

RIIO-ED2 Investment Decision Pack

Connections+

Investment Reference No: 36/SSEPD/IT-CONNS/CONNECTIONS+



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Definitions and Abbreviations

BPDT	Business Plan Data Table
CAPEX	Capital Expenditure
CEG	Community Energy Group
CIM	Common Information Modelling
DER	Distributed Energy Resources
DG	Distributed Generation
DSO	Distribution System Operator
EJP	Engineering Justification Paper
EV	Electric Vehicle
FTE	Full Time Equivalent
ICP	Independent Connection Provider
IDNO	Independent Distribution Network Operator
IDP	Investment Decision Pack
LA	Local Authority
LCT	Low Carbon Technology
MDM	Master Data Management
NPV	Net Present Value
OPEX	Operational Expenditure

1. Executive Summary

During ED2 the number of new connections, in particularly Low Carbon Technology, will increase exponentially. Many of these will be smaller works, such as new Electric Vehicles charging points. SSEN will have to manage this massive increase in workload. To do these manually will require a lot of new specialists and would not offer the speed of service that our Stakeholders desire. In addition, larger Stakeholders, e.g. Low Carbon Technology (LCT) suppliers, require more information to help them decide where to invest on new equipment, and have requested that this information is available to them on a self-service basis. This project will deliver a 'self-service' facility for obtaining quotes for connections, with quick referral where more detailed advice is required, plus ready information for LCT suppliers to inform their investment decisions.

2. Investment Summary Table

Summary Table			
Name of Scheme / Programme	Connections+		
Primary Investment Driver	Trusted and Valued Service		
Scheme Reference / Mechanism or Category	36/SSEPD/IT-CONNS/CONNECTIONS+		
Output References / Type			
Cost (CAPEX)	■		
Delivery Year	RIIO ED2		
Reporting Table	C4		
Outputs Included in RIIO ED1 Business Plan			
Spend Apportionment	ED1	ED2 ■	ED3

3. Introduction and Background Information

The move to Flexibility markets is the single biggest change in the electricity industry in a generation. As we move into the Distribution System Operator (DSO) world in RIIO-ED2 we will need to ensure we offer as much information as possible to potential market participants about the current status of networks, so they can make informed choices as to where and what they might wish to connect. For organisations who have the capabilities to make their own assessments, we will be providing both analysed and unanalysed data through our Open Door and Tailored insights projects. Many of the potential customers, however, will not have the facilities to undertake such analysis, so will look to us to understand quickly and easily the opportunities available to them. Of course, all who wish to connect flexibility resources will want the connections process to be as simple as possible.



This project will build on the improvements we made in RIIO-ED1 to our connections systems and process and ensure that all potential customers make the most effective decisions. Once they have determined what they wish to do, they can do this as seamlessly as possible using self-service facilities as far as possible, but also ensure that connection customers always have access to the help and support they may require.

Self-service is becoming a key customer driver, with more individuals wanting to access and gain information as and when they want it, without the reliance of human contact (set call centre hours etc). Self service provides customers with instant access to information, allowing for personalisation and saving valuable time of business resources.

This project will provide the capability for customers to request various types of minor connections (New domestic Connections, Domestic EV Charging Points, Domestic Heat Pumps etc) via an online portal. The portal will provide real time information on the network to advise customers of nearest connection points, timescales, materials and costs. Customers will be able to select the required connection and go from design to payment in one seamless transaction, for some more complex connections or constrained networks it may be required to be reviewed before payment can be made.

Enabling this functionality will allow current staff to focus on the key issues or complex connections, providing the most value add for the customer, and will reduce or remove the need to increase staff levels accordingly.

Throughout the RIIO-ED2 we are expecting a significant increase in these types of applications. It is likely there will be a vast increase in Low Carbon Technology (LCT) connections, both Distributed Energy Resources (DER) and other flexibility such as Electric Vehicles (EV) charging points. The increase is not sustainable to manage manually.

This project will build on the major changes we have made to our Connections systems and processes in RIIO-ED1 and deliver automation to the self-service tools.

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
✓	✓	✓	✓

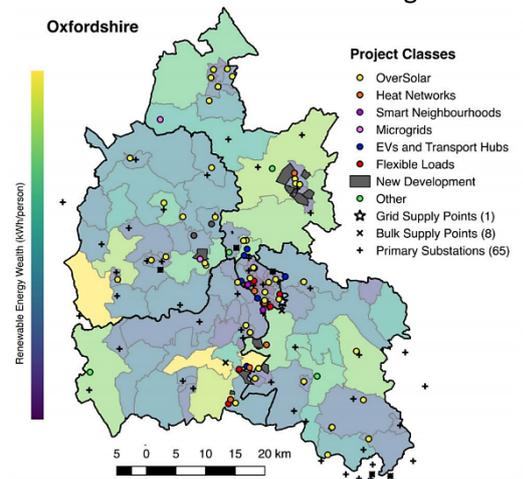
5. Optioneering

Our solution for Connections+ is split into 2 elements;

5.1.1 Tools to help customers decide what and how to connect

In terms of tools and information to assist customers decide on the best options, for larger and experienced organisations other projects will offer ‘structured’ (Tailored Insights project) and ‘unstructured’ (Open Door project) data. For smaller organisations and individuals this project will deliver:

- Self-serve platforms that show EV uptake, existing public charging infrastructure and forward network growth.
- Likewise, the external facing platforms will show Heat Pumps and other low carbon heating technology uptake, and forward network growth.
- Maps that show the network available capacity/demand levels, and what scope there may be for new flexibility, including Solar, Wind and Battery storage.
- Where the network is constrained, and any plans we have to support additional flexibility.
 - This would include potential ranges for any curtailment required in these areas.
- Where we are aware, the maps will show any new developments planned for an area.
- The maps will also show key network features, such as Grid or Bulk Supply Points and Primary Substations.
- All map points will have data associated with them, such as capacity, load, type, etc., and other key features, subject to data Triage constraints (e.g. security, privacy, commercial).



As the Flexibility market is new, we will work very closely with our supply chain and other stakeholders to ensure that we use the best available tools or systems. This could include facilities such as Blockchain to maximise customer information security, likewise CIM for the sharing of any data. Although the core project will be delivered as a complete unit, we do anticipate incremental improvements as the period progresses.

5.1.2 A connections process that is simple to use, and ‘self-service’ as far as that is possible

The system will allow for automation of basic applications taking into account load checking and design requirements. A link to the payment system within the CRM application will also allow for payment to be taken in a single transaction, enabling the application to be completed without the need for human interaction (except where the application requires further review).

The system will link to the current Work Management tool to schedule in a prospective date within an available time period / slot. This date can then be authorised by the relevant teams and the job marked as ‘Confirmed’ which would automatically update the customer.

Further two-way integration with other core applications (e.g. our GIS system) will enable the self-service platform to obtain all the information it needs to inform the customer of connection requirements and provide a satisfactory service.



The connection process will, as far as possible, follow the same process as existing (e.g. normal load type connections, such as housing estates). Users will need to login, or register if they are a first-time customer, but from there the process will be a simplified as possible, and include:

- Self-service automated quoting as far as possible, based on maps for simplicity (in RIIO-ED2 we expect this to cover minor connections).
- Where self-service is not possible a simple route to gain support from our teams and make applications
- Automation to guide users through the process, which will include:
 - Initial quoting.
 - Information needed if the user decides to progress the quote.
 - Continued support through the process, again in real time in many cases.
 - The automation is likely to include chatbots, natural language processing, security verification, machine learning and voice assistance.
- Where the user wishes to be part of the Flexibility market (i.e. to be involved in bidding, etc.), there will be links and guides on how to participate.
- Automated registration of the new flexibility on national systems if this is feasible (depends on the agreed national arrangements).

The same core system will act as an aid to our connect and notify system (e.g. for EV and Heat pump connections below limits), so that it will flag to us where any new connection may require work to our existing network (i.e. to ensure stability).

Currently we expect that the system will be based on our RIIO-ED1 IT investments (e.g. our GIS and CRM systems), with necessary upgrades (i.e. to avoid obsolescence) and extensions. We will however continue to examine the market, working with partners and the supply chain to ensure the solution offers overs value. The system will of course continue to ensure that customers have a choice in who provides their connection, and we will continue to make sure Independent Connection Providers have access to the same information as our own teams.

5.1.3 Alternative Options

As the driver for this project is the massive projected increase in the number of connections we will have to manage in ED2, coupled with a demand for more autonomy from our stakeholders, doing nothing is not an option.

Other than an IT based solution the only other option would be to vastly increase staff numbers. The projections for staff increases has been set out in our benefits and cost far more than an IT based solution. Moreover, this solution would not meet the demand for more autonomy from our stakeholders.

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

6.1.1 What and how to connect

We have held several connections stakeholder events with groups of our large customers from the following stakeholder groups:

- Distributed Generation (DG)
- ICP's & IDNO's
- Housing Developers
- Local Authority (LA) and Community Energy Groups (CEG)
- Industrial, Commercial and Consultants

These sessions were structured to allow our stakeholders to provide suggestions and ideas on what we need to do to support them throughout the RIIO-ED2 period. Within these sessions we received a number of requests to provide more granular data on our network configurations, assets and capacity levels.

Their expectation from us as a DNO is to ensure that they can make the most informed decision possible about what and where they can connect which will reduce the volume of 'speculative' applications that we receive.

During our latest stakeholder engagement event, 100% of our Connections Expert Panel agreed that this output for RIIO-ED2 would be beneficial.

Stakeholders also discussed the option for self-service where possible. Any solution to reduce the timescales to process a quotation would be met with positivity.

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

6.1.2 Self-Service Connections

Through our major connections' engagements and co-creation events with minor connections and Microgen customers we heard that our stakeholders expect as simple a process as possible. There is a desire for more modern and fast processes. They want to be able to raise applications, receive quotations, make payments and track quotation or delivery project progress online and ultimately complete most of their interactions with SSEN digitally. They do however, expect to be able to pick up the phone to us as and when required.

Microgen customers are specifically looking for a simplified, streamlined service with some kind of 'feasibility study' to check loads before application is put in (Software that allows Microgen to explore what's possible: Heatmap of network; Enter postcode; Click on area/building; Tells you what load; Tells you set of parameters; Tells you can have solar and EV), enhanced communications and a self-serve portal that would allow tracking of applications and storage of records.

7. Analysis and Cost

Costs have been built up 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. The new self-service facilities are expected to follow a waterfall methodology, whereas the customer tools will be delivered as a series of iterations. The full **build-up** of costs is contained in the ED2 IT Investment Plan (Non-Op Capex) Cost Estimate spreadsheet. The project CBA calculation spreadsheet gives full details of the NPVs for all options. Note that, as this project is to address new demands being placed on us by the move to Net Zero (i.e. a vast increase in the number of new connections), all options have increased costs and hence negative NPVs. The chosen option has the most beneficial NPV.

	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)	■					
NPV (45 Year)	■					
<i>NPV (5 year) alternative option (more staff)</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
Automate minor connections - reduce the resource required. Approx. ■ minor connections per year, average automation saving 0.4 of a person/day. Assume 30% automated. SS07 rate used.	■	■	■	■	■	■
Avoidance of increasing staff costs to manually manage new Electric Vehicle and Heat Pump connections load checks. Even if the connectivity model is sound, some connections will require a load check (as there is known to be limited head room). The ED2 projections are 56.6k rising to 133.7k EV, and 66.5k rising to 122.4k HP new connections per year. Approximately 2/3 should not require a load check, and on the remaining 1/3 a fair number could be managed automatically via the new self-service system, based on a sound customer connectivity model. This equates to an equivalent of between 17 to 36 new connections designers (SS07 rate) who would be needed in the ED2 period. More details of this calculation are held in the Benefits Build Ups file.	■	■	■	■	■	■
Offset additional resource required to manually provide LCT uptake information to Stakeholders (4 additional FTE assumed, SS07 rate)	■	■	■	■	■	■

7.2.2 Non-Financial Benefits

The project will be a key deliverable for Net Zero, as it will be a prime enabler for new flexibility. Including;

- Improved customer satisfaction
- Creates a consistent connections process
- Removes the risk of human error

7.2.2.1 Foundation to other Projects/Initiatives

None.

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 increase the complexity, and hence cost and timescale, of this project.

7.4 High Level Dependencies

Agreement of new flexibility rules connections.

A lot of the tools will be based on information provided by other projects, notably MDM & Data Lake, Analytics, Connectivity++ and Business Automation. It also has synergies with the Open Door and Tailored Insights projects.

The ED1 Connectivity+ project will need to be completed to ensure the network model is accurate and assets are placed on the right section of network.

Some of the automation functions are also reliant on the ED1 Osiris project, and this will also have to be completed before this project can be delivered.

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

The move to Net Zero will mean a massive increase in the number of new connections that we will have to manage in ED2. This is coupled with a demand by our stakeholders for more autonomy in managing their connections. The solution outlined above delivers the capacity to manage all of the additional connections and meets all the requirements of our Stakeholders. Moreover, it offers far better value than alternative (manual) methods. It has therefore been put forward as our preferred ED2 option.