



Digitalisation Strategy & Action Plan

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Foreword

Digitalisation of the energy system is at the heart of WPD's transition to build a smart and efficient energy system, supporting the UK's clear commitment for net zero carbon emissions by 2050.



The requirements of our network are changing, driven by customers' needs, decentralisation of generation now connected throughout our network and decarbonisation focussed on the increasing transition of the transport and heat sectors to electricity.

We welcomed the recommendations within the Energy System Catapult's Energy Data Taskforce report in RIIO-ED1 and my team were actively involved in contributing ideas to it. It sets out a number of expectations and recommendations, which has further sped up the digitalisation journey across the energy sector.

Our strategy continues to use the five key recommendations as guiding principles to support digitalisation and drive value and visibility of data. We have benchmarked our current position, where we will be at the end of RIIO-ED1 and ED2 against these five key recommendations. This will enable a consistent approach to understanding our progress as we recognise it's important to provide regular and purposeful updates of our progress.

We are committed to continuing to digitalise our business to ensure that we remain an efficient and effective operator of our network and deliver data and solutions in the right format, at the right time to customers and stakeholders to meet their needs and ambitions.

Our focus to continue to **Improve Data Management, Increase Network Insight and Operation** and **Deliver for Stakeholders** will ensure that we deliver these aims and beyond to further improve our business efficiency, turn our data in to information to benefit our employees and customers, deliver insight for network capacity and connection planning and new service propositions.

Our transition to a digitalised business through our Strategy, Roadmap and Action Plan will continue to be revolutionary, building on initial developments through our distribution system operator transition and innovation programme and cover all parts of our business.

We have already made a number of developments; the investment in our Connected Data Portal now enables huge amounts of valuable data to be accessed centrally and we continue to invest in our Integrated Network Model, ensuring we have a single source of the truth for our data, providing greater detail for us and our customers to benefit from.

Our Data and Digitalisation Governance Group, which I chair, drives our programme to ensure that a consistent and appropriate approach is taken across our complete business. This ensures we continue to focus in the right areas, don't leave any part of our business, employees, customers or stakeholders behind.

The development of our workforce and skills is another key component of ensuring we can digitalise our business; we have already invested in a Data Science apprenticeship scheme to ensure we have the right skills and capability moving forwards. We will continue to assess our needs and invest in the right training and skills to prepare for long term success.

Finally, I look forward to regularly sharing our progress, achievements and benefits of our digitalisation journey.

Graham Halladay
Operations Director

1. Introduction

Our vision and commitment to digitalisation is focussed on supporting the Net Zero transition, driven through delivering for our customers, employees, infrastructure and ensure we further develop our smart and flexible solutions.

Our approach to this remains consistent around our three core principles, **Data Management**, **Insight and Operation** and **Delivering for Stakeholders**. A key function of delivering our digitalisation and data commitments is governance, centred on people, processes and technology to facilitate optimised outcomes for all.



1.1. What is Digitalisation

To understand digitalisation it is important to draw a distinction between it, digitisation and open data.



Digitalisation: Using

For us the term digitalisation means using digital technologies to fundamentally change how we develop and operate the network to deliver an economic and efficient service for customers.



Digitisation: Collecting

Digitisation is the process of collecting information about the electricity grid using sensors, monitors and control equipment. We are collecting some information for the first time and converting previous analogue information into digital formats. This allows it to be computer processed in support of digitalisation.



Open Data: Sharing

By Open Data we assume that all data should be presumed open unless proven otherwise for privacy, security or commercial confidentiality reasons.



















1.2. Digitalisation – the need

Digitalisation of the energy system is at the heart of WPD's transition to build a smarter and more efficient energy system. The UK has a clear commitment to net zero carbon emissions by 2050. This is leading to unprecedented changes in the way customers use and generate energy.

We operate the network for our customers, so it is essential we continue to respond to their changing use of the network and adapt our operations to continue to deliver excellent customer service, reliability, and value for money.

At WPD, we are seeing significant levels of distributed renewable forms of generation connecting directly to our network, such as solar, wind, and energy storage along with increasing levels of Low Carbon Technologies (LCT), most prevalently electric vehicles and heat pumps.

As a result we are seeing our role as a Distribution Network Operator (DNO) expand to include Distribution System Operator (DSO) functions to manage real-time energy flows, and use technology, innovation and commercial arrangements to make optimal use of the existing network capacity.

	Today		Tomorrow
Power generation structure	 Large centralised power plants		 Many small energy generators
Electricity market	 Centralised		 Decentralised
Transmission	 Simple transmission structure		 Small-scale clusters, regional balance of supply
Distribution			
Metering	 Electro-mechanical meter		 Smart meter
End consumers			

1.3. Decentralisation & Decarbonisation

The world is changing and how electricity, and energy more widely, is produced is changing. Gone is GB's reliance only on large-scale centralised generating resource, marked by significant periods without any coal-produced electricity.

This means that electricity is being generated more locally, increasingly connected directly to the distribution network.

How our network needs to operate and interact with our customers to facilitate this type of operation is changing; data and digitalisation is and will continue to be at the centre of this.

We currently have 10GW of distributed generation connected across our four licences areas, which represents 30% of distributed generation in GB.

Our Distribution Future Energy Scenarios (DFES) illustrates how this is going to increase towards 2032.

To support the Government's commitment for the UK to become net-zero means that existing ambitious plans to decarbonise, focussed on low carbon transport and the electrification of heating have further increased.

This will see significant increases in demand on the existing electricity network.

Throughout GB it is projected that by 2032 the number of electric vehicles and heat pumps will be in the region of 17.6m and 6.3m, respectively. Within our four licence areas these numbers are expected to be 6.9m and 1.3m. Their adoption towards 2032 is shown in our DFES work.

Enabling customers and stakeholders access to data to understand the capacity and operation of the network today and forecasts as to how that will change moving forwards, timely and effectively, is crucial to enable them and others to understand how to most effectively and efficiently integrate LCTs and other new technologies on to the system.

Figure 1: Generation and Storage Growth

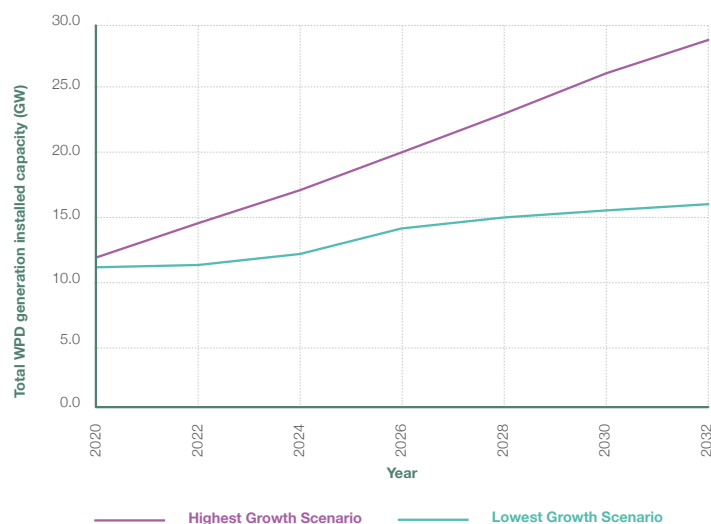


Figure 2: Electric Vehicle Projections

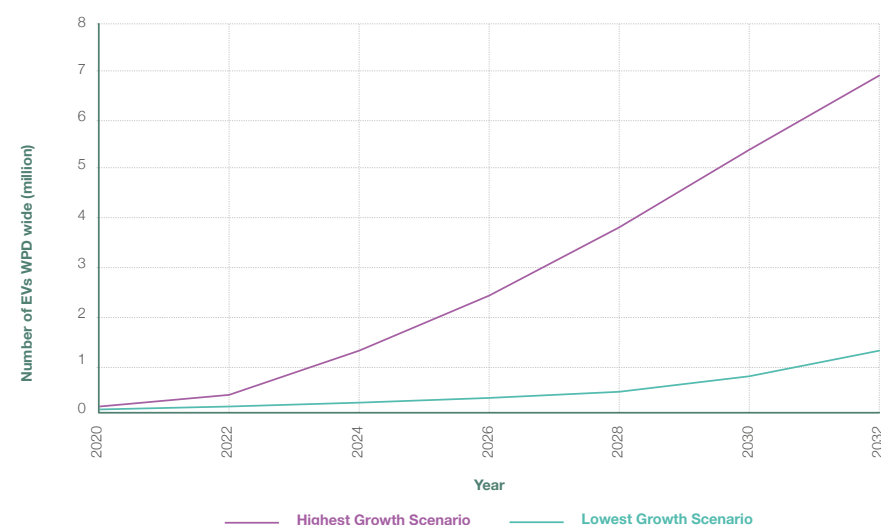
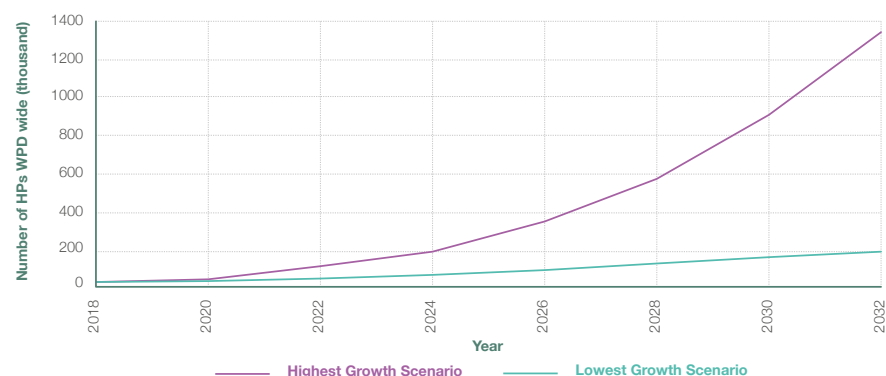


Figure 3: Heat Pump Projections



1.4. Customer & Employee focussed

Our stakeholders drive our business activity and data and digitalisation is no different.

We have developed and tested our strategy and action plans extensively both internally to ensure it meets the needs of our employees and externally as part of direct digitalisation workshop sessions, but also throughout wider stakeholder sessions; these include Connections and Flexibility as two key business elements that digitalisation and improved data is and will continue deliver improved process and outcomes.

We define user types to effectively deliver their specific needs and have expanded further this to include user personas to more effectively 'set the scheme' for their needs, skills, expectations and critically the benefits they're aiming to deliver.

Digitalisation is dynamic and so is our stakeholder engagement to continue to provide relevant and regular engagement as our action plan develops to deliver the emerging needs of our business, customers and stakeholders. We understand that traditional engagement works well both for our staff and customers but also that new modern techniques for engagement, particularly for digitalisation work well and shorten the time from feedback to implantation. We also have specialist stakeholders who are further forwards in their digitalisation journeys, such as Telecoms, to ensure our priorities and processes for development align based on previous learning and experience.

Engaging and serving our stakeholders will continue to evolve and expand through the use of single source data portals, meaning that accountability, confidence, decisions, outputs and benefits are increased to best serve their needs. This has already shown increased access and utilisation of our data to deliver value and benefit.

1.5. Infrastructure, Smart and Flexible

Understanding our infrastructure, the assets and their connectivity has always been important and core to our business, however, the time for further data and insight is now.

The way our network is operating and will operate in the future means that we require data to continue delivering the best service and to make this data available truly open to benefit customers and stakeholders to make more informed decisions on how to interest with our existing or future network.

Continuing to improve the insight of our infrastructure will mean that we will further improve our operational performance, maximising the value of our assets and network to deliver for all our customers, current and future.

Linked to infrastructure is ensuring that our network continues to be becomes increasingly smart and flexible. We have to this point implemented a number of flexibility services and active network arrangements and will use our data and data from others to ensure that these services are able to expand and mature to deliver for the needs of our customers. We will increase the visibility of our network through more sensors and monitoring, whilst utilising data such as smart meter data to drive insights at a local level.

We recognise the need to implement new systems and solutions to deliver the needs for our customers and stakeholders and this is a key focus of our digitalisation journey. These are solutions such as energy forecasting to ensure the needs of our network in the short and long term continue to be well understood through to autonomous control systems at the grid edge to optimise localised utilisation for multiple outcomes to deliver energy performance.



1.6. Governance

Our Data Governance is focussed on the development and utilisation of people, process and technology to leverage data as a valuable asset, enabled through appropriate data ownership, accessibility, security, quality and knowledge.

The development, delivery and implementation of these key aspects will be managed centrally and as such the Data Governance must span the complete business to ensure a uniformed and strategic approach.

It is focused on creating a framework to ensure the confidentiality, quality and integrity of ours and our customers' data, which we recognise is essential to meet social and legal obligations, such as regulatory compliance, data sharing and privacy policies.

We use our Data Governance to significantly reduce the risk associated with data; both business and compliance by increasing oversight, ownership, visibility and management. It enables the integration and consolidation of information from multiple systems historically managed in silos throughout the business into a single source of truth, providing economies of scale and making it possible to effectively tie information policy and process to business strategy, delivery and efficiency improvements.

Figure 4: WPD Governance Model



1.7. Linking our strategies

Our Digitalisation Strategy is key to delivering change in how we plan, manage, and operate our network and interact with and provide data to customers and third-party system participants. Therefore, it is critical that our strategies are aligned and coordinated.

Figure 5: WPD Strategy Integration



We have ensured that our strategies are aligned to our wider needs and aspirations providing a foundation to develop solutions to:

- meet the changing needs of the business and customers;
- utilising our Innovation programme to develop and trial the next set of data and digitalisation solutions;
- ensuring that our future information and operational technology (IT/OT) developments are suitably aligned to the needs of future business operations, and;
- as the level of our data increases and is presumed open it is vital that our Digital Strategy is aligned to facilitate this and how and when we present this in the right format and timescales.

We will continue to strengthen these links to shape and deliver effective digitalised solutions.

2. Energy Data Taskforce Report and beyond

Moving from a legacy analogue system to a modern, digitalised energy system, is a critical step in enabling the UK's transition to net zero carbon emissions while keeping the lights on for customers. The availability and utilisation of good quality and accessible data is key. This means providing increased access to the right data at the right time within our organisation and through open access to our customers and interested stakeholders.

Digitalisation applies to the whole energy industry, not just the network operators like us.

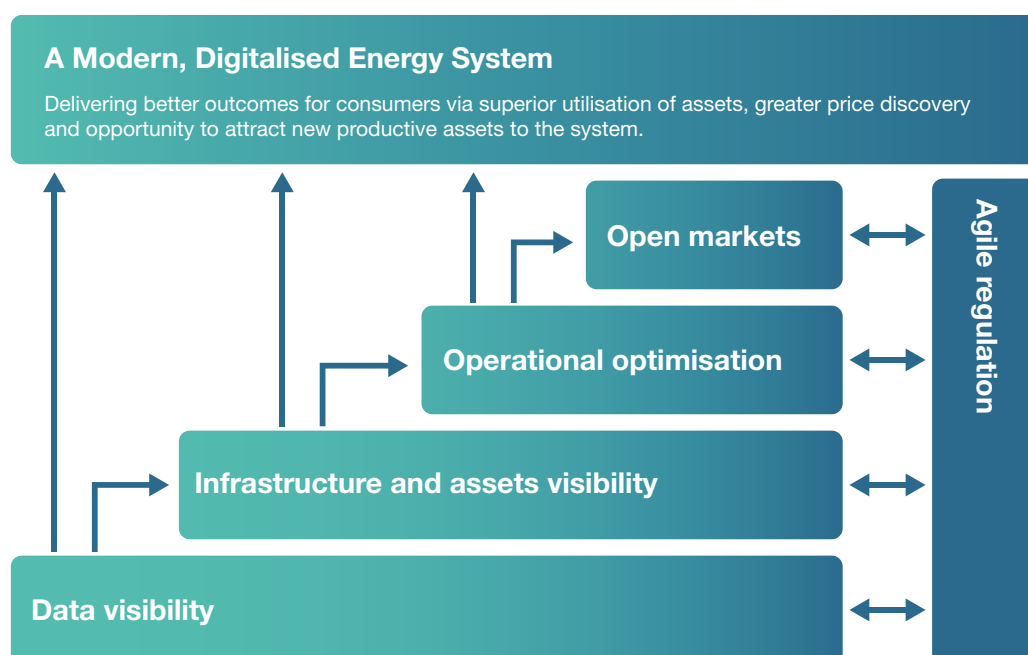
We recognise that our central position in the energy delivery chain – independent from energy service providers, suppliers and generating companies – means our role is critical.

Therefore, we have and continue work proactively with the other energy network companies via our trade association the Energy Networks Association (ENA), the government's Energy Systems Catapult (ESC) and our wider stakeholder community to identify the data that should be shared across the industry, how it should be consolidated and presented, and how it can be accessed.

ESC's Energy Data Taskforce Report¹ identified five key steps to support the transition to a modern, digitalised energy system:



Figure 6: EDTF Building blocks

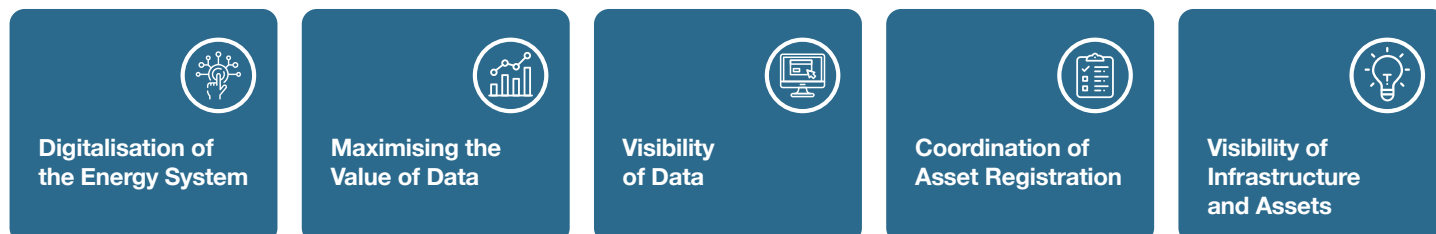


¹ <https://es.catapult.org.uk/reports/energy-data-taskforce-report/>

2. Energy Data Taskforce Report and beyond

We recognise and understand the importance of working as an industry, collaborating within and beyond the energy sector, and with stakeholders, to deliver robust and standardised data to meet these ambitions.

This has been captured within the EDTF through five key recommendations for digitalisation:



Whilst the EDTF continues to provide the backbone for digitalisation activity throughout the energy sector and we recognise the significance of the challenge and we continue to actively deliver to meet these needs, we recognise that in RIIO-ED2 to deliver our needs and those of our customers and stakeholders we need to go beyond simply meeting these key recommendations.

Delivery of our Digitalisation Strategy is dynamic and agile and the pace of change in many areas is fast; driven by new technologies and solutions available but also the needs of the business and our customers and stakeholders.

However, it is important that we continue to follow our overarching roadmap and continue to transition along our data and digitalisation maturity scale to where our employees, customers and wider stakeholders need us to be.

The following provides detail of how we are making sure that we deliver and meet the needs and expectations of the EDTF but also how we will go beyond that as is reasonable to deliver our stakeholders' needs.



Digitalisation of the Energy System

We understand that developing our business, embracing and delivering new processes, systems and ways of working and engaging with data needs the buy-in from everybody and that this is a continuing journey. Much of our early digitalisation and data focus in RIIO-ED1 came from our DSO Strategy and the development of our business-wide digitalisation strategy now ensures that it is focussed on the changes and impacts of the complete business.

We ensure this business wide approach continues and grows through leadership by our Data and Digitalisation Governance Group but also through regular and relevant engagement with our staff, the compilers, processors and users of data to ensure that the data and systems are supporting improvement across the business and to understand what else needs to be done.

Understanding the wider energy system's needs of our data and solutions and how we can leverage value and benefit from these in turn is an important factor in the processes and systems we look to engage and implement. The need to do this collaboratively and following standardised processes is at the centre of successful outcomes and we continue to take a lead in this area, demonstrated through our implementation of Common Information Model (CIM) and our open data portal, Connected Data.



Maximising the value of data

Enabling our employees and customers to maximise the value of data focusses on creating increased visibility of current and future data, which is enabled through documenting and describing our data as a matter of course, as well as centralising how our data is accessed. For our employees and customers that means continuing the implementation and utilisation of a Data Catalogue.

Our central systems, focussed on enterprise asset management, network management and geospatial information systems hold lots of our most relevant data and access to that is well understood and the value for the immediate purposes, operating and planning our network and capturing the physical location of assets and their properties is well understood. Important to increasing our maturity in these areas is consolidating these separate datasets and locally maintained datasets that individuals and teams use to complete specific tasks to drive additional value.

We are working hard to provide our data as presumed open. We became the first network operator to provide our data through an online data catalogue, Connected Data, utilising the Dublin Core metadata standard, ensuring a consistent level of supporting information is provided with each dataset.

Our engagement with all stakeholders means that we continue to develop and update our process of sharing and utilising data to deliver their needs.

2. Energy Data Taskforce Report and beyond



Visibility of Data

The implementation of our data catalogue, ensures that a single repository for relevant data exists for all employees and customers to begin to access, enabling well managed and controlled access to data, reducing any duplication issues or data remaining in silos.

We are committed to sharing our data in ways that meet the needs of their end users, whether internal or external. We do this by targeting the access to our data in three ways:

Highly visual
Typically an interactive map or graph to provide all users high level but key information, demonstrated in our Live Data Feed to understand the import, demand and generation in our four licence areas in real-time.

Raw data for download and interrogation
Enabling the utilisation of data in multiple systems and to overlay with other dataset through the provision in standardised formats such as CSV, JSON, XML etc.

Application Programming Interface (API)
Providing data using an automated approach where access is provided through a machine interface, meaning no regular human interaction is required.

Figure 7: Real-time data map

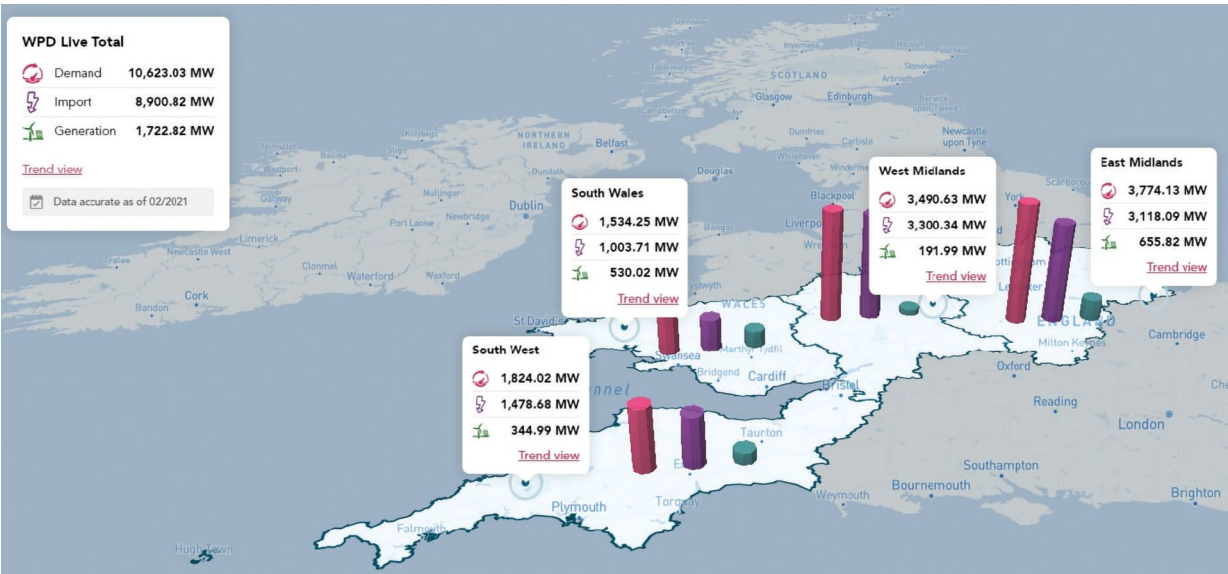


Figure 8: WPD API access

Access resource data via a web API with powerful query support. Further information in the main CKAN Data API and DataStore documentation.

Endpoints »	
The Data API can be accessed via the following actions of the CKAN action API.	
Create	https://opendata.wpdserv.net/api/3/action/datastore_create
Update / Insert	https://opendata.wpdserv.net/api/3/action/datastore_upsert
Query	https://opendata.wpdserv.net/api/3/action/datastore_search
Query (via SQL)	https://opendata.wpdserv.net/api/3/action/datastore_search_sql

Utilising our solutions to maximise the value of data comes hand in hand with the visibility of data and our commitment to make data open and accessible in a standardised but importantly a timely manner to inform key decisions internally and for our customers and stakeholders.

This ranges from key asset and connectivity information to better inform our customers' new connection process to providing in real-time, via API, flexibility market data to inform pricing optimisation and requirements discovery.



Coordination of Asset Registration

Our assets are well understood as are other organisations' assets within their companies, however, there is clearly a need to standardise the approach to share data related to assets and the terms and definitions used.

Work has begun in this area, with examples such as the Embedded Capacity Register (ECR)², which has been adopted as a standard mechanism to share data on generation above 1MW on all Distribution Network Operators' (DNO) networks.

The use of additional datasets to drive coordination of registration is also required, focussing on assets such as electric vehicle (EV) chargers and heat pumps.

The value of direct access for datasets, such as relating to the Renewable Heat Incentive (RHI) and from the Office for Zero Emission Vehicles (OZEV), to understand volumes and locations of heat pumps and EV chargers to inform our planning assumptions, respectively, is of significant value.

We will work collaboratively with these organisations to develop regular and effective transfer and sharing of data; this will have significant value in terms of maximising the utilisation of our existing network by understanding in more detail what's connected and where.



Visibility of Infrastructure and Assets

Understanding our infrastructure and assets in a common and consolidated manner with other utilities is key for third parties to take a whole systems approach to short and long term investment planning.

Our innovation work with Wales and West Utilities (WWU), using our respective gas and electricity asset and infrastructure detail to develop multiple scenarios to support South Wales' net-zero 2050 ambitions³, has demonstrated the value of making this data available.

Our complete GIS is available on the web, providing geographic locations of all assets and summary details of the assets themselves and our CIM development is now providing that additional asset information. A number of interactive maps are also available identifying elements such as network capacity or the need for flexibility.

Our customers need to be confident that a process they follow for one organisation is the same as for another. Continuing to collaborate effectively with our peers is key to our strategy; we are demonstrating this through taking a lead role on the National Energy System Map⁴, providing a GB view of gas and electricity assets in an open format.

To drive additional value for us, our customers and our stakeholders a greater degree of interoperability is needed between these disparate elements, which will start with developing overlay functionality of our interactive maps.

We understand the need to provide this data in a standardised format, linked to the coordination of asset registration activity, to enable third parties to overlay and combine different datasets to create a complete energy picture of defined areas.

² <https://www.westernpower.co.uk/our-network/embedded-capacity-register>

³ <https://www.westernpower.co.uk/net-zero-south-wales-project>

⁴ <https://www.youtube.com/watch?v=MyZs0wxc0OI>

2. Energy Data Taskforce Report and beyond



Going beyond EDTF

Meeting the EDTF recommendations is challenging and we are not only committed to meeting those but also recognise that going beyond these is what will serve our employees and customers best in the long term. We have a number of commitments that will ensure we continue to be a leader in digitalisation in the energy sector and beyond.

Data being a specialist activity to data being everyone's role

We are quickly moving from an approach where data historically the coordination, management and manipulation has been handled by a few specialist staff to a coordinated approach to data management and utilisation through all employees within the business. This has been supported through the use of tablets with applications to view, capture and manage data effectively out in the field and the implementation of new centralised data solutions. We are committed to continuing and advancing this trend, through systems and appropriate training to encompass a culture of responsibility and ownership of data.

Sharing when asked to presuming open

Flexibility markets, new connection propositions and asset operation will be best served from data being provided in a timescale and format that suits their needs. We will continue to transition our culture from sharing data when asked to asking why data cannot be shared open and transparently in a format or formats that suit all. This will deliver improvements for our business model and others alike.

Best as a business to best as a sector

Supporting wider capability and capacity throughout the sector, sharing our process as well as our output moving forwards is key to ensuring we support the advancement of the wider energy sector and not just our business. We have proactively taken this approach in the use of CIM as a mechanism to share asset and infrastructure data and we will continue to share our approach to its fullest extent as far as is practical.

Taking our customers on the journey

There are many data and digitalised developments we can make to support active and informed customers on their journeys, where they're perhaps ahead of us in their digitalisation journey, however, we recognise, through our user personas, that a number need greater support from us. We will deliver and demonstrate solutions and examples of how our data can be utilised, on its own or as a combination of multiple datasets to provide outputs that can improve multiple outcomes.

Structured approach to knowledge gathering

As we identify the need for development and investment we have engaged beyond the energy sector, such as during the implementation of our data catalogue leveraging learning from other sectors who have successfully implemented such technologies. Moving to a structured and formal approach to regularly and routinely capturing knowledge of the digitalisation journey and process of wider sectors through strategic relationships to inform our longer term roadmap will move us away from tactical to strategic engagement.

3. Our Approach

Our Digitalisation Strategy focusses on three pillars, which have been developed and refined from our initial strategy through extensive internal and external stakeholder engagement, broadening the expectations and focus of our activity to:



Improving data management



Increasing network insight and operation



Delivering for stakeholders

We recognise that improving our data and delivering our digitalisation commitments are key to:

- Further improving business efficiency;
- Driving enhanced performance;
- Turning data into information that benefits customers;
- Providing open data to market participants;
- Producing better insight into asset capability for customers;
- Planning to connect new loads, storage, or generation;
- Developing new connection and service propositions.



3. Our Approach

3.1. Improving data management

Improving our data management for our benefit and for that of our customers and stakeholders is key and is the backbone to being able to deliver value from it and enable digitalised solutions to be developed. We understand improving our data management is a journey that we are tracking and measuring to ensure we continue to focus in the right areas.

We have already demonstrated improvements in our data management processes through targeted project activity to understand our data sets, lineage (how our data is derived and where from), and business and third-party use. As a business we have recently invested in a new Geographic Information System (GIS), enabling us to further digitise our records and improve data capture activities. This, and other work, will continue to improve our data management across the organisation. A key part of improving our data management is to employ best practice in this area and we are committed to delivering against the Data Best Practice Principles⁵.

Governance processes

Key to robust and appropriate data management is data governance. This focusses on having appropriate data owners and processes, ensuring responsibility and transparency, to enable data quality to be managed and improved. Providing a set of rules and processes to follow that are fit and appropriate for our complete business is key to ensuring that we can maintain a consistent approach to data improvement and management as well as providing a route for feedback to improve and adapt as required.

Improving data quality

Continuous data quality improvement is required to maximise the value of any digitalised business and we're no different. Enforcing governance processes is already supporting this as well as the implementation of project driven improvement activities to fill data gaps and quality issues. Our data quality has been fit for purpose in the 20th century but our customers and stakeholders' reliance on it is significantly increasing; we are seeing this through our developing flexibility activity, where good quality data provides improved solutions.

We have already undertaken a number of data quality improvement activities, which to date have focussed on targeted activity to largely meet a new business need and now is the time for a more structured approach to this quality improvement.

Our data governance will play an important role in improving our data quality through clear ownership and responsibility but we recognise that we have gaps and inaccuracies in our data, where this data has historically not been required and utilised on a regular basis – this is changing and changing rapidly.

A data centric approach throughout our business is being implemented to drive data quality improvements.

This includes changes to how we capture data at source, store the data and manage it. For our existing data we have largely relied on relatively manual processes for improving it. We will now focus on rules based improvements initially to enable a degree of automation supported by machine learning (ML) to provide improvement on an enduring basis.

Single source of the truth

To be able to drive value from any data, confidence in that data is required. We have a number of different legacy systems to capture and store our data and our focus is to ensure that we have a single source of the truth.

Changing our processes to ensure that data is only entered in a single place, rather than a number of times within different systems, and developing appropriate complimentary master data management processes will provide data that is trusted, accessible and usable.

We have begun activity in this area, through the development and implementation of our Integrated Network Model (INM), which connects directly to our three core asset data systems, our enterprise asset management, network management and geospatial information system. This identifies discrepancies in data between these systems and through an automated process creates a single version of our network, the assets and connectivity. Further understanding our assets and the connected network will serve to drive wide scale benefits to meet our customers' needs.

3.2. Increasing network insight and operation

Leveraging value from data is fundamental to becoming a truly digitalised business. Innovation projects we have delivered have developed new solutions capable of providing enhanced visibility of our network, what it's doing and what it's likely to do.

These solutions, together with advanced control systems, are being rolled out across our network. This roll-out is aligned with our customers incrementally switching from fossil fuels to electricity to meet their heat and transport needs, requiring a more dynamic and responsive network.

Using increased and improved data is key to how we operate our network in real-time, through the provision of more informed actions to maximise the capability of our existing assets and how we maintain, plan and reinforce our network in the long term. Utilising advanced insight and solutions is supporting, and will continue to, reducing risk and cost in delivering the network and operation required to allow customers and stakeholders to meet and exceed their needs and expectations to support the net-zero vision.

Additional data and monitoring

Having improved network monitoring and access to more data enables decisions to be better informed and made more dynamically. It is becoming more important to have access to more data at increased granularity as customers are increasingly engaging with the network and expecting it respond.

We will continue to improve our base level network visibility to inform our business and customers in planning and operational timeframes. Targeting areas of high LCT integration (either actual or projected) with more dense data capture capability in the first instance will serve us and our customers well to inform optimised operation to minimise the need for traditional reinforcement.

We will be able to drive value from increased asset data to understand the condition of the network and specific assets to identify and plan interventions such as delivering cost savings and risk reduction over routine or time-based maintenance.

As well as network data and monitoring, we recognise the need for much wider data capture to inform and improve our business efficiency, from understanding our processes, like new connections and outage planning to how we engage with customers effected by power cuts.

Use of external data and services

Whilst we are increasing the density and volume of monitoring and data capture on our network, it's recognised that there's a need to use relevant external data sets and services to leverage greatest value. We already utilise data sets such as weather forecasts to inform our operational decisions and we will enhance this as appropriate.

As we make more data available we recognise that others will also have skills and capabilities to drive value from our data, whether that's through advanced analytic techniques or integrating with other data sets and we'd look to utilise these third party services where they drive value to our network and customers.

Understanding yesterday, today and tomorrow

Detailed understanding of the network's activity for historic periods, live information and what it's likely to do enables key decisions to be made for how we operate our network and also for customers as to how they do or will operate their assets or connect and interact with our network.

We have recognised this need and share our real-time and historic network power flow information openly in our three formats, highly visual, raw data and API, for our four licence areas. Our commitment is to further increase the granularity of this data to provide greater insight and as our forecasting maturing develops share this in the same manner to support our increasing flexibility services and other activity.

3. Our Approach

3.3. Delivering for stakeholders

Meeting the needs and expectations of our stakeholders, internal and external, is the fundamental priority of our digitalisation activity and our strategy is focussed on delivering this.

Ensuring our Digitalisation Strategy is focussed on the right areas requires significant and on-going engagement both internally and externally to ensure the focus and priority areas meet current and future challenges as effectively and efficiently as possible.

Engagement needs to occur both informally and formally, whether it's the development of a data capture process from our field staff or the implementation of a completely new system, such as the implementation of a data catalogue. We recognise that both these routes are incredibly valuable and will continue to be facilitated.

We know there are a wide range of customer and stakeholders that are keen to engage and can add real value in to the solutions we develop for external, as well as internal, use. These solutions vary from supporting online and automation of connection applications, using our detailed data to support academic and research fields through to developing and delivering new energy market offerings. We already engage extensively through our innovation, network strategy and our dedicated stakeholder engagement team; our engagement for digitalisation and data work will be no different.

Defining needs and engaging

We understand that our employees, customers and stakeholders have specific aims and targets that require our data and advanced solutions to be realised, where it is not always understood which of our data will best support their ambitions. Therefore, we have and will continue to focus our internal and external engagement on an action and benefit process, which is what action is required to deliver what benefit and what data is required to support that action.

Building on this is a process of consultation of how to present that data that is most useful for all or a range of potential users. We have successfully used this process to gather extensive data use cases categorised against five internal and six external data user categories.

By sharing our current user types we can understand from feedback and engagement where, moving forwards, these can be developed and enhanced to ensure that we're capturing the right user types to prioritise datasets and digitalised solutions.

We have worked to provide greater insight in to our data stakeholders through the creation of user personas. We have developed profiles for specific roles within our user types to ensure our investments and developments are aligned to meet and exceed their needs.

We continue to use a number of diverse engagement strategies, from our traditional face to face round table events to providing regular updates in digestible formats, such as short podcasts and videos of our latest developments and activities.

Consultation is also important and we will provide opportunities to feed in to formal consultations, as we do today, but also short polls on LinkedIn and Twitter, to provide quick and easy ways for all user types to readily engage.

Internal

Design & Planning

Network planning engineers, commercial flexibility managers and support staff;

Operation

Network control room functions for DNO and DSO functions;

Finance

Financial managers, finance support functions and reporting;

Regulatory

business analysts, regulatory reporters and operation planning staff;

Information/Operation Technology

System architects, communication engineers and maintenance support.

External

Energy Sector

Aggregators, energy providers, flexibility platforms, network operators, electricity generators and renewable generators;

Academic & Innovators

Academic researchers, entrepreneurs and innovators;

Third Sector

Charitable sector, campaign groups and community energy organisations;

Public Sector & Regulatory Bodies

Local authorities, policy makers, regulators, social work and care systems;

Commercial

Commercial energy market, low carbon technology provider, consultants, developers and EV fleet operators;

Consumer

Consumers, investors and intensive energy users.

Figure 9: User persona examples

Increasing internal access to data

Access to a single version of centralised data throughout our business and externally, moving away from locally owned and derived datasets is critical to ensuring that our business and operations continue to be coordinated, efficient and effective whilst providing the visibility to customers to inform their decisions.

Ensuring that data is available as required throughout will only continue to grow in importance. We will build on our data catalogue and governance activity to ensure that our data is always accessible to drive consistency and system benefits internally and shaped to deliver the needs of our external users effectively.

We will continuously and actively look for developments and improvements, both to the data and the access processes to ensure they're fit for purpose and support our aims.

Discoverable and searchable

We are committed to making sure that our data is both discoverable and searchable. We recognise that data can be difficult to find and we have undertaken a number of activities as a business and a wider industry, through ENA, to ensure that this is no longer the case. Continuing to develop our Connected Data Portal⁶ is key to further improving the availability and access to our data and complimentary data sets. This is linked to our improved data management activity, ensuring that we first understand our data, its format, its key descriptors and other relevant information to drive value. An online data catalogue, complimentary to our internal version will ensure that customers and stakeholders are provided the right data, in the right format at the right time.

Standardised and usable

Working as an industry to provide a level of data standardisation is already on-going, where the ECR has been an example, but we are aware that customers need greater standardisation of data across electricity distribution network operators and wider energy system operators. We are committed to facilitating this standardisation and provision of usable data, supported by information to access, interpret and drive value from the data. An online version of our GIS system is already available and we will continue to develop this to provide customers the information that they need to support their planning activity and beyond and act as a basis in supporting the implementation of a system wide Digital System Map.

Key is the standardisation of the terms used to describe data, whether that's datasets or detail within them across the industry so that when a stakeholder is searching our data they're provided the same detail as any other DNO. We will continue to lead the discussion with the energy sector to further standardise data terminology through the implementation of an industry wide glossary and vocabulary to support this.

Open data charter

We understand the value of data, to us, our customers and stakeholders and are committed to our Data Charter to ensure we capture, manage and share our data to enable the delivery of the net-zero transition.

Central to our charter is presuming data to be open and accessible to customers and interested third parties. A company-wide, centralised data sharing assessment tool, has been implemented to provide consistency in the approach to assess the openness of data.

It is not simply the process of sharing our data but ensuring it is shared in a timely, accurate and complete manner that suits the end user and enables them to meet their aims. Our targeted approach to data sharing facilitates ensuring that customers are provided this effectively.

Figure 10: WPD Open Data Charter

⁶ <https://connecteddata.westernpower.co.uk>

4. Information Technology & Telecoms

Information Technology (IT) is a core activity to facilitate our digitalisation transformation.

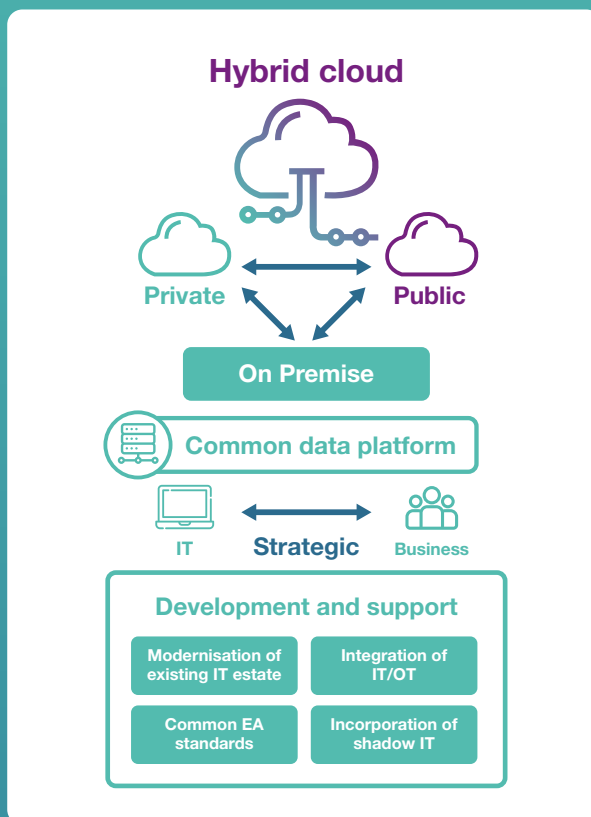
To support the transition to a fully digitalised organisation our IT systems will need to be rationalised and modernised and this will include, replacing and upgrading ad-hoc legacy applications; embracing and investing in new technologies, integration tools and common data platforms. IT Systems will also need to be further integrated with operation technologies related to power delivery systems.

Our IT systems have traditionally been focused primarily on the core principles of security, reliability and resilience and that approach has served well, however, as we move to a culture of open data and digitalisation we realise that we need to also make our systems more accessible, agile and adaptable to change, whilst continuing to enhance our Cyber Security controls.

It is likely that some of our on premise solutions today will be cloud based tomorrow to ensure that our solutions continue to be scalable, supported, flexible and cost efficient.

We will continue to ensure that our solutions are appropriate with use cases driving our investment in new and augmented solutions, likely to encompass a hybrid cloud architecture, utilising infrastructure, platform and software as a service solutions (IaaS, PaaS and SaaS).

As well as IT playing a key role in the Digitalisation & Data Governance Group an IT Change Board will be implemented to drive the strategic planning function through the creation of a defined, prioritised and agreed project portfolio, supporting the needs of the wider business and the central IT Strategy.



Telecommunications

In order to fully digitise our system a modern, robust and secure telecoms system is required. Our insourced model for the provision of telecoms has served us well and will continue to do so, procuring services too where appropriate.

There are a number of key activities being trialled for future deployment, including the implementation of an LTE solution. As the numbers of assets and equipment connected to our network increase the cost and capability of managing the monitoring and control using traditional radio telecoms will become restrictive.

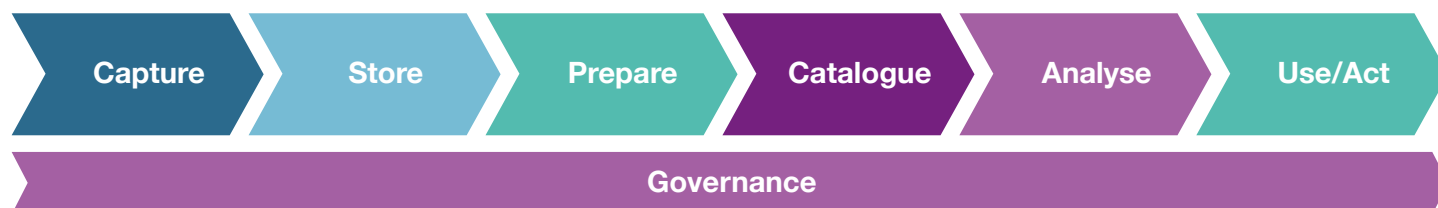
The radio infrastructure for our future will need to be able to overcome these limitations and be scalable for future network growth and data demands, whilst ensuring efficiency, effectiveness in operation, resilient to power failure and to be at the point of need.

Coordination will be driven between our digitalisation, innovation and telecoms activity to ensure solutions are fit for purpose and meet the needs of today, tomorrow and beyond.

5. Data Strategy

Our data strategy is key to our wider digitalisation strategy and embedded as part of our data governance. The value of data to inform and enable action is driven through a consistent, well developed and managed data pipeline and ours focusses on six key elements.

Figure 11: Data and Value Flow



5.1. Capture

Understanding the data we need, our customers need both now and in the future in critical.

Our approach to data capture is focussed on our asset and network information, real-time and historic energy flows and key third party data. Implementing the right systems and solutions to facilitate this, from enhanced field tool systems, enabling our staff capture, track and verify data at source is important to capture the right data first time, every time.

Taking our customers and staff on our digitalisation journey will ensure that our capture tools, processes and systems employed will drive the benefits we need further down our data pipeline.

5.2. Store

Ensuring that our data is stored and structured effectively will enable greatest value and insight from our data.

Our strategy is focussed on the on-going implementation and development of master data management. Delivering benefits through defined master storage systems, support a data culture of 'single source of truth' and enabling greater defined data flows between source storage systems to provide greater insight as needed.

Greater use of data lakes, warehouses and visualisation layers as appropriate will enable the further steps of our data pipeline to deliver optimised data for our staff and customers to take action through direct access to the right structured or unstructured data.

5.3. Prepare

The value of data is driven through the correct management and presentation to the right systems and users at the right times.

We recognise the value of providing well-structured data to end users, both data proficient and those on the start of their data journey. Our preparation will focus on prioritised datasets being regularly and routinely extracted, described (metadata and dictionaries) and presented to our internal data catalogue.

As key element of data preparation is understanding and management quality and completeness, presented to all along with the data. An integrated approach to data management means that analysis and action further in the process will and does continue to inform capture and storage techniques to enable improvements.

5.4. Catalogue

A single access repository for business data internally (and externally) drives many tangible benefits; reducing the time to access the right data, increased trust in data and greater understanding of the data through it being well described.

This facilitates improved data governance and understanding of the data within the organisation to enable business-wide improved operations and decision making.

5. Data Strategy

5.5. Analyse

Being able to analyse data to drive value from it by both data and business experts will ensure that we continue to maximise the value of data for us and our customers.

This means implementing market leading business intelligence tool(s) linked to our source systems and structured datasets to create highly visualised and digestible information and insight to improve all aspects of business operation.

Utilising advanced data science techniques, incorporating machine learning (ML) and other solutions to automate the process of driving insight from data will also be a feature of our analysis activities moving forwards.

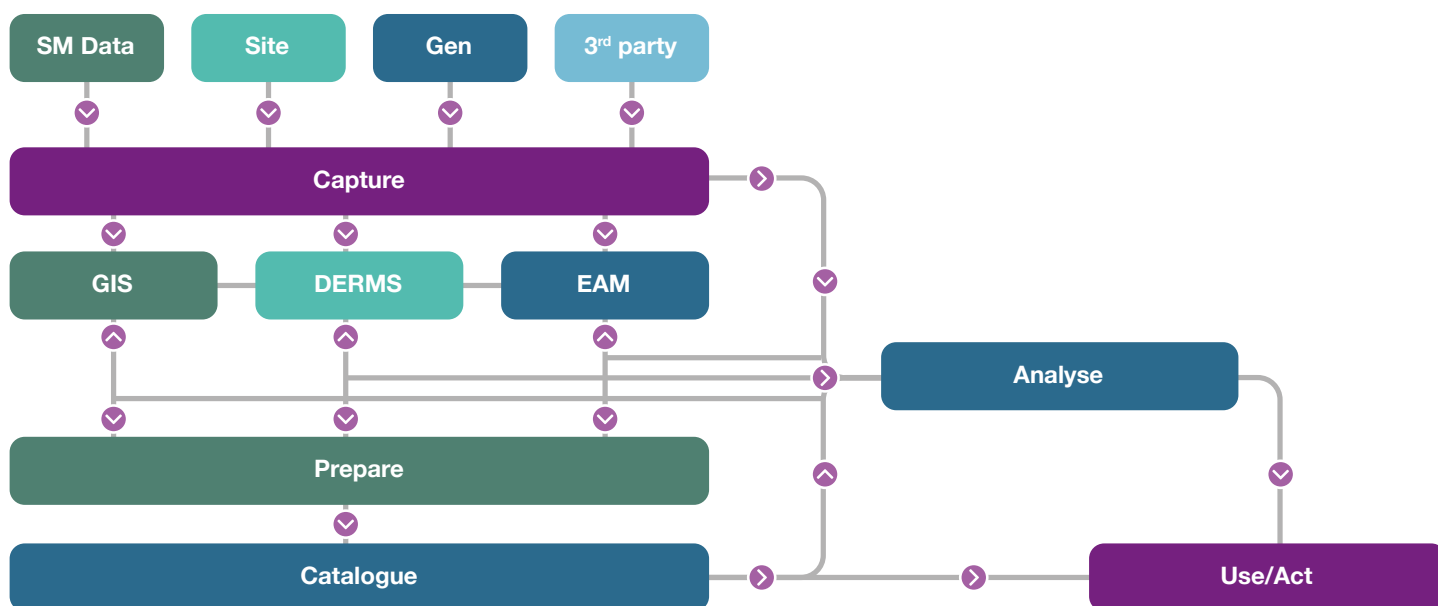
5.6. Use/Act

Clearing being able to use and act on data is the driving force behind a data strategy.

Analysis plays a central role in providing the right data, in the right format at the right time to enable our employees and customers make informed and improved decisions.

An integrated and consolidated approach to data management will enable this. An example of this is highlighted below, demonstrating the possible flows of data for a subset of asset and operational data. Turning high volumes of complex data in to clear and well-structured information will continue to ensure that data and insight is valued to support decision making whilst ensuring that data is suitably democratised to be shared, valued and utilised externally.

Figure 12: Example Data Pipeline Flow (Asset and Operation Data)



5.7. Maturity

We recognise that our transition to a more digitalised and data centric business needs to be appropriately benchmarked to understand our current position and clearly demonstrate our progress as we deliver our Action Plan.

To support this we have implemented a standardised maturity model to enable a common approach and understand of progress is seven key areas. We have undertaken a number of internal workshops to understand our current digitalisation and data maturity, across 16 business units.

We will regularly review our position on the maturity scale, with clear detail as to what actions and developments have driven an increase in maturity. We will continually evaluate the value and benefit of assessing our maturity scale in this manner based on feedback and any approach to further standardise maturity benchmarking and assessment throughout the energy industry.

Table 1: Maturity Model

	Unaware	Aware	Developing	Competent	Leader
Leadership	Data focus is not recognised in the business	Some departments with recognised accountability for aspects of data exist, however are not joined up	Aspects of leading edge practice in Data Management work together with established steering groups and a small amount of cross function working	A Data Strategy has been developed and is appropriate for the business that has been adopted robustly throughout	Senior management throughout the organisation drive new thinking and behaviour on data throughout the business
Prioritisation	No company-wide view of which information is key for business decisions	KPIs developed and business critical data understood to support management reporting	Data model linked to key data management decision processes	The Data model is use to actively prioritise IT and data investment decisions	Business-wide data model that is used to drive all key IT and Data investments
Value Chain	No understanding of the cost and value of information	Project costs are tracked but only qualitative benefits for data and IT investments	The true costs of dedicated management of data and information are understood and measured	The value chain for data and information is understood and documented from raw data to access for decision making	Whole costs and benefits of managing data and information are understood and monitored robustly
Performance Management	No data quality measurement process exists	Data quality measurements only for regulatory requirements	Widespread quality management measurement but only limited and localised initiatives to manage quality	Comprehensive quality measurement and process to maintain quality levels	Data quality actively managed and optimised to meet business needs
Motivation	People in the organisation only value the data they actually use themselves	The need for quality data is clear when managed and used locally	An appropriate system is used to incentivise behaviours around data quality within SLAs and KPIs	The business consequences of data quality are widely understood and the long term benefits of quality data are valued locally	Everyone in the organisation treats data and information as a core asset
Data Process	Process for capturing, processing and correcting data are not documented	Process for capturing, processing and correcting data documented and improvements actioned locally	Company-wide coordination of data quality process improvement under a centralised process	Strategy to implement data and information maintenance process to reduce one-off improvement and data cleansing requirements	Data and information managed as an asset and data quality processes integrated into core business processes
Approach to IT	Data and information strategy is seen as an IR/IT problem	Some attempt to define roles between IR/IT and data roles exists	Some cross functional prioritisation of data and information system developments is in place and cost benefits are tracked	Usability is the key measure of system success for IR/IT and data roles	Strong collaboration leading to creation of solutions using appropriate technology within a Data Strategy

Q2 2021

Start RIIO-ED2

End RIIO-ED2

6. Employees, skills and capabilities

To deliver our long-term strategy of using digital technologies and delivering open data we will need to transform aspects of our business including capability, people, and culture.

We have already seen the use and expansion of field applications, driven through tablets, to collect data and provide information to field staff helping to enhance the data to the business and the understanding of the importance of data. Increasing the volume and types of data we gather from site is key to enabling us to drive insight and improve the operation of our business.

Recognising that new skills and capabilities are required within our business we have already started introducing new development roles within our business, including Data Science apprentices, who gain a foundation degree throughout their training. We have previously focussed our graduate intake on electrical engineers and we have recognised the need to widen the disciplines as part of our graduate scheme to include data science, mathematics and IT focussed degrees.

We are committed in ensuring that everyone within our organisation is taken on the digitalisation journey to deliver best value. This involves the creation of new roles with new skills and re-training of existing staff to understand new and developing data sets, the capture of metadata and the wider language of data. We are already implementing some of these developments and will continue to do so that our staff are ready and prepared to actively engage and use this data.

In order to build on our existing activities to ensure our current and future workforce and the skills needed are appropriate we will continue to invest in new skills and people to ensure we continue to have a credible path the delivering our Digitalisation Strategy.

We know that historically specific technical skills have been managed and contained within silos. Creating and implementing multidisciplinary teams, which a range of diverse skills, to speed up our time from design through to build and deployment.

Through the creation of our Data and Digitalisation team we have centralised a significant aspect of our data management resource to impact and influence the business consistently and effectively. This work will continue and increase to drive the culture of 'data is everyone's role'.

Demonstrating the benefit to colleagues of the changes in their working processes and practices is critical to ensuring the full benefits are realised. We do and will continue to deliver this through regular formal and informal feedback on existing systems and new developments.

For every significant development we form a group of 'super users', made up of end and key users of the new systems and solutions. All levels of the business being able to feed in to and shape our digitalisation journey ensures that we maximise the benefits.

Our next phase is for solutions to be utilised externally is to implement an external 'super users' group, made up of key potential users to ensure an optimised and effective solution is delivered.



7. Working collaboratively

We know that collaboration is key to delivering best value to our customers and stakeholders and we are actively collaborating with other DNOs and the wider energy sector to make sure this happens.

Our approach is to identify needs for development and understand through collaboration and discussion how best to provide a solution to that need, either collaboratively as part of our individual action plan. We do this by understanding whether it is a specific need of our business due to a system or process, a set of customers and stakeholders unique to our business or due to timescales or whether developing an industry wide solution, and in some instances beyond, is the right approach.

We have a number examples of where we have already and continue to work collaboratively and we are committed to ensuring this collaboration grows as we deliver our Roadmap and Action Plan.

Open Networks

The Open Networks Project is a major industry initiative between gas and electricity licence operators that is working to transform the way our energy networks operate, underpinning the delivery of the smart grid.

The project seeks to enable the uptake of new smart energy technologies by more and more homes, businesses, and communities in the UK. Allowing customers to take advantage of these new technologies to take control of their energy will lower costs and secure the energy we rely on every day.

We work collaboratively as part of this initiative to work towards standardised processes and mechanisms for exchanging data, between organisations, such as investigating the implementation of Common Information Model (CIM) and presenting data consistently to customers and stakeholder across organisation.

Data and Digitalisation Steering Group

The Data and Digitalisation Steering Group (DDSG) is a combined gas and electricity ENA group leading on data and digitalisation, working towards common approaches to meet the EDTF recommendations, focussed on the five key recommendations.

Working collaboratively as part of this group will ensure that customer experiences with licence operator data, from the mechanisms to access it, the formats and the contents will be harmonised to maximise value and minimise effort in driving that value.

Energy Systems Catapult

We understand that working with experts is key to delivering our Digitalisation Strategy and Energy Systems Catapult (ESC), as the authors of the EDTF report, enable us to develop greater insight in to digitalisation and delivering value from our existing data and creating the appropriate new datasets.

ESC is our key delivery partner on our innovation project, Presumed Open Data (POD) focussed on maximising the value and visibility of data, delivering our data triage process and cataloguing activity.



8. Programme delivery & governance

8.1. Methodology

Digitalisation is and will continue to involve and impact our complete business, our interactions with customers and stakeholders and the services we offer them and them us.

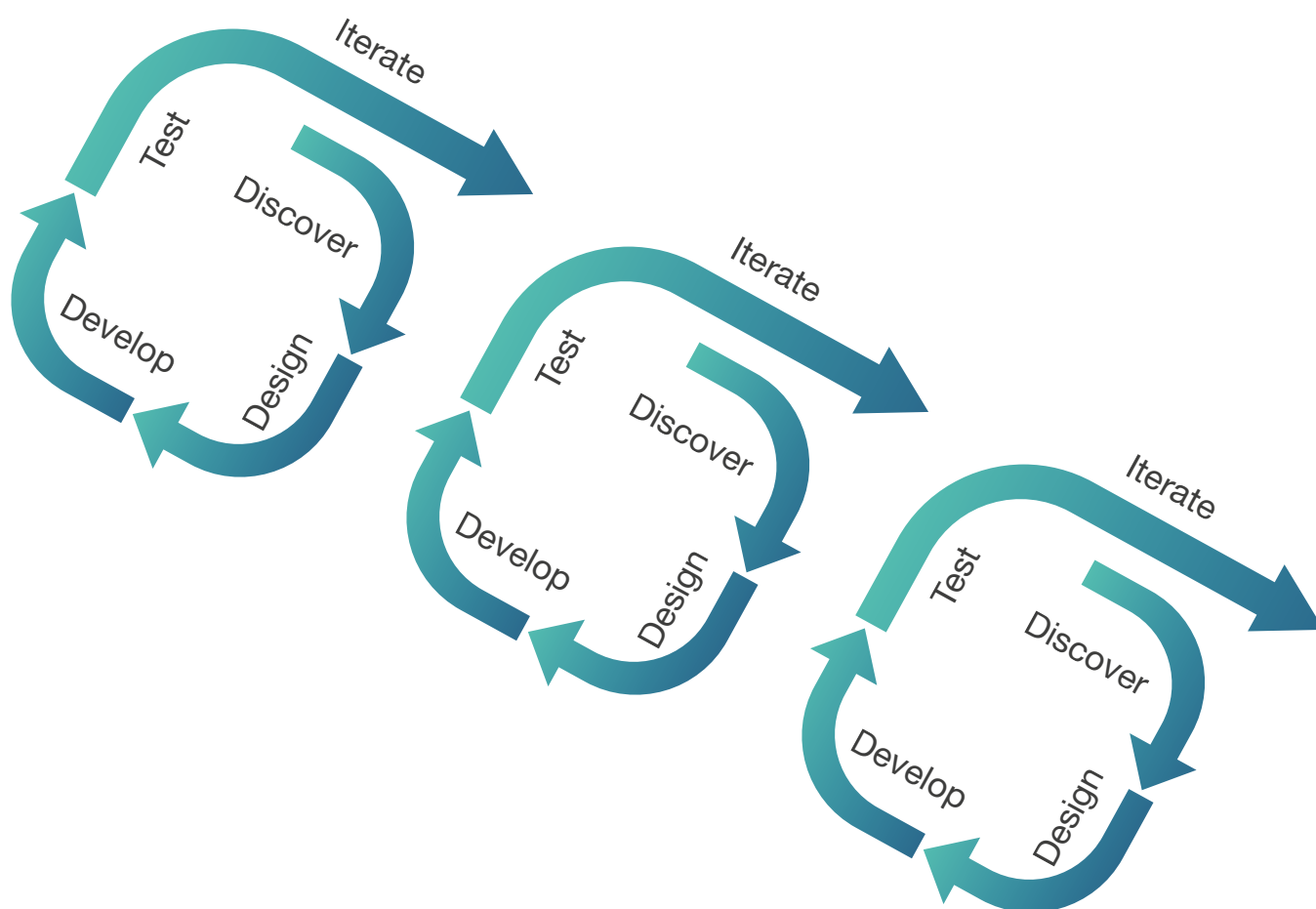
The developments we're employing are revolutionary and wide ranging and we need to continually drive value and improvements. It's critical that we take an active and agile approach to delivery, development and improvement.

We want to deliver value as quickly and effectively as possible, providing output and benefit as soon as it's available, take feedback from the users' experience, iterate, develop and improve. Adopting an agile delivery model will make this possible.

We have aligned and integrated our digitalisation delivery approach to that used within our Information Technology (IT) function, taking advantage of their existing systems, tool and processes.

We have implemented a web-based development management tool. This has enabled us to adopt a Kanban approach⁷ to project development, allowing everyone to visualise work activity, giving a view of the progress and process from start to finish. This also means that we have a central and open repository for issue-tracking and pipelines for continuous integration and deployment (CI/CD).

Figure 13: Agile Delivery Approach



8.2. Governance

Effective project governance is critical to all projects, ensuring that the accountabilities and responsibilities are understood, providing a decision making framework that is clear, appropriate and repeatable to enable a well-structured and delivered digitalisation programme.

We have a well-established business change governance process, developed as part of our long running innovation programme and we are utilising this to support our digitalisation project governance.

Structure

Our governance structure is driven by our Digitalisation and Data Governance Group approving the Digitalisation Strategy and Roadmap. For each of our projects there will be a Steering Group, made up of relevant people from within the business, where their current processes will be changed as part of implementing the project's solution, or are key to enabling the development and implementation.

Where a project is driving direct external value and benefit the Steering Group will also have appropriate representation from a user representative; this could be a community energy group, another utility provider or an energy aggregator as examples. A Steering Group will be typically made up of the Project Sponsor, the likely owner of solution on implementation, Senior Users, to inform the approach and output and Suppliers, providing key inputs to support the development.

The Project Sponsor, although part of the Steering Group will also have their own explicit role to ensure that the vision and the benefits of the project are delivered. Importantly each development will have a specific Project Manager to ensure that the planning, design and delivery of each project is provided to time, cost and quality. Overarching is the programme management, governing the projects as part of the action plan and the wider roadmap activity, ensuring decisions at each level can be appropriately made through agreed tolerances and exception reporting.

Figure 14: Digitalisation Delivery Governance Hierarchy



Project Setup

Each new digitalisation project has to follow a defined registration process in order to get approval to proceed to the delivery stage of the project.

The project approval focusses on producing a Project Initiation Document (PID), outlining the project scope, the business case, aims and benefits and the key outputs and milestones. It also includes a high level project delivery outline, a list of project resource requirements, finance detail, key risks, assumptions and dependencies.

The PID is developed by the Project or Programme Manager, reviewed and supported by the Project Sponsor and approved by the Steering Group or Governance Group dependant on project value. This provides a clear capture to measure delivery performance and success at the end of the project effectively.

Project Delivery

The Project Manager takes responsibility for the day to day delivery of the project using a standard set of tools to manage deliverables, risks, issues, assumptions and dependencies.

Reporting is described in the Digitalisation Delivery Governance Hierarchy, ensuring that the right level of oversight and visibility of the project and its progress against the PID deliverables.

Appropriate tolerances for time, cost and quality are set for each reporting level, enabling effective delivery to be achieved whilst ensuring appropriate bounds are set to ensure the original aims of the project are delivered.

Measuring Success

Delivering the projects against their original aims and objectives is critical to facilitating a successful digitalisation programme. To ensure that success is continually measured a RAG status is used against each aim and objective identified in the PID.

This ensures that at the earliest point any anticipated issues can be identified and rectified. Once the solution is delivered it is important to review the complete product or solutions against the original aims and objectives. Three to six months after the project is implemented a full 'success review' takes place at Steering Group and Governance Group level.

This enables a complete retrospective review of a project's outcomes and understand if any further iterative developments are required.

9. Measuring success

Digitalisation Strategy and Action Plan progress must be effectively tracked and measured to ensuring we are delivering benefits for all. We have developed a number of areas where we will measure success where internal and external engagement and feedback on progress to data to shape our future roadmaps and delivery will be vital.



Understanding our employees' and customers' needs

Continuing to demonstrate valuable and beneficial engagement through the continued refinement and development of our data user personas. We will clearly highlight our areas of development against these user personas to track progress and output for the variety of data users to ensure a balanced approach is taken and validate our deliverables.



Improving data quality

The ability to trust data is the basis for the business to transform in to a data centric organisation that make decisions based on information from many different data sources rather than historical knowledge. We will demonstrate this greater engagement, interaction and utilisation of data internally and externally to greater impact within the energy sector and beyond.



Industry leading data and digitalisation strategy and action plan

Ensuring we have an industry leading strategy and action plan is key to delivering for our customers and stakeholders. We will use maturity models to measure our progress and work with data and digitalisation experts to inform our output and next steps continuously to support this.





Driving value from our systems and solutions

We know we must measure the impact of our work, understanding how it's benefitted end users and how value can be further increased, and share this data. For each new implementation captured within our action plan we will, following implementation, provide insight on the benefits it's delivered to measure the success and impact. Utilising feedback from our data users will support further developments and new system implementations.



Effectively collaborate

Capturing our collaborative efforts will demonstrate our continuing commitment to collaboration. We will do this within the energy sector and wider to ensure we deliver optimised outcomes.

Taking a lead on collaboration in this space is important to us and we will measure this through our implementation of collaborative developments.



Developing skills and capabilities

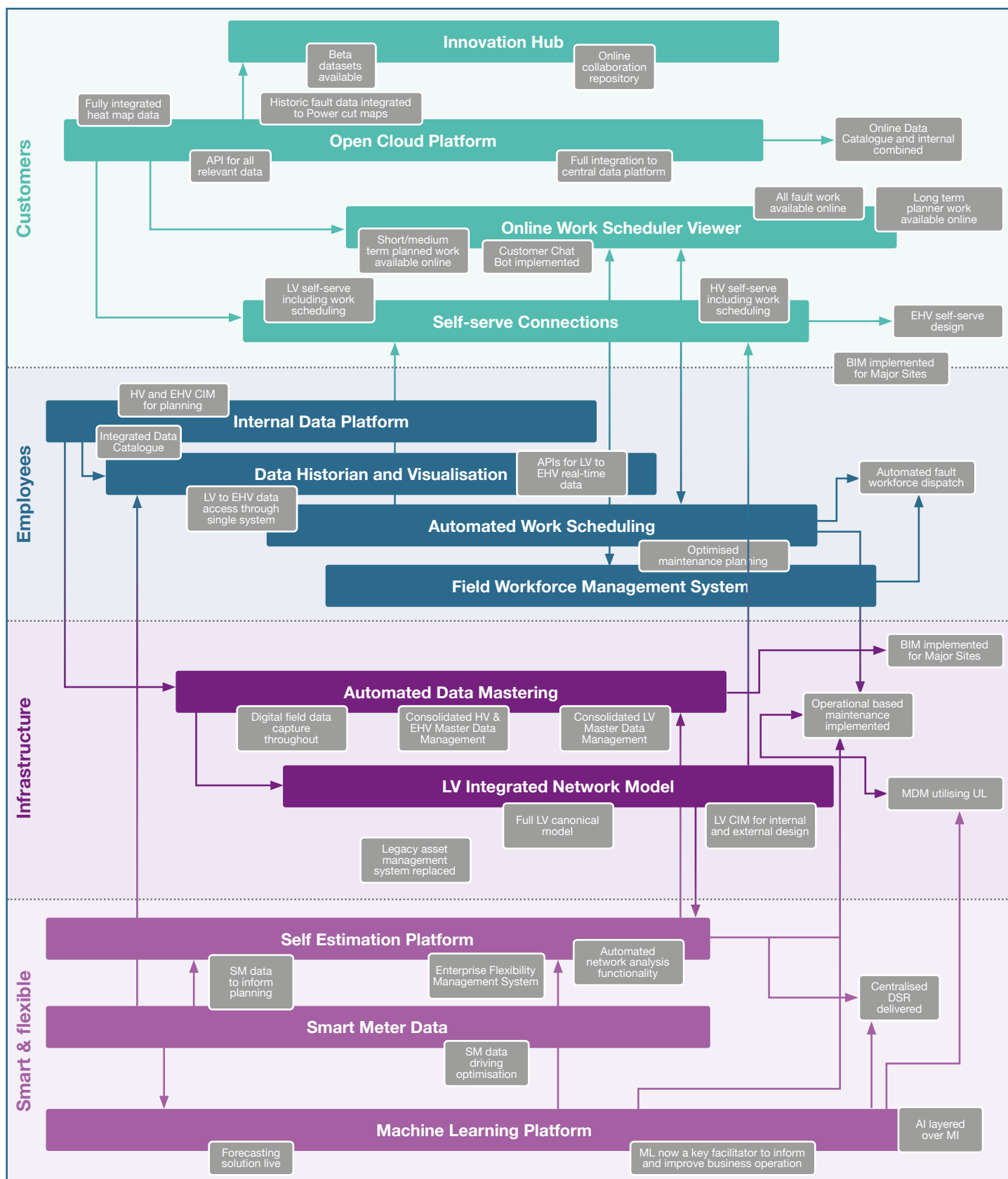
Having the right people, with the right skills is what will allow us to deliver our strategy and action plan.

Sharing how our Data and Digitalisation team is developing in terms of staff and skills as well as the business wide training taking place, further improving our organisational data literacy and understanding will enable our success to be effectively measured.



10. Digitalisation Roadmap

Our Digitalisation Roadmap is ambitious, revolutionary and will deliver for our key stakeholders, the business we operate today and the business we need to operate moving forwards.





RIIO-ED2 Digitalisation Action Plan

RIIO-ED2 Digitalisation Action Plan

Digitalisation of the energy system is at the heart of our transition to deliver a smart and flexible energy system supporting the UK's clear commitment to net zero carbon emissions by 2050.

This is leading to unprecedented changes in the way customers use and generate energy. We operate the network for our customers, so it is essential we respond to their changing use of the network and adapt our operations to continue to deliver excellent customer service, reliability, and value for money. We have set out our long term ambitions as part of our digitalisation strategy; describing how we plan to continue our digitalisation journey and deliver new and improved solutions and data access internally and externally for our customers and stakeholders.

This document focusses on our planned activity throughout RIIO-ED2 to deliver our digitalisation strategy and measuring progress against our long-term roadmap.

How we approach digitalisation delivery, ensuring it meets ours and our stakeholders needs, how we will regularly communicate our activity and ensure we continue regular and relevant engagement is core to our strategy and is demonstrated throughout this action plan. We will provide an update of this document at least every six months. We know that many people will want more frequent updates as to the progress against our delivery plan and specific projects, therefore, we're making this available and interactive online.

You can view our delivery plan online, see the progress against key milestones, get updates from the team through blogs and videos, feedback on progress and input through formal consultations but more frequently through quick and engaging surveys as well as links to direct output from each and all activity.

Our action plan continues to focus on implementing revolutionary change to deliver for our key four drivers, customers, our employees, infrastructure and ensuring our system is smart and flexible. The high level outputs within our roadmap demonstrate this revolutionary and step change approach to deliver our digitalisation strategy; setting the foundations for tangible and valuable outcomes for all our current and future data and system users.

Our ambitious action plan outcomes for the next five year period will mean that we not only deliver but exceed the need and expectations of our stakeholders, ensuring we play our part in delivering the energy revolution!

J. Berry

Jonathan Berry
Data & Digitalisation Manager

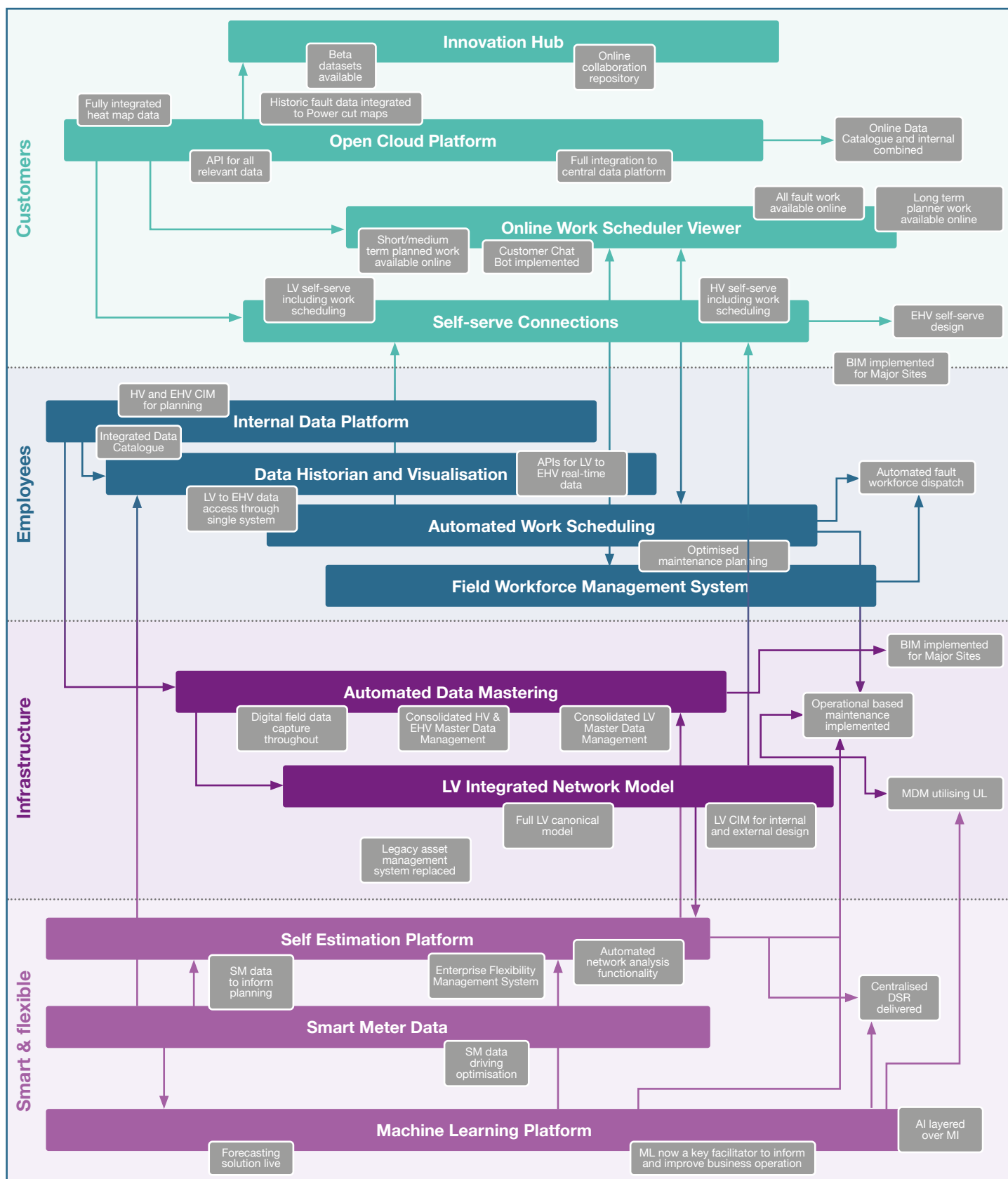
Programme structure

To provide clarity on our action plan over the five year period of RIIO-ED2 we have provided an easy to digest programme structure, outlining our planned work, drivers, the benefits to be delivered and what this will mean in terms of our investments and solutions to realise these benefits.

	Description	Drivers	Benefits	Investments/solutions
Year 1	Building on the significant data and digitalisation work in RIIO-ED1 this first year will deliver a greater consolidation of data access internally and externally, driving greater value, such as complete LV self-serve functionality, implementation of a single source master data management system and structured data and digitalisation training for all our staff.	<ul style="list-style-type: none"> Customers provided greater access to the network through fully integrated LV self-serve functionality Internal Data Platform increases the data flow between master data systems, increasing data value CIM utilised as the standardised network data system to improve network planning and design capability Master data management continues to increase and improve providing greater data visibility 	<ul style="list-style-type: none"> Improved time to quote and connect for new connections customers Increased data governance improving internal processes to increase efficiency Trust in data continues to improve accompanied with greater internal and external access Real-time data transfer increases value and visibility of flexibility 	<ul style="list-style-type: none"> Integrated internal platform Increased data warehousing and virtualisation layer Business-wide data historian Single point asset and network heat map Innovation Data Hub Customer facing LV design tool Network forecasting solution Real-time data API platform
Year 2-3	We continuously improve our data management and now more broadly implement solutions to drive value from this data and benefits. How we manage our work programmes and operational staff will change as we fully digitise and automate where appropriate. To meet our continuing data needs our asset management tool will be updated. Our maturity is now increasing and we begin to drive greater value from machine learning approaches to benefit all.	<ul style="list-style-type: none"> Optimising our field workforce through automated planning Improving business wide data access through a centralised Data Catalogue Fit for the future asset management information and processes Driving optimised business insight through the use of machine learning techniques 	<ul style="list-style-type: none"> Operational efficiencies and response to network needs improved Mature data access and governance approach now implemented throughout the business Data driven decisions on the operation and maintenance of the network implemented All operational and market data shared as open Customers engagement with us further streamlined 	<ul style="list-style-type: none"> Work programme management solution Field workforce programming system Single asset registration platform Leading edge asset management system Enterprise Flexibility management system Smart meter data analytics platform Machine learning platform
Year 4-5	We're now a fully data centric business, using data consistently throughout the business to drive improved and automated decisions. Our hybrid cloud infrastructure means that our customers have direct access to more data than ever as well as digitalised solutions to coordinate new connection and flexibility provisions. A continued data and systems integration approach means that our digitalisation maturity level has moved beyond sector leading and is now used by other sectors as a successful approach.	<ul style="list-style-type: none"> Digitalised capture of all asset and network data to drive complete CIM and BIM implementation Improved system operation through integrated flexibility and network operation coordination Transparency of data and data flows internally and externally Enhanced customer engagement and interactions 	<ul style="list-style-type: none"> Confidence in single source of truth data throughout the business driving improved outputs Customers further expand their benefits and value from new connection and flexibility propositions Greater internal capability to continue to deliver data and digitalisation in to RIIO-ED3 	<ul style="list-style-type: none"> Automated fault response solution Hybrid cloud infrastructure fully implemented Fully integrated and centralised DSR system Machine learning driven master data management Fully digitalised workforce capability BIM for all major sites

Delivery Roadmap

To enable the delivery of our programme of outcomes it's key that we have an ambitious delivery roadmap in place of systems and platforms. These investments outlined below will ensure that we can build our data and digitalisation capability and maturity enabling a consolidated and integrated approach to delivering solutions meeting our users' needs.





Digitalisation of the energy system is at the heart of our transition to deliver a smart and flexible energy system supporting the UK's clear commitment to net zero carbon emissions by 2050.

Delivery benefits and milestones

Our delivery roadmap ensures that we can deliver outcomes and benefits for our customers, employees, infrastructure and to ensure we operate a smart and flexible system. Against our key drivers below are the outcomes and benefits that will be delivered in the 3 time periods identified.

	Customers	Employees	Infrastructure	Smart & Flexible
Year 1	<ul style="list-style-type: none"> All data centrally accessible and described Interactive data and system feedback mechanism developed 24/7 LV self-service design and payment functionality Power cut and fault history checker Innovation Data Hub implemented Interactive heat maps for all assets 	<ul style="list-style-type: none"> Structured data and digitalisation training for all Consolidated LV design to delivery activity - integrated planning and delivery management Implementation of Data Platform to optimise data visibility and access between systems All engineering data accessed through the Data Catalogue 	<ul style="list-style-type: none"> CIM used for all HV and EHV network modelling Single source master data management implemented Data Historian and Warehouse implemented All new asset information captured digitally Wide scale LV monitoring 	<ul style="list-style-type: none"> Time Series Data available at primary substation level Initial data platform implemented to facilitate machine learning Network forecasting solution implemented Real-time flexibility data for scheduling and settlement in place
Year 2-3	<ul style="list-style-type: none"> Innovation Hub implemented to drive new customer propositions and insight 24/7 HV self-serve design and payment functionality Single source register platform for all LCTs Automated chat bot for customer interactions Work and resource online tracking available 	<ul style="list-style-type: none"> Automated delivery programming solution implemented All business data accessed through Data Catalogue HR and administration functions digitised Fully digitised work management system delivered 	<ul style="list-style-type: none"> All asset maintenance activity captured digitally Legacy enterprise asset management system replaced Operational based maintenance implemented Digitalisation of all LV network commences All assets digitally 'stamped' 	<ul style="list-style-type: none"> ICCP is used for all operational communications with National Grid Transmission Fully enabled flexibility management system (ERP & CRM) implemented Centralised mechanism for real-time dispatch developed Real-time voltage control implemented across all network areas Smart Meter data analytics platform live
Year 4-5	<ul style="list-style-type: none"> 24/7 EHV self-serve design functionality Real-time network configuration and operational data is available Online and interactive work scheduling in place Fully integrated open cloud data platform accessible 	<ul style="list-style-type: none"> Automated fault dispatch technology implemented Field workforce management system fully embedded Machine learning fully implemented to deliver critical business decision making 	<ul style="list-style-type: none"> Artificial Intelligence used to improve master data management BIM implemented on all major substation sites Digital capture of all asset maintenance and operation activity Strategic analysis and investment planning tool implemented 	<ul style="list-style-type: none"> Transition from DNP3 to IEC61850 for SCADA Full scale centralised DSR implemented Optimisation of integrated DNO and DSO operational systems Smart meter data utilised for operational optimisation

Morris Charts

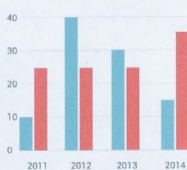
Line Chart



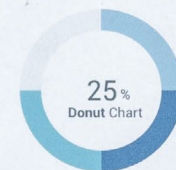
Area Chart



Bar Chart

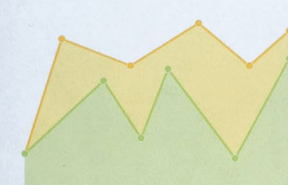


Donut Chart

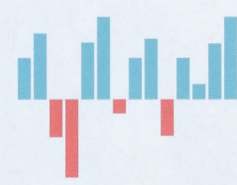


Sparkline Charts

Line Chart



Bar Chart



Pie Chart



Easy Pie Charts



Delivering Data Best Practice

Delivering Data Best Practice

The need for data best practice is clear and we are committed to ensuring our activities are in line with the Data Best Practice Guidance, adopted by Ofgem, which outlines these 12 principles:

- Identify the roles of stakeholders of the data;
- Use common terms within data, metadata and supporting information;
- Describe data accurately using industry standard metadata;
- Enable potential users to understand the data by providing supporting information;
- Make datasets discoverable for potential users;
- Learn and understand the needs of their current and prospective data users;
- Ensure data quality maintenance and improvement is prioritised by user needs;
- Ensure that data is interoperable with other data and digital services;
- Protect data and systems in accordance with Security, Privacy and Resilience best practice;
- Store, archive and provide access to data in ways that maximise sustaining value;
- Ensure that data relating to common assets is Presumed Open;
- Conduct Open Data Triage for Presumed Open data.

The following section documents our current progress against each of the 12 principles and our plan to further meet and exceed these.



Identify the roles of stakeholders of the data

Progress to date

Our progress in this area has focussed on both internal and external data stakeholders.

Internal Stakeholders - Roles and Responsibilities

To support our data governance approach and continuing to increase our data maturity we have defined clear data roles and responsibilities, providing clarity on data, its ownership, quality, improvement and classification.

Data Steward

A Data Steward supports the business departments in the desired use of data. Their role is to be organised by data domains (e.g. customer data, asset data and system data). Data stewards evaluate requirements and problems with data, and support projects and digitalisation initiatives as experts for their respective domain. Their role is split into:

- **Business Data Stewards** - responsible for measuring and reporting the data quality, defining guidelines for creating and maintaining the data and documenting the data in a data catalogue (upon implementation).
- **Technical Data Stewards** - responsible for the data model and data lifecycle across IT systems. They provide standardised data element definitions and formats and profile source system details and data flows between systems. They shall work across domains (master data systems).

Data Owners

Data owners specify the business requirements on data and on data quality. The data owner role is assigned to a Senior Manager in the respective business function or department.

Data Operator

Data operators will operate the data life-cycle based on the defined standards. They create and maintain this data. This role is to be taken by staff in respective department of the relevant Data Owner, or in dedicated support functions.

Data User

Data users, as the name suggests, use the data. This can be directly as a dataset to understand a process, procedure, action or potential action or as part of a wider system or solution that utilises the data.

Executive Sponsor

The Executive Sponsor (WPD's Operations Director) provides sponsorship, strategic direction, funding and oversight for data management.

Data Manager

The Data Manager (WPD's Data & Digitalisation Manager) is responsible for defining, producing and delivering a digitalisation and data management strategy and maintaining appropriate Data Governance. This role also manages Business Data Stewards.

External Stakeholders

Understand the needs of our customers, stakeholders and wider third parties is paramount to providing optimised digitalised and data solutions. To this point we have defined a robust set of external users by type to tailor data needs appropriately based on their proposed actions, role and benefit to be delivered. The table on the next page describes these types by sector, their roles and a wider description.

Appropriately defining data users has enabled us to ensure our data solutions, such our Network Capacity Map, Connected Data Portal and wider be delivered to meet their needs appropriately.



Table 2: User type definitions

Sector	Role	Description
Energy sector	Aggregator	Organisations including DNOs, generators, and technology data and service providers (e.g. storage and aggregators).
	Energy provider	
	Flexibility platform provider	
	Network operator	
	Data analytics provider	
	Electricity generator	
	National Grid	
	Renewables/micro generators	
Academic and innovators	Academic researcher	Actors and organisations focused on innovation and research both for commercial and academic purposes. There is significant cross over between work in this sector, the energy sector, and the commercial sector.
	Entrepreneurs	
	Innovators	
Third sector	Charitable sector	Charitable and campaign organisations, voluntary, and community groups such as community energy groups. Particularly focused on environmental issues, decarbonisation and socio-economic equality.
	Campaign groups	
	Community energy organisation	
Public sector and regulation	Local authority	Predominantly dominated by local authority planning and policy, also includes regulators, government policy makers and social care. Focus on planning policy, decarbonisation and infrastructure planning.
	Policy makers	
	Regulator	
	Social work/care system	
Commercial	Commercial market	Commercial stakeholders, many of which are interrelated with energy sector. Clear focus on innovation, decarbonisation, infrastructure planning and development.
	Low carbon technology provider	
	Consultant	
	Renewable energy developer or installer	
	Electric vehicle charge point operator	
	Housing/building developer	
	Electric vehicle fleet operator	
Consumers	Consumers	Interrelated across other sector. Focus on individual 'prosumer' habits and engagement in the energy system.
	Investors	
	Intensive consumer (large industry)	

Identify the roles of stakeholders of the data

Planned action

Internal Stakeholders - Roles and Responsibilities

Our internal data stakeholders will continue to be assessed, developed and refined as necessary. These roles will continue in their maturity through further strengthening of our Data Governance and data solutions, building on the implementation of a company-wide Data Catalogue.

Expansion of our internal user personas will continue to maximise our understanding of internal needs throughout the business. These will be further informed by regular engagement, formally and informally, to meet the internal needs.

An internal Data forum will be created to internally crowdsource data knowledge, discovery and insight throughout the business. This will support our continued commitment to a data and digital culture throughout the organisation rather than focussed on specific teams and disciplines.

External Stakeholders

Our regular and relevant engagement is central to our digitalisation strategy and delivery.

This will continue as will the further implementation and expansion of user personas, building on our beta versions currently.

These will be made interactive, where external stakeholders themselves can directly input and update to ensure that their current and future needs are directly understood and solutions delivered to meet those needs.

Use common terms within data, metadata and supporting information

Progress to date

We have taken significant steps to date in providing commonality for our data and metadata as described. Work has been carried out collaboratively across the energy industry to facilitate this, such as the Embedded Capacity Register. Our data is shared with consistent metadata and data dictionaries consistently, discussed in further sections – we have standardised our process to ensure common terms are used as far as has been possible to this point.

As the first UK DNO to utilise common information model (CIM) format to share our network asset and connectivity data externally, we have led the way in the use of common terms to describe our data driven by international standards.

Planned action

We are committed to working collaboratively within the energy sector and beyond to drive the use of common terminology, building on the existing collaborative work driven by the Energy Systems Catapult (ESC)⁸.

⁸ <https://modernisingenergydata.atlassian.net/wiki/spaces/MED/pages/729645057/Glossary+of+Terms>

Describe data accurately using industry standard metadata

Progress to date

Recognising the need for standardisation as to the way our data is described, we have implemented the Dublin Core metadata standard, as recommended by the EDTF. This has meant that we now consistently capture our metadata as set out in Table 3. This has enabled us to drive consistency in the presentation of data externally as well as linking related datasets and common data tags to support data discovery.

Table 3: Dublin Core Metadata Structure

Element	Description	Dublin Standard
Title	Name given to the resource	Core
Creator	Entity primarily responsible for making the resource	Core
Subject	Topic of the resource (e.g. Keywords from an agreed vocabulary)	Core
Description	Account of the resource	Core
Publisher	Entity responsible for making the resource available	Core
Contributor	Entity responsible for making contributions to the resource	Core
Date	Point or period of time associated with an event in the lifecycle of the resource	Core
Type	Nature or genre of the resource such as a data group	Core
Format	File format, physical medium, or dimensions of the resource	Core
Identifier	Compact sequence of characters that establishes the identity of a resource, institution or person alone or in combination with other elements e.g. Uniform Resource Identifier (URI) or Digital Object Identifier (DOI)	Core
Source	Related resource from which the described resource is derived (e.g. Source URI or DOI)	Core
Language	Language of the resource (Selected language(s) from an agreed vocabulary e.g. ISO 639-2 or ISO 639-3)	Core
Relation	Related Resource (e.g. related item URI or DOI)	Core
Coverage	Spatial or temporal topic of the resource, spatial applicability of the resource, or jurisdiction under which the resource is relevant	Core
Rights	Information about rights held in and over the resource such as Open Licence	Core

An example of completed metadata is included below:

Table 4: Transformer detail for the South West Licence Area Metadata

Element	Description
Title	Transformer detail for the South West Licence Area
Creator	Western Power Distribution
Subject	Transformer; Rating; Power; Impedance
Description	Key technical information for the transformers in WPD's South West region, including but not limited to voltage, impedance and ratings
Publisher	Western Power Distribution
Contributor	Data & Digitalisation
Date	2020-12-03 08:38:00 (UTC)
Type	System and Network
Format	CSV
Identifier	TX_South_West
Source	Western Power Distribution
Language	EN
Relation	LTDS
Coverage	South West
Rights	WPD Open Data Licence

Planned action

We recognise that the Dublin Core metadata standard is useful to standardise the capture of information around data, however, we know that even greater value can be delivered through the expansion of standard metadata elements. We are supportive of delivering these expansions as a wider energy sector community to ensure consistency remains and serves customers and wider data users' best.

Enable potential users to understand the data by providing supporting information

Progress to date

Additional to the use of a standardised metadata arrangement we have recognised the need for additional information to support a data user's understanding of the data to provide the most value and benefit. To support that we have standardised our approach to data dictionary capture, describing the data at field level to ensure that end users know the data, what and how it is represented.

Table 5: Data Dictionary Structure

Element	Description
Title	Name of field (e.g. Rating, Name, ID) [Power Rating]
Type	String, Float, Integer, Boolean etc. [Float]
Description	Account of the field [The standard rating of the asset as defined in IECXXX]
Example	An example of the data contents [35.5]
Unit	Capture of the International System of Units or other for the field [MW]

Table 6: Data Dictionary Example

Title	Type	Description	Example	Unit
Area	Text	The name of the licence area from which the data is taken	EAST	
GSP Group	Text	The name of the substation group that the substation is contained within	Berkswell 132kV	
BSP	Text	The substation area to which the substation belongs	Coventry Central	
Substation	Text	The substation to which the node belongs	Courthouse Green 11	
Node	Text	Unique node which identifies the substation/transformer	COUG5J	
Voltage	Numeric	The voltage at the substation	11	kV
Max Demand 2019/20	Numeric	The maximum demand seen at the substation between 01/10/2019 to 30/09/2020	13.21	MVA
Max Demand 2019/20 PF	Numeric	The Power Factor at the substation	0.98	
Forecast Load Information 2020/21	Numeric	Forecast Maximum demand year 1	13.45	MVA
Forecast Load Information 2021/22	Numeric	Forecast Maximum demand year 2	13.68	MVA
Forecast Load Information 2022/23	Numeric	Forecast Maximum demand year	13.93	MVA
Forecast Load Information 2023/24	Numeric	Forecast Maximum demand year 4	14.23	MVA
Forecast Load Information 2024/25	Numeric	Forecast Maximum demand year 5	14.64	MVA
Firm Capacity	Numeric	Firm Capacity of the substation site	23	MVA

Planned action

Understanding that more information is better to support the wider understanding of our data we will continue to provide complete and consolidated data dictionaries.

We will use the collaborative work about common terminology and glossaries to support this. More widely we will deliver distinct data reports for our more complex datasets to add that additional value.

We have already demonstrated this as part of some of our innovation datasets, such as our collaborative Net Zero South Wales activity.

<https://connecteddata.westernpower.co.uk/dataset/net-zero-south-wales-2050>

Make datasets discoverable for potential users

Progress to date

Our work on understanding data users and their data needs, including the specific data and the format it's shared in has been foundational to our digitalisation programme and will continue to be. We have adopted a three format philosophy:

Highly visual
Typically an interactive map or graph to provide all users high level but key information, demonstrated in our Live Data Feed to understand the import, demand and generation in our four licence areas in real-time.

Raw data for download and interrogation
Enabling the utilisation of data in multiple systems and to overlay with other dataset through the provision in standardised formats such as CSV, JSON, XML etc.

Application Programming Interface (API)
Providing data using an automated approach where access is provided through a machine interface, meaning no regular human interaction is required.

Figure 15: Real-time Data Map

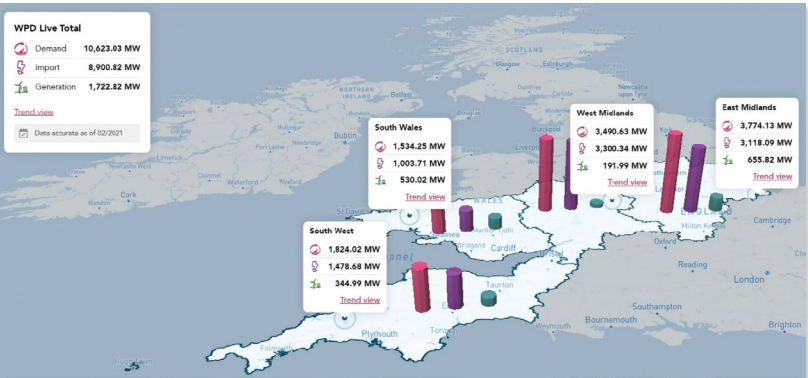


Figure 16: WPD API access

Access resource data via a web API with powerful query support. Further information in the main CKAN Data API and DataStore documentation.

Endpoints »	
The Data API can be accessed via the following actions of the CKAN action API.	
Create	https://opendata.wpdserv.net/api/3/action/datastore_create
Update / Insert	https://opendata.wpdserv.net/api/3/action/datastore_upsert
Query	https://opendata.wpdserv.net/api/3/action/datastore_search
Query (via SQL)	https://opendata.wpdserv.net/api/3/action/datastore_search_sql

Planned action

Making more data as visible and interactive for our customers as possible is key for the value of our data to keep increasing, therefore, we are committed to delivering greater data through visual means. This will include a centralised data mapping functionality with a number of overlays so the right information can be provided at the right time without the need to utilise often complex GIS systems. This will support new connections and flexibility propositions as well as data users such as local authorities; continuing to support their net zero ambitions.

Utilising our solutions to maximise the value of data comes hand in hand with the visibility of data and our commitment to make data open and accessible in a standardised but importantly a timely manner to inform key decisions internally and for our customers and stakeholders.

This ranges from key asset and connectivity information to better inform our customers' new connection process to providing in real-time, via API, flexibility market data to inform pricing optimisation and requirements discovery.

We have a number of examples where we have provided highly visualised data:

- Network Capacity Map
- Real-time Data Viewer
- Power Cuts Map
- ECR Dashboard

Our Connected Data Portal provides centralised access to machine readable datasets with an interactive exploratory function without the need to download the data as well as API provision for all relevant datasets.

Learn and understand the needs of their current and prospective data users

Progress to date

To support providing the right data, at the right time and in the right format through extensive engagement we determined high level internal and external data users:

Internal



Design & Planning

Network planning engineers, commercial flexibility managers and support staff;



Operation

Network control room functions for DNO and DSO functions;



Finance

Financial managers, finance support functions and reporting;



Regulatory

Business analysts, regulatory reporters and operation planning staff;



Information/Operation Technology

System architects, communication engineers and maintenance support.

External



Energy Sector

Aggregators, energy providers, flexibility platforms, network operators, electricity generators and renewable generators;



Academic & Innovators

Academic researchers, entrepreneurs and innovators;



Third Sector

Charitable sector, campaign groups and community energy organisations;



Public Sector & Regulatory Bodies

Local authorities, policy makers, regulators, social work and care systems;



Commercial

Commercial energy market, low carbon technology provider, consultants, developers and EV fleet operators;



Consumer

Consumers, investors and intensive energy users.

This enabled to ensure we delivered data and solutions that met users' needs effectively and consistently. We also worked to provide greater insight in to our data stakeholders through the creation of user personas. We have developed profiles for specific roles within our user types to ensure our investments and developments are aligned to meet and exceed their needs.

Planned action

We will continue to use a number of diverse engagement strategies, from our traditional face to face round table events to providing regular updates in digestible formats, such as short podcasts and videos of our latest developments and activities. Consultation is also important and we will provide opportunities to feed in to formal consultations, as we do today, but also short polls on LinkedIn and Twitter, to provide quick and easy ways for all user types to readily engage. This will continue to place customers and data users at the heart of our digitalisation and data activities.

Ensure data quality maintenance and improvement is prioritised by user needs

Progress to date

Our engagement strategy has ensured that we understand customers and data users prioritised data sets. We have consistently included these prioritised datasets within our strategy to ensure openness, transparency and the opportunity for comment and feedback. This is the same internally and this has enabled our focus on improvement and maintaining data quality on these prioritised datasets. The implementation of our internal data catalogue has enabled us to more robustly track, manage and improve data quality through standard metrics for our data process to effectively manage.

Planned action

We will continue to use our effective and extensive engagement to drive prioritised needs and datasets. Extensions to our current feedback process on data will enable direct comment and feedback to be managed on data quality, at dataset or field level to further improve our understanding of our data users' needs.

Ensure that data is interoperable with other data and digital services

Progress to date

As the first UK DNO to implement Common Information Model (CIM) as a format to share our asset and connectivity data, we recognise and value the need to standardise data for interoperability. We ensure that all data is shared in standardised format and have worked hard to transition to CSV, JSON and XML format to share relevant data. Delivering machine readable has meant that a vast amount of our data is now available via API, enabling greater interoperability with digital services.

Planned action

Continuing to ensure our data is presented and delivered in standardised, machine readable, format is key. We will build our capability to further enable API access to data, moving to greater real-time data. Collaboration will further enhance our capability to ensure interoperability and we will lead and champion this activity.

Protect data and systems in accordance with Security, Privacy and Resilience best practice

Progress to date

Progress in this area has focussed on a number of elements, principally implementing appropriate security standards to meet the requirements of network and information systems (NIS) regulations 2018. Robust industrial control systems and operational technology security plans have also been implemented.

Planned action

Furthering our focus on maturing our cyber security metrics and continuing to assess security posture against industry recognised benchmarking standards to ensure industry best practice is maintained. This will involve the continued standardisation of scalable technology solutions for both IT and OT to improve security and gain economies of scale.

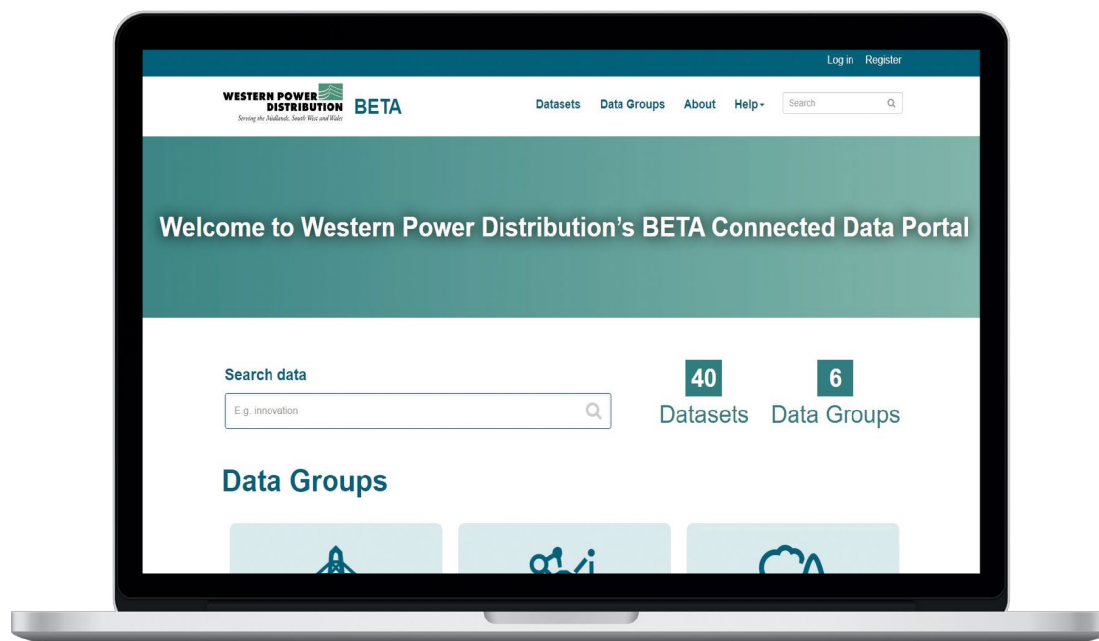
As we transition increasing volumes of data to the cloud we will ensure that there is dedicated, skilled cyber resource to provide in-house specialists, supplemented with expert third part resource where required, to ensure that our operating principles are optimised.

Store, archive and provide access to data in ways that maximise sustaining value

Progress to date

Our Connected Data Portal facilitates centralised external access, where our data is mirrored on cloud services to provide a vast amount of access to customers and data users:

Figure 17: Connected Data Portal



As well as the latest data being stored and available historic data is maintained and made available to provide a greater understanding of the data's 'story' and carry out further analysis and investigation to drive insight. An example of this is included below.

Our internal data catalogue facilitates a centralised data access point for our staff with access to the latest and archived data to meet their needs.

The lineage of the data is also captured to ensure the greatest understanding and context for our data is provided.

Figure 18: Archived Data Availability

Data Files			
Name	Format	Last Changed	Download
Embedded Capacity Register - December 2020	CSV	1 month ago	Download Explore
Embedded Capacity Register - February 2021	CSV	1 month ago	Download Explore
Embedded Capacity Register January 2021	CSV	1 month ago	Download Explore

Planned action

All data accessed internally is stored on-premise and mirrored in a cloud environment for external access. Moving forwards we will utilise a hybrid, public and private cloud architecture to deliver improved data availability and access through enabling staff and external data users' access to the same datasets. We will continue to expand our internal and external data catalogue functionalities and assess them against our and our customers' needs.

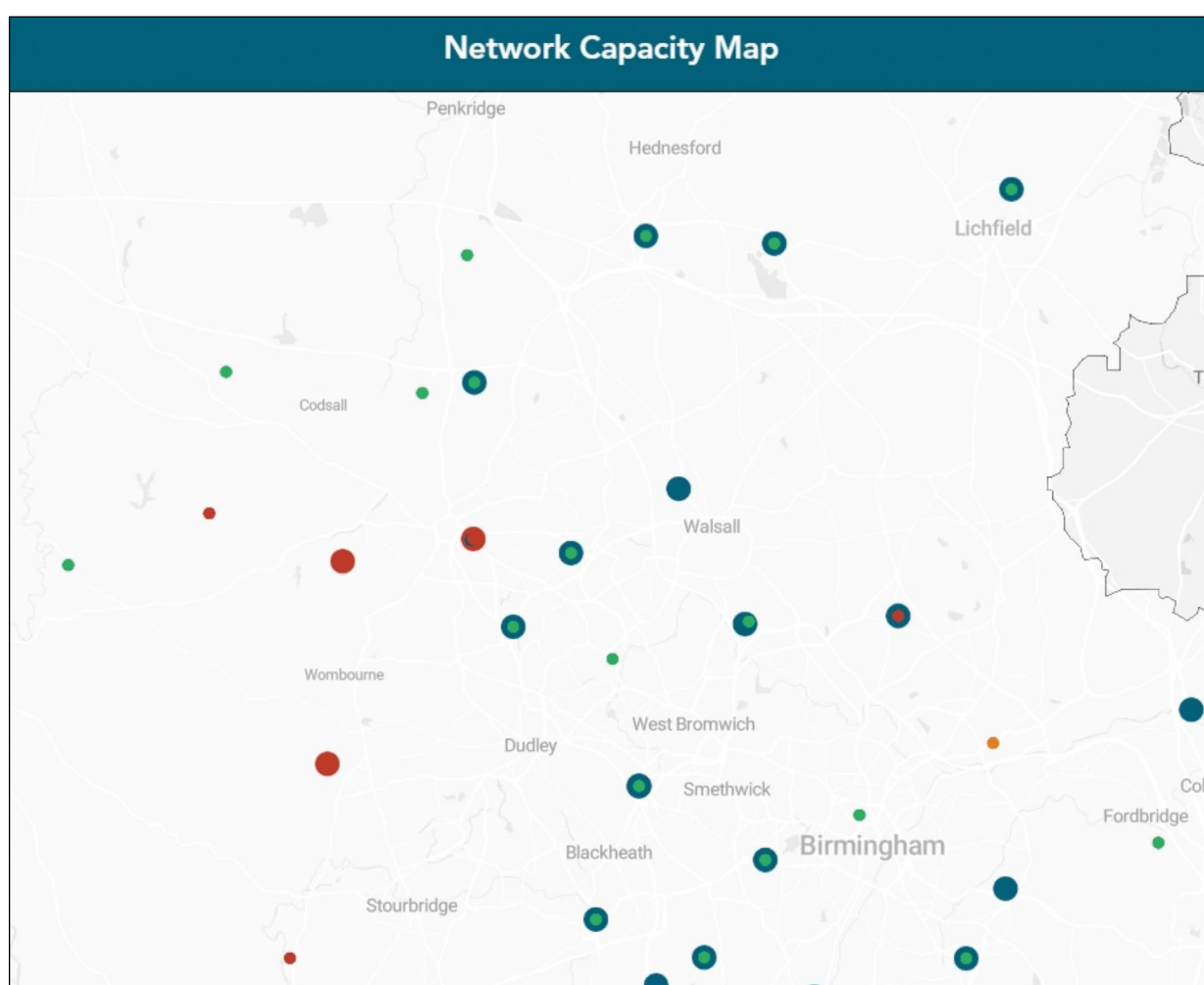
Ensure that data relating to common assets is Presumed Open

Progress to date

We have taken significant steps to ensure that our asset information is presumed open to this point. As mentioned, our asset and connectivity data is made available for our HV and above assets in CIM format for use in all power system analysis tools to further remove barriers to data access. Our work to make our network data in Shapefile format has also been significant, making this available through our Connected Data Portal at the same granularity as our CIM data, focussed on GIS use.

Mapping our data through our Network Capacity Map has meant that customers as well as understanding the geographic location of assets can also understand their key capabilities to support new connection and flexibility offerings.

Figure 19: WPD Network Capacity Map



Planned action

We will continue to share our common asset data as open, increasing the granularity of data shared openly and in increasingly dynamic and interactive formats, providing wider supporting information to provide greater context and understand of the data. The frequency of our dataset refresh and update will increase to ensure that the transparency of our data is further increased.



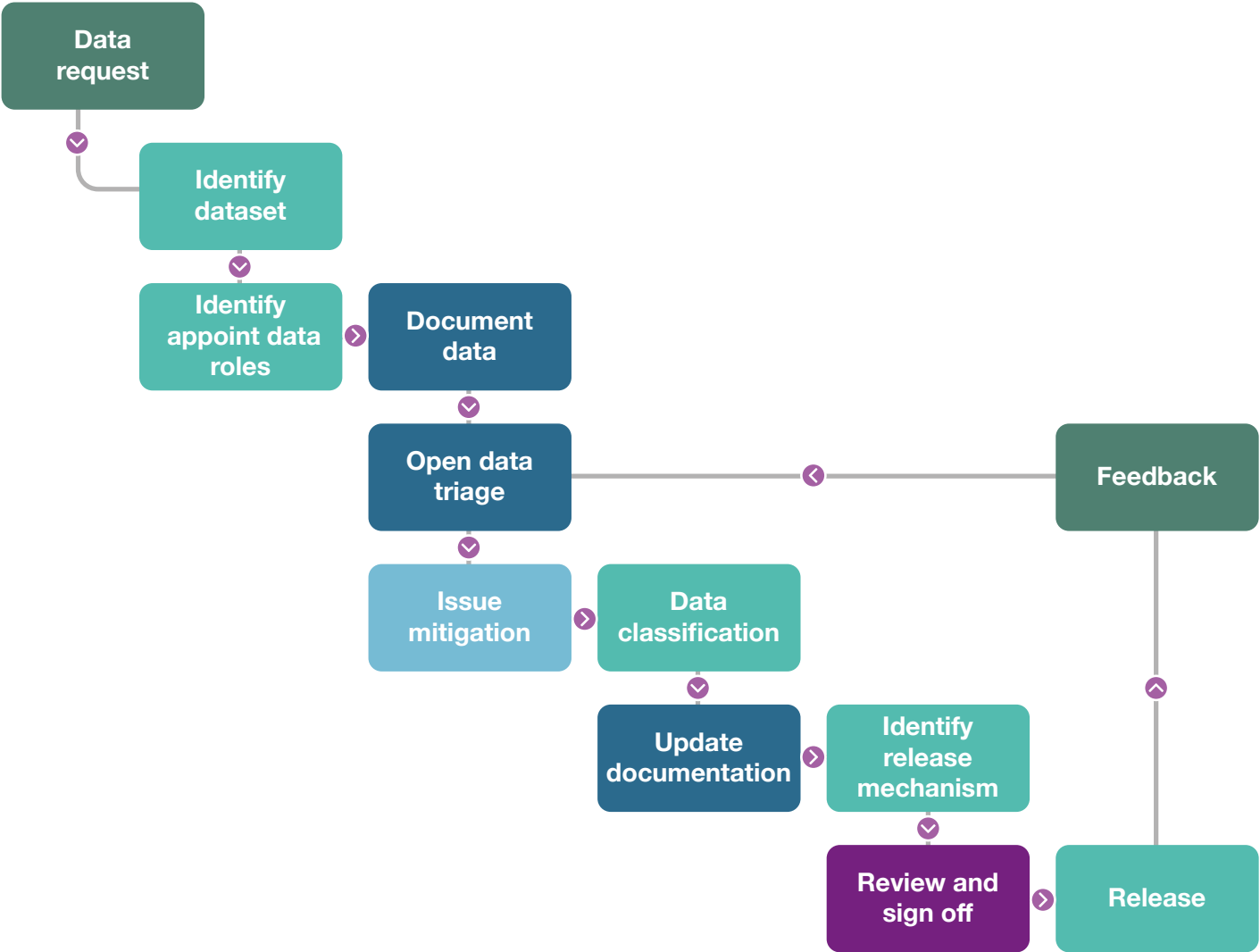
The need for data best practice is clear and we are committed to ensuring our activities are in line with the Data Best Practice Guidance, adopted by Ofgem

Conduct Open Data Triage for Presumed Open data

Progress to date

We have an established Open Data Triage process and Playbook utilised consistently for all our datasets shared externally, or determined to be Closed and not able to share. This was developed as part of our industry leading innovation project, Presumed Open Data. We have established a Data Process team internally that coordinates this throughout the business, working closely with data owners, operators and stewards. This has seen up deliver our prioritised datasets and more to this point consistently.

Figure 20: High level Data Triage Playbook process



Planned action

The utilisation of advanced data analytics techniques will be employed to further automate our Open Data Triage process. This will continue to expand our data shared openly and to all. The expansion of the use of our Data Catalogue, to surface and discover data automatically will also enable this – supporting the continuing strengthening of our internal Data Governance.



Engaging Our Data & Digital Stakeholders

Engaging our data & digital stakeholders

Continuous and relevant engagement with data users, both internal and external, is key to delivering appropriate digitalisation and data solutions to be serve their needs and ultimately support the net-zero carbon commitments.

We have a strong track record across the business of stakeholder engagement and we have ensured that this is leveraged to support our digitalisation activities.

External engagement

The needs of our customers and stakeholders is critical to ensuring our digitalisation and data activities are focussed to deliver the most value and benefit.

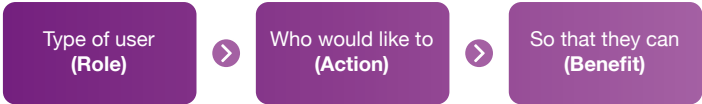
Identifying external data user types has been a key focus of our digitalisation activity; recognising that different users have varying needs and expectations of the same data. As with internal engagement and needs, ensuring the right data is in the right format at the right time is vital.

We have a number of examples where we have ensured that this is the case, specifically our interactive maps that provide users easy to navigate geographic based data to information on aspects such as network capacity and future energy scenarios, where the more detailed source data is also openly available for more technical users to build their own analysis.

We followed an extensive engagement process to ensure we developed a robust high-quality methodology to understand our different data user types. We assessed our existing datasets,

some publicly available and some currently only available internally, where we identified over 100. We used this to drive a number of external workshops, providing participants an overview of the types of datasets which are and could be available.

This stage of the workshop also introduced the ‘use case scenario’ structure which is set out in the following format:



This is a useful tool for structuring input so that use cases are thought out more clearly, outputs are easily ordered and prioritised, and key points can be integrated into the design process for data sharing.

An example use case scenario using this format is detailed below:

Table 7: Example of an external data use case scenario

Type of User (Role)	Who would like to (Action)	So that they can (Benefit)
A local authority	Access data about the network capacity for new EV charging points.	Implement appropriate development management policies to target new EV charging points as part of new housing development, and enable appropriate retrofits to existing development. Thereby reducing carbon emissions, and increasing likelihood of developers delivering on planning requirements.

As part of our workshops participants provide focussed input as part of small breakout sessions, working through a range of use cases. This approach ensures we generate a high volume of potential use cases which would be refined in the subsequent session.

Building on the input and use cases identified further focussed time is then given to answering the following two questions:



What data access functionality would be required to support each use case?



What data (specific or general) would be needed to deliver these use cases?

This ensures both the use cases and data access requirements are suitably identified to deliver optimised solutions.

104 use case ideas were collated as part of these extensive workshops to date. In order to effectively analyse these responses there was a need to further group responses under corresponding themes to interpret which use cases were shared or stratified between different sectors, which use cases required the same data and same data access functionality, and which use cases were variants on a central point and should be amalgamated.

In this context, use cases are analysed using a process of formal coding. Coding is a qualitative inquiry process in which a word or short phrase is assigned to a portion of data (in this case the use case scenario) in order to create a summative representation of the content. To aid analysis these themes are further grouped in to categories.

Table 8 sets out the categories and corresponding themes that use cases have been grouped under. The use cases are grouped into seven core categories: Connections, Capacity and Constraints, Policy and Planning, Decarbonisation of buildings and transport, Research and modelling, Customer vulnerability and support, DNO operations, and Tariffs and trading.

Table 8: Categorisation of use cases

Category	Theme	Description
Connections, Capacity and Constraints	Connections, Capacity and Constraints	Use cases which seek to understand where sufficient capacity exists to connect energy assets to the WPD network and what constraints exist. Use cases in this theme often explicitly or implicitly discuss flexibility and renewable generation.
Customer vulnerability and support	Equality and Advocacy	Use cases which aim to ensure that vulnerable or under-represented consumers benefit from the opportunity of decarbonisation.
Decarbonisation of buildings and Transport	Decarbonisation	Use cases which aim to decarbonise individual buildings or through community based collective action. Use cases focus on energy efficiency, low carbon heat and carbon intensity at time of use.
	Enabling EV Charging	Use cases which focus on enabling the deployment and operation of Electric Vehicle charging infrastructure.
DNO operations	Improving Data Quality and Interoperability	Use cases which focused on improving the quality of WPD's data in some way.
	Improving Fault Diagnosis	Use cases which aimed to reduce the time it takes WPD to diagnose issues on its network (power or telecoms).
	Optimising Network Strategy, Planning and Operation	Use cases which aim to improve the way WPD invests in and operates its network (power or telecoms) to maximise efficiency or performance.
Policy and Planning	Local Area Energy Planning	Use cases which focus on developing a plan for the development of the local area and energy network. Many use cases are written from the perspective of a local authority (14) planning a decarbonisation strategy for an area.
	Policy	Use cases which use data to inform policy making.
	Environment	Use cases which seek to use data to improve environmental conditions such as air quality and ecology.
Research and Modelling	Education and Research	Use cases which aim to improve the understanding of the energy system through community education or academic research. Note, whilst there were many use cases in this theme they were often more loosely defined and many focused on opportunistic data exploration or increasing understanding WPD rather than specific actions.
	Cross-Sector	Use cases which look at the cross-sector opportunities of data sharing.
Tariffs and Trading	Tariffs and Trading	Use cases which look to use data to improve trading strategy or develop more intelligent tariffs. These use cases are generally interested in time or location specific value.

Engaging our data & digital stakeholders

In parallel to developing categories and themes to group and analyse data there was also a need to clean the raw qualitative data which had been collected to ensure terminology and wording was consistent across use cases to enable appropriate structuring and grouping of use cases.

In this context, the data was reviewed and refined so that individual stakeholders were referenced using a unique name (e.g. local authorities can also be referred to as local government or local councils).

Table 9 outlines the stakeholder descriptions used within the use case scenarios and sectors within which these have been grouped.

It is important to note that groups are inherently interrelated and there is therefore cross over between different sectors and different themes.

Table 9: User type definitions

Category	Theme	Description
Energy sector	Aggregator	Organisations including DNOs, generators, and technology data and service providers (e.g. storage and aggregators).
	Energy provider	
	Flexibility platform provider	
	Network operator	
	Data analytics provider	
	Electricity generator	
	National Grid	
	Renewables/micro generators	
Academic and innovators	Academic researcher	Actors and organisations focused on innovation and research both for commercial and academic purposes. There is significant cross over between work in this sector, the energy sector, and the commercial sector.
	Entrepreneurs	
	Innovators	
Third sector	Charitable sector	Charitable and campaign organisations, voluntary, and community groups such as community energy groups. Particularly focused on environmental issues, decarbonisation and socio-economic equality.
	Campaign groups	
	Community energy organisation	
Public sector and regulation	Local authority	Predominantly dominated by local authority planning and policy, also includes regulators, government policy makers and social care. Focus on planning policy, decarbonisation and infrastructure planning.
	Policy makers	
	Regulator	
	social work/care system	
Commercial	Commercial market	Commercial stakeholders, many of which are interrelated with energy sector. Clear focus on innovation, decarbonisation, infrastructure planning and development.
	Low carbon technology provider	
	Consultant	
	Renewable energy developer or installer	
	Electric vehicle charge point operator	
	Housing/building developer	
	Electric vehicle fleet operator	
Consumers	Consumers	Interrelated across other sector. Focus on individual 'prosumer' habits and engagement in the energy system.
	Investors	
	Intensive consumer (large industry)	

Table 10 highlights the percentage of use cases for each stakeholder sector that fall within the different identified use case categories.

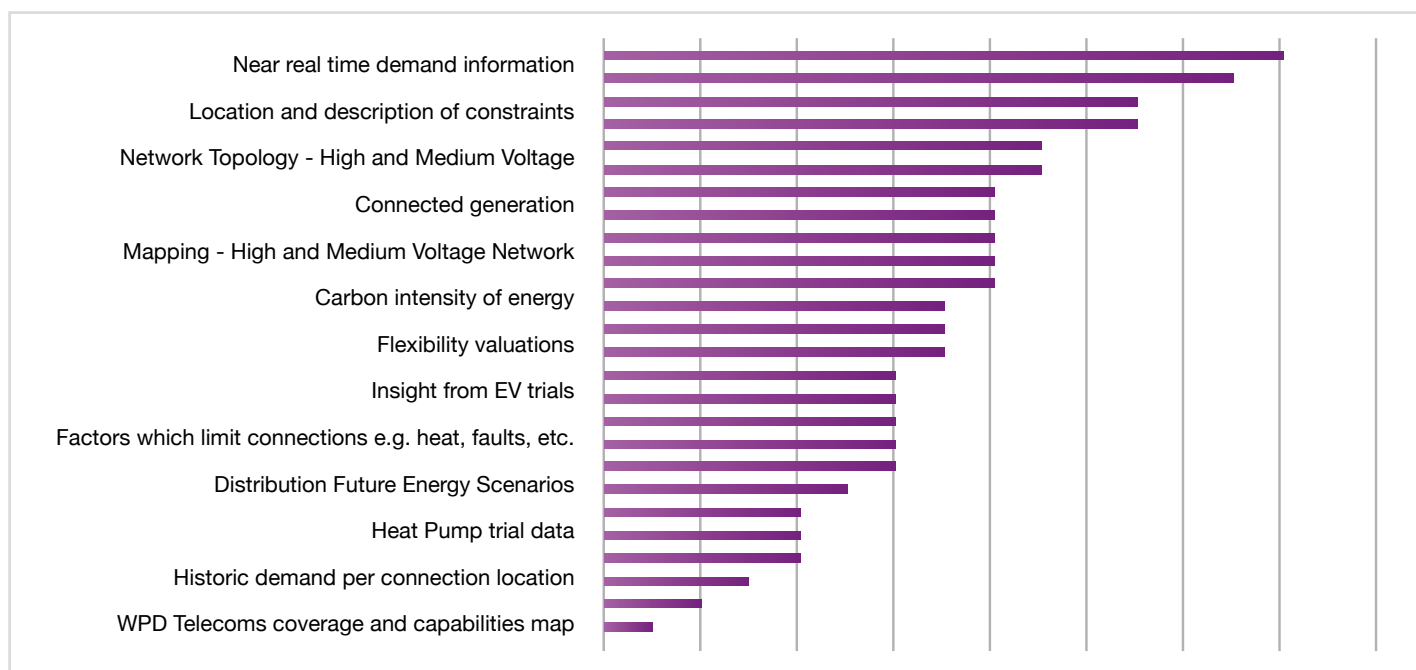
Table 10: Percentage of use cases for each stakeholder sector that fall within each use case category

	Energy sector	Academics and innovators	Third sector	Public sector and regulation	Commercial	Consumers
Connections and Constraints	20%	16%	19%	14%	21%	33%
Customer vulnerability and support	0%	5%	10%	12%	0%	0%
Decarbonisation of buildings and transport	15%	21%	25%	28%	38%	33%
DNO operations	22%	5%	3%	5%	7%	0%
Planning and Policy	24%	11%	16%	37%	24%	0%
Research and Modelling	5%	42%	19%	5%	4%	0%
Tariffs and Trading	15%	0%	10%	0%	7%	33%

Utilising this approach has allowed us to develop an understanding of the different user types and the focus of their needs, through the categorisation of use cases. This has provided a robust basis for continuous engagement.

We continue to use this engagement methodology to understand the data and access needs of external data users. This process is particularly useful as it allows the focus to remain on the action and benefit from improved and increased data access around user types and use cases, enabling us to translate that to our data sets and prioritisation future activity and feed in to future engagement.

Table 11: External dataset prioritisation



Engaging our data & digital stakeholders

Sharing our developments and progress is also key. We provide a six monthly update of our Action Plan but also provide online access to our digitalisation programme, providing regular updates on the projects’ progress through blogs and videos. This ensures that all user types can easily access and understand our process and importantly enabling feedback and engagement at every stage.

Internal engagement

Our staff are pivotal to the successful operation of our business and delivering digitalised solutions that meet their needs to continue to be effective and efficient in their roles is integral to our strategy and action plan.

Enabling all levels of staff to feed in to the strategy, highlighting their needs and expectations, is really important as well as making sure we ‘take them on the journey’.

We use formal and informal engagement to understand their data-related needs through targeted surveys on specific datasets to understand their quality and need for improvement to drive additional value and wider engagement to understand the need for additional datasets and digitalised solutions.

We initially followed a similar engagement process to that used as part of external engagement, facilitating open and interactive workshops with all departments of the business using identified internal use cases as shown in **Table 12**.

Table 12: Internal use case and examples

Use Cases	Examples
Network and Assets	Infrastructure Monitoring Constraints Planning Sites
Operational	Works Faults Costs and Pricing Flexibility Customers Contact Forecasting Procurement
Third Party Connections	Generation and Storage Resources Generation and Demand Smart Meters Low Carbon Technologies Electric Vehicles
Others	Environmental Community

We engaged to understand specific use case based on these themes and examples and identified a number of internal data users:

- Design and planning;
- Finance and Resourcing;
- Information and Operational Technology;
- Operations;
- Regulatory.

We recognise that a number of user types require the same data in different formats to suit their needs and ensuring centralised access is key to provide the right data in the right format at the right time.

Identifying these user types enabled us to understand their data needs in more detail, track the suitability and prioritisation of current and future needs through data access information.

This work to date has supported our data driven developments, such as the Integrated Network Model, providing a single source of the truth for asset and connectivity benefitting a number of internal user types as well as centralising data access.

Continuing engagement

Continuing to effectively engage is a priority for us to ensure we continue to deliver a Digitalisation Strategy and Action Plan that suits our staff and our stakeholders needs.

Our engagement has served us well to this point, enabling us to establish an initial strategy, roadmap and programme of digitalisation activity delivering tangible benefits to a wide set of users.

As we increase the number of digitalised solutions and datasets, we recognise the need to widen our approach beyond understanding the needs that don't currently exist but also how to maximise the value of what's already available.

Both internally and externally we ensure that direct routes for feedback to teams and individuals is available at each point of data access as well as analysing the frequency that data is accessed, and where appropriate, by what user types. This allows us to provide targeted engagement, understanding the need to develop both low and highly utilised datasets and digitalised solutions to ensure best value continues to be delivered.

As well as the format different customers and stakeholders want to interact with our data, the same is true for how they want to engage and provide feedback. We ensure that there is a balance between formal, large-scale, engagement, which often suits larger organisations and entities, in the form of face to face or online sessions and smaller, more regular informal engagements.

These regularly take place as quick and interactive online surveys, promoted through our social media, such as Facebook and Instagram, which ensures we get as wide a level of feedback as possible from all user types.

We also understand that some user types are harder to target than others and as well as utilising as diverse an engagement approach as possible we utilise expert external resource to provide input to represent user types, such as CSE to inform as to the needs of vulnerable and fuel poor customers and Regan for community energy groups.

By sharing our current user types we can understand from feedback and engagement where, moving forwards, these can be developed and enhanced to ensure that we're capturing the right user types to prioritise datasets and digitalised solutions. We have worked to provide greater insight in to our data stakeholders through the creation of user personas. We have developed profiles for specific roles within our user types to ensure our investments and developments are aligned to meet and exceed their needs.

Continuous interaction with our stakeholder engagement teams ensures that we take all opportunities to engage customers and stakeholders in our current and planned digitalisation and data activities to shape, input and feedback.



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