

RIIO-ED2 Investment Decision Pack

Master Data Management, Data Lake & Analytics

Investment Reference No: 33/SSEPD/IT-ASSET/DATALAKE

Investment Reference No: 18/SSEPD/IT-ASSET/ANALYTICS



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Definitions and Abbreviations

| | |
|-------|---|
| ADMS | Advanced Distribution Management System |
| AI | Artificial Intelligence |
| ANM | Automated Network Management |
| BEIS | Department for Business, Energy and Industrial Strategy |
| BPDT | Business Plan Data Table |
| CAPEX | Capital Expenditure |
| CEG | Community Energy Group |
| CI | Customer Interruptions |
| CIM | Common Information Modelling |
| CML | Customer Minutes Lost |
| CNAIM | Common Network Asset Indices Methodology |
| CRM | Customer Relationship Management |
| DER | Distributed Energy Resources |
| DG | Distributed Generation |
| DMEU | Data Model for Energy and Utilities |
| DSO | Distribution System Operator |
| EDT | Energy Data Taskforce |
| EJP | Engineering Justification Paper |
| ESC | Energy Systems Catapult |
| EV | Electric Vehicle |
| FTE | Full Time Equivalent |
| GIS | Geographical Information System |
| ICP | Independent Connection Provider |
| IDNO | Independent Distribution Network Operator |
| IDP | Investment Decision Pack |
| LA | Local Authority |
| LCT | Low Carbon Technology |
| LiDAR | Light Detection and Ranging |
| MDM | Master Data Management |



| | |
|------|---------------------------|
| NPV | Net Present Value |
| OPEX | Operational Expenditure |
| PSA | Power System Analysis |
| WAM | Work and Asset Management |
| WSC | Whole System Coordinator |

1. Executive Summary

Good data stewardship is vital for any asset managing organisation, as set out in ISO 55001. Open Data is a fundamental requirement for a DNO in ED2, to enable Open Markets. New asset types and categories will need to be added as the country's portfolio of Low Carbon Technology increases. This project will deliver the base for all the above needs, in particular the requirements set out by the Energy Data Taskforce, as well as supporting other initiatives, such as analytics, which is a cornerstone of a modern digital business and aiding the establishment of efficient Flexibility Markets. This work will form the base for Data Best Practice guidance and Data Assurance Reporting compliance.

2. Investment Summary Table

| Summary Table | | | |
|--|---|----------|-----|
| Name of Scheme / Programme | Master Data Management, Data Lake & Analytics | | |
| Primary Investment Driver | Safe, Resilient and Responsive Networks | | |
| Scheme Reference / Mechanism or Category | 33/SSEPD/IT-ASSET/DATALAKE 18/SSEPD/IT-ASSET/ANALYTICS | | |
| 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

MDM and Data Lake

At the core of our new IT systems will be the need to master data to standards, and to provide a central store that can be used by any authorised user, and act as a base for data sharing with our stakeholders. This will both be a foundation to deliver Open Data, and a platform to support our other objectives.

In RIIO ED1 we are deploying several new systems to provide a base for our RIIO ED2 Information & Systems Strategy: this included Maximo for Work and Asset Management, Electric Office for GIS, a new Oracle based system for CRM and Connections, and PowerOn Advantage to manage the network in real time. These deployments included a lot of work to both standardise and improve data. For example, interfaces between systems have been based on CIM standards, and indeed we were the first DNO to make a full GIS based on GE’s Electric Office available to Independent Connections Providers. Master Data Management and a central store for data (‘Data Lake’) will build on that work and be the first elements to be developed in our fully integrated systems, allowing us to meet our commitments for Open Data, as well as supporting the flexibility market and many other areas of the business, especially as a base for analytics use cases. The data needs for a Distribution System Operator (DSO) in the Flexibility Market will increase in both scope and granularity, requiring us to increase data gathering, maintenance and analysis throughout the period.

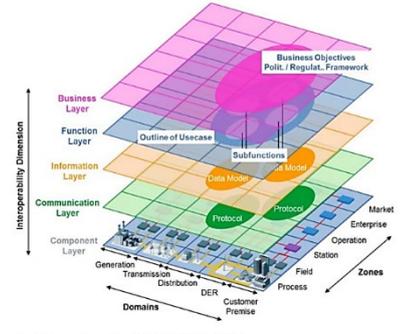


Figure 3: Diagrammatic representation of the Smart Grid Architecture Model

As can be seen in the diagram opposite (taken from our November 2017 Supporting a Smarter Electricity System document <https://www.ssen.co.uk/SmarterElectricity/>) the Distribution network will be a key element in the overall ‘Smart Grid’ architecture. As well as being able to provide data to others, including the Energy System Operator (ESO), Transmission Operator (TO) and both large and small energy providers, we also need to have far greater understanding of the operation of our network on a day to day basis. The Data Lake will provide the basis for such analysis, as well as providing information ‘on demand’ to our various stakeholders. Work on this system will be continuous in order to service the changing and increasing needs of the Flexibility Market and our Stakeholders.

Analytics

In RIIO-ED1 we also established a Data and Analytics (DnA) function, based on the Microsoft Azure cloud. We also did work on mapping our data to standards and in making many improvements in asset data quality. Structured and linked data will be available for internal and external users (through facilities provided in other projects).

However, for most users this data will not give any fully meaningful insights unless it is presented in a way that meets their core needs. Our RIIO-ED2 plan therefore includes a rolling programme of analytics to provide increasingly granular insights into our data, both for external and internal users, further productionising the Data and Analytics function. This will enable many benefits, including informing our external Stakeholders about the potential of a connection at any location on our network, informing the flexibility market, ensuring proactive asset management, and enhancing delivery of our strategic themes.

4. Business Plan Fit

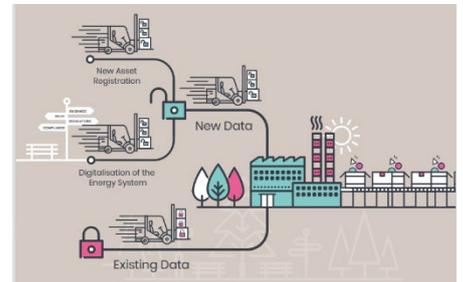
This project can be mapped to following strategic themes:

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

5. Optioneering

5.1.1 Master Data Management (MDM)

MDM will build on the data catalogue and metadata definition that we commenced in ED1. Our early work on this area was based around the recommendations from the Energy Data Taskforce: A Strategy for a Modern Digitalised Energy System (<https://es.catapult.org.uk/news/energy-data-taskforce-report>), as set out in our Networks Digital Strategy. We will align with the final requirements of the Data Best Practice guidance work that is in development by Ofgem along with their delivery partner, the Energy Systems Catapult (ESC), and will align with the wider work with the Department for Business, Energy and Industrial Strategy (BEIS) and Innovate UK in our joint efforts "Modernising Energy Data". We will also ensure that we cover all pertinent security aspects, such as the considerations set out in ISO 19650-5. It will provide a base for many of our RIIO ED2 IT improvements, that will support flexibility, deliver financial benefits, improve our environmental and safety management, and most importantly provide the core for the transparency requested by our Stakeholders.



We will align with the final requirements of the Data Best Practice guidance work issued by the Energy Data Taskforce (EDT), whose initial recommendations are:

- **Data Visibility:** Understanding the data that exists, the data that is missing, which datasets are important, and making it easier to access and understand data.
- **Infrastructure and Asset Visibility:** Revealing system assets and infrastructure, where they are located and their capabilities, to inform system planning and management.
- **Operational Optimisation:** Enabling operational data to be layered across the assets to support system optimisation and facilitating multiple actors to participate at all levels across the system.
- **Open Markets:** Achieving much better price discovery, through unlocking new markets, informed by time, location and service value data.
- **Agile Regulation:** Enabling regulators to adopt a much more agile and risk reflective approach to regulation of the sector, by giving them access to more and better data.
- **Align to best international standards** (e.g. ISO 8000, the global standard for Data Quality and Enterprise Master Data), which "...establishes the concept of Portability as a requirement for Enterprise Master Data and is commonly used to manage critical business information...").

Our core RIIO ED1 applications already follow these standards, and generally use consolidation, however other options including registry and consolidation will also be used, where appropriate. Some older systems need to be addressed and, as all systems must be aligned, these applications will either be updated or replaced. ED2 will require many changes to systems in order to deliver market flexibility, and we will use agile, lean and continuous improvement methodologies to refine our overall data strategy throughout the period. Overall MDM will enable us to establish our data and analytics, data governance, data management and data stewardship capabilities. We have adopted the IBM

Data Model for Energy and Utilities (DMEU) and have already deployed the Axon Data Governance Tool and Microsoft PowerBI solutions. These principles and systems are expected to be the base in ED2 for MDM.

We will continue to improve data, for our LV systems, to ensure cleansed and linked data sets that are regularly maintained and integrated across systems. This will require enduring data maintenance, including availability of existing data in the field, with simple updating facilities available for staff. We will also use new tools if deemed beneficial, such as a gamification platform for data cleansing, to further improve data quality. For example, we have integrated and are utilising smart meter data to enhance our understanding of network connectivity and improve fault management. We have also established data pipelines to enable data proof of concepts and commenced the automation of core processes, including KPI reporting, worked time recording and fatigue management.

Our data needs to be fully shared between many systems (internal and external), and we propose to use the Common Information Model (CIM) IEC 61970, 61968 and 62325 standards for data exchange, as far as possible. However, whilst these are nominal standards, there are variations across the sector, so we will work with Stakeholders to ensure that the final version(s) we use are suitable for consumption by all, albeit in some cases requiring limited conversion. Many of our core ED1 applications use CIM (either directly or as part of data exchanges), however again there are some variations, and we will work with the product vendors to ensure commonality as far as possible. Our aim is to have an overall data model that both supports our ED2 objectives, and meets our Stakeholder requirement for portability, in alignment with open data principles. We will define internal and external facing use cases to test and validate all of the data principles.

This work is vital to a Digital business, as failure to have proper management of data, based on industry standard guidance, would mean that we would neither be able to service the flexibility markets, nor support Open Data.

5.1.2 'Data Lake'

In terms of using data for analysis and insight, industry best practice is to have a central store where all data is available in a state ready for use. This store therefore must have all pertinent data from multiple systems, pooling key datasets into a central location to allow other systems to access and automate processes with the 'single source of truth', removing the risk of delays or errors. The advantages of such a store is that all data is already integrated, and any analysis does not place a risk or burden on core systems that are needed for business-critical operations. It will provide a base for many reporting activities (e.g. Business Intelligence, Common Network Asset Indices Methodology, Network Asset Risk Metrics, Customer Interruptions/Customer Minutes Lost, etc.) as well as many forms of analysis. The store must include data that we currently share or will share in the future, either internally or externally.

We will establish a 'Data Lake'¹ where all information needed for analysis or insight can be sourced, and where pertinent, combined with external data, such as weather or environment. We will build on our current Cloud hosted option, Cloud being preferred as it provides simple extensibility, however it must continue to be capable of meeting security requirements. The 'Data Lake' will provide for any reporting or data export to Stakeholders and be the fundamental source for Open Data. Some of the data sources that will be incorporated include:

- GIS
- ADMS
- WAM
- CRM
- DSO Applications
- Smart Meters

¹ Architecturally speaking, the system will be a Data Warehouse, in that data will be structured and linked. SSEN use the Data Vault model - https://en.wikipedia.org/wiki/Data_vault_modeling.

- Finance systems

Other external data sources will need to be considered and added where beneficial, such as weather data, planning data and environmental data.

This work will include some integration between the different core applications, as well as to the Data Lake. This will ensure we can continue to improve our data, in line with our Data Strategy, as well as reducing administration burden. We expect a certain amount of data improvement, both through tools and physical survey, will be required as part of the data harmonisation. This store will link to tools that will allow analysis and provide meaningful insight, both internally and externally, as well as to portals to allow our external stakeholders to access this data (in some cases using APIs), subject to security, privacy and commercial considerations (Triage). These tools and portals are set out in other projects in our submission (e.g. Open Door, Tailored Insights, Business Automation). Without a Data Lake or similar pool of connected data it would be impossible to service Open Data requirements in a timely manner, without the deployment of significant resources. It would also remove many of the opportunities afforded by new analytics tools and techniques to improve efficiency and reliability, and to effectively service many aspects of the flexibility market, in particular competition.

5.1.3 Analytics

Throughout the RIIO-ED2 period we will produce increasingly granular levels of analysis around our strategic themes, and to deliver the insights required by our Stakeholders. Initially these are more likely to use fixed algorithms, but as the period progresses, we expect to use more Artificial Intelligence (AI) in our analysis. Some of the analysis we expect to cover includes:

- 'Real time' Heat Maps to maximise flexibility potential.
- Real-time Fault level monitoring (ability to model faults in real-time using load, voltage, power flow, frequency and reliability).
- Targeted notification - heat maps - accurate fault locations.
- Support to WSC and Coordination Portal (including ICCP link, ADMS, PSA).
- Curtailment Assessment.
- ANM improvement.
- Flexible Power for service availability.
- Manage the network based on risk (real-time network risk analysis).
- Data Portal support (e.g. highlight data inconsistencies).
- Improvements to Connectivity Model.
- Load Modelling and Heat Maps.
- Power quality.
- Power Theft in conveyance.

Analytics will enhance Statutory and Regulatory reporting, including near real time analysis from financial data. It will enable comprehensive reporting of Biodiversity and Natural Capital impacts, using data collated for the new tools from our EnviroTrack project coupled with many other data sources. It will help us ensure the Losses Strategy is followed when undertaking LV asset replacement work. Analytics will help improved our analysis of fault information, by bringing together multiple sources including past faults, LiDAR information, Linear and Fixed asset information (health data), anticipated loading hot spots, weather and local geology. It will bring additional efficiencies to our tree cutting programme, including adaption to changes such as climate, ash dieback, etc.

It will also help deliver our LV Strategy. The LV network will change drastically in the coming years and will require a more proactive approach to operation and control. Analytics will support:

- Creation of a digital twin of the LV network based on the Connectivity Model to use in LV control room/control system.
- Roll-out monitoring and communications infrastructure to collect real-time data from across the LV network.
- Expanding and improving LV automation to develop a more responsive network overall.

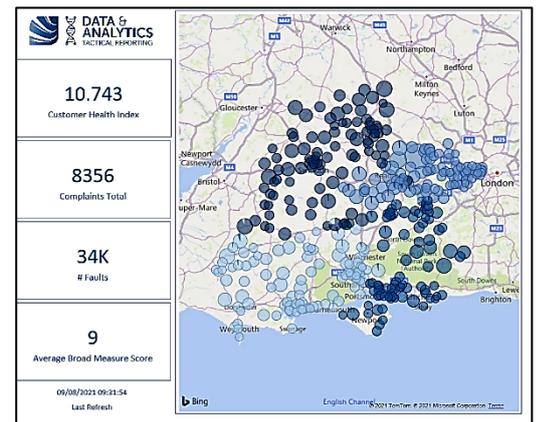
- Leveraging the use and value of LV monitoring (and other Operational Technology, such as smart meters) data by developing data analytics tools to process and understand data that is collected.

Analytics will help us to understand and address asset failures due to specific characteristics, so that we can form and implement effective strategies to address these items (e.g. replacement programme for Consac cable, tree cutting strategy), ensuring we align with other ongoing work (such as inspection and maintenance activity). This might include:

- Utilising LV Monitoring, smart meters and other operational technologies to improve fault finding and digitise reporting processes.
- Ensuring fault and remedial action records are logged centrally in our asset management systems.
- Performing root-cause analysis (where practicable) on faults to better understand the extent of issues on our network and implement efficient solutions.

Analytics will help us avoid customer disruption, improve network reliability, improve fault restoration performance, and improve customer and stakeholder trust by stabilising the level of faults on the network. This might include:

- Continuing to deploy LV monitoring and fault management devices (e.g. Bidoyng) in areas with high incidence of faults. Pro-actively manage legacy issues in known problem areas as well as analysis of fault patterns.
- Deploying LV monitoring devices on all new substations as standard from ED2
- Developing tools to analyse data from monitoring devices and feed this into Outage Management System (OMS) and maintenance plans.
- Mapping information on problematic assets to load and non-load investment plans to support cost-benefit analysis (CBA) and to ensure that we are investing efficiently.



Analytics will also provide many benefits for other ED2 projects, such as Connectivity++, Investment Optimisation. Note that specific analytics for the Flexibility Market are covered in our LCT Analytics project.

To deliver these benefits, we will need a collation of static and dynamic data, delivered through the Data Lake, integration using a Common Network Model of some siloed data sources, and analytics to drive understanding. We propose to use Advanced Analytics including AI tools to provide the necessary insights. The tools will use the static data (information about asset location, connectivity, specification, health, criticality, etc.) and dynamic data (telemetry, Internet of Things, weather, etc.) to build insights on how the network is performing, given the demands and energy sources over time. This analysis will build on existing facilities, such as our current LV monitoring programme, to give a more accurate picture of our network in near real time. It will provide additional support to Customers, particularly those who are vulnerable. Most importantly, analytics will be a key tool in supporting the flexibility market. These tools will also help us to identify where data is limited, hence focussing survey and data gathering to areas of real benefit. Where such tools have been deployed, they have shown real benefits (e.g. https://www.bentley.com/en/project-profiles/sa_water_adelaide_metro).

We propose to develop these tools in a staged approach, improving knowledge over whole RIIO-ED2 period, based on use cases developed internally and with all our Stakeholders. After each deployment we will hold reviews, both internally and with Stakeholders where output is shared, so that subsequent deployments can benefit from learnings. We will continue to use ‘best of breed’ tools and practices and make use of third party specialists through collaboration with our supply chain. We will also look to use the Open Data initiative to invite third parties to develop apps and other analytics based tools, as far as this is compliant with security, privacy and commercial rules.

5.1.4 New Low Carbon Technologies

During the RIIO-ED2 period there will be many new Low Carbon Technology (LCT) assets installed, and different parameters will need to be recorded about these, and existing, assets. We will need to add these assets and attributes to existing and other RIIO-ED2 planned systems, and this work will include:

- Updates to our Asset Management, GIS and ADMS systems.
- Updates to our integration software to allow our systems to interchange the new data.
- Updates to our Data Lake facilities, to allow the new data to be shared with Stakeholders where appropriate.
- Updates to analytics and reporting.
- Potentially updates to industry data flows, to allow interchange between market participants.
- Where appropriate, updates to our externally facing systems (e.g. Website, Open Door, Tailored Insights Flexibility portal, other RIIO-ED2 tools) to allow external Stakeholder to provide, view and update the new data categories, as appropriate, and subject to the normal security, privacy and commercial considerations.

As this work is largely updates to existing internal systems, we do not anticipate going to the market for this work, however we will ensure that any market tools or techniques that might add value are considered.

5.1.5 Alternative Options

This project is split into 4 core deliverables, MDM, Data Lake, Analytics and New LCT assets.

Master Data Management is a methodology and structured organisation of data. It is a core foundation for Open Data and supports many other business needs, especially Flexibility. The Data Lake is the foundation for that data, providing a structured warehouse of information that can give near real time information for Open Data and Analytics, as well as supporting reporting and analytics. As such there are no viable alternatives to these solutions. Analytics is a cornerstone of our Digital Strategy and has good benefits (with more expected throughout ED2). Adding new LCT assets and new attributes into our existing applications (especially WAM and GIS) will be a necessary action during the period, as new types of LCT assets become available. None of the above have viable alternatives that deliver all of the same outcomes. The alternative option, which will result in an increase in staff numbers, set out in the CBA can only deliver some of the elements delivered by the IT solution (circa 50%).

The proposed solutions have been based on the best value solutions that are currently available. However, given the pace of development in this area, the market will be re-examined throughout the project lifecycle to ensure the best value solutions at that time are chosen for delivery.

6. Stakeholder Evidence

These initiatives provide the basis and platform to provide initiatives stakeholders have requested that are set out in the Open Door and Tailored Insights projects. This includes various Stakeholder Engagement workings with Distributed Generation (DG), ICP's & IDNO's, Housing Developers, Local Authority (LA) and Community Energy Groups (CEG), and Industrial, Commercial and Consultants.

Our Stakeholders have stated that they wish to have access to meaningful insights into the performance and options to engage with our networks. Increasingly they require this information to be made available in a digital form. To deliver the improvements requested in value and reliability will require us to understand the performance and cost of our assets at increasingly granular levels.

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

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, rounded to 2 decimal places for simplicity. The bulk of the work will be in Year 1, with further iterations to pick up new assets and systems as they come on stream over the rest of RIIO-ED2. Costs and benefits have been set out in the years they are expected to occur. 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 (Partial Alternative Option)</i> | ■ | | | | | |
| <i>NPV 45 Year (Partial 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 |
|--|-------|--------|--------|--------|--------|--------|
| Reduced manual data collation for reporting and analysis, covering areas such as Management reporting / staff admin, Portfolio Management / Investment Planning, Engineering Design, System Planning, Quoting and Design, Control Room reporting / analysis, Financial reporting / analysis, IT team data extracts and | ■ | ■ | ■ | ■ | ■ | ■ |

| | | | | | | |
|--|-----|-----|-----|-----|-----|-----|
| <p>Group Central DNA team analysis. Savings based a build-up of 37 hours x 60 = 2220 mins / week, 15mins saving per day x 5 days = 75mins / week, 75 mins equates to 3.38% of a 37 hour working week, and 1200 x 3.38% = 40.5 FTE (assume 40.5 FTE). Assume offset of 21 new FTE (based on achieving 50% of above benefit)</p> <p>21 FTE x SSE06 (£63,778) = ■■■</p> | | | | | | |
| <p>Reduced effort to gather data for third parties. Savings based on 20 people @ 10 days/year) = 200 days Offset of 1 new FTE</p> <p>1 FTE x SSE06 (■■■) = ■■■</p> <p>This is believed to be a very conservative estimate.</p> | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ |
| <p>Use Analytics/algorithms to take raw voltage data per LV feeder and map customers to one of the three distinct voltage profiles representing each phase, as phase allocation will be vital to manage Flex (especially EV). The alternative would be manual survey. Assuming a maximum survey rate of 150/day, with approx. 4.2m meter points, and at 225 days a year, that equates to circa 124 person years. Using SS05 staff rate, and assuming a 50% reduction</p> | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ |

There are potentially many other benefits, however these are difficult to both assess and realise, therefore have not been included at this stage. These include:

- Reduction in the cost of reporting, both internal and to external stakeholders.
- Reduction in time resolving data inconsistencies.
- Improved customer scores.
- Reduction in equipment failure through proactive maintenance (refurbishment v replacement, targeted and planned work v reactive).
- Remove need for additional resource that would be required to manually develop and update heat maps and similar analysis.
- Use Analytics/algorithms to take raw voltage data per LV feeder and map customers to one of the three distinct voltage profiles representing each phase, as phase allocation will be vital to manage Flex (especially EV). The alternative would be manual survey.
- Targeted survey work.

- Time saved by reducing duplication of different departments (DSO, operations, portfolio, control room) from analysing the same data to answer slightly different questions/hypothesis.
- Visibility to frontline operatives, to help them decide remedial solutions during faults
- Visibility to portfolio managers and designers to propose and design engineering solutions.
- Near real time reporting, trending and hot spotting of past, current IIS incidents and penalty performance. This can lead to a pro-active intervention identified quicker and result in a capex or opex solution put in place.
- Consistent methodology and resilient approach mean the data can still be provided out of hours and resources are stretched (in the evening, in the Christmas holidays, during storms) with minimal staff handling and issuing data.
- Improved KPI's across all of our key deliverables which will allow us to make better decisions on where to focus attention to improve efficiency for our customers.

7.2.2 Non-Financial Benefits

Once implemented this project will be the bedrock and enabler to:

- Deliver on Open Data requirements to regulator and stakeholder standards.
- A single base for many reporting activities (e.g. Business Intelligence, CNAIM, NOMs, NARMs, etc.) – 'single source of truth'.
- Segregation of reporting data which reduces the burden, thus reducing risk of performance impact or outage on the operational systems, when performing analysis upon the data sets.
- All our data will be meeting the level of maturity expected of a major asset owner, when measured against ISO 55000 and ISO 17020, particularly regarding its accuracy, completeness and timeliness
- Increased adherence to the Common Information Model (CIM) IEC 61970, 61968 and 62325 standards for data exchange where technically possible.
- Meet Stakeholder commitments for Open Data (EDT commitments).
- Provide better insights to field staff, improving safety.
- Improve environmental performance, especially regarding Natural Capital.
- Speed Net Zero delivery.

7.2.2.1 Foundation to other Projects/Initiatives

Master Data Management, Data Lake & Analytics will be a foundation to many other projects, including Open Door and Tailored Insights.

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.

To maximise benefits, especially in regard to servicing the flexibility market, other projects and systems will need to ensure automated synchronisation of field collected data, as soon as connection is available and suitable.

7.4 High Level Dependencies

To deliver the full benefits of data sharing with all Stakeholders, the project will require agreement with Stakeholders on formats for any required data exchanges. Failure to gain agreement will not negate the direct benefits to our business but will complicate data sharing.

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

This project delivers the base to many aspects of our ED2 programme, including advanced analytics, business automation, and of course supporting the move to DSO. It also provides a pool of structured data that will deliver the Open Data requirement, making all our data freely available to the market, subject to suitable triage. The financial benefits set out in this plan are the minimum we expect to achieve, and do not take into account the external benefits that will be delivered by this work to our Stakeholders. Manual alternatives cannot deliver the same level of benefit, especially for external stakeholders.