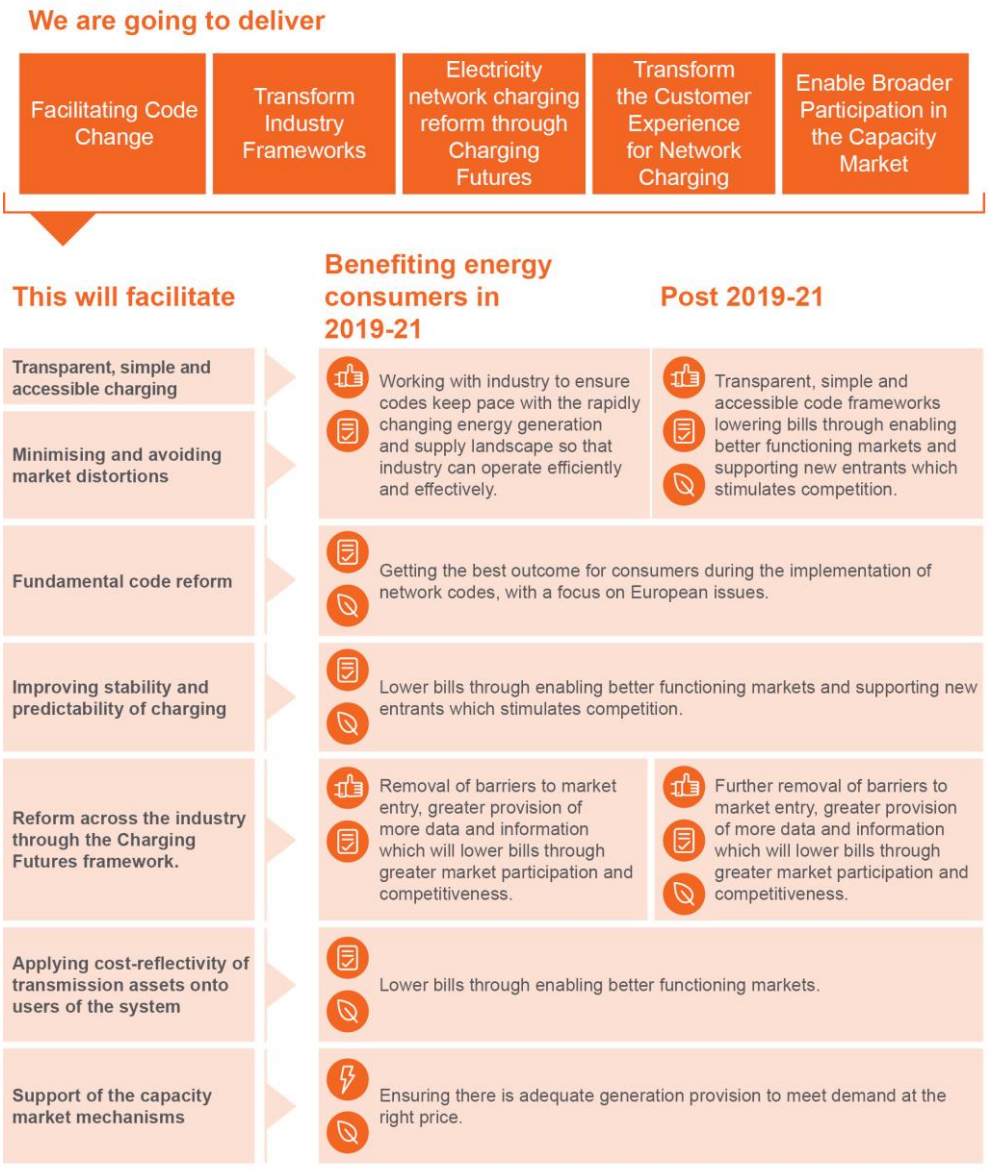
We have identified five key focus areas which we will transform over 2019-21: facilitate code change, evolve industry frameworks to enable decentralised, decarbonised and digitalised energy markets, facilitate electricity network charging reform through Charging Futures, transform the customer experience for network charging and enable broader participation in the Capacity Market. These transformations will deliver consumer value under the following categories:

Our aim is to reduce the end-consumer bill; we can drive lower costs through this principle by enabling better functioning markets and supporting new entrants which stimulates competition due to our support of market changes concerned with:

- Transparent, simple and accessible charging;
- Minimising and avoiding market distortions;
- Improving stability and predictability of charging;
- Applying cost-reflectivity of transmission assets onto users of the system;
- Fundamental code reform - this will both improve customer service and lower consumer bills by removing barriers to entry and better facilitating competitive markets;
- Facilitating reform across the industry through our work within the Charging Futures framework.

We will deliver improved quality of service benefits through focus on our stakeholders, suppliers, providers and customers, which should in turn, benefit the customers of those organisations, end consumers.

Principle 4 benefits under 2019-21 Forward Plan



Activities and deliverables 2019-21

Over the next two years we will focus on five areas to deliver these outcomes:

- Facilitating code change,
- Transform industry frameworks to enable decentralised, decarbonised and digitalised energy markets,
- Facilitate electricity network charging reform through Charging Futures,
- Transform the customer experience for network charging
- Enable broader participation in the Capacity Market

This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Facilitating code change

We will work with industry to ensure codes keep pace with the rapidly changing energy generation and supply landscape so that the industry can operate efficiently and effectively for the benefit of the consumer. We will help stakeholders access information in a clear and transparent way, to enable informed and value-adding debate.

Consumer benefit outcomes

Get the basics right

We recognise that we still have work to do when delivering against our stakeholders' baseline expectations. During 2019-20, we will continue to remove frustrations from the code change experience.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Meeting calendar & transparency of workgroups	All meetings available within our code modification calendar on our website with meeting outcomes available and transparent.	Q1 2019-20	Meeting baseline
Governance process FAQs, improved guidance material and critical friend review	Documentation that educates the industry on the governance process and increased service provision to modification proposers.	Q2 2019-20	Meeting baseline
Facilitation of pre-modification discussions	Supporting pre-modification proposals with subject matter expertise and cross code implications being considered.	Q3 2019-20	Meeting baseline
Incorporation of all 14 Code Administrator Code of Practice (CACoP) Principles	Adoption of all 14 CACoP principles in a robust manner whilst supporting the development of modifications.	Q3 2019-20	Meeting baseline

Enabling all network users to understand and contribute to the code change process

There are increasing numbers of parties in the electricity industry and the needs and preferences of those parties is also increasing. As a code administrator, we believe that we can do more to keep people informed of how our frameworks are developed, creating opportunities for network users to contribute to their development. This will see a more effective governance process that delivers greater consumer benefit. This involves developing different levels of information, communications and routes to access, so stakeholders can use to choose the level that is right for them; whether it is key strategic insights or a detailed involvement in proposed changes. Developments across 2019-21 will be driven by ongoing engagement with our stakeholders.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Engage all parties to understand information requirements for code modifications and provide executive summaries on modifications	Work with stakeholders to understand how they want to be able to better access information on code modifications. Introduction of executive summaries on modifications to highlight the essential points.	Q1 2019-20	Meeting baseline
Code administrator website	Redevelop our code administration webpages to improve access to information required for industry parties to raise new modifications and understand progress of existing modifications.	Q3 2019-20	Meeting baseline
Governance surgeries	Surgeries including webinars and bite size videos to show and guide industry parties through the process.	Q2 2019-20	Exceeding baseline
Historical timelines & horizon scanning: cross-code	Showcase all historical modifications and outcomes across Grid Code, CUSC and STC over last two years. Provide a view of all cross-code changes which impact codes we manage.	Q2 2019-20	Exceeding baseline
Horizon scanning: strategic	Consideration of change congestion across the energy industry with legislative and regulatory changes considered in a three to five-year strategic view.	Q3 2019-20	Exceeding baseline
Stakeholder seminars	Hosting and supporting stakeholders, in person and online, to increase awareness of the governance process, allow access to information and increase visibility of the services offered.	Q4 2019-20	Exceeding baseline

Transform industry frameworks to enable decentralised, decarbonised and digitalised energy markets

There is need for fundamental code reform, this will improve customer service and lower consumer bills by removing barriers to entry and better facilitating competitive markets. We will ensure that consumer representatives can have a voice in the debates, alongside new and smaller participants, to drive fair outcomes for all. Whilst we have traditionally facilitated discussions when focussing on major reform, through legal separation of the ESO we want to step up and provide increased thought leadership. Helping to better inform industry discussions and deliver better outcomes for consumers.

Leadership in the successful transformation of the electricity access and charging regime

We will take a leading role through increased thought leadership, continuing our role as lead secretariat for Charging Futures to facilitate balanced industry-wide debate throughout the consultation periods and the subsequent decision-making process. Where appropriate we will support the transformation of charging and access through code modifications. We will focus efforts on:

- **Targeted Charging Review (TCR):** In November 2018, Ofgem published their minded to consultation and draft impact assessment for the TCR and plan to publish a consultation decision/policy statement in June 2019. Relevant code modifications are expected to be raised in Q2 2019-20 to implement this decision/policy statement.
- **Balancing Services Charges Task Force:** Throughout Q1 2019-20, we will work collaboratively and transparently to conclude the ESO-led task force to provide the final report to Ofgem. This will ensure Ofgem can consider the views of the task force in parallel to wider industry feedback on their TCR minded to consultation. Relevant code modifications related to Balancing Services Charges are expected to be raised in Q2 2019-20 following the publication of the TCR decision/policy statement.
- **Network Access and Forward-Looking Charges Review:** Ofgem launched their Significant Code Review for the Electricity Network Access Project in December 2018 and we will continue to provide collaborative thought leadership within this programme ahead of a decision being made by Ofgem in Autumn 2020. In parallel we will continue to be actively involved in those areas which are outside of the scope of the Significant Code Review, such as the development and delivery of incremental improvements to queue management and interactivity in collaboration with the ENA Open Networks project.

Leadership in the Energy Codes Review

In November 2018, BEIS and Ofgem announced an Energy Codes Review programme intending to deliver a consultation on existing arrangements by summer 2019. The review will assess whether the existing energy codes are fit-for-purpose and the need for fundamental reform.

Through our engagement with stakeholders and our experience with the existing arrangements, we believe this to be a timely and necessary review. We will be fully involved with the aim of ensuring that the arrangements work for our customers, wider stakeholders and consumers. To support and stimulate the debate, we will publish a thought-piece to set out our own views on the potential future arrangements; this will be informed by the insights we have gained from feedback recently provided by stakeholders related to issues with the energy codes and how they can be improved.

Working for you on European matters

In our 2018-19 Forward Plan, we discussed our role in the continued implementation of the European Network Codes and how we prepare for and influence the Clean Energy Package and EU exit aiming to mitigate risks to both industry and consumers. Over the next two years, we will continue to work for and with our stakeholders on European matters to provide transparency on future change which will affect those stakeholders and ensure valued outcomes for consumers. We will focus efforts on:

- **European Network Codes:** We will continue to provide leadership in the development and implementation of the current European Network Codes programme with the support of our key stakeholders.
- **Clean Energy Package:** We will work with our stakeholders to help them understand the implications of the Clean Energy Package for their businesses by publishing a high-level impact assessment Q1 2019-20.

- **ENTSO-E:** We will continue to actively participate in ENTSO-E to deliver value for stakeholders; this will include active engagement in committees and working groups and regular engagement with other TSOs to share and learn from best practice.
- **EU exit:** We will continue to work with our key stakeholders, including BEIS and Ofgem, to ensure that we are prepared on these topics for EU exit, as well as being prepared much more widely in respect of, for example, security of supply, operability, codes, licences and future relationships.

Unlocking whole system network development opportunities

Our 2018-19 Forward Plan set out opportunities associated with whole system network development thinking and the benefits of reviewing SQSS alongside the NOA; we will take forward our thinking on the review throughout 2019-20.

Developing and driving targeted market improvements

We can offer a unique perspective through our role at the heart of the energy system and continue to provide targeted input where we believe our views can add value. We will work with our stakeholders to understand their current and future market framework pain points, identifying potential further code modifications to be raised. We will engage stakeholders further to identify, develop and drive such targeted market improvements, whilst remaining mindful of existing planned changes and the effect this has on industry time and resource.

We will continue to provide our views on both queue management and interactivity through the Energy Networks Association (ENA) Open Networks project having considered industry feedback on the consultation published in December 2018. This could involve targeted code modifications at the appropriate time.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Leadership in the successful transformation of electricity access and charging	Publication of ESO-led Balancing Services Charges Task Force final report.	Q2 2019-20	Exceeding baseline
	Leadership in network access and forward-looking charges review.	Ongoing	Exceeding Baseline
Leadership in the Energy Codes Review	Publish thought piece on potential future arrangements of the Energy Codes as part of the wider Energy Codes review programme.	Q1 2019-20	Exceeding baseline
Working for you on European matters	Publication of an ESO high-level impact assessment of the Clean Energy Package.	Q1 2019-20	Exceeding baseline
Unlocking whole system network development opportunities	Continue to review potential options under the SQSS review.	Q1 2019-20	Exceeding baseline
Developing and driving targeted market improvements	Continue our review of new commercial security arrangements for long lead time high value transmission schemes.	Q1 2019-20	Exceeding baseline

Facilitate electricity network charging reform through Charging Futures

We will engage with current and future users of the GB electricity system to consider current issues across both transmission and distribution arrangements to give more effective reforms, providing an efficiently operating system for the benefit of the end consumer.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Facilitate electricity network charging reform through Charging Futures 1. Targeted Charging Review 2. Access and Forward Looking Charges SCR 3. Reform of Balancing Services Charges	Facilitate reform of arrangements across the whole electricity system by communicating with all users of the electricity system and creating opportunities for all users to learn, ask and contribute to reform. This will include: • Regular Forums, • Webinars, • Podcasts, • Emails, • Summary notes • Charging Futures website.	Please see the Charging Futures website - http://www.chargingfutures.com/	Exceeding baseline

Transform the customer experience for network charging

We will continue to focus on the better provision of data and information and removing unnecessary barriers to market entry through improved onboarding processes.

Consumer benefit outcomes

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Improve our ESO charging query processes	Introduction of a single point of contact for all ESO charging queries and publication of our updated query management standards.	Q1 2019-20	Meeting baseline
Improve understanding of our onboarding processes and	Publish guidance to help and support new suppliers in understanding our charges,	Q1 2019-20	Meeting baseline

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
streamline to meet our customer needs	our obligations, and what you need to do.		
	Simplifying our approach for onboarding customers.	Q2 2019-20	
	Redefine our processes to make them more customer centric.	Q3–Q4 2019-20	
New data reports for BSUoS	Publication of new supporting data about BSUoS charges, to enable customers to be informed about this key charge.	Q1 2019-20	Exceeding baseline
Reform of website content in to a user-centric knowledge base	Support our increased information provision by improving information signposting on our website.	Q2 2019-20	Exceeding baseline
Publications and guidance of the impact of charging reform to our customers	Significant reform to the charging arrangements are expected over the 2019–21 timeframe, Together with Charging Futures will work to make data accessible and understandable.	Ongoing from Q2 2019-20	Exceeding baseline
Introduce new 'new entrant' e-learning on charging	Develop a suite of training to support new entrants in understanding our charges.	Q4 2019-20	Exceeding baseline
	Developing further training and guidance to help all parties engage and understand charging methodologies.	Q1 – Q3 2020-21	
Improve the digital customer experience for TNUoS, BSUoS and Connection Charging Data; including the introduction of a new NGESO billing system	We are investigating options for updating our systems, and have a clear drive to put customer functionality at the heart of any new products.	Q1 – Q4 2020-21	Exceeding baseline
Establish a 'cross party' approach to onboarding, mapping out whole industry requirements	Work with suppliers to be a critical friend in supporting them starting in the market, for both their obligations with NGESO and with other industry parties such as Ofgem and ELEXON.	Q1 – Q4 2020-21	Exceeding baseline

Enable broader participation in the Capacity Market

The European Court of Justice judgement in November 2018 means that the Capacity Market (CM) is in a standstill period until such a time the government achieves approval for the scheme. During this standstill period, we continue to believe that a Capacity Market is the correct mechanism to deliver security of supply for GB. In this period, we, and the EMR Delivery Body, support the Government as they seek resolution and work with our customers to ensure we provide certainty with regard to CM obligations. Below, we have set out our planned high-level deliverables for the Capacity Market and will refresh these accordingly in due course.

Capacity Market Customer Journey

Customers have told us that the CM is too complicated and the IT systems that we use as the EMR Delivery Body do not do enough to guide applicants through the process. In 2019-20 we will work with applicants to build on the guidance that we produced in 2018-19. In conjunction with the guidance and the customer support, where possible we will look to make improvements to our systems to ensure performance and improve user experience.

Capacity Market Five Year Review

BEIS and Ofgem have initiated their processes to review the CM five years after its implementation. We believe that the CM has met its core objective to ensure security of supply during times of winter peak demand at the lowest cost to consumers and agree that there is a need for the continuation of the CM. We observe that the CM has undergone significant change since 2014 and is now operating in a very different context. The CM's framework has not evolved at the same pace and cannot adequately support the efficient and effective delivery of the CM, in its current guise.

The five-year review provides a valuable opportunity to consider whether changes to the CM might be required either now or in the future to ensure that it remains fit for purpose. Key areas identified are: the interplay between security of supply and system operability requirements; the participation of renewables; interconnector participation; and improvements to the CM's existing framework and governance arrangements. We and the EMR Delivery Body will fully support these reviews and work with BEIS, Ofgem and industry to implement any resulting change.

Contracts for Difference

In 2019-20 we, and the EMR Delivery Body, will facilitate the Contract for Difference (CfD) Allocation Round 3 (AR3). The EMR Delivery Body is working with other delivery partners and potential applications to deliver regulatory changes and improve on the round 2 (2015) process. CFD AR3 introduces new technologies such as remote island wind. We must engage with new and existing applicants to ensure that the process is a success in 19/20.

It is anticipated that BEIS will conduct a CfD five-year review in 2019-20; we will engage and support this process. We want to ensure that the scheme continues to deliver growth in affordable clean energy.

How we will measure performance in 2019-20

Metric 7 - Code administrator: stakeholder satisfaction

Consumer benefit

Consumers benefit from competitive markets that reflect the design and use of the networks that connect them. Ensuring that technical and commercial arrangements keep up with changing behaviours and new technologies is critical to facilitating these markets. As code administrator, we have a central role in making the development of technical and commercial codes a transparent

and accessible process. Improved performance in our code administration function enables all network users to contribute more effectively to future arrangements.

Context

We are code administrator for three codes: Connection and Use of System Code (CUSC), System Operator Transmission Owner Code (STC) and Grid Code. There are increasing numbers of parties in the electricity industry that have an increasing variety of needs and preferences. As a code administrator, we believe that we can do more to keep people informed of how our frameworks are being developed and creating opportunities for network users to contribute to their development.

The most recent half year CACoP survey highlighted an improvement in our performance across the three codes we administer. Whilst this is progress in the right direction, we are committed to the ambitious strategy we have set ourselves. This included the publication of an improvement plan in October 2018 focused on the ease of interpreting information, technology & facilitation and the provision of support.

For 2019-20, we continue our journey of getting the basics right but will increasingly focus on more value-added activities that will support network users to stay better informed and build a greater understanding of developments and hence enable more effective contributions to the code change process.

Framework

We will continue to use the results from Ofgem's Code Administration Code of Practice (CACoP) survey as the baseline for our performance in this area to demonstrate the impact our deliverables are having in this area. This will be supported by stakeholder surveys following key activities to ask how likely they are to recommend the service provided to colleagues. By doing this we will be able to understand how well each of these activities are meeting the needs of our stakeholders.

Metric

We acknowledge that there is considerable effort required to successfully achieve the step change required in this area, so for 2019-20, we continue to target increased performance for each of our codes when benchmarked against our previous CACoP survey scores.

Exceeds benchmark: Increased overall performance across all of our three codes (STC/CUSC/Grid Code) in the 2020-21 CACoP survey due to be carried out in spring 2020; benchmarked with our previous scores.

In line with benchmark: no improvement in overall performance across all of our three codes (STC/CUSC/Grid Code) in the 2020-21 CACoP survey due to be carried out in spring 2020; benchmarked with our previous scores.

Below benchmark: Decreased overall performance across all of our three codes (STC/CUSC/Grid Code) in the 2020-21 CACoP survey due to be carried out in spring 2020; benchmarked with our previous scores.

In addition to CACoP surveys, we will also seek feedback from our stakeholders through the use of surveys at set points in the year and following key deliverables such as the conclusion of workgroups. These survey's will be able to target our stakeholders' key expectations of the service we provide them and give continuous feedback for us to respond to and iterate on our improvements.

Exceeds benchmark: Increased overall performance across all of our three codes (STC/CUSC/Grid Code); benchmarked with our previous scores.

In line with benchmark: no improvement in overall performance across all of our three codes (STC/CUSC/Grid Code); benchmarked with our previous scores.

Below benchmark: Decreased overall performance across all of our three codes (STC/CUSC/Grid Code); benchmarked with our previous scores.

Metric 8 - Charging Futures

Consumer benefit

By supporting current and future network customers through change, Charging Futures will help realise benefits to the end-consumer by:

- Stimulating competition and facilitating an expanding market – reducing barriers to entry for new customers, leading to greater choice and enhanced service for consumers.
- Managing a complete and collaborative cross-system change process – 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.

Context

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. This will be measured by outcome-focused performance indicators.

We have committed to three engagement objectives to best support industry through Charging Futures. Every network user, no matter their size or where they are connected to the electricity network, has the opportunity to:

1. Learn – about electricity network charging across the whole system today, and how it could change in the future.
2. Ask – regularly ask charging and regulatory experts questions related to reforms, and wider charging code change.
3. Contribute – be able to contribute to reform at all stages and through a number of ways.

Framework

To demonstrate how we have met these three engagement objectives, we will use a combination of outcome-focused measures. These are outlined in the table below. We will survey the full Charging Futures membership list (currently over 500 members) and will assess our performance based on the three primary measure questions.

Engagement objective with industry	Desired outcome	Primary measure (survey question)
Learn about electricity network charging across the whole system today, and how it could change in the future	• A wider range of industry participants have a better understanding of how charging works today – particularly smaller and newer players • Industry knows what and when change might happen in electricity charging and access arrangements • Industry feels better able to 'contribute' to sessions because of an increasing knowledge base	Through Charging Futures, to what extent do you feel you've had the opportunity to improve your understanding of electricity network charging arrangements, current developments, and the options for change in the future?
Regularly Ask charging and regulatory experts questions related to upcoming reform	• Industry acknowledges and appreciates an increasing opportunity to ask questions of charging and regulatory experts	Through Charging Futures, to what extent do you feel you've had the opportunity to ask charging and

Engagement objective with industry	Desired outcome	Primary measure (survey question)
		regulatory experts about potential change?
Be able to Contribute through the differing stages of reform	• A wide range of network users are contributing to reform at all stages, through Charging Futures • Participants are satisfied with the number of opportunities and range of routes through which they can contribute to reform • The quality of contributions from a greater number of industry participants has improved when compared to previous consultations and code work groups • Industry has multiple ways to feedback and develop the Charging Futures process to best benefit it	Through Charging Futures, to what extent do you feel you've had the opportunity to contribute to high level changes around future GB charging and access arrangements?

Following key engagement activities, we will also survey attendees to ask how likely they are to recommend the activity to colleagues. By doing this we will be able to understand how well each of these activities are meeting the needs of our stakeholders.

Metric

Our success as lead secretariat should be judged against our ability to maintain the overall scores for these measures throughout the year. This will be calculated by periodically repeating the survey throughout the year and averaging these scores. These scores will then be compared against the initial baseline score.

Performance Benchmarks

Exceeds benchmark: Average scores from surveys undertaken throughout the year are higher than the baseline score.

In line with benchmark: Average scores from surveys undertaken throughout the year equal the baseline score.

Below benchmark: Engagement scores achieved throughout the year fall below the baseline score.

As further evidence of the outcomes that we are achieving for Charging Futures members, we will supplement the primary survey measures through the continued collection of supporting metrics. Many of the secondary metrics will be determined through an assessment of the utilisation of the Charging Futures web portal (www.chargingfutures.com).

Metric 9 – Year ahead forecast vs outturn annual BSUoS

Consumer benefit

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 need be added to the supply contract and as a result the lower the cost for the end consumer.

Context

The nature of BSUoS and the impact that significant and unexpected events during the year can have on the cost of system balancing means that there is significant uncertainty in an annual forecast. An event such as £18m spend on margin over 3 days, or significant fault outages like HVDC can cost tens of millions of pounds. Our incentive performance could easily be lost by an event could happen on day two of the incentive period. It is this level of uncertainty that has informed our development of thresholds across which our performance will be measured.

Metric definition and targets

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)[7].

Exceeds benchmark: exceeding target is under 10%. APE.

In line with benchmark: proposed baseline target is less than 20% APE.

Below benchmark: underperforming greater than 20% APE.

Performance can be driven by within year events so we won't have a clear picture of the result until the end of the year. We therefore don't expect to report on this measure on a monthly basis and introduce metric 9 at a monthly granularity.

Metric 10 – Month ahead forecast vs outturn monthly BSUoS

Consumer benefit

Some of our customers have told us they manage their price and balancing risks via month-ahead products. We also understand large consumers on pass through contracts seek to understand their month-ahead BSUoS costs. For both of these reasons the quality of our month ahead BSUoS forecast can influence the risk premia that parties are having to manage with the ultimate benefit of reducing consumer cost.

Context

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. We propose that to ensure we are continually incentivised to improve our forecast that this metric does not just look explicitly at the volatility but at the number of occurrences outside of a 10% and 20% band. This means we will be appropriately incentivised to avoid very high errors.

Our thresholds have not been established based on historic performance: the data below shows that in 2017 we wouldn't have met either threshold, we therefore consider Metric 10 to be a realistic measure of our potential performance.

Please note too that we provide a narrative on the monthly volatility in the BSUoS report published on the ESO website, and can explain why a month's error is outside the target range due to unforeseen events.

Metric

The metric will count the occurrences of absolute percentage error (APE) for our monthly forecast with outturn data available at month end

Performance Benchmarks

Exceeds benchmark: Exceeding is meeting baseline performance and five or more forecasts less than 10% APE.

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7 APE = abs((Actual – forecast)/ actual). APE calculates the difference between actual and forecast divided by the actual to give a percentage error, the absolute value is take to account for positive and negative errors.

In line with benchmark: Of the 12 forecasts over a financial year, baseline performance is less than five forecasts above 20% APE.

Below benchmark: five or more forecasts above 20% APE.

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

Long-term vision

The focus of system planning is to further manage the transition to a low carbon network. We do this by recommending the most economical network and operability solutions, based on analysis of onshore, offshore and potential cross-border options.

To design the network we need by 2030, we will be working seamlessly with the Distribution System Operators (DSOs), through new markets and using new processes, to explore all possible solutions for meeting transmission system needs. These needs will be optimised alongside distribution system needs to deliver best value for consumers – regardless of asset ownership boundaries.

Currently, efficient transmission network investment planning and development is shaped by the data we hold and the modelling we undertake to provide future transmission system needs information for the industry. Decentralisation of the electricity system opens up a wider range of approaches across the transmission and distribution systems to find new and novel solutions to current and future challenges. Effectively, meeting those challenges depends on coordination and collaboration across network boundaries.

Enabling choices that deliver the most benefit when whole system costs are considered must be at the heart of future developments. Combining new ways of planning and developing energy systems with fit-for-purpose commercial mechanisms that provide revenue streams for distributed energy resources (DER), should support this aim.

Delivering consumer benefit

By working more efficiently with other network operators to identify and respond to whole electricity system challenges, the outcomes we are pursuing through this principle are:

- **Promoting competition in the provision of balancing services**: Facilitating least cost solutions to allow DER to participate in energy and services markets, enhancing liquidity to drive down costs; and
- **Getting the most out of existing network infrastructure**: optimising the use of existing network capacity and minimising the cost of operating the system.

Our overall aim is to reduce end-consumer bills through ensuring the most efficient options are chosen when planning and developing the energy system of the future. We co-ordinate with other network operators to deliver this.

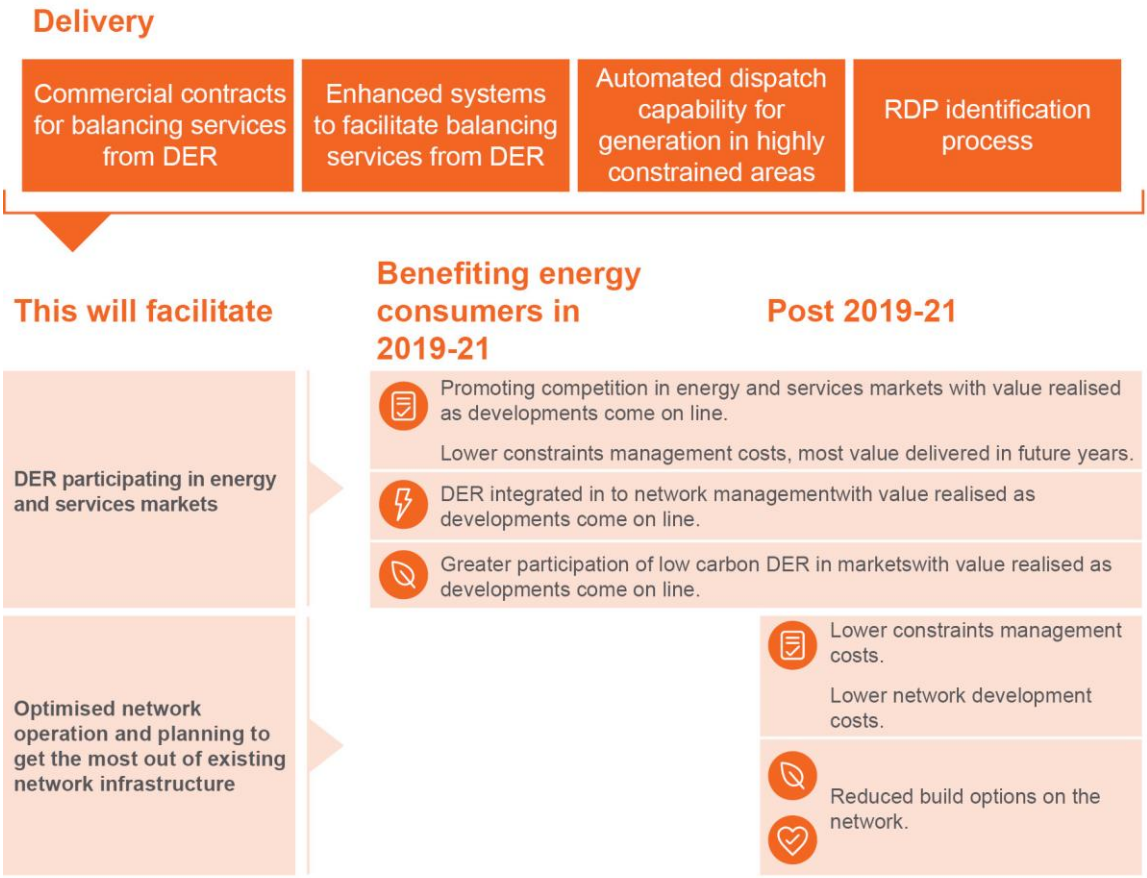
The cost of transmission network installation and maintenance is recovered from transmission-connected generators and suppliers (demand tariffs) via the TNUoS charge which ultimately is passed on to the end consumer. We play a fundamental role in recommending the optimum options to develop the networks, and searching for new ways to identify more options including reduced or no build options. This should put downward pressure on this charge.

The cost of operating the system is also paid by generators and suppliers (the BSUoS charge), which is also captured in end-consumer bills. There is potential for us to further drive down this charge by finding innovative ways to optimise the use of assets across the whole system for system operation needs.

Consumers can further benefit from the early connection of new generation in areas of the network which, without significant asset investment, there has previously been limited opportunity for new connections. Our Regional Development Programmes (RDPs) facilitate this; the increased market participation that results should bring price benefits through increased liquidity; and should also support the achievement of low carbon objectives (as much of the new distributed generation will also be low-carbon).

Over the next two years we will focus on establishing further RDPs across Great Britain, as a vehicle to enhancing the types of consumer value we have outlined. We will develop a process to more systematically identify new RDP opportunities across Great Britain.

Principle 5 benefits under 2019-21 Forward Plan



Activities and deliverables 2019-21

Over the next two years we will focus on two areas to deliver these outcomes:

- Ongoing Regional Development Programmes
- Development of a Proactive Regional Development Programme Identification Process

This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Ongoing Regional Development Programmes

A key focus of our first RDPs in the South-West and South-East of England was to allow new DER to connect earlier than would otherwise have been the case if asset solutions were required, by promoting participation in balancing services markets. The aim is for this is to increase competitive pressure on existing market participants for relevant services, which should lead to lower prices submitted to us, delivering value for consumers. The identification of operability solutions as an alternative to network asset solutions avoids costly network upgrades and allows DER to participate in markets much earlier than otherwise would be possible. During 2018-19, we commenced the delivery phase of these two RDPs, seeking to establish the technical and commercial arrangements that will underpin these new connections. We will continue this work into the 2019-21 period, as follows:

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Commercial contracts for balancing services from DER	Implementation of new commercial contracts to allow DER to participate in the provision of transmission constraint management services in our in-flight RDP areas.	Q4 2019-20	Exceeding baseline
Enhanced systems to facilitate balancing services from DER	Implementation of enhanced systems and ways of working between transmission and distribution to support provision of transmission services by DER.	Q2 20120/21	Exceeding baseline
Automated dispatch capability for generation in highly constrained areas	Development of 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.	To be confirmed.	Exceeding baseline
	Implementation of GEMS in accordance with agreed plan.		Exceeding baseline
	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.		Exceeding baseline

Development of a proactive RDP identification process

Consumer benefit outcome

To date, we have launched RDPs in response to recognised system issues. We believe that further value can be generated by taking a proactive approach working with DNOs to develop a process that will collaboratively identify future system needs and therefore opportunities for RDPs. Through this deliverable we will develop a systematic process to identify needs cases for further RDPs, to 'productionise' what has so far been a 'learning by doing'; project-based approach. This will enable us to be consistent in our approach, and ensure we can capitalise on all opportunities

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
RDP identification process	We will develop an agreed process with DNOs to identify the need for future RDPs.	Q3 2019-20	Exceeding baseline

How we will measure performance in 2019-20

Metric 11 - Whole system, unlocking cross-boundary solutions

Consumer benefit

The deliverables under this principle seek to benefit consumers in the following ways:

1. Saving infrastructure costs by avoiding or deferring the need to build additional assets to cope with further DER connections; and
2. Reducing balancing costs by promoting competition in the provision of balancing services, so that downward pressure can be brought to bear on prices.

RDPs act as enablers for DER to connect to networks and participate in markets, reducing the costs of developing and operating the electricity system in the future. Whilst it is very hard to quantify potential future savings in operational costs, we can consider the benefits of flexible connection capacity in terms of avoided asset spend.

Context

The RDP regions in South-East England, South-West England and South-West Scotland are characterised by limitations in transmission network capacity that, under normal circumstances, would mean long connection lead-times whilst expensive asset reinforcement was undertaken.

South-East England: The South-East coast network, with its multiple interconnectors to Continental Europe and large transmission-connected generators, meant that transmission capacity issues were beginning to impact on customer connection dates. DER developers rely on the ability to be able to connect to the network quickly, so this was perceived as a potential barrier to the growth of renewables in the area.

South-West England: Available transmission and distribution network capacity issues could potentially limit the volume of DER that will be able to connect in the South-West of England. Renewable resources, such as solar and wind, are favourable in the region and it is expected to play a major part in meeting the future governmental green energy targets, so it is important that connections can be facilitated in a timely manner.

South-West Scotland: This sparsely-populated region of southern Scotland has a large potential for growth of renewable energy sources. The predominant renewable resource in the area is wind, and it is anticipated that this already congested area will attract further development, with connection requests expected to grow significantly over the coming years.

During 2017-18, we collaborated with UK Power Networks (UKPN) and Western Power Distribution (WPD) to define ways that would enable, DER to continue to connect in these constrained areas. We also worked closely with Scottish Power Energy Networks (SPEN) on a way to tackle the challenges of the South-West Scotland network.

The deliverables captured in our 2018-19 Forward Plan represented the start of the delivery phase of work to enable these connections, and to give us access to a wider range of constraint management tools, which support the ongoing efficient management of transmission network issues, supporting system security and potentially driving down balancing costs. The nature of this work has meant that delivery continues in the period covered by this Forward Plan, and the metric below seeks to quantify the value of this work to consumers.

Metric

Assessment of the performance will be on an ex-post basis, using:

1. The level of DER MW that have signed contracts to connect to the distribution networks; and
2. A narrative setting out how we have established the conditions under which these new connections have been made possible.

The baseline date for each region is that when the conditions to facilitate further connections were established; as follows:

Region	Date
South-East England	1st April 2019
South-West England	1st April 2019

This metric 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.

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

Long-term vision

We develop ways of working and processes that enable whole system operation and ensure that we find ways to make the best use of all resources available across the system.

We will develop a whole system approach by working across the industry with other network operators including TOs, DNOs and an increasingly diverse range of customers.

We will work with DNOs to allow access to a wider range of resources and tools, whilst managing the technical challenges presented by operating the system in ways that were never anticipated when it was built. To optimise benefits to the consumer, we will collaborate widely across industry to find creative solutions to operating challenges that traditionally would be solved through balancing actions in the Balancing Market.

We want to improve our customer's experience and ensure they have full visibility of how to access and use the networks from the time of their initial connection and throughout the operating life cycle of their assets including maintenance and refurbishment programmes.

The types of customers connecting to our networks have changed, this brings a more diverse range of services and with that the levels of support provided through the connection process and the contract management phase of the connection require a change of approach. We will work with customers through the early phase of their investment to ensure the connection point offered reflects the best whole system outcome and the quality of the contract provides the ability to connect swiftly.

As volumes of distributed energy resources continue to increase we will strengthen our relationships with DNOs, evolve the way we work together and support them as they transition to become DSOs.

Delivering consumer benefit

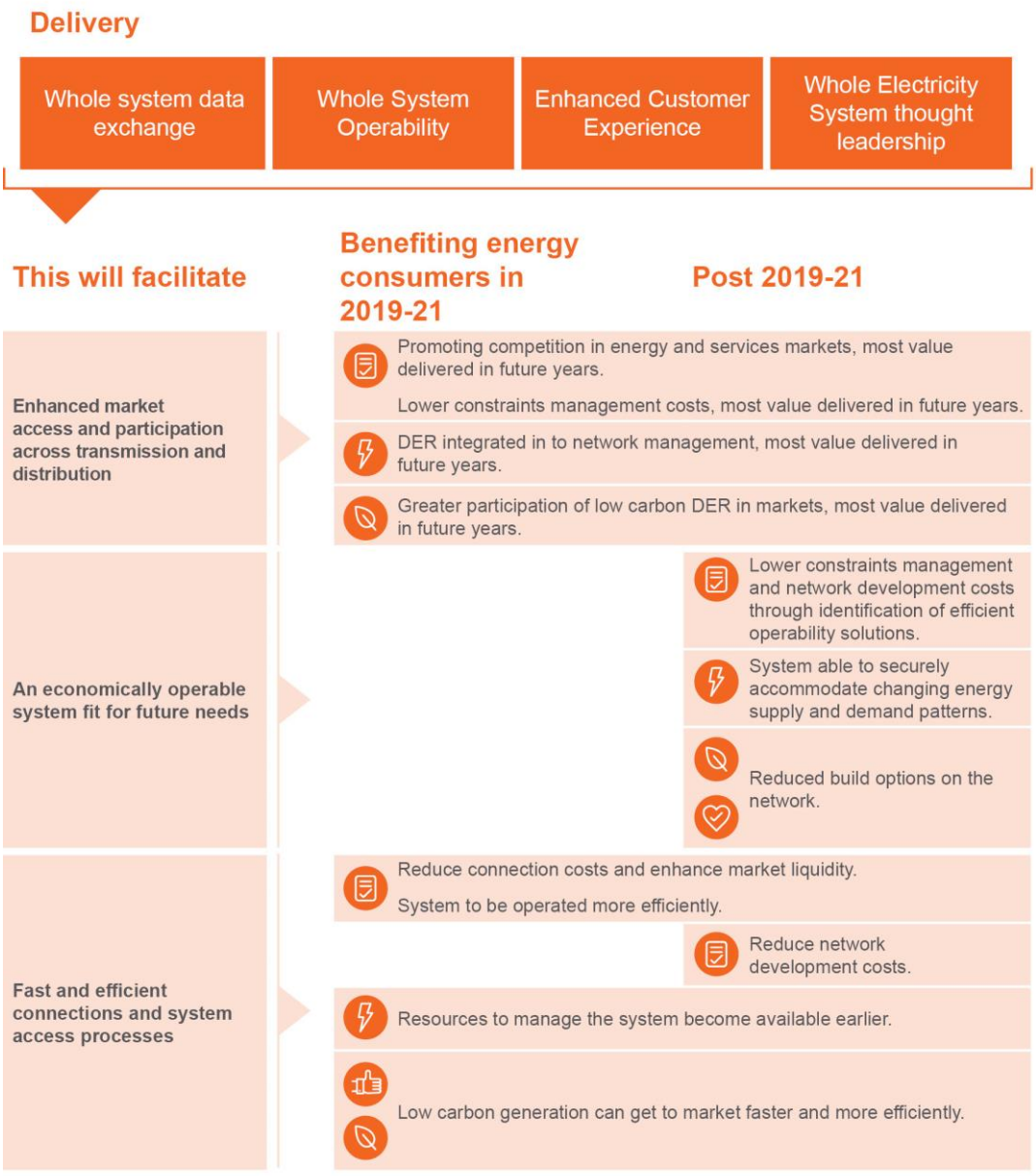
Successful delivery of our operational role on a whole system basis will unlock huge benefits for consumers well in to the future. Succeeding in this area will benefit consumers in several ways including, identification of the most economic and efficient parts the network for new connections to be made, resulting in quicker connection times and ultimately lower costs to the electricity consumer. This approach will also facilitate a faster route to connection enabling low carbon targets to be achieved quicker and enabling new revenue streams to emerge for DER.

We also work on looking across longer timescales at how we can operate the system efficiently as it transforms with low-carbon and decentralised generation supplying changing consumer demand patterns, ensuring the system is fit for consumer expectations in 2030 and beyond.

The outcomes we are pursuing through this principle are:

- Optimised use of energy resources and existing network assets to minimise costs of operating the network
- Greater liquidity in energy and services markets due to enhanced market access and participation
- Better service for customers and efficient connection processes to reduce industry costs
- A secure and economically operable system fit for future needs
- Supporting the development of tools and techniques for system operation of distribution networks and understanding how we will need to change to ensure efficient whole electricity system outcomes

Principle 6 benefits under 2019-21 Forward Plan



Activities and deliverables 2019-21

Over the next two years we will focus on four areas to deliver these outcomes:

- Whole system data exchange
- Whole system operability
- Enhanced customer experience
- Whole electricity system thought leadership

This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Whole system data exchange

Our current activities to ensure coordination across system boundaries to deliver efficient network planning are set out in the Grid Code Planning Code. They revolve around the exchange of data between network companies to assess the security and safety of the transmission system at the interface with Network Operators. They do this for both operational and investment planning purposes.

Consumer benefit outcomes

Part of this process requires the DNO to inform us of new connections in their network to allow us to assess impacts on the transmission network. This is the 'Statement of Works' process. The existing Statement of Works Process has been in place for a long time and was not designed to accommodate the volume of applications that DNOs have seen in recent years.

A newly developed data exchange approach provides DNOs visibility of the volume of capacity available at individual Grid Supply Points up to a set limit and greater transparency enabling them to contract with embedded customers more quickly without individual applications to us. By removing barriers to connection with the distribution network the new process allows DER to participate in markets much earlier than otherwise possible enhancing liquidity in energy and services markets.

This approach also saves the connecting customer £10k to £15k and can remove as much as 9 months from the connection offer process.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Extended roll out of enhanced whole system data exchange	The existing Week 24 data exchange process is in place to ensure that system modelling information of DNO networks is up to date to allow us and TOs to model the whole network accurately. Recently we have developed the Appendix G process which allows us to manage the connection of DER more quickly by releasing available capacity at Grid Supply Points to allow DNOs to offer connections. This process requires data to be updated more frequently providing a more accurate view of the distribution networks, we will review the Week 24 process and the Appendix G requirements to determine whether a revised approach to data exchange can be adopted.	Q2 2019-20	Meeting Baseline
Commercial flexibility around operational connections	In some congested areas of the transmission network, customers have connection agreements that require them to reduce their generation output under specific outage conditions. These conditions exist where transmission reinforcements have not been completed or where it is uneconomic to develop new infrastructure. The assessment of the network and the situations where restrictions exist is sensitive to generation contracted background and operating conditions on the system. By working with TOs, we will develop a process for identifying opportunities to more flexibly operate the network to prevent service	Q1 2019-20	Exceeding baseline

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
	disruptions where possible. This could be achieved through more targeted use of enhanced transmission equipment ratings or development of local operating procedures that can be introduced for specific conditions.		

Whole system operability

Increased volumes of distributed generation on parts of the network are causing operational challenges that lead to additional costs of operating the network including constraint payments to generators operating on a part of the network that cannot accommodate their output. Challenges such as high voltage and RoCoF require us to work with DNOs more closely than ever before to identify new ways of operating the whole electricity system to reduce costs.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Roll out of Loss of Mains Protection setting	We have proactively identified an opportunity to reduce costs of operating the system through changing protection settings on distributed generators and have trialled different approaches in a number of areas. Having learned from the successful vector shift change exercise, in 2019-21 we will engage other network operators to implement Loss of Mains changes more widely.	Commencing Q1 2019-20	Exceeding baseline
Defining roles and responsibility for voltage management across the transmission-distribution interface	Working with DNOs to optimise voltage on a whole system basis: • Short-term operational solutions • Transmission - distribution reactive power performance measures	Q3 2019-20	Exceeding baseline
Inertia Measurement	Implement a first of a kind system to measure system inertia in real-time and use it to optimise real-time operation, service procurement and network development.	Q3 2019-20	Exceeding baseline

Enhanced customer experience

Improvements to our systems and processes for managing customer connections and access to the transmission network will help our customers to be more efficient as they participate in energy markets or develop network assets. Such efficiencies will be passed on to the end consumer through reduced energy and network development costs.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Transmission Outage and Generator Availability (TOGA) replacement	Following stakeholder engagement to understand user requirements, we will be developing the TOGA system replacement. This is the tool that customers and TOs use to request system access.	Q4 2019-20	Meeting baseline
Customer journey mapping - outage planning	Working with teams across National Grid Electricity Transmission (NGET) to improve the experience for networks and market participants relating to outage management. This will involve developing concepts which will seek to address the pain points in the existing process. This includes ideas on how we can do things differently to provide a better service as well as considering the activities that would need to be in place.	Q1 2019-20	Meeting baseline
Connections customer portal	Detailed scoping of tool to provide a visual and live update for customers on the progress of their connection application.		Exceeding baseline

Whole electricity system thought leadership

Our vision of the future energy landscape is based on a world where we work closely with DSOs to ensure routes to local, regional and national markets are aligned and optimised collectively for all participants creating value for the end consumer[8]. We recognise that this future will develop over time. Through the period 2019-21 we will;

- Build on our thought leadership to provide clear articulation of how our role will change through the next decade. Through the RIIO-2 process, we will define our role and deliver against our business plan.
- Share learnings from initiatives such as RDPs as well as our innovation projects such as Power Potential to inform industry thinking.
- Work with others including continuing our key role in the ENA Open Networks project. This will include ESO representation on all relevant Open Networks deliverables, leading where appropriate. Further details on these activities will be provided as the 2019 work programme is confirmed. This will include a lead role in the proposed Whole Energy System workstream.

We play a key role in the ENA Open Networks project, and will be actively involved across all workstreams and the majority of its 2019 deliverables. We will continue to support this project and identify areas for us to take a lead on. Across the ENA Open Networks workstreams, we are engaged in over 30 working groups and/ or product development groups.

8 The UK could save £17-40 bn across the electricity system from now to 2050 by deploying flexibility technologies, 'An analysis of electricity system flexibility for Great Britain', Carbon Trust / Imperial College London, November 2016

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
ESO thought leadership – how our role will evolve	Describing how our role will change over the next decade to meet the challenges of whole electricity system.	Q1 2019-20	Exceeding baseline
Whole Electricity System learnings paper	Describing how our initiatives and innovation projects are supporting Whole Electricity System thinking and identifying potential new areas of work.	Q2 2019-20, update Q2 202-/21	Exceeding baseline
ENA Open Networks project 2019 ESO input	We will play a proactive role in the ENA Open Networks Project including leading the development of a number of products.	Q3 2019-20	Meeting baseline (although certain roles may be exceeding)
ENA Open Networks project Whole Energy System lead	Leading the development of the Whole Energy System workstream of the Open Networks project.	Q3 2019-20	Exceeding baseline

How we will measure performance in 2019-20

Metric 12 - System access management

Consumer benefit

Reducing unnecessary network and balancing costs by improving the system access request planning process.

Context

We direct the flow of electricity over the transmission system in real time and the three TOs and OFTOs own the assets through which the electricity is transferred. To ensure that these assets are maintained, the TOs need to ask us for access to their assets. When the system access requests are formally submitted, we performs due diligence on these requests and, if secure and economic, they are accepted into the master outage plan.

When a system access request has been accepted into the plan, customers will have acted on the assumption that it will go ahead. This includes TOs, DNOs and generators who could have, for example, incurred costs hiring specialist contractors or equipment. Sometimes these requests are delayed or even cancelled within day for a variety of reasons from unforeseeable weather conditions to faults on the system to planning process failures. These cancellations can lead to higher network costs. (The estimated delay costs to the TOs are between £5,000 and £15,000 a day.

Metric

This metric looks to drive down the number of planned outages that are delayed by more than an hour or cancelled by us in the control phase due to process failure, investigating the reason for cancellations and putting in place changes into the process where appropriate to prevent a repeat. Sometimes we should cancel system access requests that have been accepted into the plan because these are no longer securable or the costs are too high. We will continue to cancel system access requests where needed; however this number should be as low as practical to

avoid costs for external stakeholders and our costs in re-planning these requests. The tension between these two aspects is dynamic and so the ESO will work to reduce the number of control phase cancellations out of every 1,000 system access 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.

Performance benchmarks

Current performance: 11.5 delays more than an hour or cancellations within day per 1,000 outages accepted into the master outage plan.

Exceeds benchmark: Less than 10.4 per 1,000 outages (more than 10% reduction).

In line with benchmark: 10.9 -10.4 per 1,000 outages (5-10% reduction).

Below with benchmark: More than 10.9 per 1,000 outages (less than 5% reduction).

Metric 13 - Connections agreement management

Consumer benefit

Reducing balancing costs by ensuring that we have access to appropriate commercial options following changes to the transmission network, to maintain its operation of the transmission system.

Context

The GB transmission system is constantly under change as the three TOs and OFTOs build new assets. All generation that needs to be connected to the transmission system requires a contract with us. After the TOs make changes to the transmission system, they inform us of these changes. We need to ensure that the relevant contracts for the affected generators are then updated to reflect this change.

Some agreements permit us to curtail generation under certain circumstances at no cost but if an agreement is not up to date and the generation requires curtailment, we may need to instruct this through a Bid Offer Acceptance (BOA). Ensuring that connections agreements are up to date to reflect changes to the transmission network gives us more options to ensure the system can be run safely and securely and potentially saves BSUoS cost when we would need to pay to curtail generation.

Updating connection agreements requires collaboration between us and the relevant TO and then a three-month period to get the updated agreement signed off by the customer. We cannot control all aspects of the performance as it requires interaction between us, the TO and the customer, so targets reflect this.

Metric

This metric will measure how long it takes from the point of notification for these agreements to be updated. This metric drives efficient and effective management of existing connections contracts by measuring the percentage of contracts up to date within nine months.

Performance benchmarks

Current performance: = 86%.

Exceeds benchmark: >90% of agreements to be updated within nine months of notification.

In line with benchmark: 80-90% of agreements to be updated within nine months of notification.

Below benchmark: < 80% of agreements to be updated within nine months of notification.

Metric 14 - Right first time connection offers

Consumer benefit

Ensuring Connection offers sent to customers are 100% correct minimises re-work and facilitates timely and efficient connection to the network.

Context

Historically customers connecting to our networks have been involved in the industry for many years and have experience in developing new projects and the connection application process. With the increase in renewable generation and smaller sized projects connecting to our networks, the customers we now work with have much less knowledge of the network and the processes for connection. This provides us with an opportunity to provide excellent customer service and to use the skills and knowledge we have of the industry to help new entrants come into the market. This requires us to work much more closely with those customers who are new to the industry to ensure that the solution we develop is right for their business. This metric measures how well we deal with this challenge by quantifying how often we get it right first time.

Metric

To measure the quality of a customer's connection offer we will use 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. 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.

Performance benchmarks

Current performance: = 94%.

Exceeds benchmark: >95% of offers right first time.

In line with benchmark: 95% of offers right first time.

Below benchmark: < 95% of offers right first time.

Principle 7
Facilitate timely, efficient and competitive network investments

Long-term vision

We aim to promote competition in network development through considering all viable options, and performing robust independent analysis to determine the economically and technically optimum solutions.

We will expand the Network Options Assessment (NOA) process to include solutions to network development challenges from network and non-network providers across transmission and distribution expanding the range of system needs that a NOA-type approach is applied to. Our Network Development Roadmap published in July 2018[9] showed how we intended on making these changes to support greater participation in the NOA and support competition.

In the future, solutions to network development challenges may include commercial solutions and distribution network solutions in addition to traditional transmission network build options.

The outcomes we are pursuing through this principle are:

- Identifying and analysing a wider range of options through the NOA process
- Driving competition on a whole system basis
- Facilitating participation in provision on solutions to meet network challenges from non-traditional parties and solutions
- Application of the NOA-type approach to a wider range of system needs

Delivering consumer benefit

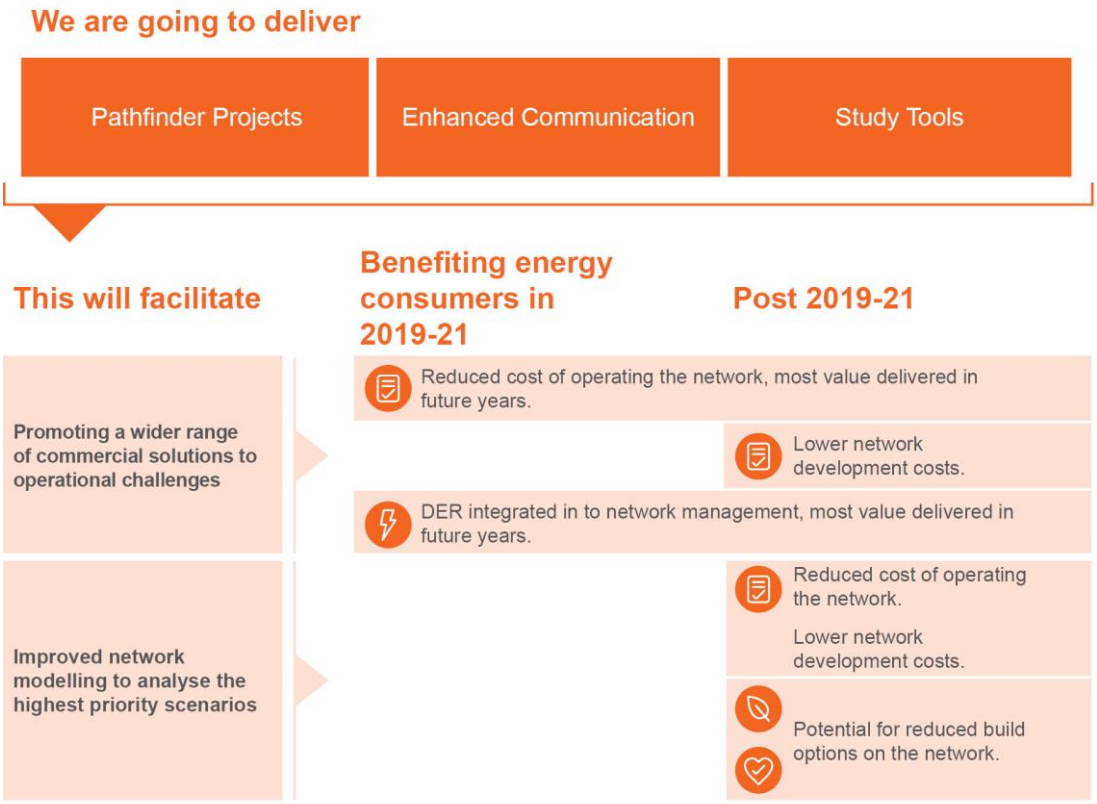
Our aim is to reduce the consumer bill through ensuring we identify and evaluate all options for network development. Through evaluating a range of solutions using a NOA-type approach we will be able to identify options that are the best value for consumers.

In the Network Development Roadmap, we said over the next two years we will focus on expanding the NOA process to evaluate a wider range of options. We identified work that we would do that has now extended to six specific programmes at this point: stability pathfinder, voltage pathfinder, voltage screening tools, thermal constraint assessment tool, constraint management pathfinder and enhanced communication.

Pathfinder projects will identify solutions to transmission operation challenges and promote a wider range of commercial solutions to meet the challenges. This will drive reduced costs of operating the network through more efficient solutions to issues such as high volts. A wider range of solutions combined with enhanced modelling capability, to better accommodate changing supply and demand dynamics, will also facilitate optimal network development investment.

9 https://www.nationalgrideso.com/sites/eso/files/documents/Network%20Development%20Roadmap%20-%20Confirming%20the%20direction%20July%202018.pdf

Principle 7 benefits under 2019-21 Forward Plan



Activities and deliverables 2019/21

Over the next two years we will focus on three areas to deliver these outcomes:

- Pathfinder projects
- Study tools
- Enhanced communication

This section provides more detail on our deliverables, how they will deliver consumer benefit and delivery dates.

Pathfinder projects

A pathfinding project is a 'trial by doing' approach to develop new processes, expand capabilities and learn along the way often requiring collaboration between us, TOs and DNOs. They build upon work previously undertaken, for example through RDPs or ENA Open Networks project, to develop the necessary processes to support delivery of new whole system ways of working consistently across Great Britain.

Consumer benefit outcome

We use pathfinding projects to develop the capabilities that we and other parties need to take forward expanding our approach to network development. Developing a cost-benefit analysis that compares network and non-network solutions that have different lifetimes or contracting periods will be challenging and we will develop our approach through pathfinding projects. This will include

developing processes for working with a wider set of stakeholders and exploring the value reflected by different length contracts, particularly when the provision of new, long term market solutions is being considered.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Stability pathfinder	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. 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. Develop and test processes to obtain and evaluate options to meet the requirements set out through technical and economic assessment. Develop a methodology for inclusion in the NOA methodology for 2020-21.	Request For Information (RFI): Q1 2019-20 Output of stability pathfinder: Q3 2019-20 Inclusion in NOA Methodology: Q1 2020-21	Exceeding baseline
South Wales and Mersey Voltage pathfinder	These will build on the 2018-19 deliverables to progress the consideration of broader options to meet transmission system needs. These focus on high voltage system needs, seeking solutions from transmission and distribution network owners in addition to market based solutions. We will further develop these projects following on from the initial RFI, determining whether there is value to run a commercial tender and, where relevant conducting post tender evaluation through NOA based criteria and assessment to determine the best combination of asset and commercial solutions for meeting these regional high voltage needs. This will develop the necessary contract arrangements to facilitate participation by new and existing providers.	Decision to seek market solutions: Q1 2019-20 Project recommendations: Q2 2019-20	Exceeding baseline
Pennines Voltage pathfinder	Continuation of the high voltage project in the Pennine region to also consider market based solutions.	Decision to seek market solutions: Q1 2019-20	Exceeding baseline

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
	Continue with the Pennines voltage pathfinder to include commercial solutions. Further develop the necessary funding mechanisms to facilitate the participation of DNO solutions.	Project recommendations: Q2 2019-20	
Constraint Management Pathfinder	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 the GB consumers as the electricity network evolves.	Technical and economic analysis concluded in Q2 2019-20. Stakeholder engagement &, commercial aspects completed by Q4 2019-20.	Exceeding baseline

Study tools

Our study tools sit at the heart of our capability to model the transmission network and its behaviour. The generation and demand elements of that model are uncertain in the future meaning we have outcomes that are very uncertain. Historically we have studied the winter peak demand period with an intact system and credible conditions over the whole year. By using enhanced study tools combined with a probabilistic approach we will assess the year-round transmission network needs. This is a completely new way of modelling and interpreting results, a step-change in one of our core capabilities.

A probabilistic approach will help us enhance our analysis beyond our current approach to boundaries providing greater insight on the likelihood of specific events occurring. This will enable us to focus analysis on the correct boundaries and scenarios, i.e. those that have resulted in high operational costs. This means that appropriate solutions can be evaluated to reduce the operational spend, creating greater benefit for consumers. In future, it could help improve the value that the Electricity Ten Year Statement (ETYS) and NOA drive for consumers by ensuring the right balance between operational and network solutions. In some cases, this could mean an increase or decrease in the amount of network capacity recommended when compared to our historic analysis approach, ensuring better outcomes for consumers.

We will continue work on our new voltage needs identification tools and processes to help assess in areas where local voltage issues could arise in future. Following screening of the issues we will look at priority regions in more detail and apply the NOA approach of comparing network and non-network solutions to regional voltage challenges.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Voltage needs identification tools/ processes	To enable a systematic approach to identifying snapshots for further investigation through detailed power system studies. The need for this process is driven by the increase in embedded renewable generation, giving rise to costly regional high voltage challenges.		Exceeding baseline
	Document and test voltage needs identification tools / processes for inclusion in the NOA. methodology. Identify up to three areas for further evaluation.	Q1 2019-20	
	Continuous improvement of the tools & processes.	Q3 2019-20	
Thermal probabilistic assessment tool / process	Development of a thermal probabilistic assessment tool / process to allow greater consideration of year-round conditions. This tool / process can be used to identify the most relevant system boundaries and provide a better estimation of the transfer capability which reflects year-round operation.	Proof of Concept: Q2 2019-20 Initial boundary capability results available: Q3 2019-20	Exceeding baseline

Enhanced communication

Consumer benefit outcomes

We believe a key aspect of broadening the NOA is by increasing the number and type of participants and that this will be driven by the quality and relevance of the information and data that we can provide. In considering a broader set of system needs and seeking solutions from a wider range of participants, we need to ensure that we can communicate effectively. Our current stakeholders have a high technical understanding and our network planning publications and requirements are tailored more to their requirements. In engaging a wider audience, we need to be able to set out our requirements and recommendations in such a way that they can be easily interpreted and appropriate solutions developed to meet the relevant system needs. Through our ETYS and NOA publications and continued stakeholder engagement we plan to evolve how we communicate system needs to facilitate greater stakeholder participation creating improved competition.

We continuously seek stakeholder feedback on our publications and are utilising existing industry forums to increase the awareness of our network planning documents and processes. We will continue with this in addition to looking to make modifications to our publications.

Deliverable	Description	Delivery Date	Meeting or Exceeding Baseline
Improve accessibility of the Electricity Ten Year Statement (ETYS) and Network Development Assessment (NOA) publications	Enhance the information that is provided on system needs to allow a wider audience to better understand needs and propose solutions to meet them.		Meeting baseline
	Continue to engage with stakeholders on the development of capabilities and implementation of the Network Development Roadmap.	Ongoing	
	Publication of needs to the market through RFI packs, which are supported by webinars.	Q1 2019-20	
	Enhancements to information in ETYS, to include requirements for a wider set of system needs and more detail on existing system needs.	Q2 2019-20	
	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.	Ongoing	

How we will measure performance in 2019-20

Metric 15 - NOA consumer benefit

Consumer benefit

Reducing network and balancing costs by pursing a full range of good quality options to be included into a Network Options Assessment. This includes the annual NOA process in addition to cost benefit assessments conducted on projects outside of the annual process.

Context

We carry out the NOA annually to recommend to the three TOs in Great Britain which reinforcement projects should proceed to meet the future needs for the bulk transfer of electricity over the electricity system, and which to delay. The NOA methodology, approved annually by Ofgem, uses 'single year least worst regret' analysis to quantify the risk each course of action poses. Selecting the strategy with the lowest maximum regret leaves the consumer exposed to the lowest risk.

To continue to drive consumer value and manage future uncertainty, we are expanding the system needs for which a network option assessment approach is used to determine the best solution. The first step is to implement a NOA style approach to determine the most efficient solutions to high voltage and stability needs. We are seeking solutions to these needs from a broader set of solution providers including DNOs and market participants in addition to TOs. Greater participation from stakeholders maximises value for consumers.

The requirement to consider a broad set of solutions from a broader audience to any system need will drive us to work with all parties to devise good quality options, including reduced build and commercial solutions where these are appropriate. These may be a cost-effective solution for the long term or a method to save constraint cost in the short term while larger network assets are built.

Metric

This metric will count how many of the reduced-build options that have been submitted to the NOA process appear in the optimal path and, where this is the case, what their consumer value is. Further it will also include the number of non-TO solutions received for system needs assessed by a NOA style approach, and the consumer benefit these solutions deliver, where the need is not driven by network compliance.

For clarity, we will only include reduced-build options that have been initiated by us as this will drive us to continue to be proactive in looking for these options.

This metric will include two aspects: the number of reduced build options appearing in optimal paths and non-TO solutions, and the consumer value driven by these options. The number of options is expressed as a count and the consumer value will be based on £/kW saving for alternative options against traditional build options or against taking actions in the balancing mechanism.

The challenge to measuring success against

Our objectives in this area are to identify alternative solutions to transmission system capability challenges that go beyond traditional network asset solutions where in the interests of energy consumers.

In any given year, there are not always non-transmission build options that can be included within the NOA and the consumer value of these options is not in the control of the ESO. Therefore, it is very difficult to measure the value of our efforts to achieve our objectives in this area.

Our initial thinking on how we can measure the value delivered is outlined below.

We would value stakeholder feedback on how we assess value delivered and how it can be quantified.

Performance Benchmarks

Exceeds benchmark: Larger number of value-add options than target and consumer benefit greater than or equal to 10% in excess of target.

In line with benchmark: Number of value-add alternative options meets target and consumer benefit within 10% of target.

Below benchmark: Number of value-add alternative options below target and consumer benefit below 10% of target.

Shape our Forward Plan

Our Forward Plan publication is the beginning of a conversation with you and we would be delighted to receive your written views on the content of this document and have you join us at our event on 22 January.

Your input is needed

We publish this plan for discussion with stakeholders, ensuring that we are focusing our activities to deliver most value for consumers. We invite stakeholders to respond to our consultation by 14 February 2019, and ask the following questions across all principles:

1. Do you have any comments on whether our plans are heading in the right direction to meet current and future market needs?
2. Please give us your view on whether we are targeting the right activities, for example those that will deliver most benefit for consumers?
3. We present in our plan, how our activities will meet and exceed baseline expectations between 2019-21 (see page 5 for definition of exceeding baseline expectations), do you have any comments on this?
4. Do you agree that our metrics will allow us to track our performance as we deliver against our plans?

In addition to these questions, we would also like to hear your feedback on:

- Principle 1: additional trades information provision (page 15)
- Metric 6: Reform of balancing services (page 36)
- Metric 15: NOA consumer benefit (page 72)

Forward Plan Consultation Event

On the 22 January, we will be holding an interactive workshop for stakeholders to review and challenge our Forward Plan. We will consider the feedback from this workshop as well as your written consultation responses, to inform development of our final 2019-21 Forward Plan to be published in March. It is vital that we receive your input on our priorities and activities for the 2019-21 period and beyond to ensure we are doing everything we can to drive efficient outcomes for energy consumers. Please register for the event here.

Please send your consultation response to box.soincentives.electricity@nationalgrid.com; unless you ask us not to, we will publish responses on our website alongside the final Forward Plan in March 2019.

A

Approach to stakeholder engagement and feedback collection

Approach to stakeholder engagement and feedback collection

In response to feedback in 2018, we published two documents providing greater clarity on how we are engaging stakeholders to seek input and feedback on our performance.

In Getting the balance right we provided an overview of our engagement channels and forums. In Driving performance through stakeholder engagement we provided further detail on our engagement approach including detail on the stakeholder survey questions we are asking. The purpose of this Appendix is not to reproduce the detail of what has been shared in the above documents as we will continue with the outlined approach; we want to provide visibility of where we will be making any changes to our approach in 2019-21.

As noted in previous publications, our intention is to ask stakeholder satisfaction questions both at the outcome level (i.e. how satisfied stakeholders are with the speed and scale of our work to reform balancing services markets) and the deliverable level (i.e. How effective specific Product Roadmaps are at addressing barriers). We also stated that we will define baselines for the questions and seek to continuously improve stakeholder satisfaction scores against those baselines. We will continue with this approach in 2019-21, building on the baseline scores we have started to define throughout the first half of 2018-19.

How we have performed year to date, including where we have been able to develop baselines upon which to improve can be found in our mid-year report and a comprehensive update on performance will be provided in our End of year report in April. This will provide a more comprehensive baseline of performance upon which to measure our progress in 2019-21.

Changes to the stakeholder feedback framework for 2019-21:

Provider Experience

For the Ancillary Services Provider Journey in Principle 3 we will be asking a new set of questions at each key stage of the process to test if we are providing the right level of information:

At the Research Stage of the Provider Journey the questions are:

1. I found it easy to find the information I needed
2. I was provided with information of sufficient quality to enable me to make an informed decision

   (Questions 1 & 2 are rated on a 5-point scales: strongly agree to strongly disagree)
3. What can we do to improve the accessibility of our information? (Free comments box)

Further questions will be developed to gain stakeholder insight into our performance at other stages in the process.

B

Deliverables List

Full Deliverables List

This table summarises the deliverables listed within the principle delivery sections. We recognise the overlaps between our four roles and that our deliverables can contribute to more than one principle; within the table we recognise where a deliverable is a primary contributor to a principle using the following icon ☑ and where a deliverable contributes to the success of other principles we using the following icon ✓. As we report progress against our plan, we will report all deliverables against their primary principle only providing detail on how they have contributed to all appropriate principles.

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
Insight documents								
Future Energy Scenarios (FES)	Q2 2019-20 & 2020-21	☑	✓	✓	✓	✓	✓	✓
Winter Outlook and Winter Review and consultation	Q1 & Q3 2019-20 & 2020-21	☑	✓	✓	✓	✓	✓	✓
Summer Outlook	Q1 2019-20 & 2020-21	☑	✓	✓	✓	✓	✓	✓
Stakeholder interactions								
Electricity Operational Forum	Q2, Q3, Q4 2019-20 & 2020-21	☑	✓					
ENCC visit days	Q1, Q2, Q3, Q4 2019-20 & 2020-21	☑	✓					
Operational Insights								
Insight on balancing decisions taken	Q2 & Q3 2019-20	☑	✓					
Insight on constraint boundaries	Q2 2019-20	☑	✓					
Forecasting								
Publish Forecasting Strategy Project roadmap	Q1 2019-20	☑						
Publish half-hourly PV forecasts to market, 24 times a day	Q1 2019-20	☑						
Publish four additional wind forecasts to the market	Q2 2019-20	☑						
Publish an additional DA demand update at 12:00pm every day	Q2 2019-20	☑						
Make energy forecasts more accessible via a dedicated website and APIs	Q3 2019-20	☑						
Information access								
Open data	Q1, Q3 2019-20	☑						

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
Operability reports and information								
Operability strategy reports and updates	Q1 & Q3 2019-20		✓				☑	
Transparency around our data								
Publication of operational planning data	Q1 2019-20		☑					
Publish forward looking voltage requirements	Q4 2019-20		☑					
Future of the ENCC	Q1 2019-20		☑					
Addressing operational issues								
Roll out of Loss of Mains (protection setting)	Q1-Q4 2019-20		✓				☑	
Upgrade of information systems								
IT investment	Q2 2019-20		☑					
Product Roadmaps for Response and Reserve Implementation								
Rollout of full functionality in frequency response auction trial	Q2 2019-20			☑				
Report on development of new frequency response product suite	Q4 2019-20			☑				
Report on auction trial	Q1 2020-21			☑				
Market design for reformed reserve products: communicate and engage on proposal for reformed reserve products	H1 2019-20			☑				
Market design for reformed reserve products: Implementation plan for the new reserve product suite published	Q4 2019-20			☑				
Report on our plan for retaining standard products	Q1 2019-20			☑				
Start migration of non-BM STOR providers to ASDP	Q2 2019-20			☑				
Implementation of Pan-European replacement reserve standard products	Throughout 2019-21			☑				
Product Roadmap for Reactive Implementation								
Communicate reactive power requirements & historic spend	Q2 2019-20			☑				

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
Implement approach for efficient reactive power flows between networks	Q2 2020-21			☑				
Work with industry to determine future role for reactive power and design more competitive reactive power services	Q4 2019 – Q2 2020-21			☑				
Commence implementation plan to enable rollout new approach to competitive reactive power services	Q3 2020-21			☑				
Power Potential trial with UK Power Networks (UKPN)	Q2 – Q4 2019-20			☑				
Review learning from Power Potential	Q4 2019-20			☑				
Product Roadmap for Restoration Implementation								
Alternative Approaches to Restoration	2019-20			☑				
Develop and evolve a market approach for the Procurement of Black Start Services	Q4 2019-20			☑				
Power Responsive								
Deliver innovation projects to unlock demand flexibility	Q1 - Q4 2020-21			☑				
Power Responsive Stakeholder Engagement	Q1 2019-20 - Q4 2020-21			☑				
Wider Access to BM Roadmap Implementation								
Clearer accession requirements for BM participation and enable aggregated BMU participation in balancing services	Q1 2019-20			☑				
Use better technology/ systems to improve efficiency of installing communications with BM providers and optimising BMY dispatch	Delivery throughout 2019-20			☑				
Support industry work on providing and delivering against PNs (ELEXON led) and also support on work on accurate settlement for behind the meter	Q3 2019-20			☑				
Intermittent Generation								
Raise code modification to apply Power Available consistently across technical & commercial codes	Q1 2019-20			☑				

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
Publish Power Park Module signal best practice guide	Q2 2019-20			☑				
Deliver Power Available integration phase 1	Q3 2019-20			☑				
Deliver Power Available integration phase 2	Q1 2020-21			☑				
Publish wider strategy for flexibility from intermittent generation	Q4 2019-20			☑				
Provider Experience								
Feedback Approach	Q1 2019-20			☑				
Improved online resources	Q1 2019-20			☑				
Facilitating code change: Get the basics right								
Meeting calendar & transparency of workgroups	Q1 2019-20				☑			
Governance process FAQs, improved guidance material and critical friend review	Q2 2019-20				☑			
Facilitation of pre-modification discussions	Q3 2019-20				☑			
Incorporation of all 14 Code Administrator Code of Practice (CACoP) Principles	Q3 2019-20				☑			
Facilitating code change: Enabling all network users to understand and contribute to the code change process								
Engage all parties to understand information requirements for code modifications & provide executive summaries on modifications	Q1 2019-20				☑			
Code administrator website	Q3 2019-20				☑			
Governance surgeries	Q2 2019-20				☑			
Historical Timelines & Horizon scanning: cross-code	Q2 2019-20				☑			
Horizon scanning: strategic	Q3 2019-20				☑			
Stakeholder seminars	Q4 2019-20				☑			
Transform industry frameworks to enable decentralised, decarbonised and digitalised energy markets								
Leadership in the successful transformation of the electricity access and charging	Q2 2019-20				☑			

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
Leadership in the Energy Codes Review	Ongoing				☑			
Working for you on European matters	Q1 2019-20				☑			
Unlocking whole system network development opportunities	Q1 2019-20				☑			
Developing and driving targeted market improvements	Q1 2019-20				☑			
Facilitate electricity network charging reform through Charging Futures								
Facilitate electricity network charging reform through Charging Futures 1. Targeted Charging Review 2. Access and Forward Looking Charges SCR 3. Reform of Balancing Services Charges	Please see Charging Futures website - http://www.chargingfutures.com/				☑			
Transform the customer experience for network charging								
Improve our ESO charging query processes	Q1 2019-20				☑			
Improve understanding of our onboarding processes and streamline to meet our customer needs	Q1 2019-20 - Q4 2019-20				☑			
New data reports for BSUoS	Q1 2019-20				☑			
Reform of website content in to a user-centric knowledge base	Q2 2019-20				☑			
Publications and guidance of the impact of Charging Reform to our customers	Ongoing from Q2 2019-20				☑			
Introduce new 'new entrant' e-learning on charging	Q4 2019-20 - Q3 2020-21				☑			
Improve the digital customer experience for TNUoS, BSUoS and Connection Charging Data; including the introduction of a new NGESO billing system	Q1 – Q4 2020-21				☑			
Establish a 'cross party' approach to onboarding, mapping out whole industry requirements	Q1 – Q4 2020-21				☑			
Ongoing Regional Development Programmes								
Commercial contracts for balancing services from DER	Q4 2019-20		✓	✓		☑	✓	✓
Enhanced systems to facilitate balancing services from DER	Q2 2020-21		✓	✓		☑	✓	✓

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
Automated dispatch capability for generation in highly constrained areas	To be confirmed		✓	✓		☑	✓	✓
Development of a Proactive Regional Development Programme Identification Process								
RDP identification process	Q3 2019-20		✓	✓		☑	✓	✓
Whole system data exchange								
Extended roll out of enhanced whole system data exchange	Q2 2019-20	✓	✓	✓	✓	✓	☑	✓
Commercial flexibility around operational connections	Q1 2019-20		✓	✓	✓	✓	☑	✓
Whole system Operability								
Roll out of Loss of Mains (protection setting)	Commencing Q1 2019-20		✓			✓	☑	
Defining roles and responsibility for voltage management across the Transmission-distribution interface	Q3 2019-20		✓			✓	☑	
Inertia Measurement	Q3 2019-20		✓			✓	☑	
Enhanced Customer Experience								
Transmission Outage and Generator Availability (TOGA) replacement	Q4 2019-20		✓				☑	
Customer journey mapping - outage planning	Q1 2019-20		✓				☑	
Connections customer portal	Ongoing						☑	
Whole Electricity System thought leadership								
ESO thought leadership – how the ESO role will evolve	Q1 2019-20	✓	✓	✓	✓	✓	☑	✓
Whole Electricity System learnings paper	Q2 2019-20, update Q2 2020-21	✓	✓	✓	✓	✓	☑	✓
ENA Open Networks project 2019 ESO input	Q3 2019-20	✓	✓	✓	✓	✓	☑	✓
Open Networks Whole Energy System lead	Q3 2019-20		✓	✓	✓	✓	☑	✓
Pathfinder Projects								
Stability pathfinder: Inclusion in NOA Methodology	Q1 2020-21		✓			✓		☑

Deliverable	Delivery Date	P1	P2	P3	P4	P5	P6	P7
South Wales and Mersey Voltage pathfinder: - project recommendations	Q2 2019-20		✓			✓		☑
Pennines Voltage pathfinder: project recommendations	Q2 2019-20		✓			✓		☑
Constraint management pathfinder: technical and economic analysis concluded	Q2 2019-20.		✓			✓		☑
Study tools								
Document and test voltage needs identification tools / processes for inclusion in the NOA methodology	Q1 2019-20		✓			✓	✓	☑
Thermal probabilistic assessment tool / process – initial boundary capability results available	Q3 2019-20		✓			✓	✓	☑
Enhanced communication								
Enhance the information that is provided on system needs to allow a wider audience to better understand needs and propose solutions to meet them	Q2 2019-20	✓	✓	✓		✓	✓	☑
Continue to engage with stakeholders on the development of capabilities and implementation of the Network Development Roadmap	Ongoing	✓	✓	✓		✓	✓	☑

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