Digitalisation Strategy

March 2022

Electricity Transmission

nationalgrid

Contents

Executive summary

National Grid Electricity Transmission plays a pivotal role at the heart of the UK's energy system. We own the electricity transmission network in England and Wales, and we make sure electricity reaches homes and businesses safely, reliability and efficiently. As part of commitment to net zero, we aim to enable a clean, fair, and affordable energy future for all.

To do this, we are transforming towards becoming an intelligent, connected utility. We believe our digital transformation is the key to:

Accelerated delivery of new renewable capacity: Meeting the government's target of 40GW of offshore wind connected by 2030 requires us to deliver infrastructure to enable us to quadruple the existing capacity in an accelerated timeline.

Faster, cheaper network connections: Reducing the time and cost for customers to connect to our network through an improved end-to-end connections process.

Efficient asset management: Harnessing real-time insights from asset data to unlock greater value within our asset operations and maintain network reliability at an affordable cost for our customers; and transforming our business to achieve a step change in productivity.

To deliver these business outcomes, we are developing our organisational capability, re-imagining our processes, and leveraging frontier technologies. We are building a culture, ways of working and skills that are agile, flexible, and responsive to change.

We are supportive of the work that the Energy System Catapult have led on the Energy Data Task force report in 2019, and the recent Energy Digitalisation Taskforce published in January 2022. We are part of a wider landscape of stakeholders, and will work collaboratively to facilitate innovative, whole system solutions as we move to a low carbon energy system.

We have made good progress in our digitalisation strategy over the last year. For example, with our ConnectNow online customer portal, we provide our customers with timely transparency of costs and work delivery to enable them to connect to our network through better engagement and collaboration with us. Moreover, we have a clear digitalisation roadmap that offers flexibility to respond to changes driven by the needs of our stakeholders and the external environment.

We hope that you enjoy reading our digitalisation strategy and we look forward to continuing our engagement with you on delivering net zero and enabling a clean, fair, and affordable energy future for all.

Chris Bennett
Interim President,
Electricity Transmission

Adriana Karaboutis
Chief Information and Digital Officer,
Information Technology

1. Who we are and what we do

1.1 Who we are

We are National Grid Electricity Transmission plc (NGET). We own and maintain the high voltage electricity network in England and Wales. That includes approximately 4,500 miles of overhead line, about 900 miles of underground cable and more than 300 substations.

Serving England and Wales, we move electricity from where it is generated, down the superhighway of the electricity system, to our direct customers and to the distribution companies that deliver power to homes and businesses. Our cables and substations are at the centre of the energy system. Every time a phone is plugged in, or switch is turned on, we've played a part, connecting homes and business to the electricity they need. We play a pivotal role in turning the UK's net zero ambitions into reality.

1.2 Our operating context

We are experiencing a period of unprecedented change, which has accelerated since the publication of our previous digitalisation strategy in 2020. There are several external factors driving the need for us to transform the way we operate to deliver on our net zero commitments and enable a clean, fair, and affordable energy future for all.

- **The energy transition and net zero:**
  The government have published key strategy and policy documents which set out a roadmap for achieving net zero by 2050. This includes the Prime Minister's 10-point plan and the Government's net zero strategy. Delivery of the UK's net zero target requires 40GW of offshore wind connected to our transmission network by 2030, and large-scale decarbonisation of our heating, transport, and industrial activities.

- **Customer expectations:**
  Customer expectations and habits have been changing over the last decade as digital technology becomes an increasing part of our day to day lives. The COVID-19 pandemic has accelerated this shift to digital, with today's consumers expecting a digital first, seamless and connected customer experience. Smart home energy devices (such as smart meters, intelligent thermostats, and smart voice assistants) have also raised awareness of energy consumption.

- **Global energy markets:**
  There has been significant volatility in the global gas market, putting significant pressure on consumer energy bills and feeding into a cost-of-living crisis. This volatility has developed as the world starts to emerge from the COVID-19 pandemic and supply chains have experienced disruption.

- **Sustainability:**
  Stakeholders are demanding action on environmental, social and governance issues. Businesses are re-inventing their operating models around sustainable practice, from core business operations to partnerships and supply chains. We have our own 'Responsible Business Charter' which sets out what this responsibility means for us, and commitments and ambitions over the coming years.

- **Technology:**
  Modern technology continues to transform our society. We are already seeing the widespread adoption of a range of digital technologies including artificial intelligence, machine learning, cloud computing, 5G, internet of things, digital twins, and virtual reality.

1.3 Our vision, strategic priorities, and values

The changing operating context defines our vision to be at the heart of net zero, and a clean, fair, and affordable energy future. As set out below, we have a clear view of what we need to do to bring our vision to life. This will be realised through our values of doing the right thing, finding a better way, and making it happen. These values also underpin the digital transformation journey we are currently on as we deliver our digitalisation strategy.

Electricity Transmission — **To be at the heart of a clean, fair and affordable energy future**

Why?

Why do we need to do things differently

1. There's a huge amount to do to turn **net zero** into **reality**
2. We have **more customers** with **different needs** and expectations
3. We're operating in a new **more stretching regulatory framework**
4. Society expects us to be **a responsible business** - it's core to what we are and our values
5. ET needs to be a **great place to work** that is **digital-enabled**

What?

What are our priorities for the next five years

Enable the energy transmission for all

- Be the experts on power systems and delivering practical solutions
- Deliver the connections and wider infrastructure needed to make net zero a reality
- Deliver work sustainably and cut our own admissions

Our network will form the backbone of net zero.

We're turning the UK's net zero ambitions into reality by building the infrastructure needed to deliver green power across the country, in a **fair and affordable way**.
We are also leading by example by cutting our own emissions.

Deliver efficiently for our customers

- Keep everyone safe
- Maintain reliability
- Deliver our commitments below our allowances: show operational exellence and financial discipline
- Be recognised for our contribution to communities

We can only deliver on our vision for clean energy in the long-term if we get the fundamentals right.

We must be absolutely clear what we've committed to doing, and then find ways to deliver it safely and within our allowances.

Grow our organisational capability

- Become a digital-enabled business
- Innovate and collaborate, across our teams and with our stakeholders, suppliers and partners
- Build the capability we need for the future

If we're going to thrive, we need to transform - and keep transforming - to keep pace with a changing world.

We will innovate and adapt in faster and smarter ways, setting the pace at the cutting edge of engineering and asset management.

Empower our people for great performance

- Clear accountability in our structures
- Provide great experiences and careers while growing our diversity, eqquity and inclusivity
- Focus our culture on our results and our purpose
- Support and improve the health and wellbeing of our colleagues

ET is at the heart of the energy future and our people are at the heart of ET.

We will be a place where people want to work; where we can attract, develop and retain the talent we need for today and the future.

How?

How will we do it

Do the right thing

- Act safely, inclusively and with integrity
- Support and care for each other
- Speak up, challenge and act

Find a better way

- Work as one team to find solutions
- Embrace learning and new ideas
- Simplify to what really matters

Make it happen

- Be bold and act with passion and purpose
- Take ownership to deliver to customers
- Focus on progress over perfection

Figure 1: Our vision, strategic priorities and values

2. Our digitalisation strategy

2.1 Our digitalisation ambition

To enable net zero, and a clean, fair, and affordable energy future for all, we are transforming towards becoming an Intelligent, Connected Utility.

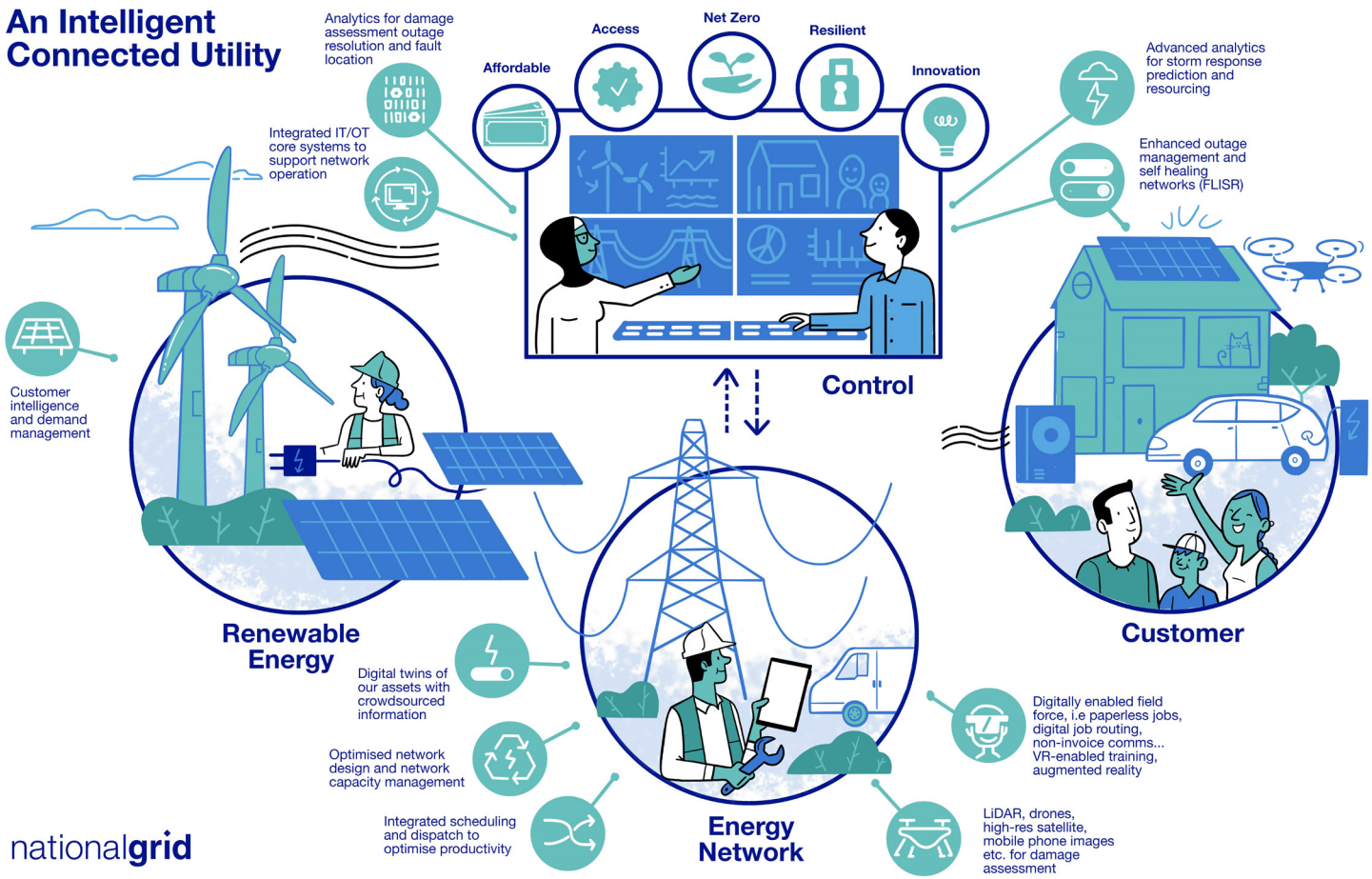

Figure 2: Becoming an Intelligent, Connected Utility

2.2 Our digitalisation objectives and enablers

We have carefully aligned our digitalisation ambition, objectives, and enablers against our stakeholders' priorities, the Energy Data Taskforce recommendations and the Digitalisation Strategy and Action Plan (DSAP) guidance from OFGEM.

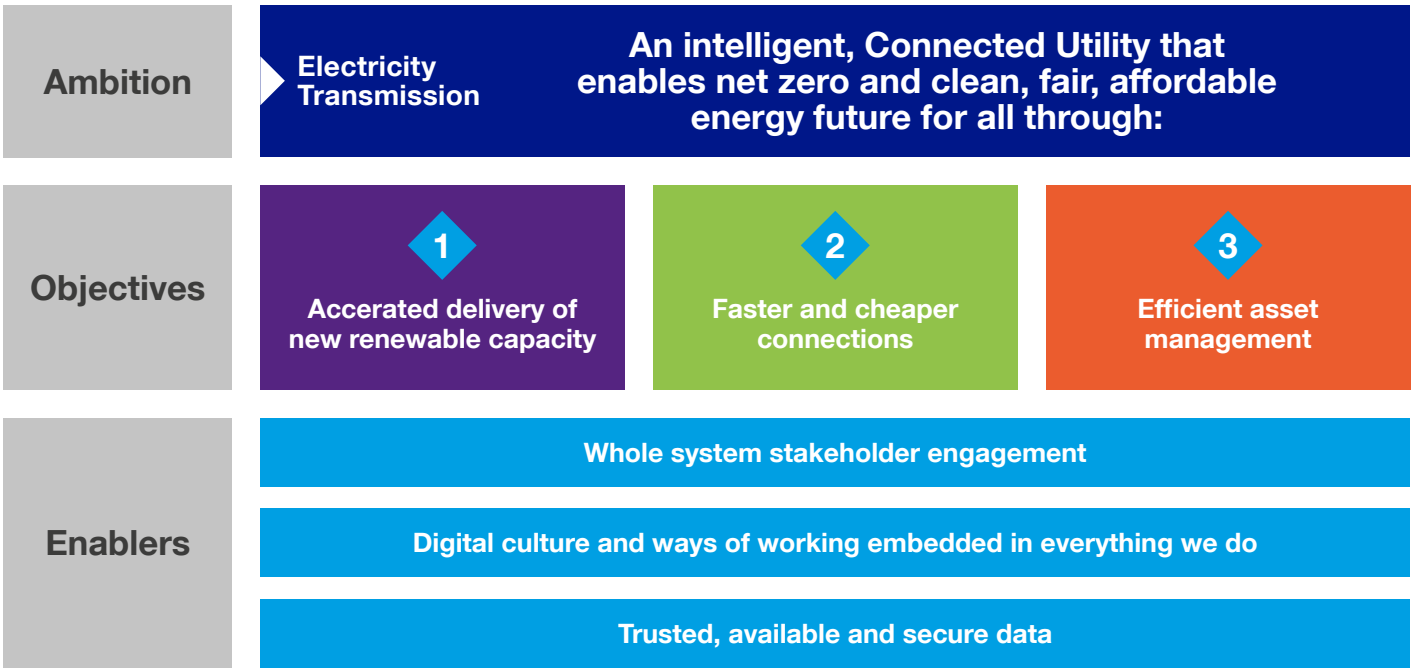

Figure 3: Our digitalisation ambition, objectives and enablers

Our objectives:

We believe our digital transformation is the key to achieving our objectives of:

1. **Accelerated delivery of new renewable capacity:** Meeting the government's target of 40GW of offshore wind connected by 2030 requires us to deliver infrastructure to enable us to quadruple our existing capacity over an accelerated timeline.

2. **Faster, cheaper network connections:** Reducing the time and cost for customers to connect to our network through an improved end-to-end connections process.

3. **Efficient asset management:** Harnessing real-time insights from asset data to unlock greater value within our asset operation and maintain network reliability at an affordable cost for our customers; and a step change in productivity.

Our Enablers:

Whole system stakeholder engagement

We recognise that we have a leading role to play in the UK's energy system and are committed to collaborating closely across the whole stakeholder landscape to enable net zero, and a clean, fair, and affordable energy future.

In line with the recent Energy Digitalisation Taskforce report, we recognise that we are part of a whole system of data and digitalisation initiatives that need to be more integrated, open, and accessible. As such, we are strongly supportive of the work the Energy Systems Catapult have led on the energy data taskforce report in 2019, and the recent energy digitalisation taskforce report published in January 2022. We have been an active voice in discussions and are actively engaging in delivery of the recommendations, such as our work with the Energy Networks Association on the National Energy Systems Map.

We are involved in an innovation project with some of our industry peers looking at digital inclusion to understand the scale and impact of it on our energy consumers and assess current and future needs in the transition to net zero. This will inform both Transmission and Distribution engagement and communication strategies, as well as a deployment of local initiatives that will benefit our communities.

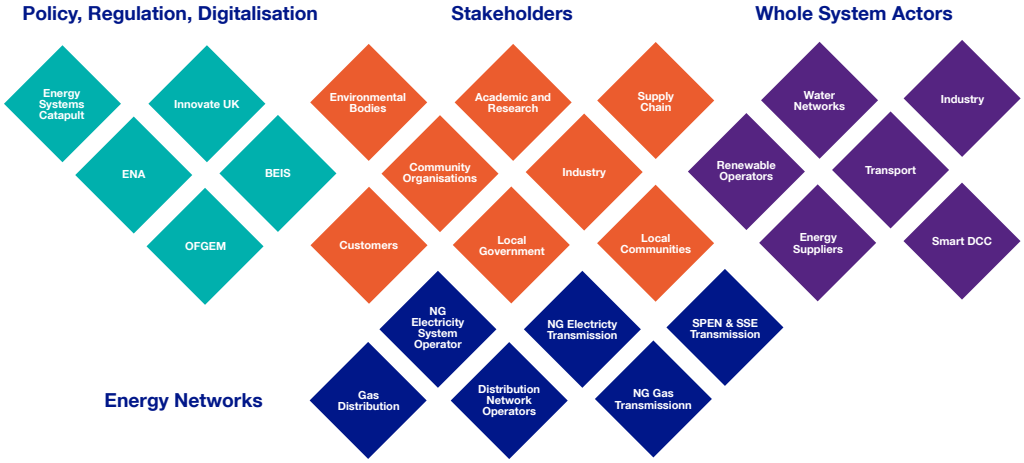

Figure 4: Whole System digitalisation landscape

It is important that our business priorities are informed by our stakeholders and that we are focused on delivering outcomes that matter to them. We carried out our largest ever stakeholder engagement exercise to develop our 2021–2026 business plan, engaging with over 1,000 individuals covering all our main stakeholder groups. We also listened to over 11,000 households and over 750 business consumers through meetings, focus groups and surveys. We have engaged across our stakeholder groups to develop this strategy and aligned our digitalisation strategy objectives to our RIIO-T2 stakeholder priorities.

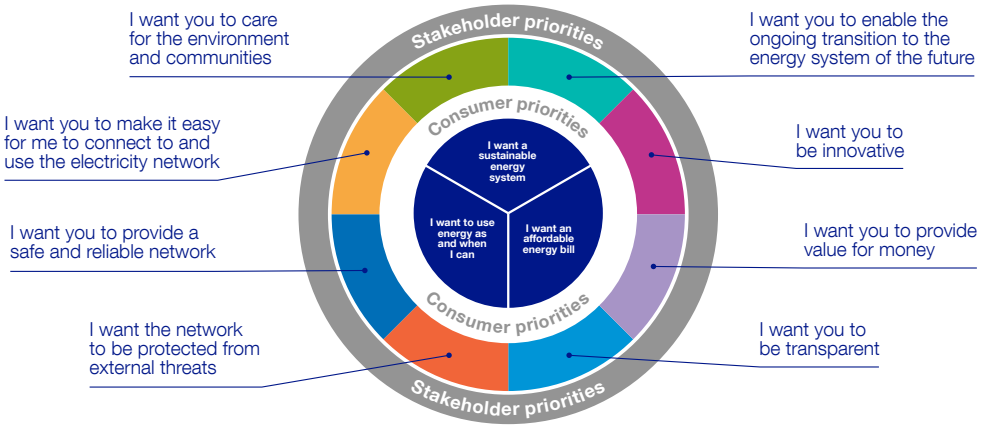

Figure 5: Our stakeholders' priorities for RIIO-T2

Digital culture and ways of working embedded in everything we do

Becoming an intelligent, connected utility means adopting new ways of working that enable faster delivery of value for our customers and stakeholders.

To do this, we are adopting a product operating model for digital delivery, which includes agile methodology to orient the solutions closer to the problem and deliver faster iterative capability releases to all our products - this starts with embedding multi-disciplinary teams in each of our lines of business, focused on addressing a specific customer, stakeholder, or business need; and upskilling those teams across all phases of the product development lifecycle illustrated below.

Figure 6: Our approach to product development

We deliver in smaller increments, with the use of wireframes, prototypes, and minimum viable products (MVP's) to continually test assumptions and if necessary, pivoting the delivery to ensure the right outcome is achieved. As a result, teams can understand the problem, remove risk early, and drive to the features that deliver the intended outcome.

In addition, we know we are competing for scarce digital talent; and so, we continue to invest in the development of specific learning pathways and training focused on upskilling our colleagues in agile methods, product development, and data management and exploitation. And we are deploying several digital enablement tools to better equip our teams to be product- and service-centric; tools such as **Jira software**, allow our people to capture tasks and then plan and deliver against them in an efficient way.

Rapid development of digital products in response to existing and emerging needs will help increase our teams' confidence in the ability of digitalisation to deliver for customers and stakeholders. And, fostering a shared understanding of digital methods and tools alongside stakeholder needs, will enable us to upskill our workforce in a way that will help embed and sustain digital ways of working and a stakeholder-centric culture throughout our organisation.

Trusted, available and secure data

We rely on the Data Lifecycle management process to govern, control, and manage our data assets following international data best practice defined by the DAMA DM-BOK, which we adopted across the organisation through a Data Management Standard.

There are seven stages within the lifecycle which allow us to manage our data from its inception to deletion.

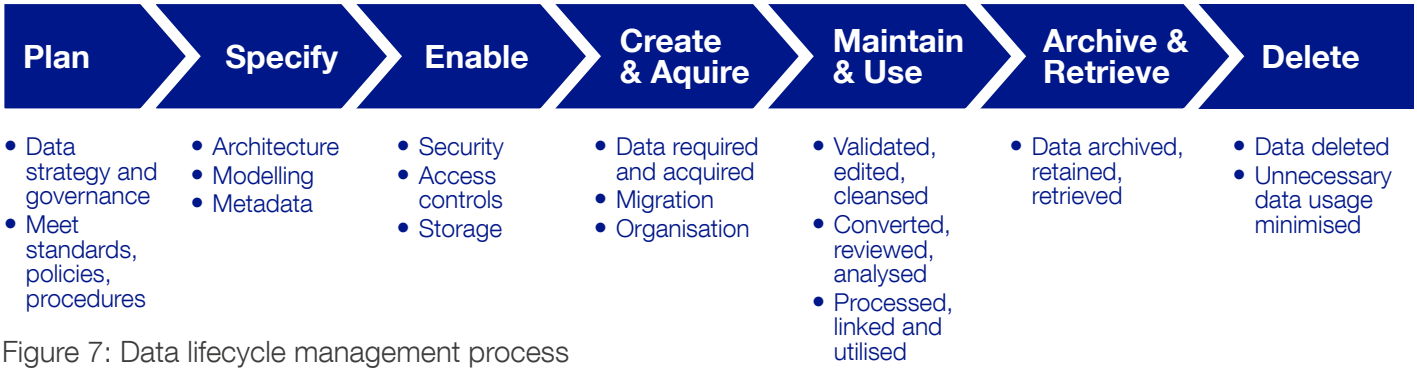

Figure 7: Data lifecycle management process

We recognise the value of using fit-for-purpose, standardised and good quality data. We are looking to improve data cataloguing capabilities to enable more efficient sharing of data in line with presumed open principles from industry best practice guidance to-date. Below we provide some of the main high-level milestones and how we aspire to tackle them while we explore opportunities to develop an open data portal to drive cross-industry collaboration and innovation.

- **We are migrating to a cloud data platform to improve the integration and interoperability of our data using modernised data management tools:**
  We appreciate the role that stakeholder engagement plays in prioritising the data needs as well as interoperability requirements. Through this, we will work towards development of data improvement plans for our data assets - enriching existing data and capturing new data where appropriate. We aspire to integrate our diverse range of data assets and its users through data lifecycle management practices. By doing so, we will seek to understand the technological and cultural gaps between existing and desired capabilities while being informed by stakeholder and customer requirements.

- **We are motivated to standardise our data assets though application of industry best practices including metadata standards, policies, and processes:**
  We have an ambition to perform an evaluation of industry-recognised energy metadata best practices to identify the fit-for-purpose governance techniques for our data assets. These practices will be embedded into our existing data management standards to ensure data governance consistency from both internal and external perspectives.

- **We recognise the importance of data transparency so we are exploring opportunities to develop an open data portal that will drive collaboration and innovation:**
  We will continue to develop our internal metadata catalogue. We have ambitions to provide an external data catalogue for stakeholders, accessible via an open data portal, to browse and request the range of data we hold. We will seek to understand which supporting materials are needed alongside the open data catalogue to enable our stakeholders derive the most value from our data assets

We are also part of the Energy Networks Association's **Energy Data Request Tool**, providing stakeholders with a central mechanism by which to request provision of datasets by energy networks. Our internal data triage process ensures that the necessary governance and metadata standards are followed, and that any risk associated with publishing a dataset is minimised.

In addition, we want to improve our ability to anticipate future stakeholder needs and to tailor our data, products, and services to address different needs. With that in mind, we have worked with our stakeholders to develop personas to help us better understand the data needs of different user groups, and where digitalisation can play a part in servicing those needs. We continue to review and update the persona groups regularly based on internal and external feedback.

Personas	Who they are	Primary needs	Challenges
Connecting Customers and Energy Insiders 	Stakeholders that work in, or closely with the energy industry, such as network companies, system operators, and connecting customers.	Require data to inform their day-to-day operations, long-term investments and decision making. Require access to many different datasets to support their activities, such as details on assets and their condition, operational data, and performance.	Information sharing agreements are often non-existent and lengthy to put in place. Limited view of connection application status and want to connect cheaply and quickly.
Innovative Thinkers 	Stakeholders who are interested in our assets and network and may have unique or wide interests for accessing our data, such as members of the public, communities, academia, and wider energy innovators.	Require our data (often combined with other data sources) to answer wider questions they are interested in. May not know what data they need and rely on us to share and collaborate to meet their outcomes.	Available datasets are poorly signposted and difficult to find. Data is often not provided in accessible, non-technical terms, making it difficult to understand where they come from and any potential limitations.
Policy Influencers and decision-makers 	Stakeholders such as consumer groups, regulators and other government departments who oversee the energy sector, the public interest, and consumer protection.	Require access to longer term data that supports them in their strategic oversight, long-term policy making and decision-making. Require our data in their service to the public.	They expect complete, high quality, and consistent datasets to inform their thinking, which is often not available or a work in progress.

Table 1: Overview of stakeholder personas used to inform our digitalisation strategy and products

As we move forward, we intend to embed our Digitalisation Strategy and Action Plan principles, so that they are intrinsic in the fabric of our organisation, inherently woven into our wider stakeholder engagement strategy, and become part of our business-as-usual approach.

2.3 Learning from others

We have reviewed case studies from other relevant peer organisations to inform our digitalisation strategy. Recognising that we are not the first organisation to undergo a digital transformation, we have spent time reviewing case studies from other adjacent sectors and organisations of our scale. Further, we have reviewed the context, scope and lessons learnt from each of these digital transformation case studies and used the learnings to inform our digitalisation strategy.

Case Study	EDF New nuclear build	Openreach Agile transformation	BP Data driven decisions	Suedlink Digital backbone
Context	Edf are delivering new new nuclear power station (Hinckley Point C) which is one of Europe's largest capital projects and crucial for the UK's net zero ambitions.	Openreach are responsible for rolling out next generation fibre infrastructure across the UK. They operate in a high regulated environment.	BP have set an ambition of being a net zero company by 2050. They are undergoing a significant business transformation away from fossil fuels.	Suedlink is one of the largest capital projects in Europe. It will deliver 700km of transmission cables to achieve Germany's renewable target by 2050.
What they did	EDF are using the latest digital building information management technology to improve the design and construction process.	Openreach used innovative, agile ways of working to deliver significant efficiencies in their core business to re-invest in the fibre roll-out.	BP are using a data driven approach to 're-imagine energy'. They have made significant investments in data governance, data science and analytics.	Suedlink invested in a digital backbone built on leading technology platforms and data integration to reduce Grey IT.
Relevance to NGET	Digitalisation can significantly improve the design and construction of large capital projects, such as our 40GW by 2030 programme.	Digitalisation is as much about new ways of working as it is about technology. Digital culture should be at the centre of transformation.	Data is crucial to digital transformation and it requires time, effort and patience to unlock value from organisational date.	Taking an end to end view across business processes and customer journeys is key.
How this has informed our strategy	We will apply digitalisation to our 40GW by 2030 programme, accelerating the delivery of renewable capacity for the UK.	We have a clear focus on building a digital culture in our strategy. We will equip people with new skills, recruit new talent.	We are making investments in data platforms, such as our cloud data platform and open data portal. We are refreshing our data strategy.	We are transforming our end to end journeys, such as our Customer connections journey. We will integrate better across our business.

Table 2: Case studies informing our digitalisation strategy

2.4 Key risks and mitigations

We have used the learning from those organisations to inform the risk areas and mitigations.

Risk	Potential Impact	Mitigation
Our cultural change programme is not successful	There are delays to the delivery of our digital products and services, and we don't realise the full value for our stakeholders.	Engage early with our people and break the change into small increments. Be willing to listen and adapt to feedback.
Governance holds us back and we do not realise full value of digital investments		Refresh our governance based on lessons learnt from others to enable digitalisation.
We do not fully understand the priorities of our stakeholders	We deliver products and services that do not meet our stakeholders needs. There are some stakeholders without equal access to our services.	Continuous stakeholder engagement through a variety of channels. Ensure we reach a diverse range of stakeholders.
Lack of industry collaboration	Costs are higher as learnings are not shared, products and services have overlapping functionality, and can't be used with other products and services.	We will take a leading role in bringing different organisations together using digitalisation to break down boundaries and siloes.
The level of digital change cannot be absorbed by the business	Higher costs, and lower realisation of benefits. Loss of value for our stakeholders.	Engage with stakeholders to prioritise most pressing needs and co-develop solutions.
We do not manage our data adequately, missing out on value		Refresh our data strategy and put strong data governance in place, prior to using data for insight and sharing with our stakeholders.
We are more vulnerable to cyber-attacks as we deploy more digital technology across our business	Loss of data or interruptions to business operations, causing impacts to the services we provide to our customers.	We continue to invest in our cyber capability. Run simulated attack and response exercises.
We are not able to attract the right talent, or develop the right skills	We are left behind and cannot deliver all our digital products and services. Potential impact on existing workforce morale and retention.	Use a variety of talent pipelines and invest in allowing our people to develop new skills.

Table 3: Key digitalisation risks and mitigations

3. Our progress to-date

We are continuing to prioritise our external products and services based on feedback from our stakeholders.

3.1 Accelerated delivery of new renewable capacity

Meeting the government's target of 40GW of offshore wind connected by 2030 requires us to deliver infrastructure to enable us to quadruple the existing capacity in an accelerated timeline. We are engaging with other organisations who have delivered major infrastructure programmes of national significance (e.g., Olympics, Terminal 5) to understand their use of technology to manage scale and complexity.

Digitalisation will be key to, for example, managing multiple data sets and unlocking innovation across a wide range of supply chain partners across 16 construction projects on the East Coast programme.

3.2 Faster, cheaper connections

Our lighthouse product ConnectNow provides better information to guide and inform customers where to connect quicker and at lower cost; this is an important step into stakeholder transparency and provides the customer choice and optionality directly to their hands in where and how they want to connect to the Grid based on available capacity.

The number and diversity of connection applications we receive each year has been increasing, including applications from new customers. ConnectNow has been key to helping deliver over 400 connection requests per annum - a tenfold increase compared to two years ago.

More about ConnectNow is available from our **website** or our **YouTube** channel.

We are also piloting a digital product, SolutionLab, which standardises and industrialises connection designs, reducing the effort to provide baseline costings, scope, materials and effort for new connections and utilising people expertise such as Power System Engineers to ratify and complete the design. We are also looking to deploy artificial intelligence (AI) within the product across the development lifecycle to help identify the best routes for cables and pad placements. Following these lighthouse projects, we will now move to scale from April 2022.

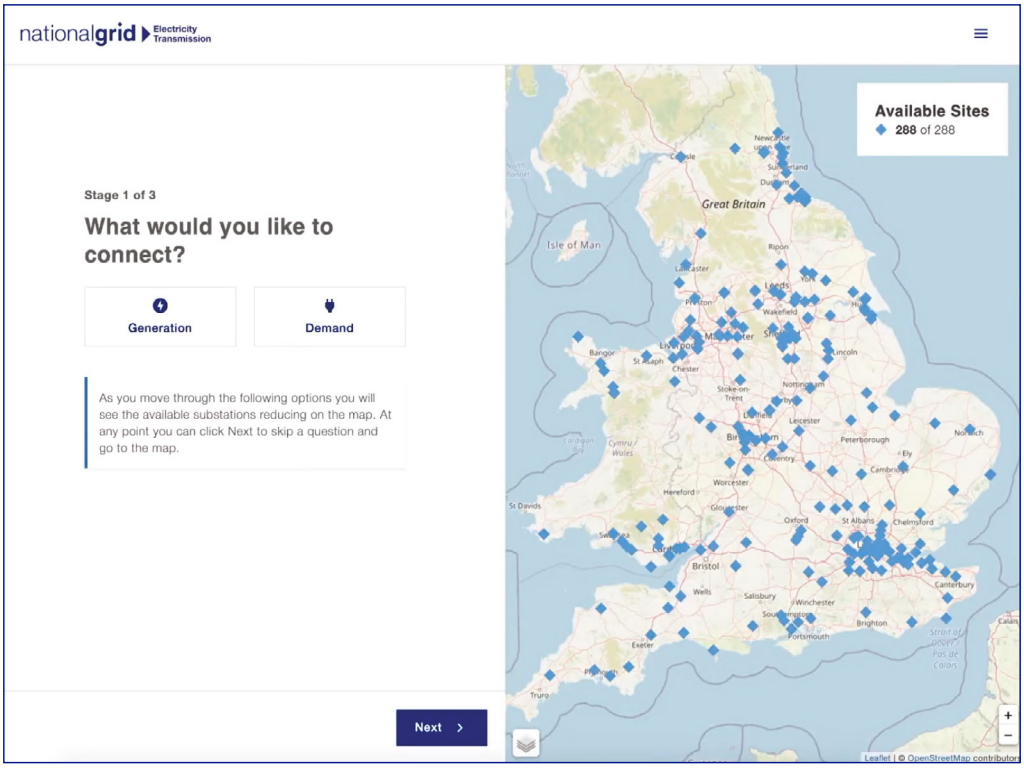

Figure 8: Screenshot of ConnectNow Research Assistant

3.3 Efficient asset management

Building Information Modelling

(BIM) BIM is the use of a shared digital representation of a built asset to facilitate design, construction, and operation processes to form reliable data and models for decision-making on interventions and construction. We are actively exploring the use of BIM on our projects to maintain a more complete and continuous understanding of our assets and their characteristics and helps improve productivity and reduce re-work.

Digital twin

We maintain a digital twin of our network (for example, a power systems model of the UK electricity network) so we can model different supply and demand scenarios and network configurations. We aim to develop this during the RIIO-T2 period, which will allow us to simulate risks and predict failure modes to improve planned interventions. Digital twin technology will enable better asset management decisions during this price control, and be key to developing a robust, well evidenced RIIO-T3 business plan.

Asset intelligence and optimisation

We are continuing to develop ways to better optimise our interventions. Our Asset Investment Planning tool with **Copperleaf** will enable us to maximise efficiency by helping us find smart solutions to bundle our works. Our **Critical Path Manager** will also build a single view of our intervention plans to help us visualise outage and manage risk on our network. These investments are currently underway, and we will continue to develop them to optimise our network planning.

Improving productivity through Digital Work Management (DWM) We have started to roll out Digital Work Management (DWM) which allows our field staff to record in real-time work performed, time, and asset health data as they progress through tasks. As one job is complete, staff are notified of the next job. DWM eliminates paperwork and travelling time. Productive organisation of our works allows us to deliver at pace to meet the UK's ambitious net zero targets and guarantees value for money for consumers.

Asset condition and Internet of Things Our Internet of Things platform enables the collection of asset performance and condition data. In the RIIO-T2 period, we intend to connect sensors on our older assets to enable better informed condition monitoring and interventions; increasing productivity by increasing data frequency and reducing effort to collect data. Ultimately this will result in reduced maintenance cost and more informed asset management decision-making to provide our stakeholders with confidence that the interventions we are making are cost-efficient and justified.

3.4 Our digitalisation roadmap

Our roadmap for the next two years builds on our progress to-date and will continue to evolve in line with feedback from our stakeholders.

Digitalisation objectives	Our digitalisation roadmap for the next two years			Digitalisation Outcomes
1 **Accelerated delivery of new renewable capacity**	Deployment of BIM and Common Data Environment across all inflight construction approach to accelerate delivery.	Adoption of cutting-edge digital approach to enable East Coast 40GW offshore wind by 2030 delivery model across the entire construction lifecycle (including planning, consenting, early phase development and optioneering).		Our systems representour plans and sites accurately enabling work to be delivered faster and at a lower risk.
2 **Faster and cheaper connections**	Automatic customer connection designs saving time to offer, overall delivery time and cost.	Our portal keeps customers informed in real time across all project types.	Single geographic view of historic and future project and survey data.	We guide our customers to the best places to connect to deliver net zero at reduced cost and time to connect.
3 **Efficient asset management**	Digital twin trial to simulate risks and plan intervention more effectively.	Connect new data from distributed sensors to provide live asset insights.	Crowdsource site intelligence updates from the field and our contractors.	We make faster and better decisions on our interventions ad plan changes that we can evidence.
Enablers	**Whole system stakeholder engagement**			We are built on strong foundations; our people, customers, stakeholders and regulator trust our systems, data and delivery plans.
	Digital culture and ways of working embedded in everything we do			
	Trusted, available and secure data			

Figure 9: Our digitalisation roadmap

Appendices

Appendix A: Our approach to stakeholder engagement

We are continuing to invest in capturing and analysing data about how stakeholders interact with our data, processes, and systems on a day-to-day basis to better inform how we plan our business and create and deliver tailored services and products.

Since the publication of our digitalisation strategy in December 2020, with our Independent User Group (IUG), we have identified five main areas to further develop in the next two years:

You said	We did
Clearer purpose and objectives that are externally focussed. We recognise the need to map our strategy to the objectives of our stakeholders and clearly articulate our organisation's vision for data and digitalisation, and benefits it brings our stakeholders.	We have worked closely with our internal teams and external partners in defining our vision of what an 'Intelligent, connected utility' means to us and our stakeholders. We have included three pillars in our updated strategy that are underpinned by continuous stakeholder engagement and strong governance and cyber-security, to be able to meet our stakeholders' priorities.
Benefits for different stakeholders. Our IUG challenged us to set out how our digitalisation strategy will offer wider benefits beyond cost efficiency and consider social value.	We received innovation funding for two of our innovation projects this year: • Super Conductor Applications for Dense Energy Transmission (SCADENT) project which replaces conventional cables with High Temperature Superconductor (HTS) cable which can reduce energy losses and provide wider environmental benefits including reduced disturbance to local communities caused by construction activities. • Eye in the Sky project that investigates new satellite data analytics solutions that can help GB networks to improve the visibility of infrastructure and assets, response in emergency and risk assess effects of climate change. We created and are refining new digital services such as ConnectNow to inform our business and customers the best places to connect to deliver net zero, at reduced cost and time to connect.
Downstream digital data system. Our stakeholders have asked us to outline how we will work with downstream systems (i.e., Distribution System Operators, embedded generation, storage demand (e.g., rapid chargers etc.) connected to the distribution networks) to digitally connect to the wider system, and how we can support them in consuming our data and digitalisation services	We published our **Whole System Strategy** in March 2021. Currently, we are reaching out to our stakeholders, including other networks and local authorities, to undertake pilot projects to establish our whole system working processes and procedures. We are developing data sharing practices between different entities to jointly evaluate solutions and establishing governance approaches to agree whole system solutions across different businesses. We are also collaborating with other licensees through our innovation projects such as Sustainable Electrical Gas Insulated Lines (SEGIL) and SCADENT which partners with a variety of organisations such as Scottish Power, the ESO, Orsted, University of Manchester, Strathclyde University, UKPN, and others.

Applying best practices. The IUG challenged us to benchmark and compare and learn from other organisations.	We recognise that we are not the only organisation going through digital transformation. We have reviewed case studies from other relevant peer organisations to inform our approach, including in telecommunications, nuclear, and oil and gas. Reviewing the latest best practice and lessons learnt from other organisations will form part of our ongoing approach.
Business Transformation. We recognise the need to reshape our business processes and align stakeholder insight with our business decisions.	Internally we have facilitated workshops with each business unit in our entire organisation to understand current business constraints and have worked together with the digital community to identify how these problem areas could be resolved. New products and features have been estimated at a high level, with information on value / business benefits being overlaid.

Table 4: Digitalisation strategy 'You said - We did'

Appendix B: How our digitalisation strategy aligns with our other strategies

Delivery of our stakeholders' priorities is supported by a range of supplementary strategies, documents, and reports which form part of our RIIO T-2 business plan (2021–2026).

The table below provides an overview of how our digitalisation strategy complements our other strategies, documents, and reports. It demonstrates how our initiatives come together to enable the delivery of our business plan commitments:

Strategic priority	Supporting document	How our digitalisation strategy enables key data and strategic priorities
Enable the energy transition for all	Responsible Business report	• **Climate Change data:** We provide extensive data on our performance through public submissions to Climate Disclosure Project (CDP) and many other ESG disclosures to investors. We will develop our climate change data capability over the 2021–2026 period. • **Circular Economy, Waste Management:** We aim to improve our waste data capture over time.
	Environmental Action plan	• We have been at the forefront of the global development of low-carbon alternatives to SF6, and we will continue to drive industry by sharing our expertise, data, and tools.
Deliver Efficiently for our customers	Resilient Whole System approach	• We will continue to maximise the capacity and interactions of our energy systems using smart technology, enabling supply and demand to interact with the system more flexibly, to enable Net Zero. • We will develop common approaches, forums, and data sharing to enable the whole system solutions to be delivered at pace. • We will collaborate with local authorities and government to deliver co-ordinated plans that will help decarbonise GB.
	Innovation strategy	• We will continually engage with stakeholders to identify which data and information provides the greatest opportunity and seek to find ways to make this available. • We have recently been successful in winning funding in the Strategic Innovation Fund for Innovation projects, which includes an innovation project investigating if satellite data can improve emergency response. • We recognise that that is more than we can do when it comes to sharing our data. Open data will drive innovation and unlock additional opportunities for value. • We will develop tools and techniques that allow the digitisation of many of our processes, and overall management of data, as well as exploring the application of artificial intelligence across many of our activities.
Empower our people for great performance	Responsible Business charter	• We anticipate a greater need for people skilled in data analytics and artificial intelligence to manage more complex grid flows, manage customer interactions needed to leverage demand-side management, and support piloting and scaling of new technologies such as hydrogen and heat pumps. This need for new skills will be partly met through our community initiatives such as Grid for Good.

Table 5: Alignment between our RIIO-T2 business plan and digitalisation strategy

Appendix C: Data best practice

Our business processes use data sourced from multiple systems. Digitisation of data and provision of open data to our stakeholders requires governance and consistency. Our cloud data platform will integrate our data assets using the techniques defined by the Energy Data Taskforce and our internal business system standards, integrated into our data lifecycle. This includes but not limited to data best practice and data management standard.

We will continue to engage and collaborate with our stakeholders to understand their data needs, raise the awareness of our publicly available data, and consult on how we can improve and expand both data and provision of it. Below is the progress and plan we have with each of the associated Data Best Practice Principles:

Data Best Practice Principles	Progress and planned approach
Identify the roles of stakeholders of Data Assets	We will capture stakeholder needs and information within our data catalogue and use it to inform our subsequent work and future stakeholder engagement. We are establishing a decentralised data governance model that is built around relevant and fit-for-purpose roles and responsibilities driven by the Data Best Practice principles and our internal Data Management Standard.
Use common terms within Data, Metadata and supporting information	To enable our stakeholders to search and utilise the datasets across the organisation, we are implementing a cloud data platform solution that provides users with a data catalogue where they can search the data they need, understand how to access it, and how to use it.
Describe data accurately using industry standard metadata	The techniques that we use to manage the metadata associated with our data assets are driven by our data management standard based on the DAMA DM-BOK international best practice. We will also align to a broadly adopted metadata standard widely used across the UK energy market.
Enable potential data users to understand the data assets by providing supporting information	As we are moving towards a product centric organisation, we will engage with our stakeholders on the data assets which they are interested in and consult on the supporting information they would require alongside them.
Make datasets discoverable to potential users	We are already engaged as part of the ENA's Energy Data Request Tool, with a data triage process in place to ensure we can be as open as we can in responses to requests, without introducing unacceptable levels of risk to critical national infrastructure. The externally facing data catalogue that we are aspiring to build will improve the discoverability and transparency of our data assets for the stakeholders.
Learn and understand the needs of their current and prospective data users	We will maintain a log and use this insight to develop our data sharing and digital service offerings.

Ensure data quality maintenance and improvement is prioritised by user needs	The establishment of the cloud data platform will help us improve our data quality metrics. Previously, in 2020 we applied data quality techniques to improve our business-critical data. Once we establish a new suite of data quality applications, alongside work on developing a digitally focused and aware culture, our plan is to focus our data quality efforts on the users' needs driven by the digital products and data assets developments.
Ensure that data is interoperable with other data and digital services	We will work with our peers in the energy industry to ensure that we all adopt standards which enable this interoperability in our shared data and digital services.
Protect data and systems in accordance with Security, Privacy and Resilience best practice	We have robust data compliance policies and guidelines in place to ensure security, privacy, and resilience of our data. For example, we follow compliance with the UK 'General Data Protection Regulation' as well as internally adopted 'Records Management Policy'. In addition, our data management standard ensures that we apply relevant local data protection controls, resilience and disaster recovery techniques, and incident management plans for our business-critical data.
Store, archive and provide access to data in ways that maximise sustaining value	Our data management standard provides us with guidelines for how we archive, retrieve, and delete the data at the end of its lifecycle. The key techniques that we use include data criticality categorisations, data security classifications, data consumer details, retention period, and method of disposal and retrieval.
Ensure that data relating to common assets is Presumed Open	We have been publishing our transmission network data on our **website** to demonstrate our developing alignment with the 'Presumed Open' principles.
Conduct Open Data Triage for Presumed Open data	We will complete formal triage assessment for sharing of 'Presumed Open' data, both internally and externally.

Table 6: Our application of the data best practice principles laid out by OFGEM

Appendix D: Embedding Digitalisation Strategy and Action Plan Guidance

The table below describes how we will embed Ofgem's Digitalisation Strategy and Action Plan Guidance principles into our wider engagement strategy

Digitalisation strategy action plan OFGEM guidance principles	How we have applied this in our strategy
1. Prioritise providing benefits to the stakeholders who pay for the products and services as well as benefits that are in the public interest	Creation of personas to understand strategic priorities, mapping benefits of our products and services to these personas, and ensuring wider stakeholder team are informed.
2. Ensure products and services work towards a defined vision	We have a defined vision of becoming an 'Intelligent, connected utility'.
3. Take full advantage of opportunities to deliver benefits early and to iterate improvements to products and services	Embed new agile, faster, iterative ways of working to enable greater testing with and feedback at pace from stakeholders to meet priorities.
4. Enable stakeholders to understand the products and services, the status of their delivery and how to access them	Undertake regular engagement through various channels to test and educate stakeholders on products and services.
5. Ensure visibility about the nature and status of actions in the Digitalisation Action Plan	Ensure our Digitalisation Action Plan is kept up to date, and provide multiple channels for engagement and feedback.
6. Ensure there is shared understanding of success and performance is measured	Establish tools to ensure delivery risks are managed and have a clear vision of what success looks like.
7. Coordinate with the wider ecosystem of products and services	Active engagement in industry. Digitalisation efforts and leadership to bring different organisations together for the common good and to break down siloes and boundaries.

Table 7: Our engagement strategy alignment with DSAP Guidance

Appendix E: How we will measure success

We are accountable to our stakeholders and recognise the importance of tracking and measuring our commitments to ensure we are meeting our business goal and outcomes.

For our key objectives, we will measure ourselves by demonstrating increasing year on year maturity in our wider Data and Digital Maturity Assessment and strive towards a "Leader" status by building user feedback intelligence. We will measure the effectiveness of our stakeholder engagement using an assessment matrix on a six-month basis.

In this section we set out the key success measures which we'll use to hold ourselves to account and provide transparency to our stakeholders:

What success looks like for us	What success looks like for our stakeholders	How we will measure ourselves
1. Accelerated delivery of new renewable capacity		
• Make optimal decisions to reinforce our network at pace, to increase our capability to connect significant renewable generation. • Use data insights to create new products and services to efficiently meet net zero targets.	• We help meet the government's target of 40GW of offshore wind connected by 2030. • We optimise our data and insights to deliver infrastructure projects efficiently, within our allowed expenditure, with minimum damage to the environment.	• We will report on infrastructure delivery progress, including any new products and services developed to meet stakeholder objectives. • We will continue to engage with stakeholders on projects and what data and services they require to be kept informed of delivery progress.
2. Faster, cheaper network connections		
• Reduce the time to connect by 50% and cost for customers by 10% to connect to our network through an improved end-to-end connections process. • Develop internal processes to facilitate external outcomes prioritised by stakeholders.	• We are easier to deal with and customers have better choice about how to interact with us, with digital and non-digital options. • We continue to improve the connections journey for our customers by reducing the time to connect by 50% and cost by 10%. • We deliver our licence obligations efficiently and provide value for money for stakeholders.	• We aim to meet our ambitious targets to reduce cost and time to connect for our customers. • We will continue to meet our licence obligations and incentive targets, such as the Quality of Connections incentive.
3. Efficient asset management		
• Harnessing real-time insights from asset data to unlock greater value within our asset operations and maintain network reliability at an affordable cost for our customers; and a step change in productivity.	• We maintain world class level of reliability for consumers. • We ensure affordability and value for money for consumers today and in the future by justifying our network refurbishments and replacements. • We share and make our asset data easily discoverable, so that stakeholders can find the data that they need.	• We will continue to meet our licence obligations and incentive targets, for example, our Network Asset Risk Metrics commitments, the Security and Quality of Supply Standard, and Energy Not Supplied (ENS) incentive. • We will measure ourselves against the data best practice guidelines, ensuring that we exceed each of them by the end of the RIIO T-2 period (2026).

Table 8: Measuring success of our digitalisation strategy

Glossary of terms

Glossary of terms

A

Agile
A way of working or methodology that uses an iterative approach of development and testing, where requirements and solutions evolve through collaboration across teams.

Analytics
The process of analysing data to make conclusions about information, and drive decisions using advanced technologies including Machine Learning and Artificial Intelligence.

Application
In information technology, an application is a programme or software that helps users undertake a specific task.

Artificial Intelligence (AI)
Advanced analysis and logic-based techniques, including machine learning, which can be used to interpret data and support human decision-making or take actions directly.

C

Cyber security
Reducing the risk of a cyber-attack on individuals or organisations by protecting the devices and the services accessed from access, theft or damage and assuring its confidentiality, integrity, and availability by implementing appropriate controls.

D

DAMA DM-BOK
DAMA's (the Data Management Association's) Data Management Body of Knowledge, is an internationally recognised collection of best practice designed to support organisations' information and data management needs.

Data asset
Any entity that is comprised of data. A data asset may be a system or application output file, database, document, or a web page. A data asset also includes a service that may be provided to access data from an application. Similarly, a web site that returns data in response to specific queries (e.g., www.weather.com) would be a data asset.

Data best practice guidance
A guidance document issued by Ofgem in accordance with Special Condition 9.5 (Digitalisation) of our RIIO-2 price controls, which also applies to Electricity Transmission and Gas Transmission and Distribution network owners, as well as the Electricity System Operator.

Data catalogue
The store of information about our data which helps us to manage it. It enables us to find out about the data we have, its usage, purpose, ownership, and more.

Data culture
A data culture is an organisation culture of data driven decision making.

Data governance
The process of setting, controlling, administering, and monitoring adherence with policy with respect to data, information, records, and their usage.

Data lifecycle
The stages of managing data through a sequence of steps from its inception to deletion. This includes the following stages: Plan, Specify, Enable, Create and Acquire, Maintain and Use, Archive and Retrieve, Delete.

Data management
A control framework defined by data governance, to provide assurance that the right people have the right access at the right time to quality data to run and grow the business effectively in an environment where data is actively treated as an asset.

Data maturity
The degree to which an organisation can employ data and associated data management and governance capabilities to generate value.

Data quality
The degree to which data is fit for consumption and meets the needs of data users. Data quality is made up of a few dimensions, including completeness, accuracy, timeliness, validity, consistency, and uniqueness.

Data triage
A process to systematically identify issues with a dataset which limit their potential openness and then identify what techniques can be used to mitigate these issues.

Datasets
A collection of related sets of information that is composed of separate elements but can be manipulated as a unit by a computer.

Digital maturity
The degree to which an organisation can employ digital capabilities to generate value.

Digital product
A variety of business applications used with analytics that connect insights to actions that offers utility to users.

Digital Twin
Realistic digital representations of physical assets.

Digitalisation Strategy
The strategic approach taken by an organisation to digitalise its Products and Service in accordance with Special Condition 9.5 (Digitalisation) of our RIIO-2 price controls, which also applies to Electricity Transmission and Gas Transmission and Distribution network owners, as well as the Electricity System Operator.

Digitalisation
The use of digital technologies to change an organisation's operating model and provide new revenue or equivalent value-creating opportunities; it is the process of moving to a digital business/organisation.

E

ENA
Energy Networks Association (ENA) is the industry body representing energy network operators in the UK and Ireland.

Energy Data Taskforce
The Energy Data Taskforce (EDTF) was commissioned by the UK Government, Ofgem and Innovate UK to deliver a set of actionable recommendations that challenge the status quo and help deliver the digitalised energy system needed to reach Net zero.

ESO
The Electricity System Operator (ESO) is responsible for operating the transmission network in England, Scotland, and Wales, moving electricity around the country to ensure that the right amount of electricity is where it's needed, when it's needed and keeping supply and demand in perfect balance.

I

Independent user group
A group of experts from across the energy industry and beyond that whose role is to scrutinise our business plans and stakeholder engagement approaches on behalf of the interests of end consumers, the environment, public interest groups and our other customers and stakeholders.

IT
Information Technology: refers to information processing, including software, hardware, communications technologies, and related services.

M

Machine learning
An important branch of artificial intelligence, whereby computer software that can learn from data and improve the way decisions are being made.

Metadata
A set of data that describes and gives information about other data.

Minimum Viable Product (MVP)
A version of a product that has the minimum number of features so that it can be used by customers. The purpose of releasing an MVP is so customers can provide feedback for future development.

N

Net zero
Net zero refers to the balance between the amount of greenhouse gas produced and the amount removed from the atmosphere. The UK Government amended the Climate Change Act to commit the UK to achieving net zero by 2050.

P

Presumed open data
The principle that data should be as open as possible, where anyone is free to use, re-use or redistribute it.

Products and Services
Anything that a party can offer to a market for attention, acquisition, use or consumption that could satisfy a need or want.

R

RIIO-T2
Price control for the high voltage electricity transmission networks and high-pressure gas transmission networks which transmit energy across Britain from where it is generated. The price control runs for five years from 2021-2026. Also referred to as RIIO-2.

W

Wireframes
High-level block diagrams to represent how a digital product or service will look and operate used in Agile development.

Tables and figures

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