Role 3 System insight, planning and network development - RIIO-2 aims

The energy landscape has undergone a revolution in recent times and change will continue at an even greater pace. The ESO sits at the heart of a complex, multi-directional system of electricity flows, where small-scale renewables, storage and demand-side participation make operating the system more challenging than ever before. This is an incredibly significant and exciting engineering challenge but one that we are already rising to, and have a plan for, in Role 3.

Role 3 is critical to the success of the ESO business plan, required to promote innovation and to design and build the tools, data and models to drive towards a sustainable, whole energy future. It must ultimately deliver a robust, operable, low carbon system at lowest cost to consumers for the Control Room to operate in real time. The successful delivery of our zero-carbon operation by 2025 ambition is dependent upon the longer-term, cutting-edge activities that we will undertake in Role 3. It will also ensure that the system remains adaptable to different scenarios as the external policy and operational context continues to evolve at pace.

To meet our ambitions, we are breaking ground where no other Transmission System Operator (TSO) has been before through development of world-leading tools, capabilities and approaches to assess and resolve system needs. As a result, we are not able to look to other TSOs for answers, we must do this by leading the way. It is through development of these capabilities that we can bring new technologies and innovative solutions to market and support delivery of a level playing field. The tools developed in Role 3 underpin the establishment of technical requirements to unlock consumer value and ultimately reach our ambition of achieving competition everywhere. To this end, more than half of our ongoing innovation projects are to support and further the work of Role 3.

Our five-year strategy for Role 3 is to inform key policy areas, providing the industry with a clear and detailed view of the future energy system and pathways to inform their plans and investment decisions. We will deploy brand new technical and economic modelling tools and approaches; and expand the use of competition to support development of the network. This will ensure that the network is always ready for the demands placed on it and can operate securely as we transition to a zero carbon electricity system. We will work with other network organisations to develop consistent and coordinated processes for customers that facilitate efficient connection and access to the system, and ensure we have the tools to assess and manage overall system operability.

By March 2023, the end of BP1, Role 3 will have delivered the capability it needs to deliver for the system to be zero carbon operable by 2025, enabling an appropriate mix of assets and services to provide network capacity and system operability. Again, this is due to the longer-term nature of the activities within it. Alongside the development of our BP1 deliverables we will look out to 2030 to develop understanding on the next steps required to further support the decarbonisation transition.

The aims of Role 3 in our RIIO-2 business plan are:

1. **Driving towards a sustainable whole energy future including actively supporting the Distribution System Operation (DSO) transition.** We will work collaboratively with third parties to deliver whole system outcomes and value to consumers. Our proposals in the short-term focus on enhancing the way we work across the electricity transmission and distribution networks and

using a whole energy system view to provide insight on policy issues and pathways to net zero by 2050. More specifically, we will work with Distribution Network Operators (DNOs) and Transmission Owners (TOs) to:

- Actively engage in the development of DSOs and alignment with ED-2 business plans;
- share learnings and support DNOs to develop Future Energy Scenarios (FES) and Network Options Assessment (NOA) processes;
- seek opportunities to review and align technical standards;
- enhance and automate our customers' experiences; and
- deliver greater value from enhanced access planning.

We expect to take an increasingly broader view from a whole electricity to a whole energy system approach across our Role 3 activities through the RIIO-2 period.

2. **Test innovative and ground-breaking approaches to network challenges, scaling up best practice to enable wider roll out.** For example:
    - We will transform network planning to facilitate competition everywhere - our Pathfinders are world leading and will facilitate learning that will be incorporated into the NOA methodology. We are continuing to learn from the Pathfinders and each new pathfinder, tackling a different system need each time, learns from the last. In RIIO-2 we will be looking to convert the learning into established ongoing processes to procure services to deliver the best value to consumers;
    - NOA will be extended to include end-of-asset life replacement decisions and Connections Wider Works;
    - Regional Development Plans (RDPs) are localised currently but will be scaled up to apply in each DNO area, with a plan in place to do so by March 2023; and
    - Learnings from deeper system access planning trials and any associated new processes will be rolled out ready for go-live in 2023/24.

3. **Transform and enhance our tools, data and capabilities.** A huge amount of analysis and modelling work goes into achieving all our Role 3 outputs e.g. *FES*, *Electricity Ten Year Statement (ETYS)*, *NOA*, connections and system access. In a rapidly decarbonising and decentralising world, with a significant increase in market participants, the volume of available data and complexity of assessing system requirements increases. We must invest in our tools and capabilities to be able to undertake and automate more complex system modelling and data exchange. In turn this will enable us to consider wider whole energy system interactions in our *FES*, assess and communicate future operability needs, and model more complex network issues and possible solutions than we can today. It is this capability that will facilitate understanding of, and solutions to, the operability challenges beyond 2025 and facilitate further competition. We also intend to demonstrate greater co-ordination between our key stakeholder publications, ensuring that future operability requirements are understood by the industry and therefore opportunities to participate in markets are more clear.

    As we broaden our whole system thinking and analysis to more of our Role 3 activities, we must invest in capabilities to enable the path to net zero.

4. **Facilitate a level playing field for all types of solutions to compete to solve all types of network needs.** In order to reach our ambition of Competition Everywhere, we will work with Ofgem, TOs and DNOs to support alignment of price control arrangements to facilitate whole system outcomes and network competition. Proposed activities, across Roles 2 and 3, will evolve network development tender processes through lessons learned sessions with tender participants and identify and seek resolution with the industry to remove blockers to participation. Our enhanced tools and capabilities

will enable more efficient assessment of tenders for issues in longer term timeframes that are currently extremely challenging to examine.

Role 3 contributes to meeting each of our ambitions:

- An electricity system that can operate carbon free - Role 3 will have introduced new tools and technologies required to cover longer-term asset build and also the specification of services to be competitively procured closer to real-time to manage challenges such as thermal constraints, voltage and inertia.
- Competition Everywhere – Role 3 will deliver the world leading technical and economic assessment capability to enable competitive network and non-network solutions to a range of system challenges through our Network Development proposals. This will be underpinned by activities that support development of a level playing field for all network needs.
- A whole system strategy that supports net zero by 2050 – in Role 3, via our 'Lead the Debate' activities, we will support government and industry in meeting the legislated net zero emissions target by examining whole system operability and interactions across the GB energy landscape.
- The Electricity System Operator is a trusted partner – across the activities in Role 3 we will work collaboratively and transparently with stakeholders (network companies in particular) to address the challenges of the energy transition and support the DSO transition.