

Distribution RIIO ED2

Business Case

DSO Workforce Capability

Investment Reference: 2_SSEPD_DSO_Workforce_Capability

Contents

- 1. SUMMARY TABLE..... 3
- 2. DELIVERING NET ZERO 4
 - 2.1 Context 4
 - 2.2 The Role of Distribution Networks 5
- 3. CONTEXT 6
 - 3.1 RIIO-ED1 Performance 6
 - 3.2 Minimum Requirements for RIIO-ED2 7
- 4. BENEFITS 9
 - 4.1 Societal Benefits 9
 - 4.2 Network Efficiency Benefits 9
 - 4.3 Avoided Reinforcement 9
- 5. DELIVERABILITY & RISK STATEMENT 12
- 6. CONCLUSION..... 13

1. SUMMARY TABLE

Name of Scheme	DSO Workforce Capability																																								
Primary Investment Driver	<p>Ofgem Baseline Expectations for DSO in RIIO-ED2 pertaining to the flexibility lifecycle that will provide cost effective and resilient network solutions.</p> <p>Associated Workstreams – Load-Related & Non Load-Related Investment, Whole System, Connections, Data.</p> <p>Associated IT/OT Capabilities/Enablers for DSO (detailed in Chapter 5 - It and Digitalisation) –</p> <table border="1"> <thead> <tr> <th>IT/OT System</th> <th>DSO Share</th> <th>Capex</th> <th>Opex (IDP)</th> </tr> </thead> <tbody> <tr> <td>DSO ANM</td> <td>100%</td> <td>5.1</td> <td>0.2</td> </tr> <tr> <td>DSO Enablement (Orchestrator)</td> <td>100%</td> <td>7.5</td> <td>0.1</td> </tr> <tr> <td>DSO Management (Optimiser)</td> <td>100%</td> <td>10.6</td> <td>0.5</td> </tr> <tr> <td>Flexibility Contracting</td> <td>100%</td> <td>8.2</td> <td>0.5</td> </tr> <tr> <td>PSA+</td> <td>100%</td> <td>1.5</td> <td>0.1</td> </tr> <tr> <td>Commercial Optimisation</td> <td>100%</td> <td>6.4</td> <td>0.1</td> </tr> <tr> <td>LCT Analytics</td> <td>25%</td> <td>0.4</td> <td>0.0</td> </tr> <tr> <td>Investment Optimisation</td> <td>50%</td> <td>3.6</td> <td>0.1</td> </tr> <tr> <td colspan="2" style="text-align: right;">SUBTOTAL</td> <td>£43.3m</td> <td>£1.7m</td> </tr> </tbody> </table>	IT/OT System	DSO Share	Capex	Opex (IDP)	DSO ANM	100%	5.1	0.2	DSO Enablement (Orchestrator)	100%	7.5	0.1	DSO Management (Optimiser)	100%	10.6	0.5	Flexibility Contracting	100%	8.2	0.5	PSA+	100%	1.5	0.1	Commercial Optimisation	100%	6.4	0.1	LCT Analytics	25%	0.4	0.0	Investment Optimisation	50%	3.6	0.1	SUBTOTAL		£43.3m	£1.7m
IT/OT System	DSO Share	Capex	Opex (IDP)																																						
DSO ANM	100%	5.1	0.2																																						
DSO Enablement (Orchestrator)	100%	7.5	0.1																																						
DSO Management (Optimiser)	100%	10.6	0.5																																						
Flexibility Contracting	100%	8.2	0.5																																						
PSA+	100%	1.5	0.1																																						
Commercial Optimisation	100%	6.4	0.1																																						
LCT Analytics	25%	0.4	0.0																																						
Investment Optimisation	50%	3.6	0.1																																						
SUBTOTAL		£43.3m	£1.7m																																						
Scheme Category	DSO (As input in the Business Plan Data Tables)																																								
Output Type	Workforce Capability – recruitment, training and business support costs to mitigate conflicts of interest																																								
Cost	£28.1m (<i>incremental spend in RIIO-ED2</i>)																																								
Delivery Year	2023-8																																								
Reporting Table	<i>Where in the Business Plan Data Tables volumes/costs/outputs are recorded</i>																																								
Outputs in ED1 Plan	No																																								
Spend apportionment	RIIO-ED2 – 100%																																								

2. DELIVERING NET ZERO

2.1 Context

The UK's electricity system is changing. The increase in small-scale renewables and low-carbon technologies is creating opportunities for consumers to generate and sell electricity, store electricity using batteries, and even for electric vehicles (EVs) to feed energy into the electricity system. Delivering Net Zero at lowest cost within this context requires;

- A highly flexible energy system
- Customer awareness of the value of flexibility technologies
- A whole system planning framework

A range of studies has demonstrated that the benefits of this approach out to 2050 could be as high as **£16.7bn** per annum. These benefits have been documented in a number of key industry studies and are detailed in the following table:

Publication	Benefits
<p>“Value of Flexibility in a Decarbonised Grid and System Externalities of Low-Carbon Generation Technologies”</p> <p>Report for the Committee on Climate Change Imperial College London October 2015</p>	<p>More than £3bn/Year for 100g/kWh scenario, £8bn/ year by 2030 for a 50g/kWh scenario, from a flexible energy system</p>
<p>“An Analysis of Electricity System Flexibility for GB”</p> <p>Carbon Trust with Imperial College London, November 2016</p>	<p>£17-40bn over the period to 2050 from a flexible energy system that support electrification of transport</p>
<p>“Smart Power”</p> <p>National Infrastructure Commission published its report Smart Power, May 2016</p>	<p>A smart system, built principally around interconnection, storage and DSR could deliver £8bn of savings per year by 2030</p>
<p>“Roadmap for Flexibility Services to 2030”</p> <p>Report for the Committee on Climate Change, Imperial College London with Poyry, May 2017</p>	<p>£3.2bn – £4.7bn/ year in 2030</p> <p>From a flexible energy system that met a carbon reductions target of 100g/kWh</p>
<p>“Value of Baseload Capacity in a Low-carbon GB Electricity”</p> <p>Imperial College London report for Ofgem, August 2018</p>	<p>£10.4bn - £13.6bn/ year from a flexible energy system that met a carbon reductions target of 25g/kWh</p>
<p>“Early Insights into System Impacts of Smart Local Energy Systems (SLES)”</p> <p>EnergyREV, Aunedi, M., Green, T, C., June 2020</p>	<p>£1.2bn/ year to £2.8bn/ year total cost saving by 2030 (assuming 10% and 50% SLES penetration respectively and emissions limit of 100g CO₂/kWh in 2030)</p> <p>£2.9bn/ year - £8.7bn/ year total cost saving by 2040 (assuming 10% and 50% SLES penetration respectively and emissions limit of 100g CO₂/kWh in 2040)</p>

In the last few months an update to the Carbon Trust report from 2016 concluded, ‘A fully flexible energy system has the potential to deliver material net savings of between **£9.6 billion** and **£16.7 billion** per annum in 2050’.¹ Baroness Brown of Cambridge (Chair of the Carbon Trust) stated, ‘ The report demonstrates that energy flexibility can reduce the cost of meeting net zero and mitigate the impact of wider changes in the energy system, ensuring we reach net zero efficiently, effectively and at lowest cost’.

2.2 The Role of Distribution Networks

The Government’s recent Ten Point Plan for climate action and subsequent White Paper was the most significant policy intervention for the energy industry in nearly ten years, and the UK’s energy networks will be the foundation on which it is delivered. This has been given even more impetus by the announcement of a new emissions reduction target, the Climate Change Committee’s Sixth Budget and even more ambitious policies in Scotland – a route map to Net Zero emissions that will need to be facilitated by distribution networks. To ensure the benefits of this transition are realised, DNOs are developing the DSO capabilities that will facilitate these emerging markets. Our VISION for DSO is to make the best use of our electricity networks, data and emerging technology to facilitate the decarbonisation of transport and heat at maximum pace, and at minimal cost to UK plc. Building a coordinated, efficient and cost-effective DSO operating capability is key to facilitating the delivery of the UK’s Net Zero ambitions and will provide strong value to consumers.

In RIIO-ED2 SSEN will invest **£27.1m** in building the **DSO Workforce and Business Support Capability** required to deliver these DSO functions. We will also spend **£1.0m** to extend our layered approach to mitigating conflicts of interest and our role as a neutral market facilitator. This will be funded in part by the savings that we will realise by deploying flexibility as a network solution and mitigating the need for costly reinforcement. Our investment in processes, systems, change management and workforce capability will ensure that we have the information, processes and capability to select the most appropriate solutions to allow the network to support the transition to Net Zero in an efficient, reliable and demonstrably neutral manner.

In addition SSEN will be spending **£45m** on our IT and OT infrastructure to support DSO. Details of this expenditure can be seen in our;

- **Digitalisation Strategy (Annex 5.1)** – which contains a description and justification of our RIIO-ED2 IT, OT and Digital investments
- **Digital Investment Plan Strategic Annex (Annex 5.2)**
 - **Digital Strategy** - our customer-centric strategy view of digital services and data
 - **Digital Action Plan** - our short-term actions and progress to achieve our Digital Strategy

¹ Flexibility in Great Britain (2021) Carbon Trust and Imperial College - [Flexibility in GB report.pdf \(storage.googleapis.com\)](#)

3. CONTEXT

3.1 RIIO-ED1 Performance

We strongly support the transition to net zero carbon emissions and are already playing an active role in delivering the UK and Scottish Governments' respective 2050 and 2045 targets. An increase in low-carbon distributed generation, electric vehicles, demand side response and energy storage are transforming our network, giving customers access to new products and services. To accommodate the changes that will enable net zero, we are already implementing DSO functions, putting customers and communities at the heart of the process and ensuring best value for money. In 2017, we published [Supporting a Smarter Electricity System](#) which outlines the principles that underpins this transition and our latest update can be read in [Delivering DSO: A Progress Update](#), which details how we have put the following DSO priorities into practice:



SSEN's strategic direction for DSO is based on our RIIO-ED1 experience to date with innovation and stakeholder engagement. We have established the following;

- Our 'learning by doing' approach in RIIO-ED1 has demonstrated that our strategic outcome for DSO delivers on all our wider strategic themes of **facilitating progress to net zero; delivering safe, resilient and responsive networks;** and **providing a trusted and valued service to customers and communities**
- From extensive feedback, gathered by direct engagement with stakeholders and through the ENA's Open Networks project, we have established that the majority of stakeholders want us to deliver the DSO functions outlined in Ofgem's Baseline Expectations for DSO in RIIO-ED2
- Delivering DSO functions helps supports the realisation of wider benefits and customer value in other key business plans such as Vulnerability, Innovation, Whole System, Sustainability, Connections, Load/Non-Load Related Investment
- DSO functions supplement and enhance the core functionality of our network, building on its expertise and contributing to cost-effective planning, development and operation of both our network assets and wider network solutions

SSEN's ED1 experience has given us good visibility of the functions we need in place to deliver DSO operationally in RIIO-ED2. We have established that the deployment of flexibility, which is at the heart of the DSO capabilities that SSEN will deliver in RIIO-ED2, underpins a cost-effective approach to accommodating the increasing pressures on the grid through the deployment of LCT. Increased flexibility, derived from distributed energy resources, ancillary services and peer to peer trading of constraints, capacity and energy, can be a key driver of reduced total system costs. This includes the effect of lower levels of peak electricity demand, reduced cost of investing in and operating low-carbon generation and avoidance of reinforcement of local distribution networks. In RIIO-ED1, we have contracted in excess of **468MW of flexibility services** for the management of network constraints and fault support. This has delivered a TOTEX saving of **£251k** and avoided **3,250tCO2**. In addition **Flexible connections** have also contributed significant benefits to customers in RIIO-ED1, avoiding **90.6** years of connections delays and generating **£60m** of benefit across **412MW** of capacity.

3.2 Minimum Requirements for RIIO-ED2

ED2 is a crucial period as the take up of LCTs and renewable generation starts to accelerate. As you can see from the previous section SSEN is already making the investments in new people, systems and capabilities required to deliver these benefits in ED2 and beyond. SSEN plans to comprehensively deliver against stakeholder expectations for DSO, including Ofgem’s baseline expectations, by;

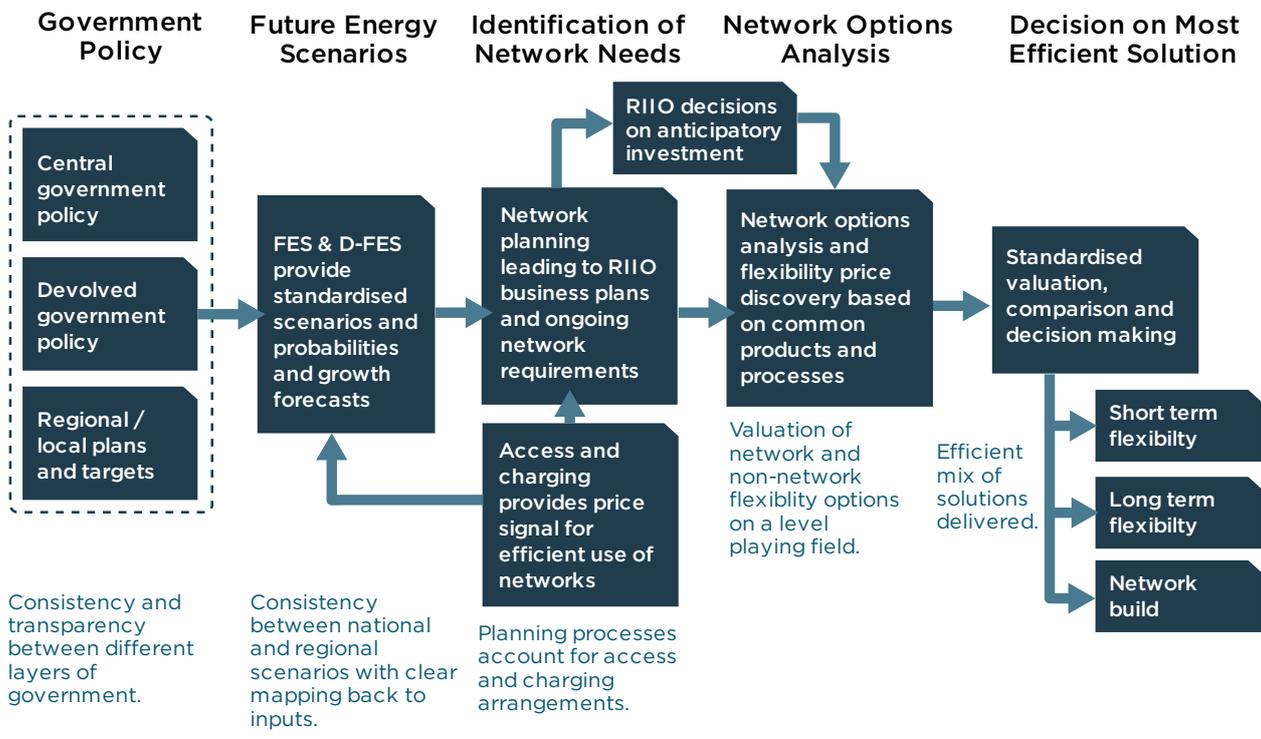
- demonstrating a robust approach to **planning and network development** that utilizes standardized, coordinated and transparent insights from a range of sources (e.g. DFES, NDPs, LTDS, RDPs) and incorporates the growing list of potential solutions (flexibility services, smart grid technologies)
- delivering efficient and effective **network operation** that resiliently accommodates the increasing proportion of DER in the energy mix and reduces the potential for conflict through network visibility and coordination with the ESO
- and encouraging vigorous **market development** with simple, efficient processes and transparent decisions; improving access for participants, stimulating engagement and fostering liquidity whilst maintain our role as a neutral facilitator of the market.

SSEN’s detailed proposals for our DSO Capability can be viewed in our DSO Strategy but in summary the principles and activities comprehensively detailed in each of these areas is designed to deliver all of the baseline expectations required to remain compliant with proposed regulation in RIIO-ED2 at a total cost of **£93.5m** (this includes continuing RIIO-ED1 spend, payments for flex services, DSO workforce and IT/OT/Business Support Costs).

The following diagram highlights the core functionality that our DSO Workforce Capability will build in RIIO-ED2:



This core functionality is based on the requirements to meet Ofgem’s baseline expectations and align with the flexibility lifecycle:



4. BENEFITS

4.1 Societal Benefits

As we have already detailed in the opening section building a cost-effective DSO capability and delivering the minimum requirements outlined in our DSO Strategy will result in significant benefits for consumers;

- A reduction in household energy bills due to greater energy efficiency measures
- Fair distribution of benefits from smart technology, ensuring vulnerable customers are not left behind
- Investment savings for Local Authorities
- A localised, balanced energy system
- Reduced inequalities from affordable energy to meet the needs of all consumers
- Ecosystem benefits (including carbon savings) from a more flexible network

4.2 Network Efficiency Benefits

In addition there are a further network efficiencies that will deliver a range of benefits to consumers in ED2 and beyond;

- Reduce investment needed in new generation plant through better use of demand side flexibility
- Enable greater market access to existing ESO markets to reduce balancing service costs
- Help to avoid/defer Transmission investment through use of distribution solutions
- Accelerated carbon benefits through faster connection of renewables to Transmission and Distribution and enabling rapid uptake of LCTs Lower operational costs for non load-related issues
- Reduction in diesel deployment with reduced carbon emissions
- Increase in network resilience for connected customers
- Optionality value so less stranded assets
- Reduced losses with reduced costs
- Reduced time to connect resulting in quicker connections
- Increase in renewable generation on the network to support Net Zero goals

4.3 Avoided Reinforcement

Finally the new DSO capability will help us to reduce distribution costs and we will avoid up to £50m of reinforcement in RIIO-ED2 through the use of flexibility. This investment will enable significant benefits in RIIO-ED2 by reinforcing our 'Flexibility First' commitment as a network solution and mitigating the need for costly reinforcement of our networks. The combined savings from deferring reinforcement and avoiding capital expenditure in RIIO-ED2 range from **£18.3m** to **£46.3m** (dependent on market liquidity²) under our assumed Consumer Transformation scenario. This scenario tends towards reinforcement because of the rapid uptake of low carbon technology, indicating this range of benefits could be at the lowest end of the potential benefits for flexibility in RIIO-ED2. The scenario assumes;

- High levels of decarbonisation and societal change.
- Consumers adopt new technologies rapidly, and more decentralised solutions are developed.
- Rapid uptake of EVs, low carbon technologies and energy efficiency
- Significant electrification of domestic heat and commercial heat

² These figures assume a flexibility services availability payment of £300 and £75 respectively. Our current payment of £150 delivers **£32m** of savings in RIIO-ED2.

- Low carbon electricity generation more distributed, with high amounts of onshore wind and solar PV

Whilst all scenarios contain an element of uncertainty some key underlying assumptions can be made with a high degree of certainty;

- Renewable energy generation capacity is very likely to significantly increase
- Unabated fossil fuel electricity generation is very likely to continue to decline
- The shift to more decentralised energy assets will continue to some degree
- The electrification of transport is already in progress and will accelerate
- Hydrogen has a key role to play for industrial processes and some forms of transport
- Further energy efficiency deployment is vitally needed in both homes and businesses
- The electrification of heat will increase although there remains a key uncertainty over the role that hydrogen boilers could play

All of these factors will have significant impacts on the electricity network that can be mitigated to a greater or lesser extent through the development of a **DSO Capability** that operates a more dynamic, flexible and cost-effective network.

Benefits	Flex Costs - Low	Flex Costs - Medium	Flex Costs - High
Capex Deferred Beyond ED2	41.9	27.6	15.2
Capex Deferral Savings in ED2	4.4	4.3	3.1
Reduction in ED2 TOTEX from Flex	46.3	32.0	18.3
Costs			
Flex Costs	5.1	5.8	6.5
Total Costs	5.1	5.8	6.5
Net ED2 Benefits	41.2	26.1	11.8
Flexibility services deployed			
Flex Capacity considered MVA	649	649	649
Flex Capacity used MVA	208	190	176

DEFINITIONS:

- *Capex Deferred beyond ED2: capital expenditure for all projects where deferral recommendation would mean flex works to end of RIIO-ED2 period*
- *Capex Deferral Savings in RIIO-ED2: Time value of money saving (NPV from CEM tool) - roughly 3.5% of capital expenditure- where deferrals would still result in conventional reinforcement within ED2*
- *Flex Costs: Money required to be spent on availability and utilisation of flexibility services to defer capital expenditure*
- *Flex Capacity Considered: sum of magnitude of the overloads for which a flex solution was considered (choosing the largest single overload out of the 5 RIIO-ED2 years for each scheme)*
- *Flex Capacity Used: sum of magnitude of overloads that flex solutions were deployed to resolve- selecting largest overload out of the RIIO-ED2 years*

5. DELIVERABILITY & RISK STATEMENT

Our Chapter **Ensuring Deliverability and a Resilient Workforce (Chapter 16)** describes our approach to evidencing the deliverability of our overall plan as a package, and its individual components. Testing of our EJPs has prioritised assessment of efficiency and capacity, and this has ensured that we can demonstrate a credible plan to move from SSEN's RIIO-ED1 performance to our target RIIO-ED2 efficiency. We have also demonstrated that SSEN's in house and contractor options can, or will through investment or managed change, provide the capacity and skills at the right time, in the right locations. This assessment has been part of the regular assessment of our EJPs, IDPs and BPDTs, and we will further refine our bottom up efficiencies and work plan phasing for our final submission in December through the ongoing development of our RIIO-ED2 Commercial & Deliverability Strategy and engagement with our supply chain.

6. CONCLUSION

In ED2 SSEN will invest **£27.1m** in building the **DSO Workforce Capability** required to deliver the DSO functions which will accommodate the UK's changing energy system. The increase in small-scale renewables and low-carbon technologies is creating opportunities for consumers to generate and sell electricity, store electricity using batteries, and even for electric vehicles (EVs) to alleviate demand on the electricity system by charging at periods of low demand.

To ensure the benefits of this transition are realised, SSEN will develop the DSO functions that will neutrally facilitate these emerging markets funded in part by the savings that we will realise by deploying flexibility as a network solution and mitigating the need for costly reinforcement. We will spend **£1.0m** to extend our layered approach to mitigating conflicts of interest in support of our role as a neutral market facilitator.

This investment will enable significant benefits in RIIO-ED2 by reinforcing our '**Flexibility First**' commitment as a network solution and mitigating the need for costly reinforcement of our networks. The combined savings from deferring reinforcement and avoiding capital expenditure in RIIO-ED2 range from **£18.3m** to **£46.3m** (dependent on market liquidity³) under our assumed Consumer Transformation scenario. This scenario tends towards reinforcement because of the rapid uptake of low carbon technology, indicating this range of benefits could be at the lowest end of the potential benefits for flexibility in RIIO-ED2.

Our VISION for DSO is to make the best use of our electricity networks, data and emerging technology to facilitate the decarbonisation of transport and heat at maximum pace, and at minimal cost to consumers.

³ These figures assume a flexibility services availability payment of £300/MWh and £75/MWh respectively. Our current payment of £150/MWh delivers **£32m** of savings in RIIO-ED2.