RIIO-ED2 Business Plan
December 2021

SP ENERGY NETWORKS

Annex 4C.2:

RIIO-ED2 Non-Operational IT and Telecoms Business Plan - Data Strategy

PRINCIPAL PARTNER
UN CLIMATE CHANGE CONFERENCE UK 2021
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Contents

1. An introduction to this annex

1.1 Scope

Our Data Strategy complements our Digitalisation Strategy (see annex 4C.1 IT and Digitalisation Strategy). Together, data and digitalisation (D&D) will enable us to transform our business and meet the objectives of the Energy Data Taskforce's report on "A Strategy for a Modern Digitalised Energy System").

The key drivers for our proposal are:

- Compliance with the principles set out in the Data Best Practice Guidance (DBPG) (Data_Best_Practice_Guidance_v1.pdf (ofgem.gov.uk)) to ensure that the value of our data, and its use and treatment, is maximised effectively for the benefit of customers and stakeholders.
- Ensuring that we are set up for success to play a key role in enabling Net Zero through effective data flows that support increased electrification, introduction of flexible services, scaling of mechanisms for managing the energy system and risk mitigation to increase resilience throughout the energy transition.
- Empowering employees and customers through improved accessibility to quality data at the point of need, and enriched insight to help them to make informed decisions.
- Ensuring our regulatory and operational reporting continues to evolve and remains robust throughout the energy transition.
- Identify opportunities for increased efficiency, offering value for money to our customers.
- Improved understanding our network at all levels to enable effective planning and investment.
- Achieving better interoperability so that our organisation can respond to the challenge of enabling the energy transition and support the drive to Net Zero.
- Responding to challenges that might emerge as the industry and market evolve.
- Ensuring that we can meet our regulatory and legal obligations on data.
- Driving better Whole System outcomes through the sharing of open and shared data.
- Utilising data to stimulate new markets and innovative services.

Stakeholder outcomes resulting from the implementation of our strategy include:

Stakeholder	Data Strategy Outcomes
Customers	More efficient, scalable solutions for customers to support their evolving energy needs and enable actions on Net Zero
Regulatory/ Government	Creation of a modern digitalised energy system, enabling innovation for Net Zero through flexible markets and preserving system resilience throughout the energy transition. Reliable evidence base and associated metrics to enable informed strategic decision making
Whole System	Industry collaboration on standards and protocols; sharing best practice; collective action enabled for greater combined impact on Net Zero
Partnerships	Creating new opportunities for partnership which have the potential to reduce costs, develop new markets and models and innovate for Net Zero
Advisory/Industry SMEs	Providing data to enable study/ development of new solutions for market
Transport, Heat, and Industrial Demand	Providing data to enable study, development, and implementation of decarbonisation options including maximising the combined investment in energy / transport / heat particularly on Net Zero
Developers	Data to enable decisions and services including supporting the modernisation of homes to reduce carbon footprint and empowerment of communities and individuals to make and enact more informed decisions about energy usage
Public Sector	Data to enable decisions, and product/ service innovation via flexible markets and support local and national government initiatives for a just transition to Net Zero

Table 1 Stakeholder Outcomes

1.2 Key highlights

Our Data Strategy will deliver enhanced features that will ensure we can leverage our data more effectively to satisfy the drivers above; these are explored through the 6 pillars of the SPEN Data Strategy that can be seen below:

Figure 1 Data Pillars and Key Features

It is important to note that all 6 pillars above are intrinsically linked. Without investment in all 6, the ultimate value potential and likelihood of success in deploying an effective offering will be diminished.

We aim to increase our data maturity in the lead up to, during and post RIIO-ED2. The figure below shows a data maturity model which highlights the 'art of the possible' of how we can maximise the value of our data as a DNO, and as we transition to a DSO facilitating Net Zero:

SPEN Data Maturity Model

Data Strategy Pillars

1. Intelligent Data Capture
2. Digital Twin & Decisioning
3. Reporting & Analytics,
4. People & Culture
5. Data as an Asset & Service
6. Data Governance & Risk

Value

Maturity Level	Enabled Data Capabilities	Top Use Cases
Level 5 Industrial: Data as the fabric of business operations and a differentiator for the business	1. End-to-end and enduring data tooling across governance, quality, and master data management 2. Autonomous decisioning for asset & network, AI & ML assisted optimisation 3. Enterprise-wide analytics, AI & ML driven decisioning, single unified data landscape & ecosystem 4. Data literate workforce, highly digitally engaged, data science team, and digital services factory 5. Full product ownership of data – data products either created in-house or sourced externally 6. Clear CDO / data stewardship, data design authority and data management committees	• Cognitive analytics • Real-time and on-demand analytics & reporting • DSO market operations, flexibility services optimisation, carbon analytics • Full digital twin with predictive capability • Digital services factory
Level 4 Critical: Inclusion of strategic and business services	1. Established governance, MDM, & data quality tools, with use of a data catalogue/locator 2. Prediction of asset and network operational scenarios with next best action recommendation 3. Enduring reporting & analytics platforms, RRP transformation & integration 4. Advanced data engineering and data science skills, leading data skills thought leadership 5. Interoperability with whole system through open data, new uses being piloted for scale 6. CDO function mobilised with clear roles and responsibilities for data governance & risk	• Predictive analytics • Operational & regulatory reporting integration with open data • Connected asset / construction / worker • Drone and LiDAR asset inspections data accessible
Level 3 Beta: Data is being scaled across the organisation and used to support digital services	1. Maturing governance, data management & data quality tools, IoT/Smart devices for operational use cases 2. Scenario planning, prediction of network constraints & faults, real-time event monitoring 3. Advanced insights portal with self-serve/on-demand analytics & reporting, open data integration 4. Advanced data architecture, modelling, and visualisation skills, participation in open data forums 5. Deployment of enterprise service bus and open API library (to expose data externally) 6. Data owners and data stewards identified & onboarded, governance & risk processes mapped	• Descriptive analytics • Reporting & analytics insights portal • Single view of customer / plan / asset • Field work management enhancements / field device upgrades
Level 2 Organised: Strategy in place with limited implementation	1. Basic data management and data quality tools, IoT/Smart devices for non-operational use cases 2. Mature digital representation of assets and network with integration across systems 3. Basic insights portal with data visualisation, minimal system integration with data sources 4. Limited enterprise data architecture and modelling skills 5. Big data platform, ingestion of some early open data, centralisation of external data hub 6. Basic hub and spoke model deployed with key data roles identified	• Descriptive analytics • CRM and customer service enhancements • Integrated network modelling, external exposure of network connectivity model and constraint information
Level 1 Ad-hoc: Data is not co-ordinated with no strategy in place	1. No interconnected data tooling, some discrete data applications 2. Basic digital representation of assets and network, no integration as data spread across systems 3. Ad-hoc reporting only, no system integration with operational data sources or data warehouse 4. Low or no data literacy and skills 5. Point to point use of data, with no appreciation of future use cases or value 6. No data operating model or formal risk management	• Ad-hoc reports typically based on extracts • Basic operational and RRP reporting • Network connectivity model and asset management records

Figure 2 SPEN Data Maturity Model

By implementing our Data Strategy, we will advance from an early stage of maturity on data (i.e. Level 1 or 2) with pockets of good practice to a fully data driven organisation with systemic data capability. Some areas of our business, for example Operational Technology (OT), are at a more advanced starting point due to their being a requirement, historically, to achieve a higher capability to support business operations.

We are acutely aware that the people journey to increase data literacy and apply more advanced techniques using data is as much a key to success as processes and platforms. To mitigate this risk, our Data Strategy emphasises the importance of supporting our people on this digitalisation journey to build the skills and adopt the ways of working that we will need to deliver a better future quicker.

Therefore, the section on Digital Skills and Change Enablement within the broader IT & Digitalisation Strategy (Section 7 – Pillar 5: Investing in the digital skills of our people) should similarly be taken to be a critical enabler in our pathway to becoming a data driven, digitalised organisation and ultimately achieving outcomes such as effective enablement of Net Zero, scaling to enable innovative flexible solutions, de-risking services to support increased electrification and continuing to deliver value for money for customers and other stakeholders.

1.3 Benefits

The following value tree was developed with broad input from across the SPEN business and through engagement with external stakeholders. Each initiative in the IT & Digitalisation Strategy has identified the target benefits to deliver outcomes and maximise impact. In turn we have captured which of the initiatives within the IT & Digitalisation Strategy are underpinned by the 6 pillars of our Data Strategy providing a direct line of sight to value creation and traceability on outcomes.

SPEN Digitalisation Strategy Value Tree

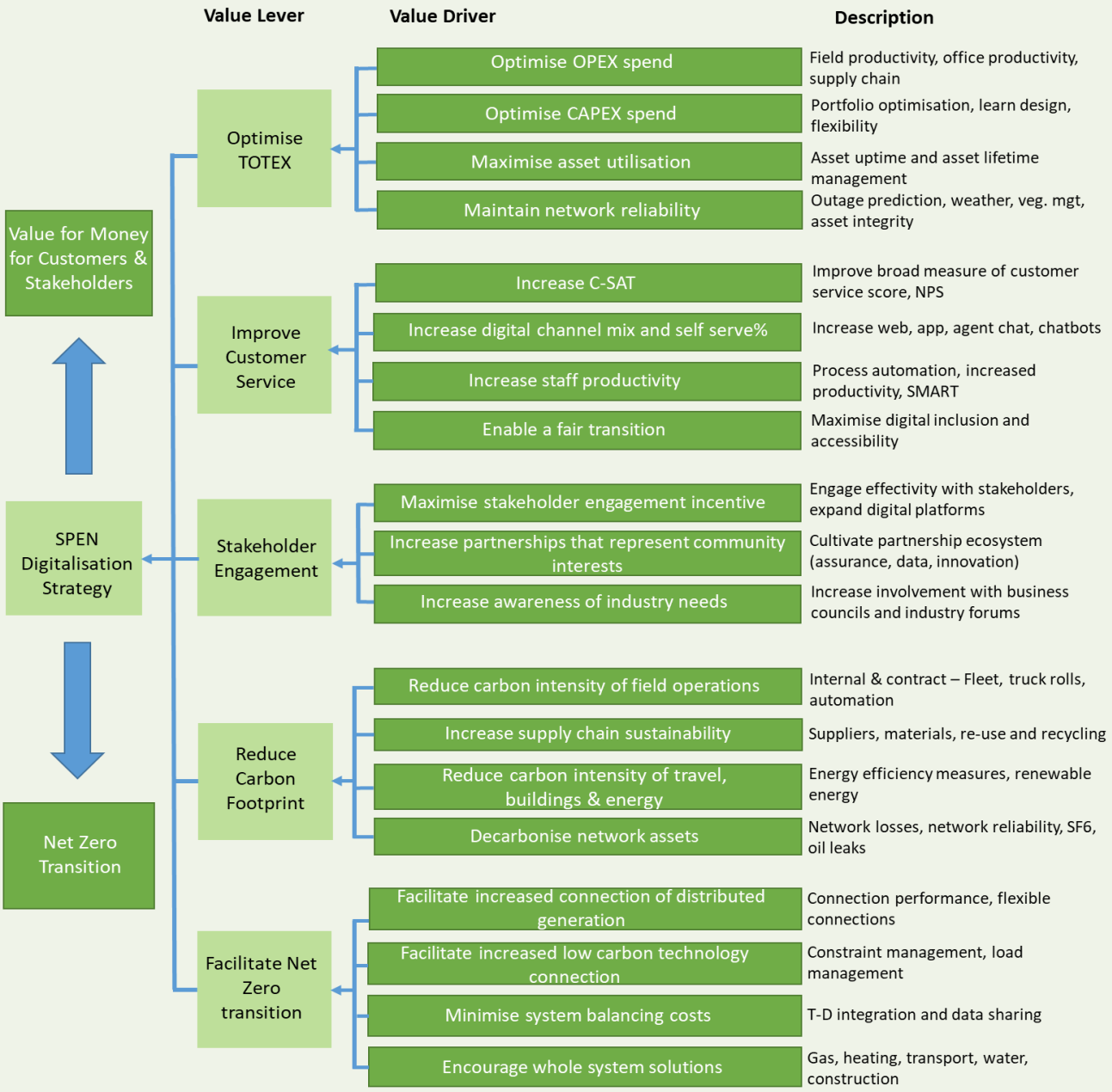


Figure 3 SPEN Digitalisation Strategy Value Tree

In addition to satisfying the characteristics required from the organisation to follow through on the initiatives from a data and data solutions perspective, our Data Strategy provides the foundation for a new, extensible way of working which will let our business and IT teams scale more easily and efficiently, and which is critical to the deliverability of our plans. Through maturing our data capabilities, we will not only deliver the initiatives outlined in our data and digitalisation strategies, but we will also accelerate the delivery of stakeholder benefits and do so on a more sustainable basis than we could at our current data maturity level.

1.4 Customer and stakeholder input

The team has leveraged stakeholder consultation insights from the Energy Systems Catapult[1] in addition to our own stakeholder engagement feedback to ensure due consideration of the priorities for each stakeholder group. The resulting stakeholder map (See Figure 11) was produced to highlight the type of value stakeholders stand to gain as a result of the implementation of our Data Strategy and associated initiatives.

To complement this activity, we conducted 18 workshops with ~200 people across 9 directorates of our workforce to understand their interests, pain points and to identify key opportunities to digitalise for the target outcomes in the value tree above.

Based upon these insights, we identified a set of characteristics (ways in which stakeholders wanted or needed to be able to interact with data and data solutions) to satisfy those motivations. In turn this was used to derive the set of data capabilities and level of maturity needed across those 6 pillars to meet those needs in line with the target outcomes identified above.

The target outcomes and set of capabilities (ensuring the value potential of data can be delivered upon and with some degree of agility and flex for the future) was refined through 3 deep dive workshops with a broad representation of colleagues from across SPEN including IT and OT experts as well as external industry and data domain experts from Accenture. This was followed up by interviews with 5 subject matter experts in SPEN to ensure alignment between our Data and Digitalisation Strategies.

The resulting outputs from this are the value tree above and the 6 data pillars outlined in our Data Strategy with discrete mapping at a low level to ensure traceability to the original stakeholder interests, colleague opportunities and experiences; as well as the targets and approaches set out within this Data Strategy.

Further validation included 5 socialisation sessions with Heriot-Watt University and a second-round review with an Accenture leadership team specialising in digitalisation strategies for energy networks.

In addition, our involvement in key industry groups such as the ENA's Data and Digitalisation Steering Group and Open Networks and IceBreakerOne has also provided the opportunity to promote an outcomes-based approach, with due consideration for stakeholders, as well as identifying emerging trends or themes.

Open invitations to members of the public to join briefings and help to shape the strategy were promoted. We have enhanced our data portal and provide direct contact details there, and via the ENA, for anyone interested in reaching out with a data request or comment. We have introduced a new Data Governance Forum which meets monthly and has accountability for directing the shape and implementation of our Data Strategy as well as our oversight of our Open Data Initiative. This group will take up the opportunity from 2022 to regularly review stakeholder feedback on data and to invite stakeholders to share details of their interests, feedback on their experience and to input to our data roadmap.

[1] "Local energy data innovation – Discovery findings" UK Energy Systems Catapult (Sept 2020)

1.5 Delivering our Plan

Within each pillar of the Data Strategy there are a number of initiatives referenced which sit within 'Annex 4C.1: RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy'. These initiatives explain how the technology components will be delivered to support each element set out in this Data Strategy. This Data Strategy explains how each of the 6 data pillars, and subsequent initiatives and projects will contribute towards meeting the 11 Principles set out in Ofgem's Data Best Practice Guidance. A detailed outline of how we plan to fulfil our promises and implement the changes required to achieve the goals set out in the Business Plan Incentives (BPI) and DBPG can be found in Section 4 of this Strategy: '4.0 Implementation Programme'; here, our roadmap, data maturity assessment, engagement, value and delivery approach – among other things – are explained in detail. Utilising predominantly agile methodologies will allow us to adapt to change as required, and to work iteratively to ensure that we meet stakeholder needs and maximise the value of data for our operations, our staff, our customers, and our stakeholders.

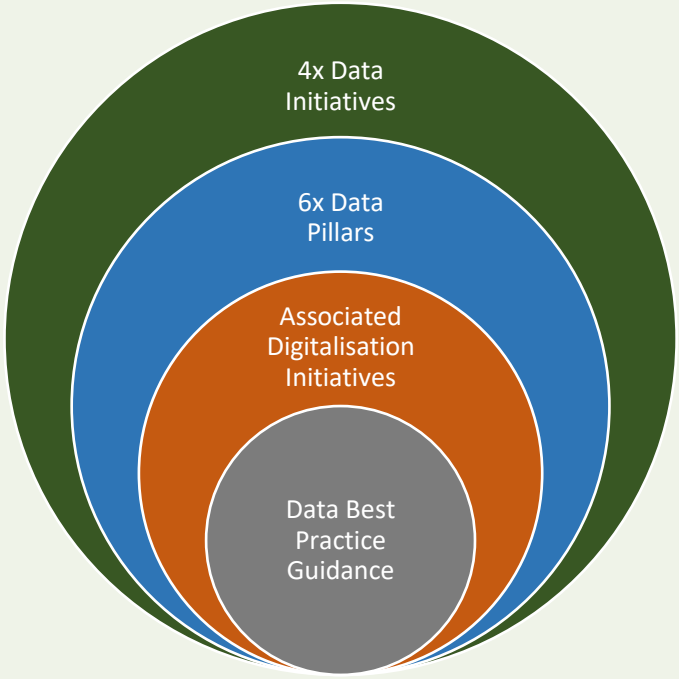


Figure 4 Data Strategy Structure

1.6 Signpost to Ofgem's business plan requirements

Ofgem BP Guidance	Annex Section
4.5	Section 4.2 Implementation Programme: Stakeholders Section 4.3 Implementation Programme: Engagement Further detail on stakeholder engagement can be found in our IT & Digitalisation Strategy (Annex 4C.1) – Section 1.4 Customer and Stakeholder input Section 9.4.2 RIIO-ED3 Preparation: Method Section 2.1 Governance: Methodology Section 2.1 Governance: Overview Section 8 Pillar 6: Improving Mastery of our Data
4.6	Section 4.2 Implementation Programme: Stakeholders Section 4.3 Implementation Programme: Engagement Section 10.1 Data as an Asset & Service: Overview Section 10.1.4 Data as an Asset & Service: Open Data Further detail on stakeholder engagement can be found in our IT & Digitalisation Strategy (Annex 4C.1) – Section 1.4 Customer and Stakeholder input Section 3.A.1.2.1 Self service functions: Channel of Choice Section 10.1 Appendices: Customer Engagement Section 6.2 DSO Market Operation: Open Data All Initiatives within Section 8 Pillar 6: Improving Mastery of our Data have specified related personas.
4.8 4.9 4.10 4.11 4.12 4.13	Section 5: Data Maturity & Compliance with the Data Best Practice Guidance Each pillar of the Data Strategy contains a section referring to how each pillar meets the Data Best Practice Guidance Section 6.4 Intelligent Data Capture: Mapping to Data Best Practice Guidance Section 7.4 Digital Twin & Decisioning: Mapping to Data Best Practice Guidance Section 8.4 Reporting & Analytics: Mapping to Data Best Practice Guidance Section 9.3 People and Culture: Mapping to Data Best Practice Guidance Section 10.4 Data as an Asset & Service: Mapping to Data Best Practice Guidance Section 11.4 Data Mastery & Governance: Mapping to Data Best Practice Guidance
4.14	Section 4.7.2 Implementation Programme: Our Delivery Approach

4.15 4.16	Section 5: Data Maturity & Compliance with the Data Best Practice Guidance RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy (Annex 4C.1) – Section 8 Pillar 6: Improving Mastery of our Data All DBPG are outlined per initiative, as well as a current state and change drivers required to reach future state and to comply with the DBPG
4.17	Our Data Strategy defines our initiatives that will enable us to comply fully with the DBPG: Section 6.4 Intelligent Data Capture: Mapping to Data Best Practice Guidance Section 7.4 Digital Twin & Decisioning: Mapping to Data Best Practice Guidance Section 8.4 Reporting & Analytics: Mapping to Data Best Practice Guidance Section 9.3 People and Culture: Mapping to Data Best Practice Guidance Section 10.4 Data as an Asset & Service: Mapping to Data Best Practice Guidance Section 11.4 Data Mastery & Governance: Mapping to Data Best Practice Guidance The detail on these initiatives can be found in each of the pillars of our RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy (Annex 4C.1): Section 3 Pillar 1: Using Digital Technologies to Deliver Enhanced Customer Service Section 4 Pillar 2: Optimised Asset & Network Management Section 5 Pillar 3: Developing Options to Manage Peaks in Load Section 6 Pillar 4: Supporting New Business Models and Markets Section 7 Pillar 5: Investing in the Digital Skills of our People Section 8 Pillar 6: Improving Mastery of our Data
4.18	Our Data Strategy defines our initiatives that will enable us to comply fully with the DBPG: Section 6.4 Intelligent Data Capture: Mapping to Data Best Practice Guidance Section 7.4 Digital Twin & Decisioning: Mapping to Data Best Practice Guidance Section 8.4 Reporting & Analytics: Mapping to Data Best Practice Guidance Section 9.3 People and Culture: Mapping to Data Best Practice Guidance Section 10.4 Data as an Asset & Service: Mapping to Data Best Practice Guidance Section 11.4 Data Mastery & Governance: Mapping to Data Best Practice Guidance The detail on these initiatives with all supporting information can be found in each of the pillars of our RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy (Annex 4C.1): Section 3 Pillar 1: Using Digital Technologies to Deliver Enhanced Customer Service Section 4 Pillar 2: Optimised Asset & Network Management

	Section 5 Pillar 3: Developing Options to Manage Peaks in Load Section 6 Pillar 4: Supporting New Business Models and Markets Section 7 Pillar 5: Investing in the Digital Skills of our People Section 8 Pillar 6: Improving Mastery of our Data
5.25	Section 5.2 and 10.1.4: SPEN are active members of the ENA's DDSG and the subgroup delivering the National Energy System Map. We will continue to drive the collaborative delivery of this important project, and ensure the platform is capable of responding to changing stakeholder requirements.

2. Executive Summary

We recognise the criticality of investing in data to deliver a better future, quicker through a digitalised energy system. This journey through digitalisation will require us to identify valuable data and to use it more effectively to enrich existing processes; and open up new opportunities for product and service innovations which will offer stakeholder value, and which will let us scale our energy services within a very different industry context.

To do so, we must transform our business' culture. We must give greater focus to opportunities within Low Voltage networks to support a range of different stakeholder needs and support their individual decarbonisation journeys. We must maximise our value chain by using data to optimise our network and asset management activities building on our NAMS solution which was implemented in RIIO-ED1. Finally, we must digitalise our operational processes to reduce time-consuming manual effort that prevents us from maximizing the value of our data for innovation and continuous improvement.

Within our Data Strategy we have set out 6 critical data capabilities which will underpin our broader ED2 digitalisation plans. These capabilities will enable us to manage and to use our data more effectively. We will quality assure our data and make it more accessible for more people (internally and externally) so that we can deliver more value for our stakeholders. We will take a 'presumed open' approach to the publication and sharing of our data. This is because we recognise the important role that data will play in enabling a flexible energy market, by providing the type of stimulus needed for product and service innovations, to accelerate the transition to Net Zero. Our proposed approach and target state capabilities are informed, and indeed shaped, by the work of the Energy Data Task Force and the subsequent Data Best Practice Guidance.

2.1 Target State Data Capabilities

The figure below shows our target state for each of the 6 pillars outlined within this document:

Figure 5 Target State Data Capabilities

2.2 Value

The delivery of target outcomes will be supported in the following way:

Combined Impact

- Efficiency and better decision making
- Continuous improvement, service personalisation, efficiency, privacy, and trust upheld by improved data quality / methods, flexible services enablement
- Security of green energy supply/ data to support flexible services, transparency of footprint and focus on reduction of Co2

Figure 6 Value Drivers

It is important to note that all 6 data pillars are intrinsically linked. Without investment in all of them, the ultimate value potential and likelihood of success in deploying an effective data offering will be diminished.

Our strategy emphasises the importance of supporting our people throughout this digitalisation journey to deliver a better future quicker. The skills of our people and culture across our business will be critical in determining how successful we are in adopting and using these technologies and methods to deliver on the potential for value highlighted above. Therefore, the section on Digital Skills and Change Enablement within the broader IT & Digitalisation Strategy should similarly be taken to be a critical enabler in our pathway to becoming a data driven, digitalised organisation.

2.3 Data Best Practice Guidance

Our strategy for data has taken each one of Ofgem's Data Best Practice Guidance Principles[2] to heart because we recognise that strong data management practices will underpin our digital journey:

	Pillars	1 Identify the Role of Stakeholders of Data Assets	2 Use Common Terms	3 Describe Data Accurately	4 Provide Info to Data Users	5 Make Data Discoverable	6 Learn & Deliver to Users' Needs	7. Prioritise Data Quality, Maintenance & Improvement	8 Ensure Data Assets are Interoperable	9 Protect Data Assets	10 Store, Archive, Provide Access for Sustainable Benefit	11 Presume All Data Assets to be Open
1	Intelligent Data Capture		✓	✓	✓	✓			✓		✓	✓
2	Digital Twin & Decisioning		✓	✓	✓	✓			✓	✓	✓	
3	Reporting & Analytics		✓	✓	✓	✓			✓		✓	✓
4	People & Culture	✓					✓	✓		✓	✓	✓
5	Data Mastery & Governance	✓	✓	✓	✓	✓	✓	✓		✓	✓	
6	Data as an Asset & Service	✓	✓	✓	✓	✓			✓	✓	✓	✓

Table 2 Breakdown of the 6 Data Pillars against Ofgem's Data Best Practice Guidance Principles

[2] https://www.ofgem.gov.uk/sites/default/files/2021-11/Data_Best_Practice_Guidance_v1.pdf

2.4 Digitalisation Use Cases

Our Data Strategy supports delivery of our future vision and is fully integrated with our IT & Digitalisation Strategy; some examples of Digitalisation Use Cases can be seen below:

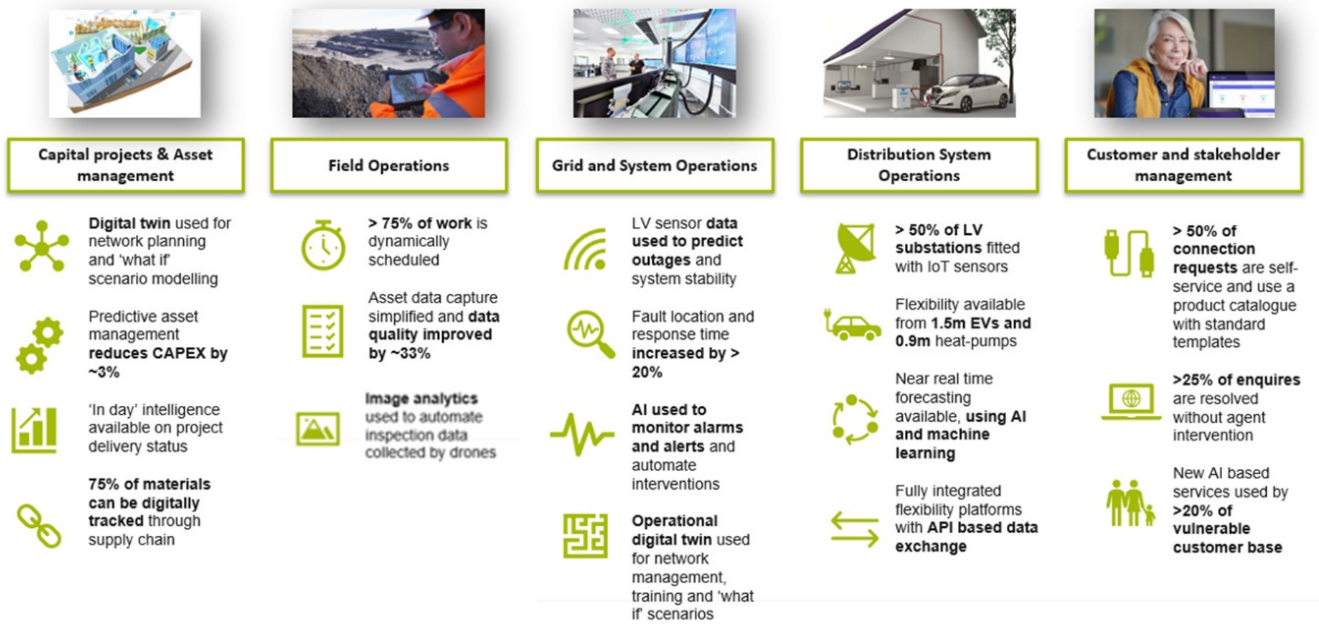


Figure 7 Examples of the Types of Digitalisation use Cases that are supported through Data Mastery (numbers are for illustration only)

3. Our Target State on Data

The vision for our Data Strategy is to maximise the value of data for our stakeholders. To this end, we have identified 6 critical data capabilities that we will need to invest in to deliver sustainable value, as shown in the house diagram below:

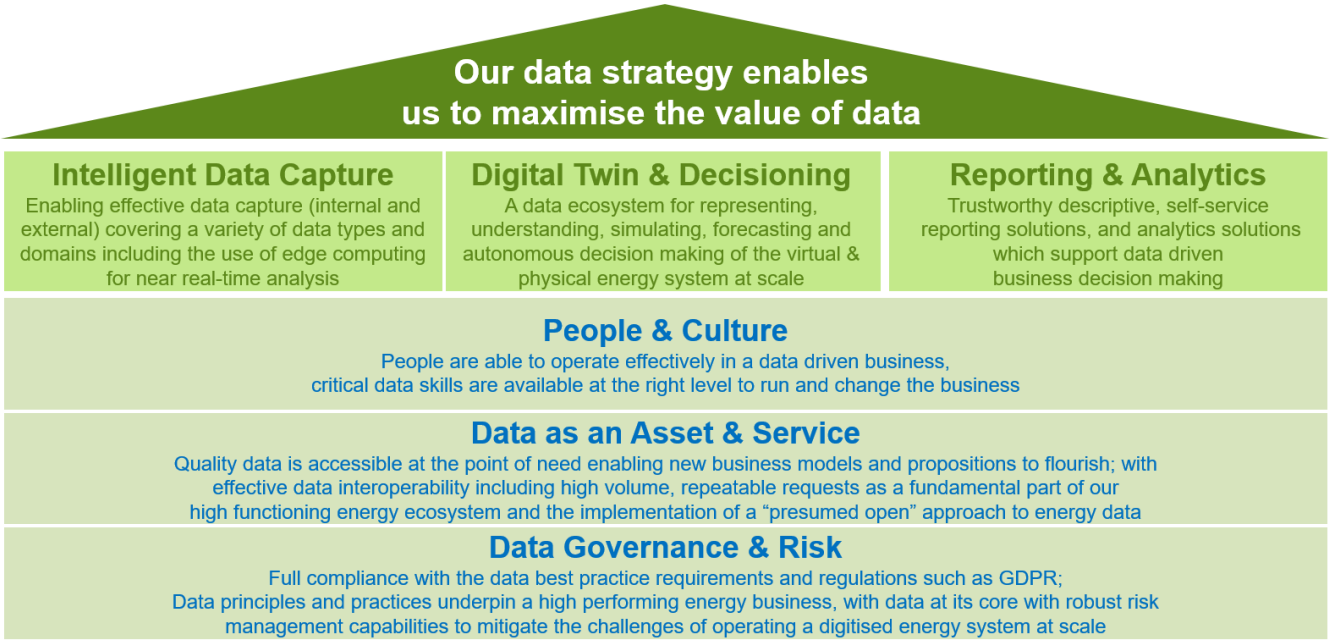


Figure 8 Critical Data Pillars for Sustainable Value

The specifics behind each capability are explored in the following pages. Below is a conceptual architecture view of our anticipated data technology stack at target:

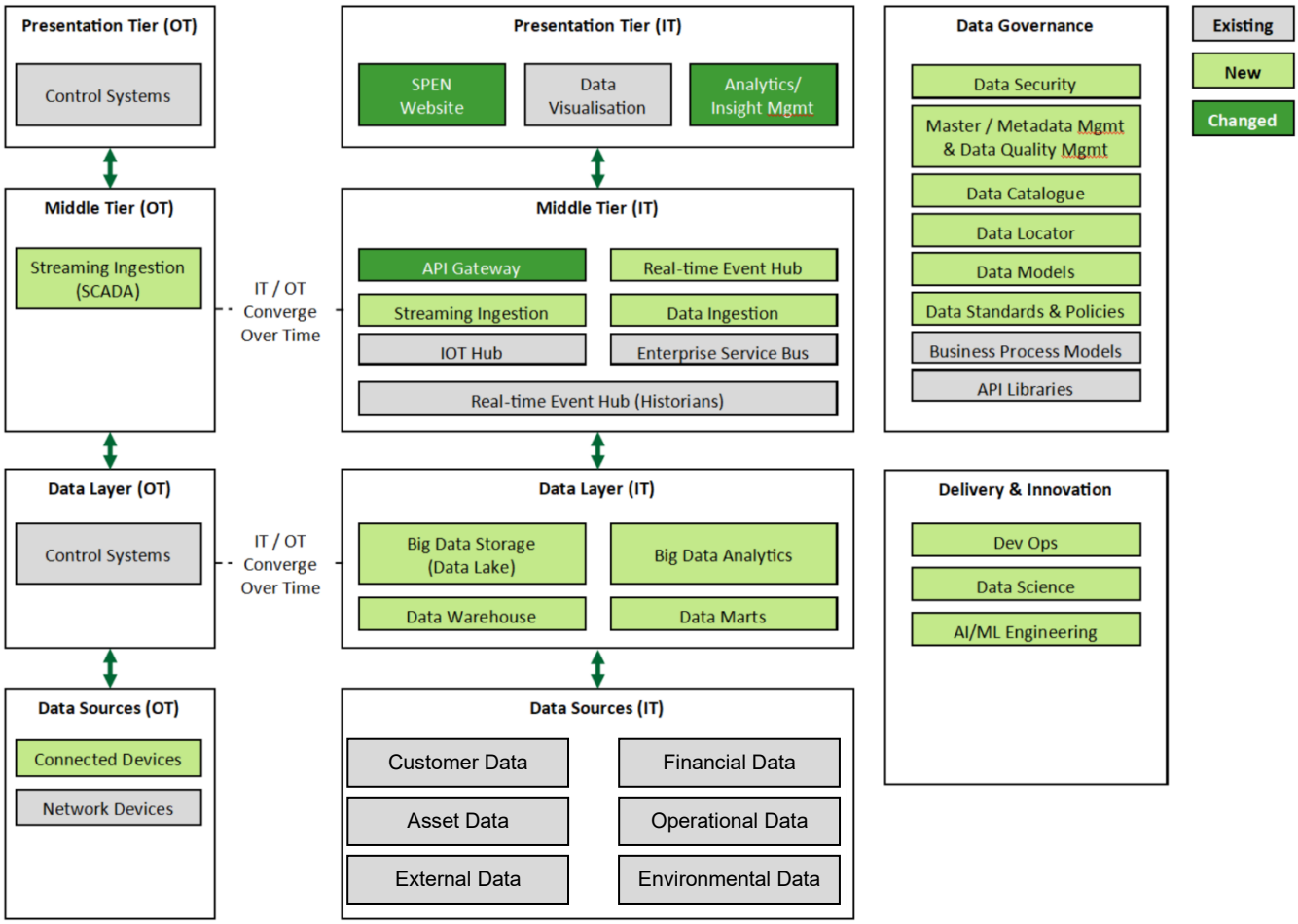


Figure 9 Conceptual View of our Planned Data Technology Stack at Target

4. Implementation Programme

4.1 Our Roadmap

Our proposed roadmap prioritises opportunities for value creation and reflects lessons learned as well as considering the requirements from the Data Best Practice Guidance to build a stable foundation upon which to scale our data capabilities over the longer term. We have also proposed accelerating the initial work on enablers to hit the ground running at the start of the ED2 period. Our approach will balance building foundations, learning by doing and delivering incremental value creation, as demonstrated in our roadmap below:

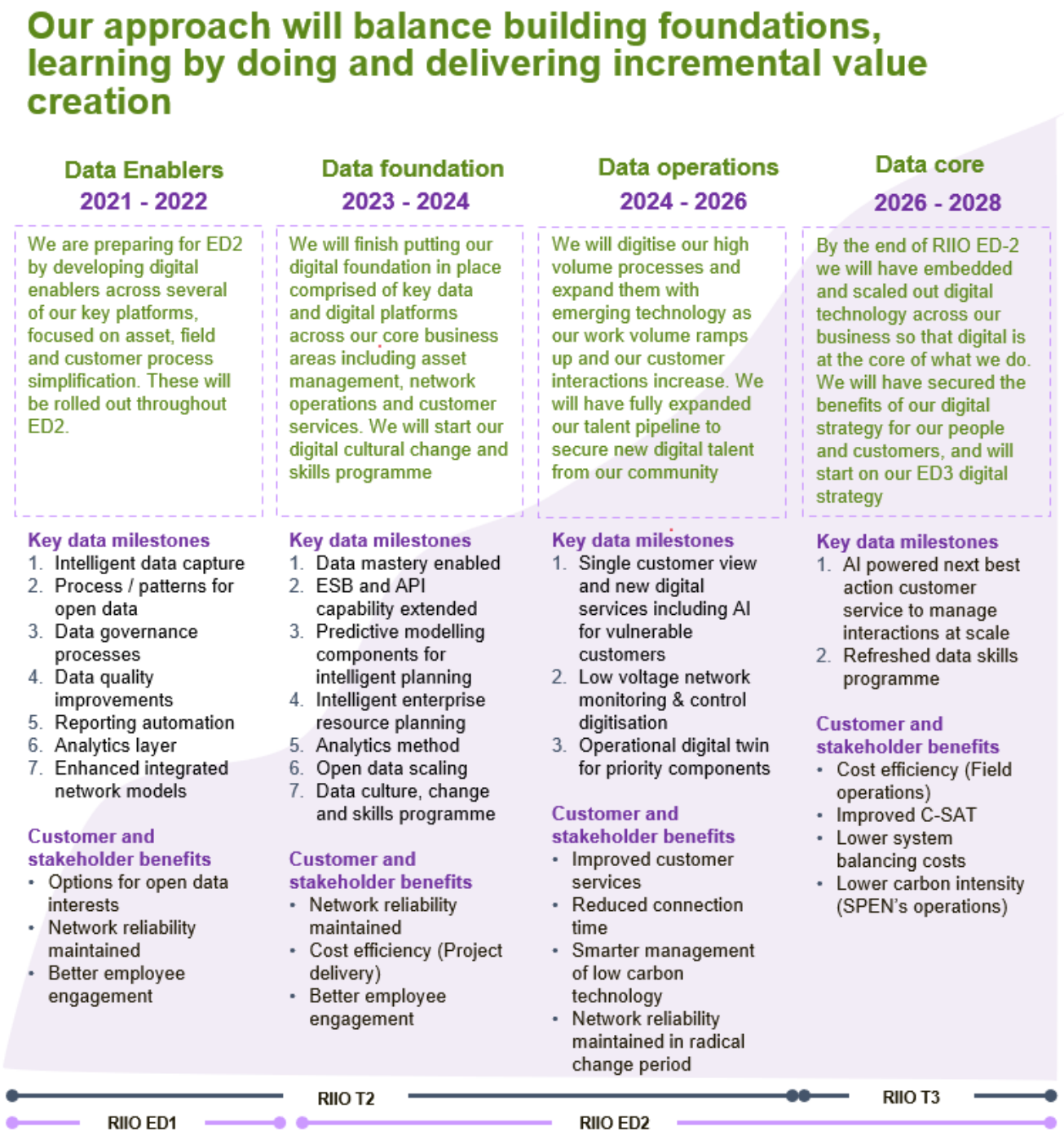


Figure 10 Investment Programme Roadmap

4.2 Stakeholders

4.2.1 Identification

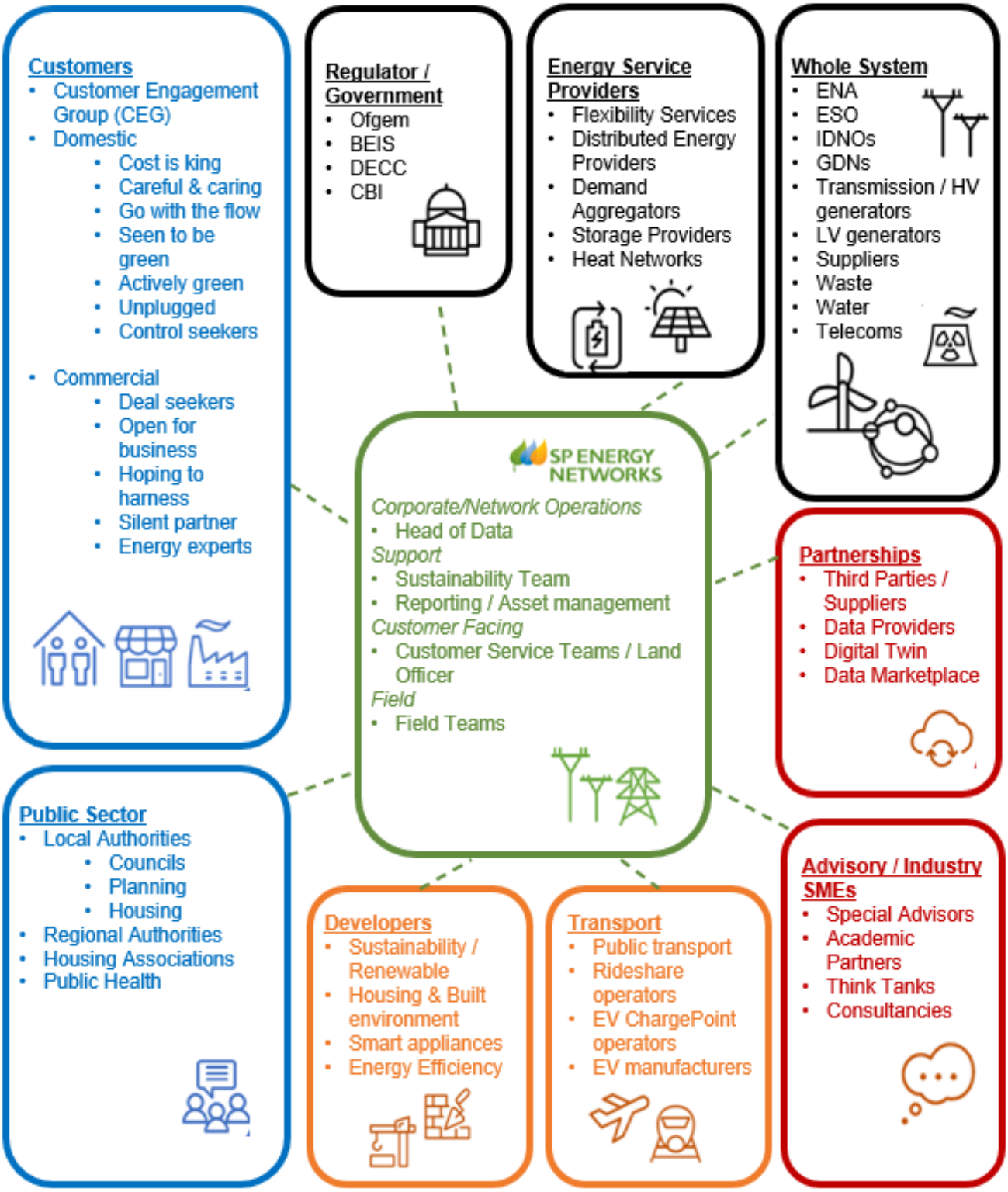


Figure 11 SPEN Digitalisation Stakeholder and Customer Mapping

4.3 Engagement

4.3.1 Stakeholder Impacts

Stakeholder	Impact of Data Strategy
Customers	Enhanced, efficient and scalable solutions for customers to support their evolving energy needs as part of a just transition. Enhanced protection for our vulnerable customers
Regulatory/ Government	Enabling innovation for Net Zero through flexible markets and delivering efficiencies through Whole System solutions
Whole System	Industry collaboration on standards and protocols; sharing best practice; collective action enabled for greater combined impact on Net Zero. Cross vector (transport and heat) solutions to accelerate decarbonisation
Partnerships	Creating new opportunities for partnerships and collaborations which have the potential to reduce costs, increase resiliency of supply and innovate for Net Zero. Collaboration with community energy and helping to facilitate our transition to becoming a DSO.
Advisory/Industry SMEs	Providing data to enable study/ development of new solutions for market
Developers	Data to enable decisions and services including supporting the modernisation of homes to reduce carbon footprint and empowerment of communities and individuals to make and enact more informed decisions about energy usage
Public Sector	Data to enable decisions, and product/ service innovation via flex markets and support local and national government initiatives for a just transition to Net Zero

Table 3 Stakeholder Impacts

4.4 Requirements

The following diagram summarises the structure of our Data Strategy:

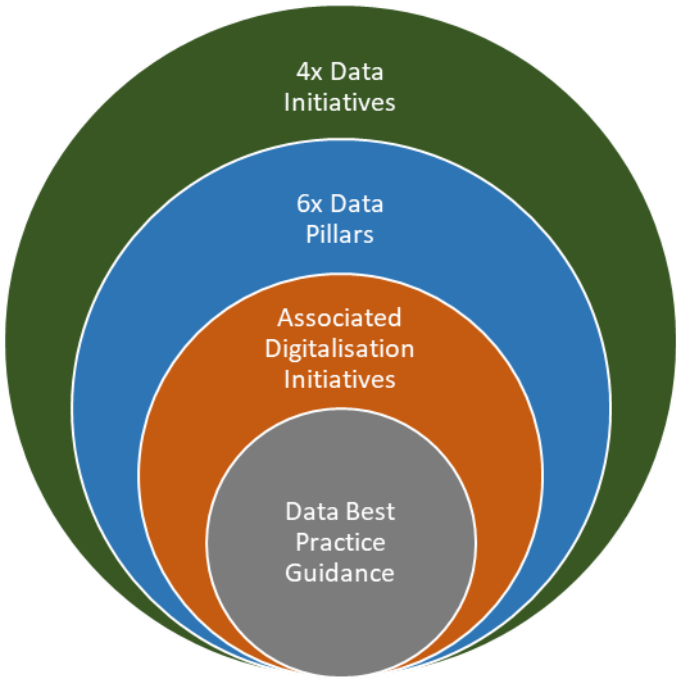


Figure 12 Data Strategy Structure

The Mastery of Data Pillar from our IT & Digitalisation Strategy (Annex 4C.1) includes 4 initiatives:

- Implementation of a Big Data Platform
- Data and Systems Integration
- Operational & Regulatory Reporting
- Data Mastery & Governance

Our Data Strategy is split into 6 Data Pillars:

- Intelligent Data Capture
- Digital Twin & Decisioning
- Reporting & Analytics
- People & Culture
- Data as an Asset & Service
- Data Mastery & Governance

Each pillar from our Data Strategy cross references the relevant technology projects which are detailed further in our IT & Digitalisation Strategy (Annex 4C.1: RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy).

4.5 Value

The delivery of target outcomes will be supported in the following way:

Combined Impact

- Efficiency and better decision making
- Continuous improvement, service personalisation, efficiency, privacy, and trust upheld by improved data quality / methods, flexible services enablement
- Security of green energy supply/ data to support flexible services, transparency of footprint and focus on reduction of Co2

Figure 13 Value Drivers

It is important to note that the 6 data pillars are intrinsically linked, and the values will be delivered through the combined delivery of all 6 pillars. Reduced investment in any of the data pillars will erode the ultimate value potential and diminish the likelihood of success in deploying an effective offering.

For example, if we were to invest in reporting (pillar 3) without a complementary investment in a data as an asset & service (pillar 6) then we may use better visualisation methods to support decision making through data. However, we would be limited in our ability to exploit the full functionality of enterprise reporting tools such as drill throughs or other dynamic features; nor would it be possible to automate data inputs which would miss the opportunity to reduce manual effort and errors associated with reporting, and fail to increase speed to insight. In terms of providing a foundation for more advanced data activities, developing a combined foundation

(of pillars 3 and 6) has the potential to enable more advanced commitments such as digital twin and (supporting capabilities for) AI assisted decisioning.

4.6 Deliverability

The scale of this change is enormous, and we have begun our transition focused on key areas[3] which will provide a good foundation for our journey. We have drawn upon exemplars from other industries and geographies (below). These lessons learned inform our focus and approach to increase our likelihood of success.

Critical Success Factors drawn from external exemplars:

Learning & link to Data Pillar	Company & Context	What they did	Impact
Reporting & Analytics Enterprise views of data and business friendly accessibility are critical for adoption of data assets and reporting/ analytics solutions	**Large Global Pharmaceutical Company** - Limited analytical capabilities due to siloed research data repositories - Inefficiency as research scientists spending too much time looking for "best" repository or source - Inability to effectively share work - Underutilisation of data sources due to difficult user interface	Deployed AWS data lake for self-service analytics: - Enterprise catalogue - Automated Ingestion - Business friendly search interface - Transparency on data quality metrics in catalogue - Shared space to provision and wrangle data	-Better search results - Accessible enterprise knowledge - Improved efficiency - Easily extensible, via a base taxonomy to plug-in new models and data sources
Digital Twin & Decisioning Digital twins have the potential to power action if the right metrics are selected	**Petrofac** - Efficiency/ cost reduction targets ambitious to maximise availability of North Sea assets - Little low hanging fruit left	An Azure based platform collects and amalgamates people and equipment data, providing real time visibility into a site's operational performance	- Increased uptime - Faster decision making - Scheduled safety tasks/alerts - Reduced operating costs through reduced surveys
People & Culture Stakeholder engagement and a culture of experimentation are key to scaling	**Mars** - Inconsistent operator processing - Wastage due to variation in production	A 3D model of the production process was created in Azure Cloud with real time recommendation for operators and forecasting capability and solution scaled elsewhere	- Increased efficiency - Increased stakeholder collaboration for problem solving - Scalable model for problem solving

[3] LV Models, SMART analysis, automated switching schemes, outage prediction, digitised asset maps

Data as an Asset & Service People are at the heart of our data transformation	**Unilever** - Digital manufacturing was trailing behind industry benchmarks - This required end-to-end supply chain digital transformation	- Role modelling from executive - New and changed role profiles - Designed with tomorrow not today in mind - Partnered to bridge skill gaps and support speed to scale	- Experimented proof of concept at 3 sites (fail/test/iterate) before first digital twin minimum viable product - Partnered with technology firms to scale across the organisation - Evolved people culture that supports and embraces scaled digital transformation
Data Mastery & Governance Emphasise the importance of data quality if data is a critical ingredient in the production of generating value	**European DSO** - Aging infrastructure - Pressure to pivot into energy transition/ emerging grid tech	Identified and tapped into 6 value pockets, reorienting their organisation around these: - Predictive monitoring to prevent disruption to operations - Insight alignment with stakeholders for optimal decision - Bottom-up asset planning, modelling changes in energy demand on regional distribution - Health trends for individual assets - Forecasts on distributed energy - Asset portfolio planning	- Faster time-to-market and increased value delivered by analytics

Table 4 Data-related Critical Success Factors of recent Digitalisation and Digital Transformation Projects

4.8 Our Delivery Approach

4.8.1 Change Management, Prosci, ADKAR

Our strategy emphasises the importance of supporting our people throughout this digitalisation journey to deliver a better future quicker. The skills of our people and culture across our business will be critical in determining how successful we are in adopting and using these technologies and methods to deliver on the potential for value highlighted above. Therefore, the section on Digital Skills and Change Enablement within the broader IT & Digitalisation Strategy is a critical enabler in our pathway to becoming a data driven, digital organisation. Internal stakeholders will be assisted by using Prosci change management methodology. This methodology has been selected as the global change management process and will be applied in all Iberdrola Networks Businesses (Neoenergia, SP Energy Networks, Avangrid Networks, and i-DE).

Change management is the approach to driving adoption and usage, so initiatives deliver expected results and outcomes. Applying change management enables organisations to deliver results on each change more effectively and build competencies that grow the organisations capacity to tackle more changes at the same time.

Change management focuses on helping people change how they do their jobs, allowing us to capture the adoption contribution and the people-dependent portion of project ROI.

SPEN are currently increasing the number of Prosci Change practitioners within the organisation to embed the change culture and provide our change practitioners with the processes and tools to build customised, targeted and research-based change management strategies and plans to drive project results and outcomes. We have noted below the tool and method we have adopted from the Prosci toolkit:

The **Project Change Triangle (PCT)** has three strategic elements that reflect the overall health of a project that must be in place and strong in order to achieve project success:

- Leadership/Sponsorship: governance, strategy, and direction
- Project Management: the technical side of change
- Change Management: the people side of change

The **ADKAR Model** is a simple but effective model for managing individual change made up of five building blocks of change: Awareness, Desire, Knowledge, Ability and Reinforcement.

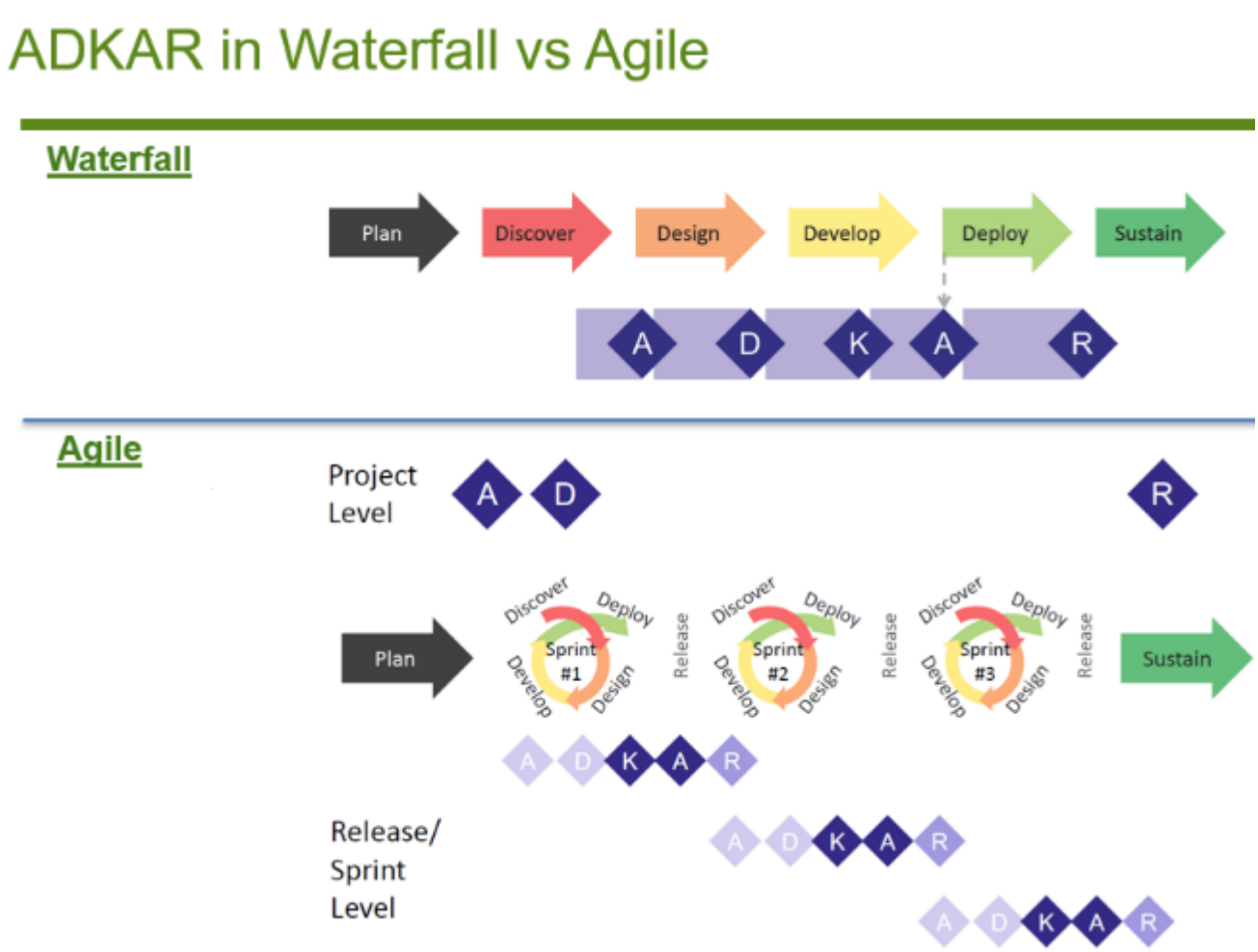


Figure 14 Visual Diagram of the ADKAR Model

4.8.2 Delivery Approach

An agile delivery approach will be used in delivering all data related projects. The Agile Manifesto embodies the following core values:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

Agile is used predominately for projects where subject matter experts need to be involved to ensure stakeholders needs are at the heart of the all solutions built and where complexity and uncertainty are high. In the data context, this is especially important when the value of prototypes and proof of concepts needs validation before the project can be scaled across the enterprise.

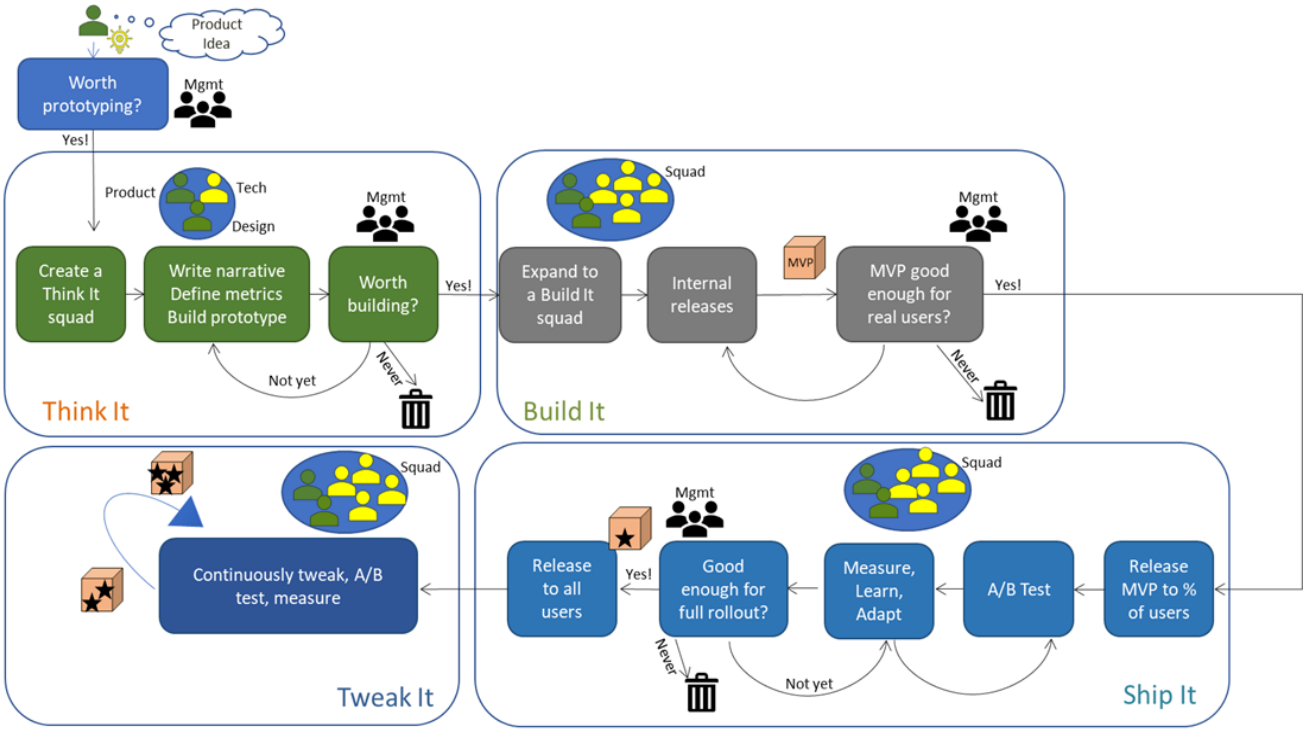
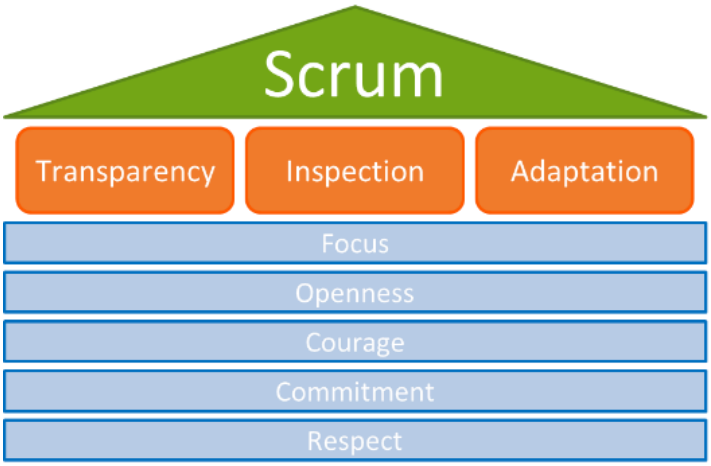


Figure 15 Scottish Power UKIT – Agile Delivery Approach and Development Stages

There are different types of agile delivery methods, SPEN's adopted method is Scrum.

Scrum is a **lightweight**, **iterative,** and **incremental** framework (note – not a process) for managing **complex** work. It is based on empiricism, which asserts that knowledge comes from experience and making decisions based on what is known.

Scrum includes the same types of activities as traditional waterfall projects, but rather than implementing them as sequentially, they are encapsulated into multiple iterations (called sprints) to create a working piece of software (increment). In this way, Scrum builds the application incrementally, with each increment adding and improving features and functionality on top of the output of previous increments.



Empiricism: Knowledge comes from experience and making decisions based on what is known.

Transparency: To make decisions, people need visibility into the journey and the current state of the product

Inspection: To prevent deviation from the desired goal or end product, people need to inspect what is being created, and how, at regular intervals

Adaption: When deviations occur, the product should be adjusted as soon as possible

Figure 16 The Agile Scrum Framework

The core values and principle of the Agile Scrum Framework can be seen in the figure below:

Figure 17 The Agile Scrum Framework – Core Values and Principles

The diagram below gives a visual representation of the scrum process:

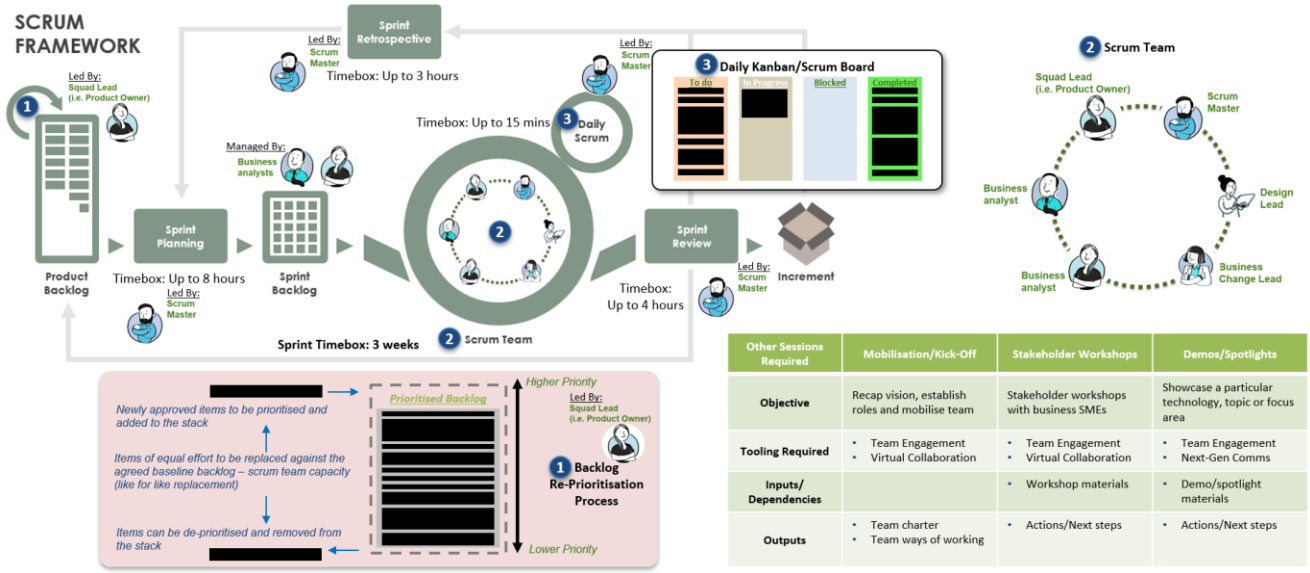


Figure 18 The Scrum Process (showing the main rituals and artefacts)

The make-up of a Scrum team is described below:

1. Scrum Master champions the project and provides help and guidance on both the agile framework and any blockers or barriers.
2. A Product Owner orders the work for a complex problem into a Product Backlog.
3. The Scrum Team turns a selection of the work into an Increment of value during a Sprint.
4. The Scrum Team and its stakeholders inspect the results and adjust for the next Sprint.
5. Repeat

The Scrum team will carry out fortnightly sprints with a set of defined user cases. The deliverables will be pulled from the product backlog by collective team with agreement based on business benefits. The output of the sprints maybe implemented into production dependent on business value.

4.8.3 Data Driven Innovation Approach

According to Gartner, 85% of big data projects fail.[4]

VentureBeat report that 87% of data science projects never make it to production.[5]

Gartner state that “Through 2022, only 20% of analytic insights will deliver business outcomes.”[6]

In 2020, New Vantage published a report highlighting the primary drivers for failure:

Top Challenges to Business Adoption	2018	2019
Lack of organisational alignment / agility	25.0%	40.3%
Cultural resistance	32.5%	23.6%
Technology solutions	15.2%	5.0%
Understanding data as an asset	30.0%	13.9%
Executive leadership	7.5%	7.0%

Table 5 Top Challenges to Business Adoption

Therefore, it is critical that alongside the efforts to deliver solutions with agility (iterative learning, efficiency, a focus on value and pace) that a clear model to support the particular nuances of data driven innovation is introduced to complement the agile and ADKAR delivery ethos and methods.

Our approach to address these challenges is to adopt the SEAL model which adapts the traditional data and analytics model for the big data world that exists today. It will enable us to design analytics and modelling solutions iteratively, delivering results early and incrementally. Our approach will increase the likelihood of successfully scaling analytics solutions and models to achieve their true value potential.

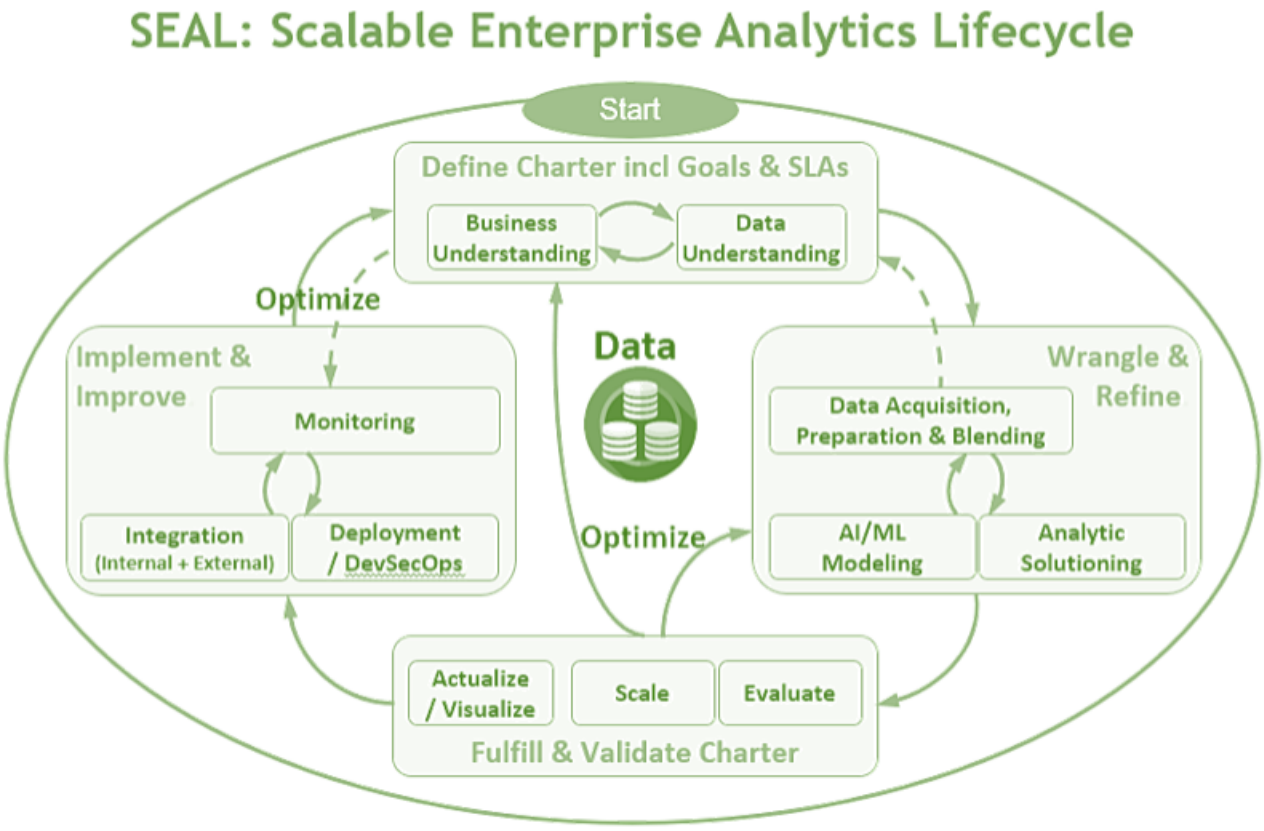


Figure 19 Visual Representation of The Scalable Enterprise Analytics Lifecycle[7]

[4] Gartner, 2017
[5] VentureBeat, 2019
[6] Gartner, 2019
[7] Modernizing the Analytics and Data Science Lifecycle for the Scalable Enterprise: The SEAL Method

Our approach incorporates the following key features:

- **Define charter goals and SLAs** to ensure alignment between business and data experts
- **Wrangling and refinement** will enable us to feature engineer data to ensure its characteristics match its intended usage; and to continuously revisit input data to ensure that the best data is used for models and analytics solutions in the spirit of continuous improvement. (Data wrangling is the process of cleaning and unifying messy and complex data sets for easy access and analysis)
- **Fulfil and validate** to ensure that performance is evaluated and considered prior to scaling; and tag code to stories so that multiple users can iterate to continuously evaluate and improve performance
- **Implement and improve** to support Quality by Design (QbD), Security by Design (SbD), and Privacy by Design (PbD) at the inception of each story

Several feedback loops are inherent in the SEAL approach, such as looping back to the 'business charter' at 'wrangle and refine' once the shape of the opportunity becomes clearer. Likewise, at 'implement and improve' stage for continuous monitoring and performance improvement - critical for actively managing machine learning models as part of a business process. This iterative approach provides a base for experimentation and innovation, enabling us to develop analytics practices and applying these methods to "fail fast" and identify successful solutions to be productionised and scaled.

4.9 Risks and Mitigations

Risk	Severity of Impact	Likelihood	Mitigation
An enterprise-wide view of data cannot be achieved because of a lack of consensus upon the format, sources or definitions for key data items which means that data siloes persist and different results are achieved for key metrics	High – Failure to align on definitions for key data items will mean that these cannot be exposed for use across the enterprise limiting our ability to maximise the value from our data and preventing us from reducing inefficiency and thereby increasing the capacity we need to enable our analytics experts to focus on value creation rather than data preparation activities; adjacent challenges for scaling to support open data would also be material	Medium – There are limited formal procedures for recognising data and controlling that record across business units	• Programme engagement and involvement with data experts (augmented by additional expertise from partners as required) and the introduction of committee structures will ensure that an enterprise data catalogue and metrics are developed and formalised • Data owners will provide a business point of escalation for resolution through to an accountable senior manager

Risk	Severity of Impact	Likelihood	Mitigation
We cannot execute good decisions because we lack clarity on the measures that matter and the skills to use data well which will limit our ability to take action to improve stakeholder outcomes	Medium – Failure to equip our people with the skills and knowledge to interact with data will mean that we can't prioritise the actions we need to take to make the greatest difference	Medium – There will be role families that are materially impacted, and the absorbability of the business will be tested throughout this period so the role of leadership in emphasising the priority of doing data well will be key and avoid falling back on 'intuitive' decision making	• Clear Pre-Ed2 comms about the need for change and the journey will set expectations about the • Options to build skills via role relevant training will be critical
Mistrust of data quality means few people will fully use data to make a difference. This mistrust stems from limited visibility of data, quality assurance measures and the absence of clear routes to resolution on potential data quality issues	Medium – Data is likely to be used (in the absence of alternatives) but the maximum value return won't be achieved	Low – In areas of unfamiliarity users are less likely to invest time exploring potential connections for opportunities to deliver value or to doubt the data when it does/ doesn't support a particular hypothesis	• Validation of data with owners • Automated scans for anomalies/ volatility • Introduction of clear routes to escalate issues will provide more transparency on data quality • Proactive publication of data catalogues will also go some way to assuring users on data accessibility, quality and exposing any relevant health warnings
It's hard to make connections through data because of siloed projects which build out ad hoc data sets which means that there is no coherent data view for analytics	High – There are no common data practices nor learning options nor standardised approaches to enable reuse of solutions	High – Without buy in across relevant practitioner groups there will be significant challenge to introducing the libraries and procedures needed to accelerate the business through the data maturity curve and support practitioners to experiment and scale at pace	• Establish a community of practice drawn from all relevant areas (voluntary basis) which is afforded formal recognition to consult on role change and learning pathways and support the development and adoption of principles and policies for data use, as well as community events • Introduce a baseline level of education on data, principles, and practices

Risk	Severity of Impact	Likelihood	Mitigation
The business' upstream processes heavily rely on EUAs and manual processes because the business processes are not fully digitised which means that the data ecosystem has holes and the fragments may prove insufficient to give confidence in insight to act	Medium – The absence of digitised processes will severely limit the potential for our business to deliver value through data	Medium – The prevalence of spreadsheets and point solutions is high and the pressure to develop new solutions at pace throughout the ED2 period may lead to an increase in technical debt	• Identify the most significant opportunities to deliver value through data • Establish cross functional teams to design and deliver solutions that will digitise upstream processes and apply best practices in data for actionable insight • Support knowledge transfer to business participants to champion the change and promote the benefits to others
The current Cloud stack is an extremely fast-moving environment with many of the technologies on monthly release cycles of new features.	High – This is a hot development area and there are continually updates, new releases and new propositions/ models coming online which have different merits	Medium – This may result in the "best practice" approach changing regularly resulting in disruption or course correction mid project or wasted effort requiring re-work	• The decoupled, "plug and play" style of this architecture will make it easier to adapt/ pivot and connect solutions where change in direction is warranted • Our Agile delivery model should ensure releases are offering incremental value and avoiding long, intensive development periods with limited return
The costs of Platform as a Service technologies is inside of cloud Provider control	High – May have some hidden cost due to egress and ingress of data	High – Variable costs could quickly spiral out of control	• It will be critical that designs and approaches balance performance and cost requirements by default • Proper financial and quality controls should be used to support active monitoring
The technologies in the architectures described in this document are largely new to SP and therefore significant training will be required by the company on the new process and ways of working	High – Time & cost – this may increase time to train and deploy and suboptimal performance of solutions	Medium – There are mechanisms available such as expert resources via Factories upon which the teams can draw down expertise, but execution will still be a challenge	• Role relevant training, assets, and playbooks to mitigate issues due to poor practices • Data principles and policies for good decisions • Delivery partners who guide and limit our exposure to risk through past experience

Risk	Severity of Impact	Likelihood	Mitigation
A Data Lake can become unmanageable if rigorous folder management is not adopted	High – Cost, quality and performance will all be impacted negatively without a good design	High – Ambiguity around terms of use and a lack of accountability for enforcement actions on poor practices will most likely lead to issues	• Accountable Exec for data practices supported by new virtual data governance organisation • Playbook and policies (terms of use) introduced • Committee structure introduced to support engagement, awareness and enforcement actions where required based upon regular reviews of use
A well-defined support model is not currently in place for all the technologies featured	High – Cloud provider may not provide support for some services	Low – The approach and governance processes of the organisation ensure that solutions must have appropriate support models in place before productionisation	• The process of solution selection and implementation must ensure SPEN's suppliers are able to make appropriate commitments to support the service
If data is downloaded to a non-corporate device, or, used incorrectly by a malicious user, there is a risk that the organisation may fail to meet GDPR compliance	High – Failure to comply with GDPR and DPA regulations	Low – Access controls within tools will plug into (staff), ID&V (customer) and authentication (3rd parties) together with access controls for data (around privileges	• Cyber policy and protocols will mitigate risk to solutions from malicious external attacks • Policies and associated controls (overseen by Committee and Exec sponsor) will limit exposure internally and via approved users/ devices • Protections to mask or otherwise obfuscate or anonymise any data deemed to be higher risk will be considered by committee in line with the policies to be developed
Data storage may grow exponentially resulting in significantly more cost than envisaged	High – Cost is largely based upon volumes of data and use of compute power	Low – Sizing estimations have been externally validated with Accenture based upon industry standard	• Estimations already account for a 15-20% CAGR • Continual monitoring of use and culling of underutilised storage or tables will be considered both in the interests of cost and good practice

Risk	Severity of Impact	Likelihood	Mitigation
Cyber security procedures do not permit effective use of streaming technologies for OT data (OT/IT)	High – Would prevent delivery of real-time use cases	Medium – Emerging area of focus in a rapidly changing field of energy management requiring discovery and testing	• Work closely with Cyber / IT security early in project to evaluate tools and address any concerns early •
Integration tooling is not scaled effectively for the demand level	High – Tooling could fail resulting in delayed responses to requests	Low – Use cases will provide an opportunity to estimate impacts prior to go live and size solutions accordingly	• Agile delivery will encourage prototyping, piloting and regular review and improvement • Monitoring of solutions and latency to support a degree of contingency will be part of an active management procedure
Mistrust of data prevents data driven decision making and failure to apply data methods for improved business performance	High – Shifting the culture of the organisation may be as challenging (if not more) than implementing technologies and processes and consultations with business teams indicate a lack of trust of data quality already exists	High – Failure to collectively identify what data is important, to evaluate its quality and the balance of risk in the round, and the absence of formal mechanisms for redress (on an ongoing basis) all serve to undermine the perception of data quality even where no issue exists and to distract efforts from evaluating and addressing material issues for priority data that needs to be of a sufficiently high quality for key use cases	• Shared information on data items, definitions, sources, and metrics • New mechanisms for meta and master and data quality management • New responsibilities for data ownership and stewardship • Increased awareness and emphasis on good data practices through role relevant learning and comms • Committee structure with oversight on data roadmap and data governance including quality management

Table 6 Implementation Programme Risks and Mitigations

5. Data Maturity & Compliance with the Data Best Practice Guidance

5.1.1 Overview

We have evidenced our commitment to complying with the Data Best Practice Guidance throughout our Data Strategy. We will increase our maturity in the lead up to, and throughout the duration of ED2. In doing so, we aim to shift our culture to being more data driven, and subsequently improving processes, opening up our data and providing collaboration opportunities which will allow us to drive forward while keeping up with the changes that working towards a low carbon, flexible energy marketplace will require us to meet.

Below shows a data maturity model which highlights the ‘art of the possible’ of how we can maximise the value of our data as a DNO, and as we transition to a DSO facilitating Net Zero:

SPEN Data Maturity Model

Data Strategy Pillars

1. Intelligent Data Capture
2. Digital Twin & Decisioning
3. Reporting & Analytics,
4. People & Culture
5. Data as an Asset & Service
6. Data Governance & Risk

Value

Maturity Level	Enabled Data Capabilities	Top Use Cases
Level 5 Industrial: Data as the fabric of business operations and a differentiator for the business	1. End-to-end and enduring data tooling across governance, quality, and master data management 2. Autonomous decisioning for asset & network, AI & ML assisted optimisation 3. Enterprise-wide analytics, AI & ML driven decisioning, single unified data landscape & ecosystem 4. Data literate workforce, highly digitally engaged, data science team, and digital services factory 5. Full product ownership of data – data products either created in-house or sourced externally 6. Clear CDO / data stewardship, data design authority and data management committees	• Cognitive analytics • Real-time and on-demand analytics & reporting • DSO market operations, flexibility services optimisation, carbon analytics • Full digital twin with predictive capability • Digital services factory
Level 4 Critical: Inclusion of strategic and business services	1. Established governance, MDM, & data quality tools, with use of a data catalogue/locator 2. Prediction of asset and network operational scenarios with next best action recommendation 3. Enduring reporting & analytics platforms, RRP transformation & integration 4. Advanced data engineering and data science skills, leading data skills thought leadership 5. Interoperability with whole system through open data, new uses being piloted for scale 6. CDO function mobilised with clear roles and responsibilities for data governance & risk	• Predictive analytics • Operational & regulatory reporting integration with open data • Connected asset / construction / worker • Drone and LiDAR asset inspections data accessible
Level 3 Beta: Data is being scaled across the organisation and used to support digital services	1. Maturing governance, data management & data quality tools, IoT/Smart devices for operational use cases 2. Scenario planning, prediction of network constraints & faults, real-time event monitoring 3. Advanced insights portal with self-serve/on-demand analytics & reporting, open data integration 4. Advanced data architecture, modelling, and visualisation skills, participation in open data forums 5. Deployment of enterprise service bus and open API library (to expose data externally) 6. Data owners and data stewards identified & onboarded, governance & risk processes mapped	• Descriptive analytics • Reporting & analytics insights portal • Single view of customer / plan / asset • Field work management enhancements / field device upgrades
Level 2 Organised: Strategy in place with limited implementation	1. Basic data management and data quality tools, IoT/Smart devices for non-operational use cases 2. Mature digital representation of assets and network with integration across systems 3. Basic insights portal with data visualisation, minimal system integration with data sources 4. Limited enterprise data architecture and modelling skills 5. Big data platform, ingestion of some early open data, centralisation of external data hub 6. Basic hub and spoke model deployed with key data roles identified	• Descriptive analytics • CRM and customer service enhancements • Integrated network modelling, external exposure of network connectivity model and constraint information
Level 1 Ad-hoc: Data is not co-ordinated with no strategy in place	1. No interconnected data tooling, some discrete data applications 2. Basic digital representation of assets and network, no integration as data spread across systems 3. Ad-hoc reporting only, no system integration with operational data sources or data warehouse 4. Low or no data literacy and skills 5. Point to point use of data, with no appreciation of future use cases or value 6. No data operating model or formal risk management	• Ad-hoc reports typically based on extracts • Basic operational and RRP reporting • Network connectivity model and asset management records

Figure 20 SPEN Data Maturity Model

5.1.2 SPEN Data Maturity Assessment

We have assessed how each of our Data Strategy pillars contributes to the 11 Data Best Practice Principles; these are presented through the document based on our 6 data pillars. In addition to assessing how each pillar contributes individually to the adherence of the guidelines, we have completed a Data Maturity Assessment to present the maturity collectively across different areas of the business.

The below assessment has been undertaken on a scale from 1-5, based on the scale used above. Our goal, through our Data Strategy, is to move to a level 3 or 4 during ED2 with focussed attention on specific initiatives that will create the greatest value and deliver the best outcomes for our stakeholders. In all cases, ensuring industry standards (where these are emerging) and Data Best Practice Guidelines are leveraged to increase the combination of whole system efforts through enhanced interoperability. This has been completed and plotted on a spider diagram to visualise current position vs. target state. A detailed description of current vs. target state for data can be found at the bottom of this section.

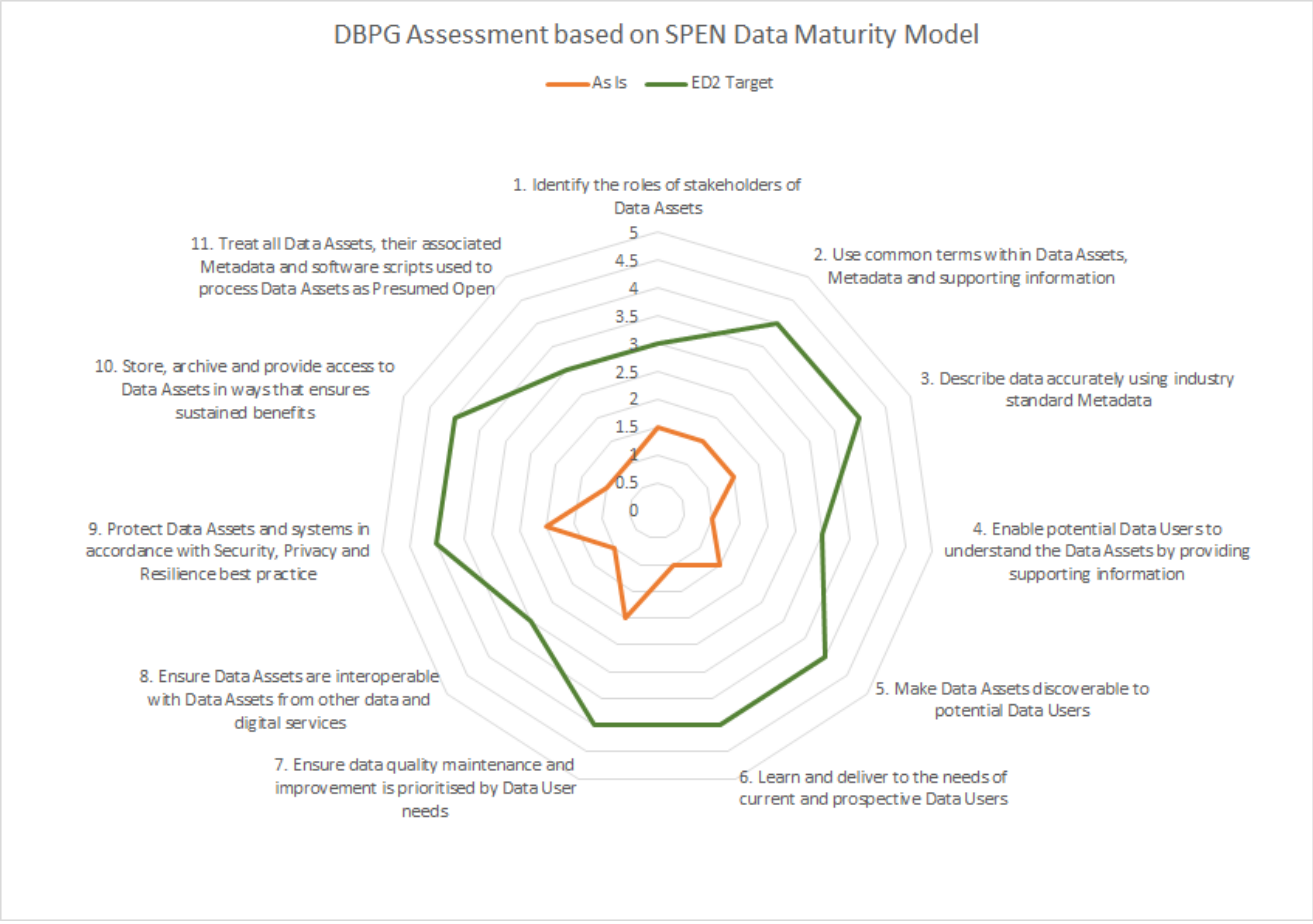


Figure 21 Data Best Practice Guidance Assessment based on SPEN Data Maturity Model

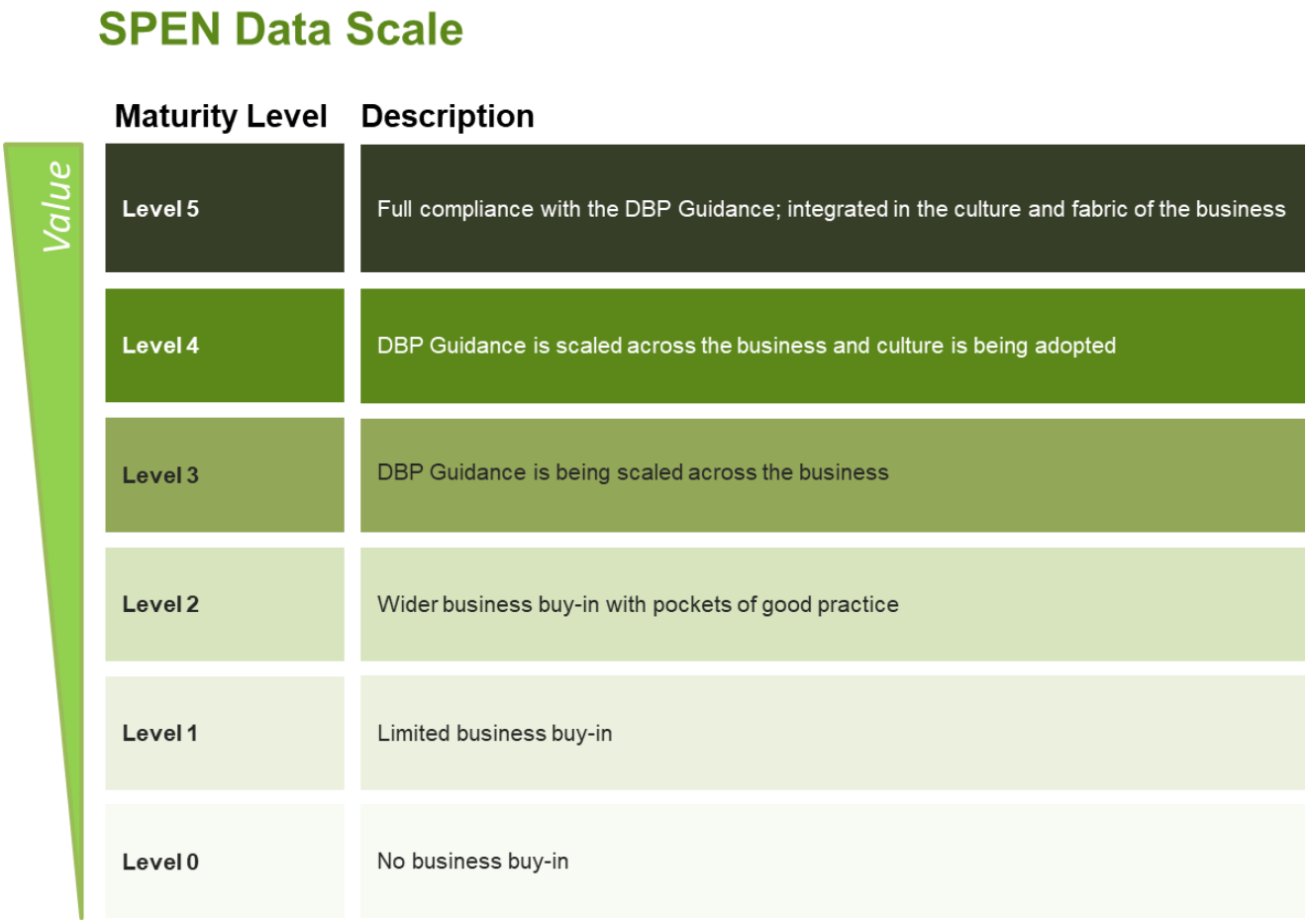


Figure 22 SPEN Data Scale Model

5.2 SPEN Data Scale Assessment

In addition to the detailed analysis of how each of the 6 data pillars within this strategy contribute towards achieving compliance with the Data Best Practice Guidance, assessments have been undertaken for the 11 Principles based on the SPEN Data Best Practice Scale above. This was undertaken for 5 key data ontologies held within SP Energy Networks (Asset, Customer, Operational, Financial and Regulatory) to give an average view of where we believe our 'starting point' is for achieving compliance with the principles set out in the guidance.

The below assessment has been undertaken utilising the SPEN Data Best Practice Scale above and plotted on a Spider Diagram to visualise the delta between current and target state (full compliance). A detailed description of current vs. target state for data can be found at the bottom of this section.

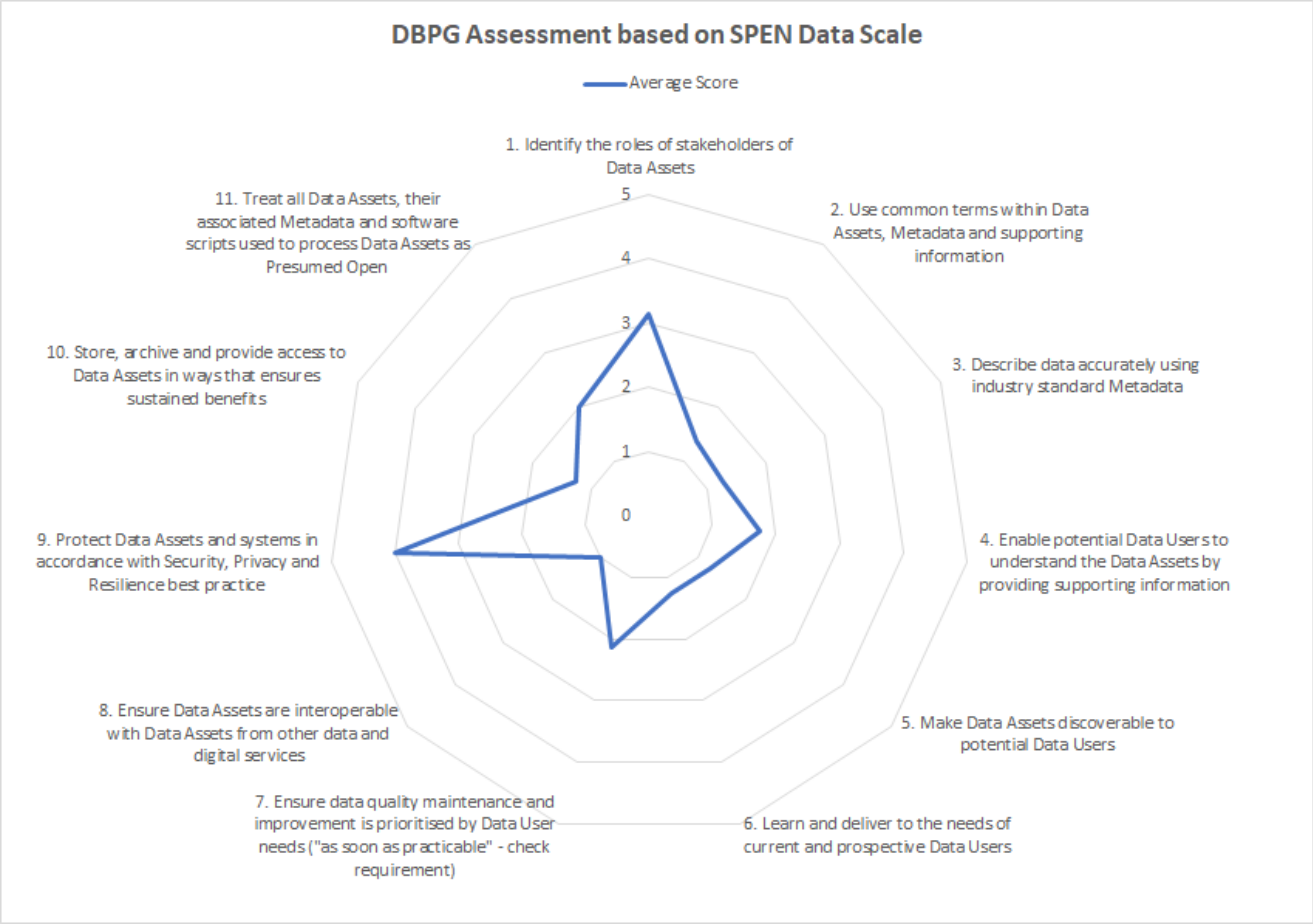


Figure 23 Data Best Practice Guidance Assessment based on SPEN Data Scale

The following table summarises our assessment of our current and target state of compliance with the 11 principles of Ofgem's Data Best Practice Guidance:

No.	DBP Principle	Our Current State	Our Target State
1	Identify the roles of stakeholders of Data Assets	From an asset data perspective, we have a long-standing Data Governance forum supported by all Operational Directors, weekly data review meetings and established documentation which outlines key roles and responsibilities, supported by weekly and monthly reports. Our energy data hub enables us to share data and to capture feedback from external stakeholders. We have participated in the ENA's data request form and the National Energy System Map projects. We have also engaged with IceBreakerOne's Open Energy project, Ofgem's LTDS and the wider EDiT review. All of which has enabled us to build a picture of stakeholders and their requirements for energy data.	A senior leader will be responsible for setting out the role of data in our organisation and the practices to be used. They will also be accountable for chairing the committee(s) responsible for implementation of those practices including operation of a stakeholder log as part of our role as a Data Custodian. SPEN is a Data Custodian and Data Controller in an ICO sense. There are instances where Data Subjects and Data Processors come into play. We will set clear expectations about our data practices for Data Subjects and exercise the appropriate the duty of care. We will highlight the relevant practices and the responsibilities that Data Processors must uphold to ensure security, privacy, ethics, commercial sensitivity, and public interest are considered by design.
2	Use common terms within Data Assets, Metadata and supporting information	We use a data mastership model across our enterprise systems for physical assets and manage relationships through system interfaces and exception reporting. However, not all of our data assets currently use a common vocabulary. We recognise the importance of adopting a commonly taxonomy which is recognisable for other organisations.	Conceptual data models will be introduced for key systems and we will progress to describe data with industry standard metadata (once standards are clear; we are participating in Icebreaker One activity to support discussions around standardisation); SPEN will introduce a set of standards and guidelines to be followed in the creation of logical data models, and governance processes to oversee the implementation of metadata standards.
3	Describe data accurately using industry standard Metadata	Information on physical assets is shared across systems based on the mastership model and the need for data in the systems based on operational and asset management requirements. We do not currently use an enterprise metadata management tool, and therefore, metadata held on our Data Assets is of varying levels of detail.	Our Data Strategy will introduce metadata management templates, mechanisms, and processes for its use. We will apply these to the data exposed via our energy data hub. And we will seek feedback on the application of metadata standards from our stakeholders, implementing a process of continuous improvement.
4	Enable potential Data Users to understand Data Assets by providing supporting information	We recognise the need to improve supporting information on our Data Assets for the benefit of end users. We don't actively maintain a data catalogue currently with supporting information for each data asset and support the establishment of industry standards, protocols, and glossaries to facilitate data understanding.	SPEN will label data with appropriate keywords to enable understandability and will incorporate additional requirements as identified through engagement with our stakeholders.

5	Make Data Assets discoverable for potential Data Users	Our energy data hub webpage enables us to make data sets available to potential data users; however, there is limited functionality for users to search for data sets. This will be enhanced as part of our Data Strategy.	SPEN will aim to establish a searchable index of data (compatible with Natural Language Processing retrieval), data maps and dictionaries to facilitate understanding of the data that exists so as to make it more visible and accessible for more people. Data roadmaps will guide potential users as new data points come onstream. A range of stakeholder engagement – for both internal communities of practice and external users via open data – will be supported (e.g. alerts for data subscribers, clinics to showcase how to use new data and the features, and other means of engagement such as hackathons for key use cases) to boost awareness and take up.
6	Learn and deliver to the needs of current and prospective Data Users	Requests are triaged upon request. In collaboration with ENA's Open Data working group we have run a POC this year which allowed a number of mock requests to be tested, followed by real requests from 'critical friends' resulting in a 5-day response service to requests. See also principle 1.	SPEN will work in collaboration with others to understand current and future users of energy data, their needs, and expectations. We already participate in a range of industry fora to understand emerging topics of interest and have scheduled workshops with stakeholders to better understand their interests. We will provide mechanisms for data users to provide feedback on published datasets and to suggest potential new data sets to be proposed.
7	Ensure data quality maintenance and improvement is prioritised by Data User needs	There are pockets of sampling and triage and correction activity which is prioritised by materiality; but this approach is not industrialised consistently, nor scalable and is not supported by DQM solutions. Within our Asset Data team, we run a wide variety of compliance and integrity reports weekly/monthly to maintain data quality and veracity, outputs of these reports are then shared with business users for feedback and quality assurance purposes. Actions identified are noted and updates made to the asset register as required. This also includes a range of visual dashboards for users to identify issues and feedback relevant information on assets.	SPEN will make reasonable efforts to ensure that the data is accurate and rectify material issues when they arise. We will introduce Master Data Management to help us look after our data and new processes to manage data quality issues. We welcome the assertion that that we should not view data quality as a barrier to opening datasets; and recognise the value in the learning opportunity highlighted by the Kaggle competition in the guidance.
8	Ensure Data Assets are interoperable with Data Assets from other data and digital services	Our Data Strategy has a strong focus on data interoperability to make data available to end users at the point of need. We recognise the importance of seamless integration of both internal and external data assets. We have implemented an enterprise service bus for internal data exchange and are developing an API gateway which will provide	We plan to invest in enhancing data interoperability to share and port data with ease between different systems, organisations, and individuals to support user needs. We will minimise friction between systems by adopting common interface standards, standard data structures such as CIM, and reference data matching. We will use APIs externally, ESB for operational data and bring together valuable

		the platform for external data sharing.	connections through data analytics enabled data lake for reporting and insight purposes.
9	Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice	Projects and services are evaluated during planning to ensure that they are risk assessed and compliant with relevant regulation and security standards. Appropriate review procedures (reflective of the service or project in question) are formally agreed and accountabilities assigned. Our nascent data triage process is applied to external requests for data.	Please refer to the content in our Cyber Resilience IT Plan (Annex 4C.5 Cyber Resilience IT Plan). We will implement active management/ curation of environments and data sets to ensure adherence to regulations such as DPA, GDPR and also to remove redundant data sets.
10	Store, archive and provide access to Data Assets in ways that ensure sustained benefits	We do not have processes in place to engage with stakeholders when archiving Data Assets. We recognise the need for robust processes to ensure risk of Data Assets being unintentionally or maliciously deleted is minimal. This will be included within our Data Strategy.	We will review on a scheduled basis the data assets we manage and develop the appropriate data lifecycle measures. We will seek stakeholder views on the storage method and formats of any archived data. We will ensure that all data that does not meet appropriate retention criteria is permanently deleted.
11	Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets as Presumed Open	We are in the process of defining our Open Data Triage processes and trialling these on our publicly available Portal.	We will actively consider Privacy, Security, Negative Consumer Impact, Commercial and Legislation and Regulation in making proactive decisions about data on common assets. We will operate a robust Open Data Triage process and consider requests for new data with due consideration and transparency. Where we determine that opening up a particular dataset breaches our risk tolerance, we will be transparent in our decision and provide a mechanism for challenge and appeal. An incremental approach to triage and due consideration for impact assessments and regulatory protections is a key part of our planned Open Data process. We will actively consider the risks of combining datasets which may introduce new or changed levels of risk exposure.

Table 7 Data Best Practice Principles: Current vs. Target State

6. Pillar 1: Intelligent Data Capture

6.1 Scope

We anticipate a proliferation in the number of devices being plugged into the data ecosystem for the networks business during RIIO-ED2. For example, more than 14,000 new sensors plus a considerable number of new smart assets will begin producing real time streams of non-control information which will be used to support decision making. These new data streams will enrich existing data on network capacity and provide a deeper understanding of asset performance.

Field devices will also benefit from enhanced functionality, as processes become digitalised across the period of ED2, leading to new data streams and a requirement to store new types of data. As a result, we will create more opportunities for staff and customers to directly capture and interact with data, to tap into its potential for value, and to validate or correct quality issues. Furthermore, customer tooling will be enhanced to deliver a more personalised experience, based upon relevant data, to enhance our customer relationship management (CRM) offering. To support this rich data ecosystem, we will introduce a common fabric for integration, using common terms.

By creating a repeatable model for plugging into an enterprise service bus our integration platform will have the capability to create solutions that enable users to view, capture, and update data. Data capture actions will be templated providing context for the data at the point of entry, and role-based access controls will provide an automatic audit trail throughout the data's lifecycle.

Our applications and digitalised processes will be easy to interact with. Data management will happen behind the scenes making our stakeholders' and our people's interactions with data feel seamless and intuitive. By providing this fabric, we will ensure that the right data is available to the right people at the right time.

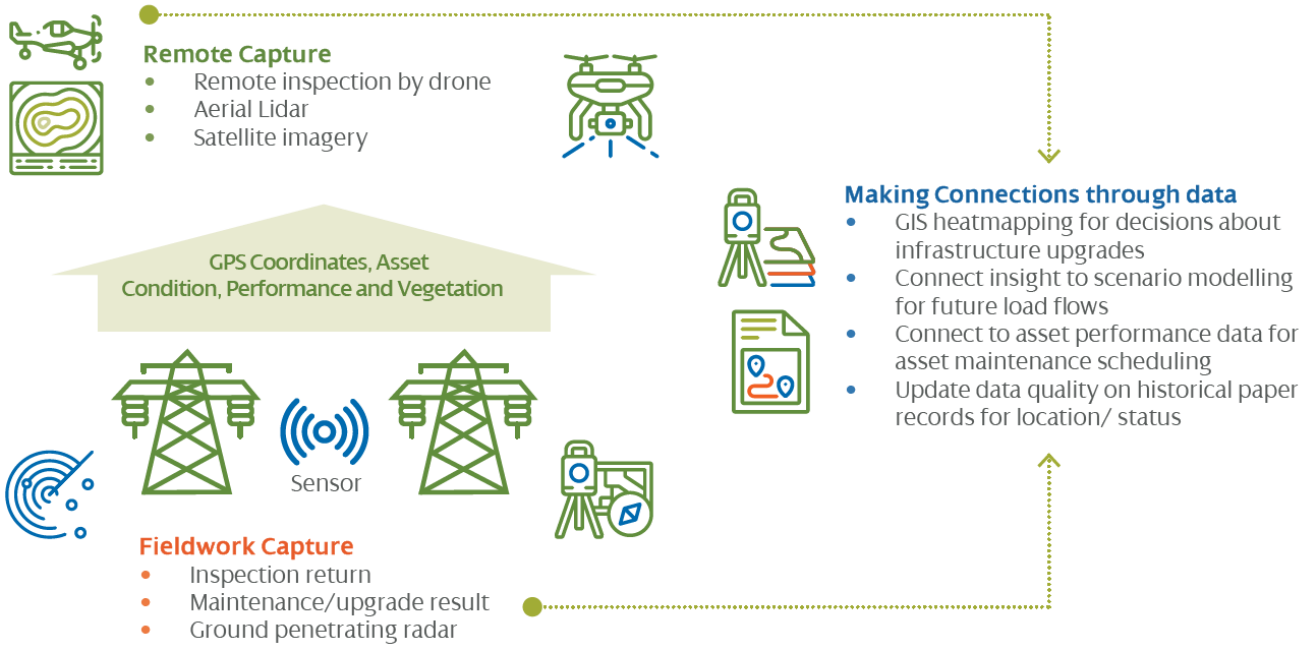


Figure 24 Asset data from a range of sources will be captured, classified, and organised so that valuable connections can be made between the data

6.2 Value

The following table outlines the value that the 'Intelligent Data Capture' pillar will generate throughout ED2:

Value for Money	Customer Service/ Experience	Stakeholder Engagement	Reduce Carbon Footprint	Facilitate Net Zero Transition
- Business will increase value derived from data - Reduction in CI/CML penalties - Reduction in cost for network upgrades through using data to drive asset maintenance /upgrades - Predictive models will be created to predict when faults may be more likely to occur	- Field workers will have greater visibility of assets, therefore able to understand and resolve issues quicker - Predictive models can be created to predict when faults may be more likely to occur, and therefore can be actioned in a shorter space of time - Fewer staff required to capture data; frees up staff to undertake more value-add activities	- Environmental team can have greater visibility of environmental risks - Greater data captured will result in more data being exposed through our open data portal - With greater insight into our network and surrounding area, this will result in more collaboration opportunities opening up	- Fewer engineers having to travel to sites for foot patrol, therefore reducing the number of vehicles required - Network upgrades can take place when necessary rather than prematurely - Capture of new environmental data enabling environmental impact to be measured and taken into consideration in decisions	- Greater transparency of the network will ensure security of green energy supply - Facilitate connection of maximum volume of LCTs

Table 8 Intelligent Data Capture: Value

6.3 Dependent Digitalisation Initiatives

The technology solutions supporting this data pillar are detailed within our Annex 4C.1 IT & Digitalisation Strategy. The following sections summarise the interdependencies.

6.3.1 Connected Assets

Data captured should be made accessible in line with industry standards such as CIM to ensure that datasets can be linked. Asset data should be indexed, searchable and accessible to connect to adjacent data sets for analysis. Beyond SP Energy Networks (SPEN) owned data, the ingestion (with a view to making accessible) of datasets such as land use, biodiversity, satellite, weather data or other types of data from external data will be supported. (See Annex 4C.1 IT & Digitalisation: 4.2 – Connected Assets).

6.3.2 Connected Worker

Field access to data from enterprise asset systems including SAP and GIS will be supported to provide onsite visibility of assets, built-in data validation and error handling by design. (See Annex 4C.1 IT & Digitalisation: 4.3 – Connected Worker).

6.3.3 CRM Platform & Customer Service Enhancements

Customer data including photographs and videos which refer to our assets and will be captured in the field and easily transmitted for storage within the Data Lake. These records will then be searchable and accessible (via data entity mapping and meta data tags) to establish a view of each customer and an easy to search index of useful text and non-text materials with context such as geographical reference points, asset labels, and more. Having all of this customer data based in one platform will allow us to create a 360-degree view of all our relevant customers' data and provide this in a context sensitive manner to our operations staff. (See Annex 4C.1 IT & Digitalisation: 3.1 – Customer Relationship Management Platform (CRM)).

6.3.4 DSO Market Operation

We will leverage best practice exemplars and industry standards to support data exchange externally with a range of stakeholders to drive the transition to DSO. We will participate in the relevant industry fora and share data to enable widespread understanding of the DSO model and the various roles involved. Our FUSION project (Fusion - SP Energy Networks) is trialling the use of the Universal Smart Energy Framework (USEF) as part of our transition to DSO. USEF provide a framework for a flexibility market model and defines the data exchanges between the different actors enabling flexibility markets to operate at the lowest cost. (See Annex 4C.1 IT & Digitalisation: 6.2 – DSO Market Operation).

6.3.5 Engineering Net Zero Platform

Our Data Strategy will support the backend data structures that underpin the entity models needed for our Engineering Net Zero platform. This digital twin of our network is a key element of our digitalisation strategy, enabling our customer self-service portal, our planning of network changes, the connection of low carbon technologies and the coordination of flexibility services amongst other things. Our Data Strategy incorporates quality assurance mechanisms and leverages our systems integration solution for data exchange to ensure the data needs of our internal and external stakeholders are met. (See Annex 4C.1 IT & Digitalisation: 5.1 – Engineering Net Zero Platform).

6.3.6 Open Data

We will continue to engage with industry initiatives to shape and develop solutions for discovery, accessibility, and enablement of shared and open data. We will consider a range of stakeholder needs including supporting customers through upgraded mapping with more detail around capacity and flexibility to achieve a better overall picture of our network to support decision making around connection needs. (See Annex 4C.1 IT & Digitalisation: 6.3 – Open Data).

6.3.7 Big Data & Analytics

We will develop a big data platform for data to be stored and subsequently analysed effectively. This will ensure that value can be derived easily from the data captured from the sensors and field devices that will be introduced to our network as well as open data that we consume as an organisation, data from the likes of social media and customer communications, data from contractors and all media captured through devices. New methods for data storage and processing will allow data to be ingested, stored, transformed, and then presented – through analytics – in an understandable way. There will also be a reporting layer to present users with the data they require. Having this in place should allow us to be better placed in having a 'Single view of the Customer'. (See Annex 4C.1 IT & Digitalisation: 8.2 – Big Data & Analytics).

6.4 Mapping to Data Best Practice Guidance

'Pillar 1: Intelligent Data Capture' supports the following Data Best Practice Guidance Principles:

1. Identify the roles of stakeholders of Data Assets
2. Use common terms within Data Assets, Metadata and supporting information
3. Describe data accurately using industry standard Metadata
4. Enable potential Data Users to understand Data Assets by providing supporting information
5. Make Data Assets discoverable to potential Data Users
6. Learn and deliver to the needs of current and prospective Data Users
7. Ensure data quality maintenance and improvement is prioritised by Data User needs
8. Ensure Data Assets are interoperable with Data Assets from other data and digital services
9. Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice
10. Store, archive and provide access to Data Assets in ways that ensures sustained benefits
11. Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets a Presumed Open

Figure 25 Intelligent Data Capture: Mapping to Data Best Practice Guidance

The following table describes how the activities in this pillar contribute towards our compliance with the principles of the DBP Guidance:

No.	DBPG Principle	How we will fulfil the DBPG principle
2	Use common terms within Data Assets, Metadata and supporting information	We will introduce metadata standards and management solutions to enable us to describe our Data Assets using agreed and appropriate terminology to meet the needs of our internal and external stakeholders. Our metadata will be treated as a data asset with appropriate governance mechanisms in place to ensure its completeness and quality.
3	Describe data accurately using industry standard Metadata	We are about to pilot IceBreakerOne's ontology and metadata record template to create meaningful metadata tags which are human and machine readable for a priority use case, with a view to scaling a successful model for data asset tagging. We are also collaborating with other network organisations on the introduction of a CIM standard for UK electricity assets. Our ontologies and metadata management solutions will be fully compliant with appropriate industry standards.
4	Enable potential Data Users to understand Data Assets by providing supporting information	We will share guidance and relevant supporting information on data assets which offer value to stakeholders, including health warnings, restrictions, hints, and tips to encourage value creation. A point of contact for queries will be shared. We will establish a community of users for our data assets and implement a range of stakeholder engagement activities to encourage and support widespread participation.
5	Make Data Assets discoverable to potential Data Users	We will provide a search mechanism for potential data users to make our data assets (including our metadata) discoverable via the above metadata tags / search function.
8	Ensure Data Assets are interoperable with Data Assets from other data and digital services	The terms that we use to define data assets and metadata will reflect emerging industry standards to reduce friction and increase interoperability through data exchanges. We will introduce new standards sponsored and enforced through our new Data Governance Forum.
10	Store, archive and provide access to Data Assets in ways that ensures sustained benefits	We have introduced a new Data Governance Forum which will oversee the implementation of our Data Strategy ensuring that relevant policies and procedures are introduced which mandate minimum standards for data lifecycle management; including consideration for the potential of new and existing data assets to offer value to stakeholders.
11	Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets as Presumed Open	We have begun trialling a new data triage process and will continue to develop and enhance this through ED2 in line with a default 'presumed open' or 'shared' status. This ensures that exceptions are granted only in cases where there is a justifiable rationale. Oversight will be achieved through our new Data Governance Forum.

Table 9 Intelligent Data Capture: Mapping to Data Best Practice Guidance

7. Pillar 2: Digital Twin & Decisioning

7.1 Scope

7.1.1 Digital Twin

A digital twin is a digital copy of something that exists in the physical world. In our case, this will include a digital copy of our physical electrical network, i.e. what it's made up of, its context and its performance. In reality, we are likely to create many digital twins which (taken together) will give us a comprehensive picture of our network, our assets, the environment around our network and assets, our customers, our stakeholders, etc. Although the data may be collected in different places, and exist in different formats, we can create a layer that lets us look it altogether. For example, we can view our Low Voltage network assets, their capacity and performance against current and future network constraints, as well as their customer/stakeholder context to create a broader context than looking at individual datasets.

This will let us understand the network as it exists today. It will also provide the basis for us to reflect and learn about historical performance. Moreover, we will be able to forecast future trends and run simulations so that we can make better decisions about how to maintain, improve and optimise our energy network for the future.

This is extremely important because it means that we can simulate the potential impacts of low carbon technologies and the impact arising from the electrification of transport, heat and industrial processes and model different approaches to optimise the network from a cost, stability, and an environmental perspective.

This insight will inform our investment decisions about how we might avoid or defer investment. It will also highlight areas where it is critical or beneficial for outcomes to upgrade infrastructure sooner. It will enable us to model where it makes sense from a long-term perspective to invest differently to support scaling long term to rise to the Net Zero challenge rather than apply incremental fixes or upgrades. We will use modelling to analyse the likely impact of new flexible services, and to find ways to optimise our inspection, maintenance, and replacement activities to make the best use of our assets. Valuable real time data streams (from sensors and smart assets) will provide new opportunities for alerts. These will be very valuable for control so that we can be hyperresponsive in mitigating risks or addressing issues in the physical system as soon as they arise.

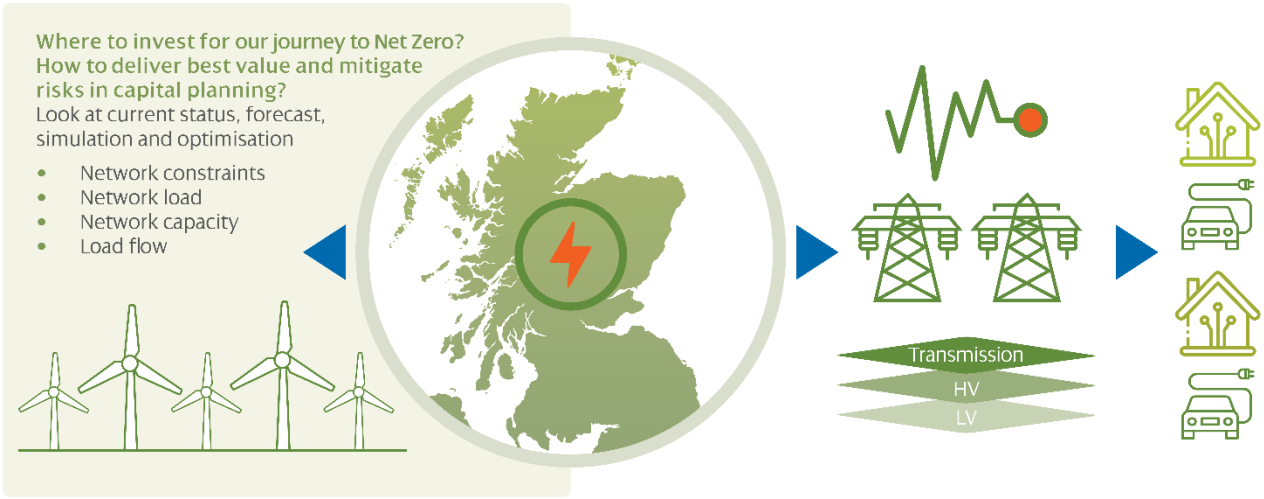


Figure 26 Digital Twin Capabilities

Our priority area of focus will be to build Digital Twin capability for our Low Voltage (LV network) so that we can simulate future trends in electric vehicles, heat pumps, and prosumer/microgrid demands (disruptive technologies). This will inform our capital planning activity and create a foundation for controlling the LV network in the physical world through the use of Artificial Intelligence (AI). LV is an area that has historically had limited focus and given its relevance for the energy transition would benefit from attention. We have demonstrated some of this capability already through various proofs of concept (PoCs) and going forward our objective is to scale these examples to continuously extend our network intelligence and our ability to make effective decisions ahead of time as well as in real time. Digital twins enable us to understand challenges, to find connections and to uncover opportunities for value through techniques such as optimisation, forecasting and simulation by bringing together data such as GIS and asset data to model emerging needs.

The diagram below illustrates how we can augment human decision making through AI (Machine Learning) for hyper-responsive, parallel optimisation of network assets to serve increasingly volatile, rising demand levels:

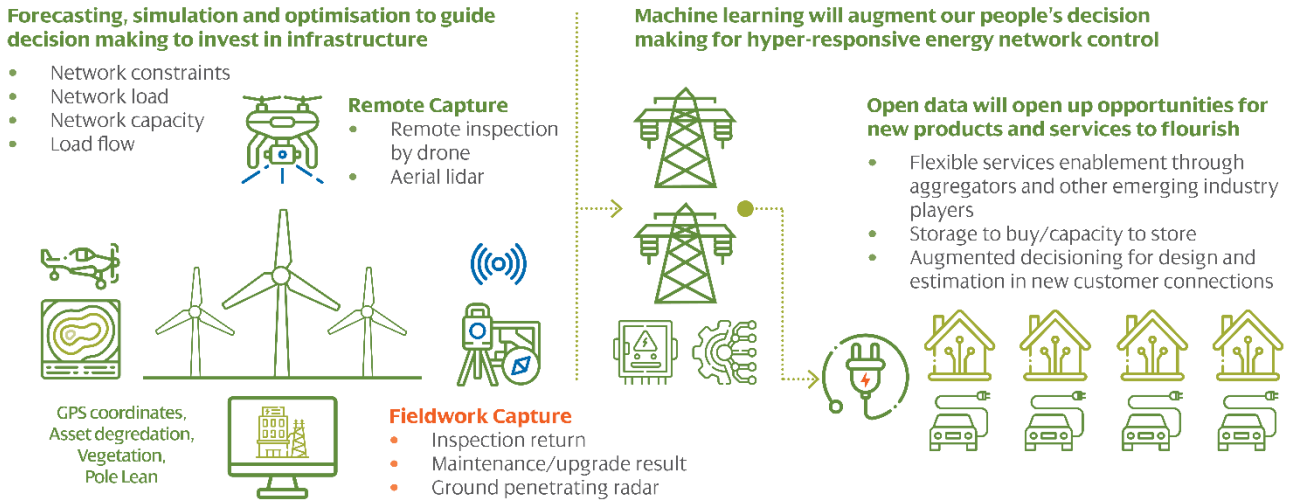


Figure 27 Augmenting human decision making through AI

7.1.2 AI and Future Energy Systems

The future of energy will mean augmenting human decision making through AI (Machine Learning) to operationalise a hyper-responsive, parallel optimisation of network assets to serve increasingly volatile, rising demand levels across various stakeholder groups and to mitigate potential risk to supply. By 2022, the International Data Corporation (IDC) predicts that 65% of CIOs will "digitally empower and enable front-line workers with data, AI, and security to extend their productivity, adaptability, and decision-making in the face of rapid changes."

Artificial Intelligence (AI) in a business context refers to the use of machines that can learn to solve problems. Machine learning solutions are very versatile and can help people to make decisions when dealing with complex problems. In an energy network (where there are many inputs, outputs and interconnected dependencies which could be impacted by potential decisions) this type of capability would let us make such decisions with greater confidence and speed because we can model multiple scenarios simultaneously to understand the potential impacts. We will explore opportunities to use machine learning to augment our people-based decision-making. This model of combined decision-making will be necessary, given the volatility and speed required to operate an energy network as part of an integrated, scaled flexible energy market.

We will continuously scan information about the network using machine learning to identify important signals from the sensors and smart assets data and run a multitude of key scenarios through our Digital Twin set of models. The result will be recommendations with confidence levels to help us to make more effective decisions. Within the control systems, we intend to automate some recommendations from machines such as rerouting energy flows to reduce load or tapping into stored energy in specific parts of the network. This will help us to avoid overloading the network, reducing, or delaying reinforcement investment and lessening the risk of unplanned outages. We will always have oversight of such decisions and outcomes; and make informed, conscious choices about where to use this technology based upon due consideration for the levels of risk involved.

In our DSO Market Operation initiative, we outline how we will fulfil our role as Distribution Systems Operator (DSO) by offering data services (such as APIs). These APIs will bring in new insight about demand – providing visibility of connections and usage from aggregators, microgrids, prosumers – giving us the ability to forecast usage and respond as effectively as possible using our AI augmented approach to decision making. Although we will lay the foundations and start this journey in ED2, as our role in enabling a more flexible energy market expands, it is likely we will continue this path in future years and start to see a convergence between IT and OT. Security policies and protocols, which will be relevant for this future energy model, are outlined more fully in our Annex 4C.5 Cyber Resilience IT Plan document.

7.2 Value

The following table outlines the value that the 'Digital Twin & Decisioning' pillar will generate throughout ED2:

Value for Money	Customer Service/ Experience	Stakeholder Engagement	Reduce Carbon Footprint	Facilitate Net Zero Transition
- Having a digital twin will allow better decision making around how money is invested as the impact of investment will be clear	- Understanding the condition of assets will optimise maintenance and reduce replacements, therefore reducing time off supply for customers - Closely monitoring assets will allow us to predict when faults are likely to occur and act proactively/quickly to reduce time off supply	- A digital twin will be created of our environmental landscape; this data will be made open to benefit other stakeholders - Habitat analysis will be conducted prior to working on-site - Risks such as vegetation close to overhead lines will be flagged to allow mitigating actions to take place	- Understanding the condition of our assets will allow us to optimise our asset maintenance, reduce replacement and prolong the working life of each asset	- Detailed knowledge of our assets will provide the basis of our Net Zero transition – we will be able to pinpoint poorly functioning assets, reduce unnecessary replacement and ensure a continuous green supply of energy to our customers

Table 10 Digital Twin & Decisioning: Value

7.3 Dependent Digitalisation Initiatives

The technology solutions supporting this data pillar are detailed within our annex 4C.1 IT & Digitalisation Strategy. The following sections summarise the interdependencies.

7.3.1 Asset Management Solutions

The introduction of suitable platforms and analytics software will be enabled to let those in relevant roles work with the data captured. Single view of the data will enable projects such as smarter network operation, facilitate enhanced customer service, facilitate external data sharing, and provide the basis for digital twins. (See Annex 4C.1 IT & Digitalisation: 4.1 – Asset Management Solutions).

7.3.2 DSO Market Operation

Forecasting tools will be enabled through a framework for ML Ops (Machine Learning Operations) capabilities. This will build on existing Smart Systems (NAVI & SDIF etc) development to support existing and new market-based platforms to gather market participants and support a path to integration with existing and supporting new settlement / billing systems. (See Annex 4C.1 IT & Digitalisation: 6.2 – DSO Market Operation).

7.3.3 Engineering Net Zero

Self-service fixed price quote process (machine learning enabled), connectivity for LV network sensors will benefit from enhanced AI assisted decisioning that makes use of new IOT data in the data ecosystem enabled through connected devices. (See Annex 4C.1 IT & Digitalisation: 5.1 – Engineering Net Zero Platform).

7.3.4 Supply Chain, Procurement and Logistics

Improving operational efficiency by ensuring we are supporting digital processes end to end through an effective data model and using analytics solutions for optimisation and intelligent automation to support better stock forecasting and management, including recommendations or auto-replenishment. (See Annex 4C.1 IT & Digitalisation: 4.4 – Supply Chain, Procurement and Logistics).

7.3.5 Sustainable Operations

Digital capture of natural capital and habitat information associated with our assets will be used to aid decision making. Storage of LiDAR data, enablement of searchable image data from increased frequency drone inspections with higher granularity supported through our Big Data Platforms and proposed Metadata solutions. (See Annex 4C.1 IT & Digitalisation: 6.1 – Sustainable Operations).

7.3.6 Advanced Vegetation Management

Leveraging advanced image processing and data storage capacity, supporting enriched view for vegetation management and potential to link to SYGRIS (a customisable platform capable of linking with multiple systems to collect data on sustainability into a central data bank for reporting). (See Annex 4C.1 IT & Digitalisation: 6.1 – Sustainable Operations).

7.4 Mapping to Data Best Practice Guidance

Pillar 2: Digital Twin & Decisioning' supports the following Data Best Practice Guidance Principles:

1. Identify the roles of stakeholders of Data Assets
2. Use common terms within Data Assets, Metadata and supporting information
3. Describe data accurately using industry standard Metadata
4. Enable potential Data Users to understand Data Assets by providing supporting information
5. Make Data Assets discoverable to potential Data Users
6. Learn and deliver to the needs of current and prospective Data Users
7. Ensure data quality maintenance and improvement is prioritised by Data User needs
8. Ensure Data Assets are interoperable with Data Assets from other data and digital services
9. Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice
10. Store, archive and provide access to Data Assets in ways that ensures sustained benefits
11. Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets a Presumed Open

Figure 28 DBPG Principles Supported by 'Pillar 2: Digital Twin & Decisioning'

The following table describes how the activities in this pillar contribute towards our compliance with the principles of the DBP Guidance:

No.	DBPG Principle	How we will fulfil the DBPG Principle
2	Use common terms within Data Assets, Metadata and supporting information	We will introduce a common fabric for integration of existing and new data points, using (for outbound) and anticipating (for inbound) common terms and formats. For digital twin and autonomous solutions – which will require a greater degree of external data exchange – we will ensure good practice (CI:CD:CT - Continuous Integration, Continuous Delivery, Continuous Testing) techniques and practices are adopted to reduce the likelihood of friction and facilitate exchanges of data including derived model decisions and outcomes.
3	Describe data accurately using industry standard Metadata	We are currently piloting IceBreakerOne's ontology and metadata record template to create meaningful metadata tags which are human and machine readable for a priority use case, with a view to scaling a successful model for data asset tagging. This will be critical for ensuring advanced analytics solutions (value chain components) can be reused and/ or scaled with minimal friction and effort.

4	Enable potential Data Users to understand Data Assets by providing supporting information	In line with triage outcomes for given data assets, we will provide relevant supporting documentation about our data assets - including an inventory of active machine learning based solutions. We will provide a point of contact for queries or issues. Due consideration for skill levels will be incorporated in the guidance – to facilitate uptake and reduce obstacles - based upon the value potential of an asset for a community of users.
5	Make Data Assets discoverable to potential Data Users	In line with triage outcomes, we will create a search mechanism for potential data users to discover data (including digital twins) using the metadata tags above.
8	Ensure Data Assets are interoperable with Data Assets from other data and digital services	The terms that we use to define data assets and metadata will reflect emerging industry standards to reduce friction and increase interoperability through data exchanges. We are trialling IceBreakerOne's ontology and metadata record template plus exploring potential collaborations other network organisations to test and learn how to arrive at a common approach that facilitates a smooth data exchange. We will be use case led (adopting an agile approach to delivery that encourages iterative learning and a focus on value creation) so that we iterate to the optimal design pattern for exchanges based upon the emerging use cases. Once patterns become established, we will look to reuse these to avoid unnecessary delay/ effort.
9	Protect Data Assets and systems in accordance with Security, Privacy, and Resilience best practice	Policies and procedures (Annex 4C.5 Cyber Resilience IT Plan) will ensure that we adhere to relevant regulations and protect data assets through privacy and resilience by design.
10	Store, archive and provide access to Data Assets in ways that ensures sustained benefits	We have introduced a new Data Governance Forum which will oversee the implementation of our Data Strategy ensuring that relevant policies and procedures are introduced which mandate minimum standards for active data lifecycle; including consideration for the potential of new and existing data assets to offer value to stakeholders. Appropriate supporting data will also be captured to ensure that the explainability of model outcomes can be enhanced by providing an accurate view at a point of time of the input data profile and algorithm version(s) and policies in place. An annual review of associated model inventory and supporting documentation will be overseen by our Data Governance Forum and with an accountable senior leader.

Table 11 Digital Twin & Decisioning: Mapping to Data Best Practice Guidance

8. Pillar 3: Reporting & Analytics

8.1 Scope

Figure 29 Our people will self-serve on insight from a suite of trustworthy visual reporting

We will establish an Insight Portal for data visualisation where our people can access automated, trustworthy reporting to be able to make good decisions that are informed by data. This will make it easy to use robust metrics which make use of standardised calculations, reporting catalogues and data dictionaries which all reference approved sources to enable users to actively track progress on the measures that matter.

Our reporting suite will span customer, performance, operational, regulatory, financial, and environmental metrics. As a result, there will be fewer, more robust metrics within reports with dynamic features, leading to speedier action; and less labour-intensive processes to extract and manipulate data.

Our tools will be intuitive to avoid potential barriers to use – and new, role relevant learning pathways will promote the skills and culture change our people need to use data well to evaluate performance and to hunt for improvement opportunities. New intelligence will create opportunities to enrich the degree of autonomy within the energy system by providing real time, diagnostic insights and connections including at the edge of grid.

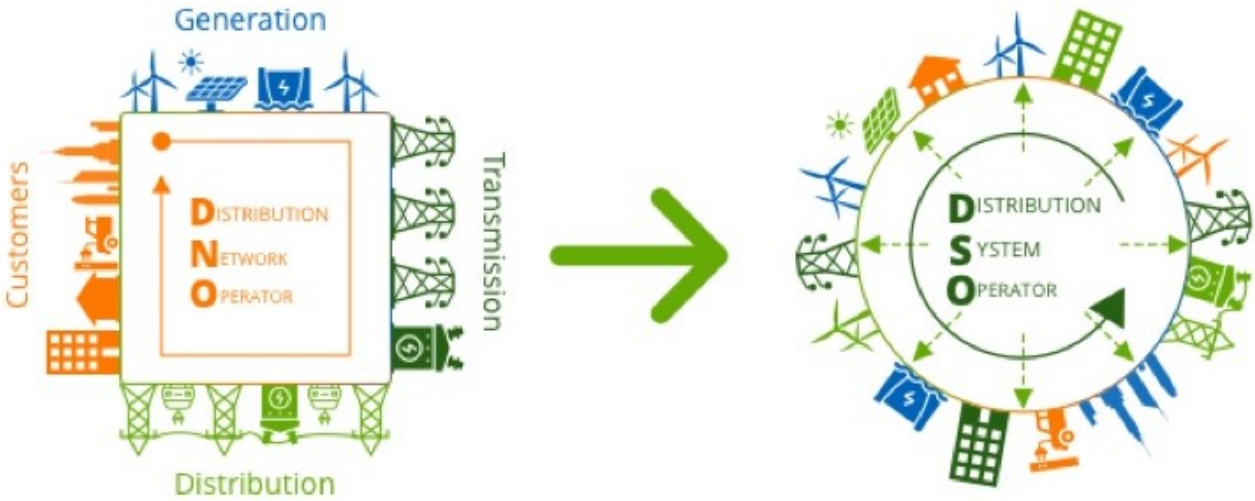


Figure 30 Opportunity creation

Whereas reporting provides a window onto past performance, analytics can provide a deeper level of insight. It lets us diagnose the root causes of underperformance and can help us to identify potential avenues to improve an outcome. Unlike reporting, analytics can involve one off or infrequent investigations through data and usually requires more advanced data skills.

Analytics techniques, such as optimisation, forecasting and scenario modelling, will be used to develop an evidence base upon which we will make important decisions. From capital planning to logistics optimisation and pricing algorithms for new connections, there is almost no end to the opportunities we can tackle using analytical methods.

Our approach will leverage cross-industry best practice and we will adopt an experimental method[8] to rigorously test the likely effectiveness of potential actions before we scale them.

A data lake will house important data that will be useful for many people. This will ensure that more people benefit from access to quality assured data for reporting and analytics. This will simultaneously reduce the effort and time required to create actionable insight, by minimising the time spent by our data experts and business teams on duplicative, intensive manual data engineering activities.

New learning pathways will enable more people to learn the data skills that we will need. We will complement this activity by introducing a set of Data Principles and a Playbook to promote the adoption of good data practices. As a result, we will both increase our capacity to do reporting and analytics and raise standards. A key driver for this guidance is to ensure that we consider trust, security, and privacy by design; and that our analytics solutions are actively managed throughout the innovation lifecycle from proof of value to a productionised analytics service with regular, scheduled evaluation and oversight controls in place.

[8] “Principles of Experimental Design for Big Data”, Drovandi et al. 2017 (UCLID)

8.2 Value

The following table outlines the value that the 'Reporting & Analytics' pillar will generate throughout ED2:

Value for Money	Customer Service/ Experience	Stakeholder Engagement	Reduce Carbon Footprint	Facilitate Net Zero Transition
- Full visibility of projects will show efficiencies of teams - Automating reports will allow resources to be used for more value-add work, such as advanced analytics of the output data - Good quality reports will improve efficiency of work conducted as well as decisions made	- New reporting platforms will allow us to have a view of end-to-end trace of customer engagement, and subsequently will improve customer experience - Reporting functionality will allow us to identify new services and improve engagement with customers	- Making our reporting data available through our open data platform will allow stakeholders to conduct their own analysis on our data, perhaps in conjunction with other DNO/DSOs publishing similar datasets	- Digitising reports and documents will reduce the amount of single-use materials used, as well as travel to obtain said materials	- New reporting tools for carbon accounting will facilitate the transition to Net Zero

Table 12 Reporting & Analytics: Value

8.3 Dependent Digitalisation Initiatives

The technology solutions supporting this data pillar are detailed within our annex 4C.1 IT & Digitalisation Strategy. The following sections summarise the interdependencies.

8.3.1 Operational and Regulatory Reporting

Investment in reporting and insight capabilities will be vital to the delivery of ED2. The requirements span the following:

- Regulatory Reporting Pack (RRP) for Ofgem (SPD and SPM)
- Operational Reporting covering all aspects of financial management, project management, faults, logistics and connections
- Condition Based Risk Management (CBRM) Reporting
- Customer Service Reporting
- Industrialising Reporting and Analytics

SP Energy Networks will introduce a new reporting portal to provide access to automated, trustworthy reporting which makes use of data visualisation techniques to help more people across the organisation to make decisions that are informed by data.

We will introduce metric libraries, supported by data dictionaries, and draw data from approved sources, to enable more people to self-service their needs via visual, automated reports to track progress on the measures that matter.

Our reporting suite will span customer, performance, operational, regulatory, financial, and environmental metrics. As a result, there will be fewer, more robust metrics and reports with dynamic features such as drill through and filters. This will increase the speed to insight and ultimately to action, as less labour-intensive processes are needed to extract and manipulate data. (See Annex 4C.1 IT & Digitalisation: 8.1 – Operational and Regulatory Reporting)

8.3.2 Industrialising Reporting and Analytics

The automation of basic, repeatable reporting will reduce unnecessary manual effort and allow more attention to be focussed on deriving value from data. This automation will free up time for analysts to focus on more complex work and drive us towards a greater data maturity level. Having the ability to access a data library with common code will save time in re-engineering features which are commonly needed and will ensure that data can always be reconciled back to the source. Key data will land or stream into locations such as Data Warehouse or Data Lake, and API libraries will be set up to support productionised feeds. (See Annex 4C.1 IT & Digitalisation: 8.1 – Operational and Regulatory Reporting)

8.3.3 Benefits of Reporting and Analytics for Stakeholders

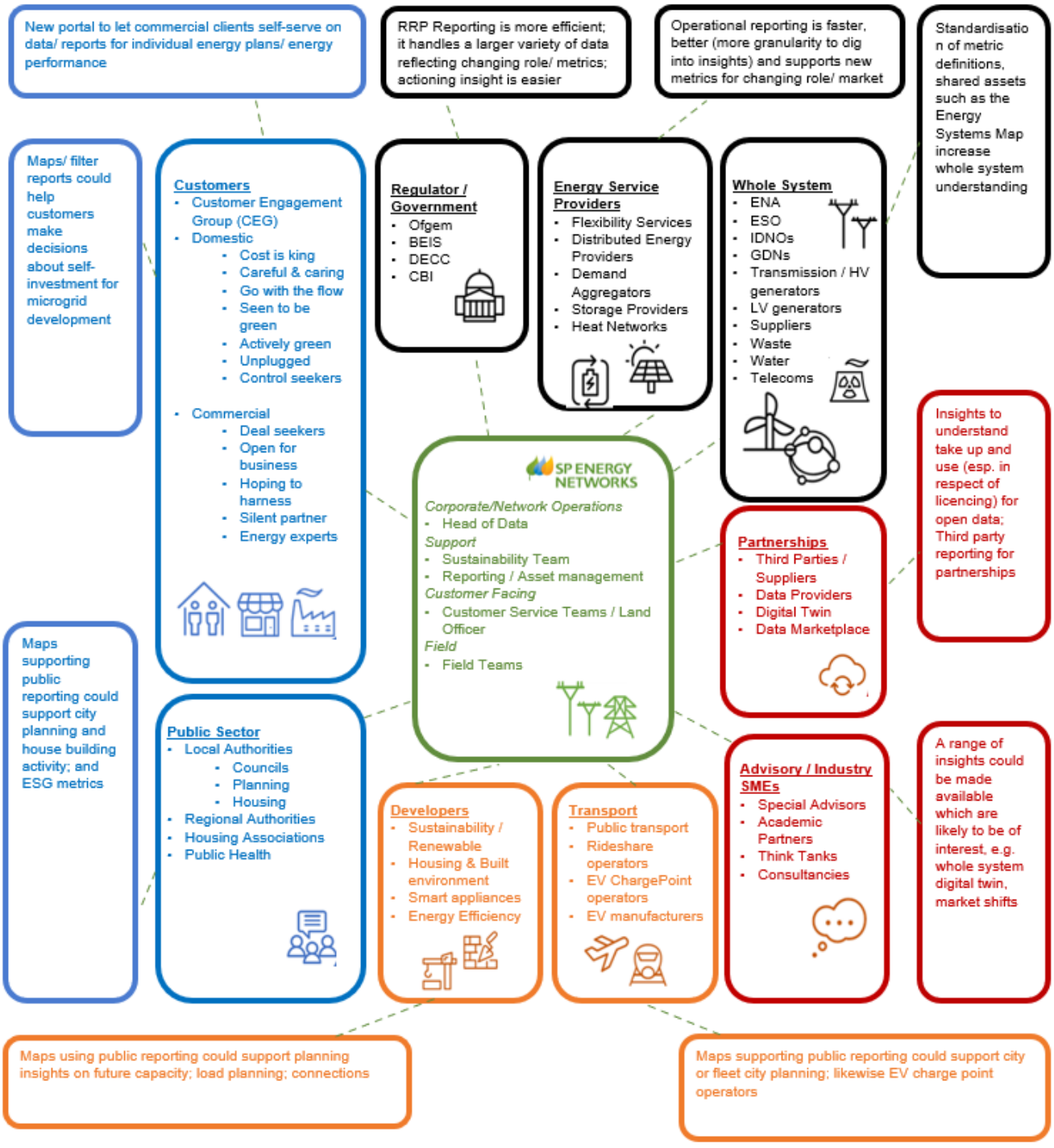


Figure 31 SPEN Stakeholder Map for Reporting and Analytics

8.3.4 Functional Model

The diagram below shows the high-level conceptual component overview of the functional model/data architecture solution. (Note the build activity here will take place in the platforms below rather than a need for new platforms to be instituted which is covered in the Big Data Initiative and the Systems Integration Initiative).

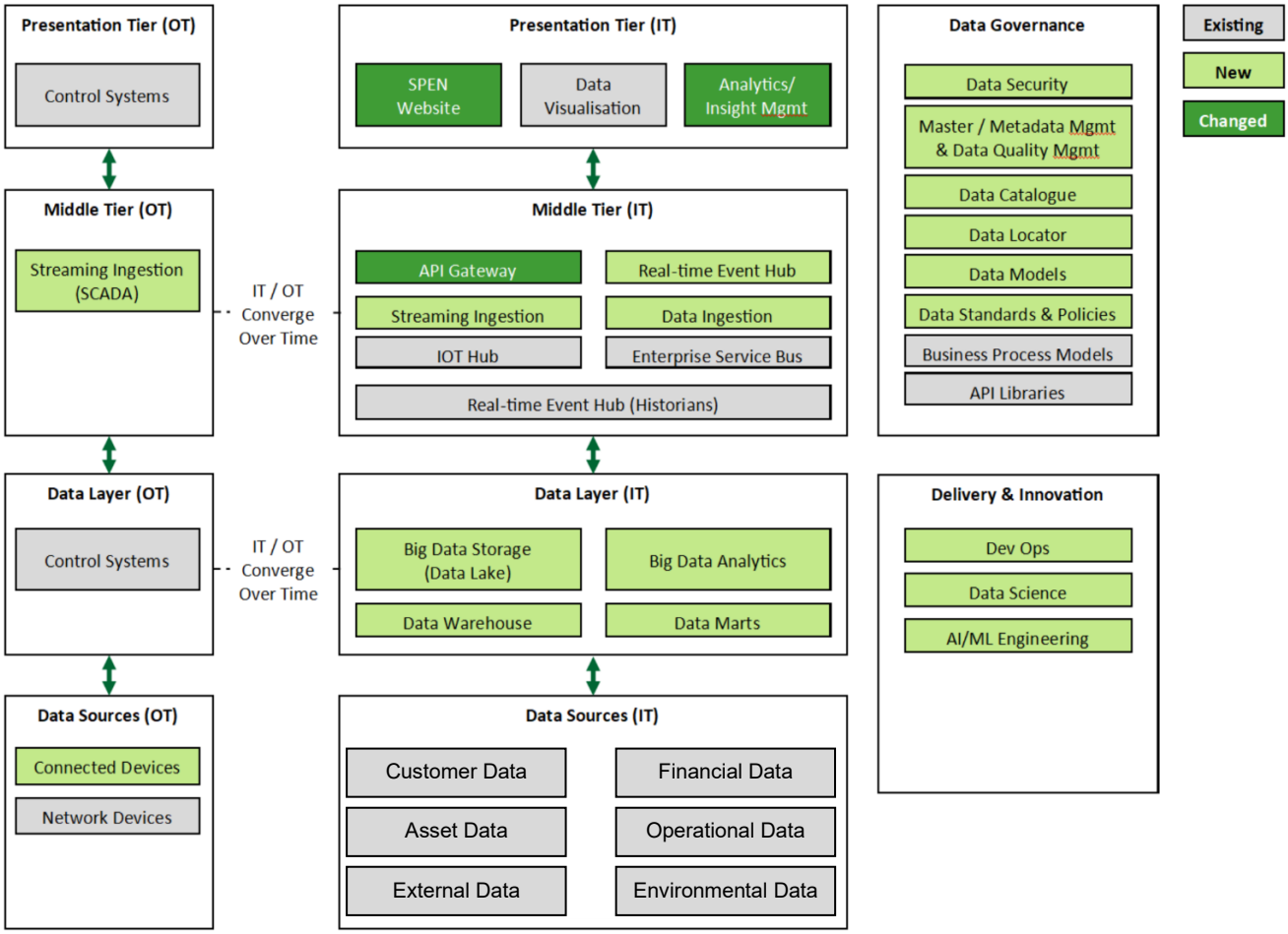


Figure 33 Reporting & Analytics: Functional Model

8.4 Mapping to Data Best Practice Guidance

'Pillar 3: Reporting & Analytics' supports the following Data Best Practice Guidance Principles:

1. Identify the roles of stakeholders of Data Assets
2. Use common terms within Data Assets, Metadata and supporting information
3. Describe data accurately using industry standard Metadata
4. Enable potential Data Users to understand Data Assets by providing supporting information
5. Make Data Assets discoverable to potential Data Users
6. Learn and deliver to the needs of current and prospective Data Users
7. Ensure data quality maintenance and improvement is prioritised by Data User needs
8. Ensure Data Assets are interoperable with Data Assets from other data and digital services
9. Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice
10. Store, archive and provide access to Data Assets in ways that ensures sustained benefits
11. Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets a Presumed Open

Figure 34 Reporting & Analytics: Mapping to Data Best Practice Guidance

The following table describes how the activities in this pillar contribute towards our compliance with the principles of the DBP Guidance:

No.	DBPG Principle	How we will fulfil the DBPG principle
2	Use common terms within Data Assets, Metadata and supporting information	Leveraging data assets for reporting and analytics will become easier as a result of the activities above as common terms and metadata tags will benefit not just external parties but also internal operations and client/ stakeholder reporting. These terms and tags will provide a basis by which to catalogue insight so that it is easier to identify key metrics and supporting data and to speak the same language on performance across organisational hierarchies and teams and with external stakeholders.
3	Describe data accurately using industry standard Metadata	Data assets may also include the reports and analytical schemas in addition to the upstream data sources and ETLs and so consistent use of terms and tags will support enhanced data lineage as sources are more readily identified and can be reported across the reporting or analytics supply chain with greater confidence.
4	Enable potential Data Users to understand Data Assets by providing supporting information	Supporting documentation will set out procedures for responsible use and help more data users benefit from enhanced access to data. A key contact will be named for data assets making it easier to follow up on queries.
5	Make Data Assets discoverable to potential Data Users	Metadata tags will be accessible through search functions to make it easier to identify the data needed to satisfy reporting needs. The same techniques will be employed for analytical work where the outputs are permanent or semi-permanent to ensure these are similarly discoverable to potential users (internally or externally; triage outcome dependent) with due care taken to ensure that the data literacy of a user community is reflected in the tone and level of detail and type of instruction provided.
8	Ensure Data Assets are interoperable with Data Assets from other data and digital services	Increased standardisation of routes to and formats of data for reporting will make it easier to access. Our approach to standard ontologies for data and metadata will enable us to release the maximum value of data and establish a schema layer for reporting and insight. This should serve to increase the consistency of metrics (definitions and use), sources (definitions and use) and reports (improving efficiency). We are already trialling an approach to creating an index of key metrics and common data schema as part of a 2021 project covering several customer and RRP reporting, topics. If successful, we plan to accelerate the adoption of this approach into 2022 to build a robust foundation for reporting.
10	Store, archive and provide access to Data Assets in ways that ensures sustained benefits	We are actively working to introduce new credential-based controls and disaster recovery procedures for MicroStrategy (1 of 2 strategic reporting tools) and are introducing guidelines and additional training to support better understanding and execution of best practice in reporting development and management including data schemas that support these. This is a key area of focus through 2021/2 and we plan to provide clear guidance to data owners on their responsibilities and how this relates to downstream reporting solutions developed by reporting owners.
11	Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets as Presumed Open	Our data triage process (currently being trialled) will continue to be enhanced and industrialised to ensure that we are able to support data requests except where there is a justifiable rationale not to do so.

Table 13 Reporting & Analytics: Mapping to Data Best Practice Guidance

9. Pillar 4: People and Culture

9.1 Scope

People, as much as data, will be at the heart of our transformation. Some of the common reasons why data transformations fail include a lack of a clear business case and goals, persistent data silos, and treating the data challenge as an IT project.[9] Transformation is challenging and our people must embrace and adapt to the change – from what they do, to the way that they do it by thinking differently about data.

"The gap between good analytics that harbour potential value and actually realising that value is one that data literacy is intended to bridge. The data literacy trend is a result of the realisation that simply generating great analytics isn't going to lead to results unless the business is ready, willing, and able to act on those analytics." [10]

Our leaders have a key role to play in shaping our culture, by setting out clear expectations about the role of data for our business. A senior leader will be accountable for shaping the data agenda, supported by the entire leadership team who will make clear across our organisation that there is an imperative for change; that data has become mission critical.

Inevitably, the shape of our organisation will change as manual processes are digitalised. For example, for many people on a technical career path such as engineering, we will encourage them to boost their effectiveness as an engineer by augmenting those skills with new ones involving data. In almost every field, from leaders to domain specialists, there will be a need to develop greater levels of data literacy. We will support our people to reskill for this next generation networks business through role relevant learning pathways. We will provide clear guidance on data policies, principles, and best practice. It is likely we will have to make changes to our role profiles to reflect data skills and responsibilities as the norm for many roles. We will consult with employees to shape our skills agenda and build a bridge to change.

In addition to boosting data literacy across our business roles, we will also need a level of access to deep, technical data expertise. This will be achieved by investing in deepening and growing our data and analytics capability within SPEN. Where it makes sense to tap into expertise at an enterprise level because there may be infrequent need for specialised skills, or a short term need for more capacity/ support to scale which is more cost effective to borrow from an enterprise team. With this in mind, we will leverage support from an enterprise level Digital Hub to support our transformation journey borrowing support where and when we need it to execute our strategy. This will provide the added benefit of retaining data skills within SPEN and let us benefit from lessons learned across the group without necessarily entering any areas of sensitivity or conflict of interest.

[9] "Digital Transformation Comes Down to Talent in 4 Key Areas" HBR 2020
[10] International Institute for Analytics

9.2 Value

The following table outlines the value that the 'People & Culture' pillar will generate throughout ED2:

Value for Money	Customer Service/ Experience	Stakeholder Engagement	Reduce Carbon Footprint	Facilitate Net Zero Transition
Changing to a more data driven culture will ensure that decisions are made with an evidence base – this should improve efficiency and reduce errors.	Taking a data driven approach to customer service will ensure that SPEN can respond to customers quicker, and more effectively.	Adopting a more digital culture in the organisation should change the way that colleagues think about data and analytics – this culture shift should encourage empowerment for citizen data science activities as well as seeking innovation opportunities.	Changing the culture surrounding how work is completed in the company will contribute towards the reduction of our carbon footprint; even small educational sessions can have a huge impact when adopted by the whole company.	Adopting a data driven culture will be at the heart of our just transition towards Net Zero. This would not be possible without the collection, analysis, and utilisation of data from our network.

Table 14 People & Culture: Value

Skill Profiles and Associated Descriptions

Skill Profile	Description
Data Steward	• Interpret data legislation, devise data policy and support implementation of governance ensuring standards are clearly set and expectations met. • Progress each dataset through our internal data triage process to determine open data classification and agree data lifecycle management approach. • Provide guidance to business and technology teams on data use including ethical standards and methods. • Translate business strategy into data management strategies with domain specificity, determining official sources of data, supporting data definitions and quality assurance/ investigation activity. • Manage access, provisioning and supporting data owners and data users as domain subject matter experts on data. • Support the development and management of business and technical metadata and identifying critical data items. • Define standards for metadata and supporting tools for application, controls, and compliance.
Data Interpreter	• Tell stories with data and translate a business problem into a problem that can be solved through data with good business domain knowledge. • Use critical thinking and data skills to support data experts providing a bridge between business priorities and data opportunities and their realisation. • Support the business to understand and evaluate data options/solutions. • Understand and support the needs of external data stakeholders and translate these into actionable deliverables. • Develop stakeholder engagement plans and deliver events, communications, and interactions to ensure our data stakeholders are fully identified, their needs are understood, and we have communicated our plans to deliver to their requirements.

Data Analysis	• Deliver reporting and insight including regulatory, customer, operational, financial, and environmental. • Develop and maintain metrics definitions and reporting solutions (content as well as narrative) and support user interactivity (enabling self-service for reporting and support basic diagnostic capability). Utilise visualisation methods. • Apply objectivity and rigour for analysis, and business domain expertise for value focus to deliver actionable insight which can enable change.
Data Science	• Use statistics, computer science and problem-solving skills to solve business problems through advanced analytics – applying advanced problem structuring methods and statistical modelling techniques (e.g. ML), developing algorithms, using big data tools and advanced coding skills. • Apply visualisation to explore data and communicate findings. • Apply scientific rigour for experimental methods. The adoption of low-code/no-code solutions will encourage users to build their own reporting/analytics solutions and empower citizen data scientists.

Data Engineering	• **Feature engineering**: Source and prepare data in support of developing analytical models (working with system owners / data architects to source data), wrangle data, feature engineer data, prepare data for external publication, remediate data quality issues.
	• **Data engineering**:
	  ○ Produce robust, reusable data flow solutions at scale for enterprise-wide use.
	  ○ Manage whole view of data flow architecture.
	  ○ Build and maintain ETL pipelines/ productionised data flow solutions.
	  ○ Identify and productionise data sources (internal and external) working with system owners/ data owners/ architects to source and land data in approved definitions and formats.

Data Platform Engineering	• Responsible for scaling high performing data solutions (operational, analytical, decisioning) platforms. • Accountable for delivery of technical architecture to support principle and designs from data architecture. • Build, deliver and maintain platforms and services. • Own and remediate technical issues. • Ensure platforms can operate as an effective ecosystem. • Horizon scanning for rapid, incremental deployment of new functionality.
Decision Engineering	• Model, build, monitor and optimises logic deployed at scale in live data solutions that support decision making (AI/ML enabled) in a domain. • Expert responsible for the logical framework for the solution(s). • Liaises with data scientists and business teams to successfully scale new logic. • Responsible for the logical integrity of solutions deployed and evaluates the effectiveness and optimisation of solutions for business opportunity. • Recommends and applies corrective actions. • Sets parameters and applies model changes.
Data Architecture	• Defines the principles, process, and technology framework for data to support business use with ease. • Key point of authority to present options and recommendation into Committee structure to assure the integrity of our data solutions and support business uses via an extendable, plug and play architecture. • Liaison to platform engineering to ensure technology infrastructure supports business priorities. • Liaison to a virtual data governance organisation to ensure high standards and consistent application of policies and patterns.

Table 15 Data Skills required to support our Data Strategy and Data Operating Model

Skill Requirements per Data Initiative

Initiative	Assumptions	Enduring Impact
Big Data Platform	• Includes business domain experts, data analysts, data scientists, and scrum leads to be seconded into cross functional agile teams for the purpose of delivery in the labs • 2 years of 3 x Data Scientists to support each lab • A learning support programme will be offered to business team (subject matter experts - domain; data scientists- technical skills; product owners/ scrum leads - delivery methods including critical success factors for data projects) with temporary resource then transitioning out at end of Y2025 to cutover to BAU model post each lab across the 3 topic areas • Data Engineering for the 3 data projects (Big Data Platform; Operational & Regulatory Reporting; Data and Systems Integration) is included - providing a SPEN wide access layer for all types of data for reporting, modelling and decisioning purposes.	• Data Scientists diverted from other work at cutover but also working alongside temporary resources within scrum to deliver analytics solutions as part of labs. • Investment in up-front temporary resource for data engineering work across all components of the 'data layer'. • Reduction in capacity post Y2025 to enduring resource 1x data engineer (ideally drawn from a central pool such as Digital Hub) so that the resource can be used when required.
Data and Systems Integration	• Enterprise Service Bus (ESB) technical analyst / systems integrator. Capabilities to utilise ESB technology for data exchange • Application Programming Interface (API) technical analyst / systems integrator. Support the implementation and ongoing management of APIs to exchange data externally (bidirectional).	• Enduring resources associated with IT overhead including a new cost type for Open Data Security / Authentication (set out in Annex 4C.5 Cyber Resilience IT Plan)
Operational and Regulatory Reporting	• Includes business domain experts, data analysts, data scientists, and scrum leads to be seconded into the digital hub agile teams for the purposes of delivery as part of the labs • 2 years of 3 x Data Scientists to support each lab • A learning support programme will be offered to business team (subject matter experts - domain; data scientists- technical skills; product owners/ scrum leads - delivery methods including critical success factors for data projects) with temporary resource then transitioning out at end of Y2025 to cutover to BAU model post each lab across the 5 topic areas. • Data layer work (and resource costs) and Advanced Analytics work (Digital Twin, Modelling, ML Ops) are included in Big Data Platform costs. • All enterprise reporting tooling development/technology support costs are included in IT overhead.	• Business Analysts diverted from other work but absorbable due to efficiencies starting to take effect from Y2023+.
Data Mastery and Governance	Overhead applied to all initiatives to cover data quality / mastery/ compliance activities for this pillar: • Retain Enterprise Architect/ Data Governance Expert service • No migration required from existing data quality, data governance, and MDM tooling • Both Meta/Master Data Management required	• Beyond lifespan of 5-year programme overhead to be factored into BAU as a continuous requirement

Table 16 Data Initiative Resource Requirements

To build on this collaborative approach to resourcing opportunities to innovate through data, we will introduce new ways of working involving cross functional teams. We will adopt an agile first approach to data, using stakeholder feedback to ensure that we deliver value early and incrementally, whilst and reflecting upon lessons learned.

9.3 Mapping to Data Best Practice Guidance

'Pillar 4: People & Culture' supports the following Data Best Practice Guidance Principles:

1. Identify the roles of stakeholders of Data Assets
2. Use common terms within Data Assets, Metadata and supporting information
3. Describe data accurately using industry standard Metadata
4. Enable potential Data Users to understand Data Assets by providing supporting information
5. Make Data Assets discoverable to potential Data Users
6. Learn and deliver to the needs of current and prospective Data Users
7. Ensure data quality maintenance and improvement is prioritised by Data User needs
8. Ensure Data Assets are interoperable with Data Assets from other data and digital services
9. Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice
10. Store, archive and provide access to Data Assets in ways that ensures sustained benefits
11. Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets a Presumed Open

Figure 35 People & Culture: Mapping to Data Best Practice Guidance

The following table describes how the activities in this pillar contribute towards our compliance with the principles of the DBP Guidance:

No.	DBPG Principle	How we will fulfil the DBPG principles
1	Identify the roles of stakeholders of Data Assets	Clearly applying the ICO definitions for roles and ensuring that our people understand so that we undertake our responsibilities effectively. Developing a culture where we understand the value of data internally and the opportunity it represents for external stakeholders.
6	Learn and deliver to the needs of current and prospective Data Users	Mapping stakeholder needs and understanding potential blockers to using data effectively, providing support and guidance. Including opportunities for upskilling our people. Providing the mechanisms to capture stakeholder input and reflecting this back into our deliverables and plans.
7	Ensure data quality maintenance and improvement is prioritised by Data User needs	Clear accountabilities for evaluating and prioritising data quality issues for resolution; and appropriate training for those with responsibility for associated processes.
9	Protect Data Assets and systems in accordance with Security, Privacy, and Resilience best practice	Investing in training and creating learning opportunities to advance our mastery of data competencies; and assigning formal responsibilities for supporting our organisation's policies and their implementation.
10	Store, archive and provide access to Data Assets in ways that ensures sustained benefits	As above as well as training, information and tooling that supports our people through effective systems and processes for effective data lifecycle management.
11	Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets as Presumed Open	Training, policies and monitoring as well as a clear roadmap (with accountable executive) to support our roadmap and transition to presumed open and shared (where appropriate) by default, except in cases where there is a justifiable rationale to reject a request.

Table 17 People & Culture: Mapping to Data Best Practice Guidance

10. Pillar 5: Data as an Asset & Service

10.1 Scope

We have more data than ever, but data is only valuable if we use it well. The first step to treating data as an asset is to build an enterprise-wide view of our data. That will make it more discoverable and more readily accessible for the people who need to use it for value creation. Data mastery is about know how to use our data to secure business outcomes and deliver value for our stakeholders.

10.1.1 Operational Data

We will ensure that all data associated with critical business processes has an identified system of record. This data will be mastered with policies introduced for governance and supporting protocols. New connections that enable a range of applications to read, write and update key data items will do so via an Enterprise Service Bus (ESB). Data connections which need access to near real-time data to support use cases will plug into streaming solutions supported by event hubs to satisfy requirements for real time controls and alerts. Our services will be device agnostic to ensure interoperability.

Automated, machine learning powered scans will be introduced to spot for data quality issues, enabled through a new Master Data Management (MDM) solution and leveraging metadata standards, so that any unexpected issues can be flagged for investigation and triaged by data stewards with visibility for data owners who can evaluate the risk and undertake appropriate corrective action.

External data flows will be supported through API / microservice management tools. Our Open Data initiative (see section 6.3 in our annex 4C.1 IT & Digitalisation Strategy) will enable us to contribute to whole system solutions as part of a modern digitalised energy system.

10.1.2 Analytical Data

We will copy important data from the relevant system of record to an analytical data layer which comprises a data lake, data warehouse and event hub. This will establish a common set of labelled and managed data and expose this within views which are relevant and easy to use for reporting, analytics and AI assisted decisioning. The data lake will accommodate all classes of data, enabling us to identify new connections between datasets, to undertake detailed investigations, to create complex multi-variant reports and run simulations. We will combine traditional data points (such as manually collected data from inspections, static asset information, network loading, aerial LiDAR, etc) and new data streams (such as performance on the LV network gathered from 14K new sensors and smart devices/ assets, satellite imagery, drone footage, etc). When we find connections of value these can then be organised and automated to make these relationships as widely available as possible.

Example	Bronze	Silver	Gold	Platinum
1 System	✓	✓	✓	✓
2 Systems Aligned	x	✓	✓	✓
3 Systems Aligned	x	x	✓	✓
Human Verified	x	x	x	✓

Table 18 Building Connections Between Information from Different Sources will Help Improve Veracity and Usefulness. Matching Records across Multiples Systems Might be Used to Infer the Likelihood of Accuracy

We will support our data community through the implementation of industry standards and applications of Ofgem's Data Best Practice Guidance. Feature stores and data dictionaries will be made available to users to enable reuse of data features across different use cases. Automated data feeds will undertake the job of extraction, transformation and load with views providing easy access for more people to work with data. Metadata will help people understand data they want to use and enable algorithmic data exchange.

Our Data Strategy will help more people to access the information that they need to better understand the energy system, making new connections through data and providing opportunities to develop solutions that will deliver the maximum benefit to our customers, our stakeholders and to the environment.

Key types of data which are a priority for us to curate include customer, asset, and operational data alongside contextual information such as location, environment, weather, and device statuses. As the variety of data continue to grow, we will ensure we can handle any important new data points coming onstream into the data lake. Relevant derived data, from analytical modelling and simulations, may also be stored in our data lake until it becomes useful to be consumed by operational applications and/or for reporting purposes.

Some examples of data classes that we will leverage to deliver value for stakeholders:

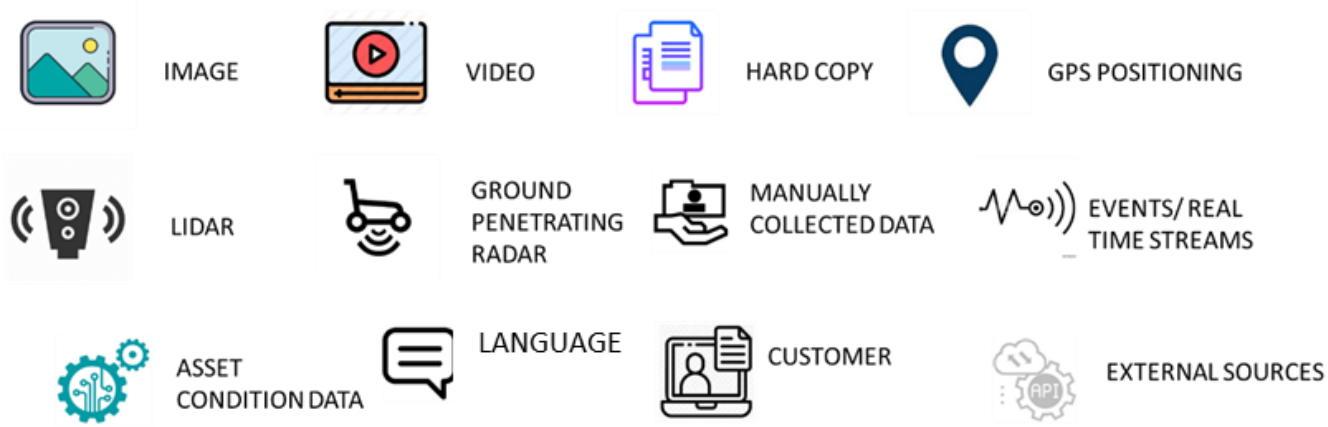


Figure 36 Data Classes

10.1.3 Data Governance

We will introduce data catalogues with supporting dictionaries for definitions to help more people understand what data is available, what it means and how it can be used. We will introduce conceptual data maps that are business friendly with supporting technical maps detailing the data available in logical and physical systems to make it easier and faster to make important connections to data as part of design and development activities. These will also include details of the data's suitability, potential value and risk assessment for data sharing via our Open Data solutions (see section 6.3 in our annex 4C.3 IT and Digitalisation Strategy). Master data will help us make important logical connections through data, and metadata will let us manage our data more effectively across the data lifecycle. The section on people (section 9 above) contains more information about the complementary business change we will introduce to support this and our initiative on data mastery and governance (11 below) contains more on the programme we propose to deliver this.

10.1.4 Open Data

We will make our data available in a range of ways. For those interested in citizen data science,[11] we will make no / low code[12] options available - providing visualisation tools that have proven successful in promoting take up within other industries.[13] This will address potential barriers to participation from stakeholders who want to explore interests in energy and the environment but who many not have advanced data skills. We will introduce tailored tools to support specific stakeholder needs, such as tools for designing your own connection, making it easier for our customers to make informed decisions about individual energy goals and plans. This will be of

[11] "Citizen Data Science", Gartner Blog (2018)
[12] "The Low Code No Code Movement: More Disruptive Than You Realise" Forbes (2017)
[13] E.g. TFL, BBC, Incumbent Banks

significant benefit to community energy groups who can utilise open data for actioning local initiatives such as to target fuel poverty, help vulnerable customers and/or develop local energy transition solutions. In partnership other companies opening up their data, and the Coalition of organisations model (see Figure 43), further analysis can be done to solidify our Priority Services Register, identify wider forms of vulnerability in our area, and how we can help those customers (More information can be found in Annex 4B.1 – Vulnerability Strategy).

Of course, a key driver for open / shared data is the enablement of flexible services as part of an energy technology (EnTech) ecosystem critical in transitioning to Net Zero.[14] We will pave the way for aggregators, retailers and suppliers to tap into intelligence about the network so that they can create next generation, products and services. We will make open data plugs (e.g. API stores) available to support high volume, high frequency data connections similar to the model for open banking.[15] In this way we will deliver our commitments as part of the modernising energy systems initiative.[16] We believe that this will encourage and enable whole systems thinking for consumers and prosumers to access new offerings to reduce their carbon footprint, optimise energy usage and achieve best value.

Partnership Model in ED2

In ED2 we will evolve our partnership model to be much more proactive. A Coalition of organisations will be formed with shared governance & data and they will work together collectively with the customer at the centre of their efforts.

The organisations will share one platform so customers can ask for support through one organisation and receive support from many organisations.

The aim will be to holistically look at customer needs and then work collectively to deliver the best joined up support.

Each organisation will bring their service offering to the table. The group will be regularly informed by a panel of vulnerability experts to ensure the group are informed on trends and can continuously evolve the service offering.

By moving our partnership model to this more proactive, collaborative approach customers will be able to receive a broader range of services to best meet their needs by going to only one organisation without needing to know what is available.

Figure 37: Partnership Model

We will promote open / shared data and lead the way in stimulating take up across the EnTech ecosystem to drive customer and environmental outcomes. We will continue to chair/ participate in the relevant industry groups to support activities for standardisation which will improve clarity and create mechanisms for collaborative working and the sharing of lessons learned.

For external purposes a user-friendly interface (e.g. website, mobile, library of APIs) and guidance will be developed with options to subscribe for data updates. We will publish data based on 3 different approaches:

- Proactive – through regular consultation with stakeholders on data that would be valuable which will feature on our roadmap in terms of release dates / features and will move to a managed, automated supply of pre-approved data items / formats
- Mandatory – there are likely to be standards and minimum commitments to data provision that will require to support cross industry coordination on strategic goals
- Reactive – we anticipate ad-hoc requests for data and will offer a service to triage those requirements with a clear service level on the time to respond (depending upon the complexity of the requirement) with advice on whether we can / will share the data and providing a supporting rationale and timeframe if necessary

We will actively engage with stakeholders who might be interested in our data to ensure we understand the variety of needs we should support and the most appropriate mechanism for sharing (e.g. no code tools versus APIs for commercial use). Feedback on what data is (or would be) useful and reviews of how data is being used in the ecosystem and by whom will help us continually improve our thinking about what should be prioritised for release and which methods are most suitable.

Our virtual Chief Data Office organisation (senior leader sponsor supported by data stewards) will have responsibility for delivering our Data Strategy including our data roadmap and our open / shared data services. Oversight and accountability will be undertaken by the Chief Data Office organisation to agree the policies, processes and mechanisms that will enable delivery. In the short term, we will prioritise sharing information about our LV network and the mechanisms for sharing data and seeking feedback. Our roadmap for data will be developed collaboratively and through continuous engagement with our stakeholders. We will review usage

[14] Powering Our Net Zero Future" BEIS
[15] https://standards.openbanking.org.uk/
[16] https://www.gov.uk/government/groups/modernising-energy-data

and feedback and continuously develop our solutions, providing clear visibility via our digitalisation action plan and through a variety of other stakeholder engagement activities.

We will introduce training on open / shared data - principles, risk assessments and support for culture change - to ensure that the default position our people take is 'presumed open'. A risk-based approach to data triage will operate a presumed open first approach to releasing data that may be of interest externally; and will assign responsibility for exposing data to data owners who will need to provide a rationale for any exceptions. The supply of data will be supported by automated data feeds providing routine data at the appropriate grain and format required via SP Portal (RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy (Annex 4C.1) – Section 6.3: Open Data) and if appropriate via broker services. Registration and licencing may be required depending upon the grain / sensitivity of data/ combination of data items made available under the shared data arrangements. Business processes as well as technical solutions will be introduced to triage and evaluate the risk profile for data and codify with a view to industrialising the solutions, e.g. in low-risk cases the Open Data Portal might expose data with the option to register and provide feedback but for more sensitive data it may be that the data processor will require a license to handle the data. This will necessitate a solution for authentication by SPEN, with agreements and terms of use that set out specific legal responsibilities. There are no costs included in this initiative to cover Open Data delivery (See RIIO-ED2 Non-Operational IT and Telecoms Business Plan – IT & Digitalisation Strategy (Annex 4C.1) – Section 6.3: Open Data for costs which are budgeted there including data work) but many of the solutions set out here will provide the foundations and the framework within which the Open Data solutions will be designed, developed and deployed.

We have played an active role in the Energy Networks Association's "National Energy System Map" (NESM) project. Our original proof of concept for an "all Scotland heat map" included data from the Scottish gas and electricity transmission and distribution network organisations and enabled us to develop some key learnings that were taken forward into the wider pilot launched at the Energy Networks Innovation Conference in October 2021. We will continue to drive the collaborative delivery of this important initiative, supporting the development of a NESM platform that meets the needs of stakeholders. In particular, we recognise the need for the data in the NESM to be responsive to changing stakeholder requirements and for the platform to be capable of delivering new datasets quickly. For example, we are part of the current working group on the Long-Term Development Statement and will ensure that the NESM platform has the flexibility to deliver new requirements as they are approved.

10.2 Value

The following table outlines the value that the 'Data as an Asset & Service' pillar will generate throughout ED2:

Value for Money	Customer Service/ Experience	Stakeholder Engagement	Reduce Carbon Footprint	Facilitate Net Zero Transition
- Reduced upfront investment in hardware by opting for cloud hosted services - Gaining the full value of our data	- Enhanced security and disaster recovery for data stored; this ensures we will be able to help customers at all times	- Data more easily accessible to set up API connections via our open data portal - Greater collaboration opportunities for data sharing/analysis once CIM has been adopted	- Reduced carbon footprint based on: IT operational efficiency, IT equipment efficiency and data centre infrastructure efficiency reduce the energy required to deliver required services	- Event stream processing will be key in our transition towards being a DSO, and to facilitate Net Zero

Table 19 Data as an Asset & Service: Value

10.3 Dependent Digitalisation Initiatives

The technology solutions supporting this data pillar are detailed within our annex 4C.1 IT & Digitalisation Strategy. The following sections summarise the interdependencies.

10.3.1 Big Data & Analytics

SPEN generates large volumes of data which need to be captured, processed, stored, extracted, analysed, and shared to extract/expose value for our customers and stakeholders. To achieve this, big data solutions must be implemented. These solutions will include new data capture mechanisms, as well as new methods for data storage and processing which can ingest, store, transform, connect, and present data. In addition, we plan to have a reporting data storage and data layer to ensure that people can gain access to the data that they need. Finally, we aim to – through additional data capture and data system integration – create a 'single view of the [dataset]' (e.g. customer, asset, environmental metric, financial metric, etc) to provide a robust foundation for our reporting and analytical capabilities. (See Annex 4C.1 IT & Digitalisation: 8.2 – Big Data & Analytics).

10.3.2 Data & Systems Integration

This initiative will implement the technology, platforms and models required to integrate our data systems with a goal of making data available to stakeholders in an understandable way, at their point of need. This will be achieved through the introduction of several projects. Implementing a Common Information Model (CIM) will be vital in ensuring that our data is in an industry-recognised understandable format, allowing it to be interoperable with asset data from other sources; this may be through the way we structure our source data or via a translation method such as SDIF/INM. We aim to create an API gateway to provide a single access point for REST (Representational State Transfer)/SOAP (Simple Object Access Protocol) based APIs; access management; version management; load throttling and developer portals. Finally, we aim to provide an event stream processing solution. (See Annex 4C.1 IT & Digitalisation: 8.3 – Data & Systems Integration).

10.4 Mapping to Data Best Practice Guidance

'Pillar 5: Data as an Asset & Service' supports the following Data Best Practice Guidance Principles:

1. Identify the roles of stakeholders of Data Assets
2. Use common terms within Data Assets, Metadata and supporting information
3. Describe data accurately using industry standard Metadata
4. Enable potential Data Users to understand Data Assets by providing supporting information
5. Make Data Assets discoverable to potential Data Users
6. Learn and deliver to the needs of current and prospective Data Users
7. Ensure data quality maintenance and improvement is prioritised by Data User needs
8. Ensure Data Assets are interoperable with Data Assets from other data and digital services
9. Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice
10. Store, archive and provide access to Data Assets in ways that ensures sustained benefits
11. Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets a Presumed Open

Figure 38 Data as an Asset & Service: Mapping to Data Best Practice Guidance

The following table describes how the activities in this pillar contribute towards our compliance with the principles of the DBP Guidance:

No.	DBPG Principle	How we will fulfil the DBPG principle
1	Identify the roles of stakeholders of Data Assets	Data assets will have identified data owners and their accountabilities will be defined as part of a data governance framework with oversight from our Data Governance Forum. The usage of data assets by external stakeholders will be monitored and understood, enabling the value extracted from them to be maximised.
2	Use common terms within Data Assets, Metadata and supporting information	Relevant industry standard taxonomies will be used to recognise/ refer to data assets within relevant documentation, and to tag data assets. Interoperability will be considered as part of our data management activities.
3	Describe data accurately using industry standard Metadata	Metadata (leveraging the above taxonomy) will be managed via our Metadata Data Management platform. Responsibility will be as described in our pillar 4 (see section 9 above).
4	Enable potential Data Users to understand Data Assets by providing supporting information	We will ensure that we supply relevant information to enable audiences to make use of data with relevant information (as appropriate to the audience and data set) to outline for example data structure description, contextual information, example usage and any validity criteria.
5	Make Data Assets discoverable to potential Data Users	Metadata will be accessible at entry points which are relevant for internal and external data stakeholders.
6	Learn and deliver to the needs of current and prospective Data Users	Data assets will be evaluated by the Data Owner with support and oversight from the accountable senior leader and committee as to their potential for stakeholder value with a review (at least annually) to ensure it is up to date and to reflect on feedback from communities of users.
7	Ensure data quality maintenance and improvement is prioritised by Data User needs	As above, with a route for escalation and resolution including visibility and risk assessment signed off by the Data Owner, and clear accountability for resolution.
9	Protect Data Assets and systems in accordance with Security, Privacy, and Resilience best practice	A clear blueprint for the extensibility and management of data supported by new tooling and ways of working as well as business processes will be introduced to enhance data lifecycle management and mitigate against data risks.
10	Store, archive and provide access to Data Assets in ways that ensures sustained benefits	Clear policies and accountabilities will be defined (centrally) and assigned for specific data assets to maximise value potential subject to a relevant data triage process outcome.

Table 20 Data as an Asset & Service: Mapping to Data Best Practice Guidance

11. Pillar 6: Data Mastery & Governance

11.1 Scope

We expect the volume and classes of data continue to grow exponentially whilst our need for actionable insight delivered in near real time will accelerate to respond to the challenge of the energy transition. It is essential that we industrialise our methods to accommodate an elastic landscape of data creation, curation, and management. And that we make it easy for stakeholders (internal and external) to understand what data exists and to access it more easily to make decisions and to take actions that will deliver value. With that in mind, there are 3 key areas of focus for our Data Mastery & Governance Initiative:

- Master Data Management (MDM) will enable business colleagues and third parties to share data more easily without the need to expend additional effort to translate it because everyone will agree upon its definition, standards, accuracy, and authority.
- Meta Data Management (MetaDM) The Data Best Practice Guidance recommends that organisations should seek to use metadata to understand and manage their data more effectively - establishing policies and processes that ensure information can be integrated, accessed, shared, linked, analysed and looked after for the benefit of stakeholders (internal and external).
- Data quality management (DQM) is a systematic approach that evaluates and resolves discrepancies between the anticipated and desired values and types of data to a level that is appropriate to the data need of stakeholders.

The requirements above may be solvable in many ways and may in fact be delivered in a single technology tool depending upon the mix and desired approach for our organisation. Discovery work is needed to validate the requirement in sufficient detail to guide product selection and inform our approach to implementation and embedding from the perspective of both business and technology architecture. We are clear that good data practices are as much about ensuring everyone has an interest and a role to play in supporting better data management as it is about landing the tools to make that achievable at scale. That is why we have proposed a dual programme of activity to support the technology and the business change to achieve this goal.

We will introduce new governance models and data management solutions which will underpin our overall approach to data. These solutions will require business and technology change. Business data owners and stewards will be assigned, and responsibilities mandated. Our data elements will be defined in business terms, mapped, modelled, and analysed (with metadata defined) and archived and retained within the auspices of clear data policies that we will set out. These will reference the Data Best Practice Guidance and we will introduce tooling to make it easier for our people to actively manage our data.

Our data governance framework will establish the rules and processes to control and assure the data that we use. It will allow us to identify and mitigate risks, comply with legal and regulatory requirements, and ensure that we maximise the value of data to our organisation and for our stakeholders.

11.2 Value

The following table outlines the value that the 'Data Mastery & Governance' pillar will generate throughout ED2:

Value for Money	Customer Service/ Experience	Stakeholder Engagement	Reduce Carbon Footprint	Facilitate Net Zero Transition
- Greater trust around data; can strive to make data driven decisions to improve efficiency and save money	- Customer data should be up to date and a single, 'best source of the truth' should be available and easily updatable to ensure best customer experience	- Better quality of data for sharing via open data portal and collaborating with external groups - Data is more discoverable and accessible	- Data that is mastered and governed correctly will cut down the number of wasted journeys undertaken by engineers e.g. to get materials that are not in the store as expected, or to visit a customer who's contact/address details have not been updated	- Data is of high quality to make data driven decisions that will be required to facilitate Net Zero transition

Table 21 Data Mastery & Governance: Value

11.3 Dependent Digitalisation Initiatives

The technology solutions supporting this data pillar are detailed within our annex 4C.1 IT & Digitalisation Strategy. The following sections summarise the interdependencies.

11.3.1 Data Governance

Deloitte highlight 5 signs that an organisation should consider an industrialised approach for MDM:

- Unclear Picture of Data – Data is lying across disparate locations, systems, applications, and other sources so it can never present a complete picture
- Finding Data Turning Troublesome – There are no inter-domain associations between departments to know which data is the right data when working on problems which cut across domain areas of expertise
- Dipping Customer Satisfaction – Customer dissatisfaction can be a consequence of inconsistent, incomplete, low-quality data that can result in bad reviews and reputational damage as workaround will never provide the same seamless experience
- Increasing Unstructured Data – Unstructured data doesn't have an already defined schema or data model. It can be textual or non-textual but can be a cause of concern as it can lead to huge ambiguities if its data that is routinely used for reporting and tables are being spun up on the fly that really need to be more tightly controlled (note: this does not mean there is not a valid place for unstructured data)
- Suffering Business Intelligence – Incorrect or incomplete data undermines the validity of analysis and reduce the likelihood of data driven decision making and ultimately value realization

Whilst the statements above may be true to varying extents across different parts of any business, it is clear that to scale the levels of data maturity set out in our Data Strategy, it will be necessary to adopt more industrialised methods for data management. We recognise the value of metadata (data about data) in enabling us to manage data more effectively and will deploy master data management and metadata management tools as described above. We will adopt common terms and definitions for data making it discoverable, accessible, understandable, and interoperable. We will introduce tools and processes for assuring data quality, for example including checks for required values, valid data types, and valid codes. Our data quality management rules will ensure the veracity of the data loaded into the system at the point of capture, and throughout the data lifecycle. Our DQM approach will combine technology solutions with human sampling, enabling automated repeatable data cleanse activity capable of operating at scale to replace manual

and time-consuming discrete data labelling and classification activities. To complement the people changes set out in Data Mastery, the Governance solutions proposed will be established with a key principle of supporting people to understand what data we have and make good decisions about how to look after it and how to use it well.

In recent years, there has been a convergence in solutions for DQM, MDM and Meta Data Management and our pre-ED2 work will focus on discovery of the requirement we have for tooling to enable effective management across the data lifecycle given our data landscape. (See Annex 4C.1 IT & Digitalisation: 8.4 – Data Governance & Mastery).

11.3.2 Data Mastery

Data mastery means knowing how to use data to secure business outcomes, being able to transform data and insights into actions, having the necessary infrastructure, governance, and operations in place, and knowing how to leverage external data and enhance insights to deliver benefits. To achieve data mastery, we will introduce a virtual data governance organisation to support colleagues across the business to oversee quality, governance, and management of data. We will also introduce new conceptual, logical, and physical data maps to protect our underlying data models and provide the required data architecture to cope with the increase in volume and variety of data being captured and processed on our network. This data must be understandable, accessible, and interoperable, with a data owner assigned. (See Annex 4C.1 IT & Digitalisation: 8.4 – Data Governance & Mastery).

11.4 Mapping to Data Best Practice Guidance

'Pillar 6: Data Mastery & Governance' supports the following Data Best Practice Guidance Principles:

1. Identify the roles of stakeholders of Data Assets
2. Use common terms within Data Assets, Metadata and supporting information
3. Describe data accurately using industry standard Metadata
4. Enable potential Data Users to understand Data Assets by providing supporting information
5. Make Data Assets discoverable to potential Data Users
6. Learn and deliver to the needs of current and prospective Data Users
7. Ensure data quality maintenance and improvement is prioritised by Data User needs
8. Ensure Data Assets are interoperable with Data Assets from other data and digital services
9. Protect Data Assets and systems in accordance with Security, Privacy and Resilience best practice
10. Store, archive and provide access to Data Assets in ways that ensures sustained benefits
11. Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets a Presumed Open

Figure 39 Data Mastery & Governance: Mapping to Data Best Practice Guidance

The following table describes how the activities in this pillar contribute towards our compliance with the principles of the DBP Guidance:

No.	DBPG Principle	How we will fulfil the DBPG principle
1	Identify the roles of stakeholders of Data Assets	A senior leader, and committee with oversight, will have responsibility for this principle with documented stakeholder roles and responsibilities reviewed at least annually.
2	Use common terms within Data Assets, Metadata and supporting information	A logical taxonomy (the emerging industry standard) will be used to label and define data assets.
3	Describe data accurately using industry standard Metadata	The above will be used as a basis, as well as being use case driven, to define and apply effective metadata tags.
4	Enable potential Data Users to understand Data Assets by providing supporting information	Metadata tags and supporting documentation will be made accessible for stakeholders with an interest in data assets; a point of contact is already promoted via our Data Portal.
5	Make Data Assets discoverable to potential Data Users	Subject to approval for a given data asset to be classified as open or shared, we will provide a means to search metadata to make its existence discoverable.
8	Ensure Data Assets are interoperable with Data Assets from other data and digital services	Our conceptual architecture reflects a growing need for greater interoperability between data assets to provide seamless, end to end digitalisation via standardised patterns and taxonomies for improved ease of data exchange. Our logical and physical architecture is not yet set for the period, but these design principles are recognised and will form the basis for our approach.
9	Protect Data Assets and systems in accordance with Security, Privacy, and Resilience best practice	We will ensure that compliance with this guidance does not negatively impact our compliance with all relevant regulations, legislation, and Security, Privacy and Resilience (SPaR) requirements through robust governance processes to take a risk-based approach to design/ implementation/ run the business.
10	Store, archive and provide access to Data Assets in ways that ensures sustained benefits	We will establish a common framework and set of policies with appropriate training and accountability for the storage, archiving and provision of access to assets across the data lifecycle overseen by our Data Governance Forum.
11	Treat all Data Assets, their associated Metadata and software scripts used to process Data Assets as Presumed Open	We will take a proportionate, risk-based approach to data triage ensuring that assets are shared or made open where there is the potential to deliver stakeholder value which is not countered by a disproportionately high level of risk, cost, or effort to provide it.

Table 22 Data Mastery & Governance: Mapping to Data Best Practice Guidance

12. Conclusions

We recognise the criticality of investing in data to deliver a better future quicker for more people through a digitalised energy system. Within our Data Strategy we have set out 6 critical data pillars which will underpin our broader ED2 digitalisation plans.

These pillars will enable us to manage and to use our data more effectively, in line with Ofgem's Data Best Practice Guidance.

We will quality assure our data. We will make it more accessible for more people (internally and externally) so that we can deliver more value for our stakeholders. We will take a 'presumed open' approach to data because we recognise the important role that data will play in enabling a flexible energy market, by providing the stimulus for the type of product and service innovations needed to accelerate the transition to Net Zero. Our strategy also emphasises the importance of supporting our people throughout this journey to deliver a better future quicker.

Without this investment, we risk being unable to satisfy our stakeholders' needs effectively. This becomes even more critical in the future when these 6 data pillars are mission critical to future service models. Realistically, these changes need time to land, be absorbed and be embedded in the organisation so it is important we embark on our journey towards Data Best Practice as soon as we can.

There is a considerable amount of work required before the ED2 period to enable us to fully assess the needs of our stakeholders and set out a comprehensive roadmap and approach to deliver this with confidence. This document sets out our ambition and overarching target state, aligned with The Data Best Practice Guidance and the ambitions of the Energy Digitalisation and Energy Data Task Forces, to deliver incremental value for stakeholders and our high-level roadmap. Our proposed delivery model will provide the chance for us to learn as we go to increase the relevance and impact of our solutions for stakeholders on a sustainable basis.

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