

ESO RIIO-2 Business Plan 2 (2023-25)

Mid-Scheme 2023-24 Incentives Report Executive Summary

May 2024



Foreword

Welcome to our RIIO-2 2023-25 Mid-Scheme Incentives Report.



Fintan Slye

Executive Director, Electricity System Operator

We are now half-way through our second RIIO-2 business plan (BP2) and we continue to step up and lead in the delivery of a decarbonised energy system for Great Britain.

In January 2024, we were delighted to share the identity of our new organisation - National Energy System Operator (NESO), which will take on a critical role at the heart of the whole energy system. When we formally become NESO this summer, we will continue to deliver with a focus on energy security, affordability and sustainability, whilst taking on new accountabilities. We will take on new roles including Strategic Spatial Energy Planner (SSEP), Regional Energy Strategic Planner (RESP), Resilience and Security, and Whole System Market Strategy. These will form a core part of the blueprint for how we will help Great Britain progress towards a sustainable energy future.

Great Britain continues to be one of the fastest decarbonising electricity systems in the world and we are on track to operate a zero carbon electricity transmission system for periods in 2025. We have continued to break records with the highest solar and wind power output ever achieved, alongside the lowest level of fossil fuel generation and carbon intensity.

Over the past year we have focused on delivery against our highly ambitious plan supported by the transformation of our Digital, Data and Technology (DD&T) function. It's fantastic to see many of our key activities progressing including the first release of the Open Balancing Platform (OBP) which is a significant step forward for our balancing capabilities. We have also launched our new Enduring Auction Capability (EAC) platform, enabling providers to participate in multiple Frequency Response services simultaneously for the first time.

We continue to lead the world in network strategic development. In March 2024, we published our Beyond 2030 report



delivering the second Transitional Centralised Strategic Network Plan (tCSNP2). We made recommendations of £59 billion onshore and offshore network investment throughout the 2030s. This will facilitate the connection of an extra 21GW of offshore wind as well as a breadth of other low carbon generation across Great Britain. We have explored ground-breaking technologies and solutions across the whole electricity system which will be critical in achieving our net zero targets.

Business Plan 1 (BP1) was defined by the Covid-19 pandemic, Russia's illegal invasion of Ukraine, and a cost-of-living crisis which saw massive increases in energy prices. Although our own costs make up a very small percentage of total energy system costs, we continue to be focused on driving these down. We have delivered a huge range of initiatives across our balancing costs strategy portfolio and reduced costs for the benefit of consumers. Underpinned by falling wholesale prices, balancing costs over the first year of BP2 were £2.4bn compared to £3.1bn and £3.8bn in the first and second years of BP1.

Building trust with our customers and stakeholders remains a top priority and we have been working hard with industry, government and Ofgem to build trust and credibility for our organisation now and in the future. Over the past year, we've asked stakeholders for their feedback on how well we are delivering our BP2 activities. We know there is more that we can do to

address concerns about our responsiveness and how we are delivering some of our activities e.g. connections. We have already set up a new Customer Service and Relationship Management team to start acting on this. In addition, we are setting up a dedicated Customer function in our new organisation design to make longer-term change. This function will help us make the necessary shift in improving our customer experience and drive a more customer-centric culture.



Unparalleled levels of change will be needed across the whole system to transition away from fossil fuels and deliver clean, green, affordable and reliable energy for everyone across the country. We're excited about the role we will play in this change as NESO. We look forward to continuing to work with you as we deliver on our existing BP2 commitments and take on new responsibilities and activities.

Roles Overview



Role 1 – Control Centre Operations

In Role 1, we have continued to focus on the areas that matter to our customers and end consumers, while operating a safe and reliable supply of electricity to Great Britain. Our strategic plan has seen the costs incurred in balancing the system fall. Over the last year these costs were £1.4bn lower compared to the final year of Business Plan 1. We have opened up our markets, removing barriers to entry for low carbon technologies like batteries, electric vehicles and distributed generation. Our IT systems and processes are transforming, and in the past year we have successfully delivered the Open Balancing Platform and implemented our Distributed ReStart project. Our progress in Role 1 means we are delivering on the ambitious plans we set out at the start of RIIO-2 to operate a zero carbon electricity system. We know there is still more to do and we will continue to work closely with our customers to understand their needs and facilitate low carbon assets into our markets.

Craig Dyke - Director of System Operations



Role 2 – Market development and transactions

Our Role 2 activities have continued to make our markets more efficient and accessible for customers. Over the past year, we've focused on improving what we do and how we do it including launching new platforms, improving transparency and enhancing our stakeholder engagement. Our new EMR portal has provided an improved experience for our customers and the Enduring Auction Capability platform is expected to deliver benefits of £86.5m per year. We've continued to develop our markets for all stakeholders and improved transparency by confirming our approach to new Reserve products. A new approach to our Markets Forum has also increased transparency for our stakeholders. We've increased engagement for our Net Zero Market Reform programme by widening our stakeholder groups as we begin to work on gas and whole energy markets. We have also changed our approach to resolving problems with the Constraints Collaboration Project. We will continue to make progress in these areas so we can drive the changes needed over the next decades.

Matt Magill – Acting Director of Markets



Role 3 – System insight, planning and network development

In Role 3, we have delivered well against our RIIO-2 commitments and have also gone above and beyond in some areas. Our strategic efforts to prepare for the ability to operate a zero-carbon electricity system are coming to fruition. Records for maximum zero carbon generation or lowest carbon emissions are regularly being broken – the latest records being 91.8% and 19gCO₂/kWh respectively. This puts us in a great position to meet our target of periods of zero carbon operation in 2025. In the past year, we've also published the Beyond 2030 network plan. This plan lays the foundations for a decarbonised electricity system in Great Britain, delivering on government zero carbon targets and providing savings for consumers. We have listened to customer feedback and made progress on connections reform activities and tactical plans. However, due to the continued growth of connections applications our actions so far have not been enough and more radical changes are now in the plan.

Julian Leslie - Director of Strategic Planning

Role 1 – Control Centre Operations



Craig Dyke

Director of System Operations

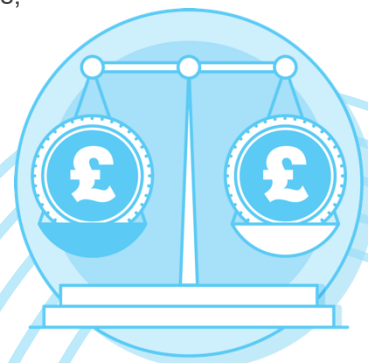
We have continued to operate a safe and reliable supply of electricity to Great Britain over the last 12 months and are delivering against our key BP2 commitments. However, we do recognise the need to continue to remove barriers to facilitate smaller-scale assets entering our markets. We have achieved the following headlines in Role 1:

- Continued to deliver against our balancing costs strategy with costs £0.3bn lower than our Metric 1A benchmark for the first year of BP2 (£2.4bn vs £2.7bn). Costs were also £1.4bn lower compared to the final year of BP1.
- Launched Release 1 of the Open Balancing Platform (OBP) which will deliver enhanced dispatch capability to meet fast-changing customer requirements.
- In response to stakeholder feedback, co-created a plan with industry detailing how we will enhance the use of storage assets in the Balancing Mechanism (BM). We are currently on track against this plan.
- Continued to open access to markets for 'small' participants through relaxing operational metering standards, which allows technologies such as Electric Vehicles (EVs) (currently c1000) into the market to be dispatched for balancing. This will build on circa 2GW of small units that have entered our markets since the Wider Access initiative was launched in 2019.
- Completed our Distributed ReStart project; a world-first initiative exploring how distributed energy resources can be used to restore power to the network and initiated delivery of our first distributed restoration zone in the South East region in collaboration with UKPN.
- Made significant tactical improvements in our wind generation forecasting and are now seeing improved performance against Metric 1C which underperformed at the start of BP2.

Balancing Costs

In our efforts to operate an evolving system and minimise balancing costs, we have undertaken a huge range of initiatives within our balancing costs strategy.

Over BP1, balancing costs rose significantly due to a multitude of factors but primarily as a result of extremely high wholesale costs. In BP2, we have seen wholesale costs come down and the impact of our balancing costs strategy, which was implemented in BP1 take



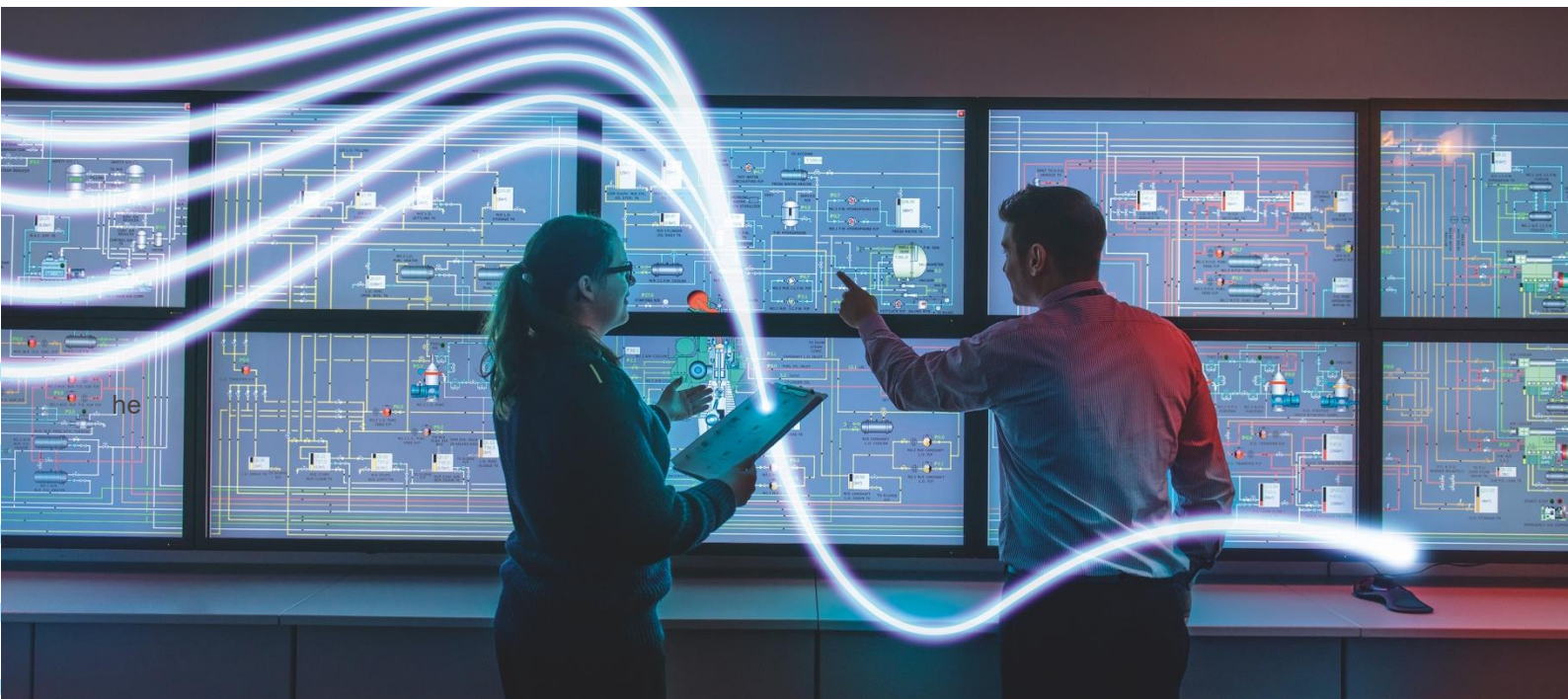
effect. As a result, balancing costs over the first year of BP2 were £2.4bn compared to £3.1bn and £3.8bn in the first and second years of BP1.

Our balancing costs strategy has improved our performance against Metric 1A and includes several key initiatives including the Constraints Management Pathfinder, launch of the Balancing Reserve service and trading outside of the BM to meet system and energy needs at minimum cost. We have also optimised and improved our outage procedure to maximise flows on the electricity system whilst minimising constraint costs. At the start of BP2, we updated the methodology for Metric 1A so it more accurately reflects the drivers of balancing costs that are within our control. Metric 1A has exceeded expectations against the benchmark in 8 of the 12 months over the first year of BP2, and has met expectations overall.

DD&T Delivery

Our Balancing Programme is transforming the balancing capabilities of our control centre for the future. Following a strategic review in BP1, where we engaged with our industry stakeholders to ensure we deliver the required capabilities, we are now on track and delivering against this co-created plan. In December 2023, Release 1 of the OBP went live on time and on budget, providing enhanced bulk dispatch capability within the control room for two zones - batteries and small Balancing Mechanism Units (BMUs). Based on industry feedback, implementation of the battery zone was delivered four months earlier (originally planned for April 2024) than the original plan agreed with stakeholders in April 2022. In January 2024, we resolved early life issues on OBP, which saw an increase of 220% in the average daily volume instructed for batteries from 500MWh (April 2023-January 2024) to 1600MWh (January 2024- March 2024). For the small BM unit zone, since Release 1 (December 2023) there has been an increase of 47% in average daily instructed volume from 560MWh to 830MWh.

In our Network Control programme, our supplier announced a new platform for situational awareness that is more modular in design. We have reviewed the option to gain early access to this new platform and confirmed it will unlock modular design benefits by 2025 and further benefits across future years. We have reviewed our delivery plan against this opportunity and re-aligned our timeline with our supplier platform roll-out strategy. This has moved the go-live date from April 2025 to October 2025. We believe this is the right decision for consumers with greater long-term benefits being realised. We have also responded rapidly to system events, with oscillation monitoring products being identified as new scope into the programme. These have been deployed to both real-time and post-event teams to enhance our situational awareness.



Operational policy changes

We have been reviewing the effectiveness of existing policies and updating them to fully enable the benefits of our IT delivery across the RIIO-2 period. We are moving through the process of a proposed Grid Code modification to establish data feeds for the provision of storage parameters. This modification will mean we can provide greater operational awareness of the capability of storage assets. We have also updated our policies on scheduling and dispatch of storage assets. An additional change in March 2024 means that batteries can now be instructed to run for at least 30 minutes, whereas previously they were restricted to 15 minutes. Since the implementation of the change there has been an increase in continuous battery instructions greater than 15 minutes from 25% in February 2024 to 46%. Following customer feedback, we recognise that we have more work to do on battery dispatch. We have implemented short term actions such as policy changes and resource deployment, which have seen a notable improvement as previously mentioned.

We recognise the need to continue to overcome barriers to facilitate smaller-scale assets entering our markets and are working to determine an enduring way forward for operational metering. We have accelerated our activities and are now admitting small-scale aggregated assets of up to 300MW into the BM. This will allow for greater consumer participation in flexibility, allowing capacity from small-scale assets, such as EV chargers and electric heating systems, to be used to balance the electricity system in real time by our control room. This builds on a Power Responsive trial that took place in 2023 and is something that our industry stakeholders have been asking for.

Market Monitoring

In line with our BP2 planned deliverables, we commissioned an independent review of the market monitoring function. The objective of this review was to ensure that we are fulfilling the licence condition and REMIT obligations of proactively monitoring ESO balancing markets for suspicious activity. The review concluded that we have attained a high standard of practice within a short time, and that policies, processes and risk assessments are well designed and clearly written.



We have developed robust and fuel-specific methodologies for assessing reasonableness of bid and offer prices. We identified many periods across 2022 and 2023 where the overall cost of marginal bids from units that hold Contracts for Difference (CfD) were extremely high because of avoided CfD repayments to Low Carbon Contracts Company (LCCC). This led to £160m in excess balancing costs to the consumer. This issue was identified as a flaw in the interaction between the CfDs and the Balancing Market (BM). Collaborative efforts with LCCC, Ofgem and DESNZ led to the decision that a Balancing and Settlement Code (BSC) modification was the best solution, resulting in the creation of BSC workgroup P462 to address the issue.

Forecasting

In BP2, we have continued to enhance our forecasting to provide market participants and the control centre with more accurate and more frequent forecasts for improved commercial and operational decisions. We have seen a notable improvement in our demand forecasting since BP1, which is now supported by Machine-Learning capability.

Our wind generation forecasting underperformed at the start of BP2. Recognising this, we've made significant tactical improvements and have recently seen improved accuracy. These improvements included a complete systems audit, an update of all the wind models, and the continuous improvements in the application of windfarm outage data. Our legacy system remains a constraining factor. However, our metric performance met expectations in three out of the last five months of the year. We are continuing to work with numerous industry stakeholders to improve the quality of the data we receive for use in our forecasts.

We anticipate additional enhancements will be available later in 2024, with the release of our next-generation wind forecasting product (PEF R5). This product will allow the use of richer weather data and a wider range of models, including AI/Machine Learning capability. Further improvements to the demand forecasts will also be realised, through improved embedded wind modelling.



Restoration

The new Electricity System Restoration Standard (ESRS) obligates us to have sufficient capability and arrangements in place to restore 100% of Great Britain's electricity demand within five days by the end of 2026. We are currently on track to meet this obligation. In BP2, we have made timely progress (64% of the BP2 plan delivered so far) in implementing ESRS and have been working with wider industry to gain approval for many of the main code modifications required for implementation. To achieve the regional restoration targets, we've launched more tenders across all seven restoration regions.

In October 2023, we completed our Distributed ReStart project, which was an award winning, world-first initiative. The project explored how distributed energy resources (DER) such as solar, wind and hydro, can be used to restore power to the transmission network in the unlikely event of a blackout. This project was a huge success delivering an additional trial while staying under budget and demonstrating the value of the service. We included the learning from this project in our tenders launched in Autumn 2022 and are now working with UKPN and the contracted companies to deliver our first Distributed Restoration Zone in the South East region. This allows DERs to participate in the restoration market, in addition to the conventional generators, making it more cost effective for the end consumer.

Stakeholder engagement

Our Operational Transparency Forum provides transparency around weekly system operation and actions. It continues to see a record number of attendees each week, up to 400, with over 1000 external registered participants.

In our Balancing Programme we have enhanced engagement by developing the style of industry events, introducing four new stakeholder focus groups (Storage, Forecasting, Technology and Optimisation), and implementing a regular newsletter. These activities ensure that we update and listen to our stakeholders more regularly and through more channels to ensure our roadmaps are prioritised and validated with industry based on their feedback.

Stakeholders have told us that we need to improve the dispatch of storage assets in the BM. In response to this feedback, we set out a plan in October 2023 detailing how we would enhance the use of storage assets in the BM. A plan was developed collaboratively with industry and was endorsed by the Energy Storage Network. It was then updated with additional activities based on further industry feedback through increased engagement. We have completed 16 activities so far in BP2 including the aforementioned battery zone as part of OBP Release 1, and the launch of the Balancing Reserve product. Our current plan of activities to enhance utilisation of energy storage takes us to the end of 2025 and we remain committed to continuing this journey of collaboration and co-creation with the energy industry to address current and future challenges.



Going forward

For the remainder of BP2 we will be focusing on:

- Removing barriers for distributed flexibility to participate in our markets.
- Delivering the on target plan to be able to operate the system at zero carbon in 2025.
- Further developing our balancing costs strategy, publishing a new report and continuing to minimise costs for consumers.
- Delivering our DD&T investments including further OBP releases, opening up more opportunities for new market participants and reducing costs for consumers.
- Embedding our new Resilience and Emergency Management role which will take a whole system perspective when considering resilience and security for Great Britain.

Role 2 – Market development and transactions



Matt Magill

Acting Director of Markets

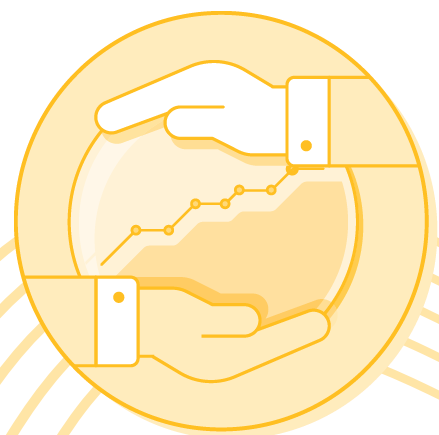
Over the last 12 months we have made good progress in delivering our key activities as set out in BP2. However, we recognise that improvements are needed across our code change and market development processes. We have achieved the following headlines in Role 2:

- In January 2024, we opened the new Electricity Market Reform (EMR) Portal for registrations in preparation for the 2025 Capacity Market (CM) Auction. We know the success of the new EMR Portal is one of the largest drivers of performance in Role 2 and we are pleased to be on track against our latest plans.
- Re-planned our market reforms and started to develop new reserve products, some of which had been deferred from BP1. This includes successfully delivering the first stage of the Enduring Auction Capability (EAC) platform, which we expect will deliver benefits of £86.5m per year.
- Identified several issues in relation to the drafting of our code documents and made internal process changes following a review. We have identified no impacts to our customers or stakeholders as a result of the drafting issues.
- Introduced changes in response to stakeholder feedback to improve transparency around our activities and decision making. This includes a re-launch of the Markets Forum.
- Concluded our Net Zero Market Reform Programme, delivering holistic recommendations for GB market reform. Since then, we have joined the government's Review of Electricity Market Arrangements (REMA) as a delivery partner.
- In preparation for our new NESO roles in gas and whole energy markets, we have established teams and grown critical capabilities. We have also established a team dedicated to unlocking the potential from distributed flexibility and supporting the coordination of flexibility across transmission and distribution.

Market Reforms

We've continued to identify and remove barriers to access for market participants. Feedback shows that our customers want to deliver multiple services and so we have developed our balancing services to make participation in our markets easier.

A significant outcome of this work is our new EAC platform, which launched as planned in November 2023, and enables market participants to bid on opportunities to deliver multiple frequency response services simultaneously for the first time. In the first



round of auctions, we saw clearing prices fall 35% across our Dynamic Frequency Response markets and full use of the platform's functionality such as stacking.

In March 2024, we ran the first auction for our new Balancing Reserve product, which was developed through our Reserve Reform activities that we delayed under BP1 to prioritise critical activities for Winter 2022/23. This market could deliver a potential consumer saving of £639m across the next four years under a base case scenario.

We expect to launch additional new Reserve products in the next 18 months (Slow Reserve (SR) and Quick Reserve (QR)) with the first of these going live in September 2024 and the final delivery in September 2025. These will be procured at day-ahead and will offer new routes to market for our customers. We will continue to iterate these designs in conjunction with our stakeholders to ensure the best outcome for all.

In support of our goal to align all procurement with day-ahead, we have reduced the volume of non-day ahead procurement by phasing out services such as Dynamic Firm Frequency Response. Our new procurement goal has been further supported through the continuing maturity of our Frequency Response services (Dynamic Containment, Dynamic Regulation, and Dynamic Moderation), which have resulted in greater market liquidity.

Our management of processes around market development is a particular area of focus for our teams. Our RIIO-2 plan was highly ambitious, committing us to a comprehensive level of market reform with a high number of dependencies. This meant that some reforms were unable to proceed as planned and we had to move at pace to develop others when we consider there to be consumer benefit. However, we recognise that in some instances this has led to unintended consequences and we will continue our discussions with Ofgem and industry to mitigate these.

We are trialling a new approach to designing market products and services – our Constraints Collaboration Project. This project is above and beyond our original BP2 commitments. In January 2024, we took to industry the challenge presented by rising thermal constraints and their costs. We outlined the scope, the limitations within which we need to work and asked for their proposals for how to solve the problem. This collaborative approach has received lots of support, engagement and positive feedback from industry. We anticipate this will result in industry-supported solutions that we can take forward to implementation.

Demand Flexibility Service

Building on the success of the launch of the Demand Flexibility Service (DFS) in BP1, this service continues to grow. Households and businesses are demonstrating their continued interest and commitment to electricity flexibility and are seeing rewards for their participation through a range of providers.

Winter 2023/24 saw around 2.5 million households and businesses sign up with over 3.6GWh delivered across both our live and planned test events. This year, the service evolved to offer us access to procurement within day at two timescales, as well as maintaining the day-ahead option. We have also moved from tests with a Guaranteed Acceptance price (GAP) to competitive tests.

As well as generating new routes to markets for consumer energy resources, and providing an additional tool for our control room, DFS has cemented our position as a world leader in developing flexibility offerings and allowed us to realise significant learnings in terms of this type of flexibility.

Codes and charging

We have supported industry with continuing to progress 83 modifications across the codes to facilitate positive industry change over the last 12 months. Some of the key highlights include; the approval of the CMP376 Connection Queue Management modification, which will allow us greater flexibility in managing the connections backlog, and approval of GC0156, the technical Grid Code elements of the Electricity System Restoration Standard, which ensures Great Britain's network has a sufficient level of resilience to restore the system in the event of an emergency. We have also continued to lead the Transmission Network Use of Charges (TNUoS) Taskforce in conjunction with Ofgem and industry to focus on key changes to the charging arrangements in the short to medium term.

We identified several issues in relation to the drafting of our code documents. As a result, we carried out an initial piece of work that considered our internal Code Administration processes and the management of Modification implementations. This work led to several process changes. We also sought external legal support to undertake an audit of both the CUSC and the Grid Code. We have identified no impacts to our customers or stakeholders as a result of the drafting issues. We are continuing to further review our internal processes and are fully committed to putting in place enhancements to the existing control framework.

DD&T Delivery

In January 2023, we agreed a new plan with industry for delivery of the new EMR Portal in Q1 of 2024, and we are currently on track. We have made good progress with the live version opening for registration as planned in January 2024 and a customer familiarisation period opening in March 2024. Full release of the portal is scheduled for May 2024, in time for the prequalification assessment window opening in July 2024. Using a staged approach has enabled us to address defects as they are identified, meaning that development can continue towards the release date. We will continue with a fix forward approach post-launch, but retaining support that means we can continuously improve the portal by rolling out enhancements, implementing regulatory changes and addressing defects.

We are responsible for recovering around £9bn per year on behalf of the transmission operators. Since the start of BP2 our new Settlements and Revenue System (STAR) has had six successful releases to collect different charges including connections charging and the migration of Firm Frequency Response. The releases also include mandatory/legislative changes to the billing of TNUoS charges and generation, and Assistance for Areas of High Electricity Distribution Costs (AAHEDC). Balancing Services Use of System (BSUoS) charges will be implemented in STAR as part of the final release at the end of September this year.

Our Single Markets Platform (SMP) has been a notable success for Role 2 and has led the way in agile delivery. So far in BP2, the platform has continued to deliver its prioritised backlog through 12 releases over the last 12 months to increase user functionality, including additional balancing services, and integrating with other ESO systems. Close collaboration with industry through monthly "Show and Listen" webinars allows co-creation and the flexibility for re-prioritisation to ensure user value is optimised and the programme can deliver its backlog efficiently.

In support of the ambition to integrate more closely with DSO / Flexibility markets, the SMP has led on the development of a proof of concept with a DSO (UKPN) and Electralink. As part of this, meter data is being matched to



determine potential risks of conflict between DSO and ESO markets. Our expectation is that this proof of concept will demonstrate how we can progress co-operatively with DSOs to deliver system approaches.

Distributed Flexibility

We believe that distributed flexibility is critical to achieve the net zero ambition. We therefore established a dedicated team in 2023, working closely with our industry colleagues to develop our first Flexibility Market Strategy to unlock the potential of distributed flexibility. We have defined our vision, desired outcomes for 2028, and identified six workstreams to help us achieve the outcomes and develop a roadmap of actions. Our proposal has been tested with various industry colleagues via the Markets Forum, industry workshops and bilateral conversations.

Looking ahead, we are committed to deepening the collaboration with industry, focusing on identifying and prioritising the blockers and pain points to enhance accessibility of our flexibility markets for distributed resources. Facilitating ESO-DSO market stacking to optimise the use of distributed assets will be another focus area. Additionally, we are dedicated to supporting the design and implementation of the Market Facilitator and various industry wide transformational programmes. A Call for Input on our Flexibility Market Strategy will be launched in May 2024 to make our engagement more effective and inclusive.

Net Zero Market Reform (NZMR) and Review of Electricity Market Arrangements (REMA)

Established in 2021, our NZMR programme aimed to holistically examine the changes to current GB electricity market design that will be required to achieve net zero. In December 2023, we published our Phase 4 report which built on the work of previous phases and provided our conclusions on the required investment policy changes. This, combined with the recommendations for wholesale market reform in Phase 3, delivered our ambition to provide a view of holistic market and policy reform packages for net zero, along with pathways to achieving them.



Throughout 2023, we continued to work closely with DESNZ and Ofgem, supporting their work on REMA as a strategic advisor and in January 2024 we formally joined REMA as a delivery partner. We are supporting DESNZ in all aspects of the next phase of REMA, including wholesale market, CfD, and CM reforms. We are leading on reform options for dispatch and balancing. We take our inclusion as a delivery partner in REMA as recognition for the high quality market strategy analysis delivered through the NZMR programme.

Stakeholder engagement

We continue to use our BM reform workshops, Power Responsive events and Markets Advisory Council to shape debate and deliver the transformation needed in our electricity markets to set us on the trajectory for full decarbonisation by 2035.

We have learnt from the success of our OTF and have made significant changes to how and when we engage with stakeholders. This includes our re-launched quarterly Markets Forums where we provide updates on our activities and development of our markets. The forum also allows opportunity for attendees to provide input and raise questions. Based on feedback from the first of our new Markets Forums, our calendar of future engagement will be delivered through a combination of online and in person events, with the latest in person event being held in Scotland.

In addition to our Markets Forums, we have recognised issues our stakeholders have experienced when seeking to engage with Markets, including slow response times and lack of clarity on who they should speak to. To address this, we are embedding a “customer first” mindset by capturing and addressing where we have not met expectations and understanding more where actions have resulted in positive customer experiences.

Going forward



For the remainder of BP2 we will be focusing on:

- Ensuring security of supply for next winter and beyond into the mid-2030s.
- Delivering on our Reserve Reform commitments.
- Publishing our Flexibility Market Strategy.
- Continuing our transformation in whole energy thinking as we become NESO and formally take on the gas and whole energy market strategy roles.
- Establishing and growing capabilities with dedicated teams developing flexibility market strategy and whole system market strategy.
- Working closely with DESNZ, Ofgem and industry stakeholders to develop final recommendations under REMA.

Role 3 – System insight, planning and network development



Julian Leslie

Director of Strategic Energy Planning

Over the last 12 months we have continued to lead the world in our thinking across our network strategic development, whole energy planning and zero carbon operation activities. We have also taken on new roles and delivered well against our BP2 commitments. However, we do recognise the limitations in the current connection process, and despite efforts to improve, it is not working as intended. This is due to the number of applications we are receiving being well above the volume the current process was designed to deal with. We have achieved the following headlines in Role 3:

- Published our second Transitional Centralised Strategic Network Plan (tCSNP2) with a recommendation of £59 billion onshore and offshore network investment, and progressed the methodology development for the Centralised Strategic Network Plan (CSNP).
- Achieved a new low carbon intensity record of 27gCO₂/kWh in September 2023. This record was broken twice in April 2024 with the current record now standing at 19gCO₂/kWh. We remain on track to operate a zero carbon electricity transmission system for periods in 2025.
- Progressed our connections reform activities alongside our more tactical connections actions plans.
- Launched our world-first Megawatt Dispatch service - an innovative solution to manage the transmission and distribution interface which enabled 7.3GW new Distributed Generation to be connected.
- Starting to build our capability for our new strategic planning roles as Strategic Spatial Energy Planner (SSEP) and Regional Energy Strategic Planner (RESP).

Strategic Planning

Our electricity transmission network planning process is evolving to ensure network design and investment processes are fit for the future. In BP1, our Holistic Network Design (HND) and Network Options Assessment (NOA) work were the first steps towards a more strategic network planning approach. This work is critical for delivering affordable, clean, secure and reliable power, as we journey towards our net zero future.

One of our key Offshore Coordination activities last year was the East Anglia study. This followed the Offshore Coordination Support Scheme (OCSS) announcement and ran from November 2023 until March 2024. This region is playing a critical role in the transition of Great Britain's energy system.



Many offshore wind farms off the coast of this region are either generating or are due to connect before 2030. As a result, these windfarms were deemed out of scope of the HND. We assessed different circuit options that could transfer power around and across the region, which would optimise cost, mitigate deliverability and operability challenges, and minimise environment and community impacts if the decision by DESNZ is to proceed with the offshore coordination through the OCSS process.

In March 2024, we published the Beyond 2030 report. It delivers the tCSNP2, which has made a set of network recommendations throughout the 2030s, and it will facilitate the connection of an extra 21GW of offshore wind as well as a breadth of other low carbon generation across Britain. Our recommendation is one coordinated onshore and offshore network design totalling £59 billion investment. This design encompasses the outputs of the Holistic Network Design Follow-up Exercise (HNDfUE) and the enhanced NOA and will facilitate offshore wind connections from the Crown Estate Scotland's ScotWind leasing round.

The second iteration of the tCSNP is an intermediate step in our transition to a new planning approach under CSNP. It will provide broader coordinated network planning activity and combine more energy vectors, whole system thinking and third-party solutions. A high-level initial methodology for CSNP is under development to focus on the proposed areas of change in [Ofgem's CSNP consultation decision](#). It will capture the key processes of the new framework, concentrating on electricity transmission network planning. To align with this consultation, we have developed a new framework for FES 2024 and tested this with stakeholders at our dedicated framework workshop. In Spring 2024, we will commence a consultation on the methodology for CSNP to provide opportunity for feedback from a broad range of stakeholders. A more comprehensive, final methodology for the CSNP will be published later in 2024.

In November 2023, Ofgem announced that NESO will take on the role of RESP ensuring energy networks are regionally coordinated across fuel vectors and between geographies. We have been recruiting a team, developing relationships with key stakeholders, and working with Ofgem as they lead the design of the RESP function, governance and boundaries. We are expecting a consultation on RESP this Summer with initial outputs expected to inform the Electricity Distribution ED3 price control in late 2025 / early 2026.

The Transmission Acceleration Action Plan was published in August 2023 as the government's response to the Electricity Networks Commissioner's report on accelerating electricity transmission network build. One of the key action areas was to create a Strategic Spatial Energy Plan (SSEP). Since then we have been working closely with the government to develop the SSEP initiative to bridge the gap between government policy and Network Development Plans. We are setting up the SSEP team to deliver, and will be supporting DESNZ ahead of officially commissioning the role, which will instruct us to develop the SSEP in line with the Commissioner's recommendations.



Network Competition

We have continued to develop the detailed early competition proposals, consulting stakeholders throughout the process. We submitted our updated proposals to Ofgem in September 2023 and published these in January 2024. We also responded to the evolving network planning processes, as set out in Ofgem's CSNP consultation, by recommending adaptations to the early competition model. We are on track to meet the delivery timeframes agreed with Ofgem and the overall target set up by DESNZ, with a view to launching the first competitive process by the end of 2024.

Connections

The growth in connections application volumes and connection offers continues at unprecedented levels. Applications are currently at 20GW per month and around 250GW has been added to the queue in the last year. The transmission queue currently stands at over 530GW, with over 80GW already connected. This is more than double the installed transmission-connected capacity expected by 2050 under the 'Leading the Way' scenario in our FES 2023. We are continuing to respond to the growth in applications with a range of shorter-term tactical actions whilst progressing with our medium-term, more fundamental, connections reform work

We have invested to improve our own performance. To service the queue, headcount has grown by around 50% compared with last year. A new management team and structure supports business as usual performance, change management and policy reform. Our work so far has seen improved connection dates for around 40GW of projects and we are working with the Energy Networks Association to deliver better dates for a further 30GW. We recognise that there is a lot of operational work still to be done. To improve customer satisfaction, we need to focus on our responsiveness and communications, and to continue to make our processes quicker.

In December 2023, we published connections reform recommendations. We also hosted a series of events to share the recommendations in more detail and show how they link to wider industry reforms, such as the Connections Action Plan and Transmission Acceleration Action Plan. Following further analysis, we published an update in April 2024 detailing an enhanced approach to enable viable, net zero-aligned projects to be connected more quickly. We intend to apply this approach to projects already in the queue as well as those joining.

Our proposals would add two process gates, requiring customers to demonstrate that they have secured key land options and rights and have a pathway to submitting planning. We will seek changes to the level and phasing of fees and securities that would need to be met at this stage. These proposals, known as TMO4+, have been publicly welcomed by Ofgem who have agreed with our request that they are treated under the urgent modifications process. We will be engaging in extensive consultation under the codes process before Ofgem's final decision in November 2024. This would allow us to start reordering the queue from a "first come, first served" to a "first ready" basis. Our latest planning assumptions indicate that the queue could be more than halved by summer 2025, enabling earlier connection dates for projects that have met both gates.



Zero Carbon Operation

Our plans to deliver new services, policies and processes are enabling us to get closer than ever to Zero Carbon Operation (ZCO) of 100%. The Loss of Mains Change Programme, Frequency Risk and Control Report (FRCR), Voltage and Stability Pathfinders, and Dynamic Containment (DC) have led to new maximum solar and wind generation levels, minimum carbon intensity from electricity generation, and a new maximum ZCO%. On 28 December 2023, we achieved 91.3% Zero Carbon Generation Output and recorded lowest carbon intensity of 27gCO₂/kWh on 18 September 2023. In April 2024 new low carbon intensity records were achieved twice with the current record now standing at 19gCO₂/kWh (15 April).

The remaining programme of work will close the gap to 100% ZCO and extend our ability to operate a zero carbon transmission system across more market and system scenarios.

Regional Development Programmes (RDPs)

Delivering against our committed timescales across the RDPs has remained a challenge in BP2. We are working closely with Ofgem and our partners to ensure we continue to unlock more network capacity, reduce constraints and open new revenue streams for market participants.

In September 2023, we launched the world's first Megawatt (MW) Dispatch service, developed jointly with UKPN and National Grid Electricity Distribution (NGED). We are currently working with both DNOs on the evolution and enhancement of the service and underpinning processes. The MW Dispatch Service will support the management of transmission network constraints, by enabling Distribution Network generators and batteries to play an active role in local constraint management. Capacity reallocation using the technology enabled by MW Dispatch will accelerate over 7.3GW and 500 connections in the Southwest, South Wales, Southeast and the Midlands. This new service provides a potentially cheaper and easier to enter alternative to the existing constraint management process used within the BM. This means costs will be reduced for consumers.

Stakeholder engagement

We have increased engagement with our stakeholders particularly across our connections activities and strategic planning. In 2023 we hosted five in-person grid connection events, attended by over 550 customers and stakeholders. This included our annual customer seminars in Glasgow and London, and the launch of our Connections Reform Final Recommendations in Birmingham. We ran monthly webinars to provide updates across connections, as well as bespoke online events showcasing progress on reform, the connections portal and our five-point plan. To complement these activities, we send regular newsletters to over 1,100 people. The stakeholder feedback has been adopted to shape the workstream arrangement under Connections Reform.

We have developed a stakeholder engagement plan for CSNP. In February 2024, we delivered workshops on environment and community impact assessment. We have adopted a tailored engagement approach on areas of the methodology development and a phased approach linking to specific stages of the CSNP. We have also started to build our engagement with our new set of stakeholders that are interested in the RESP processes. Alongside engaging with DNOs and GDNs, we have also held workshops in the main industrial clusters and had follow up discussions.

In our FES development, we have significantly scaled up stakeholder engagement over the last year to ensure our stakeholders' voices are heard and their valuable input has been adopted in our processes. For our 2024 FES launch event we saw a 61% increase in stakeholder participation in comparison to the previous year. We have also continued with our Topic Table Talk Day for FES 2024, which attracted 80 stakeholders representing a wide range of energy industry organisations.

Going forward



For the remainder of BP2 we will be focusing on:

- Completing and implementing our connections reforms and tactical actions to resolve the current connections process.
- Embedding our new strategic planning roles along with the further development of our new roles in SSEP and RESP.
- Delivering the first NESO-led Gas Network Development plan.
- Finalising the methodologies for SSEP, CSNP and RESP.
- Preparing for competition in transmission with a view to launching the first competitive process by the end of 2024.
- Delivering the remaining Zero Carbon Operations programme of work to close the gap to 100% zero carbon operation for periods in 2025.
- Supporting the Transmission Acceleration Action Plan (TAAP).



Shubhi Rajnish
Chief Information Officer

In BP1, we focused on strong design of our digital products, delivering foundational platforms, building the right skills and people capability, shifting our ways of working, and establishing frameworks to drive effectiveness. We also delivered new platforms that focus on creating customer engagement and increase the ease of working with us.

This set us up to implement technology changes at pace in BP2, delivering Release 1 of the OBP, the first stage of the EAC platform and the required technology changes for the world's first MW Dispatch service.

On top of delivering the above, over the last 12 months we have driven and accelerated progress in multiple areas such as:

- DD&T Governance - developing a deeper understanding of the interdependency between our investments;
- Ways of Working - enhancing our capabilities in modern software engineering practices plus our flexibility to incorporate growing customer expectations into our products;
- Security - strengthening cyber security architecture to ensure secure, reliable systems by focusing on secure by design.

We also published a fully revamped [Digitalisation Strategy](#) detailing new crosscutting efforts that will be essential to achieving our 2035 and NESO ambitions. In it we set out our digital ambition and digital strategy to become a digital leader and drive collaborative digitalisation of the whole energy system, utilising the power of data and innovation.

Digital, Data and Technology (DD&T) Governance

Building on the DD&T Governance Framework that was established in March 2023, we have made further improvements to the standards of our regular forums at project, programme, role and portfolio-level across the DD&T portfolio. This was accompanied by realignment of architectural governance forums to enhance our framework overall. With these improvements, we have delivered a step change in the transparency of our investments both internally and externally.

A new financial sanctioning process was also rolled out, focusing on whole life sanction and enabling our various delivery methodologies



(e.g. Agile) to have the financial flexibility to deliver value faster with the right level of governance and without losing the appropriate levels of control.

From an ESO Security perspective, we also developed a Risk Management and Controls framework, which ensures we include the right physical and cyber considerations across the company and our investments from the outset.

Ways of working

In BP2, we have introduced several critical improvements in our ways of working. We have also consolidated our partnerships, priorities and plans to ensure we transform the company to improve our digital capability across the organisation. To that effect, we have launched ways of working connect sessions open to the whole organisation to develop capability through training and demos. We have also put in place the various required engagement channels.

Implementation of an Agile DevSecOps Transformation Office has taken place. Alongside it, we have stood up a capability development programme that includes developing skills matrices and identifying required technical professions, piloting these for Product management profession.

We have continued to test our ways of working, digitalisation strategy, plans for data and AI and delivery efficiency with the Technology Advisory Council (TAC). TAC is an external council comprising of individuals from across the energy, technology and broader industries. Their feedback and experience have allowed us to shape our overall thinking on digital, data and technology in ESO.

Technology Business Management (TBM)

Continuing on the good progress during BP1 to allow a holistic and granular view of all the DD&T investments, we have worked with the Technology Business Management (TBM) council on the first draft of the Utilities Business Services TBM Taxonomy extension. The TBM council has sent out a public consultation on the utilities extension and we are starting a pilot of a tool for DD&T investments based on this extension.

Regulatory reporting

We have fully implemented a quarterly Cost Monitoring Framework (CMF) with Ofgem to provide our regulator with confidence on our DD&T delivery. This framework introduces transparency on our overall delivery plans, achievements, decisions, risks and dependencies as well as providing an overview of our costs. This is done at investment, role and portfolio levels.

To provide industry stakeholders with the same level of transparency, we have also increased our support in various ESO stakeholder events and have provided an update on all our investments in line with the CMF through an appendix in our incentives reporting. This will continue to take place every six months.

We have worked very closely with Ofgem to address all their BP1 Draft Determinations concerns, via deep dives, knowledge sharing sessions and visits to our sites on top of our weekly engagement and formal documented replies. We have progressed all concerns, with positive feedback from Ofgem, already leading to the closure of 52 concerns, with another 53 currently being assessed by Ofgem.

Transition to NESO

In our journey to becoming NESO, we have established an integrated planning team for specific dependency management between our current delivery and our new transition plans. This lowers the impact of NESO transition activities on our BP2 planned deliverables.

We have developed our own technology strategies, such as designing our new NESO cloud architecture to be Critical National Infrastructure (CNI) capable, and have also agreed security standards, control frameworks and patterns for operation from summer 2024.

In preparation for the transition, we are making sure that we have fit for purpose data governance, policies and are implementing them onto our data analytics platform. In parallel to agreeing transitional services as we separate from National Grid systems, we are transitioning them to modern practices and architecture where possible as we build the future technology estate for NESO.

All these activities are essential in enabling our current and future digital, data and technology ambitions that enable NESO's outcome and priorities.



Going forward

For the remainder of BP2 we will be focusing on:

- Executing and expanding our ways of working plans, modernising the company's digital capabilities.
- Increase our ability to share data openly with industry participants and grow our AI capabilities.
- Continuing to update our digital strategy based on our transition to NESO.
- Successfully transitioning digital to NESO from National Grid Group and deploy all required capabilities to operate NESO efficiently and securely.
- Fully implement ESO Security's Risk Management and Controls framework, expanding the same framework to other areas where appropriate.

Thank you for reading our 2023-24 Mid-Scheme Incentives Report

For further information, please contact:

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For further details on the ESO incentive scheme, please visit our website at:
www.nationalgrideso.com/our-strategy/riio/how-were-performing-under-riio-2

You can also find out more about our RIIO-2 Business Plan at:
www.nationalgrideso.com/what-we-do/our-strategy/our-riio-2-business-plan