Digitalisation Strategy

Harnessing the power of digital technologies
to create the network of the future

WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Contents

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 to 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 welcome the Energy System Catapult's Energy Data Taskforce report, setting out a number of expectations and recommendations, which has further sped up the digitalisation journey across the energy sector. Our strategy uses 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 digitalising 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 improve our data management, increase network insight and operation and to presume data as open will ensure that we deliver these aims to further improve our business efficiency, turn our data in to information to benefit 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 have to be revolutionary, building on initial developments through our distribution system operator transition and innovation programme and cover all parts of our business.

We've already started a number of developments; it's now possible to view much of our data in a variety of formats from our Energy Data Hub and we've invested in an 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. Recognising that digitalisation is and will continue to be a key focus area across our business a Digitalisation and Data Governance Group has been implemented, which I chair, to ensure that a consistent and appropriate approach is taken across our complete business. This will ensure we continue to focus in the right areas, don't leave any part of our business, our 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 increased our number of Telecoms and Control Systems apprentices to ensure we have the right skills moving forwards as these areas increase in their critically to enable a connected and dynamic system. 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.
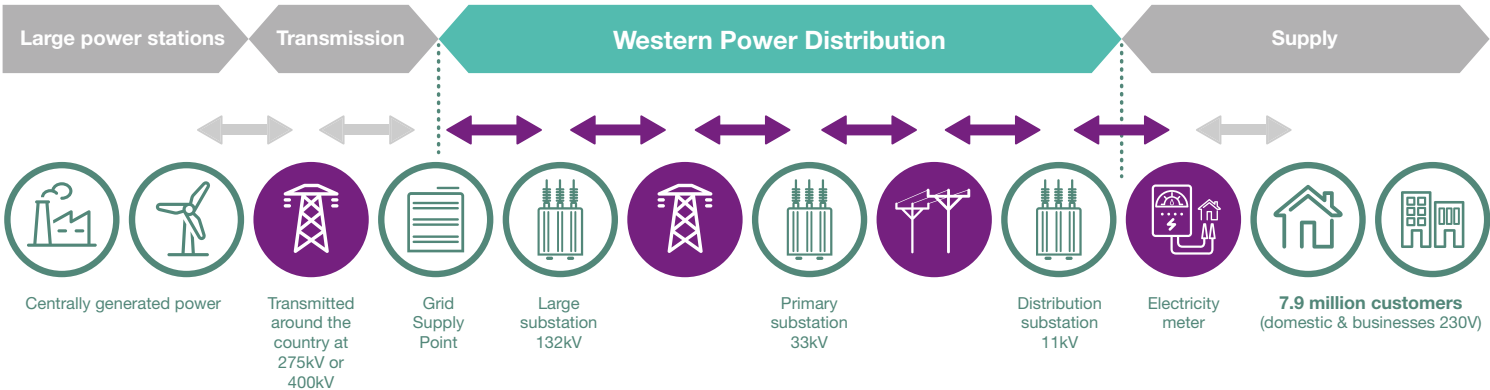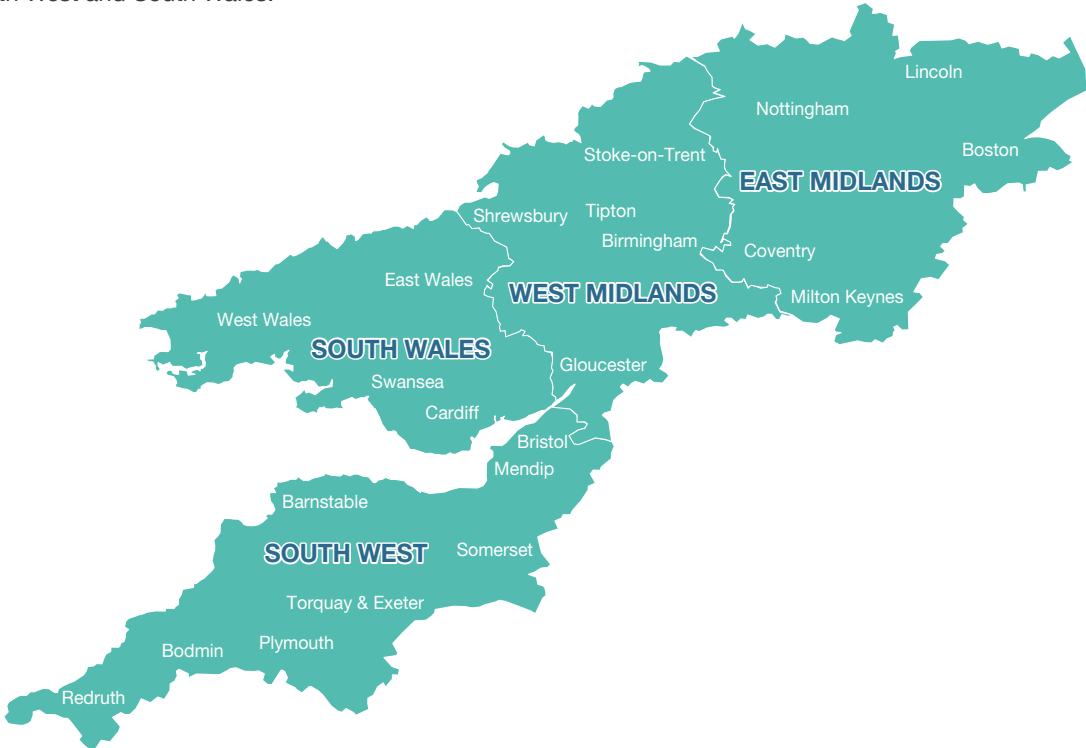
Graham Halladay
Operations Director

Who we are

Western Power Distribution delivers electricity to 7.9 million customers (27% of the UK population) over an area of 55,000km².

This electricity is distributed over 220,000km of overhead lines and underground cables, fed from 185,000 substations. The area served by WPD is shown in the map below and covers four licence areas, East Midlands, West Midlands, South West and South Wales.

| Large power stations | Transmission | Western Power Distribution | | | Supply |

- Centrally generated power
- Transmitted around the country at 275kV or 400kV
- Grid Supply Point
- Large substation 132kV
- Primary substation 33kV
- Distribution substation 11kV
- Electricity meter
- **7.9 million customers** (domestic & businesses 230V)

Our core responsibilities as part of RIIO ED-1 are to keep the lights on, maintain equipment, fix the network and connect new customers.

- Keep the lights on by operating our network assets effectively
- Maintain equipment so that the network is in a condition to remain reliable
- Fix the network if equipment gets damaged or is faulty
- Connect customers by upgrading existing networks or building new ones

As we transition to becoming a Distribution System Operator, and we take on additional roles within the developing energy system these roles will require an increased level of coordination with existing operators and consumers, as well as the creation of new forms of coordination with emerging energy participants.

- Promote innovation flexibility and non-network solutions
- Facilitate neutral markets for more efficient whole system outcomes
- Improve the resilience and security of the electricity system at a local level
- Drive competition and efficiency across all aspects of the system

Map

EAST MIDLANDS — Lincoln, Nottingham, Boston, Stoke-on-Trent, Coventry, Milton Keynes

WEST MIDLANDS — Shrewsbury, Tipton, Birmingham, East Wales

SOUTH WALES — West Wales, Swansea, Cardiff, Gloucester

SOUTH WEST — Bristol, Mendip, Barnstable, Somerset, Torquay & Exeter, Plymouth, Bodmin, Redruth

Our 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.

Presumed open

Accessible and usable

Standardised and interoperable

Relevant, engaged and beneficial

Timely, accurate and complete

Accurate development and innovation

What is digitalisation

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

Digitalisation: **Using**

Digitisation: **Collecting**

Open data: **Sharing**

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 is the process of collecting information about the electricity grid using sensors 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.

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

Digitalisation - the need

Digitalisation of the energy system is at the heart of our transition to build a smart and efficient energy system.
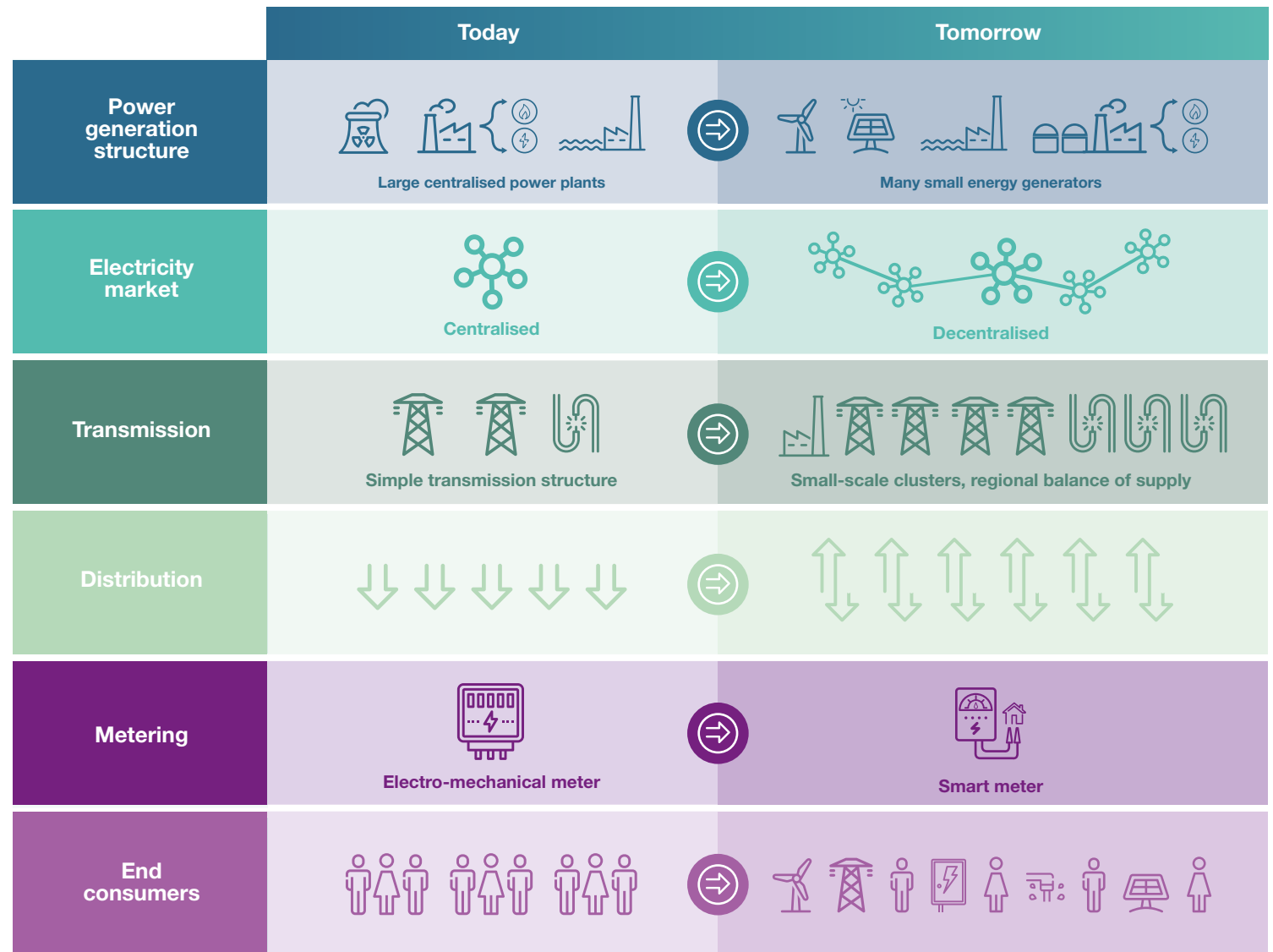
The UK has a clear commitment to net zero carbon emissions by 2050.

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 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 increases in 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) shift to become a Distribution System Operator (DSO) 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		

Decentralisation

The world is changing and how electricity, and energy more widely, is produced is changing. Gone is the GB's reliance only on large-scale centralised generating resource, marked by significant periods without any coal-produced electricity in 2020.

This means that electricity is being generated more locally, increasingly connected 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 the GB.

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

Generation and Storage Growth
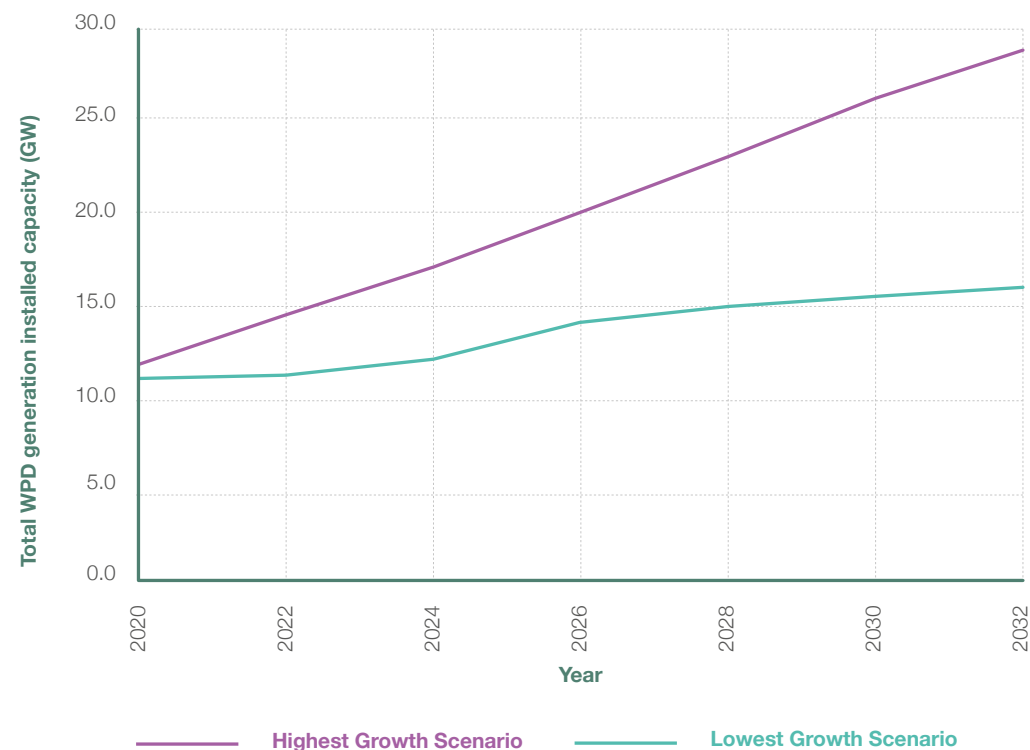
As the level of decentralised generation increases and the proliferation of localised electricity storage continues, the need for our transition to a DSO is essential to ensure we actively operate our network and facilitate third party markets, whether it's peer-to-peer energy trading, providing services to National Grid, ourselves or new and developing markets, to ensure efficient and effective network operation is maintained.

The provision of more data, which is open and relevant for use within our business, to be exchanged with the Electricity System Operator (ESO) and with third party participants will be critical to facilitate this.

Decarbonisation

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.

Electric Vehicle Numbers

Number of EVs WPD wide (million)

Year

— Highest Growth Scenario   — Lowest Growth Scenario

Heat Pump Numbers

Number of HPs WPD wide (thousand)

Year

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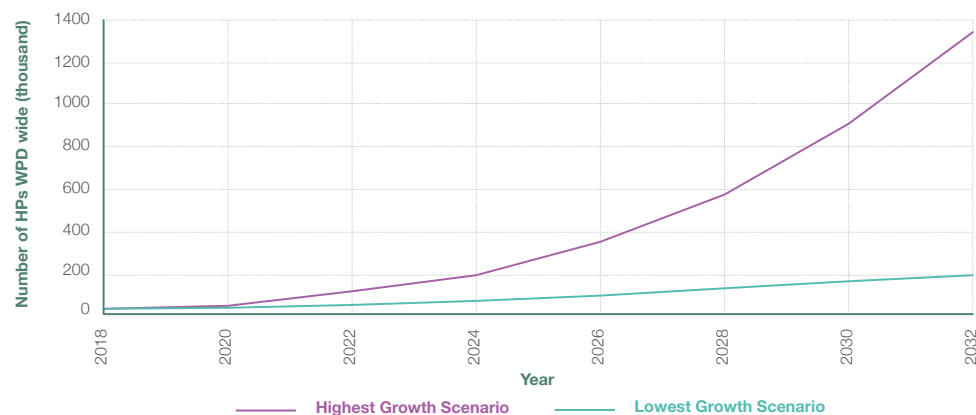
Enabling customers and stakeholders access to data to understand the capacity and operation of the network today and forecasts as to how that will change moving forwards, timely and effectively, is crucial to enable them and others to understand how to most effectively and efficiently integrate LCTs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

Customer Focussed

Meeting the needs of our customers and stakeholders is driving digitalisation across our business, ensuring we have the ability to meet and exceed data and digital requirements and that the right data is available at the right time in the right format.

Data and digitalised solutions are needed to understand where a generator is best placed on the network, similarly how to integrate a single EV charger or driving best performance from new and emerging market based services and solutions needs data. We understand the need for customers and stakeholders to have access to complete, accurate and relevant data in a format that works best for them.

Presenting data in a single format will not work for all types of customer and stakeholders and we carry out regular and relevant engagement to ensure the data we're providing, the format we're providing it in, generate the greatest benefit for all.

Customers and stakeholders have a wide variety of needs to drive an even wider assortment of benefits and we will ensure that all have the opportunity to have their voice heard, particularly to support the vulnerable in the community and fuel poor.

Digitalisation - the challenge

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 our 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 our central position in the energy delivery chain – independent from energy service providers, suppliers and generating companies – means our role is critical. Therefore, we are working with the other energy network companies via our trade association the Energy Networks Association (ENA), the government's Energy Systems Catapult (ESC) and our stakeholder community to identify the data that should be shared across the industry, how it should be pooled and how it can be accessed.

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

Data Visibility:
Understanding the data that exists, the data that is missing, which datasets are important, and making it easier to access and understand data.

Infrastructure and Asset Visibility:
Revealing system assets and infrastructure, where they are located and their capabilities, to inform system planning and management.
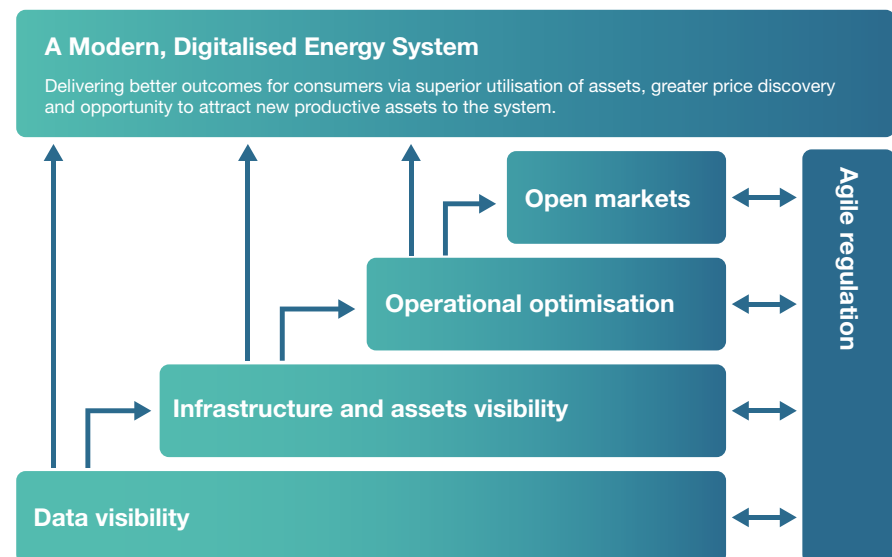
Operational Optimisation:
Enabling operational data to be layered across the assets to support system optimisation and facilitating multiple actors to participate at all levels across the system.

Open Markets:
Achieving much better price discovery, through unlocking new markets, informed by time, location and service value data.

Agile Regulation:
Enabling regulators to adopt a much more agile and risk reflective approach to regulation of the sector, by giving them access to more and better data.

A Modern, Digitalised Energy System

Delivering better outcomes for consumers via superior utilisation of assets, greater price discovery and opportunity to attract new productive assets to the system.

- Open markets
- Operational optimisation
- Infrastructure and assets visibility
- Data visibility

Agile regulation

It is important that we work as an industry, collaborating within the energy sector, and with stakeholders, to deliver robust and standardised data to meet these ambitions.

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.

We have ensured that our strategies are aligned to our aspirations: using the DSO Strategy as 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 technology (IT) 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.

An example of this has been our flexibility service offerings, to use demand and generation connected to the network to mitigate the need for investment in additional assets and infrastructure. Offering flexibility aligns to our key aim as part of our DSO Strategy to promote innovation, flexibility and non-network solutions. Through this we delivered an innovation project under Ofgem's Network Innovation Allowance (NIA) mechanism, **ENTIRE**, which developed a mechanism and process to offer these flexibility services and was quickly taken through to our **business as usual offerings**, through our Digital Strategy, which quickly enabled our data and information to be shared through an interactive map, aligned to our existing maps centred on power cuts and network capacity, ensuring customers and stakeholders were provided a consistent way to interact with our data and understand our needs and their ability to support them. This enabled us to utilise over 590MWh of flexibility in 2019/20, saving in excess of £26m in asset investment.

We will continue to use these effective links, and build on them, to deliver effective digitalised solutions.

Our approach

As a regulated business, we set out a Business Plan for a defined period (called a 'Price Review Period'), which is reviewed by our regulator, Ofgem. We are currently in RIIO-ED1 and the next regulatory period will run from 2023-2028 and will be called RIIO-ED2.

Our planning is already well underway. We are carrying out extensive stakeholder engagement which is highlighting that building a smarter energy system will need to be a priority across this five-year period. Our Digitalisation Strategy and Action Plan will continually evolve up to and beyond the submission of our RIIO-ED2 business plan.

The first draft of our RIIO-ED2 business plan will be published in December 2020 and digitalisation will be a major component of it.

Our Digitalisation Strategy is built on three underpinning elements:
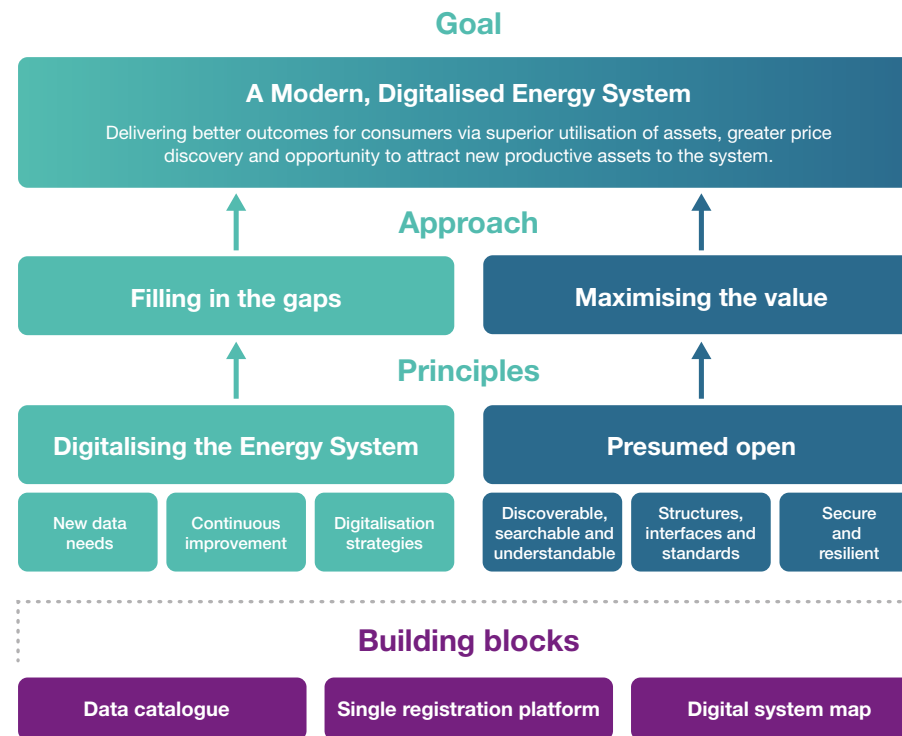
Improved data management

Increased network insight and operation

Presumed open data

These elements align to the Energy Data Taskforce report's key approaches of filling the data gap and maximising the value of data to work towards a modern, digitalised energy system.

Goal

A Modern, Digitalised Energy System

Delivering better outcomes for consumers via superior utilisation of assets, greater price discovery and opportunity to attract new productive assets to the system.

Approach

| **Filling in the gaps** | **Maximising the value** |

Principles

| **Digitalising the Energy System** | **Presumed open** |

| New data needs | Continuous improvement | Digitalisation strategies | Discoverable, searchable and understandable | Structures, interfaces and standards | Secure and resilient |

Building blocks

| **Data catalogue** | **Single registration platform** | **Digital system map** |

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.**

Improved 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 need to track and measure 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 improvement our data management is to employ best practice in this area and we are committed to adopting **Ofgem's Data Best Practice Principles**, discussed more in the **Key Focus and Priority areas section**.

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. This ensures 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. Due to its importance there is more detail on data governance in the **Key Focus and Priority Areas section**.

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 will support 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 and our customers and stakeholders' reliance on it is significantly increasing; we are seeing this through our developing flexibility activity, where good data provides improved solutions. We have already undertaken a number of data quality improvement activities, which to date has 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 needed to drive data quality improvements. This will include 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.

Improved data management

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 main 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. As part of building an INM we will ensure that we employ a Common Information Model (CIM) – a standard mechanism to share network data that does not rely on a specific tool or software - approach to asset and network data across all our voltage ranges.

Increasing network insight and operation

Leveraging value from data is fundamental to becoming a 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 regions. This roll-out is aligned with our customers incrementally switching from fossil fuels to electricity to meet their heat and transport needs.

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 will support 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 transition.

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 granulator as customers are increasingly engaging with the network and expecting it to 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 network reinforcement.

We will 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 will increase the density and volume of monitoring and data capture on our network, we recognise the 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'll look to utilise these third party services where they drive value to our network and customers.

Increase internal access to data

Access to a single version of centralised data throughout our business, moving away from locally owned and derived datasets is critical to ensuring that our business and operations continue to be coordinated, efficient and effective.

Ensuring that data is available as required throughout our business will only grow in importance. We will build on our data catalogue and governance activity to ensure that data used internally is always accessible to drive consistency and system benefits.

We will continuously and activity look for developments and improvements, both to the data and the access processes to ensure they're fit for purpose and support our aims. There's more detail on our workforce in the **Enabling our strategy** section.

Presumed Open Data

Our online Energy Data Hub is already home to many sets of network data and information.

We continue to add both raw datasets and user-friendly tools, in the form of interactive maps and systems to the Hub. We understand that access to our data is vital to support a variety of current and future elements of the electricity and wider energy system. We also recognise that the needs of different customers and stakeholders are varied and data may need to be presented in different formats. Ensuring that this data is available and that channels for sharing open data, including web portals and communication tools such as messaging apps need to be developed. This will enable the sharing of information, through application programming interfaces (API) to enable users direct access in a timely manner. We also need to ensure that these tools capture requirements and use cases to deliver data and access to that most critical for users. This is expanded in more detail in our **Engagement section**.

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 Energy Data Hub 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 Embedded Capacity Register (ECR) is an example, but we are aware that customers want 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 through **DataPortal2.0** 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 to support an industry wide **Digital System Map**.

A key requirement is to standardise 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.

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 industry 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 or 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 CIM and presenting data consistently to customers and stakeholder across organisation. An example of this is the **Embedded Capacity Register.**

Data Working Group

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

Working collaboratively as part of this group will ensure that customer experiences with licence operators' 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 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.

Flexr

Led by Electralink, Flexr looks to provide transparent data access between all energy market-participants through a secure and controlled open platform.

This presents an opportunity to bring about change to unlock energy system data to ensure an open, level playing field for the flexibility market.

We are one of two Pathfinder DNOs as part of Electralink's initial Flexr activity, providing existing and developing data sets to support its development and engage end user insight.

What will this mean and delivering value

We understand the requirement for digitalisation to centre on customer focus, decarbonisation and decentralisation. This section focusses on how our approach will deliver value, savings and benefits to us, our customers and stakeholders.

Improving our data management is the core to enabling our other two underpinning elements. Developing standard processing for creating, managing and handling data through a robust governance process; investing in solutions to improve our data quality; and ensuring we have a single source of the truth.

Improved data management

Increased network insight and operation

Presumed open data
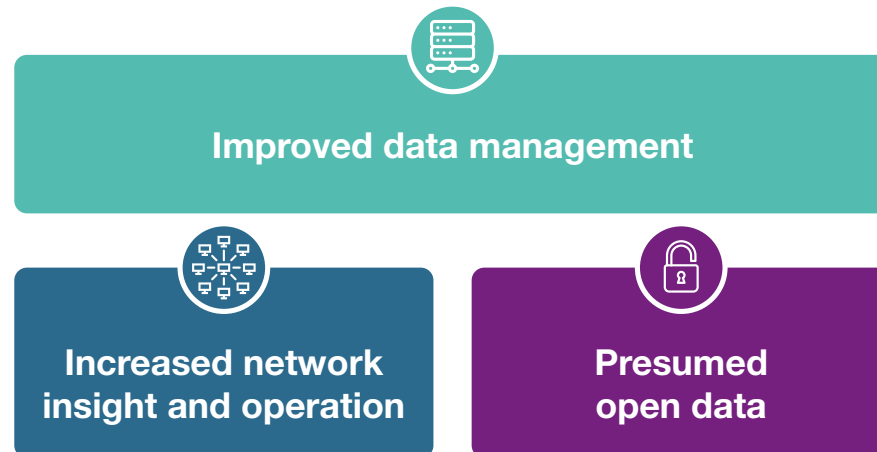
Taking data management out of silos is needed and that is exactly what our data governance and improvement plans will deliver, meaning that less time is spent gathering, organising and processing the data across the business.

This means that we can use this time to drive insight from this data to improve our performance and turn this data in to useful information to benefit our customers. This means being ambitious and investing in solutions that can support our improvement activities, which will include investing in machine learning technologies to automate the process of improving our data.

An example of using machine learning on our data is where we have gaps in the technical data of some of our assets, perhaps ratings and age. Using machine learning on our asset data sets to look for patterns in data, i.e. trends of assets by name, serial number etc. meaning that with the appropriate rules we can automatically plug these holes in our data, significantly increasing its value.

This is important as we can now make more informed design and operational decisions, saving time and money, whilst also providing a whole range of stakeholders more complete data to drive their investment decisions, perhaps around increasing their distributed generation capacity based on the rating of their local transformer or connecting cable.

What will this mean and delivering value

Improving our data management, process and quality will be incremental, ensuring that the whole business is taken on the journey and that the full value of new developments and processes is achieved, however, revolution rather than evolution will be required to improve our network insight and operation.

The need to deliver new and additional data from the network and the wider business will involve significant investment in grid connected technology and internal data systems. Decisions about on premise or cloud based solutions need to be made, more detail on this is provided in the Facilitators section, likely a mix of both and how we use this data and information to benefit all.

Historically our network management system, used to control the network in real-time, has not needed asset information typically used when planning the long term operation of the network, however, now we need to understand in real-time the flows and predicted future flows on our network. Using our single source of the truth approach means we will have one central repository to access the additional information to import and keep up to date to enable real-time load flow analysis.

This will mean that we can now optimise how we operate the network to ensure it remains secure, ensure it is configured as needed based on the load and generation connected in that instance and how it should be configured in the future. This will reduce our need to invest in new and larger assets to enable the same amount of load and generation on the network providing customers the opportunity to connect more LCTs and DG to the network faster and cheaper.

As well as using our data more effectively, using third party data and services will be important to drive efficiency and effective operation of our business. We see a big opportunity to work with data institutes and organisations, who whilst not understanding electricity networks have a huge knowledge base in terms of taking data and interrogating and augmenting it to drive value.

This links to our presumed open data approach and working to provide as much data as possible as we recognise that there is insight that we might not have derived internally but is possible when shared more widely.

Ensuring our data is presumed open and taking the assumption that it is and having to understand why it can't be shared, rather than assuming it's closed and justifying why it can be shared is key to our strategy. Our data governance will create a clear company-wide approach to ensuring that this translated in to action.

Much of our data is open, relating to our network, its operation and performance, however, we appreciate that this data is often disparate and is focussed on certain users. Our commitment is that we will continue to make more data open, ensuring it's complete, timely and relevant.

The needs of a local authority looking to plan its infrastructure investment to support their net-zero ambitions, a large organisation aiming to include a dense electric vehicle (EV) charging hub at their factory and a single customer wanting to install an EV charger at their house are all different.

We recognise this and that's why our open data approach will go above simply making data available but we will understand what type of user wants what type of data and in what format and where appropriate is guided to the right information. This will mean providing the raw data to some, high level data to others and to some, simply presenting the answer they're looking for.

What will this mean and delivering value

How this could work using network data as an example. Presenting the raw network information, such as asset and connectivity and power flow detail to the local authority to include in their wider modelling and assessment, which for the large organisation presenting this data in an online design tool where they can select different EV charging hub capacities to understand different options with varying costs and timescales.

Finally, the right information for a single customer looking to connect an EV charger is likely enabling them to enter their property details and being provided a range of simple options that they can then follow up with us online to the next steps.

Using the same data in a variety of ways for different audiences is what will deliver most benefit for our customers and stakeholders to meet and exceed their expectations and increase their interaction and utilisation of our network.

It is also important that our data is presented in the same format, where appropriate, as that of other network operators, is described in the same way and provides the same level of detail. Enabling customers and stakeholders have a clear view of the data across GB is needed to maximise the value of existing, new and developing markets.

Whether this is to support developers to easily identify optimal locations for the installation of new generation or for aggregators and energy market participants identify suitable assets to provide local and national flexibility services.

Where we are and where we're going

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, supporting our Digitalisation Roadmap.

To support this we have developed a maturity model aligned against the EDTF recommendations to enable a common approach and understanding of progress:

• **Digitalisation of the Energy System;**
• **Maximising the Value of Data;**
• **Visibility of Data;**
• **Coordination of Asset Registration;**
• **Visibility of Infrastructure and Assets.**

We have undertaken a number of internal workshops to understand our digitalisation and data maturity, across 16 business units, with support from IBM, utilising their maturity scale to define our current position.

We will regularly review our position on the maturity scale against the five key recommendations, with clear detail as to what actions and developments have driven an increase in maturity. To further inform this, as part of both our Roadmap and Action Plan, each activity will be highlighted as to which recommendation it supports to aid understanding of our progress.

The following tables illustrate the maturity scales and what this means for us against each of the EDTF recommendations. We have highlighted our current position, our target by the end of RIIO ED-1, our current price control period, ending March 2023, and the end of RIIO ED-2, March 2028.

We will continually evaluate the value and benefit of assessing our maturity scale in this manner based on feedback and any approach to standardise maturity benchmarking and assessment.

Maturity Scale

Level of Maturity	Maturity Level Description
Ad-hoc	A company which is just starting to develop capabilities for gathering information in key functional areas and is behind other companies in the corresponding market sector. Information beyond basic reporting is not available and involves time consuming, manual effort.
Foundational	A company whose capabilities to gather key information generally lags behind the majority of peers, leading to competitive disadvantages. Data gathering is mostly manual and information is not consistently available or utilised to make enterprise wide business decisions.
Competitive	A company whose capabilities generally are in line with the majority of market competitors, with a growing ability to make decisions, creating competitive advantage.
Differentiating	A company whose execution of key business strategies through utilisation of information are viewed as generally better than most other companies, creating a degree of sustainable competitive advantage.
Breakaway	An enterprise which is generally considered to be 'best in class' in their execution of key business strategies, exhibiting the characteristics of an agile, transformational and optimised organisation.

Where we are and where we're going

	Ad hoc	Foundational	Competitive	Differentiating	Breakaway
Digitalisation of the Energy System	No strategy of digitalisation, conflicting views within the organisation.	Basic high level data and digitalisation strategy outlined, often reactive to new data demands.	Strategy is continuously refined listening to the needs of multiple stakeholders, with defined use cases and output.	Strategy is driving continuous change with the use of data, exceeding the requirements of the regulator and others.	Whole organisation believes in the strategy, trailblazing change internally as well as externally.
Maximising the Value of Data	Limited use of data in the organisation, low visibility of data in the silos. Re-active data decisions.	Data is visible and understood in silos, with minimal cross silo interactions. Data is used to manage the business.	Data is driving operational improvements across multiple parts of the organisation.	Data is fully understood and feeds investment decisions. Common value standards are used across all parts of the organisation.	Extensive use of internal and external data, driving conscious value decisions across the whole organisation. Data is being used to drive new revenue streams that are not currently understood.
Visibility of Data	No visualisation of information, organisation struggles to identify datasets.	Limited understanding of data, basic metadata and data stored in silos.	Organisation has a view of large parts of its data, and the establishment of data governance and best practices. Organisation has a detailed understanding of the next steps needed.	Organisation has a common internal data catalogue with governance in place, has metadata standards and information management best practices.	Data is in a common data catalogue that allows for open data, enabling comparison of capabilities and performance with similar organisations. he organisation actively supports demand-based prioritisation for open data.
Coordination of Asset Registration	No Co-ordination of different assets within the organisation, no clear asset strategy.	Assets are registered in silos without coordination across some silos.	Assets are registered to a common register across the organisation, use of external asset data also takes place.	Assets are driving new value stream within the organisation, use of internal and external asset data.	Internal and external asset data is known and shared, driving value across different organisations. Coordinated asset strategy across the ecosystem.
Visibility of Infrastructure and Assets	No digital map of the organisation, some functions have basic digital mapping of assets.	Some mapping available for internal decision making and presented externally. Some minor investment decisions driven from this detail.	Digital system maps are used across the whole organisation and inform internal investment decisions.	Digital system mappings in coordination with similar organisations is used to create new markets and common investment decisions.	Sector leader in digital system mapping, driving sector benefits. Common sector visibility of infrastructure and assets.

Digitalisation Strategy

Making sure we get there

Our delivery of this Digitalisation Strategy is going to be dynamic and agile and the pace of change in many areas will be 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 transition from our current position on the maturity scale to where we want and need to be in three and eight years' time.

Digitalisation of the Energy System

This Strategy forms the basis for our transition from our current maturity level. We understand that developing our business, embracing new processes, systems and ways of working and engaging with data needs the buy-in from everybody and this will be a continuing journey. Much of our digitalisation and data focus has come from our DSO Strategy to this point and the creation of this Strategy now ensures that it is focussed on the changes and impacts of the complete business.

We will ensure this business wide approach continues and grows through the leadership of the newly established Digitalisation and Data 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.

Providing this regular opportunity to feedback, input to the Action Plan and development of the Roadmap will foster a company-wide ownership and commitment to delivering this Strategy and maximise the value and benefits.

Maximising the value of data

Our central systems, focussed on enterprise asset management, network management and geospatial information systems hold most of our data and access that to well understand 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.

The investment in our INM, combining and consolidating these datasets demonstrates our commitment to maximising the value of data, where this will be across our four licence areas, to inform design, planning and real-time operation of the network, by the end of 2020.

Building on this and additional data centralisation and coordination activity, we know the need is to continue to drive value, ensuring that the data is used to inform and drive investment and operational decisions.

Visibility of Data

The implementation of our data catalogue, will ensure that a single repository for relevant data exists for all colleagues to access, enabling well managed and controlled access to data, reducing any duplication issues or data remaining in silos. This is all enabled by our robust data governance, process and procedure, backed by our board-level Governance Group to ensure this is implemented throughout the business consistently.

We are committed to ensuring that everyone in the business is taken on the digitalisation journey to deliver best value. This will involve 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.

Digitalisation Strategy

Coordination of Asset Registration

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

Work has begun in this area, most recently in form of the **ECR**, which has been adopted as a standard mechanism to share data on generation above 1MW on all DNOs' networks. We also have begun to share our network asset data in CIM format, an internationally recognised standard for sharing electricity asset information.

Collaboration has started and needs to continue to ensure that standards are development and this is underway and discussed in more detail in the **Working Collaboratively** section and where required we will take the lead, as we have done with CIM to ensure that a standard approach for the benefit of all is delivered.

The use of additional datasets to drive coordination of registration is also required, focussing immediately on assets such as 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 Low Emission Vehicles (OLEV), 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 organisation 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 ambitions, has demonstrated the value of making this data available.

Our complete GIS is available on the web, through DataPortal2.0, 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.

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.

Key focus and priority areas

Throughout this document we have discussed a number of activities that will be undertaken and are detailed as part of our Roadmap and Action Plan.

This section discusses in more detail some overarching key focus and priority areas serving to underpin the delivery of the wider activity effectively and in a timely manner.

Data
Governance

To ensure that our Digitalisation Strategy is delivered effectively and co-ordinated with other organisational strategies we have implemented a Governance Group chaired by our Operations Director, with key member from across the complete business.

The Terms of Reference and meeting summaries for this group are available **here**.

Our evolving 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 will span our complete business to ensure a uniformed and strategic approach. Key elements within our Data Governance are:

- **Prioritising areas for business improvement;**
- **Maximising availability of information assets;**
- **Creating roles, responsibilities, and rules;**
- **Ensuring and improving information asset integrity;**
- **Establishing and maintaining an accountability infrastructure;**
- **Converting to a master data-based system;**
- **Developing a feedback mechanism for process improvement.**

Our Data Governance Model

Digitalisation Strategy

Cataloguing

Key to robust data governance is a central data access point and the implementation of a Data Catalogue will facilitate this. We have a diverse set of data sources, data types, user and access models and mechanisms and combining access to these through a data catalogue will enable significant internal and customer and stakeholder benefits.

We will take a focussed and prioritised approach to the implementation based on the datasets supporting use cases internally and externally, ensuring appropriate metadata management to facility discoverable,searchable and usable data.

This will enable relevant datasets to be used to facilitate system and business value.

Leveraging machine learning as part of our data catalogue and repository will also allow us to automate previously manual tasks involved in data discovery, interpretation, enhancement and relations between distinct datasets.

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

We have already undertaken a number of digitalisation and data enhancements aligned to these principles, for example, the adoption of the Dublin Core metadata standard as part our existing Presumed Open Data work, which will become the standard for all our relevant data moving forwards. Our variety of publically available information maps, guiding users to key network and supporting information, supports the principle of making datasets discoverable for potential users.

As we deliver our Action Plan to support our digitalisation Roadmap, we will ensure that every activity clearly outlines which of the 12 principles are being further supported as part of the delivery. To measure this we will implement internal audits of our processes and procedures to ensure that they're delivering and meeting the requirements of the data best practice principles, providing a mechanism to further measure our progress.

Use cases and delivering benefits

Delivering benefits internally and to our customers and stakeholders is central and we believe this is enabled through regular and relevant engagement. We have a strong track record in stakeholder engagement and digitalisation and data is now a part of that activity.

We have already undertaken significant engagement to formulate our Roadmap and Action Plan and are committed to doing this to ensure optimised solutions are delivered to maximise benefit.

Taking an action and benefit approach to identifying use cases, rather than focussing on specific datasets or digitalised solutions is our approach and us, as industry experts, will work to translate those actions, both internally and externally focussed, to ensure the right data, in the right format, at the right time is open, accessible and usable.

We have already undertaken extensive engagement around use cases and data sets, detailed further in the **Engagement section**, and through further digital surveys a number of key use case and data sets have been identified, that we will focus on:

- **Visibility of the connection pipeline to the network;**
- **Substation level data including power flows and customer types connected;**
- **Cost of reinforcement across the network;**
- **Substation level demand and generation profiles;**
- **Understanding network capacity availability against time and by connection type;**
- **Cost of network and LCT connection;**
- **Generation details, including their historic output.**

More targeted feedback in relation to specific datasets being made available to support customers' and stakeholders' needs was also undertaken, highlighting:

- **Network Data – assets and connectivity;**
- **Near real-time demand information;**
- **Location and description of network constraints;**
- **Available connection capacity;**
- **Fault data – live and historic.**

Digitalisation Strategy

Innovation

The provision of accurate and reliable data is paramount to facilitate our future business decisions. A number of innovation projects have focussed on the creation of increased data sets, such as monitoring to understand the operation of the LV network to a level and granularity not previously possible.

The increased granularity of data is vital to operating and managing a distribution network and more widely the whole energy system effectively. This includes understanding when and where to invest to determine optimal flexibility services and solutions for customers. Our innovation programme will continue to play a key role in supporting developments in the following areas:

• Facilitating access to existing and future data sets – this will enable greater visibility of our network assets, current and planned operation as well as engaging with third parties to offer service and solutions based on data;

• Generating increased data to facilitate the future needs of the network and customers – utilising additional monitoring and analytics to increase network visibility and understanding. Previous innovation projects have demonstrated the value and benefit of increased data and network visibility.

Previous innovation projects have demonstrated the value and benefit of increased data and network visibility:

• OpenLV has shown the appetite for third parties to utilise our data and generate additional information in the form of Apps and for customers and community groups to have direct and real-time information to inform on energy usage etc;

• Our LCT Detection project, used domestic metering information to understand LCTs, principally EV chargers and PVs connected to the network, that hadn't previously been identified.

Generating, accessing and interpreting data effectively will provide us and customers significant benefits. Greater coordination between our innovation and digitalisation activities will further increase the value from our innovation programme.

Progress so far

Open Access Maps

We have developed a number of open access maps to provide customers, stakeholders and other interested third parties access to a visual representation of our data, with the capability to download the background datasets to use in other formats that work for them.

We currently have maps for Power Cuts, Network Capacity, Network Flexibility, EV Capacity and our DFES.

These already provide a wide range of benefits, from customers being able to understand detail about a power cut and when they're likely to be reconnected or to plan for the investment of generation or LCTs.

All maps are available via our map hub.
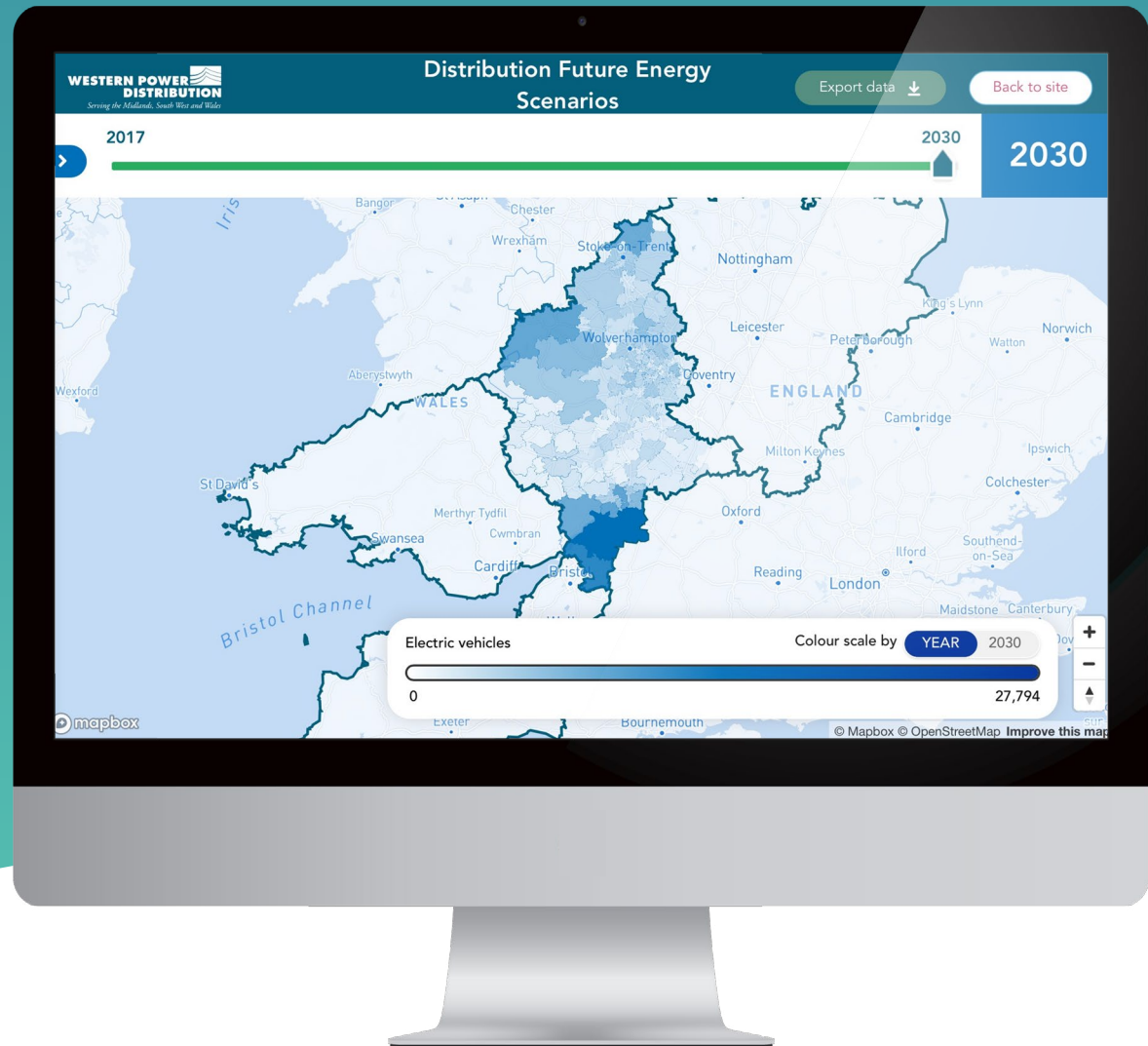
DFES Map showing EV penetration by 2030 in the West Midlands

Digitalisation Strategy

Integrated Network Model

Building on a previous Network Innovation Allowance project we have implemented an INM, which uses data from our core systems, asset management tool, network management system (NMS) and GIS to create a complete, single source of the truth, version of data.

This serves a number of valuable purposes, it allows us to drive our data improvement activity and appropriately track progress as well as generate data in CIM format for our networks that can be used internally and externally, providing a single point of access for a variety of network asset and connectivity information that has not previously been available.

Access to our CIM files is available here

Visualised INM CIM data

Embedded Capacity Register

Understanding generation connected to our network is important to us but also others, such as flexibility providers and National Grid ESO.

A collaborative approach has been taken to facilitate this across all distribution network operators, the Embedded Capacity Register (previously the system wide resource register) that provides open access to generation information by network connectivity, capacity, generation type and whether it currently provides a flexibility service, either to us or National Grid.

To ensure the data is as accessible as possible we provide headline data graphically, where the detailed data can then be accessed for further investigation.

Generation

- Photovoltaic
- Other Generation
- Storage (Battery)
- Onshore Wind
- Large CHP (>=50MW)
- Mixed
- Landfill, Gas, Sewage Gas, Biogas (notCHP)
- Waste Incineration (not CHP)
- Biomass & Energy Crops (not CHP)
- Medium CHP (>5MW,<50MW)
- Small CHP (>1MW, <5MW)
- Offshore Wind
- Storage (Pumped)
- To be confirmed
- Hydro
- Mini CHP (<1MW)
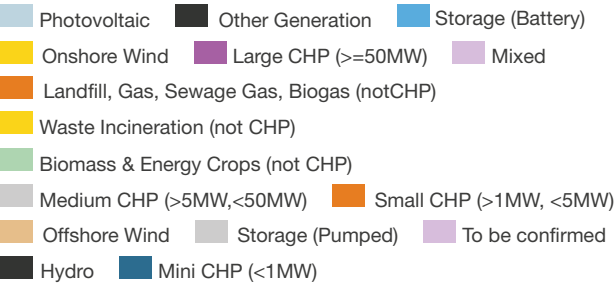
Accepted/Connected DG by area (MVA)

- Connected
- Accepted
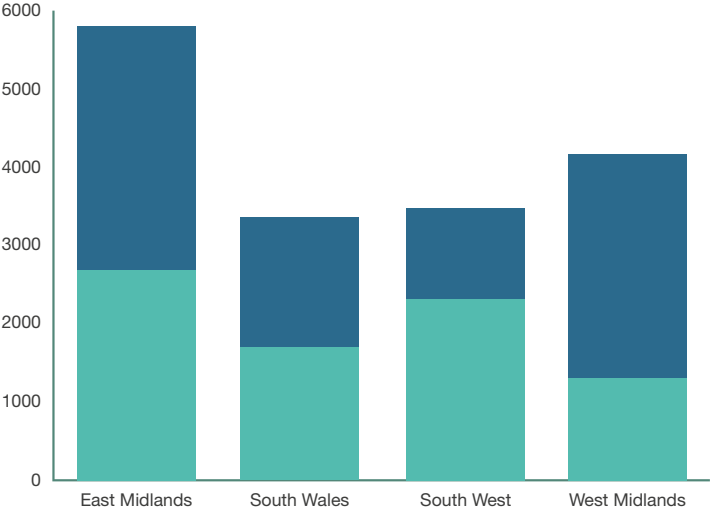
DataPortal 2.0

Our DataPortal2.0 provides a wide variety of data, via a web based application, focussed on our network assets, their geographic location and technical parameters.

Data is supplied in a number of computer aided design (CAD) formats for download and offline use, as well as being available to overlay in Google Earth format.

An online complete geographic and schematic view of the network is also available with features that allow the user to click on cables and assets to identify their connectivity, type, voltage and other parameters to support a number of activities.

Asset data represented in DataPortal 2.0

Automated Power Restoration System

Automated Power Restoration System (APRS) is a function of our network management system, PowerON. It applies an algorithmic approach to fault detection, isolation and restoration.

It uses telemetered network data to understand the location of a fault and then either recommend, or automatically execute a sequence of switching actions to isolate a fault and restore power to as much of the network as possible.

This enables us to respond to faults and restore customers more rapidly, meaning that customers are disconnected from the network for shorter periods of time. It also demonstrates the capability and capacity of automating control system functions, which will be needed to support and deliver a flexible network to meet net-zero.

Time Series Data Store

View of TSDS

Time Series Data Store (TSDS) contains all operational data points from the network which includes both detailed asset information, such as switch and circuit breaker telemetry states (open or closed), real time and calculated analogue values.

Historic data can be accessed either directly through our NMS for technical users or via an internal web service for more general use.

Historically only 30 minute maximum, minimum and average data of how the network has performed has been available, which has been appropriate and suitable, but for today and tomorrow the access to real-time and accurate data is critical to ensure our design and operational activities are optimised.

OpenLV

The need for customers and communities to understand in real-time the energy they're using, producing or more widely that is being seen on the network is critical to them being able to optimise their operations, energy usage and production.

The **OpenLV** solution is a common, low-cost platform that can facilitate the deployment of different apps to suit the needs of the network, its customers, and the broader supply chain uploaded on a local monitoring system connected at a substation.

We have already seen communities utilising this real-time data to further understand their electricity utilisation that has not previously been possible, plan for the integration of increased LCTs and explore potential revenue streams from emerging flexibility solutions.

Example of OpenLV solution

Smart Meter Data - Loss of Supply

We already use a High Volume Call Taker (HVCT) system to provide automated messaging and logging for customers who experience a loss of supply.

The loss of supply functionality of the SMETS2+ metering system now allows us to receive loss of supply alerts directly from an affected premise into our HVCT.

This means that, where there is a smart meter installed, we no longer need to rely on the customer informing us that they have lost their electricity supply. We have a live connection to the Data Communications Company (DCC) and have developed an automated process to determine whether a customer is off supply, which is then directly passed to a team to manage and restore the customer's connection.

This has enabled us to react and respond faster to customers' needs, providing an improved service and reducing their disconnection time.

Enabling our strategy

Engagement

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 occurs 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.

Internal

Our business has a diverse range of internal users of data and data driven systems. We have engaged significantly through the development of this strategy, understanding our current position, where we need to get to, why and what we have to do to realise that, which is identified in our Roadmap and Action Plan.

Key to the success of delivering our strategy is to continuously and actively engage.

Building on the creation of our Digitalisation & Data Governance Group additional groups are in place to enable the optimised delivery of new implementations and developments of existing solutions, through targeted Steering Groups, including both senior management, end user, and where appropriate customer and stakeholder representation to ensure development, implementation and operation is optimised and adopted on delivery.

Data Governance

- Digitalisation Strategy
- Governance Group
- Steering Groups
- Digitalisation Action Plan
- Business Operation

Hierarchy of our internal digitalisation delivery

Continuous engagement to understand the suitability of digitalised and data solutions is needed. We will hold regular feedback sessions and continue to create forums for informal discussion to capture suggestions for improvement and development.

External

Providing digitalised solutions and appropriate data access is key to our strategy and aligned to the delivery of the EDTF recommendations.

We know there are a wide range of customer and stakeholders that are keen to engage and can add real value 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. The **Progress to date section** details a number of externally focussed digitalised developments to date, where they were driven either by direct stakeholder request and engagement or as part of a consultation process.

We understand that 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 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 over 100 potential data use cases categorised against six data user categories (the prioritised use cases are described in the **Use cases and delivering benefits section**):

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.

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.

The way data is used by customers and stakeholders is changing and will continue to change, which will affect all aspects of our business and we recognise the importance in creating space for all sectors and organisation types to be given the ability to input, inform and support our developments. Data is and will continue to be an important factor for all our external engagement.

We will 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.

Workforce and skills

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 apps to collect data and provide information to field staff is already helping to enhance the data to the business and the understanding of the importance of data. Increasing the volume and type 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 Telecoms and DSO Control Systems 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.

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 Strategy.

We know that historically elements of specific technical skills have been managed and contained within silos. Creating and implementing multidisciplinary teams, with a range of diverse skills, to speed up our time from design through to build and deployment. Through the creation of our Digitalisation and Data team we have already started this.

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

For every significant development we will 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 will ensure that we maximise the benefits for all.

Facilitators

Key to being able to deliver our Digitalisation Strategy is increasing our interaction across departments, where the need for the strategic aims of each area are inextricably linked.

Information Technology

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 and flexible. 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).

Hybrid cloud

Private

Public

On Premise

Common data platform

IT Strategic Business

Development and support

Modernisation of existing IT estate	Integration of IT/OT
Common EA standards	Incorporation of shadow IT
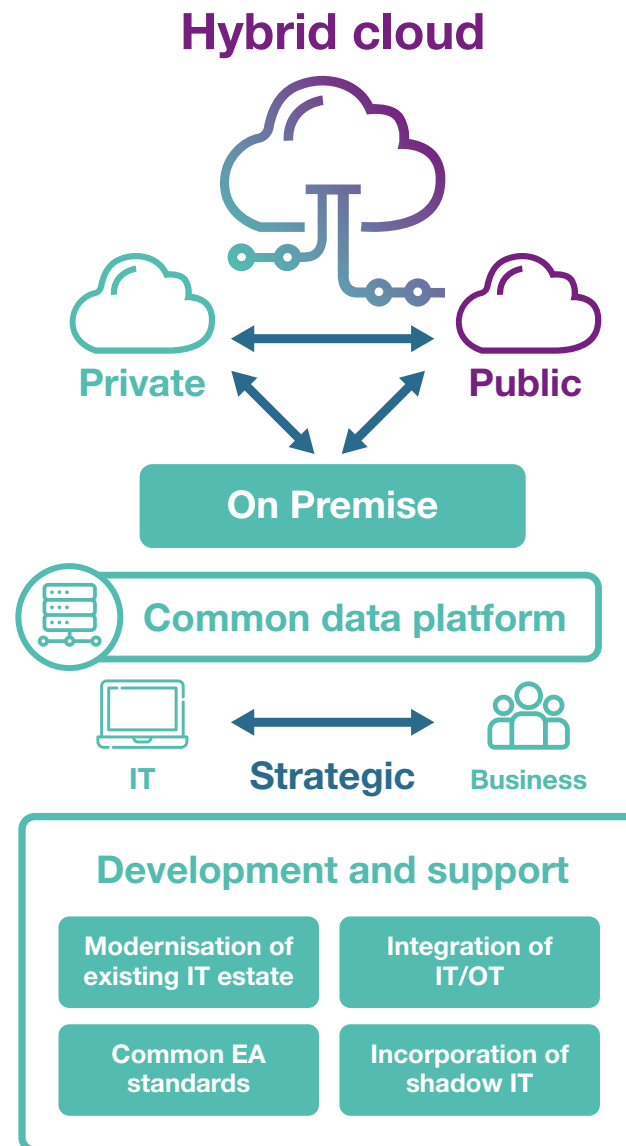
Hybrid Cloud Architecture

Facilitators

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.

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.
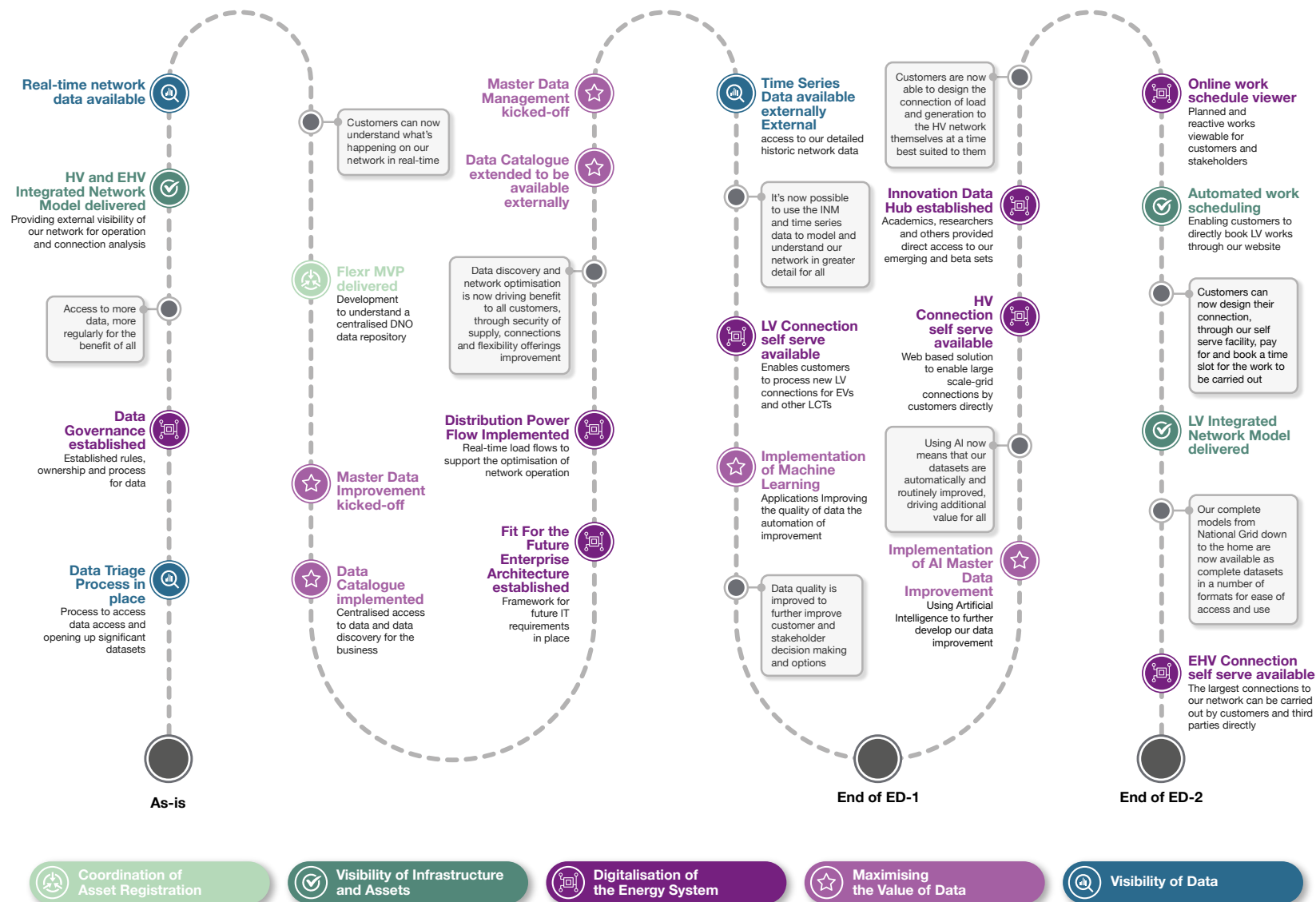
Roadmap

Our roadmap shows the key activities that we'll be undertaking to digitalise our business, where each activity is aligned to one of the five key recommendations from the EDTF.

Our shorter term activities are provided in more detail in our accompanying Action Plan.

Our roadmap is focussed on ground-breaking implementation of digitalised solutions, such as providing real-time network data to customers and stakeholders as well as continuous data improvement and master data management.

Together this will ensure we deliver our Roadmap, whilst being flexible and dynamic to meet the evolving needs of the end user, both internally and externally.

Providing greater data availability, insight and tools to make better decisions faster and more effectively is key to our Digitalisation Strategy.

Real-time network data available

HV and EHV Integrated Network Model delivered
Providing external visibility of our network for operation and connection analysis

Access to more data, more regularly for the benefit of all

Data Governance established
Established rules, ownership and process for data

Data Triage Process in place
Process to access data access and opening up significant datasets

Customers can now understand what's happening on our network in real-time

Flexr MVP delivered
Development to understand a centralised DNO data repository

Master Data Improvement kicked-off

Data Catalogue implemented
Centralised access to data and data discovery for the business

Master Data Management kicked-off

Data Catalogue extended to be available externally

Data discovery and network optimisation is now driving benefit to all customers, through security of supply, connections and flexibility offerings improvement

Distribution Power Flow Implemented
Real-time load flows to support the optimisation of network operation

Fit For the Future Enterprise Architecture established
Framework for future IT requirements in place

Time Series Data available externally External
access to our detailed historic network data

It's now possible to use the INM and time series data to model and understand our network in greater detail for all

LV Connection self serve available
Enables customers to process new LV connections for EVs and other LCTs

Implementation of Machine Learning
Applications Improving the quality of data the automation of improvement

Data quality is improved to further improve customer and stakeholder decision making and options

Customers are now able to design the connection of load and generation to the HV network themselves at a time best suited to them

Innovation Data Hub established
Academics, researchers and others provided direct access to our emerging and beta sets

HV Connection self serve available
Web based solution to enable large scale-grid connections by customers directly

Using AI now means that our datasets are automatically and routinely improved, driving additional value for all

Implementation of AI Master Data Improvement
Using Artificial Intelligence to further develop our data improvement

Online work schedule viewer
Planned and reactive works viewable for customers and stakeholders

Automated work scheduling
Enabling customers to directly book LV works through our website

Customers can now design their connection, through our self serve facility, pay for and book a time slot for the work to be carried out

LV Integrated Network Model delivered

Our complete models from National Grid down to the home are now available as complete datasets in a number of formats for ease of access and use

EHV Connection self serve available
The largest connections to our network can be carried out by customers and third parties directly

As-is

End of ED-1

End of ED-2

Coordination of Asset Registration

Visibility of Infrastructure and Assets

Digitalisation of the Energy System

Maximising the Value of Data

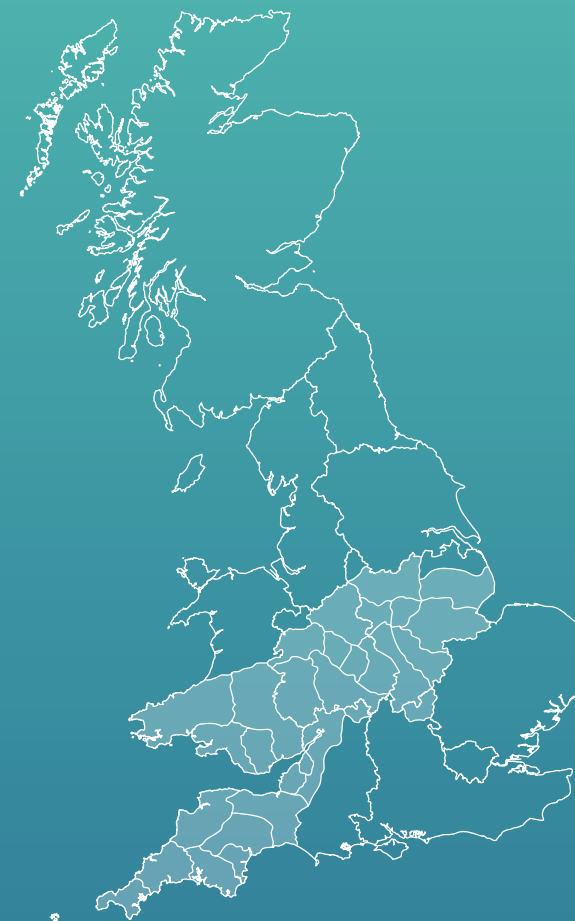**Visibility of Data**

Digitalisation Strategy

Have your say

Your voice and opinion matters to us and we'd welcome your feedback on this and our Action Plan through our consultation, open until 30th October.

How to get in touch

Find out more about all our digitalisation and data activity, track our action plan progress and more at:
www.westernpower.co.uk/digitalisation

Looking for more information, have an idea or a data need, contact our Digitalisation and Data team:
dsodigitalisation@westernpower.co.uk

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