Forward Plan 2018-19

End of Year Performance Report
3 May 2019

nationalgridESO

Introduction

Our performance in the first year of the Incentive Scheme reflects the evolving role of the Electricity System Operator (ESO) and of our shift in mindset and ways of working. We have made considerable progress against our 2018-19 Forward Plan – delivering not only strong baseline performance, but in many areas going beyond this to deliver improved processes, greater transparency, and new products and services to create real consumer value.

As the System Operator for Great Britain, we are privileged to sit at the heart of the nation's energy system, running the gas and electricity networks safely and efficiently while enabling and accelerating progress towards a low-carbon energy future. This also means that, together with our stakeholders, we are responsible for tackling some of Great Britain's most pressing energy challenges.

In March 2018 we set out our long-term vision and an ambitious plan of work for 2018-19 across our four roles: managing system balancing and operability, facilitating competitive markets, facilitating whole system outcomes and supporting competition in networks under the new ESO Incentives Scheme.

I am very proud of what we have achieved this year. We have delivered tangible consumer benefits in 2018-19 and worked on various initiatives that will deliver future benefits for consumers and stakeholders.

It is my great pleasure to present this end of year achievements report to stakeholders and the performance panel as a summary of our achievements in the first year of the Incentives Scheme.

Fintan Slye,
Director of UK System Operator

ESO Incentive Scheme

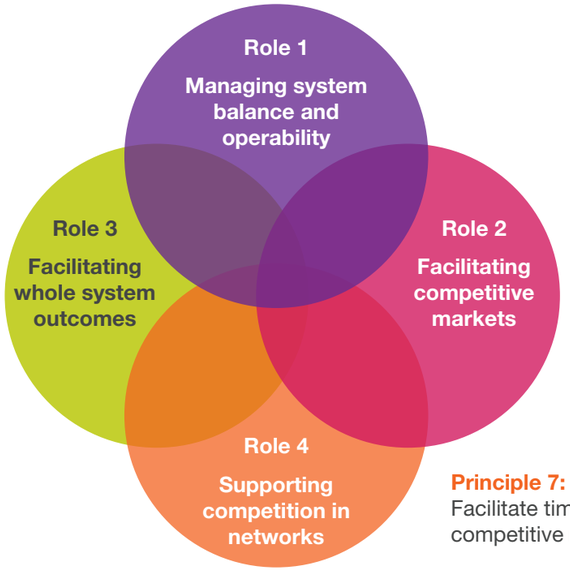
As the System Operator for Great Britain, we are privileged to sit at the heart of the nation's energy system, running the gas and electricity networks safely and efficiently while enabling and accelerating progress towards a low-carbon energy future.

In April 2018, Ofgem introduced a new regulatory and incentives framework for the Electricity System Operator (ESO) in order to encourage the ESO to proactively identify how it can maximise consumer benefits across the full range of its activities. The new arrangements include a set of seven principles for the ESO; a requirement to develop Forward Plans with industry; the publication of regular performance reports; the introduction of a new Performance Panel; and a move towards a broader, evaluative performance assessment (with associated financial incentives).

ESO Roles and Principles

Principle 1:
Support markets participants to make informed decision by providing user friendly, comprehensive and accurate information

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



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

Principle 4:
Promote competition in the wholesale and capacity markets

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

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

Principle 7:
Facilitate timely, efficient and competitive network investments

Definition of exceeding: What does exceeding baseline expectations mean?

Ofgem 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' and state that defining baseline expectations for each area of activity will likely require an element of judgement. We believe that we exceed baseline expectations through the 'what' and 'how' we deliver activities which collectively achieve an outcome that unlocks additional benefit for consumers.

Innovation funding

In this report we have ensured that the activities presented go beyond those that are supported by innovation funding, for example where we actively embed the technical knowledge and expertise we develop into our wider range of activities to bring the most benefit for consumers.

Purpose of this report

This is the first year of the new incentives framework. In line with Ofgem's Electricity System Operator Reporting and Incentive (ESORI) arrangements guidance, we are required to publish a report covering our end of year performance against our 2018-19 Forward Plan. A central part of the new scheme is the Performance Panel who play a key role in challenging and assessing our performance. In June, the panel will undertake an end of year review to evaluate our performance over the 2018-19 regulatory period (1 April 2018 to 31 March 2019). The Panel uses the following criteria when assessing the ESO's performance:

1.	2.	3.	4.	5.
Evidence of delivered benefits	Evidence of future benefits / progress against longer term initiatives	Stakeholder views	Plan delivery	Outturn performance metrics and justifications

The purpose of this report is to provide a performance summary against our Forward Plan. We present outturn deliverables, metrics, evidence of delivered benefits and how we have engaged industry and acted on stakeholder feedback. In response to Performance Panel feedback you will see an overview of this in this report including clear summaries of our performance for each of the principles. If you are seeking further details on our outturn performance, please see our evidence chapters which accompany this report.

We hope that this report provides a comprehensive overview of our activities and performance in the first 12 months of the new Incentive Scheme. We would like to hear your feedback on this report, please email us on box.soincentives.electricity@nationalgrideso.com.

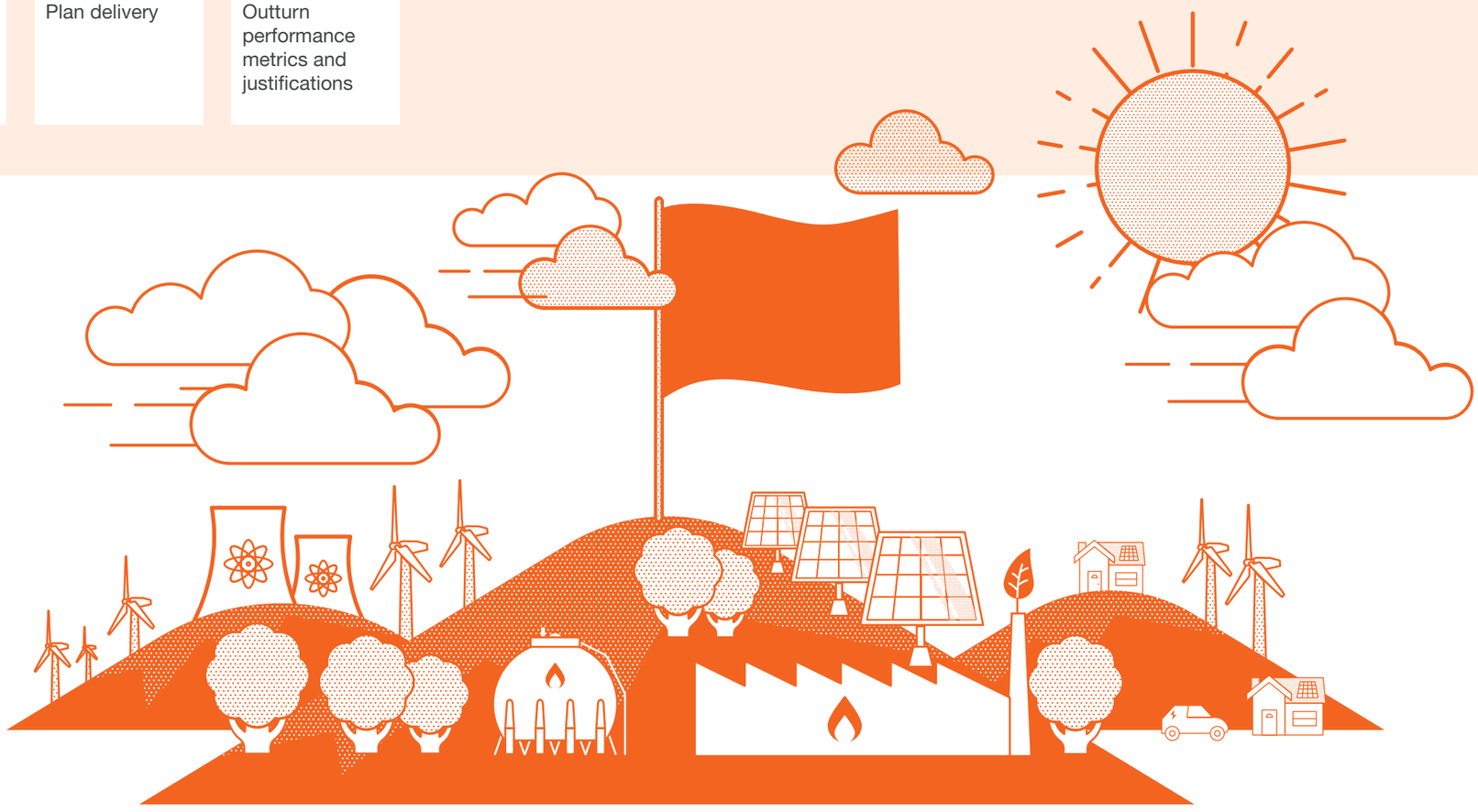
Our mission

Our mission is to enable the transformation to a sustainable energy system and ensure the delivery of reliable, affordable energy for all consumers.

Success in 2025 looks like:

- An electricity system that can operate carbon free
- A strategy for clean heat, and progress against that plan
- Competition everywhere
- The System Operator is a trusted partner

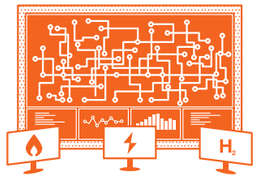
To achieve our mission, we have set out five focus areas for the System Operator, which are outlined in this document.



Our five focus areas

We have shared our vision for how we see the future of energy developing over the next decade and towards 2050. It is both exciting and enormously challenging to deliver and as the ESO for Great Britain, we are perfectly placed to lead the industry into a new era for energy. See our Towards 2030 document published on 2 April 2019.

As the industry transforms we believe our role at its heart must also evolve as we call on innovative technologies, open markets and new ways of working. We have therefore identified five focus areas that will underpin the System Operator of the future:



1

The engineering transformation

Ensuring reliable, secure system operation to deliver energy when consumers need it.

2

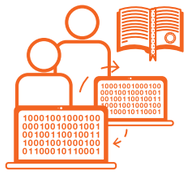
The market transformation

Unlocking consumer value through competition.

3

The sustainability transformation

Enabling and supporting the drive towards a sustainable whole energy future.



4

The smart transformation

Driving innovation and increase participation across the energy landscape.

5

The capability transformation

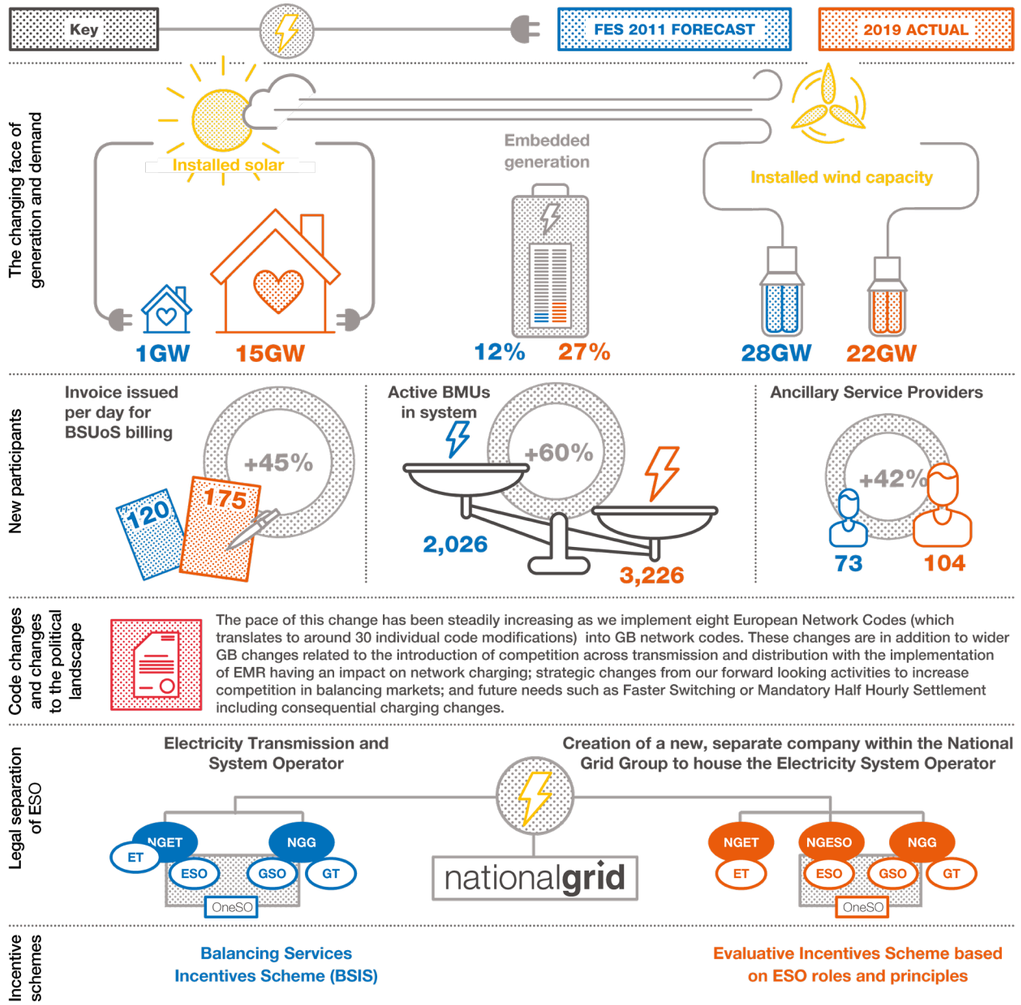
Developing the right people and systems to deliver the future.

Changing energy and political landscape

Since the start of the RIIO-T1 price control we have seen unprecedented change in the energy landscape. For example, we anticipated that in 2019 we would have around one gigawatt (GW) of solar power capacity in GB; we now have over 12 GW. Embedded generation has similarly risen from12% to 27%, as we transition to an increasingly decarbonised system. Managing this uncertainty, together with declining system inertia, has a significant impact on how we operate the system.

The adoption of new technologies, such as electricity storage, and the increasing need for distribution system operation, will require new operational processes across the transmission-distribution boundary. The continued expansion in the number of market participants will increase the volumes of technical and commercial data to be analysed and exchanged with other system users.

Increased renewable generation, particularly at a distributed level, more market participants and new technology makes our job ever more complex. Against this rapidly changing landscape the legal separation of ESO and our 2018-2021 Incentives Scheme have been key to driving towards our ambitions throughout 2018-19.



2018-19 Firsts

The changing generation mix and increasing levels of embedded generation have made 2018-19 a landmark year for the energy industry in Great Britain and presented challenges for the SO. Increased renewable generation, particularly at a distributed level, more market participants and new technology make our job ever more complex.

24 April 2018

Britain has not generated electricity from coal for more than three days – the longest streak since the 1880s.*

This record has since been broken in April 2019

16 May 2018

National Grid launched a new online tool which forecasts electricity generation across GB regions 48-hours ahead, enabling users to plan their power use to coincide with surges in greener sources.

13 August 2018

Limejump takes first aggregated unit into Balancing Mechanism.

06 November 2018

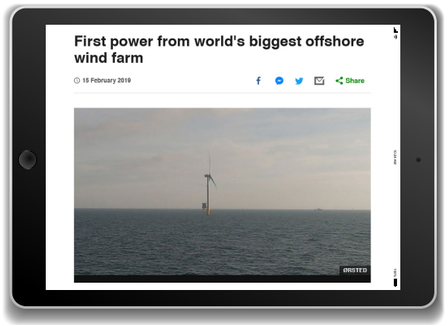
Renewable capacity has tripled in past five years, even faster growth than the 'dash for gas' of the 1990s.

03 January 2019

Wind made a greater contribution to the country's electricity needs than coal in every month apart from January.

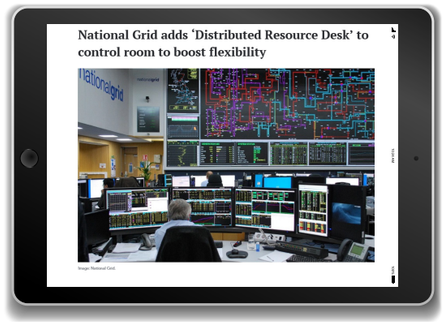
15 February 2019

Electricity has been produced for the first time at what will be the world's biggest offshore wind farm: Walney Extension Offshore Wind Farm (in the Irish Sea).



23 January 2019

National Grid has launched a new 'Distributed Resource Desk' in its control room, enabling the ESO to allow smaller market players to participate much faster.



06 March 2019

Electric cars dominate at the Geneva Motor Show.

2018-19 Performance – Our achievements

In response to Performance Panel feedback, in this section we have presented our major milestones, and articulated how we have delivered value across each role.

In this first year of our new Incentive Scheme we have delivered outcomes which are enabling the long-term transition to a decarbonised energy landscape. We have laid the foundations for our legal separation from the wider National Grid group (completed on 1 April 2019). In September 2018, we launched our new 'ESO' identity and branding as we established our distinct, more independent voice within the industry, with the consumer at the heart of our decision-making.

We have delivered consumer benefits across all of our roles in 2018-19 of up to £510m. In performing our role to manage balancing costs we have also pro-actively avoided £490m of further spend.

It is challenging to estimate the consumer benefit we deliver given the wide range of direct and indirect effects that our activities deliver. Where we have a direct impact on the consumer bill, we have provided case studies of how we deliver consumer benefit now, and unlocking in the future. Many of these examples are counterfactual and all figures should be taken as estimates.

To deliver consumer benefits there is clear evidence the ESO is removing barriers to entry and promoting competition in both existing and newly competitive markets. We are now operating the market with +350 participants; we are increasing competition in balancing services markets by reducing the on-boarding process and developing the Platform for Ancillary Services (PAS) to reduce new provider deployment from six months to seven days. Our improved forecasting, including a more than 30% improvement in solar forecasting and our best demand forecast accuracy in four years, reduces the level of risk premia in the consumer bill.

Delivering initiatives which will achieve long term benefits in the magnitude of £8.5bn

Our operation of the transmission system in 2018-19 has been the lowest carbon year we have ever had, in our step towards being capable of carbon free operation by 2025 we anticipate this being a record which is beaten year on year. Much of our deliverables in 2018-19 are contributing to this future.

Our 2018-19 Forward Plan set out 112 deliverables, of which we have delivered 105. Of these, 60% are new initiatives or tasks; with the others all involving improvements on our ways of working. Where deliverables have not been completed we explain where re-prioritisation has had to take place or what actions we are taking to advance these activities into our Forward Plan 2019-21.

Our work on high voltage pathfinder projects under Role 4 is delivering annual savings and will continue to do for years to come. Our frequency response shadow auction enables more real time procurement, better price signals and increasing competition. Our leadership and contribution to technical and commercial changes drive towards enabling competition everywhere. An example of this is our role in leading BSUoS Charging Task force as part of Charging Futures.

We have proactively engaged and are building trust through close working relationships with our stakeholders based on openness and honesty. We have helped them understand our business by clearly explaining our perspective and how they can influence our overall decision making.

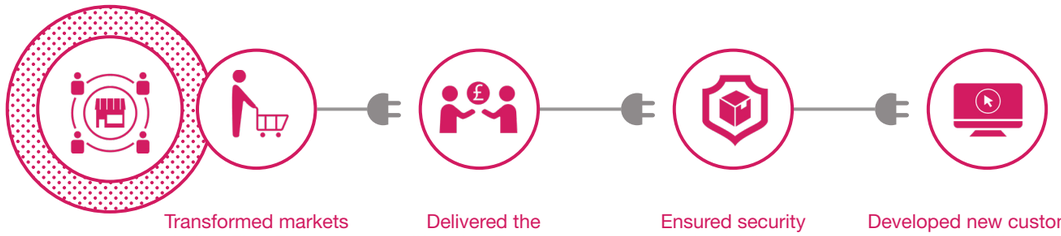
We engage stakeholders through a wide range of channels including information published on our website, our publications, consultations, newsletters, engagement forums, webinars, customer meetings and surveys. Effective stakeholder engagement is critical to our ability to understand and meet the expectations of our customers. Customer satisfaction is therefore a useful indicator of how effectively we are listening to and acting on the feedback from our stakeholders to improve the service we deliver to all of our customers.

Exceeding on 14 out of 21 metrics, on target for the remaining seven.

Role 1: Managing system balance and operability

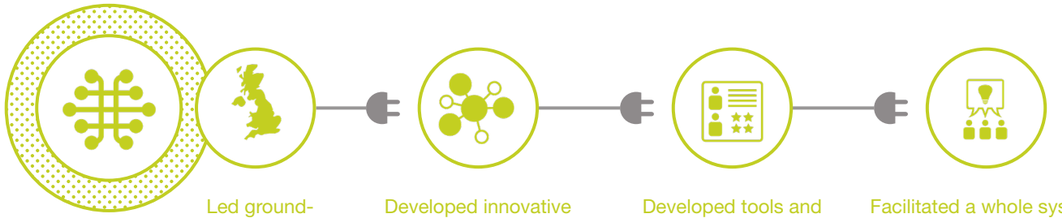
- Proactively managed balancing costs resulting in avoided costs of over £660m
- Improved forecasting by using advanced machine learning with future savings of up to £100m/year
- Enabled wider access to markets with innovative funding models and platforms
- Optimised the operations of the ENCC leading to avoided costs of £42m/year

Role 2: Facilitating competitive markets



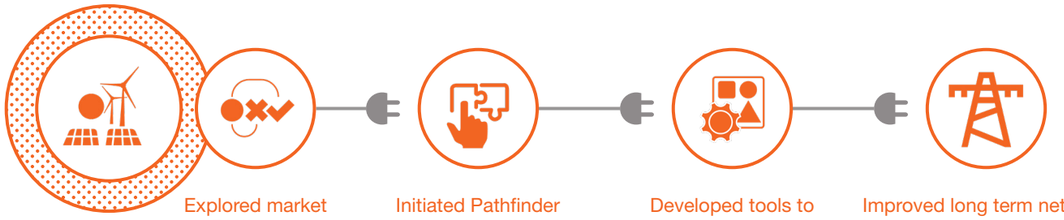
- Transformed markets including Firm Frequency Response (FFR) and Black Start resulting in cost reductions of £24m/year in FFR market
- Delivered the Charging Futures Programme and initiated the BSUoS Charging Taskforce
- Ensured security and reliability of supply during all circumstances
- Developed new customer platforms and improved customer experience

Role 3: Facilitating whole system outcomes



- Led ground-breaking industry collaboration with Regional Development Programmes (RDP)
- Developed innovative connection solutions
- Developed tools and processes to improve customer experience
- Facilitated a whole system approach to decision making with cross boundary working leading to saving of £350m relating to the South West Scotland RDP

Role 4: Supporting competition in networks



- Explored market and DNO solutions as alternatives to transmission assets with benefit of up to £1.1bn over the next 10 years
- Initiated Pathfinder projects with a 'learning by doing' approach leading to future benefits of £36m/year
- Developed tools to enable a systematic approach to identifying future network issues
- Improved long term network investments and operational strategies and following this year's NOA recommendations leads to avoided costs of up to £2.6bn over the next 10 years

Role 1

Managing system balance and operability

Our aim under Role 1 is to operate the system safely and securely, whilst driving overall efficiency and transparency in balancing strategies across time horizons.

Further, we will support market participants to make informed decisions by providing user friendly, comprehensive and accurate information.

Under this role we aim to find the optimum way of carrying out balancing and operability actions in a low-carbon, decentralised and digitised 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.

Our achievements in 2018-19

This year has continued a now established theme of rapid change as the system and markets evolve. We managed system balancing and operability through a very wide range of operational circumstances, hitting a (then) record of 76 hours of operation without coal in April 2018, and 15GW of peak wind output in December 2018. Alongside these notable milestones we have made great progress on how we fulfil our aim under Role 1.

Our Balancing Services Use of System (BSUoS) charges are the sum of our optimised economic operation of the system on a daily and within-day basis. Over the past decade we have enabled (through the "Connect and Manage" regime) the rapid increase in new and lower carbon generation to connect to the transmission system ahead of new build transmission assets and we manage this on a day to day basis. We estimate that under Role 1 we have avoided over £660m of costs throughout the year, a significant benefit to consumer bills. The majority of this we have delivered through day to day trading and taking commercial actions (eg with non-balancing market parties) to ensure safety and security in real time. Importantly we have increased our transparency of these actions, enabling market participants to make better informed future decisions, by publishing daily trade data and a daily BSUoS forecast.

The theme of increasing transparency has also extended to our commercial assessments for ancillary and balancing services tenders. By rationalising and simplifying our product requirements, developing self-service platforms and portals and, through our Platform for Ancillary Services (PAS), we are enabling wider access to these markets. A key action we took was the rapid implementation of a new distributed resources desk alongside PAS into the ENCC. We have also seen the volume of responses to tenders for services reach over 300 per month, with 40% from non-traditional providers.

As the world of system balancing and operability has become more complex, we have also made significant improvements in our use of "machine learning" artificial intelligence (Ai) techniques in our forecasting. This year we have targeted solar forecasting as this embedded generation can have a significant impact on the electricity demand observed at transmission level. Our new approach has yielded a more than 30% improvement in our solar photovoltaic (PV) forecasts, which when coupled with other improvements to our forecasting has led to demand forecast error tracking at its lowest level in four years; in turn reducing costs to consumers. We have also embraced digitisation with our new Carbon Intensity Forecasting Platform – this is a pure information provision to the market and wider interested stakeholders – at around 4.5 million hits per month that enables behavioural change that we estimate could lead to carbon emission reductions of 0.5%.

As markets and the system continue their rapid evolution, the "players" and the rules will continue to change. What we have achieved and learned this year gives us a great foundation from which to continue to evolve ourselves and to fulfil our aim of safe, secure, efficient and transparent operations into the future.

Proactively managed balancing costs resulting in avoided costs of over £660m

- **Trading benefit due to commercial actions** resulting in avoided costs of **£490m.**
- Taken further **commercial and strategic actions** which avoided balancing spend by **£129m.**
- Improved ENCC and short term **operational decision making** resulting in **£42m** of avoided costs.

Improved forecasting by using advanced machine learning with future savings of up to £100m/year

- Developed machine learning forecasting models leading to a more than **30% improvement in solar forecasting**.
- Developed **accurate day ahead demand forecasts** and Balancing Mechanism Unit (BMU) wind generation forecasts with avoided costs of up to £100m/year by 2024.
- Launched the **Carbon Intensity Forecasting Platform** which receives 4.5m hits per month.

Enabled wider access to markets with innovative funding models and platforms

- Developed a self service **Platform for Ancillary Services (PAS).**
- Developed innovative funding and procurement models.
- Reduced the time to connect from six months to <7 days for Fast Reserve.
- Developed the **Customer Data Portal Platform.**
- Launched the **IS Change Forum.**

Optimised the operations of the ENCC leading to avoided costs of £42m/year

- Changing embedded generator protection system with an **accelerated change programme.**
- **Implemented the distributed resource desk in the ENCC** which allows us to optimise small BM units, so they can compete on a level footing with other players.

"I found the [ENCC visit day] informative and it was useful to see the key deliverables which have been reached and those which are due in the future. It would be good to get an ongoing progress update distributed.

The Future Operability Challenges presentation was an interesting reminder to the evolving challenges which the ESO face to manage the system. Not only are topics like this interesting, they may also result in asset owners considering services which could be provided to alleviate some of the new issues."

ENCC visit day attendee, March 2019

Role 2

Facilitating competitive markets

Our aim with Role 2 is to ensure the rules and processes for procuring balancing services maximise competition where possible and are simple, fair and transparent. Further, we will promote competition in wholesale and capacity markets.

To deliver economic security of supply in the low-carbon world of the future and to facilitate the transition to this new world, we need to have the appropriate markets, codes and governance in place. This is extremely challenging as the current markets and code regime were designed for a world of large centralised generation whereas there is already significantly more renewables, in particular solar, and distributed generation and demand side response than we anticipated just five years ago. Our deliverables against the Forward Plan this year have helped us take great strides forward in this area.

Our achievements in 2018-19

A key feature of this year has been the backdrop of political uncertainty driven by EU Exit and the legal challenge to the Capacity Market which has required us to divert resources from planned activities to emerging issues. This is particularly the case for GB's EU Exit where the uncertainty has been much higher than expected. We have worked closely with BEIS and Ofgem, leading on ensuring that the system remains secure and operable in worst-case scenarios and that our codes remain fit for purpose in a post-EU Exit world. In response to the temporary suspension of the Capacity Market we quickly developed analysis on future security of supply in an energy only market to provide to BEIS to support the case for reinstatement of the market.

Ensuring security of supply is central to our role and it is important that we continue to prioritise and flex our plans in response to emergent issues of this type. It is pleasing that we have delivered strongly against our plans whilst taking on this extra work.

In 2015 when we launched Power Responsive our ambitious target was to have 30-50% of our tendered volume for balancing services from non-traditional sources by 2020. Our continued work against the plans in our Product Roadmaps including the simplification and standardisation of Frequency Response this year has allowed us to meet this target two years early for our response and reserve balancing services. The resulting increase in liquidity has also dramatically driven down the price in our frequency response markets, delivering £24m of value to consumers this year. We had two further significant market milestones this year with the entry of several aggregated units into the Balancing Mechanism and our first shadow auction for week-ahead frequency response. We will build on this work to ensure that we can operate a carbon free grid by 2025.

Keeping up to speed with code change is challenging for all market participants and particularly affects small players who typically have less resource to devote to this task. The Charging Futures Programme has transformed how we interact with participants on code change. Working closely with Ofgem, we have delivered the programme based on the experience we gained from Power Responsive on engaging with large numbers of diverse market participants. In our leadership of the BSUoS Charging Taskforce we have moved from facilitating to leading the debate, working closely with a wide range of stakeholders to deliver efficient markets by ensuring that the costs of balancing the system are suitably allocated.

Transformed markets including Firm Frequency Response (FFR) and Black Start resulting in cost reductions of £24m/year

- Developed the **Frequency Response auction platform** with shadow auction undertaken with market participants. This will lead to closer to real time procurement enabling more demand side response (DSR) and intermittent generation to participate efficiently in our markets, increasing competition, reducing costs and carbon.
- Developed more competitive approaches to **Black Start procurement** and are exploring non-traditional technologies' Black Start capabilities.
- **Standardisation of FFR market** including Electricity Forward Agreement (EFA) blocks and long term seasonal tenders delivering £24m in additional savings.

Delivered the Charging Futures Programme and initiated the BSUoS Charging Taskforce

- Led the **BSUoS Charging Taskforce** which delivers a cross industry strategic review of the current charging arrangements to support decisions on the future direction of balancing services charges.
- Facilitated stakeholder-led change through the **Charging Futures Programme** which led to broad and deep stakeholder engagement across multiple topics in the charging and access space.

Ensured security and reliability of supply during all circumstances including political challenges

- Advised BEIS and Ofgem on **EU Exit strategy** including energy adequacy and operability updates.
- Put in place necessary processes to ensure our codes are fit for purpose after EU Exit.
- Worked bilaterally with BEIS to fulfil **security of supply obligations** due to suspension of the Capacity Market via the Electricity Market Reform (EMR) programme capacity mechanism.

Developed new customer platforms and improved customer experience

- Treated all participants fairly in both the purchase of services and how they are dispatched.
- Streamlined the **new provider onboarding process** including interactive guidance documents and webinars.
- Improved customer experience with charging, coaching new suppliers, providing a suite of guidance documents for all charge payers and the **Charging Futures and Settlements Forum.**

> The meetings held between the ADE and the [ESO] testing team have considerably improved the process. The [ESO] testing team have put considerable effort into explaining what the tests are for and how they are evaluated. They have also shared tools that allow us to confirm if our performance is to standard (or not) without us having to refer to the testing team. This has meant that we have better understood your requirements and been able to design our systems to deliver these requirements.
>
> **ADE member, March 2019**

> I took away all I needed to, closing off some of the gaps I had personally with the TERRE solution. Presenters were knowledgeable, clear and easy to follow as they could have been given the topic. It was really refreshing and positive to see combined code workings for wider engagement on cross code changes.
>
> **Feedback on implementation of project TERRE and BM wider access**

Role 3

Facilitating whole system outcomes

Our aim for Role 3 is to coordinate across system boundaries to deliver efficient network planning and development. Further, we will coordinate effectively to ensure efficient whole system operation and optimal use of resources.

Our overarching ambition is that the planning, development, investment and operation of Great Britain's networks will be optimised on a whole system basis, irrespective of ownership boundaries. Solutions to ESO challenges will be open to a full range of participants, facilitating both market and asset solutions; and we will work to deliver best overall value for consumers, irrespective of the ESO or Distribution System Operators (DSO) performing the analysis.

Our achievements in 2018-19

This year has delivered key milestones on whole system thinking and planning, and these approaches are critical as we move to a more decentralised and decarbonised system that continues to deliver value for the consumer.

At the beginning of the performance year, our stakeholders were telling us that we weren't clear on our whole system strategy and that as a result there was suspicion that we had something to hide. To negate this perception we published two whole system strategy documents which clearly layout the principles and areas of activity that need to be concluded to successfully plan, operate and derive value from a whole system approach.

This in turn has shaped our approach to the Regional Development Programmes (RDP), the plans to incorporate more and more distributed generation. This year we have continued to make great progress with UK Power Networks (UKPN), Western Power Distribution (WPD), and SP Energy Networks (SPEN) Distribution (Dumfries and Galloway). These projects have released capacity, avoided distribution and transmission investment. For example, we have released over 200MW of capacity in UKPN and the SPEN project once delivered will save consumers £350m.

This increase in distributed generation connections has also led us to roll out the Appendix G connection process to critical Grid Supply Points (GSP) across all the GB DNOs. By providing the DNOs 'headroom' or 'materiality limits' at each GSP the DNO can offer connections to their customers before referring to us. This saves the connecting party six months in process time and approximately £15k per distribution connection.

Throughout the year we have been engaging and working with the Energy Networks Association (ENA) Open Networks to develop the detailed process and to ensure that all the network companies across GB are working together to deliver whole system solutions.

> "The Accelerated Loss of Mains Change programme is unprecedented in what it will achieve and how it will be achieved, necessitating the design of new ways of encouraging compliance with mandatory requirements as well as new commercial arrangements and ways of working between the ESO, the DNOs and iDNOs."
>
> **DNO, March 2019**

Led ground-breaking industry collaboration with Regional Development Programmes (RDP)

- Whole system approach to planning and operating electricity network with joint **Regional Development Programmes (RDP)** with UKPN (South East) and WPD (South West) including facilitating additional embedded generation connections quickly without the need for network reinforcement.
- Leadership role within the **ENA Open Networks Project** with broader representatives from across the ESO including the Energy Network Future Group.

Developed innovative connection solutions

- Created consumer value through earlier and cheaper connections.
- Developed a **Sprint process** for new connections reducing offer timescales by 30% and improved customer satisfaction.
- Updated 10 connection agreements to reflect changes in network connections within 9-month target period.
- **Accelerated loss of mains change programme** is designing a new way of encouraging compliance with mandatory requirements and new commercial arrangements.

Developed tools and processes to improve customer experience

- Reduced **Appendix G applications** for DNOs leading to reduced time scales by six months and savings of £15k per distribution application.
- Developed specifications for the replacement of the **Transmission Outage and Generator Availability (TOGA) tool** – an outage management tool for all customers.
- **Changing Embedded Generator Protection Systems** leading to savings of £170m/year from 2022.

Facilitated a whole system approach to decision making with cross boundary working leading to saving of £350m relating to the South West Scotland RDP

- **Whole system approach** to cross boundary working leading to consumer benefits of £500m by 2030.
- Published whole electricity system **thought leadership** leading to benefits of over £100m/year by 2030.
- Facilitated outcomes from **industry forums** including the ENA Open Networks forum which have improved communication with all affected parties and outage management system including Network User Planning Workshops to reduce outage churn.

Role 4

Supporting competition in networks

Our aim for Role 4 is to facilitate timely, efficient and competitive network investments.

As the connections to the whole system become more decentralised and decarbonised, the requirements for capacity on the transmission network are changing. Capacity is now required at different times of the day/year and the duration of the capacity is dependent on the weather patterns. Therefore, before network investments are made we use the NOA process and the enhancements we are making to ensure that the recommended solutions deliver the best value for the consumer by opening up the NOA process to more and more competition.

Our achievements in 2018-19

During this year, we have made big steps to making this a reality – the voltage Pathfinder has demonstrated that in certain circumstances a DNO asset delivers the best consumer outcome, and we have issued the same technical requirement to the markets, both in the long and short term, we are still in the process of analysing the market returns. Our expectation is that as we move forward each situation is unique and the best solutions across GB will result in a mixture of transmission and distribution assets alongside existing and new market players. We are also well on the way to applying the same process to finding solutions to 'grid stability', the results of this Pathfinder will be delivered later in 2019.

To allow us to better forecast and plan for the future network requirements we have enhanced our offline network study capability to allow us to perform year-round probabilistic assessments. We have engaged with the key network analysis providers from around the world and no-one has developed this year-round despatched probabilistic assessment. This is important as it ensures that in the long-term planning and development stages of the network, system issues will be identified and resolved, which avoids the solutions being delivered in real time using the on the day market.

One of the outputs of this analysis this year is for the ESO to put forward a proposal for a commercial intertrip solution into the NOA process that would manage the constraint exposure whilst the Eastern Link network and Southern Coast reinforcements are delivered. This solution, identified by the ESO, is now in development across all three TOs, and will save up to £100m/year from 2022 onwards.

"On behalf of SP Transmission I would like to acknowledge the continued effectiveness of ongoing engagement via the Joint Planning Committee sub-group, which is focussed on delivery of both the Electricity Ten Year Statement and Network Options Assessment Report. This has allowed us to contribute to the development of the proposed Network Options Assessment methodology, and is a good example of coordination between the System Operator and all three onshore Transmission Owners."

SP Transmission plc

Explored market and DNO solutions as alternatives to transmission assets with benefit of up to £1.1bn over the next 10 years

- Added **commercial solutions to NOA Process**, with benefit of up to £1.1bn over the next 10 years.
- Published **Network Development Roadmap** providing a clear roadmap of enhancements to the NOA process for all stakeholders and customers.

Initiated Pathfinder projects with a 'learning by doing' approach leading to future benefits of up to £36m/year

- Developed **Voltage Pathfinder projects** with a 'learning by doing' approach savings £36m/year by 2021.
- Initiated changes to the **NOA methodology** to enact some of the upcoming changes to Standard licence condition C27 which included the assessment of connections against the competition criteria.

Developed tools to enable a systematic approach to identifying future network issues

- Developed **thermal probabilistic assessment** case studies
- Initiated economic network development leading to lower costs for consumers by expanding the NOA process to consider wider range of system needs.
- Improved **interconnector methodology** and modelling.
- Created new tools and processes to enable distributed energy resources (DER).

Improved long term network investments and operational strategies and following this year's NOA recommendations leads to avoided costs of up to £2.2bn over the next 10 years

- Undertook **connection and infrastructure options note (CION)** assessments with up to £2bn of consumer value over 25 years.
- Initiated the **Strategic Wider Works (SWW)** process includes cost benefit analysis which considers the network impacts of the investment savings up to £400m, with the benefits realised over 40 years.

"These sessions are good at the end of the process to talk through good points and scope for improvement, from Transmission Owners to System Operators as well as System Operators to Transmission Owners. All communications have been good this year."

(anonymous), Stakeholder Satisfaction Survey, February 2019

Principle Summaries

The following pages present our performance against each principle, in relation to the evaluation criteria.

Role #1
Managing system balance and operability

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

AMBITION
Transparent accurate information to help market participants make informed investment decisions

Delivered benefits in 2018-19

- Improved confidence in forecasting with 'right first time' leading to BSUoS risk premia saving for consumers
- Improved user experience with development of self-service platforms
- Developed machine learning forecasting models leading to a more than 30% improvement in solar forecasting
- Launched the Carbon Intensity Forecasting Platform which leads to lower carbon emissions resulting in consumer benefit of £6m/year

£6m

£180m

Future benefits and long term initiatives

- Improved BSUoS forecasting leading to saving of £80m over the next 10 years (risk premia reduced over time as confidence in our forecasts improve)
- Improved Day Ahead demand forecasts (DA) and DA Balancing Mechanism Unit (BMU) wind generation forecasts with future savings up to £100m/year by 2024

Plan delivery and new ways of working

- Launched the Carbon Intensity Forecasting Platform
- Published the Investor, Customer and Stakeholder Roadmap
- Initiated ENCC 'visit days' and roadshows
- Utilised advanced machine learning technology to forecast national PV generation

65% New

35% Improved

Forward Plan 2018-19 deliverables

- ✓ Publish Future Energy Scenarios 2018
- ✓ Publish Summer and Winter Outlook Reports
- ✓ Publish Regional Carbon Intensity Forecast
- ✓ Mobilisation of demand forecast modelling review
- ✓ Implementing new energy forecasting tools, machine learning forecasting models, and cloud based systems
- ✓ Increase frequency, granularity and provide underlying assumptions of our energy forecasts
- ✓ Provide all energy forecasting data in one location
- ✓ Improve monthly BSUoS forecast accuracy and publish new report
- ✓ Publish the half hourly BSUoS forecast
- ✓ Webinars on ancillary and balancing services tender results
- ✓ Publish a schedule of ancillary and balancing services events and results for 19/20
- ✓ Publish daily balancing cost and the MBSS
- ✓ Review MBSS and improve granularity and scope of data provided
- ✓ Improvements to MBSS and FFR Market Information Report (MIR)
- ✓ Increase granularity of constraint costs and volume data
- ✓ Publish trades data at near real time
- ✓ Develop new 'Market Efficiency' metric to track market competitiveness and intervention by the ESO
- ✓ Publish tables of the information provided
- ✓ Hosting Electricity Operational Forum quarterly
- ✓ Publish an 'investor, customer and stakeholder roadmap'
- ✓ Commit to providing an FAQ document
- ✓ ENCC visit days

Stakeholder

- Future Energy Scenarios event with over 400 attendees with 98% positive feedback including (out of 5): Transparency in process (3.6), Timely in delivery (3.9), Use expertise to guide (4.1), Make things simple (3.9), Easy to work with (3.9)
- Quarterly Electricity Operational Forum with 120 attendees with score of 75%
- Ancillary and balancing services tender webinars with 44+ attendees
- Monthly ENCC visit days with positive feedback

Performance metrics

Metric	Performance
Metric 1: Commercial assessment transparency	Performance against targets is generally good with green across the board except right first time in FFR
Metric 2: Daily BSUoS provision	100% On time
Metric 3: Trades data transparency	We exceeded our baseline performance target of 90%, hitting 99% over the year
Metric 4: Forecasting accuracy	Exceeding baseline and accuracy with improvement on the last 3 year average of 12% for demand forecast and 3% for wind forecast

Role #1
Managing system balance and operability

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

AMBITION
Delivery of secure supply while controlling balancing costs

Delivered benefits in 2018-19

- In performing our role to manage balancing costs we have delivered trading benefit through the balancing mechanism resulting in £490m of avoided costs
- We have reduced balancing spend by a further £129m due to our commercial and strategic actions including embedded protection systems change programme to leading to Vector Shift savings
- Control room optimisation leading to avoided cost of £42m

£660m

£670m

Future benefits and long term initiatives

- Addressing Future Operability Challenges leading to saving of £500m/year by 2029
- Changing embedded generator protection system with an accelerated change programme leading to £170m/year from 2022
- Better choice for consumers by enhancing competition and reducing barriers to entry

- Reduce time to connect to the grid from six months to <7 days for Fast Reserve
- Implementation of Ancillary Service Dispatch Platform (ASDP) in ENCC

Plan delivery and new ways of working

- Enabled wider access to the balancing mechanism through product updates, innovative funding and procurement models
- Launched the IS Change Forum and TERRE industry days
- Developed the self service Platform for Ancillary Services (PAS)
- Worked collaboratively with European TSOs and preparation for EU network codes (TERRE Solution)

60% New

40% Improved

Forward Plan 2018-19 deliverables

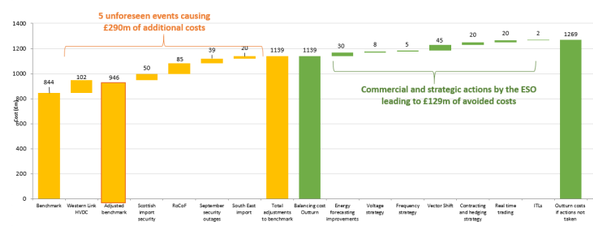
- ✓ Balancing cost management
- ✓ Publication of improved Procurement Guidelines, and report, with a framework on our current approach to the procurement of ancillary and balancing services
- × Publication of the Future of ENCC Study, recommendations and scope of future work
- ✓ Successful hosting of the Operability Forum events and expansion of our channels to share
- ✓ Initiation and delivery of the IS Change Forum with terms of reference based on feedback from customers and stakeholders
- ✓ Consultation on innovation priorities and publication of the 2019-20 ESO Innovation Strategy
- ✓ Publish Operability Report on challenges, planned activity and stakeholder engagement
- ✓ Future GB system security planning
- × Embedding of enhanced inertia modelling tools and new inertia measurement capability
- ✓ Deliver new systems capability to enable participation of distributed resources within our balancing markets
- ✓ Deliver new systems capability within the ENCC, specifically PAS (Platform for Ancillary Services)
- ✓ Significant upgrading of IT systems to prepare for implementation of European Network Codes

Stakeholder

- Launched the IS Change Forum with 77% positive feedback
- Completed our Procurement Guidelines engagements and formal consultation
- Engaged with stakeholders on our innovation projects and completed formal consultation including a SO Open Innovation Day with 130 organisations in attendance with 100% positive feedback
- Shared our first Operability Strategy Report
- Developed the ancillary services dispatch platform (ASDP) for Fast Reserve

Performance metrics

Metric	Performance
Metric 5: Balancing cost management	• Commercial and strategic actions leading to £129m of avoided costs • Trading benefit via balancing mechanism leading to £490m of savings



Role #2
Facilitating competitive markets

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

AMBITION
Facilitate new business models and technology for balancing services market

Delivered benefits in 2018-19

- Reduced barriers to entry with 350+ market participants (increase from 20 in 2016)
  - Introduced standard procurement windows and long term seasonal procurement
  - Simplified and standardised Response and Reserve contracts
- Developed an auction trial for FFR with shadow auction in March 2019
- Standardised FRR products with 50% reduction of FFR Static price and 60% reduction of FFR dynamic price in 2018-19
- Streamlined the new provider onboarding process including interactive guidance documents and webinars. Published an improved testing process for participation in our services
- Enabled wider access to BM programme with updated procurement processes so new aggregators and batteries can participate in FFR and BM

£24m

£350m

Future benefits and long term initiatives

- Developed the Frequency response auction platform with shadow auction undertaken by market participants. This will lead to closer to real time procurement enabling more DSR and intermittent generation to participate in our markets, increasing competition, reducing costs and carbon emissions
- Increased competition in ancillary and balancing services markets leading to further cost reductions of £350m over the next 10 years
- Enabled Black Start capabilities from non-traditional technologies including interconnectors and began the process with DER

Plan delivery and new ways of working

- Power Responsive Programme
- Updated onboarding process for providers
- Developed auction trial for Frequency Response market
- Enabled Black Start capabilities from non-traditional technologies
- Accelerated access for early adopters entering the balancing mechanism
- Standardised and simplified contracts for ancillary and balancing services

60% New

40% Improved

Forward Plan 2018-19 deliverables

- ✓ Standardise the FFR market with simplified contracts
- ✓ Publish Restoration Roadmap and Publish Reactive Roadmap
- ✓ Understand the journey that potential counterparties go through
- ✓ Explore restoration service provision from interconnectors
- ✓ Deliver Roadmap for Restoration service
- ✓ Publish Thermal Constraints Management information note
- ✓ Publish Wider Access to the Balancing Mechanism Roadmap
- ✓ Detailed auction trial publication and launched a weekly auction trial for response
- ✓ Deliver a new, highly scalable and flexible dispatch solution for reserve – Phase 1 roll out for Fast Reserve providers
- ✓ Deliver new standardised products for reserve together with simplified contracts
- ✓ Publish and consult industry on exclusivity clauses to improve the ability to stack products
- ✓ Publish new testing and compliance/performance monitoring policy for response and reserve providers
- ✓ Build and implement a measurement framework that will track the success of ESO in helping potential and existing providers progress through the journey
- ✓ Raise a CUSC modification for removal of Enhanced Reactive Power Service
- ✓ Raise Obligatory Reactive Power Service concerns with CUSC issues standing group
- ✓ Develop an integrated approach to buying standard and faster-acting frequency response
- ✓ Publish an invitation for Expressions of Interest for provision of reactive power services in South Wales
- ✓ Accelerated access for early adopters entering the balancing mechanism
- ✓ Grow Power Responsive including annual conference

Stakeholder

- Hosted annual Power Responsive Conference with 220 attendees allowing interested parties to find out the latest information on market and product developments, access subject matter experts directly, and feedback directly on a range of topics, as well as giving the opportunity to network with other industry parties.
- Auction trial webinar for development of new frequency response products with 180 attendees and feedback score of 4.2/5
- Power Responsive Local Authority Workshop with 47 attendees and feedback score of 8.7/10
- Wider access – Virtual Lead Parties can register secondary BMUs which facilitates participation in both TERRE and the BM with positive feedback score of 3.3/5

Performance metrics

Metric	Performance
Metric 6: Reform of Balancing Services markets	Exceeding baseline
Metric 7: Facilitate new provider on-boarding	Exceeding baseline. We engaged with providers across a cross-section of our supplier base to gain insights on their journey and areas for improvement
Metric 8: Market diversity	On target – increased liquidity in relevant markets

Role #2
Facilitating competitive markets

Principle 4
Promote competition in wholesale and capacity market

AMBITION
Transform access to the capacity market and develop codes and charging arrangements that are fit for the future

Delivered benefits in 2018-19

- Delivered the Charging Futures programme which coordinates significant charging reform, in a way where every stakeholder can equally contribute to change. It helps network users to plan, manage and shape future reform together by providing one place to: learn, ask, and contribute
- Implemented scheduled code improvements including horizon scanning documents and FAQ guides
- Developed capacity market modelling providing more information to market participants
- Improved validation of demand forecasting by establishing a dialogue with new customers at an early stage, reducing the risk of underpayments which result in an unexpected reconciliation bill
- Improved accuracy of tariff forecasts and transparency of charges, providing more certainty to market participants
- Successful implementation of the European Network Codes programme
- Developed improvement action plans through our customer journey workstreams for both charging information and code administration

Future benefits and long term initiatives

- Provided thought leadership and industry support to understand market impacts of Code changes, charging arrangements and the Capacity Market
- Delivered necessary electricity market changes including code changes
- Enabled better functioning and more efficient markets

Plan delivery and new ways of working

- Refined the five year view of TNUoS tariffs report and webinars
- Published an improvement action plan for charging information and Code administration activities
- Led the Charging Futures programme and BSUoS Charging Task Force
- Advised BEIS on the EU Exit strategy including energy adequacy and operability updates
- Worked with BEIS to fulfil security of supply obligations following the suspension of the Capacity Market

80% New
20% Improved

Forward Plan 2018-19 deliverables

- ✓ Charging data – Phase 1: Customer access to information
- ✓ Charging data – Phase 2: Better forecasting and outturn information and material
- ✓ Joint Charging and Settlement Forum
- ✓ Publish Improvement Action Plan for Code Administration
- ✓ Targeted interventions that enhance our customers' experience of our charging processes
- ✓ Improve TNUoS billing reconciliation, forecast and final tariff setting processes
- ✓ Implement a new charging customer on-boarding process
- ✓ Publish Improvement Action Plan for Charging
- ✓ Improve access to modification working groups
- ✓ Engagement on regulatory horizon project
- ✓ Publish energy adequacy and operability updates in the context of EU Exit
- ✓ Comprehensive review of BSUoS
- ✓ Initiate consideration of changes to the SQSS (developing)
- ✓ Update on our thinking on security arrangements for transmission schemes
- ✓ Consult on our renewables derating method and results
- ✓ Consult on our distributed generation derating method and results
- ✓ Deliver Charging Futures Forums that are open to all network users
- ✓ Deliver webinars, podcasts and plain English publications under the Charging Futures (CF) Brand
- ✓ Publish a report on Charging Futures (in progress)

Stakeholder

- Positive feedback on network charging training sessions and webinars including Transport and Tariff model training
- Charging Futures Forum, webinars and podcasts with combined annual feedback score of 7.9/10
  Facilitated several webinars providing accessible information including: the targeted charging review, access and forward looking task forces and settlement reform project
- Developing code changes including publishing guidance material for market participants to improve understanding of the process, facilitating greater involvement across the whole market
- Proactive engagement with the proposer of CMP286/7 to develop understanding of consumer benefit including running a first of its kind RFI to develop the case for change
- Improved customer experience with charging, coaching new suppliers, providing a suite of guidance documents and the Charging and Settlements forum
- Delivered the joint charging and settlement forums for BSUoS and TNUoS customers, recasting our forums around our customers
- Tightened the process for onboarding new suppliers by contacting them when they apply for CUSC accession, introducing ourselves as the charging team and offering advice on their CUSC obligations

Performance metrics

Metric	Performance
Metric 9: BSUoS billing	Exceeding baseline
Metric 10: Code administrator- stakeholder satisfaction	Survey results show a significant increase from last year in overall satisfaction from our customers and stakeholders across CUSC, Grid Code & STC. + 18% improvement in CUSC (from 47% to 65%) +7% improvement in Grid Code (from 59% to 66%) +1% improvement in STC (from 57% to 58%)
Metric 11: Charging Futures	Exceeding baseline with score above 7.3/10 (baseline of 6.5)
Metric 20: Month ahead BSUoS forecast vs outturn	Exceeding baseline
Metric 19: Year ahead BSUoS forecast vs outturn	Below baseline

Role #3
Facilitating whole system outcomes

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

AMBITION
Whole system approach to developing electricity networks

Delivered benefits in 2018-19

- Published and delivered against plans for three Regional Development Programmes (RDPs), which are ground-breaking collaborations with DNOs that take a whole-system approach to planning and operating electricity networks
  - the SP Energy Networks RDP optimises costs of network constraints, additional generation connections, and network development
  - the WPD RDP looks at potential options for treatment of storage at three GSPs, and how to use flexible resources to facilitate connections in constrained areas
  - the ENWL RDP assesses operability options to manage constraints versus deploying assets
- Implemented innovative contracts for DER connections in both UKPN and WPD areas
- Standardised templates for the submission of data for week 24 data exchange
- Created consumer value through earlier and cheaper connections in UKPN's South-East Coast network and WPD's South West network

£520m

Future benefits and long term initiatives

- Developed whole system approaches to networks and unlocking of further DER connections
- Supported long term network investment decisions and operational strategies across the system
- Enhanced ability of DER to resolve network constraints / issues in the South West Scotland network area
- Changing embedded generator protection systems leading to more than £170m/year saving from 2022
- Developed whole system approach to cross boundary working leading to saving of £350m over the next 40 years from the South West Scotland RDP

Plan delivery and new ways of working

- Improved and developed new tools and processes to enable DER connections
- Joint RDP with UKPN takes a whole-system approach to optimising network capacity in the South East
- Joint RDP with WPD for the South West region, to facilitate the connection of additional DER
- Launched the Accelerated Loss of Mains Protection Change programme

70% New
20% Improved

Forward Plan 2018-19 deliverables

- ✓ Publication of the WPD and UKPN Regional Development Programme Learnings
- ✓ Begin two new RDPs by publishing a bespoke work plan for each region
- ✓ Facilitate unlocking of further DER connections through:
  - Implementation of innovative connections contracts that support the roll-out of revised Statement of Works processes on a national basis and the ability for DER to provide transmission constraint management services in our in-flight RDP areas
  - Implementation of new commercial contracts to allow DER to participate in the provision of transmission constraint management services in our in-flight RDP areas (developing)
  - Implementation of enhanced systems and ways of working between T&D to support provision of transmission services by DER (developing)
- ✓ Wk24 data exchanges that help establish whether the system is compliant with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS or SQSS) and trigger remedial works if not

Stakeholder

- Our engagement with DNO stakeholders includes monthly face to face meetings with DNO and iDNO representatives to deliver RDP outcomes and develop the Accelerated Loss of Mains Change Programme. The Accelerated Loss of Mains Change programme is unprecedented in what it will achieve and how it will be achieved, necessitating the design of new ways of encouraging compliance with mandatory requirements as well as new commercial arrangements and ways of working between the ESO, the DNOs and iDNOs
- The RDPs single-stage connection offer process has created a level playing field for both transmission and distribution customers, and maximised competition by enabling both to participate in the same flexibility markets. This should increase competition in provision of services, and lower costs consumers
- The RDPs recommend technical and commercial joint-actions. Ultimately these will provide better use of local network capacity for DER connections and reduces time to connect

Performance metrics

Metric	Performance
Metric 13: Whole system – unlocking cross-boundary solutions	Exceeding baseline – 278MW of DER – capacity enabled to connect.

Role #3
Facilitating whole system outcomes

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

AMBITION
Enable innovative connection solutions on a whole system basis, irrespective of ownership boundaries

Delivered benefits in 2018-19

- Launched the new fast track (Sprint) approach for connections which reduces the offer timescales by 30%. This has also increased the number of connection application to the transmission network by 40% from the previous year with 45 new (first time) market participants (up from 15 the previous year)
- Updated 10 connection agreements to reflect changes in network connections within 9-month target period

£30m

£600m

Future benefits and long term initiatives

- Led a whole system approach to cross boundary working leading to benefits of £500m by 2030
- Published whole electricity system thought leadership leading to benefits of over £100m/year by 2030
- Enabled a more diverse range of suppliers and technologies and increased liquidity in the market
- Enhanced asset optimisation and improved access to networks
- Reduced balancing and operability intervention by the ESO

- Developed specifications for the replacement of the Transmission Outage and Generator Availability (TOGA) tool including bilateral meetings and stakeholder workshops on developing the new tool to ensure it meets stakeholder needs and expectations
- Delivered value through reduced application fees and processing time due to improved Appendix G process with all DNOs enabling quicker connection offers to connect distributed energy resources, typically reduced time scales by six months and a saving of 15k per application

Plan delivery and new ways of working

- Initiated changes to the commercial arrangements for connection charges
- Launched a pilot trial for the Appendix G process with DNOs
- Developed innovative connection solutions and connection arrangements using transformer's tertiaries
- Developed an alternative approach to enable increased boundary flows and automation of current network access planning process
- Developed the specifications of the new TOGA tool

50% New

50% Improved

Forward Plan 2018-19 deliverables

- ✓ Whole Electricity System Outcomes' paper
- ✓ ENA Open Networks Future Worlds consultation
- ✓ Extend Appendix G trial processes
- ✓ Supporting a new Tertiary connection product that the NGET TO has offered to the market
- ✓ Non-Firm and Restricted access connections
- ✓ Engage with TOs and DNOs to identify opportunities to achieve more efficient use of existing assets, making use of weather and loading related operational capabilities thereby reducing the need for investment and lowering the volume and cost of balancing actions taken
- ✓ Identify areas for process improvement under existing contracts between SO and TOs and lead change programmes to optimise consumer benefits
- ✓ Specifications for TOGA replacement
- ✓ TOGA Procurement Event
- ✓ Delivering increased volume and complexity
- ✓ Increased connection application volumes and 'Sprint' process
- ✓ Connection and Compliance customer engagement
- ✓ Customer Connection seminars
- ✓ Network user planning workshops to reduce outage 'churn'
- ✓ DNO Operational Liaison
- ✓ Identify and develop new market tools with all relevant parties to ensure efficient system solutions for operation
- ✓ Demonstrate system operability related challenges to a broader range of stakeholders identifying the scale of the impact we forecast on future operation and providing opportunity for whole system solutions to be developed
- ✓ Regular engagement with DNOs exists currently to share seasonal data and challenges encountered on networks. We will increase the volume of this engagement and include other network operators as well as large demand customers
- ✓ Build strong relationships with DNOs and review and develop contractual arrangements and processes to deliver efficient whole system focused outcomes
- ✓ Increasing our involvement and support of the ENA Open Networks Project
- ✓ Articulating our thought leadership on Whole Electricity System across a broad stakeholder base

Stakeholder

- Leadership role within the ENA Open Networks Project with broader representatives from across the ESO including the Energy Network Future Group
- Improvements in communication with all affected parties and outage management system including Network User Planning Workshops to reduce outage churn
- Hosted the Customer Connection Seminars to inform new and potential market participants with 200 attendees and positive feedback score of 4.3/5
- Published the 'Facilitating Whole Electricity System Outcomes' paper with positive feedback including that it was clear and well thought out
- Engaged on a replacement for the TOGA tool – worked closely with customers and stakeholders to listen to their views and take account of their requirements in the design of the new outage planning tool to ensure it delivers what they need

Performance metrics

Metric	Performance
Metric 14: Connections Agreement Management	Exceeding baseline
Metric 15: System Access Management	Exceeding baseline
Metric 16: Future GB electricity system security planning	Published with positive stakeholder feedback
Metric 21: Right First Time Connection Offers	On target

Role #4
Supporting competition in networks

Principle 7
Facilitate timely, effective and competitive network investments

AMBITION
Drive innovation and develop alternatives to asset solutions

Delivered benefits in 2018-19

- Reduced spend on commercial actions to manage future high voltage issues, leading to reduction in BSUoS and TNUoS charges
- Led changes to the NOA methodology to enact the upcoming changes to SLC C-27 which included the assessment of connections against the competition criteria
- Added commercial solutions to NOA process leading to up to £100m/year reduction in constraint costs
- Improved the Strategic Wider Works (SWW) process including cost benefit analysis which considers the network impacts of investments leading to savings of £400m
- Developed tools to enable a systematic approach to identifying future network issues

£504m

£6.3bn

Future benefits and long term initiatives

- Initiated low carbon generation options including reduced environmental damage of non-build options
- Developed Connection and Infrastructure Options Notes (CION) assessment with up to £2bn of consumer value over 25 years
- Initiated economic network development leading to lower costs for consumers by expanding the NOA process to consider wider range of system needs
- Improved the SWW process resulting in savings up to £400m, with the benefits realised over 40 years
- Added Commercial Solutions to the NOA Process, with benefit of up to £1.1bn over the next 10 years
- Following this year's NOA recommendations leads to avoided costs for consumers of up to £2.6bn over the next 10 years
- Developed the High Voltage Pathfinder leading to benefit of up to £36m/year, post 2021

Plan delivery and new ways of working

- Reactive power / voltage Pathfinder projects – 'learning by doing' approach
- Explored market and DNO solutions as alternatives to transmission assets
- Published Network Development Roadmap providing a clear roadmap of enhancements to the NOA process
- Developed thermal probabilistic assessment case studies
- improved interconnector methodology and modelling

60% New

40% Improved

Forward Plan 2018-19 deliverables

- ✓ Publication of the NOA methodology and report
- ✓ Publication of the 2019 NOA recommendations
- ✓ Publication of the Network Development Roadmap consultation and the final Roadmap
- ✓ Progress delivery of the pathfinder projects to implement the Network Development Roadmap
- ✓ Agree a route to fund DNO solutions in RIIO-1 and RIIO-2
- ✓ Publication of the Electricity Ten Year Statement
- ✓ Publication of the ENA Open Networks approach to whole system investment and operability options across transmission and distribution networks
- ✓ Increase the scope of the NOA methodology to include non-network solutions
- ✓ Improve and develop our modelling capability, further embedding the interconnector modelling and our analysis of offshore networks
- ✓ Progressing probabilistic year-round assessment to understand how often the network boundaries are exceeded.
- ✓ Integrate changes in our models and methodology to include analysis of generator connections
- ✓ Design developments to the NOA to support the introduction of competition in delivery of the onshore transmission network.
- ✓ Progressing with the process and methodology development for the high voltage regional network options assessment process

Stakeholder

- DNOs involved in the development of processes including industry forums
- TO workshops with feedback score of 7.3/10
- ESO 2030 Ambition workshop and customer seminars in October 2018 and March 2019 with positive feedback
- A number of bilateral conversations with a range of interested parties, eg Citizens Advice, Scottish and Welsh governments, BEIS, project developers, ADE, Renewable UK and Energy UK

Performance metrics

Metric	Performance
Metric 12: Whole system optionality	Exceeding – we identified 9 non-TO initiated options against a target of 3
Metric 17: NOA consumer benefit	Exceeding – we have exceeded our target for adding value in NOA 2018-19 by delivering 11 ESO options (against a target of one) resulting in £711m of value
Metric 18: NOA engagement	On-target – stakeholder feedback score averaged 7.3/10 over the year

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