

# RIIO-ED2 Investment Decision Pack

## DSO Enablement (Orchestrator)

Investment Reference No: 41/SSEPD/IT-DSO/DSO\_ENABLEMENT



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## Definitions and Abbreviations

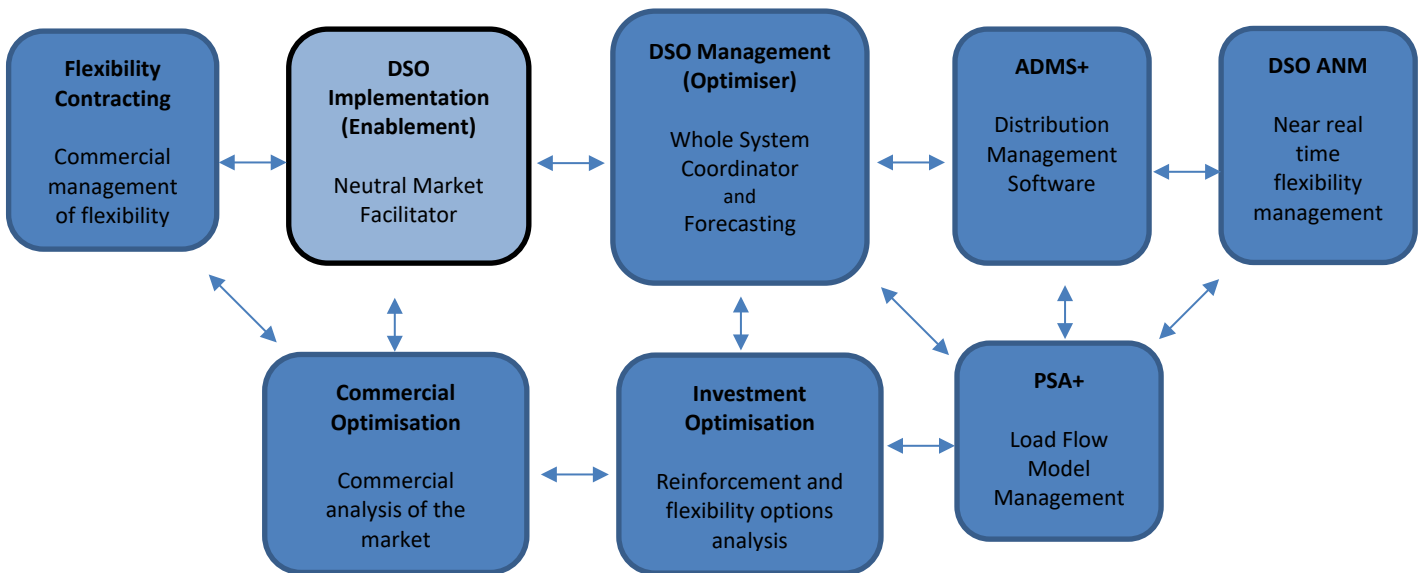
BPDT	Business Plan Data Table
CAPEX	Capital Expenditure
DNO	Distribution Network Operator
DSO	Distribution System Operator
EJP	Engineering Justification Paper
FTE	Full Time Equivalent
IDP	Investment Decision Pack
LCT	Low Carbon Technology
MDM	Master Data Management
MERLIN	Modelling the Economic Reactions Linking Individual Networks
NIC	Network Innovation Competition
NPV	Net Present Value
OMS	Outage Management System
OPEX	Operational Expenditure
WSC	Whole System Coordinator

## 1. Executive Summary

Flexibility Services and Flexibility Markets are key tools in delivering Net Zero, as they will maximise the use of Low Carbon Technology whilst minimising upgrades to the electricity networks. A prime requirement of Flexibility Services and Markets will be a 'portal' that allows groups and individuals to register and participate. This project delivers this 'portal' facility.

The DSO Management (Optimiser) investment looks to install a system evolved from the Neutral Market Facilitator trialled in the current SSEN Transition Project.

The diagram below shows the interactions between the key systems outlined in our IDPs related to DSO. It should be noted that these systems will be integrated with our main business systems, e.g. our ED1 investments, our Asset Management Database and our Geographic Information System.

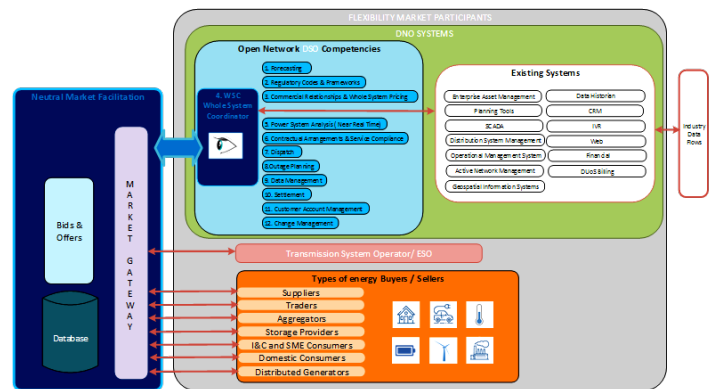


## 2. Investment Summary Table

Summary Table			
<b>Name of Scheme / Programme</b>	DSO Enablement (Orchestrator)		
<b>Primary Investment Driver</b>	Progress to Net Zero		
<b>Scheme Reference / Mechanism or Category</b>	41/SSEPD/IT-DSO/DSO_ENABLEMENT		
<b>Output References / Type</b>			
<b>Cost (CAPEX)</b>	■		
<b>Delivery Year</b>	RIIO ED2		
<b>Reporting Table</b>	C4		
<b>Outputs Included in RIIO ED1 Business Plan</b>			
<b>Spend Apportionment</b>	<b>ED1</b>	<b>ED2</b>	<b>ED3</b>
		■	

## 3. Introduction and Background Information

Throughout RIIO-ED1 we and other Distribution Network Operators (DNOs) have been engaged in many Innovation projects to determine optimum strategies, processes, commercial arrangements and other changes that will be required to efficiently facilitate our low carbon future. A key example of this is the 'Flexible Power' system, initially developed by Western Power Distribution and now subject to a five DNO delivery collaboration in which SSEN is a formal partner. To deliver Flexibility beyond these projects, many IT and OT system changes will be required. The diagram opposite is the latest iteration of what has been called the 'Eye' diagram and is taken from our NIC TRANSITION project which is trialling key IT systems. The systems trailed in Transition and the insights provided by Flexible Power will act as a blueprint for our development for delivering Flexibility. This project is also focused on the Neutral Market Facilitation development and the learning that will deliver.



#### 4. Business Plan Fit

This project can be mapped to following strategic themes:

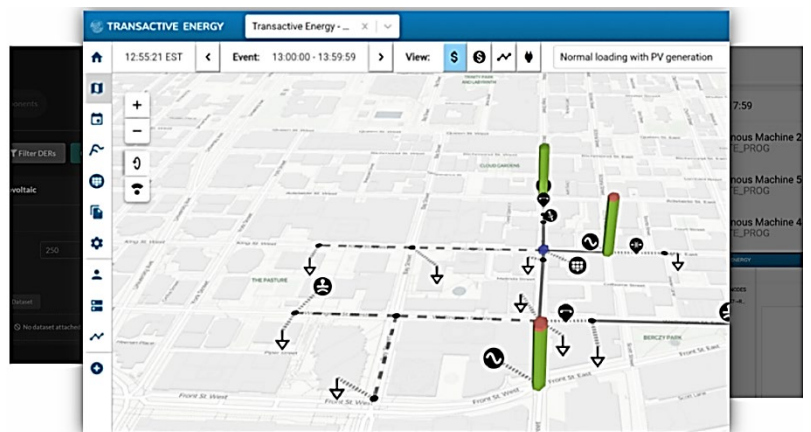
Progress to Net Zero	Safe, resilient and responsive networks	A trusted and valued service to customers and communities	Positive Impact on Society
✓	✓	✓	✓

#### 5. Optioneering

This project will deliver the functionality described in the Neutral Market Facilitator area of the TRANSITION project. An overview of the system design that is currently envisaged to manage the DSO functions is set out on the TRANSITION website (<https://ssen-transition.com/wp-content/uploads/2019/11/High-Level-Solution-Design-Summary-v1.pdf>). The actual system(s) delivered in RIIO-ED2 will be based on learnings from TRANSITION, and well as other NIC projects, including LEO (<https://ssen-transition.com/dso/leo/>), MERLIN (<https://project-merlin.co.uk/>) and EDFS/FUSION (<https://ssen-transition.com/dso/tef/>). Close working with our supply chain will be vital to ensure we select the best product(s) to deliver the necessary functionality.

Some of the key elements the tool(s) will deliver are:

- Neutral Market Facilitator functionality, including:
  - User profiles and security levels, along with registration assessment and viewing Industry Actors.
  - Energy Resource assessment, maintenance, publishing and viewing.
  - Create, Amend, Publish and View Requests.
  - Selection of Offers.
  - Automated Requests.
  - Standing Offers.
  - Prepare Draft Offers, Offer Publications, Viewing or making an Offer for a Request.
  - Constraint Market Estimates.
  - Create, Amend, Publish and View Bids.
  - Selection of Winning Bids.
  - Dispatch and Intent to Dispatch.
  - Create, Update and View Bi-lateral Contracts.
  - Constraint Bi-lateral Solution.
  - Manage Standing Data, view Audit Log, run and design Management Reports and manage Reporting Groups.
- Provide visibility of data and information to build confidence in flexibility markets.
- Establish regional and local (HV and LV) flexibility coordination function.
- Provide near real time flexibility signalling to flexibility providers.
- Support the E Tourism Toolkit (see Open Door project).
- Enable strategic partnerships with key organisations.
- Provide part of the backstop mechanism for contracts in the flexibility market - flexibility assessments.
- Allow the potential for intraday pricing.
- Facilitate Peer to Peer energy exchange.



- Interface with our Commercial systems for payments. DUoS will continue, enhanced, may need securities, will need new payments system.
- Manage reconciliations - market wide settlements.
- Facilitate baselining for demand side customers.
- Enable the management, contracting and remuneration of flexibility providers.
- Support the derivation and predication of flexibility market pricing.

This tool will therefore be the prime mechanism through which any market participant will be able to engage in the Flexibility market. The exact configurations, such as user profiles and information to be exchanged will be determined through the on-going Innovation projects and wider industry discussions.

Please note that whilst this facility will support Open Data, the facilities to deliver this to our Stakeholders, including APIs, is covered in other projects (e.g. Open Door, ■■■ MDM Data Lake & Analytics).

### 5.1.1 Alternative Options

As the driver for this project is facilitating the increasing Flexibility Market in near real time, doing nothing is not an option.

Due the number, complexity and speed of the transactions that will be needed to manage the Flexibility Market, a non-IT based solution would not be viable. This has been borne out by many international deployments of such systems, and in the on-going UK Innovation projects and trials. Moreover, a non-IT based solution would not allow market participants to have the autonomy and confidentiality they require to manage their engagement in the market. A manual alternative has however been considered for cost comparison purposes.

The proposed solution has been based on the best value IT solution that is currently available. However, given the pace of IT development, the market will be re-examined at project commencement to ensure the best value solution at that time is chosen for delivery.

## 6. Stakeholder Evidence

Much of our stakeholder engagement for DSO has been through Open Networks, where industry positions and potential solutions have been developed and shared with stakeholders to obtain honest views and opinions on the developments needed to accommodate our low carbon future. There has been strong support for initiatives relating to DSO Enablement such as a 'Common Contract' strongly indicating the need for a user-friendly flexibility interface system.

More details of overall stakeholder engagement are set out in the ***Digital Investment Plan (Annex 5.2)***.

## 7. Analysis and Cost

Costs have been developed using a bottom up approach and have been based on the best currently available solution. However, IT is a rapidly changing area, so the market will be re-examined prior to delivery, and the best value option to meet the requirements set out above will be chosen. The project has been assessed over a 5-year lifecycle, with both Opex and Benefits equated for that operational period, as IT solutions often need updating after 5 years. NPVs of both 5 and 45 years have therefore been quoted below.

### 7.1 Cost Profile

This project has the following cost profile and will be delivered as a series of sub-projects, some waterfall, other's iterations. An alternative manual option has been used in the CBA as a comparison: this does not offer as good value, and moreover will not be viable as the Flexibility Market increases in the later stages of ED2. The full build-up of costs is contained in the ED2 IT Investment Plan (Non-Op Capex) Cost Estimate spreadsheet.

	Total £'M	2023/24 £'M	2024/25 £'M	2025/26 £'M	2026/27 £'M	2027/28 £'M
CAPEX	■		■	■	■	■
ED2 OPEX	■					■
ED2 Benefits	■					■
5 Year OPEX	■					
5 Year Benefits	■					
NPV 5 Year (Recommended Option)	■					
NPV 45 Year (Recommended Option)	■					
<i>NPV 5 Year (Alternative Option)</i>	■					
<i>NPV 45 Year (Alternative Option)</i>	■					

## 7.2 Benefits

### 7.2.1 Financial Benefits

Benefits are shown for the first 5 years after the project is implemented.

	Total	Year 1	Year 2	Year 3	Year 4	Year 5
Remove the need for manual processing of transactions, both set up and maintenance.	■	■	■	■	■	■
Reductions in costs due to the effective management of contracts across all CMZs - 25% of saving achieved attributed to this gateway system.	■	■	■	■	■	■
Resource for peer to peer trading – based on 300 peer to peer contracts across ED2 with 2 weeks of FTE resource to validate and manage each contract. Avoids 12 FTE by the end of ED2, SS08 rate used.	■	■	■	■	■	■



This project is fundamental to the Flexibility market, and although the project itself has limited direct benefits to us it will enable many benefits to us across the DSO area overall. It will negate the need for some reinforcement, that without the Flexibility Market would be over [REDACTED] during the period. We estimate that there will be 1500 flexibility contracts through the ED2 period, and these will defer a range of reinforcement projects, but often the more expensive options on our Primary system or even our undersea cables. The projects range from [REDACTED]-[REDACTED], with an average of circa [REDACTED]. This project will be a fundamental support for the Flexibility Market; however, we have not assigned any of the benefits here (they are assigned to other DSO projects).

The Carbon Trust and Imperial College London has identified between £17-40bn of benefits for wider economy from a “smart more flexible energy future” which referenced in Ofgem’s and BEIS’s report on [Upgrading Our Energy System](#). Having a functioning marketplace platform is fundamental to enabling local flexibility to enable this headline benefit.

Flexibility provides further opportunities – for example CO<sub>2</sub> can be reduced through reduced use of mobile and embedded diesel generation where flexibility negates the need to generate. Our Resilience as a Service NIC project is specifically investigating the implementation of this.

As discussed in our main DSO IDP, the overarching benefits of DSO, in addition to TOTEX savings are:

- Increase in network resilience.
- Optionality value.
- Reduced losses.
- Reduced time to connect.
- Increase in renewable.

## 7.2.2 Non-Financial Benefits

The main non-financial benefit is the value for customers this development will bring by facilitating effective user-friendly market flexibility and the related opportunities for all parties. A development of this nature will time trouble and costs experienced by customers and help mitigate other impacts, e.g. reduction in the related environmental footprint.

### 7.2.2.1 Foundation to other Projects/Initiatives

Our suite of DSO projects all rely on each other to create an optimised and holistic approach to DSO. If any one of these are not delivered our DSO capability will be impeded as will our ability to deliver maximum customer value.

## 7.3 Key Assumptions

The current programme and costings assume that all planned RIIO-ED1 system changes will be complete before the start of RIIO-ED2. If some of the current planned application changes are not completed, this will extend the delivery of this project.

At present we are assuming that there will be one Market Facilitation gateway per DSO. If a different Market Facilitation gateway were introduced, this project would need to be revisited.

This project may require agreement on national standards and it is assumed that these will be agreed in time to allow the RIIO-ED2 deployment of this system.

## 7.4 High Level Dependencies

The project is reliant on several innovation projects, notably TRANSITION, to inform the requirement specifications.

Our suite of DSO projects all rely on each other to create an optimised and holistic approach to DSO. If any one of these are unable to be delivered it will impede our capability to efficiently deliver the changes needed to facilitate our low carbon future.

## 7.5 Deliverability & Risk

Our ***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 ED1 performance to our target 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. Our ***Deliverability Strategy (Annex 16.1)*** and ***Supply Chain Strategy (Annex 16.2)*** are included in the Business plan Submission.

Our deliverability testing has identified a major strategic opportunity which is relevant to all EJPs.

- In ED2 SSEN will change the way Capital Expenditure is delivered, maximising synergies within the network to minimise disruptions for our customers. This is particularly relevant for a Price Control period where volumes of work are increasing across all work types.
- The principle is to develop and deliver Programmes of work, manage risk and complexity at Programme level and to develop strategic relationships with our Suppliers and Partners to enable efficiency realisation.

## 8. Conclusion

A neutral marketplace is a fundamental requirement of the Flexibility Market. This project provides a solution much needed to facilitate the flexibility our customers and stakeholders are asking for, and a platform to help us make significant steps towards our shared NET Zero goals.