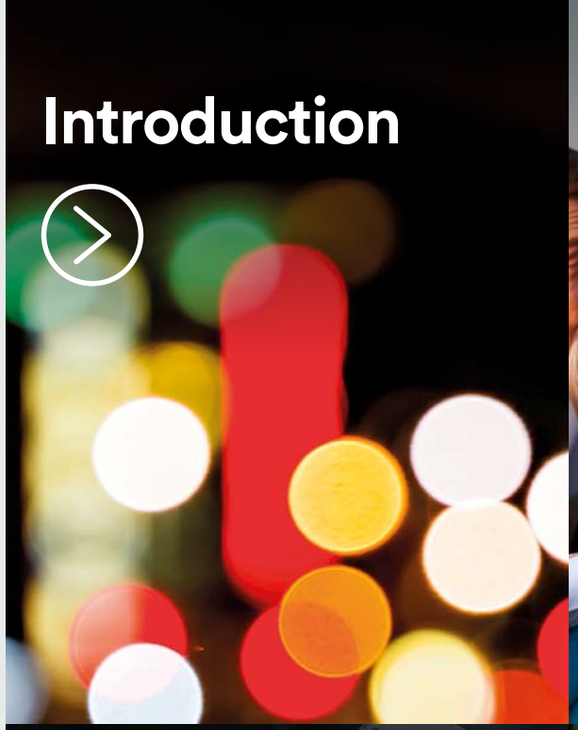
NORTHERN POWERGRID

# Digitalisation strategy and action plan

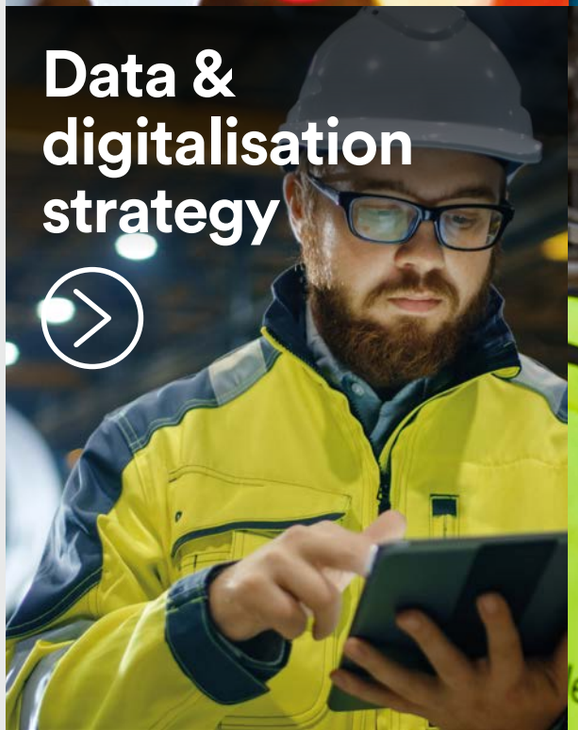
Version 5.1

June 2022 >

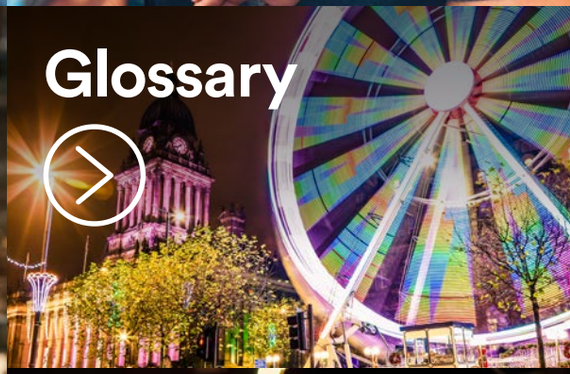
# There are five sections in this document










# Introduction

# Introduction

**The development and deployment of new technologies will be a key part of how we make the transition to zero-carbon electricity. In the next decade, we will see millions of homes and businesses embrace electric vehicles, adopt heat pumps and use battery storage in combination with renewable sources of generation.**

New digital technologies, including automation, data analytics and artificial intelligence, will enable consumers to become active participants in the energy system and transform how it operates. These changes will place new stresses on energy networks while simultaneously creating new opportunities to innovate and transform how we manage our systems and utilise flexibility services as we enable the transition to net zero.

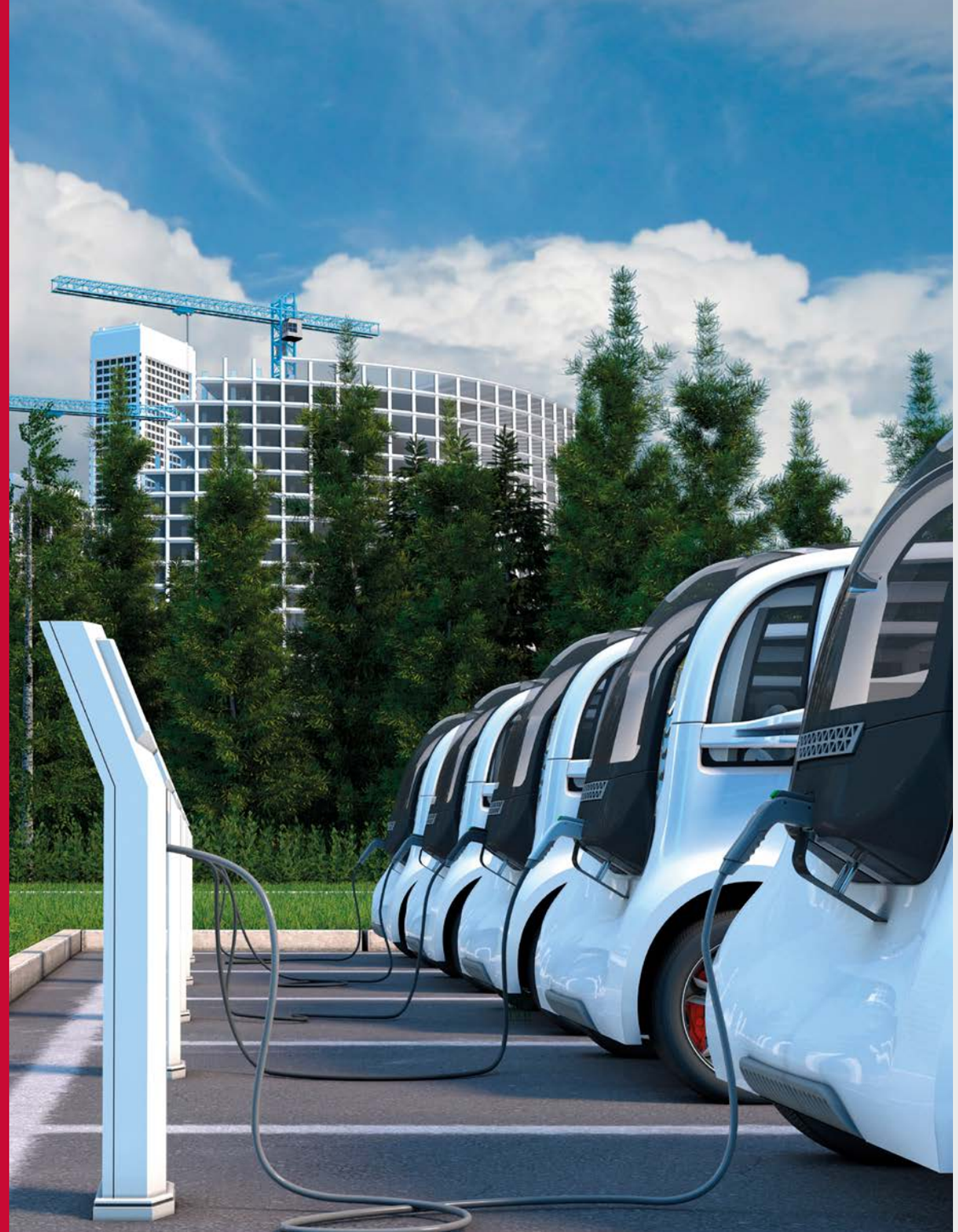
They are also driving profound changes in what our customers, partners, suppliers and employees expect from us as a business.

Energy networks have a vital role in enabling the overall energy system to evolve and support rapid decarbonisation. As a Distribution Network Operator (DNO), we have had a central role in facilitating a low-carbon energy system, connecting people to renewable power across our region.

In the future, we know that data will increasingly underpin the functions of Distribution System Operations (DSO) to meet the needs of a changing energy sector.

Our company vision is clear – we see the future as our opportunity to power our region with sustainable, long-term investments that unleash the potential of innovation, digitalisation, our people and collaboration. Our digitalisation strategy and action plan (DSAP) therefore sets out to embrace that vision and develop the digital capabilities required to meet the challenge of net zero and develop the functions of DSO.

**Throughout this document, you will see us mention existing products and services. You can access or get information on these by visiting www.northernpowergrid.com/services-directory/**



# Digital technology is a key enabler of our transition

**Our vision sees the network evolve into a trusted and neutral platform able to facilitate the optimisation of our regions' energy system and minimise the need for new infrastructure or reinforcement through maximised utilisation of low-carbon generation and flexibility services. We will do this by using data and data analytics for enhanced decision-making.**

By doing this, we are confident that the network can underpin a net-zero energy system and help use resources sustainably. At the same time, we want the network to continue to deliver what it does today, providing universal services for customers, suppliers and others to benefit everyone. Utilising digital technologies and capabilities is a key part of DSO. The digital technology revolution is transforming every area of society and energy networks are no different.

Continued investment in digital technology and innovation will drive the delivery of a more efficient, optimised network that reduces costs and improves our service for customers. It will transform our customer experience, enabling more tailored services and support – areas in which we are already making great strides. By embracing these new technologies and moving to a fully digital workplace, we will also increase our efficiency as a business, improve transparency over how we operate and enable more effective collaboration with our colleagues and other organisations.

**'Next generation' digital capabilities (people, process, technology and data) have been developing rapidly in their availability, relevance and adoption across all industries. The speed at which new products are developed and the impact on customer satisfaction are growing exponentially.**

# Data will fuel our digitalisation journey and become a core competency for our business, as it will for the sector in general

— It is widely recognised in the sector that modern data management principles will underpin the move to a more flexible, net-zero energy system. They will increase transparency and create opportunities for low-carbon innovators to access data which will enable a range of low-carbon products and services.

— We will significantly enhance our data and analytics capabilities, skills and platforms, enabling the capture and analysis of network and market data and increasing our ability to expose high quality, Open Data and create Open Data products and services in near real time.

— We are committed to following Data Best Practice (DBP) guidance principles and Energy Data Taskforce (EDTF) recommendations on the visibility of data and assets, especially regarding 'maximising value of data' and demonstrating adoption of the 'presumed open' approach. Our 'presumed open' principle means that we will openly share all our energy system data and only restrict access when issues of privacy, confidentiality or commerciality require it. Data will be made available in a raw form with metadata that describes its content and quality. Our ambition is to make as much of this data real time as possible and our plans see us invest in the technologies to make this a possibility.

— We will increase the number of available data products and services by 70%, 45% of which will refresh in real time via automated processes delivered through through application programming interfaces (APIs) as well as dedicated portals to meet the needs of as many of our stakeholders as possible. We will work with other DNOs and the Electricity System Operator (ESO) to make network data available in industry standard formats such as the common information model (CIM).

— A suite of self-serve analysis tools will be developed that both blend the data and enable external parties to generate insight. We recognise it is not just the range of data that is increasing, but also the mode in which it may be accessed. We are moving to more APIs that enable access to datasets on demand, and, in some cases, near real-time streaming interfaces. We will serve this to data stakeholders through a dedicated portal that brings both the self-serve analysis and raw data together in a 'single pane of glass' view.

— The sharing of near real-time network capacity will help ourselves and others to co-ordinate dispatching of customer flexibility services for whole system value in a way that doesn't cause a local network problem and therefore negative customer impact.

— Engaging with our stakeholders (see **here**), we have identified and prioritised 50+ data projects (Open Data, business intelligence (BI), advanced analytics, etc.) to be delivered as Minimum Viable Products (MVPs) and then refined jointly with our stakeholders to make them fit for purpose.

— You can read more about our plans specific to data in the **data vision and best practice section**.

# Investing in core digital capabilities

**Customers are at the heart of our digital transformation; this includes those who do not wish to or cannot use technology.**

More information on this can be found here.

Our strategy for the digitalisation of our network and our business is wholly focused on delivering the most efficient, reliable, affordable and safe network possible, while also enabling the transition to net-zero carbon.

In line with our design principles, we believe that the best customer outcomes can be delivered through focused investment in ten core areas that are central to the delivery of a genuinely digital network and business.

Our digital transformation is providing the opportunity to:

- deliver innovations that improve the effectiveness and reduce the overall cost of running the network, both capital costs, such as new network infrastructure, and the costs of operating the system
- empower consumers to become active participants in the energy system and adapt how it operates as it decarbonises
- transform our customer experience to provide more tailored services and support and drive higher standards of customer service
- better coordinate Network Operations and energy market operations, delivering greater efficiency and unlocking new opportunities that benefit our customers and support net zero
- create a digital workplace, increasing our efficiency as a business, enabling more effective communication and collaboration and supporting greater employee satisfaction
- further improve the reliability, resilience and safety of our network
- increase transparency and create opportunities for low-carbon innovators and policy makers to access our data.

**We want to implement, operate and participate in a digital energy network, while using technology to continuously innovate and evolve as a digital business.**

# Data and digitalisation – the journey so far

## DSAP v3

- Through the DSAP, we have consolidated our digital ambition and developed action plans.
- This allowed us to create alignment around this internally and engage with our stakeholders early in our ED2 planning.

## ED2 planning

- As the performance areas began to come into focus, we have integrated our planning with all of these areas and the accompanying enablers.
- We have developed our data strategy and vision.
- We have engaged with our stakeholders to stimulate conversations with all interested parties as well as working closely with all business plan areas to ensure that their needs, derived from their stakeholder engagement, have also been included.
- We have shared our evolving plans and our DSAP with our Customer Engagement Group (CEG) and have shaped our business plans and DSAP to take on board their comments and challenges.
- We have refined our initiatives, identified synergies and established a validated set of costings to link through to business outcomes and customer value that allow us to fully justify the need for appropriate investment.

## DSAP v4

- Using the information from both our ED2 planning and our previous versions of the DSAP, as well as feedback received from multiple sources, we have developed our fourth version of the DSAP.

## ED2 finalisation

- We have refined our ED2 plan which has resulted in some minor changes to our DSAP.

## DSAP v5

- Our fifth version of the DSAP contains the latest information from our ED2 plan, our stakeholder engagement and updates to our action plan section.

# Executive summary

# Digitalisation is one of the key enablers for our long-term business strategy and vision

**There is growing recognition of the impact that digitalisation and the power of digital data and platforms have on the day-to-day lives of customers, stakeholders and colleagues; what it will mean for our current and future business models and service offerings; and how we will adapt to meet those demands.**

Successfully embracing data and digitalisation will help us to deliver our customer-tested vision and performance areas identified within our draft business plan (as detailed in figure 1) and so:

- lead the drive towards decarbonisation
- operate a highly reliable and resilient network
- delight our customers with outstanding service
- provide remarkable value for money
- ensure world-class levels of safety and security
- be a force for good throughout our region and beyond.

**Embracing data and digitalisation will help to delight customers and stakeholders with outstanding service that is tailored to them.**

**Figure 1**
Draft business plan

**12 output areas**

# We have identified desired outcomes and objectives for our digitalisation initiatives through a structured approach

## Drivers for digitalisation

— The key driver behind our data and digitalisation strategy is the need to support our plans for decarbonisation through our DSO and whole systems propositions.

— Our data and digitalisation investment will ensure that we can facilitate our regions' decarbonisation in a flexible, affordable way.

— We believe that the best way to deliver decarbonisation will be through a decentralised energy system based around locally connected renewable generation, electricity storage solutions and demand that can flex to help keep overall costs down, facilitated by a network that is smarter and more flexible than ever.

## Options and decisions

We have formulated an optionality matrix to be applied to each digitalisation initiative, where appropriate, to determine the optimised course of action when delivering the desired outcome.

We have considered the following options:

— Re-use and expand an existing capability.
— Build a new capability in house.
— Leverage our network of strategic partners to augment and accelerate our capability build.

We have evaluated each option against cost, risk, deliverability and customer benefit to derive the most suitable one.

## What this means for stakeholders

We have considered stakeholders' views throughout, when developing our DSAP, and will continue to do so to ensure customer benefit is at the forefront of our thinking on our journey to net zero.

The benefit of this approach for you is that our increasing reliance on data and digitalisation will be enabled by tried and tested systems and processes, at an efficient cost – both financial and environmental – to benefit our communities.

## How have we optimised our plans and DSAP

We have optimised our plans through:

— merging capabilities which share commonality to align teams and reduce cost
— designing platform capabilities that can be used across multiple initiatives
— optimising phasing to develop capability once and expand from there
— leveraging our parent company's capability, expertise and access to licence agreements where possible to benefit from the economies of scale of a larger organisation.

# We are driving transformation across three time-bound stages – Enable, Expand, and Enhance

The time-bound stages have been created to allow the reader to visualise a timeline for our action plan, showing when we anticipate initiatives will be delivered. It should be noted, however, that these are not fixed start and end periods as the delivery of initiatives may cross over these time boundaries.

## Enable

**Initiatives that solve immediate challenges, take us from a manual capability to building the platform for a digitalised capability or to create the capability in the first instance.**

## Expand

**Initiatives that take either the digitalised capabilities created in the Enable stage, other existing digitalised capabilities or additional stakeholder requirements, and either expand across the enterprise or expand/standardise the use of a capability to release further benefits.**

## Enhance

**Having realised the capabilities in the Expand stage, use them to maximum advantage and deliver maximum benefit.**

# Our data and digitalisation vision:
## Embrace digital platforms to enable an optimised whole energy system, providing a resilient and efficient service for our region

**To simplify and increase focus on benefits and outputs we have distilled our eight outcomes into five key outcomes:**

**Open & transparent**
enabling innovation and development of new markets while delivering net zero at the lowest cost

**Whole system efficiency**
preparing for both a cost and carbon optimised whole energy system

**Service excellence**
delivering seamless, efficient service with more choice and personalisation

**Cyber secure**
responding to and mitigating the cyber threats of increased digitalisation

**Reduced cost**
driving lower cost, efficient operations, front and back office

# The five outcomes are enabled by ten core areas

- Open & transparent
- Whole system efficiency
- Service excellence
- Cyber secure
- Reduced cost

### 1. The journey to Open Data

Understand, improve and expand our energy system data and promote data transparency through Open Data.

### 2. Network management capability to enable net zero

Upgrade and implement new IS systems to enhance network management and decision-making in real time to enable us to efficiently operate our distribution network in a decarbonisation era.

### 3. Data at the point of need

Introduce data and applications at the point of need in order to improve colleague efficiency and effectiveness.

### 4. Cyber security & resilience

Continue to invest in advanced cyber controls and tools to maintain a robust cyber security posture, aligned to the threats emerging from increased digitalisation.

### 5. Back office

Modernise the back-office environment to reduce risk, secure information and improve colleague experience.

### 6. Field-force management

Introduce improved field-force, work and asset management processes to improve operational performance.

### 7. Robotics & automation

Deploy robotics and automation to reduce cost of low value, high volume tasks and improve customer and colleague experience.

### 8. Enabling customers to self-serve

Implement self-serve, personalised services to meet customer demand and experience, implementing a customer insight and interaction portal and reducing the cost to serve.

### 9. Advanced analytics

Enable advanced analytics to improve the planning, design and operation of our distribution network.

### 10. Future-proofed agile

Provide future-proofed, agile solutions in order to be flexible enough to adapt to the change in the energy sector.

# The core areas then break down into individual initiatives

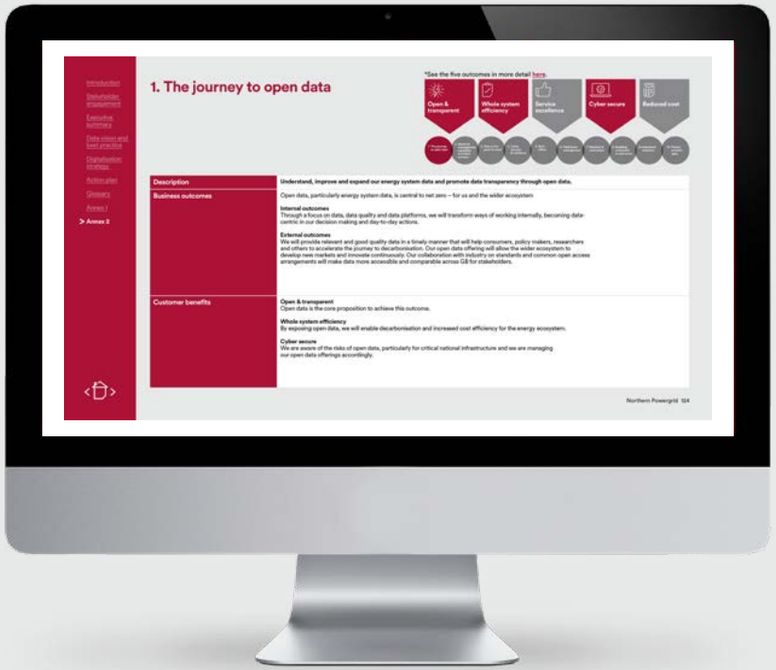
**We have grouped our data and digitalisation initiatives into ten core areas that will deliver distinct capability to our organisation and our stakeholders. Each core area has an introductory page which details:**

— the description of the core areas

— the internal and external business outcomes

— which of the five customer benefits the core area contributes to (highlighted in red) and how.

Each of our initiative pages provides low-level detail on it. These can be found here.




# How we have scrutinised and costed our plan

**As we have explained in this section, our plan has been developed with stakeholder engagement helping us to shape our initiatives and outcomes and, whilst our strategy has been internally lead, we have worked in parallel with our strategic technology partners, external specialists and our Technical Panel to apply the scrutiny necessary to ensure our plans stood up to the tests these expert groups could apply.**

Our main technology partner adopted the role of 'critical friend' in the development of our plan to challenge our propositions and bring forward best practice on all applicable areas. Our Technical Panel and CEG have also had the opportunity to challenge our thinking throughout the development and we will continue to work with those groups as we develop further updates of the DSAP.

**1**

Identified and validated data and digitalisation needs across all business plan areas.

**2**

Developed a digitalisation strategy as a north star for ED2 and beyond.

**3**

Identified dependencies of initiatives and introduced phasing to define the action plan.

**Alignment with performance areas**

**4**

Developed an initial estimate of cost per initiative.

**5**


Identified common enablers – to form IS business plan. Developed cost model.

**6**

Consolidated initiative cost and de-duplicated, identified synergies.

**7**

Refined phasing to optimise integration with business plan areas and cost.

**8**

Finalised costs and benefits. Confirmed deliverability.

# Stakeholder engagement

# Stakeholder engagement

## How you can help shape our data and digital vision and why we need your help.

**This is the fifth version of our DSAP, dated June 2022. Stakeholder expectations, technology and commercial development keep moving fast within and outside Northern Powergrid.**

An ongoing dialogue about digitalisation with customers, policy makers, regional stakeholders and colleagues is helping us to refine this strategy, providing you with the ability to influence our plans.

When producing further iterations of the DSAP, we will continue to engage widely by sending out direct communications to our stakeholders, reaching people through social media and press releases, as well as utilising the Customer Engagement Group, an independent panel of experts brought together to challenge and shape our future plans and scrutinise this area of our business plan. They have helped influence this version of our DSAP and have fed into its development on several occasions.

### Have your say

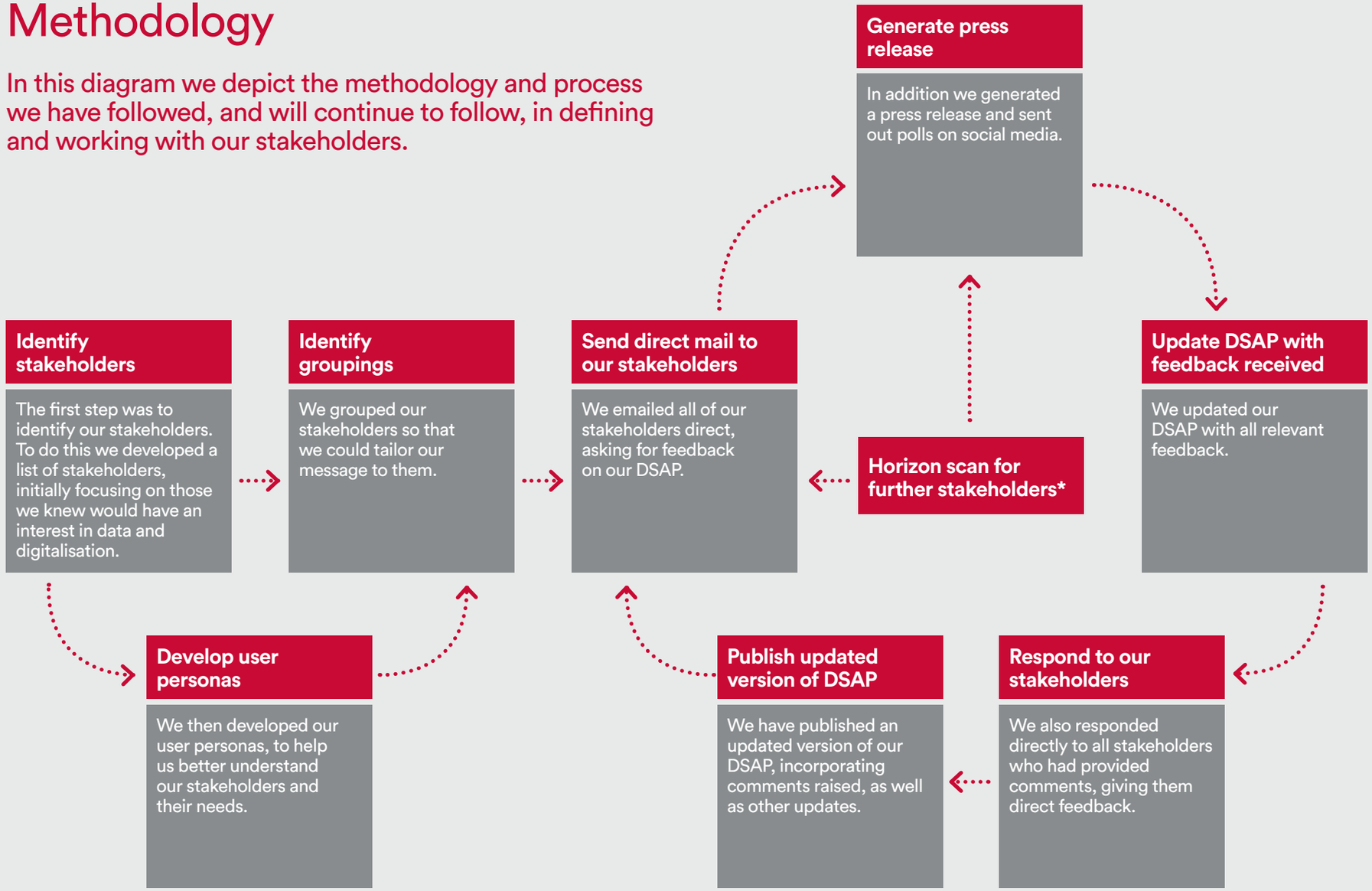
Please tell us what you think about our strategy, how you feel about some of the key themes and our ambition to underpin plans with technology and Open Data.

We would welcome your views on the goals, objectives and principles we are setting out and our direction of travel.

We have started our ongoing stakeholder engagement and have taken on board feedback and suggestions received so far in this version of the DSAP. However, any views on our plans are welcome at any time. Send your comments to: **yourpowergrid@northernpowergrid.com**

# Stakeholder engagement Methodology

In this diagram we depict the methodology and process we have followed, and will continue to follow, in defining and working with our stakeholders.




*It is key that our stakeholder list is regularly reviewed and updated, as well as ensuring we have their consent to contact them with updates to our DSAP and requests to review and feedback. In addition we are looking at online product management solutions to bolster our capabilities so we can keep in constant touch with our stakeholders to help shape our action plans, products and services. Please see here for more information.

# Developing our user personas

— To enable us to be led by customer needs and socially inclusive, we need to first understand our customers. To do this we have developed user personas for our customers, stakeholders and colleagues in relation to data and technology needs.

— When developing our user personas we developed a list of representative users, alongside their needs and wants, based on what we have heard and will continue to hear from feedback.

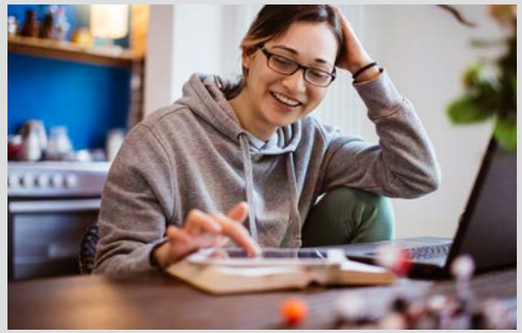
— We then ratified the user personas developed with stakeholders to ensure that we had captured their needs, challenges and ideal 'tomorrow's experience'.

— We will continuously review and add to our user persona catalogue as we identify new users or our existing users' needs and wants change.

# Case study

## Sheeba Naheed, age 32
## University professor conducting research

**'As an academic, I would like access to real world, real time and historical assets, performance data'**



**Sheeba is a senior university lecturer whose students are undertaking research into the way energy networks operate in a real world and how they might be affected by external factors such as global warming.**

Extensive electrical industry knowledge

Data literate

Data needs will change as knowledge builds

Preferred approach would be self-service

### Needs
— Online access to undefined data.

— Data to be real time as well as historical.

— Data to be accurate and follow a recognised standard.

— Predictive and analytical data outputs for research purpose.

— To simulate scenario across the real energy network.

— A seamless free triage process for data request.

### Today's challenges for Sheeba
— Real data is not readily available at present.

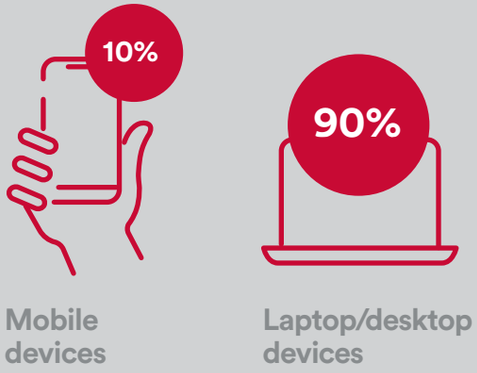
— There is no agreed standard for data within the energy industry.

— No defined data catalogue.

— No simulation environment.

— No clear way of sharing our outputs for the good of the nation.

### Access channels




Mobile devices

Laptop/desktop devices

### Tomorrow's challenges for Sheeba
— Data standards may not be compatible.

— As we become more data reliant the opportunities to release new benefits may be less than the initial gain.

# Case study

## What is different?

**I am able to easily access accurate and timely energy system data, to help inform my research and present key learnings and insights into energy systems to help with the demand for decarbonisation.**

**I will have access to a simulation environment that will allow me to model numerous network scenarios; this will allow me to better educate students, getting them ready to enter the energy industry.**

**I can liaise directly with Northern Powergrid to share and discuss research.**

### How we'll make it happen...

We will define a data strategy and architecture and will design a blueprint, processes, governance and operating model required for the management of data for internal and external purposes.

We will establish a Data Transformation Office that will be the central hub for the management of all data transformations programme. It allows us to take a portfolio view of all our data transformations, but also centrally manage our performance against data requirement delivery, especially those relating to data stakeholders' needs.

We will create a single point of accountability (SPA) that facilitates the use of internal and external data for the improvement of business operations and customer service. They will also interface with external stakeholders for their data requests; manage the digital channels that capture requests, enquiries and track services; and be available to share and discuss research.

We will cleanse and fill any gaps in our data to enhance the value of data as an asset and allow greater business and external stakeholder confidence when the data is used for modelling and decision-making.

We will open up significantly more data, following the premise of 'presumed open' and sharing it in a universally recognised format for stakeholders to access.

### Initiatives in our DSAP

— Data gap analysis.
— Data cleanse.
— Data integration platform.
— Data integrations.
— Data governance.
— Asset data integrations.
— Cloud data platform.
— Digital customer journeys.
— Cloud enabled website.
— Open Data portal.
— DSO sensor deployment.
— Analytics platform.
— Data accountability.
— Digital twin.
— Enhanced network modelling.
— Cloud analytics platform.

# Running stakeholder polls

As part of the stakeholder engagement methodology we have engaged with our stakeholders through a number of polls, surveys and workshops, and have taken the feedback on board to help shape our DSAP. Examples of the feedback are listed below:

**Should we introduce a continual feedback and improve cycle, using customer responses to enhance our systems and processes?**

**84% Yes**

**16% No**

**Should we invest in new ways for customers to give us feedback – such as chatbots or automated surveys?**

**76% Yes**

More needed

**16% No**

**Should we be one of the leaders in the drive towards decarbonisation, using data and digitalisation to support?**

**87% Yes**

Northern Powergrid should be a leader

**13% No**

Others are better placed

To find out how we have incorporated these into our DSAP please see here.

# Stakeholder engagement

## Our response to your feedback so far...

**‘You said’ We did**

**‘Some of your benefits are too business focused and don’t articulate the customer benefit.’**
Our user personas and our ED2 plans provide detailed information on the customer and stakeholder benefits of our initiatives. For more details on this see **here**.

**‘I’d like to see more detail around each approach and initiative.’**

We have spent more time getting into the details of our implementation plans, forming our action plan section.

**‘You don’t mention customers who don’t want to or cannot use digital services.’**

We have made our strategy inclusive for customers who would prefer not to use **digital services**.

**‘Document lacks information on the value customers expect to derive from digitalisation.’**

We have linked the initiatives and business outcomes to the customer value; see some examples **here.**

**‘How does this strategy tie into Open Data and consumer vulnerability?’**

We have added more information on DBP throughout this document but especially **here.**

**‘The document reads as being inward looking and should be clearer on how it will meet changing consumer needs.’**

We have put the customer at the heart of what we do throughout the document.

**‘Isn’t cyber security an issue with data and digitalisation?’**

We’ve added assurances about the importance of **cyber security**.

**‘How will you set up to continuously improve and innovate?’**

We have begun to get to grips with what a transition such as this would require from people and process changes and have included the information in this version. Examples are **here.**

**‘How will you tackle cultural barriers and bring your people along with you?’**

We understand the cultural impact of transformation on our colleagues; see **here**.

**‘I’d like to see a timeline for the changes.’**

We’ve added a timeline for the initiatives and shown some examples of the roadmaps for services we’re developing, see **here**.

**‘Could you consider adding more detail around innovation and improving and streamlining business processes?’**

We have added further detail on usage of customer analytics and insights as well as innovation and automation.

# Stakeholder engagement

## Our response to your feedback so far...

## ‘You said’ We did

**You asked for the ability to easily feed back and help shape our plans.**

We have introduced an interactive product roadmap to enable continuous feedback on our planned Open Data products and and services projects and provide visibility of our timelines.

This gives you the opportunity to easily feed back on how you feel about some of our key themes. You can access this here.

**‘Introduce a continual feedback and improve cycle, using customer responses to enhance our systems and processes?’**

Stakeholder feedback has been instrumental to the development of this and previous versions of our DSAP. That being said, we are continually looking for opportunities to improve this feedback loop and you can read about our intended trial of a software solution to improve this **here**.

**‘Can you demonstrate your transformation map as more of a ‘products and services’ roadmap?’**

We have now based our transformation roadmap on outcomes.

**‘I’d like to see further clarification on senior ownership and accountability for delivery of your strategy and action plan.’**

We have validated the deliverability of our plans as part of our ED2 business plan design. For more information on this please see **here**.

**‘Some of your benefits are too business focused and don’t articulate the customer benefit.’**

We have further refined our initiatives to include both the business outcome and the customer benefit. For more details on this see **here**.

**‘I would like to see the dependencies between the initiatives.’**

We have mapped out the dependencies for each initiative and between core areas. For further information on this see **here**.

**‘Invest in new ways for customers to give us feedback – such as chatbots or automated surveys?’**

We understand the importance of providing our customers with multiple routes for contacting us; the introduction of video chat and omni-channel is an important facet to our customer service strategy, enabled by the technology as described **here**.

**‘How will planned activities be coordinated with other organisations?’**

We have migrated to the Department for Transport’s street works system for greater collaboration and plan to further integrate.

**‘Can you clearly define your baseline set of initiatives?’**

We have worked closely with the business to identify our baseline initiatives, which can be found **here**.

# Stakeholder engagement

## Our response to your feedback so far...

## ‘You said’ We will

**‘How will you respond to new, as yet unidentified, future challenges?’**

We will continue to evaluate our position throughout the implementation of our plan. We have selected solutions that allow for flexible decision-making and so feel we have mitigated this risk as much as is reasonable at this stage.

**‘Could there be a view of what data you plan to capture from your substations?’**

Through the Data and Digital Steering Group (DDSG), we are working with DNOs to establish a common standards approach. Internally we are introducing new technologies to allow us to generate and make data available in standard format (CIM). Our DSO strategy outlines our intentions regarding data capture at substations as we see this as a significant opportunity for data analytics and sharing.

**‘What is the maturity scale of your data quality?’**

We have started improving our data quality but it is an ongoing process. We will supplement our capabilities in this space with technology in ED2 but, before then, we are undertaking several assessments of our data quality, aligned to the prioritised open datasets we intend to publish.

**‘Could this document be even more interactive, perhaps HTML?’**

This is something we will look to implement in a future iteration.

**‘Can you show a constructive, objective view of current state capabilities for your IS function?’**

As you would expect, we have focussed initially on how we intend to change to adapt to our customer and business needs in the next five years.

We expect though to be able to show our capability growth throughout the development of our DSAP and are working on this viewpoint and being able to display it digitally in future editions of this publication.

# Working with other organisations

— We have been a participant of the Energy Network Association's (ENA) Data Working Group since initiation in late 2019, now known as the Data and Digitalisation Steering Group (DDSG). Membership of this group extends across transmission, distribution, gas and electricity networks. The terms of reference for the forum, refreshed in March 2021, state they 'will seek to promote commonality, where appropriate'.

As a result, we are actively collaborating with other network companies on a variety of subgroup activities which have included establishing a national energy systems map, proposing a common triage process and identifying topics for greater co-operation. We will continue to identify areas of common interest and support combined initiatives where centralised development reduces rework, improves efficiency of decision-making, avoids wasted effort and promotes opportunities for learning once rather than in isolation. We will continue to share openly and transparently on our areas of focus, upcoming initiatives and lessons learned.

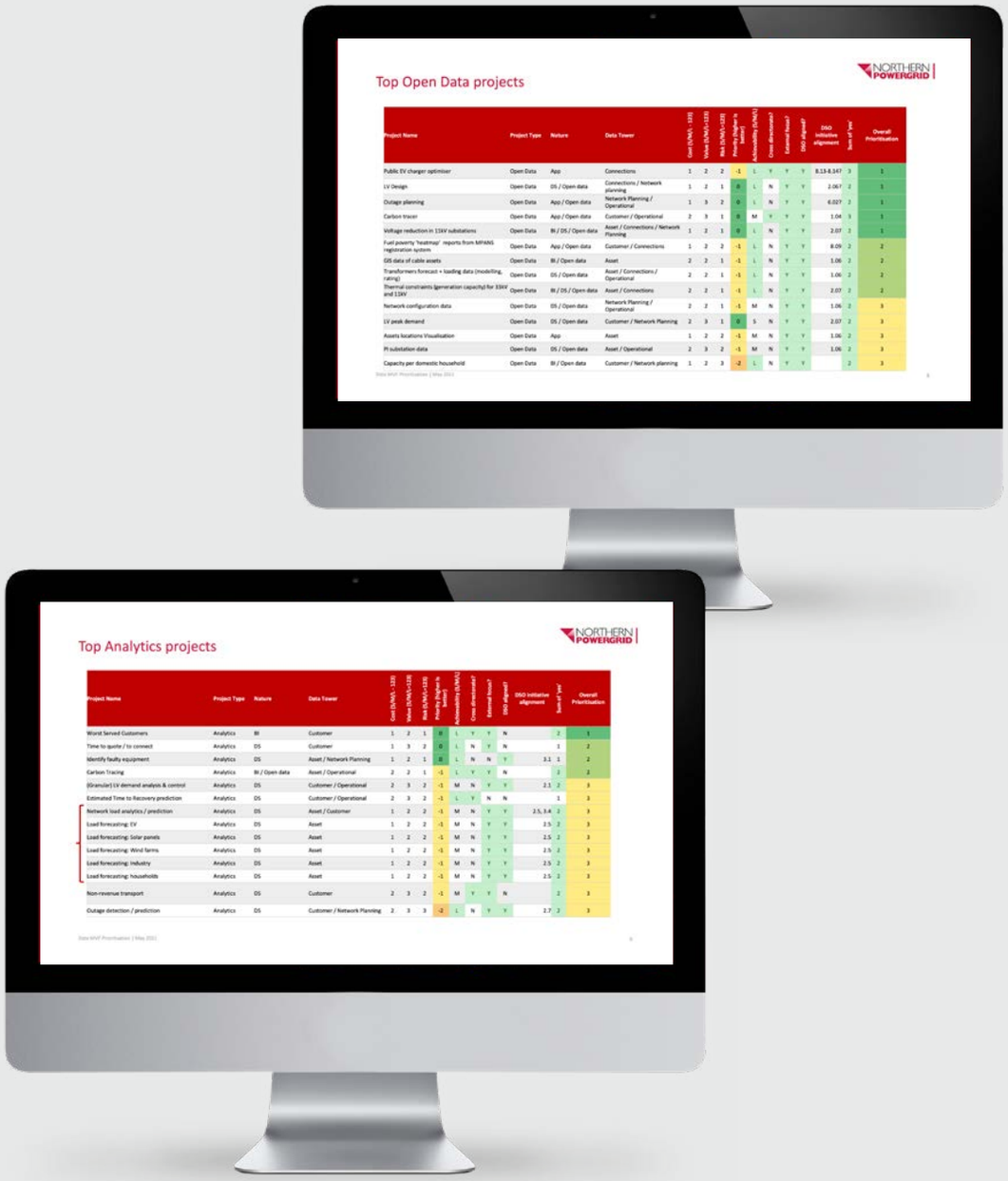
— An ongoing review of DSAPs published by other network operators will allow us to identify opportunities for joined-up delivery. Our sponsorship of ODI Leeds allows us to work with other private and public sector organisations across the region who are working on data initiatives. Stakeholder engagement ahead of publishing the DSAP created opportunities for us to learn what is important to our customers, work on initiatives that benefit local companies and listen to future data requesters. Over recent years we have built strong working relationships with a network of peers and we will prioritise meaningful dialogue to identify where our planned activities can be coordinated with other organisations.

# What we will do next

— During the development of this version of our DSAP we've received lots of feedback from consumers, stakeholders and experts, and we are planning to continue to seek this feedback in the future during our journey to net zero.

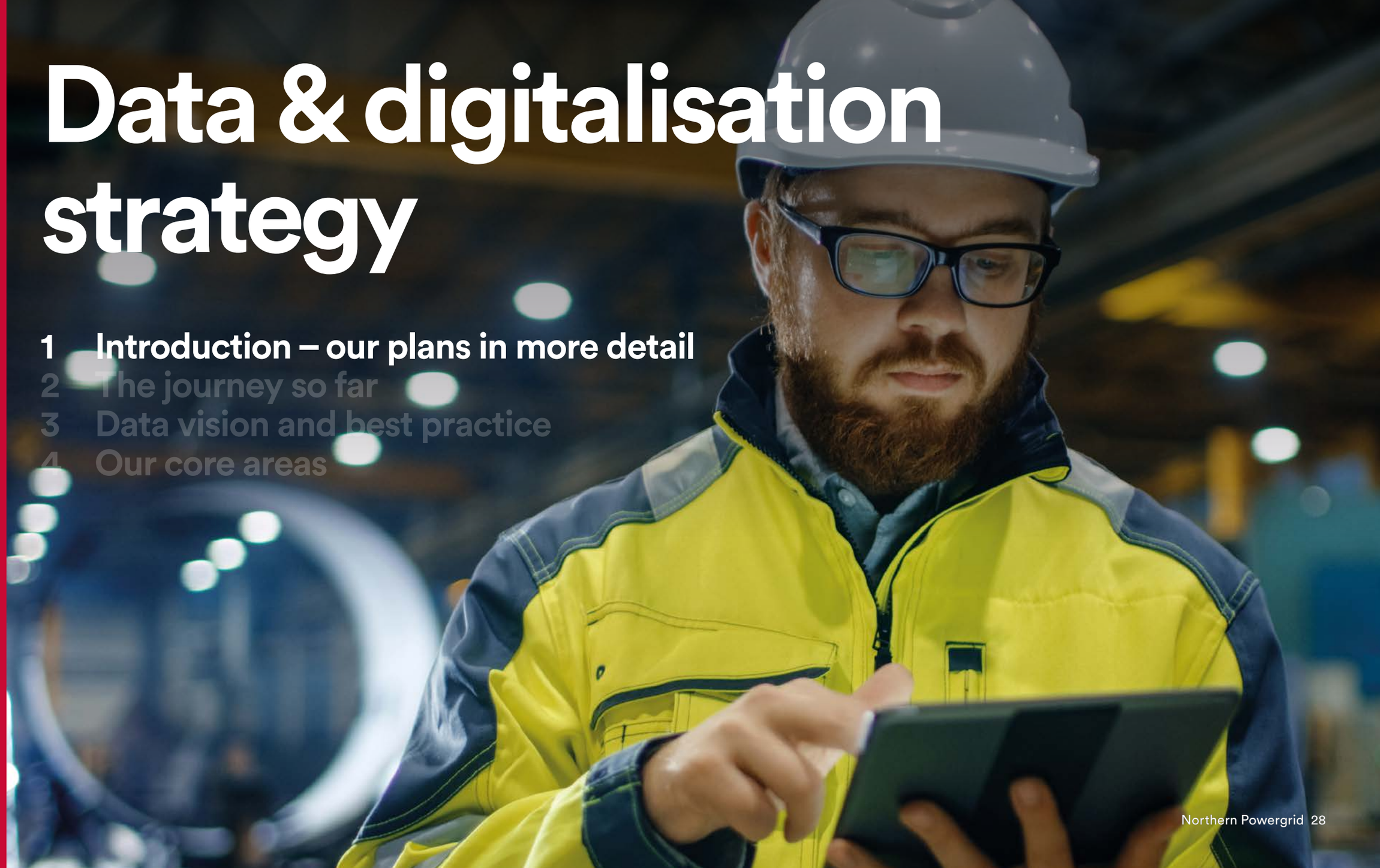
— We will constantly monitor and refine our plans, using feedback from our stakeholders as we progress into delivery. We have implemented a user-first approach so far, using stakeholder engagement from various mediums such as workshops, surveys and direct mail and we plan to continue this throughout our digital journey.

— We are now starting to deliver some of the key initiatives within our action plan, building strong foundations in readiness for ED2.



# Data & digitalisation strategy





# Our plan to deliver a digital transformation

**General comment from proofreader:**

**Smart Grid or smart grid or smartgrid?**

**Make consistent throughout?**

**We are already implementing industry-leading digital innovation projects on our network. Our 'Activating Community Engagement' project ran the world's first trial of a mobile game to incentivise households to reduce their electricity consumption at times of peak demand.**

Our 'Foresight' project is using ground-breaking data analysis to enable fault prediction and proactively deploy network technology to automate the restoration of power supplies to customers and the deployment of this technology will continue into ED2.

Looking to the future, our Distribution Future Energy Scenarios explore a range of credible decarbonisation pathways which enable us to determine our future services and investment programmes. All of these initiatives are examples of work we have done or have started in ED1 that have set in motion our digitalisation journey, but we have done much more. We have implemented a Customer Relationship Management system (CRM) to begin to improve our customer experience; we have digitalised our asset records in readiness for opening up our data, which has already allowed us to introduce a new service called AutoDesign for self-service quotations; we will have invested in smart grid enablement; we have made smart meter data investments; and have begun to develop network heat maps.

Our DSAP, developed in conjunction with opinion and feedback from external stakeholders, forms part of our approach to meeting the challenge of the new decarbonisation landscape. It sets out our vision to become part of the digital energy system, utilising all appropriate available digital tools, data and technologies and transforming the capabilities of our infrastructure and our business to support a flexible, reliable and resilient energy network for the 3.9 million homes and businesses we serve. The DSAP is integral to the future of our business and forms part of our next long-term business plan, which we have prepared for the ED2 regulatory price control period from 2023–28. We have further developed it in alignment with the five key recommendations from the EDTF's strategy[1] for a digitalised energy system which can be seen throughout.


1 Energy Data Taskforce: a strategy for a modern digitalised energy system (catapult.org.uk).

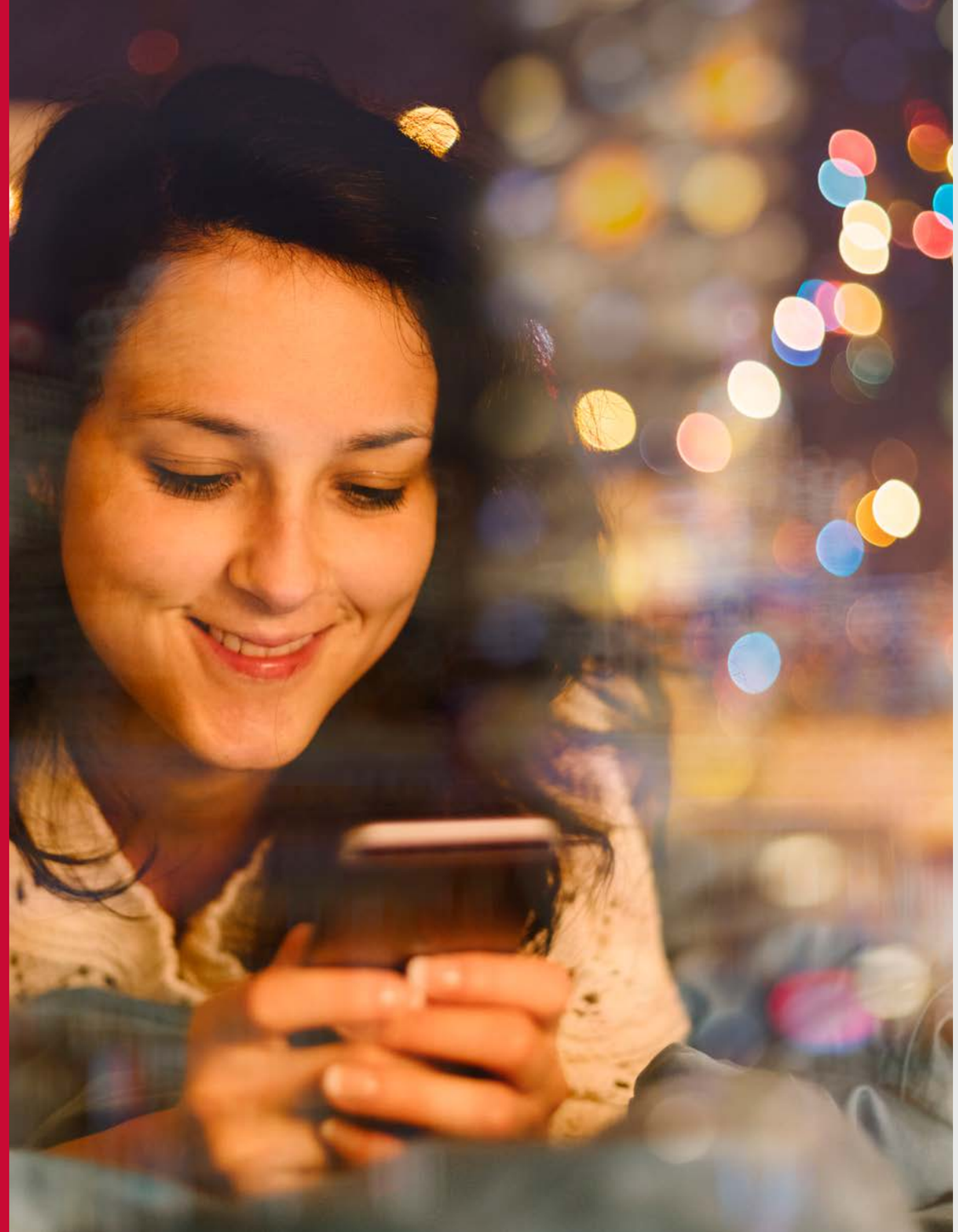
# Philosophy

**The challenges that present themselves in modernising the UK energy sector to achieve the shared goal of societal decarbonisation by 2050 are significant and we know they will not all be solved with technology, but we recognise the opportunities that digitalisation offers in solving some of these challenges and we have developed this strategy building on this ethos.**

We see the value in data; having more, increasing its quality and sharing it openly to better inform consumers and stakeholders who hold the keys to unlocking decarbonisation. We understand the need for the flow of this data to exist, in real time, between our control systems and the systems that manage the rest of the UK electricity system to deliver flexibility. We know that efficiencies can be unlocked that will mean we can do more for energy consumers in a quicker and less costly way, all whilst we bring our processes to the forefront of our digital footprint so that consumers, stakeholders and the market around us have access to our processes, ready when they need them, at their convenience.

Our digitalisation philosophy, however, matches our organisational reputation and stance in that we recognise not only the opportunities but also the risks and the need for pragmatism and caution when developing our plans. We know that there will be areas of our business that are primed and ready for digitalisation, eager to share the high-quality data that will enable insights and pave the way for the development of DSO functions. There will, however, be other areas that will take longer to adapt and adopt the new capabilities that digitalisation will bring. Therefore, as we have finalised our plans, our focus has been on refining a solution set that responds to as many of the pathways we see before us as possible, enabling a flexible landscape to manage uncertainty and risk.

You can read more about this in our **Data and Digitalisation Justification Annex** and in our DSO strategy of our main business plan.



# Philosophy (continued)

**As a provider of critical national services, we have always recognised the need to provide resilience across our energy network which sets a tone for our approach to digitalisation. The increased interconnectivity and available data alone introduces new risks, risks that we must consider in terms of physical and cyber security and which are fundamental precursors to network resilience. Our risk appetite is accordingly set very low.**

As we consider the threats that exist today, compared to those that existed as recently as five years ago, it is clear that the world around us has changed. More systems, devices and 'things' are internet connected than ever before and the expectation of the consumer is that they see no reason why more data should not be available and why processes should not be digitalised. Our consumer panels have shown that they understand the cyber threats that exist in a digitalised world and so expect us to protect both their data and the supply of their electricity as we continue this path.

That being said, our ambition is still clear and we have a well-defined view of the long-term destination and direction of travel. We are excited about the challenge that lies ahead for our business and the opportunity we have to make a difference to our region in enabling the transition to net zero. We see the future as our opportunity to unleash the potential of innovation, digitalisation, our people and collaboration to achieve our ambitions.

**As a provider of critical national services, we have always recognised the need to provide resilience across our energy network...**

# Context

**Version 4.0 of our DSAP, published in June 2021, expanded its content in a number of areas.**

It:

— further defined our plans for providing high quality Open Data to a wide audience so that stakeholders can become empowered and become active participants in our distribution network

— set out our ongoing stakeholder engagement methodology based on your feedback and updated our plans

— gained greater insight into the impact that flexibility services, decarbonisation and DSO will have on our technology solutions and planned accordingly.

We set out our trajectory of investing in the areas we know will support our business plans for ED2 and the needs of our stakeholders and have defined five key outcomes (see below) that our DSAP will deliver. These five key outcomes are supported by ten core areas which in turn deliver the initiatives that will enable our business plans to be successful. Details can be found in our **Annex 2**.

Within version 5 of our DSAP we have added some further updates and refinements, namely within the stakeholder engagement section.

Version 5.1 contains updates to our action plan so you can see our latest progress.

Previous versions of our DSAPs can be found **here**.

**Hyperlink required**

**Should the asterisk have a reference?**

*See the five outcomes in more detail **here**.

- **Open & transparent**
- **Whole system efficiency**
- **Service excellence**
- **Cyber secure**
- **Reduced cost**

# Ensuring the right outcomes through principles-led design

**The development of our DSAP is underpinned by a set of clear design principles. This ensures that innovation and initiatives that we propose are focused on delivering the right outcomes for our customers, our stakeholders and our business.**

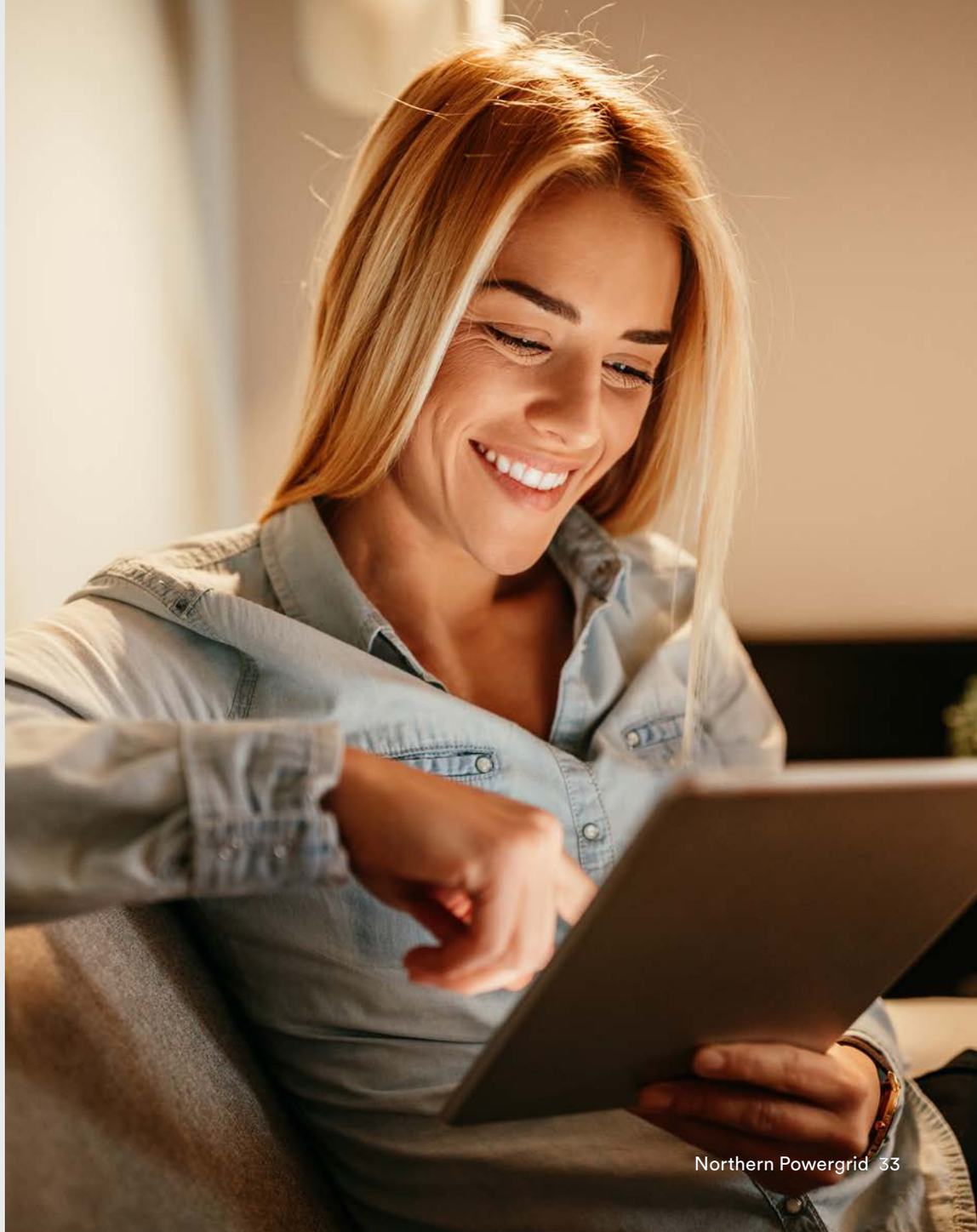
As we continue to develop our plans, it is critical we do so openly and transparently, in dialogue with our customers and wider stakeholders.

This document outlines our guiding principles for data and digitalisation, sets out our strategy, the outcomes we want to deliver and our vision for a data-empowered digital future of our network and business.

We want this plan to stimulate conversations with all interested parties. We have been working with all of our current stakeholders and the communities we serve to refine and develop our plan. Your feedback has and will continue to allow us to shape our plan in the best interests of you, our customers and stakeholders. We will continue this process and will engage with new prospective stakeholders.

You will find more information on our stakeholder engagement here.

**The work we intend to do and the initiatives we plan to deliver have the needs of our customers and stakeholders at their heart.**



# Design principles

We have used five design principles to underpin our digitalisation strategy, as listed here.

**Security is a hygiene factor**

**Customer led and socially inclusive**

**Facilitating efficiency**

**Maximising the value of data to us, our customers and stakeholders**

**Keeping the future in mind**

Does 'red design principles' need to link to somewhere?

# Unlocking digitalisation

**To unlock organisational dexterity, which will allow us to adapt easily to the ever-changing external environment, we have identified several enablers that underpin our investment in digital technologies and better data capabilities will involve an upskilling programme for our colleagues so that they have the skills to operate the systems, manage the data effectively and fully understand the value of digitalisation.**

**Our culture will be one that embraces data and digital technology as critical to our success and our colleagues will become advocates for identifying new and innovative ways to deploy our enhanced digital capabilities.**

# Getting digital right requires changes to our business and culture as well as technology

In 2020 we set out our company's ambitions to enhance our role in the region, and beyond, to play a significant role in the country's pursuit of net zero and in developing the functions of Distribution System Operation. We want to establish ourselves as:

- a trusted and neutral platform able to optimise the whole energy system and underpin the rapid transition to decarbonisation of electricity, transport and heat;
- a reliable and resilient system operator with the consumer at its heart that is a force for good;
- an enabler of cross-sector and regional economic growth; and
- an active player in the GB energy system, facilitating and enabling whole system thinking.

Digitalisation is a key enabler of these plans and can help us to meet our goals and ensure we are able to take a leading role in the changing GB energy system. We will be accelerating our digital transformation in the remaining years of the ED1 period so that when we enter ED2 our transformation is already underway.


We know that embracing digital is not just about making investments in technology platforms but is wider reaching.

To succeed in digitalisation we must also deliver lasting cultural change as a digital culture will allow us to deliver results more quickly and is key to ensuring our success in digital transformation. To deliver that change we will:

- bring our colleagues on the journey with us as we embrace, change and deploy new digital solutions across our business and it becomes an increasingly regular part of how we operate
- provide our colleagues with the training and support required to equip them with the skills to do their jobs effectively, increase their data literacy and give them confidence to be innovators in their roles
- attract new talent with digital skills that complement our existing workforce, enhance diversity and bring new ideas to our business
- continually review the progress and success of the actions we are taking, engaging with colleagues and stakeholders to do this, and refining our plans to ensure we stay on our roadmap to digitalisation.

# Developing our culture to embrace digitalisation will involve...

Key components of delivering and continuously developing our DSAP.

### Executive sponsorship

— Demonstrate clear accountability for success, including KPIs
— Provide clarity of board-level responsibility for the delivery of the DSAP

### Delivery capability

— Evaluate and document our capability/ experience to deliver digitalisation
— Understand the implication on the current operating model and ways of working

### Stakeholder/user led

— Validate the DSAP with external and internal stakeholders
— Ensure that the DSAP is considered 'evergreen'
— Align our DSAP to the business and stakeholder priorities in our draft RIIO-ED2 business plan

### Market co-ordination

— Further develop our approach to Open Data and whole market coordination
— Engage with current/future energy market actors

### Quantify the strategy

— Calculate the cost/benefit of the digitalisation strategy

# What are the risks?

We know that any significant change brings with it risks but, in this sense, it has been important for us to consider these risks in more detail as the impact of getting this wrong could directly affect the resilience of our power network or the protection of consumer data.

**As such, we believe there are four main risk vectors:**

**1**

There are risks to our operations and resilience of the electricity network in our regions. One threat vector that increases with digitalisation is that of cyber attack.

**2**

There are risks that we could lose or misrepresent data, causing us to be in breach of laws or regulations.

**3**

There are risks that our chosen path for digitalisation will be ineffective in meeting the needs of our consumers and stakeholders.

**4**

And finally there are risks that we will not be able to deliver the digitalisation strategy due to skills gaps, poor change management or lack of buy-in.

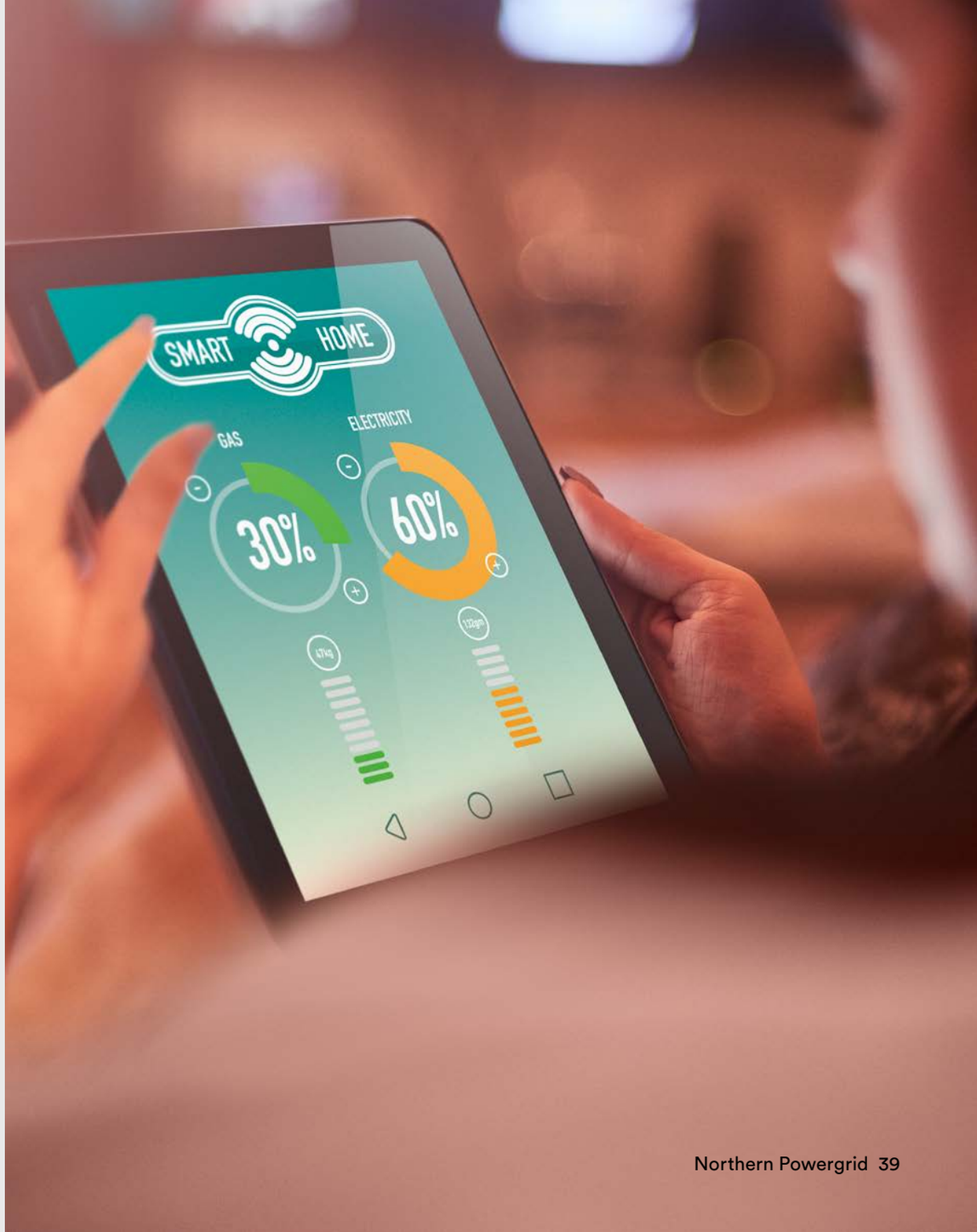
**As with any strategy such as this, we will undertake thorough risk management throughout the programme to ensure all of these are mitigated and managed appropriately but at least acknowledging these high-level risks as we commence means that we will not lose this focus as we develop the plans further.**

# Focusing on cyber and data privacy risks

**As we increase the amount of digital products and services we provide to consumers and stakeholders, we know the risk and impact of cyber attacks increase and the necessity of maintaining solid governance over data privacy will be more important than ever before.**

To this end we have devised a specific set of initiatives targeted at cyber resilience and data privacy but, to summarise, our intention is to keep your information safe by investing in technology that helps us to identify weaknesses in our IT systems and quickly detect attacks. We will use intelligent technology to help our teams quickly identify real-time threats, hunt for and resolve weaknesses in our systems and maintain our strong defences as we open up our systems to more widely share data.

We do not envisage a world where we will vastly increase the amount of personal information we will hold about consumers but we do see that the type of data we will be able to utilise could be more granular and therefore data privacy and our commitment to best practice in this area will remain by accrediting our Information Systems to the ISO27001 and ISO27019 standards. We know, from feedback you have given us on this topic, that you trust us to hold and process this type of data but we will not rest on this trust and will continue to invest in this as a key area of risk mitigation as we continue on our digitalisation journey.



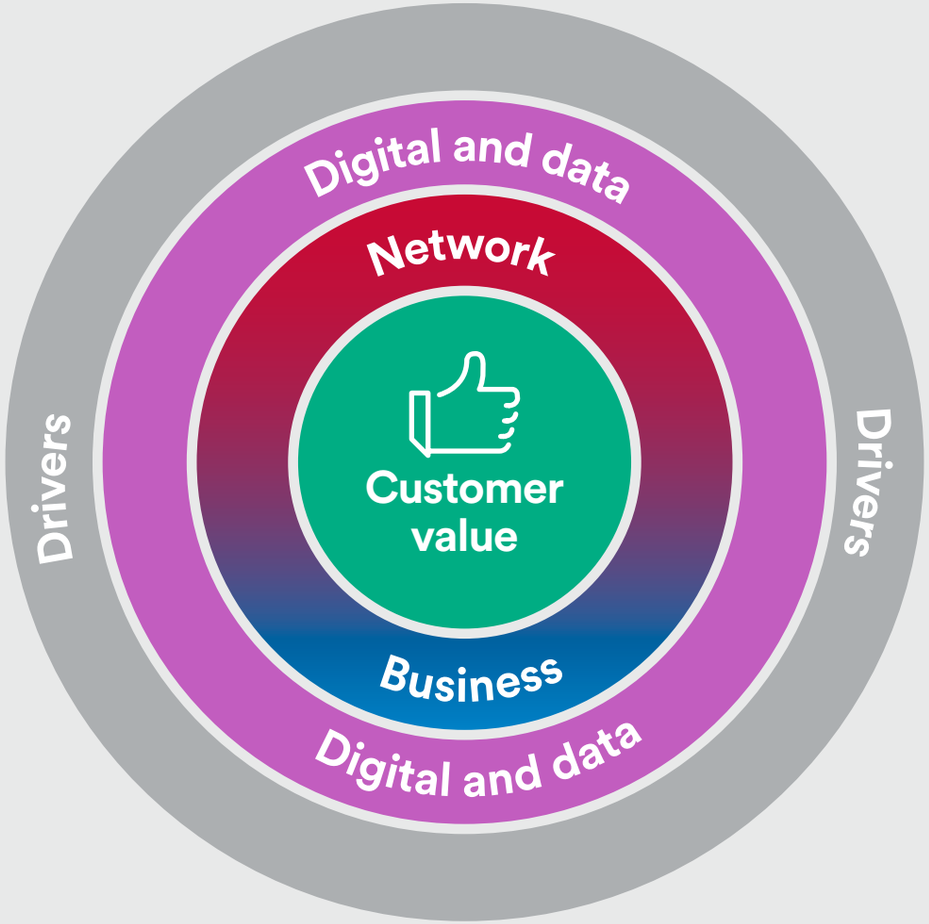
# Brought to life...

**The aim of digital transformation, and therefore our digitalisation strategy, is to meet our changing consumer and business requirements as well as aligning to the findings of the Energy Data Taskforce report[1] and its five key recommendations. This is achieved through the introduction of new, or modification of existing, customer experiences, business processes and technology enabled capabilities.**

As an enabler for these changes, all the initiatives identified within our strategy and action plan should link directly or indirectly to a business outcome, which in turn should link to a consumer value proposition.

The linkage for each initiative back to a customer benefit is detailed in the introductory page of each core area section. To illustrate the point we have pulled out several examples on page 40 and page 41, the former focused on the internal digitalisation of our business, the latter the digitalisation relating to the power network.

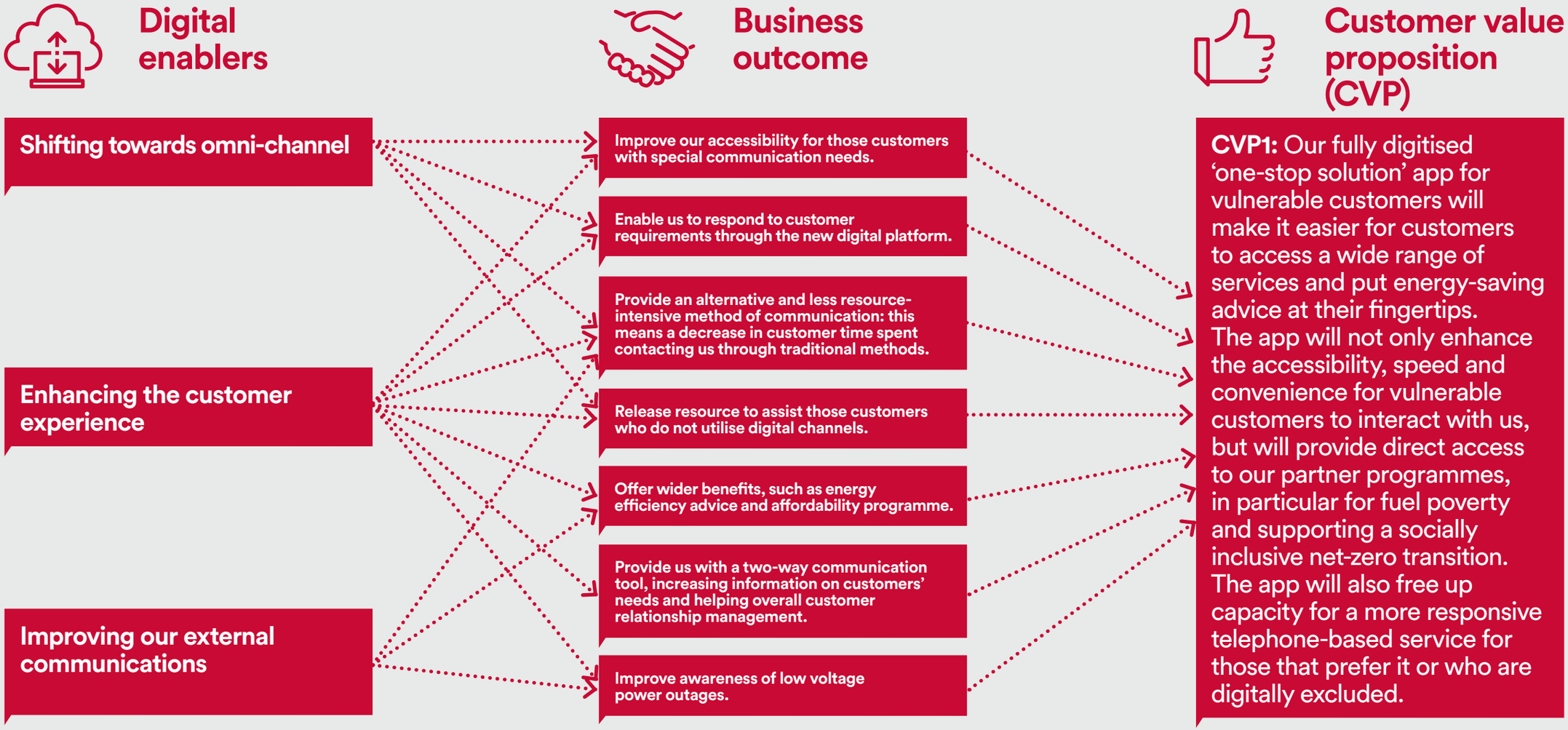
These provide the clear thread between the digital enablers, the business outcomes and the end value for our customers. We will be publishing this linkage in the future, as part of a data catalogue supporting our strategy.




1 Energy Data Taskforce: A Strategy for a Modern Digitalised Energy System (catapult.org.uk).

# How will digitalisation link to our customer value propositions?

This example shows how we will enable consumer value through improved customer service.



# How will digitalisation link to our customer value propositions?

These examples show how we will enable consumer value through improving access and the use of data and increasing resilience.

## Digital enablers

- Building data interfaces and channels so that our external stakeholders can access relevant data, but also effectively provide us with their requests.
- Focusing on data quality and leveraging technology to proactively ensure we have the right data standards in place.
- Surface existing data points and identify new or unutilised data sources. Define how and where these data points could/will be used.
- Building a flexible analytics capability to be able to introduce new data points quickly and build use cases at pace to meet fast changing demand.
- Centralising network data with technologies and tools that allow to quickly scrutinise data, rationalise it and build analytics for decision-making.
- Using digital channels to make it easy and effective for our field colleagues and contractors to capture and submit data at the point of work.

## Business outcome

- Have a full, accurate and integrated centralised dataset with the ability to share in a standard format.
- Have an operating model specific to the management of data for internal and external purposes, including a data request triage process.
- Have a clear strategy for the use of data that can be obtained from the energy system and third-party data sources.
- Enabling real-time visibility of the network, including energy flows and environmental conditions, down to the LV network level, to be able to forecast different load scenarios and predict faults.
- Developing data models to forecast loads and identify reinforcement and interventions in the network as well as ways to better exploit existing assets.

## Customer value proposition (CVP)

**CVP2:** Our free online platform Open Insights will unlock value for our customers on top of our Open Data platform. It will bring together the tools that our customers and stakeholders need to self-serve energy system data, undertake network planning and get low-carbon technologies (LCTs) connected.

**CVP3:** We will dynamically manage voltage on our system to achieve behind the meter benefits at 30 per cent of domestic properties in the 2023-28 period, increasing to 80 per cent over the project lifetime. Our solution (currently midway through innovation trials) will improve energy efficiency, delivering an estimated annual average reduction of around £20 in customer energy bills and 27kg of carbon emissions per household each year.

**CVP4:** First stage deployment of a blueprint for the next generation energy system, rolling out 30 innovative microgrid solutions in some of the most remote parts of the network to enhance system resilience.

# Roadmap

To bring to life some of the initiatives that will underpin our customer value propositions, the infographic below depicts where we see these mapping across the three time-bound stages: Enable, Expand and Enhance.

**Example one:**
Throughout this journey consumers will begin to have access to more and more data at increasingly higher quality and timeliness. This should increase the value of the data, particularly as we encourage, through integrations, the collation of external datasets.

**In progress**

**Data strategy & architecture:**
will provide us with a vision for managing data and our data stakeholders, as well as an architecture and an operating model through which the whole organisation will come together for delivery of data requirements.

**Data quality:**
will help us enhance the quality of our data, through direct input, and will reduce a reliance on spreadsheet and other sub-optimal methods of collection and sharing through use of digital solutions.

**Digitised data entry in the field:**
builds on our data quality initiative to further enhance real-time data quality from Field Operations using validated mobile data input.

**Continue on our data transformation roadmap:**
to provide increasingly more detailed, useful information for our customers and stakeholders and to ensure our data is available to those who need it.

## Enable

## Expand

## Enhance

**Data transformation:**
we will prioritise data stakeholders' requirements; define pilots; and test and refine an end-to-end delivery approach. Using the results of the pilot(s), prioritise projects and improvement activities to iteratively grow the data capability in ED2.

**New data integrations:**
we will deploy new, systematic ways of accessing our data, predominantly through our new web environment, to allow consumers and stakeholders to access our data as it becomes available.

**Further data integrations:**
as we continue to make more of our data available, so too will we develop real-time, API driven integrations to provide data but also to interface with the wider energy systems as they develop to allow for flexibility market development.

# Roadmap

**Example two:**
Throughout this journey stakeholders can increasingly get information about our assets, how they operate and how they build up into a wider systems map of the entire energy system.

**Asset platform upgrade:** in order to provide improved access to system asset data. Enhance security and produce a new architecture that sets the foundation for building future functionalities.

**Enterprise sensor exploration:** will help us establish where and how to deploy additional sensors around our power network to gain more asset information in real time.

**Condition-based risk management:** enhancing our current condition-based risk management capabilities will allow us to be more efficient in the utilisation of resources and target capital investment. It will also give stakeholders a clear view of how we model our asset risk management approach.

**Enterprise sensor deployment:** in collaboration with our DSO plans and decarbonisation agenda we will collect, correlate and create more useable, real-time asset and energy system data which can then be accessed and used by stakeholders to gain more knowledge about our part of the energy system.


**Upgrade of interfaces:** will allow us to share this data more widely within our organisation systematically but also pave the way for these interfaces to surface asset data to consumers and stakeholders.

**Further data integrations:** by utilising data integrations to their fullest we will be able to share asset data to participate in such national initiatives as the unified digital systems map of the energy system.

**For more in depth detail of our plans, benefits and outcomes, see here.**

# There is a series of activities that we should undertake to implement and drive our digital transformation

## Enable

**100%** Level of progress — DSAP journey

| First Ofgem digitalisation strategy | Digitalisation and action plan Iteration 1 | Next iterations of digitalisation and action plan published | Draft digitalisation and action plan next iterations | Preparing for implementation | Testing our delivery capability | Full scale digital transformation |
|---|---|---|---|---|---|---|
| **Activities** | | | | | | |
| Our roadmap to digitalisation submitted to Ofgem, informed by EDTF and wider stakeholder views. | The DSAP includes an action plan to underpin the strategy, creating a clear set of business-aligned digitalisation initiatives. | DSAP published to website. | Enhance our DSAP and include our ED2 business plan outputs and any revisions to our digitalisation initiatives. Rigorously test that our initiatives are both architecturally and economically robust. Refine/quantify our initiative business case(s) and so directly feed the ED2 business planning process. | Evaluate and assess our as-is and target architecture and our Target Operating Model (TOM) in line with our people strategy and wider organisational design. Identify and resolve any changes to the business and IT delivery model required to implement the digital capabilities and realise the business benefits. | Run early proof of concepts and pilots to test and learn through an early set of initiatives. | Execute the DSAP and wider programmes to set the foundation for a successful ED2. |

# Data & digitalisation strategy



# Digitalisation has been part of our journey for some time now...


We have become members of ODI Leeds, a pioneer node of the Open Data Institute, to deepen our skills and understanding of Open Data and its security requirements. We are publishing and consulting now on our Distributed Future Energy Scenarios using an Open Data approach, to co-develop our regional forecasts together with our stakeholders, in line with our security standards.


We are delivering a smart grid enablers programme, which is transforming our ability to monitor, control and communicate with more than 860 major substations and 8,000 distribution substations. This will enable us to respond to real-time information about power flow on our network. Deployment of remotely controlled network switches in conjunction with automated network switching algorithms to minimise the number and duration of customer interruptions.


We have built a connections portal that allows customers to interact with a digital model of our network and self-quote for network connections such as new housing and public electric vehicle charging points. The tool also provides a first of its kind heat map of capacity for local low voltage (LV) networks. For the first time, customers have access to real network data to optimise the connection quotation process.


We are enabling new capabilities for our colleagues by investing in rolling out modern devices and software to support efficient collaboration, better connectivity and ease of use. All of which empowers our colleagues to be able to deliver excellent customer service.

# Digitalisation has been part of our journey for some time now...


Use of mathematical algorithms to assess and predict asset health using data which informs capital investment decision-making, the determination of maintenance policy and regulatory reporting on network outputs. Power system design tools form a 'digital twin' of the network used to model a wide variety of operational conditions as we transition to more active network operation. In combination with network monitoring data this is a key DSO enabler to providing information on the energy network.


We have deployed an agile, developed Customer Relationship Management tool to allow our customers to self-serve on an increasing number of services we provide. We will continue to develop new services throughout ED1 and utilise this as an underpinning service into ED2.


We are moving to an evergreen technology environment whereby we are continually iterating to avoid technology debt and encourage the adoption of emerging technology to drive efficiencies.


We have successfully piloted a number of RPA initiatives across our back and front office functions, proving that we can make efficiency gains and process improvements in a rapid and responsive way, as well as ingesting some of our operational data into a repository, and allowed a machine learning algorithm to spot patterns that might help us predict things such as our estimated time to recover from a fault.

# Digitalisation has been part of our journey for some time now...

We are already investing in initiatives that enable data analytics and drive consumer value, an example of this is our Foresight project, detailed below.


## Enabling data analytics

**Our Foresight project is developing fault prediction and location techniques using data collected on our LV network and deploying network technology to automate the restoration of supplies to customers.**

The development of functions required for DSO includes making use of intelligence from data to develop increasingly active networks that deliver high levels of reliability and availability for customers. Identifying and preventing potential power cuts before they happen will help us deliver on this customer-focused ambition. We can do so by improving our understanding of our network's status through data analysis. Foresight is a three-year project that will enable us to spot the tell-tale signals on the network before a fault happens. It will improve our understanding of indicative pre-fault behaviour of LV cable networks and our ability to develop management options for it.

A greater understanding of fault types will support a radical change in our approach to replacement works and will improve network reliability, efficiency and maintenance programmes, which will benefit our customers and result in less physical disruption on the network and roads. If we can fix faults in advance, we will keep the power flowing to all of our customers and not only play our part in resource conservation by saving materials, but also minimise the need to dig up roads, which causes traffic disruption for local businesses and householders.


## Improving network planning and operations

**Our eAM-Spatial programme has delivered a single integrated network model that provides a single data repository for network asset information including asset attribution, spatial location and network connectivity for all our network assets.**

Combining a full asset attribute model, locational data and a comprehensive network connectivity model provides a single source of the truth regarding our network asset information. The integrated network model which interfaces with our distribution management system provides the basis of an intelligent model crucial to the development of functions required for DSO. We have a single integral model that allows all areas of the business and external data users to share information in compatible ways and formats.

The integrated network model is central to network design and planning. It is designed to integrate further with active network monitoring on the LV and HV networks and is providing an increasingly intelligent tool for the active management of the network.

Our eAM-Spatial solution is interfaced with other Information Systems to provide external access to our data and is used to provide the data source for our AutoDesign capability. Moving forward we will expand the availability of the data held within the system on an Open Data basis.

# Digitalisation has been part of our journey for some time now

Transforming customer experiences is another area where we are investing now to be strongly positioned for our ambitions for the next price control period.


## Transforming customer experiences

**AutoDesign is a new online, self-service tool that allows customers to self-serve to receive budget estimates on LV connections in minutes, and for free, with the ability to guide customers to the most cost-effective connection options. We expect it will accelerate low-carbon technology deployment by our customers, and assist our own LV design processes.**

We have a project currently running to expand this capability into higher voltages and to allow customers to obtain a full self-service design capability based on our current network configuration and then take that design through to either an estimate or a binding quotation that they can accept and pay for online without the need to engage with our teams.

This same solution will be used by our technicians where customers prefer to engage with us on a face-to-face basis and in this regard an extension to this project will see us expanding our capability to offer timed appointments for such engagements.

The outcome of this initiative provides our connections customers with omni-channels of their choice, speeds up the estimation, quotation and acceptance cycle and contributes towards decarbonisation through reductions in travel.


## Leveraging intelligent automation

**We are undertaking a cutting-edge machine learning project that will employ machine learning to predict the estimated times of restoration for our unplanned power cuts.**

We record power cut information in our Outage Management System (OMS) and machine learning will combine this data with other internal and external data sources to provide us with better insight into the factors that influence restoration times. We will use this insight to make predictions on when we will restore power to customers and improve the accuracy of information that we provide to our customers, something we know is important to them and will make a real difference to them being able to work around any service interruptions.

This marks only the beginning of our journey to use automated intelligence with our existing and emerging datasets to be able to better predict, plan and adjust according to actionable data insights. The key for us in exploring automation initiatives such as this one is that we recognise the market is not rich with the types of resource that would typically have been employed to deliver such insights. Being able to leverage technology to reduce the need for such resource means we can still enable the ambitions set out within this strategy and our business plans to underpin our output areas with high value, real-time and Open Data.

# Data & digitalisation strategy



# Our data vision – Empowered People – Informed by Data – maps to EDTF recommendations and directs our data capability build-up

— The data vision considers our data needs, values, current state and aspirations in a resilient, robust and future-proof manner. It has been built on (internal and external) stakeholder requirements for data, including Ofgem and the EDTF.

— Our data vision is built on three foundational principles that can be mapped to Ofgem's DBP principles:

1. 'Data is an asset': We take ownership and manage data as an asset.
2. 'Data is FAIR (Findable, Accessible, Interoperable, Reusable)': Data is available for advanced analytics to optimise our processes and operations.
3. 'Data is shared and trusted': Data is 'presumed open' and of the highest quality.

**When we follow our data vision, these are the benefits we create:**

**Meet stakeholder requirements**

— Stakeholders (external and internal) want data that can be accessed and trusted and is timely, secure, reliable and future-proofed.
— Owned, managed and interoperable data will enable new data products and services for customers, employees and the general public.
— Real-time engagement across different channels can be optimised, whilst connecting different datasets will allow the capture of the voice of the customer and obtainment of 'actionable' insights, i.e., how to improve our operations and customer services.

**Empower our people**

— Communicating a clear data vision will develop a better understanding of both data requirements and the benefits of data.
— Making data accessible in a meaningful way is important for our external and internal stakeholders – there is a clear requirement for a single source of the truth to simplify reporting and analytics.
— Improved data maturity will significantly improve our ability to meet stakeholders' data expectations.

**Accelerate the move to digitalisation**

— Understanding and accessing data are key stakeholder requirements. Investing in scalable data platforms will allow us to increase time on analysis rather than collecting and cleaning data.
— Interoperable data is a key enabler for our digitalisation ambitions – data models and standards influence outputs and outcomes.
— Data analytics will deliver value through actionable insights, e.g., predictive modelling and optimisation.

# Our data vision informs the capabilities required to deliver our data analytics and Open Data products and services

### Process & organisation

— Integrated, scalable, cross-functional teams with focus on delivery of business value.

— Enterprise governance ensuring controlled delivery of validated analytics including AI/ML to business units.

— Rapid feedback and model iterations to maintain alignment with changing business environment.

### Skills & people

— Agile ways of working, skills to deliver end-to-end.

— Balancing project delivery and enterprise integration – delivering fast while allowing for generalisation and re-use.

— Understanding of complex and rapidly evolving tooling landscape to ensure correct selection for the context.

### Automation & infrastructure

— Automation of key tasks such as ingest, deployment and testing to ensure high cadence iterative development allowing models to improve.

— Orchestration of data and models for efficient machine learning pipelines.

— The platforms required for a scalable analytics capability.

— Open Data interface with managed access.

### Data projects

— Analytics use cases of identified value for Northern Powergrid.

— Open Data products and services with clear benefits for stakeholders, APIs and access rights.

— Prioritisation criteria clearly defined.

Building up these capabilities will enable us to maximise the value of data through reuse and overlay of internal and external datasets. Open Data products and services that we will deliver will facilitate innovation, and creation of new business models for decarbonisation.

# Driving the change

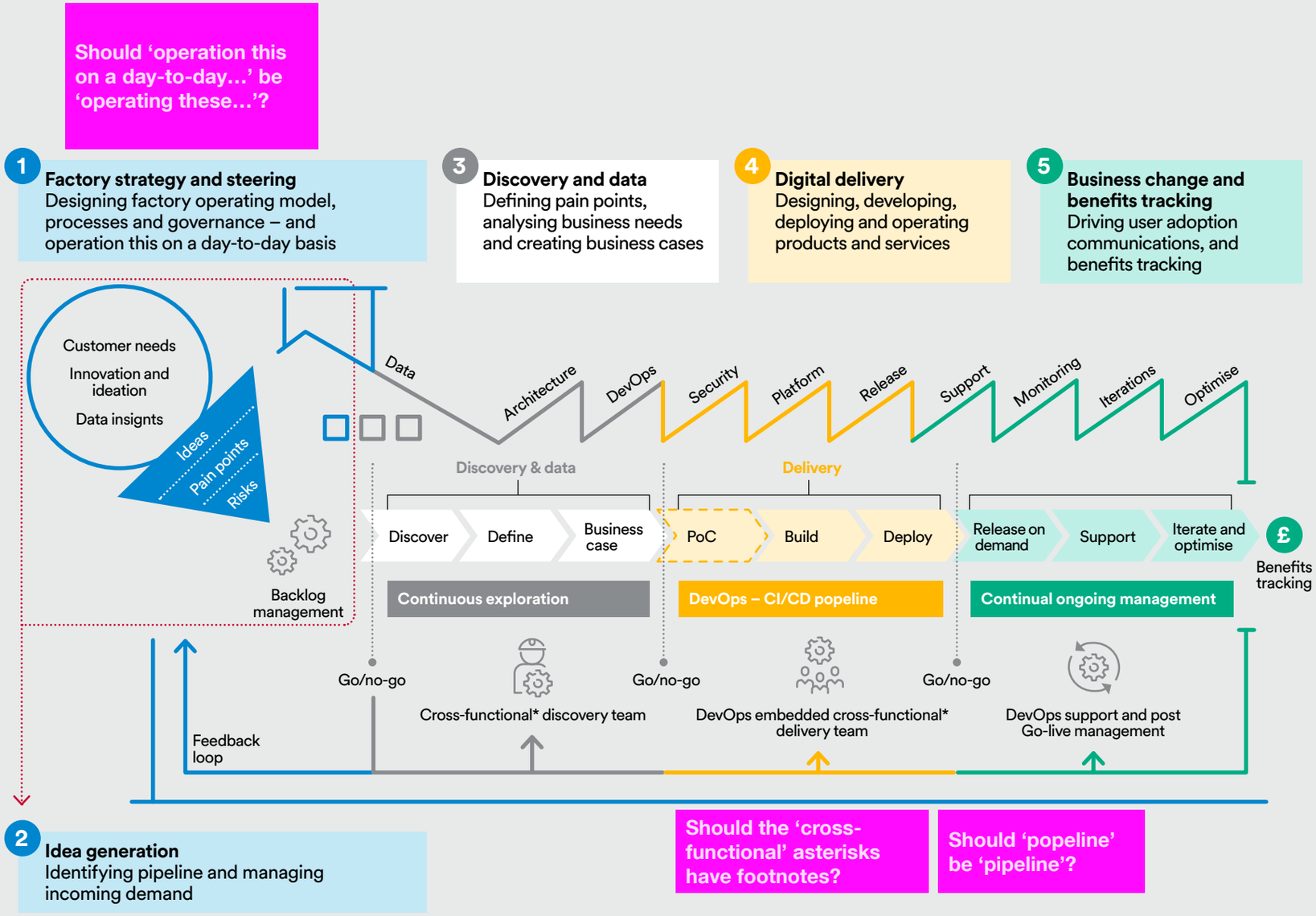
**We are creating a Data and Digitalisation Transformation Office (DDTO) to enable us to accelerate the delivery of data products and services, while building out the capabilities required in ED2.**

This is a scalable data function within Northern Powergrid that will be able to deliver our wider data vision and data requirements. It will:

— operate as a centralised function
— enable a quick route to market for in-demand skills (e.g. data scientists etc.), leveraging existing commercial frameworks/ strategic partners
— be scalable, adaptable, end-to-end, and multi-disciplined.

This approach will deliver tangible benefits to our stakeholders whilst building key foundational capabilities:

— Collaborative in-house agile delivery facility built on a cloud, microservices and API-first platform.
— Data governance capability accelerating our journey to improved data quality.
— Data analytics & data visualisation capability.



# We have identified and agreed a process of defining analytics and Open Data products and services

## 1. Creating a list of potential datasets and analytics projects

We utilise 'Art of the Possible' workshops and hackathons – both internally and externally – to identify and collate datasets. A data catalogue based on a systems view is being built.

The below slide illustrates the various data towers: current and potential data products (in red) and data services (in blue).

## 2. Identifying stakeholders' data and access needs

Our internal and external stakeholder engagements will have more focus on data. The Modernising Energy Data Access (MEDA) initiative is also used for additional input, and needs can be mined from feedback in regular intervals and through hackathons and workshops. One of the most important aspects is identifying both essential and desirable datasets that are needed for a product or a service.

The below slide illustrates an example using Modernising Energy Data – user needs.

## 3. Prioritising cases

Use cases are then prioritised through a cost/benefits lens based on a range of criteria:

- size of demand for data and urgency
- potential benefits for internal and external stakeholders
- costs (incl. time and effort)
- synergies between projects
- learnings for the organisation
- risks of opening datasets.

For each case, a growth path can be outlined starting small and adding features, APIs etc.



# We have created prioritised lists of analytics and Open Data products and services that we will initially build as Minimum Viable Products (MVPs)

Using this process, we have created a preliminary list of use cases and a proof of value backlog that are:

— mapped to external and internal stakeholder needs (thus provide value to different stakeholder groups and Northern Powergrid)

— prioritised by estimated cost/value/risk/ achievability etc.

— achievable in given timeframes and can be extended further

— allowing learnings for DDTO (e.g. agile ways of working and solving complex problems).

For prioritised use cases, proof of value charters with more details are created containing:

— data and analytics requirements

— stakeholders' needs

— risk and dependencies

— delivery/acceleration plans.

**For more information on our data products and services' proof of concepts see here.**

**A MVP is the first phase of a (potentially large) data project that lasts 6-12 weeks. The result is a proof of value, which is enough (minimum viable) to either show or falsify that this data product or service will add value. After an MVP, we make an informed decision, through use of stakeholder feedback, to either scale and industrialise, pare back or to 'fail fast' – so that the investments remain minimal.**

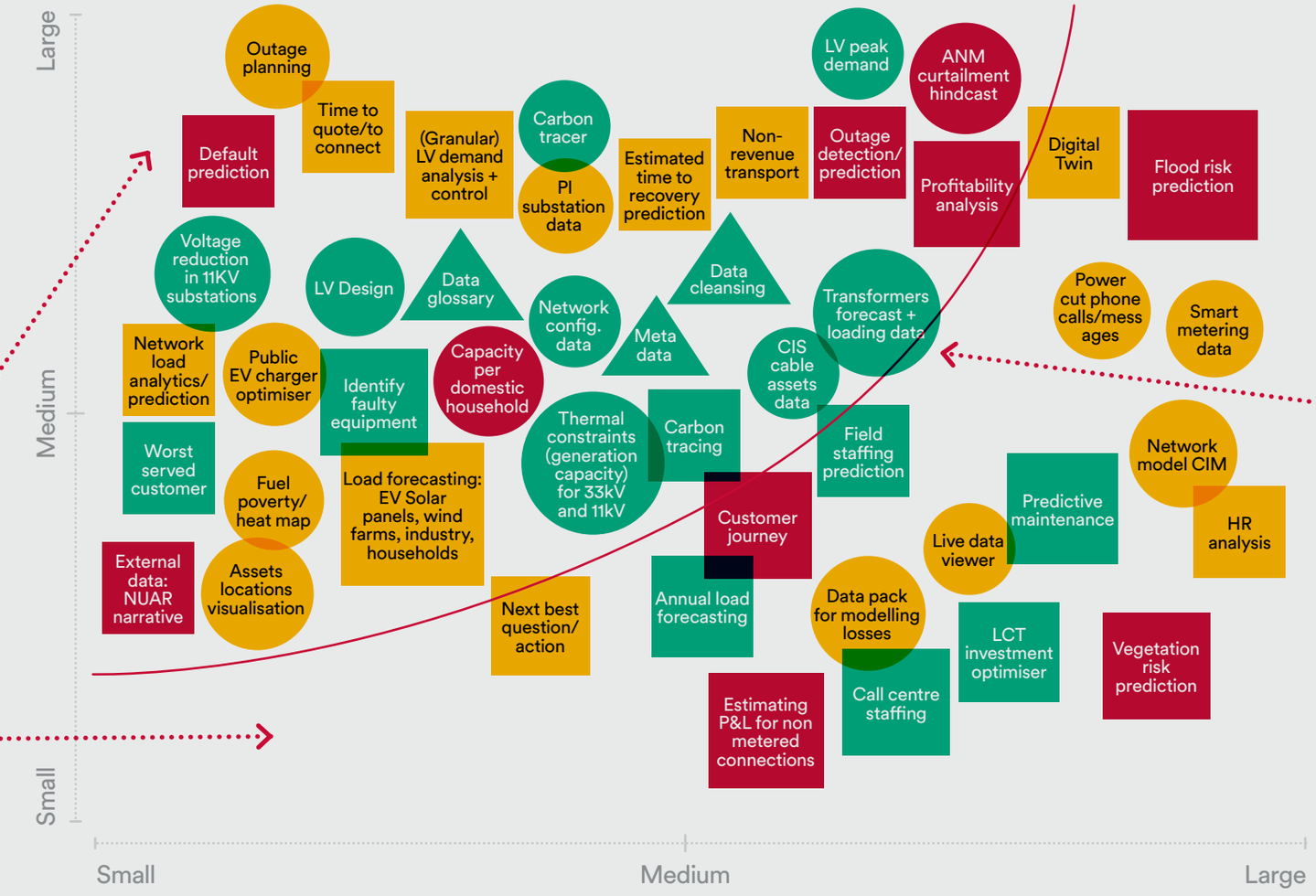
# We have conducted an initial prioritisation by mapping data use cases to a cost/value grid

**Key**
**Project type:**
- ■ Analytics
- ● Open Data
- ▲ Data foundation

**Risk:**
Small
Medium
Large

Projects can be charted out with the **high-value/ low-cost cases favoured over others** (upper left corner in the pictured diagram).

**The cost/value of the use cases** that are displayed here are based on estimations from initial case-by-case discussions (as small/ medium/large for both axes). For each case, a growth path can be outlined.




In addition to cost/ value, other variables may be considered such as **synergies between projects, learn effect for the organisation**, etc.

**Most projects can be defined as a growth path.** In the first instance, value is quickly created with a low investment on data and other resources. If that proves its value, it can be scaled up, potentially justifying larger investment for higher gain (e.g., real-time visibility of assets).

# Our current data activities are compliant with DBP guidelines. We have defined next steps to go further.

## Current data activities

— Designed a data model leveraging our defined data architecture for our current most important fields (regular reports, asset management, finance).

— We have scoped and are delivering projects to cleanse data and provide metadata, attribute data ownership, and make data interoperable/combine it with data from different sources to create insights. Our Asset Management and Finance systems are built on comprehensive/intertwined data models.

— Engaged with (external and internal) stakeholders to elicit users' data needs and wants. We have used the MEDA (Modernising Energy Data access) methodology, whilst we have clearly identified data owners and are establishing data towers.

— Our current cyber security and privacy (GDPR) measures go beyond DBP guidelines.

— Fully scoped a comprehensive/scalable data platform to support all current and future data requirements. This platform will support our plans to Open Data and so build data products and services in line with the recommendations in the Energy Data Taskforce report.

— Running numerous data science projects, that bring together data from multiple sources to gain business insights. This includes the ETR machine learning solution which will deliver a machine learning solution to predict estimated times of restoration.

— We are currently exposing data that is static or updated infrequently (e.g. Distribution Future Energy Scenarios) but have a clear plan for developing a strong Open Data proposition.

## Next steps (+ timelines from initiation to full maturity)

— Data governance will be embedded across the organisation, with clear roles and responsibilities identified and assigned (0–3 years).

— Data quality and metadata landscape will be actively monitored and managed. Two specific 'data foundation' projects are in the backlog for this, although this is a side activity for all data projects in the backlog (see annex for details) (0.5–4 years).

— Establish a scalable data catalogue by filling in missing metadata and adhering to metadata standards. The catalogue will support internal and external (through a dedicated portal) data discovery (0.5–4 years).

— We will implement our Open Data triage roadmap and grow towards a 'presumed open' data state. Please refer to the data backlog in the annex for more detail (0–4 yrs).

## Compliance with DBP

Please see **here** for details on:
1) how we are compliant with the 12 DBP principles and our plans to develop our data capabilities;
2) our plans to open datasets and so build data products and services.

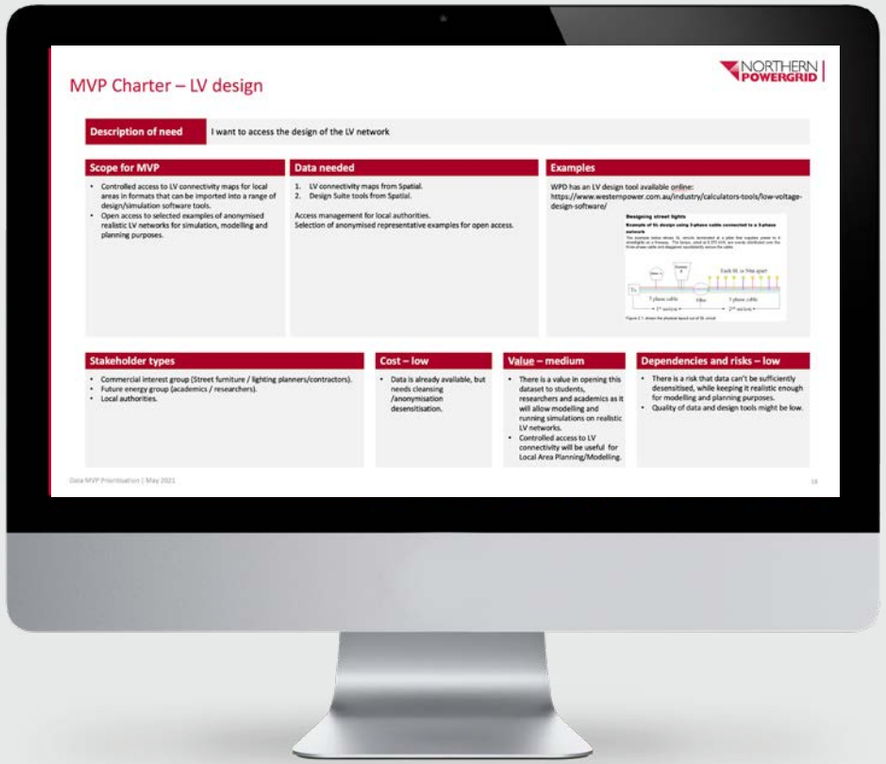
# An example: LV networks – how data can help

— Balancing generation and demand of local energy systems will be the main focus in the future. Our LV monitoring investment, smart meter data and use of data analytics to fill in the gaps will enable enhanced visibility of LV networks.

— This will allow us to optimise reliable service and accommodate more low-carbon technologies (electric vehicles, heat pumps, solar panels) in your neighbourhoods.

— To manage the volume of new data (incl. sensors), new ingestion, storage and analysis tools will be deployed, with data governance and processes guided by the DDTO and our data vision principles.

— With appropriate sensitivity mitigation techniques, we will be able to share some of the LV data openly – so it can be used by third parties for predictive modelling, running simulations, learning about optimal LV design, exploring how to increase resilience, schedule local batteries or avoid expensive reinforcements.



# Making it tangible for Open Data: how will our vision, capabilities and projects maximise the value of data during ED2?

We currently publish 14 data packages which are manually refreshed either on a monthly, daily or annual basis, except for Power Cuts Live, which are real time. During ED2, based on stakeholders' input we plan to:

- increase the number of available data products and services by 70% and automate update processes, with an expected 45% of the data products and services to be refreshed in real time
- expose at least 10 new Open Data products and services equating to gigabytes of interconnected data. These can be combined with data and inputted into models and simulations, e.g. complex decarbonisation modelling
- improve data quality within at least 40% of our key datasets
- provide access through a user-centric and future-proof data platform using open standards such as RDF, XML, CGMES, CIM etc
- deliver data products and services through APIs as well as dedicated portals
- build the data catalogue (a map of all our datasets) with an external interface and links from sector Open Data aggregators
- create data dictionaries and usage vignettes to accompany our open datasets, products and services, so that users can understand the data we are providing.

**Delivering our vision and developing data capabilities will enable the discoverability, accessibility and interoperability of our data, thereby maximising its value and opening new opportunities for our stakeholders, our business, and our network on our path towards net zero.**

# Data & digitalisation strategy



**In one of our earlier iterations of the plan (March 2020), we identified again that we wanted to implement, operate and participate in a digital energy system, using technology to continuously innovate and evolve as a digital business.**

We recognise the importance of digitalisation to our role within the GB energy system and how it provides us with the opportunity to embrace the new functions of DSO to the role of a distribution system operator whilst also providing exemplary customer service and operating a modern digitally-driven business.

Delivering a digital energy network and a digital business is key to underpinning our future strategy. In delivering this capability, we will focus on our five outcomes:

- **Open & transparent**
- **Whole system efficiency**
- **Service excellence**
- **Cyber secure**
- **Reduced cost**

# Introduction

**Outcomes are delivered through digitalisation initiatives**

To arrive at relevant and impactful digitalisation initiatives, a functional view from our business, customer engagement and regulatory guidance have identified which capabilities need to be enhanced and changed. Mapping to business objectives shows why such capabilities are in scope for change and can be found in the following slides.


## Business objective

During development, key internal stakeholders from multiple functions and business areas were engaged. Using input such as Emerging Thinking, DSO strategy, immediate needs and future ambitions, the stakeholders stated objectives they wished to achieve.

Using an analysis methodology, we have consolidated these objectives and mapped them to the associated capabilities and initiatives.

**For every objective, there may be multiple capabilities and initiatives.**

## Capabilities required

We have mapped business objectives to business capabilities using logical capability models. Delivering these business objectives will require new or additional capability.

The mapping identifies where potential investment and change is required. We have consolidated capabilities and appropriately linked them to associated business objectives.

**For every objective, there may be multiple capabilities.**

## Initiatives

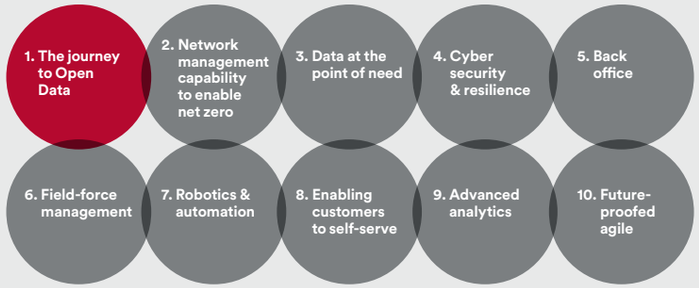
The digitalisation initiatives will deliver the new or additional business/technology capability required to deliver the DSAP.

We have identified a number of initiatives, which we have consolidated and appropriately mapped to associated business capabilities.

**For every capability, there may be multiple initiatives.**

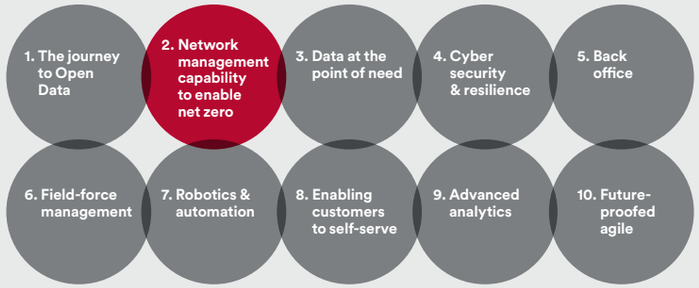
Consolidated initiative proformas provide further narrative. The reader is also advised to refer to the detail in the initiatives section.

# 1. The journey to Open Data



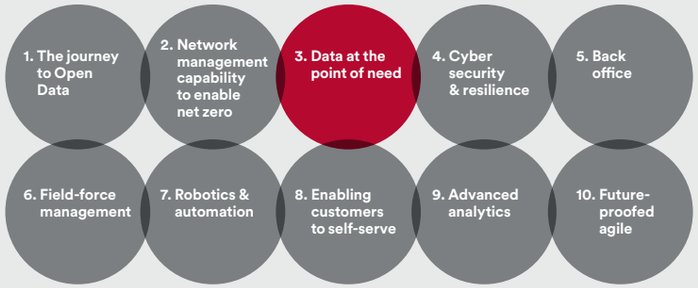

| Objectives | Capabilities required | Initiatives | |
|---|---|---|---|
| **Evolving the operating model** to set IS as an enabling function for digitalisation | Data quality management | Data governance | |
| **Focusing on data quality** and leveraging technology to proactively ensure we have the right data standards in place | Data strategy and governance | Data gap analysis | Data cleanse |
| **Using digital channels** to automate or make it easy and effective for our field colleagues and contractors to capture and submit data at the point of work | Data delivery | Data integration platform | API integration |
| **Enhancing the responsiveness of our organisation** so that we can respond to stakeholder requests more efficiently and transparently | Data triage and requirements management | Asset data integration | Cloud data platform |
| **Building Open Data interfaces and channels** so that our external stakeholders can access relevant data, but also effectively provide us with their requests | | | |
| **Using all possible sources for data** and identifying technologies to be triaged and integrated as they become available | | | |

# 2. Network management



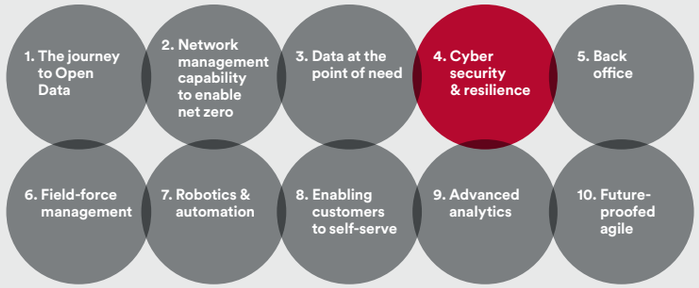

| Objectives | Capabilities required | Initiatives | |
|---|---|---|---|
| **Enabling real-time visibility of the network** including energy flows and environmental conditions, down to the LV network level, to be able to forecast different load scenarios and predict faults | Network risk management | LV management technology | Microgrid management |
| **Integrating network operation systems** and introducing commercially available systems into the control room to enable flexibility mechanisms | Network Operations management | Flexibility customer platform | DERMS |
| **Continue with digitalisation of the grid** to set the foundations for the development of DSO functions for our territories | | Advanced DMS | Network planning and operations |
| | | Digitalisation of the grid | |
| **We are enabling decarbonisation** by deploying smart grid voltage solutions, real-time thermal ratings, automatic load transfers and employing risk-based decision-making capabilities | | Network Operations, forecasting and analytics | Network Operations, automation and AI |
| **Interact with the Energy System Operator (ESO)** by establishing a direct ICCP link for real-time interaction between control rooms | Participation with ESO | ESO ICCP link | |

# 3. Data at the point of need



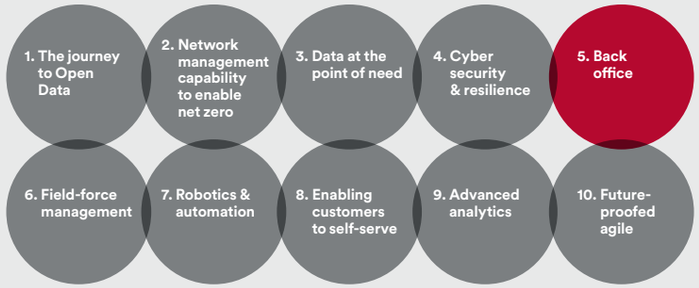

| Business objectives | Capabilities required | Initiatives |
|---|---|---|
| **Focusing on the end-user experience** with platforms that foster collaboration and productivity | End-user experience and support capability | M365 basic use |
| | | M365 extended use |
| **Building our digital skillset** to ensure our colleagues are ready for digitalisation | | Digital experience monitoring |
| **Enabling colleague self-services** to enable consumption of our information on demand | Intranet management | Colleague self-service and intranet |

# 4. Cyber security & resilience



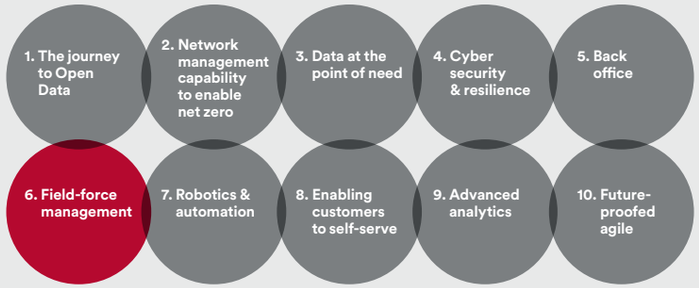

| Objectives | Capabilities required | Initiatives |
|---|---|---|
| **Transforming cyber security** to deliver highly effective cyber security services in IT and OT | Cyber security capability | Implement EDR<br>Additional cyber security tooling<br>Enhance NIS-D |
| **Enhancing the telecoms network** to better manage the telecoms assets<br>**Fully supported telecoms infrastructure** through replacement of retiring technologies | Telecoms management capability | Telecoms asset management solution<br>Telecoms asset replacement |

# 5. Back office




| Business objectives | Capabilities required | Initiatives |
|---|---|---|
| **Modernising back-office systems** to build data driven insights whilst improving compliance | **IT governance and architecture capability** | **Back-office standardisation** |
| **Improve back-office efficiency** through the adoption of standard processes and system consolidation | | **Back-office consolidation** |
| | | **Hybrid cloud optimisation** |

# 6. Field-force management




## Objectives

**Enhancing our project management capability**
to enable better integration of project data with our systems

**Digitalising work and material management**
to have more control over costs and optimise resources

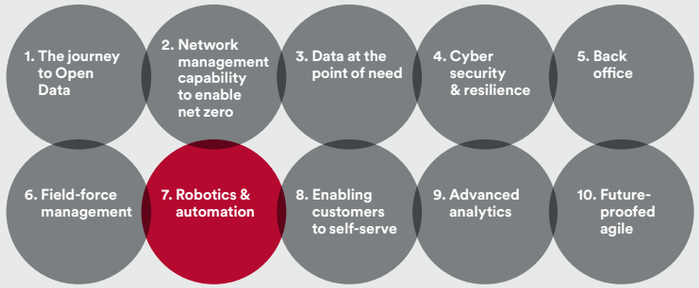
## Capabilities required

- Engineering project delivery capability
- Work planning and scheduling capability
- Material and inventory management capability

## Initiatives

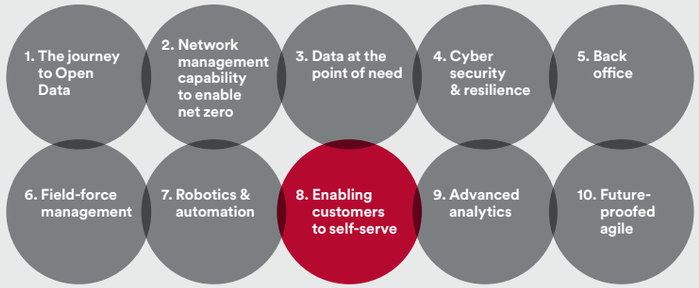
- Work and material management blueprint
- Work management solution
- Work management for connections
- Field-force mobile
- Supply chain tooling
- Material management solution

# 7. Robotics & automation



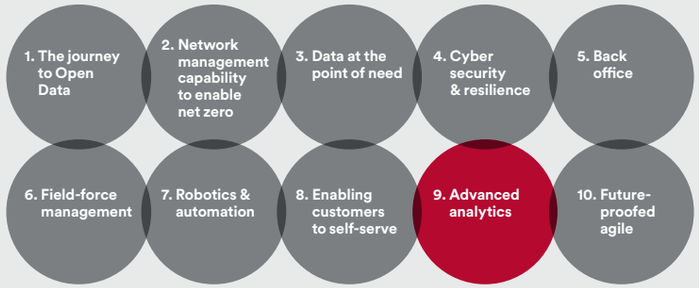

| Objectives | Capabilities required | Initiatives |
|---|---|---|
| **Using automation** to standardise processes and remove manual tasks. This will be done across all business areas | Systems integration and process automation | Scaled RPA |
| | | Customer and People Services automation |
| | | Operations automation |
| **Integrating systems** by leveraging a modern architecture to reduce manual activities and expand the ability to access common data | Customer data and records management | Integration of master data |
| **Optimising processes** to provide faster customer services while improving the colleague experience | Process improvement | Process mining |

# 8. Enabling customers to self-serve




| Objectives | Capabilities required | Initiatives | |
|---|---|---|---|
| **Shifting towards omni-channel** that customers have access to all and preferred channels whilst providing self-service functionality | Real-time chat and automation capability | Video chat and omni-channel | AI powered chat |
| **Improving our external communications** providing intuitive, modern and effective communications through preferred customer channels | Channel development and integration | Contact centre modernisation | Social listening |
| **Enhancing the customer experience** to deliver high standards along well developed customer journeys | | Digital customer journeys | Open Data portal |
| **Delivering connections sooner** to outperform regulatory performance criteria for time to quote and time to connect, whilst giving choice to the customer | | Customer service analytics portal | Cloud enabled website |
| **Automating our connections estimates and quotes** to provide customers with fast, on-demand estimates and quotations for their different connections requirements | Enquiry management and response time estimation | Connections performance framework | Connections digital journey |
| **Continued regulatory compliance** Through alignment with the central switching programme and other regulatory changes | Quotation management | Connections CRM | Automated self-serve connections |
| | Regulatory compliance | Metering registration system | |

# 9. Advanced analytics




## Objectives

**Centralising network data**
with technologies and tools that allow us to quickly scrutinise data, rationalise it and build analytics for decision-making

**Developing data models**
to forecast loads and identify reinforcement and interventions in the network as well as ways to better exploit existing assets, assessing business, customer and energy network scenarios

**Building a flexible analytics capability**
to be able to introduce new data points quickly and build use cases at pace to meet fast-changing demand

**Leveraging analytics for investment planning and system operations**
to model flexibility levers and commercial constraints to optimise our investment plans

**Increasing the use of data in asset management**
to understand the health of assets and identify interventions

**Centralising safety, health and environment**
to enable analytics and better reporting of incidents

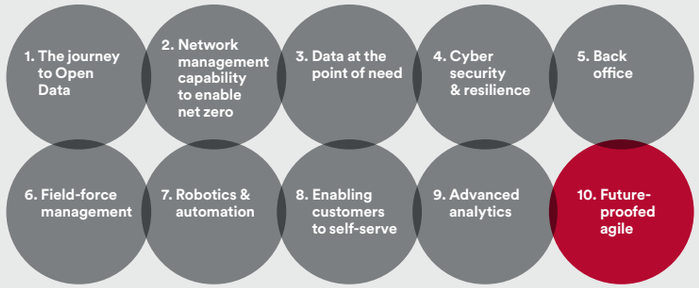
## Capabilities required

- Exploit new data opportunities
- Network investment management
- Network planning
- Risk management

## Initiatives

- Cloud analytics platform
- Data accountability
- Analytics platform
- DSO sensor deployment
- Enhanced network modelling
- Asset data platform
- Control room analytics
- Digital twin
- Condition-based risk management
- Health and safety analytics

# 10. Future-proofed agile




| Objectives | Capabilities required | Initiatives |
|---|---|---|
| **Moving towards a modern architecture** to allow flexibility and rapid integration of future services | **Infrastructure and cloud management capability** | **IT operating model for cloud**<br>**Initial cloud footprint**<br>**Cloud data platforms** |
| **Migrating to the cloud** to enable scalability while reducing technical debt | | |
| | **Finance and business performance reporting** | **Hybrid cloud for finance** |

# Action plan



# The action plan section of this document details initiatives we will be working on in the next six months

This section identifies initiatives that are either in flight or will start in the next 6 months. It outlines the core areas including their importance for our business and, our customers, and how they enable our intended outcomes.

The plans displayed in this section cover the remainder of ED1 and the whole ED2 regulatory periods to show initiatives in the next 6 months in their wider context.

Further information on these initiatives can be found in **Annex 2: Initiatives**.

To implement our strategy we know, at a high level, we will have to:

**Adopt new technologies**

+

**Cleanse and maximise our data**

+

**Embrace a digitally enabled culture**

It is important to recognise that our action plan is fluid by design. We have further refined this version of our action plan from the previous version so you may see changes as we adapt to changing circumstances and demand.

Previous versions of our DSAP can be found below:

Roadmap For Digitalisation December 2019
Roadmap For Digitalisation March 2020
DSAP December 2020
Future Initiatives Dec 2020
DSAP June 2021
DSAP December 2021

# Our transformation journey

**The initiatives will enable us to deliver a set of new and enhanced capabilities that ultimately will transform our business, and deliver stakeholder outcomes and customer benefits.**

The initiatives were prioritised by business value (see qualitative business cases in the annex) and logical sequencing and translated into a roadmap with four time-bound transition states:

- **Enable (2021–2022):** Initiatives that solve immediate challenges, provide quick wins and build the platform for future growth.
- **Expand (2023–2025):** Initiatives that build on previous work and provide further benefits or identify later stakeholder requirements for business transformation.
- **Enhance (2025–2028):** Initiatives that are either more innovative in nature or build on the previous work to complete a series of capabilities for full benefits realisation.
- **Future vision (2029–2030):** Initiatives that, due to the speed at which technologies emerge, are as yet undefined and unidentified. These will be added to the DSAP as part of our ongoing review and update process.

The digitalisation initiatives have been presented in a ten-year transformation map. The benefit of a transformation map is that it shows how the initiatives are sequenced, and what falls within each of the transformation categories above.

The transformation map includes a narrative of what we will achieve at the end of each phase of transformation, i.e. what level of change would have occurred at the end of Enable, Expand and subsequently Enhance. It is therefore advised that the reader studies the transformation map with the stage narratives side by side.

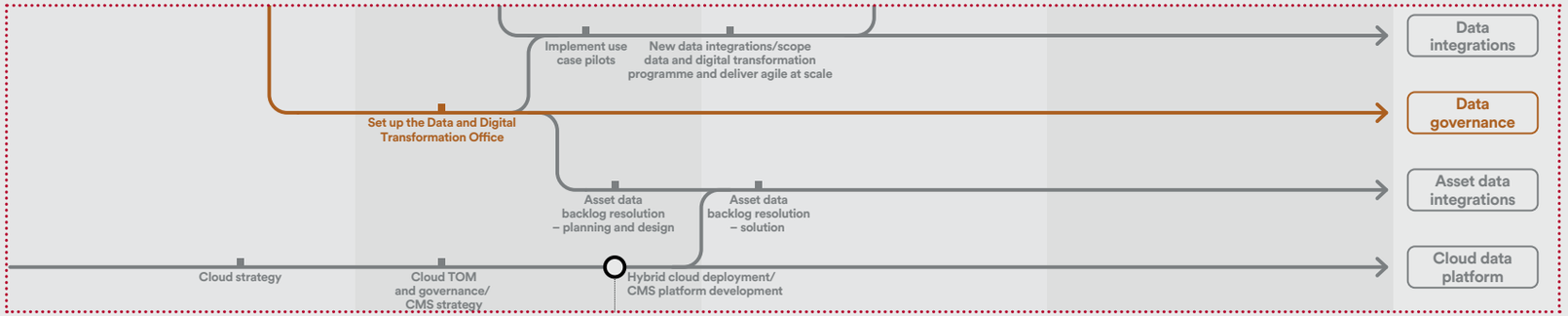
## We will go through three stages of transformation

# Transformation roadmaps – How to read

— We have updated the pictorial representation of the transformation roadmap from the t-maps we used in the last submissions of the DSAP. As we have advanced our planning, the added complexity needed a new structure (the ten core areas) and a new representation.

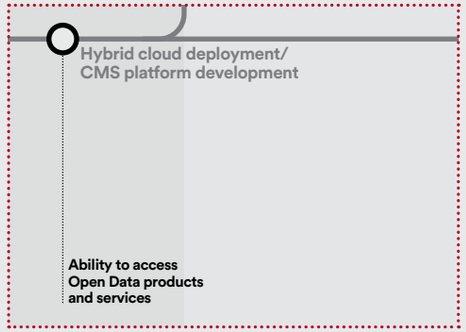
— At a summary level, we are showing capability that we will deliver to achieve the ten core areas, for example Open Data. The items on each line of the transformation roadmap denote an initiative within the core area, and the expected date for completion as per the timeline at the foot of the roadmap. For example, within the core area 'Open Data', the initiative 'Data gap analysis' has been completed in Q4 2021.

— Non-horizontal lines denote a dependency between initiatives e.g., the start date for the 'data governance' initiative is dependent upon the completion of 'data gap analysis'.




— There are two different icons for initiatives:
- A straight line displaying initiatives that are delivering internal capability or interim milestones:


- A circle displays initiatives that will deliver capability to provide notable new outcomes for our customers. This capability is highlighted in the flag above:



# Transformation roadmaps – How to read

— There is a separate detailed roadmap for each of the ten core areas, the headings denote the initiatives which form the core areas e.g. DERMS.

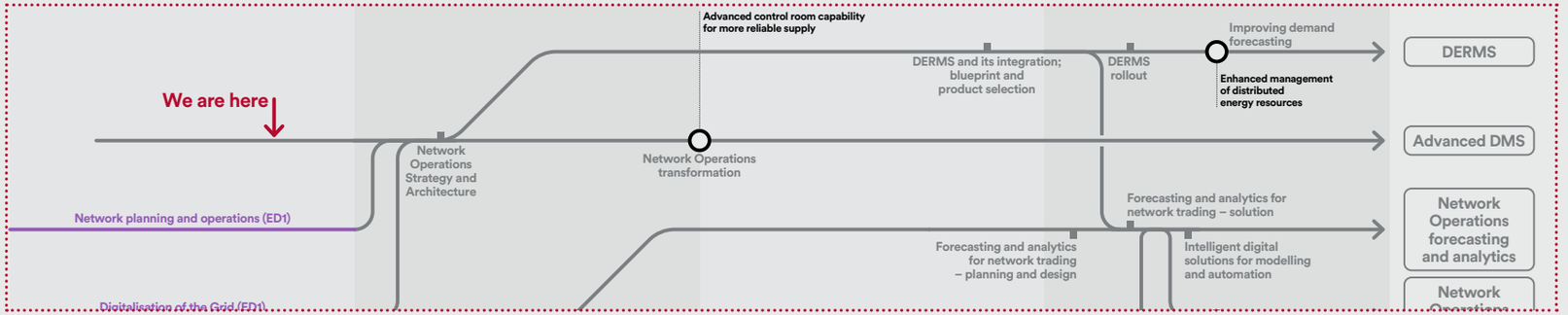
— These headline core area initiatives were previously on the roadmap in the summary roadmap – in the detail roadmap they are broken down into their underlying enabling initiatives.

— The items on each line of the transformation roadmap represent an enabling initiative and the expected date for completion as per the timeline at the foot of the roadmap. For example, within the core area 'network management', the initiative 'DERMS', the enabling initiative 'Network Operations transformation' is expected to be completed in Q4 2024.

— Non-horizontal lines denote a dependency between initiatives e.g., the start date for the 'DERMS and its integration…' enabling initiative is dependent upon the completion of 'Network Operations strategy and architecture'.


— Where a non-horizontal line crosses but does not intersect another line, there is no dependency on the line it doesn't intersect.

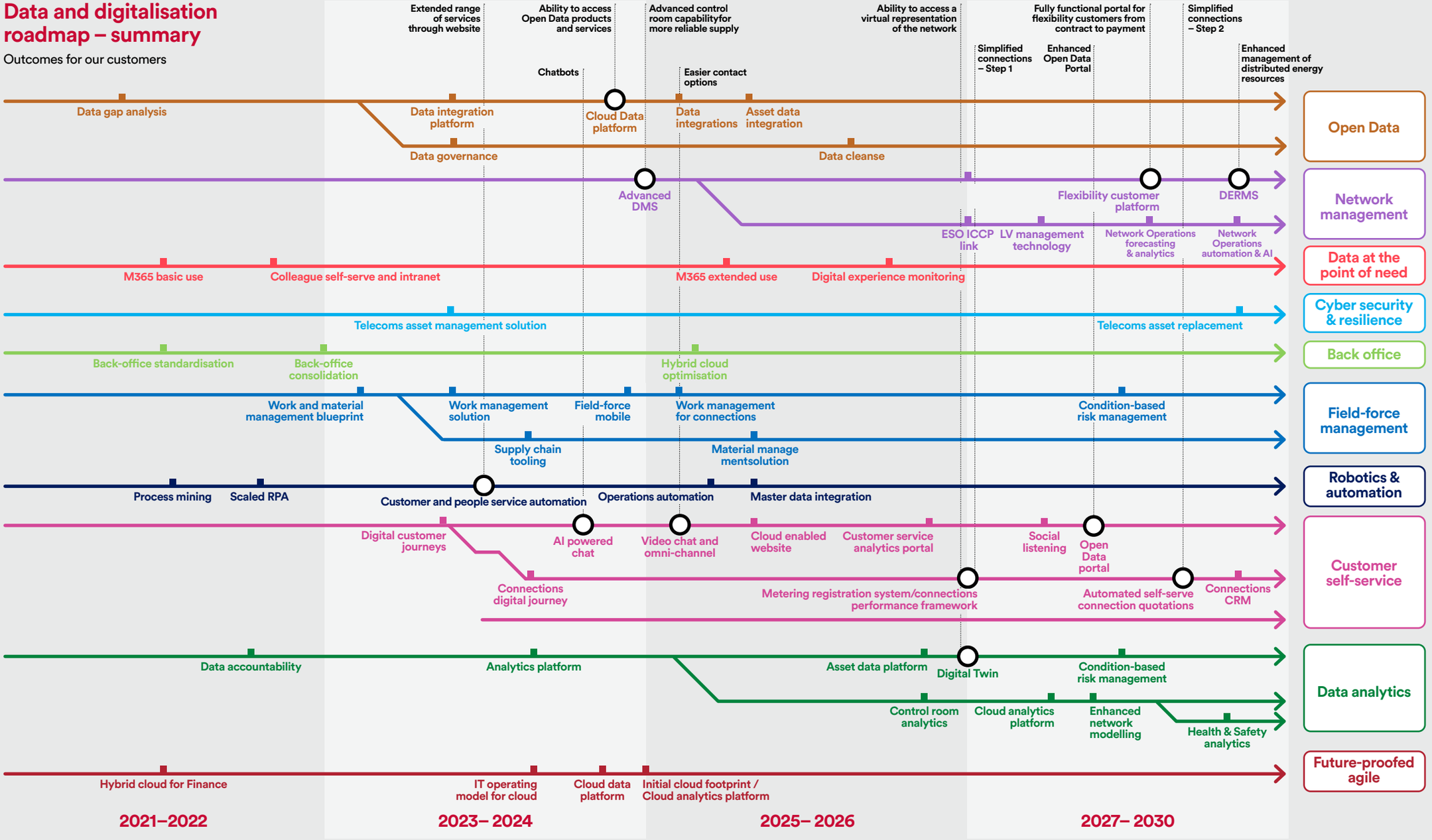
**Should this be showing the section of roadmap being referred to? Also, is it okay with stuff cutting off? Same comment for both maps.**




**Also, is it okay with stuff cutting off? Same comment for both maps.**

# Data and digitalisation roadmap – summary

Outcomes for our customers



# Initiatives – How to read

**We have grouped our data and digitalisation initiatives into ten core areas that will deliver distinct capability to our organisation and our stakeholders.**

We have produced an introductory page for each core area covering:

- which of the 5 customer benefits the core area contributes to (highlighted in red) and how and where the core area sits amongst the other core areas
- the description of the core area
- the outcomes for our business and benefits for our customers.

*See the five outcomes in more detail here.


| | |
|---|---|
| **Description** | **Understand, improve and expand our energy system data and promote data transparency through Open Data.** |
| **Business outcomes** | Open Data, particularly energy system data, is central to net zero – for us and the wider ecosystem.<br><br>**Internal outcomes**<br>Through a focus on data, data quality and data platforms, we will transform ways of working internally, becoming data-centric in our decision-making and day-to-day actions.<br><br>**External outcomes**<br>We will provide relevant and good quality data in a timely manner that will help consumers, policy makers, researchers and others to accelerate the journey to decarbonisation. Our Open Data offering will allow the wider ecosystem to develop new markets and innovate continuously. Our collaboration with industry on standards and common open access arrangements will make data more accessible and comparable across GB for stakeholders. |
| **Benefits** | Sharing our energy data with other organisations is a vital part of our transition to a DSO. By giving organisations the information that they need to adopt a "whole system" approach, the development and operation of the system can proceed in a way which delivers decarbonisation more efficiently.<br><br>Other stakeholders will also benefit from the availability of this data. For example, customers will find it easier to access data relevant to new connections, and we will be able to better co-ordinate with partners such as local authorities and other utility companies.<br><br>As part of this core area, we will also undertake a process of surfacing, cleansing and structuring data that we already hold, and will be able to make better use of datasets provided by other organisations. We will be able to use these datasets for a variety of purposes – for example, targeting support at vulnerable customers, or better forecasting where demand will grow on our network. |

**For more in depth detail of our plans, benefits and outcomes see here.**

# Action plan



# Our action plan

## 1. The journey to Open Data

Understand, improve and expand our energy system data and promote data transparency through Open Data.

## 2. Network management capability to enable net zero

Upgrade and implement new IS systems to enhance network management and decision-making in real time to enable us to efficiently operate our distribution network in a decarbonisation era.

## 3. Data at the point of need

Introduce data and applications at the point of need in order to improve colleague efficiency and effectiveness.

## 4. Cyber security & resilience

Continue to invest in advanced cyber controls and tools to maintain a robust cyber security posture, aligned to the threats emerging from increased digitalisation.

## 5. Back office

Modernise the back-office environment to reduce risk, secure information and improve colleague experience.

## 6. Field-force management

Introduce improved field-force, work and asset management processes to improve operational performance.

## 7. Robotics & automation

Deploy robotics and automation to reduce cost of low value, high volume tasks and improve customer and colleague experience.

## 8. Enabling customers to self-serve

Implement self-serve, personalised services to meet customer demand and experience, implementing a customer insight and interaction portal and reducing the cost to serve.

## 9. Advanced analytics

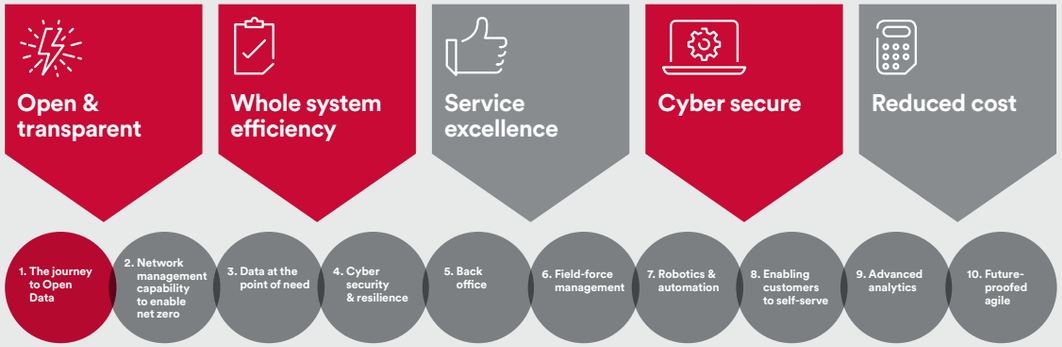
Enable advanced analytics to improve the planning, design and operation of our distribution network.

## 10. Future-proofed agile

Provide future-proofed, agile solutions in order to be flexible enough to adapt to the change in the energy sector.

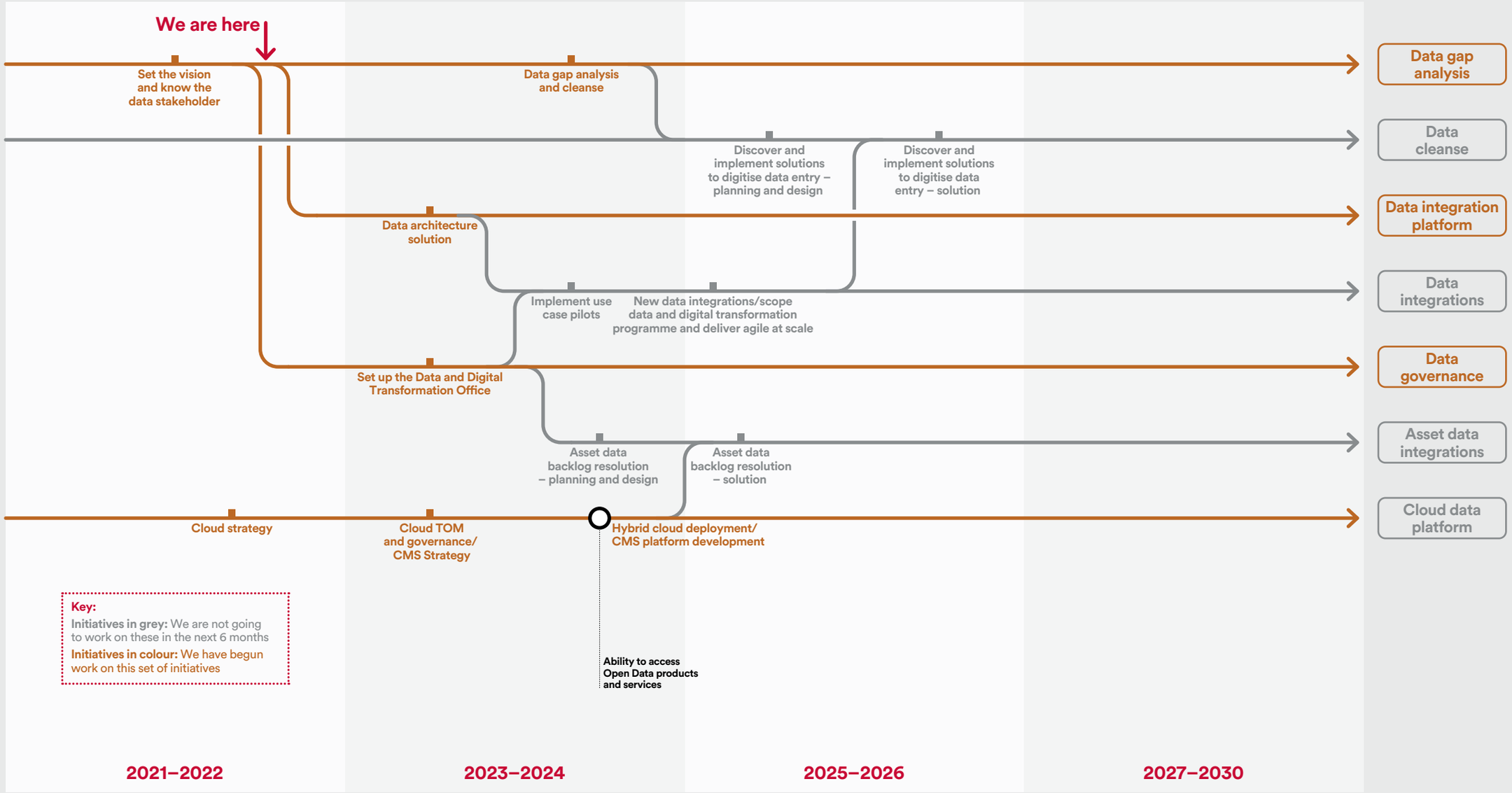
# 1. The journey to Open Data

*See the five outcomes in more detail here.



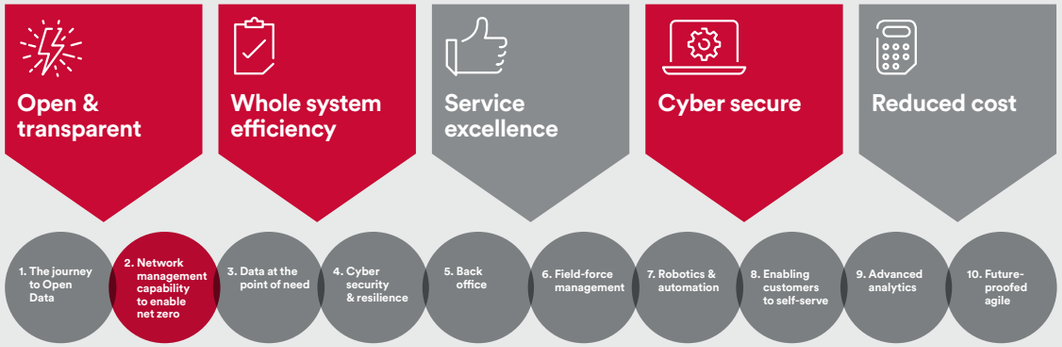

| | |
|---|---|
| **Description** | **Understand, improve and expand our energy system data and promote data transparency through Open Data.** |
| **Business outcomes** | Open Data, particularly energy system data, is central to net zero – for us and the wider ecosystem.<br><br>**Internal outcomes**<br>Through a focus on data, data quality and data platforms, we will transform ways of working internally, becoming data-centric in our decision-making and day-to-day actions.<br><br>**External outcomes**<br>We will provide relevant and good quality data in a timely manner that will help consumers, policy makers, researchers and others to accelerate the journey to decarbonisation. Our Open Data offering will allow the wider ecosystem to develop new markets and innovate continuously. Our collaboration with industry on standards and common open access arrangements will make data more accessible and comparable across GB for stakeholders. |
| **Benefits** | Sharing our energy data with other organisations is a vital part of our transition to a DSO. By giving organisations the information that they need to adopt a “whole system” approach, the development and operation of the system can proceed in a way which delivers decarbonisation more efficiently.<br><br>Other stakeholders will also benefit from the availability of this data. For example, customers will find it easier to access data relevant to new connections, and we will be able to better co-ordinate with partners such as local authorities and other utility companies.<br><br>As part of this core area, we will also undertake a process of surfacing, cleansing and structuring data that we already hold, and will be able to make better use of datasets provided by other organisations. We will be able to use these datasets for a variety of purposes – for example, targeting support at vulnerable customers, or better forecasting where demand will grow on our network. |

# 1. The journey to Open Data



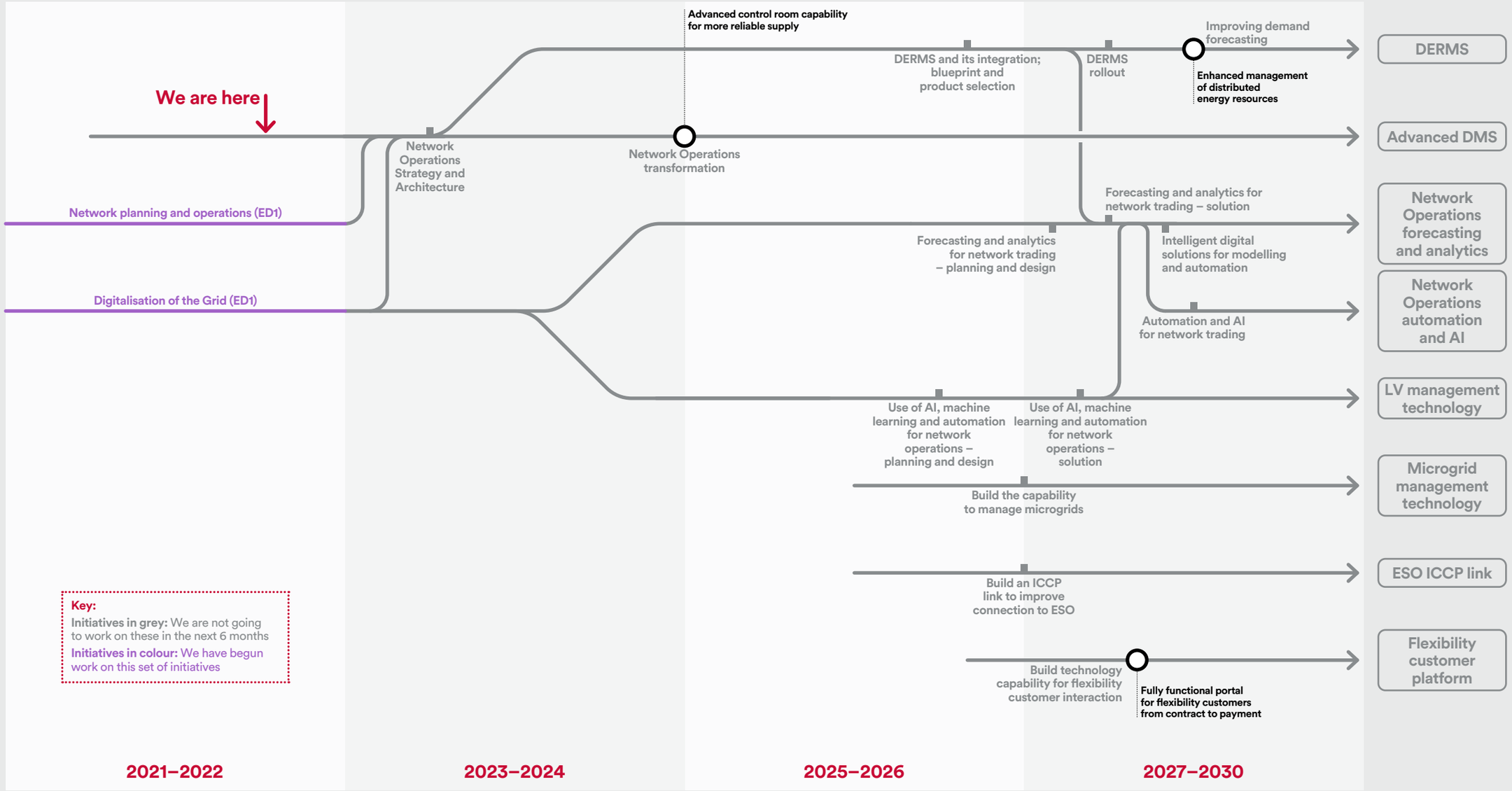
# 2. Network management capability to enable net zero

*See the five outcomes in more detail here.



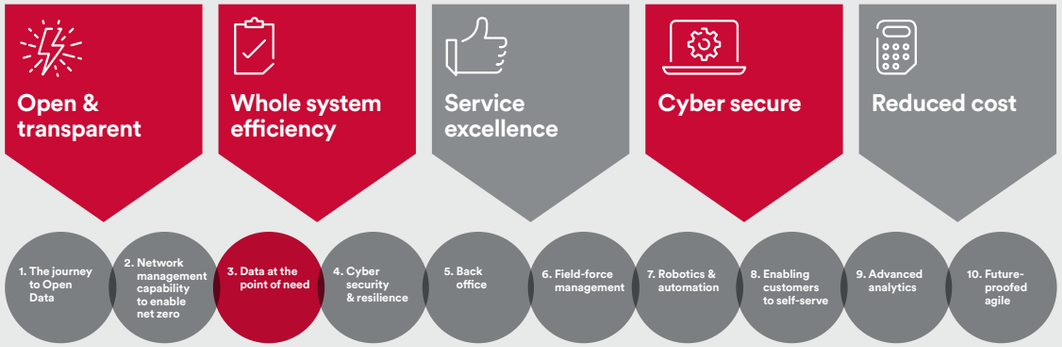

| | |
|---|---|
| **Description** | **Upgrade and implement new IS systems to enhance network management and decision-making in real time to enable us to efficiently operate our distribution network in a decarbonisation era.** |
| **Business outcomes** | New ways of managing and balancing the network are key to DSO and ultimately our net-zero ambition. Those new ways are increasingly more complex and we need data and digitalisation at an unprecedented level to manage the complexity.<br><br>As the foundation for our DSO strategy, data and digitalisation will provide the right capability to optimise the management of Distributed Energy Resources, customer flexibility, our LV network, the need for new connections and our interaction with the ESO and the wider market. We will provide our organisation with resilient and efficient technology to automate the distribution system.<br><br>The new capability will be designed to seamlessly integrate data between systems and expose the data through our Open Data proposition in the right way. |
| **Benefits** | This core area will allow us to better monitor our network, determining where interventions are required to increase network utilisation. We will then be able to adopt a “flexibility first” approach, integrating both customer flexibility and network flexibility into the day-to-day management of our network:<br><br>As a result, our network will be more reliable, better able to cope with the demands of increasing numbers of LCTs, and able to facilitate an efficient transition to net zero.<br><br>By bringing forward flexibility, our investments in this area are also likely to lead to benefits across the rest of the energy system. For example, flexible demand may be used to shift demand to times of lower wholesale market prices; reduce the nationwide peak, reducing the need for generation and transmission capacity; and provide national balancing services. We will develop a link to the ESO to facilitate these sorts of whole system benefits. |

# 2. Network management capability to enable net zero



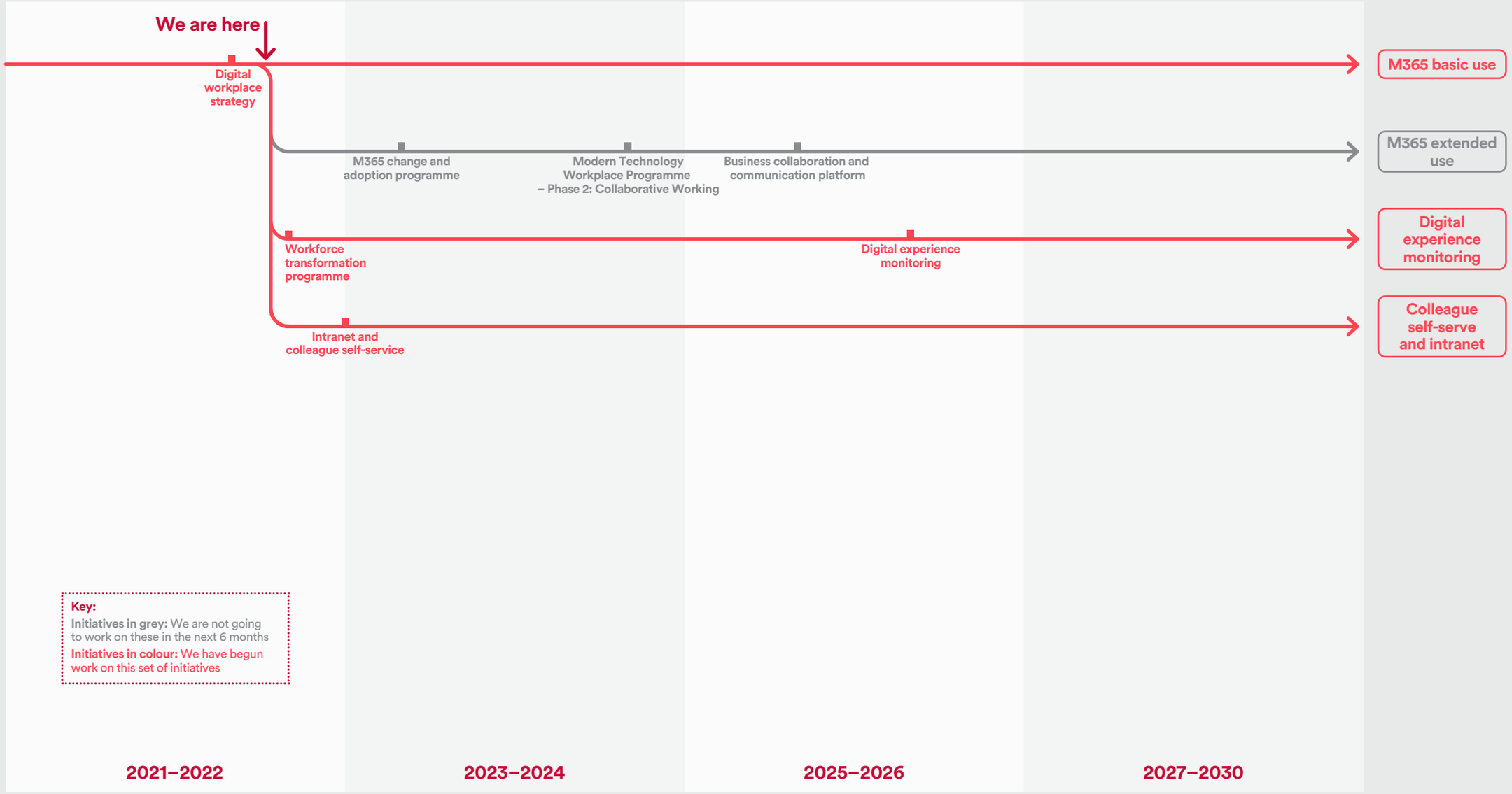
# 3. Data at the point of need

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Introduce data and applications at the point of need in order to improve colleague efficiency and effectiveness.** |
| **Business outcomes** | The nature of our work is changing in ED2 with an increased need for collaboration. The Coronavirus pandemic has helped us identify gaps in the way we make data and effective tooling for collaboration available to our colleagues.<br><br>Data at the point of need is aimed at providing new toolsets and simplified access to data to our colleagues, so that they can perform their current and future roles more efficiently and effectively. |
| **Benefits** | General purpose software such as email clients and office suites is used across all of our areas of work. Upgrading these systems will enable us to take advantage of new functionality and carry out our work more productively. For example, it will be easier for colleagues to access datasets from across the organisation, or communicate with one another. The digital experience monitoring tools will allow us to track the performance of our systems so we can continue to make processes more streamlined.<br><br>Some of these tools may also be applicable to our customer-facing activities. For example, the digital experience monitoring tools that we will implement could be used to track the availability and performance of services we provide our customers, such as self-serve tools used to request connections or report outages, or the flexibility customer platform that customers providing DER will interact with. This will improve the service to our customers, and may lead to a reduced requirement for call centres if more customers are able to successfully self-serve.<br><br>We are replacing the software and operating systems used by our colleagues with modern versions which are continuously patched and always in support. This will help avoid the build-up of technical debt and ensure that our systems are as secure as they can be. |

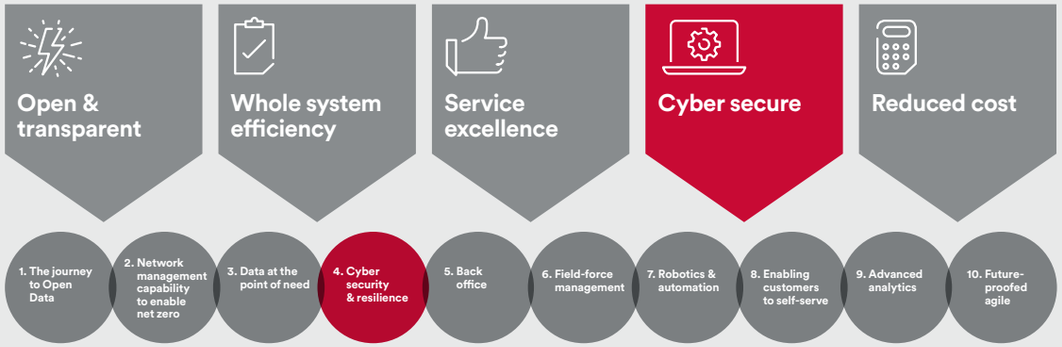
# 3. Data at the point of need



# 4. Cyber security & resilience

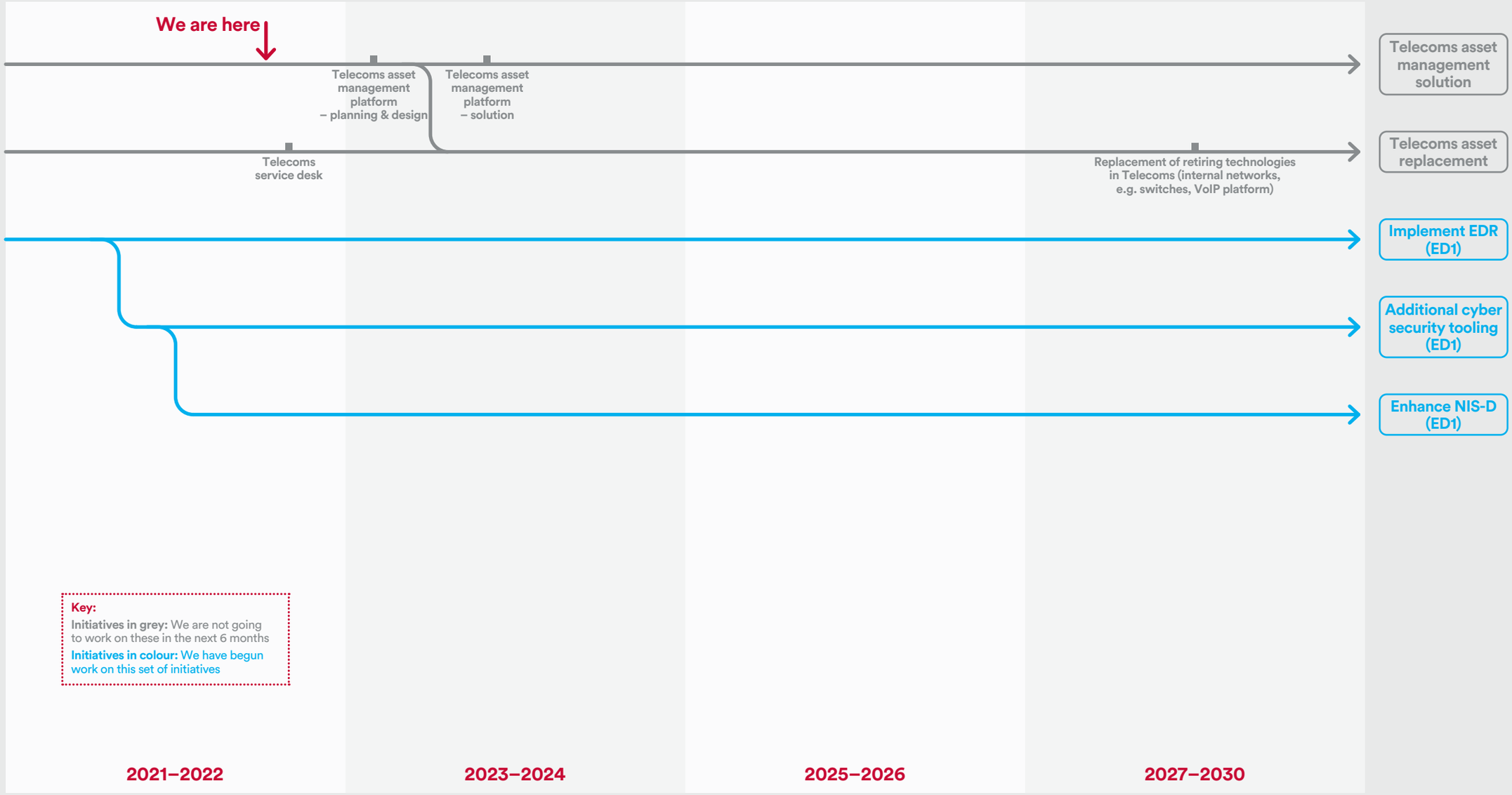
Note: Information included in this document on our plans for this area is limited due to its sensitive nature.

*See the five outcomes in more detail here.



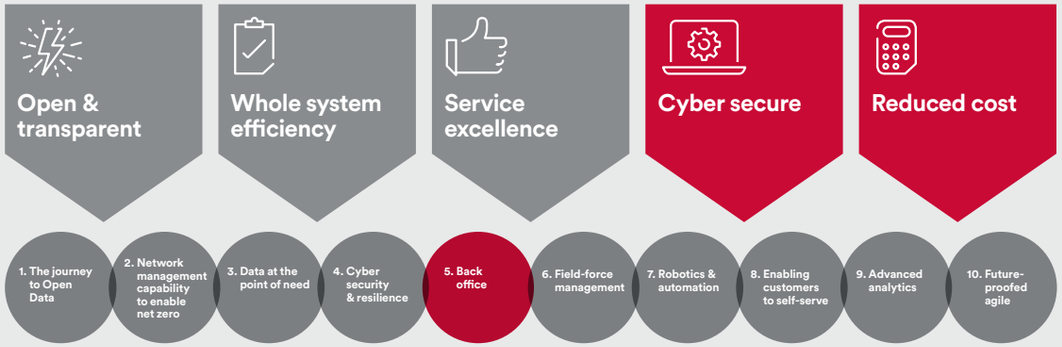

| | |
|---|---|
| **Description** | **We plan to carry out a number of initiatives to maintain our strong security posture and reduce risks in line with the deliverables within the rest of our DSAP.** |
| **Business outcomes** | To have robust cyber security policies, processes and controls in place to maintain our strong security posture and continually reduce risk to protect our customers' personal data and operate a resilient distribution network through:<br><br>— security tools and advanced threat monitoring that protect our network from unauthorised access or attack<br>— skilled and competent cyber professionals<br>— taking appropriate and proportionate measures to secure the network and IS in compliance with the NIS directive (NIS-D)<br>— protecting our customers' and employees' personal information through compliance with the general data protection regulations (GDPR)<br>— maintaining ISO 27001<br>— achieving ISO 27019<br><br>This is subtly different to the initiatives covered within our cyber security main business plan section and annexes, where we describe the initiatives and investments required to materially improve our cyber security posture, responding to the ever-changing threat landscape. You can read more about this in the main plan section and the cyber annexes here, but it is important to note that we purposefully do not release all information in this area due to its sensitive nature. |
| **Benefits** | The implementation of these systems will increase our resilience to cyber breaches, allowing us to deliver a secure and reliable power supply to customers – and if a compromise occurs, we have the systems and processes in place to detect and respond accordingly.<br><br>They will ensure our ongoing compliance with GDPR – customers can be confident in sharing data with us, safe in the knowledge we will keep that data secure. Building confidence with our customers will also help us better support vulnerable customers who will be more willing to disclose any specific considerations if they are confident that we will not disclose data beyond what we have agreed to do. |

# 4. Cyber security & resilience



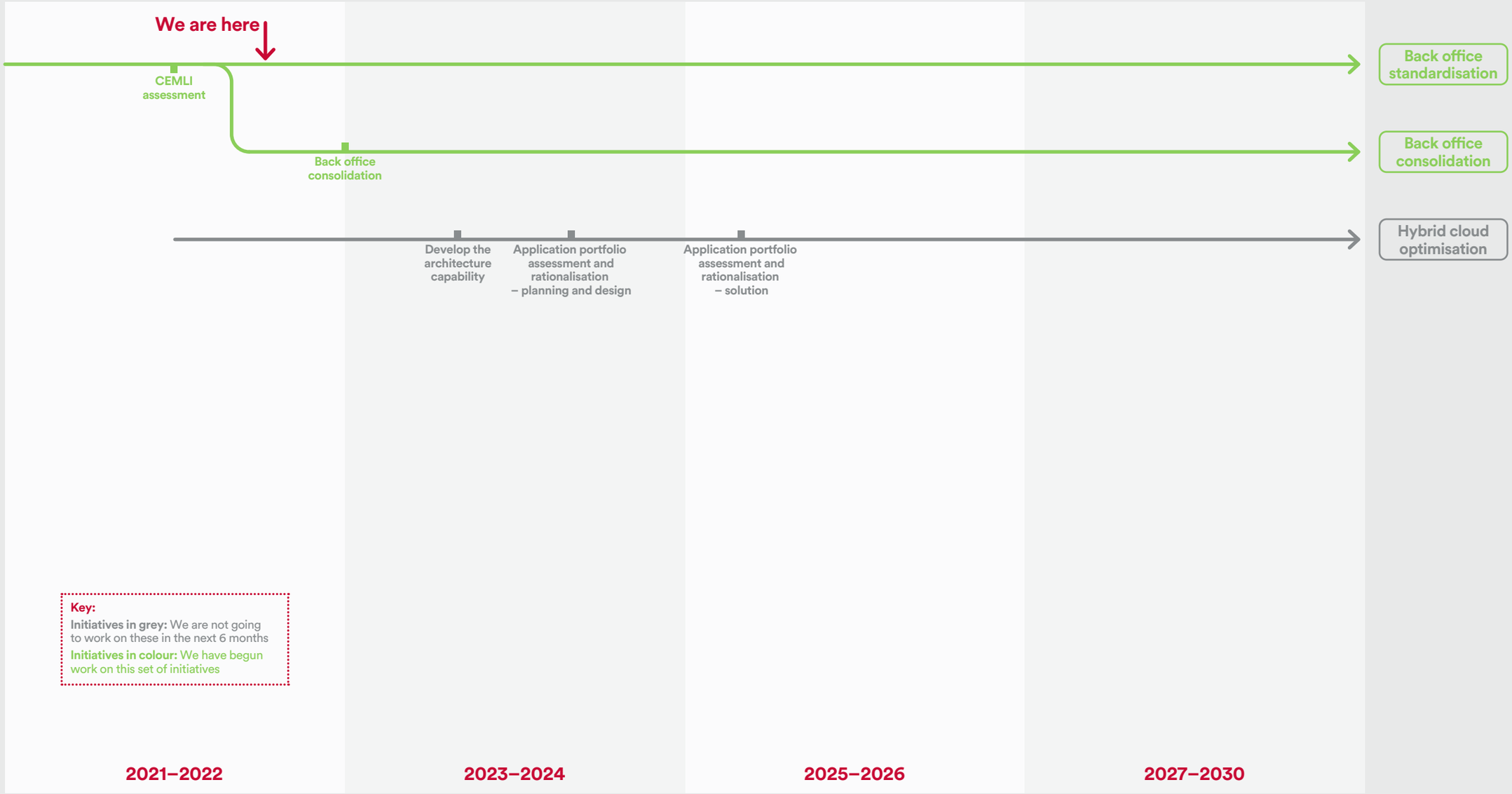
# 5. Back office

*See the five outcomes in more detail here.



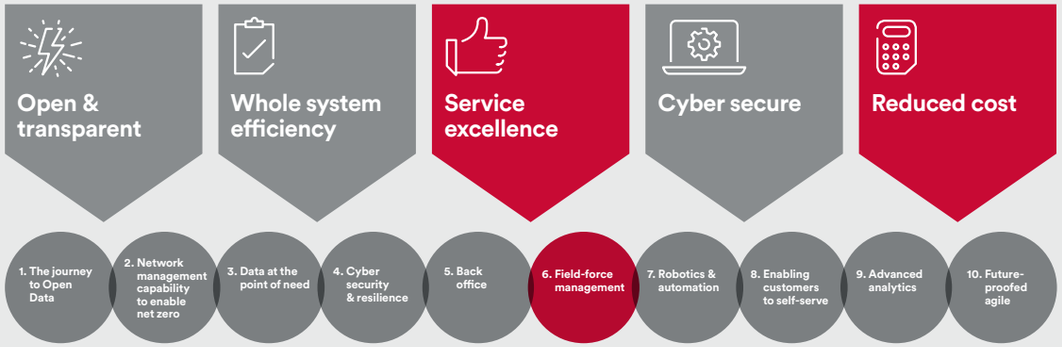

| | |
|---|---|
| **Description** | **Modernise the back-office environment to reduce risk, secure information and improve colleague experience.** |
| **Business outcomes** | Our back-office environment ranges from finance, procurement and Enterprise Resource Management (ERP) to HR. By adopting cloud-based, 'evergreen' systems, we will benefit from a lower operational cost of running those environments, but we will equally have the latest functionality available to us, which will allow us to continuously increase the efficiency of our back-office processes.<br><br>By consolidating our ERP instances, we will not only reduce our operating cost, but also increase data integrity, helping our colleagues do their jobs more effectively. |
| **Benefits** | Standardising our back-office functions and establishing a best-in-class data and digital transformation office will deliver several benefits. Firstly, by consolidating our ERP instances we will be able to reduce our operating costs and work more efficiently, this feeds directly into our commitment to holding our operating costs in line with where they are currently. It will also promote more seamless working, helping our colleagues do their jobs more effectively and ensuring the services we provide to our customers and stakeholders are efficient and secure. Looking forward, moving to evergreen cloud-based systems will provide the latest functionality without costly refresh programmes. |

# 5. Back office



# 6. Field-force management

*See the five outcomes in more detail here.

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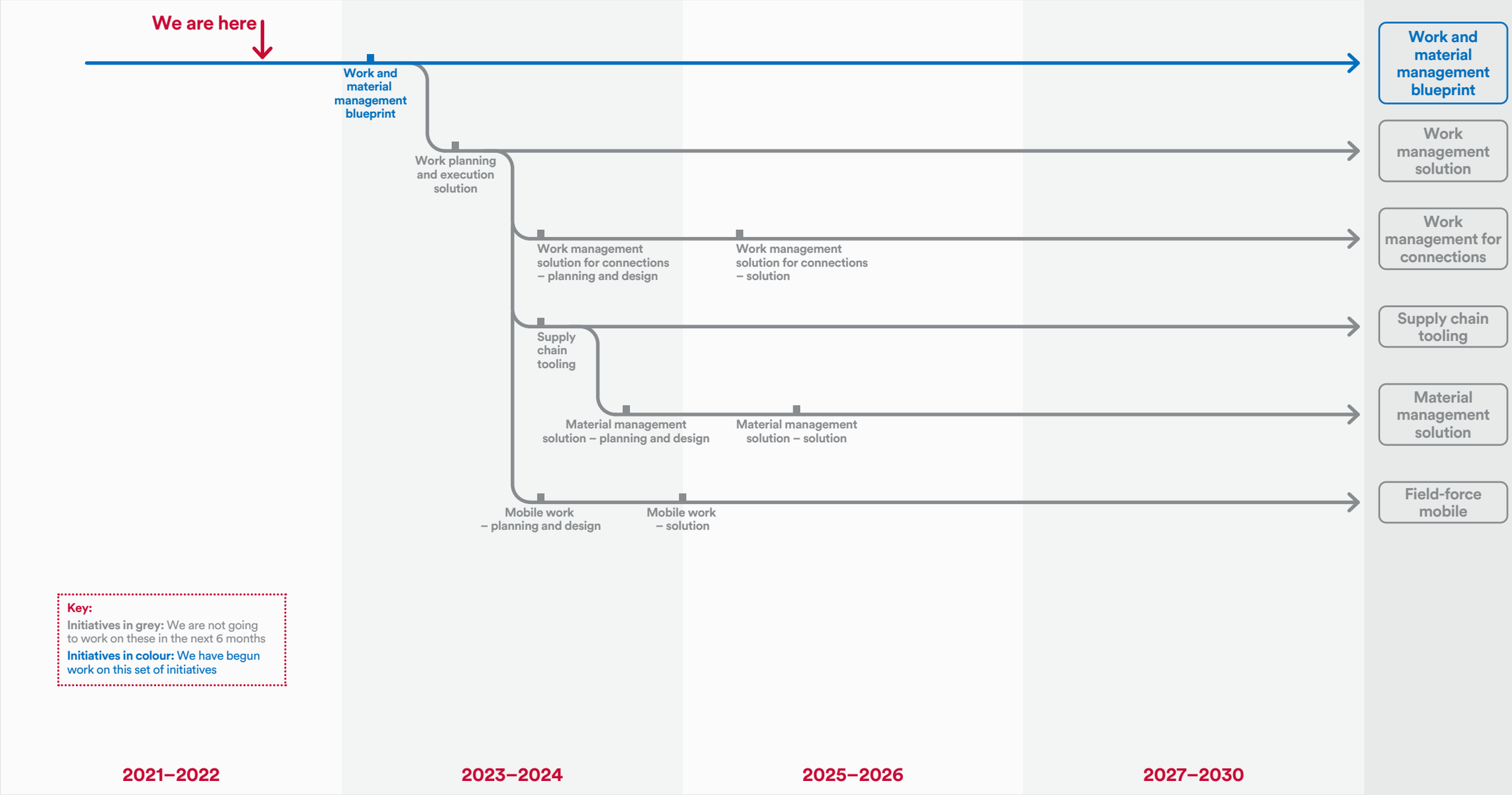
|---|---|
| **Description** | **Introduce improved field-force, work and asset management processes to improve operational performance.** |
| **Business outcomes** | Our field-force is integral to our business. To increase our efficiency as a business, we need to improve the support we give to our field-force.<br><br>Through this initiative we will enable operational efficiencies from streamlining and automating work scheduling and optimise material flows by automating the ordering of new materials based on predictions. |
| **Benefits** | By implementing improved field-force management solutions, we will improve our efficiency and ability to deliver. We will reduce lead times on connections, fix faults quicker and complete more work on a first-time basis by improving our coordination activities with third parties. By using new predictive analytics that allow us to take a more proactive approach e.g. forecasting part usage based on service requests and eliminating delays due to ordering lead times, we could expect to further improve efficiency and ultimately save money.<br><br>The move to an improved field-force management solution will also contribute to our environmental action plan. Our new supply chain tooling will replace our existing paper-based process, reducing waste. Optimising our routes for existing jobs so that the order of jobs minimises overall travel times and costs will also reduce our emissions as we transition to ultra-low emission/zero emission vehicles in our fleet. |

# 6. Field-force management



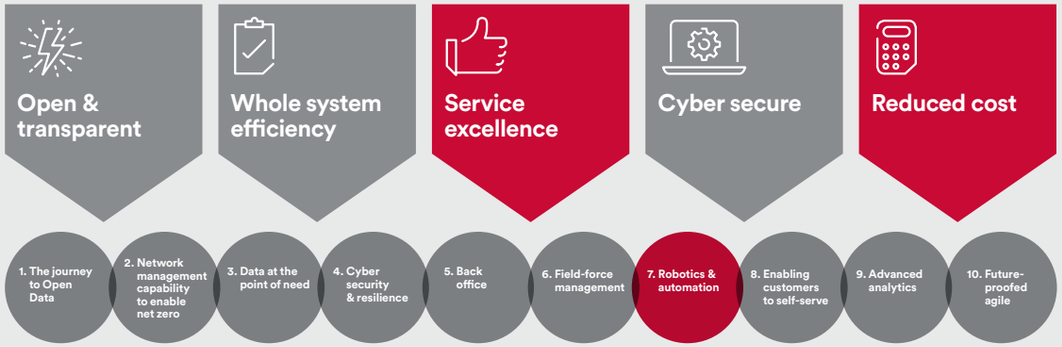

**Key:**

**Initiatives in grey:** We are not going to work on these in the next 6 months

**Initiatives in colour:** We have begun work on this set of initiatives

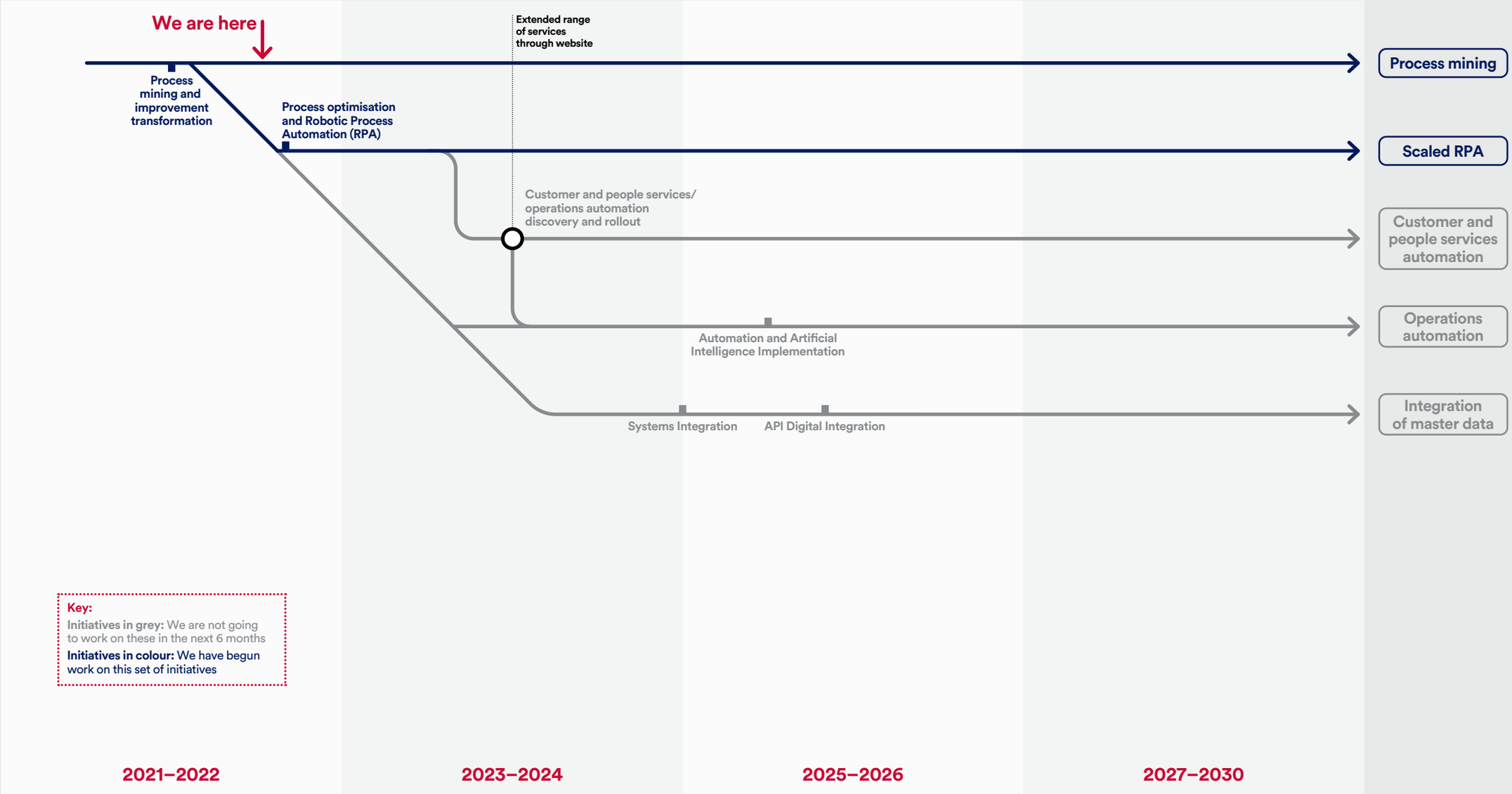
# 7. Robotics & automation

*See the five outcomes in more detail here.



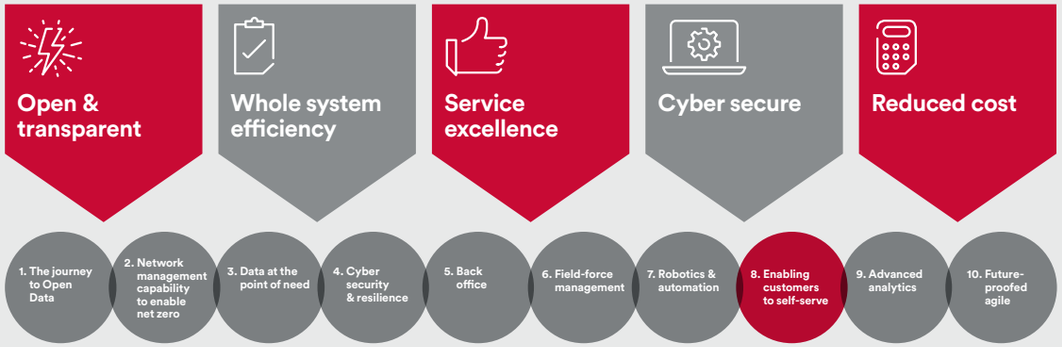

| | |
|---|---|
| **Description** | **Deploy robotics and automation to reduce cost of low value, high volume tasks and improve customer and colleague experience.** |
| **Business outcomes** | Process mining will help us remove non-value-added activities from processes, improve our documentation and then provide a stable platform for automation. We will achieve further efficiencies by automating manual activities or speeding them up through artificial intelligence.<br><br>We will deploy this technology both to the domains of customer service and operations, aiming to provide a faster, cheaper and more reliable service in both areas. |
| **Benefits** | Automation will allow us to meet increasing demand for connections as we move to a world of LCT, flexible connections, reducing the time and manual process required to register new connections and facilitating the transition to net zero. In addition, having this capability in place will mean we can deploy interim automated processes until full, end-to-end processes have been enabled by other digital investments.<br><br>More widely, process mining and automation will help us to work more efficiently, removing non-value-added activities from processes, streamlining them, and improving overall customer and colleague satisfaction without significant increase in costs. |

# 7. Robotics & automation



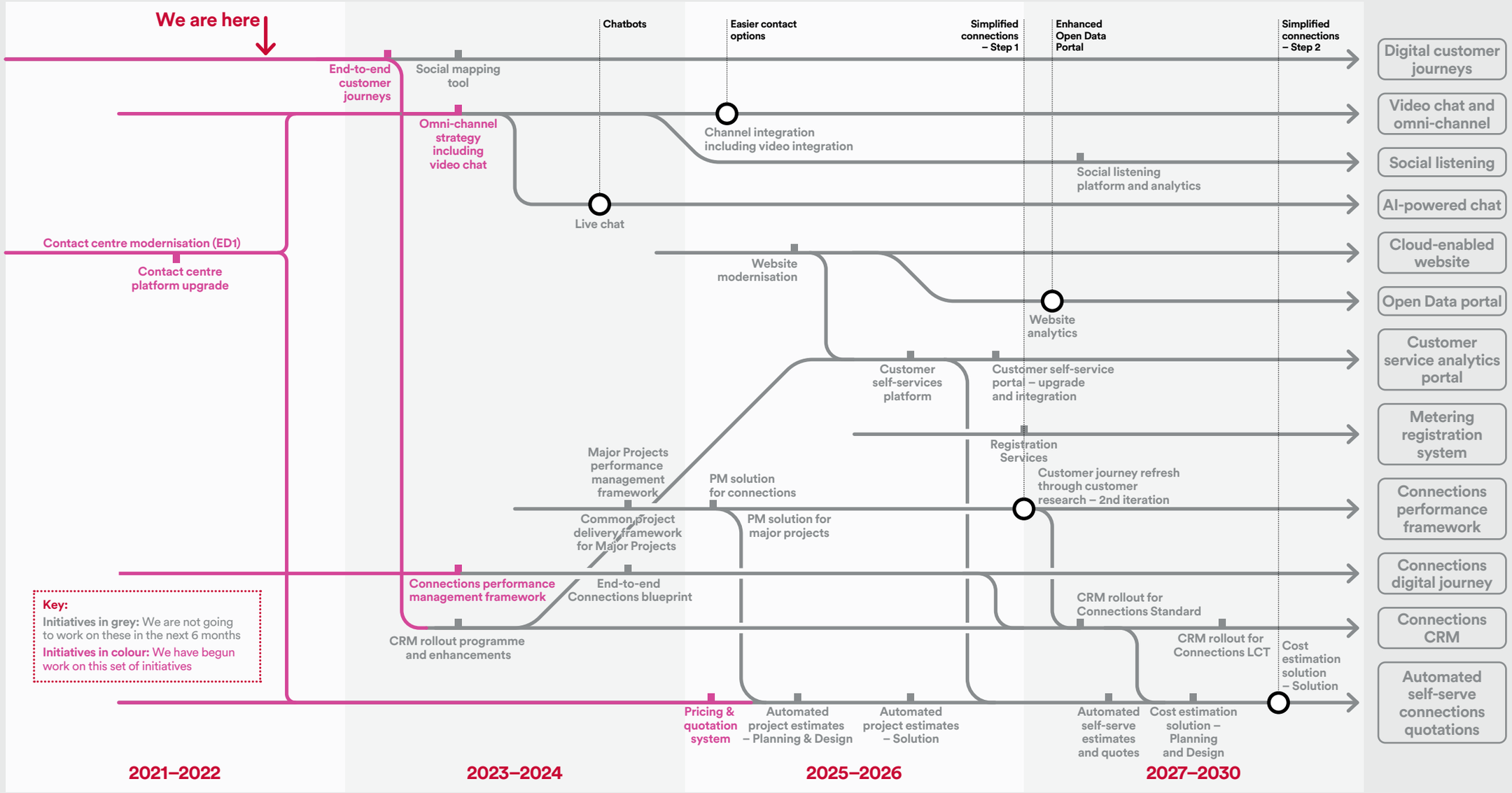
# 8. Enabling customers to self-serve

*See the five outcomes in more detail here.



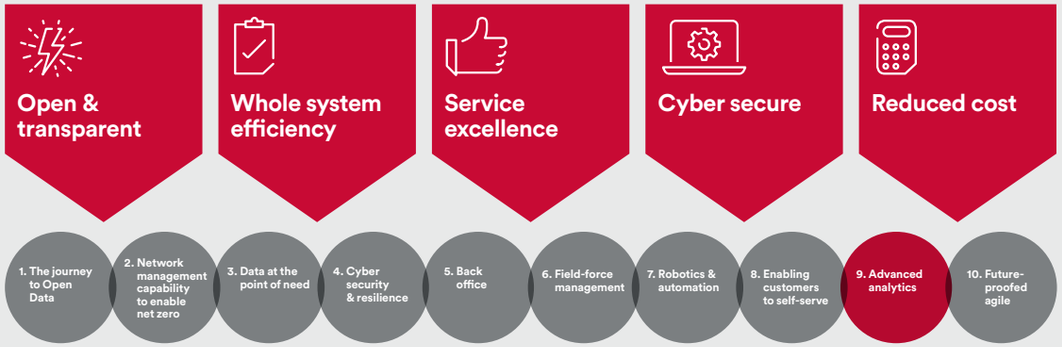

| | |
|---|---|
| **Description** | **Implement self-serve, personalised services to meet customer demand and experience, implementing a customer insight and interaction portal and reducing the cost to serve.** |
| **Business outcomes** | As part of ED2, we have proposed a number of initiatives to improve our customer service. Data and digitalisation will allow us to offer four new communication channels. This initiative will deliver the foundations for offering enhanced self-service digital offerings. Finally, it will enable both proactive communications to customers for planned and unplanned power cuts and the provision of information and support on the transition to net zero.<br><br>We will develop customer journeys to understand how we can best support our customers. We will implement new ways of support through developing a modernised website including enhanced portals for Open Data, modern contact centre technology and we will respond to the increased need for new connections. |
| **Benefits** | These initiatives will allow us to improve the customer experience, providing them with more choice as well as the opportunity to streamline our processes, freeing up colleagues to spend time with those customers who cannot or choose not to use our self-serve offering.<br><br>Taking a user-first approach, better performance monitoring, and developing a deeper understanding of the end-to-end customer journey will also allow us to provide tailored services to vulnerable customers. Vulnerability spans a number of dimensions and will vary by different groups. Research from other sectors has shown that some groups may prefer telephone-based services whilst others such as customers with mental health problems face 'serious difficulties' in using telephone services and prefer alternative communication channels. Our omni-channel approach offers alternative routes for these customers, whether it be fully self-serve or via our online webchat service.<br><br>Beyond customer experience, these initiatives will contribute to supporting decarbonisation. Streamlining processes from better integration will allow us to meet increasing demand for new LCT connections in a cost-effective manner. Expanding our self-service customer connections platform to allow the generation of quotations for LV demand connections, load increases, and budget estimates for new LV connections will allow customers to easily identify the most viable and cost-effective options, encouraging the mass uptake of LCTs, flexible connections, and network flexibility. |

# 8. Enabling customers to self-serve



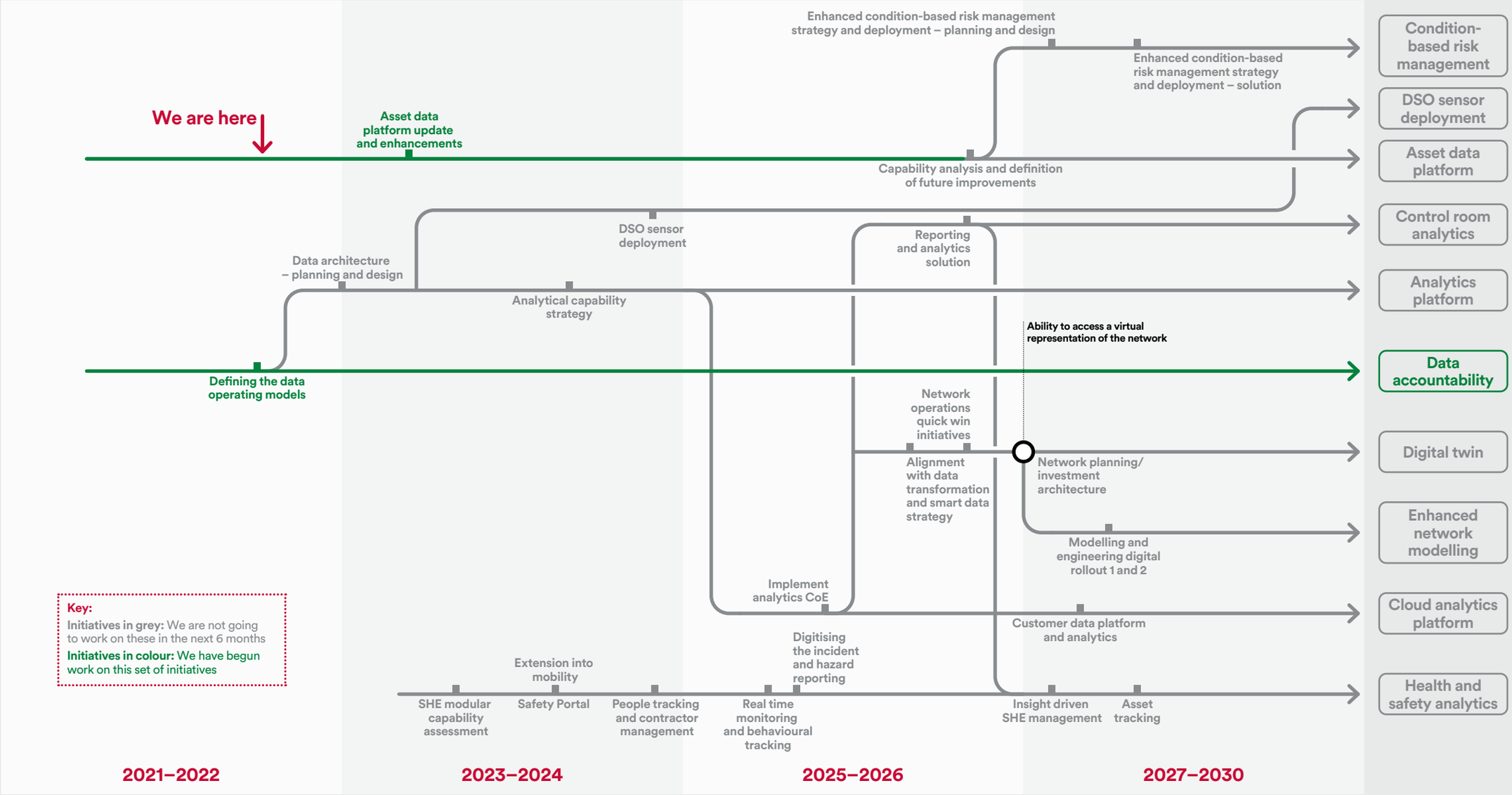
# 9. Advanced analytics

*See the five outcomes in more detail here.



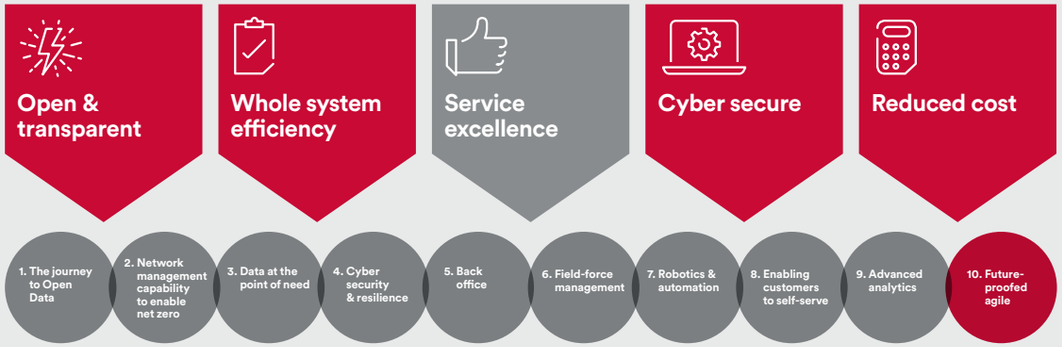

| | |
|---|---|
| **Description** | **Enable advanced analytics to improve the planning, design and operation of our distribution network.** |
| **Business outcomes** | As we are exposing more data products and services, we are focusing on gathering, cleansing and contextualising data. This makes the data we have more valuable not just to external stakeholders, but also to us internally. We will deliver the right analytics capability to use the higher value data to improve our internal ways of working across our distribution network, our customers and our colleagues for Health & Safety.<br><br>We will build capability that enables us to manage asset risk based on condition, to reduce maintenance spend and unplanned outages. Advanced control room analytics will enable more efficient distribution of energy, allowing us to reduce our dependence on carbon. We are building a digital twin to allow us to model the network and create sandbox environments to trial new concepts rather than having to physically build them, giving us a fast and low-risk option for innovation. |
| **Benefits** | Investing in advanced analytics is a critical step for managing our networks today and tomorrow, ensuring that we have the best data available when planning, designing, and operating our distribution network. This will deliver several benefits:<br>— **Enabling decarbonisation and innovation.** Improving our advanced analytics capabilities is key to taking a more flexible and data-led approach to decision-making. Our digital twin will provide a low-cost option to test new innovative ideas and allow us to flex our scenario modelling as new information comes to light. At the same time, improving our ability to analyse data from new sensors will help to forecast demand growth and lead to more efficient investment for decarbonisation pathways.<br>— **Enabling asset and environmental resilience.** Real-time monitoring combined with improved analytics to monitor and predict disruption will help us to make the most of existing infrastructure. New algorithms can help to predict future disruptions, facilitating the move to a more preventative approach and reducing disruption for our customers in the face of climate change. Analysis of our data will also guide long-term investment priorities, enabling better targeting to those areas with the greatest need and impact.<br>— **Improving health and safety.** The health and safety of our colleagues and contractors is a key priority. The centralisation of safety, health, and environment information will enable better incident prevention, for example through the expansion of real-time monitoring and asset tracking, and improved reporting of incidents when they do happen. Not only will this reduce the human cost of maintaining the network, reducing the number of accidents for our people, it will also deliver efficiency gains through streamlining our safety programme e.g. integration with asset management could trigger issue of work orders as they relate to safety inspection. |

# 9. Advanced analytics



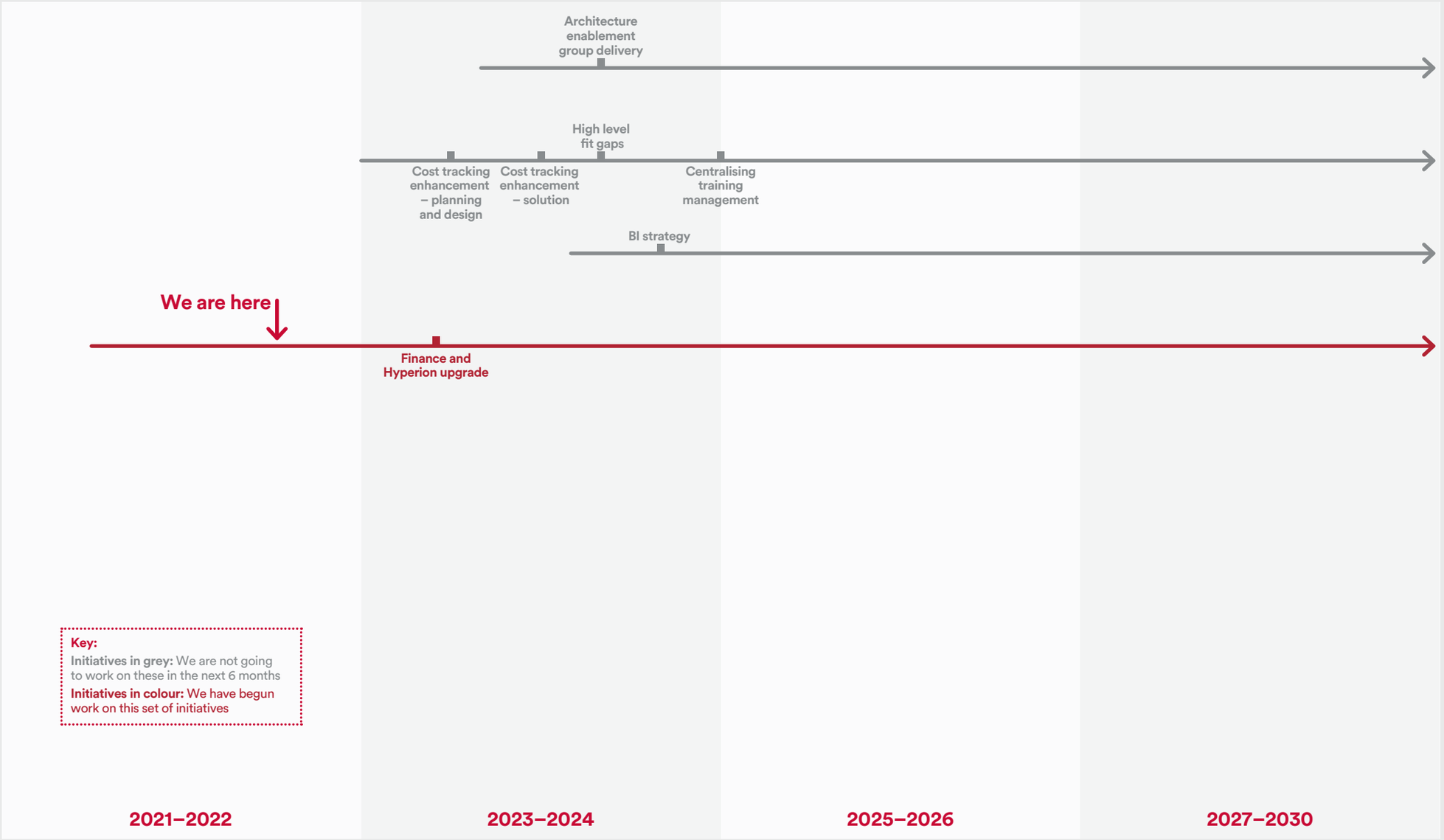
# 10. Future-proofed agile

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Provide future-proofed, agile solutions in order to be flexible enough to adapt to the change in the energy sector.** |
| **Business outcomes** | Our business, our industry and wider society are facing significant levels of change over ED2, particularly to enable decarbonisation. While we have identified some levers and capabilities that will help reduce our carbon footprint, we appreciate that there is a need for more agility and new ways of working, allowing us to cope with the uncertainty by adopting a 'sense and respond' approach.<br><br>Agile ways of working will allow us to deliver capabilities faster and with reduced risk. |
| **Benefits** | These initiatives will enable a fundamental change to the way in which we work across our whole business, supporting a 'sense and respond' approach and avoiding prescriptive approaches that cannot adapt to new innovative solutions. The benefits this will bring will extend across almost every output area, with the greatest gains felt in areas that face the most uncertainty such as the path to decarbonisation. Whilst we have a detailed plan based on projections that tie to the Government's current 10-point plan for decarbonisation, the latest Net Zero Strategy recognises that there is significant uncertainty and the final solutions may be very different from what we predict today.<br><br>For example, the Government has recently published the UK hydrogen strategy which aims to achieve 5GW of low-carbon hydrogen production capacity by 2030. However, the UK currently has almost no low-carbon hydrogen production today and several trials are currently planned for testing new technologies. We will need to be able to adapt our network planning, resourcing, and investments to the final solutions for industry, power, heat and transport.<br><br>In order to meet our decarbonisation targets in the most efficient way, we must adapt our ways of working to manage this uncertainty through an agile flexibility-first approach. This will allow us to select solutions that are scalable, extensible, and interoperable, and ensure the network is positioned to support all credible pathways to net zero. These flexible solutions will in turn require flexible ways of working and better integration of data to guide continuous decision-making. This can be achieved by adopting a hybrid cloud approach to our technical landscape, and adopting agile ways of working more widely across our data and digitalisation activities. |

# 10. Future-proofed agile

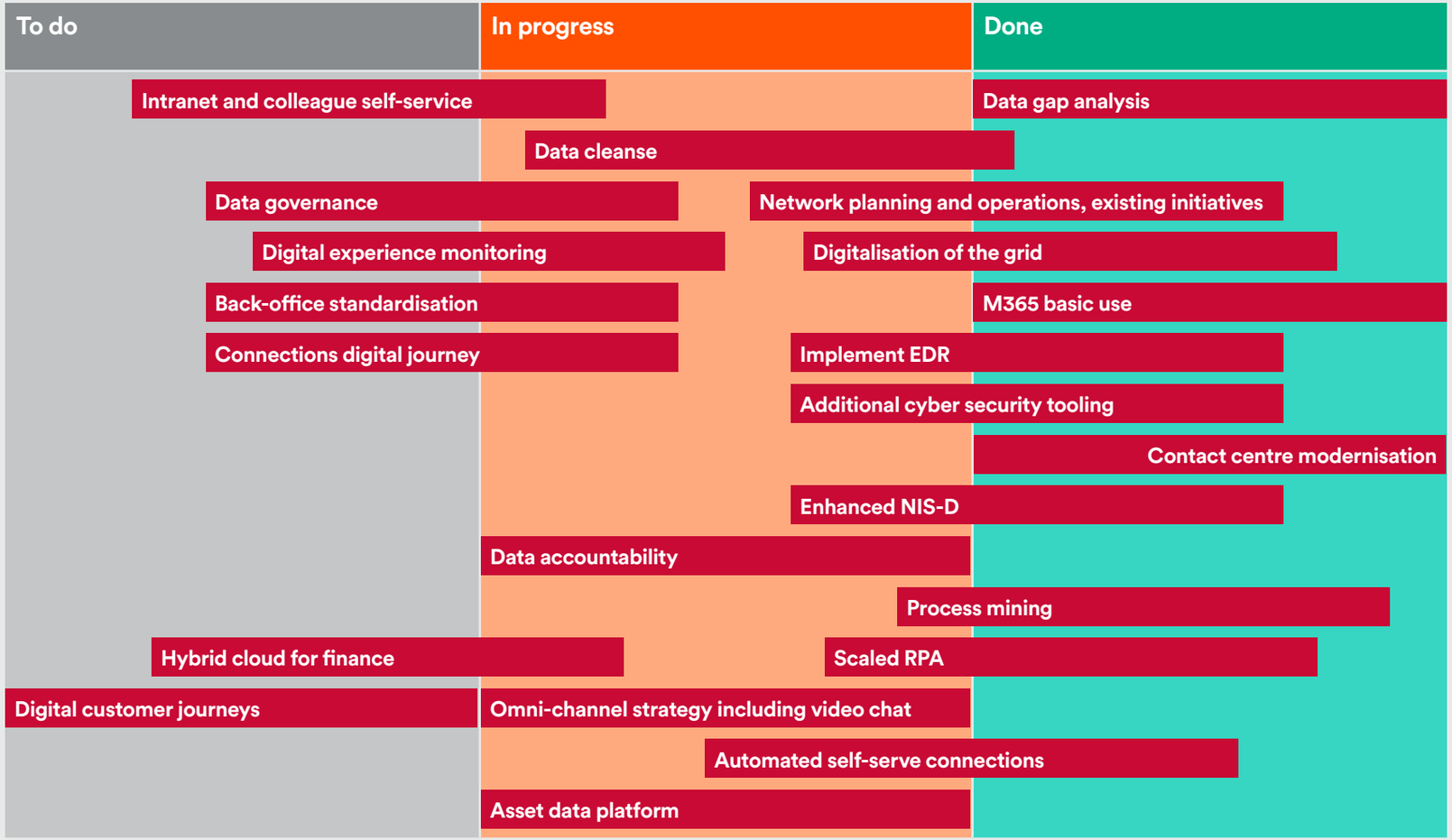


# Action plan

1 Introduction to this section
2 Our action plan
3 Progress against our plan

# Action plan progress overview

— The Kanban style board to the right details the current progress status of all initiatives within our action plan.
— It should be noted that this Kanban is forward looking and does not represent those initiatives already completed.
— For more information on Kanban boards, please see here.



# Action plan progress detail

## The table below provides a progress update for all initiatives that have been in our action plan for more than six months:

| Initiative | Update |
|---|---|
| Data gap analysis | We have set our vision and communicated with our data stakeholders. We have ratified the user personas who have data needs, with those stakeholders. Setting our vision and strategy has helped us identify additional steps to improve our data maturity and capabilities which have been fed into the implementation plans. |
| Data cleanse | Working with a leading enterprise data automation software vendor and using data automation technologies to discover hidden, implied or unknown relationships between data we have analysed data from over 30 tables held within three key systems (asset, spatial & customer) to understand data relationships, commonalities, data completeness and data inconsistencies. We have started data cleansing our asset data in preparation for the replacement of our Asset Management system. This is a key step on our journey to expose high quality data. |
| Network planning and operations, existing initiatives | We have continued to assist our operational colleagues and have supported them with awarding a contract to implement our new Distribution System Analysis Tool (DSAT) and the creation of our enduring Smart Grid platform on which we implement technologies to marshal data from the field i.e. LV monitoring. |
| Asset data platform | We are in the process of implementing our future state architecture for our integrated asset platform which will be a hybrid of cloud and on-premise services. This platform is a major foundation for us to deliver self-service Open Data through our DSO Strategy initiative Open Insight (DS0-3.1). |
| Digitalisation of the grid | We have continued to support the delivery of our DSO strategy through the continuation of our substation RTU replacement programme as well as our primary and secondary SCADA replacement programs. |
| Video chat and omni-channel | We are working with vendors to ascertain the solution candidates that will enable these capabilities linked to our existing systems and solutions. This will then enable us to plan for implementation. |
| Contact centre modernisation | The Connections team have gone live with the new solution, the deployment for the remainder of the contact centre is scheduled for early June. |
| Connections digital journey | We continue to build out our unique AutoDesign solution based around our previously defined customer and stakeholder journeys. Our new capability which is one of many phased releases will allow customers to produce and accept self-service quotations for connections to our low voltage network. |
| Connections CRM | In conjunction with our work on expanding the capability of our AutoDesign solution we are expanding our CRM system to allow customers to access our on-line services from a single portal. |
| Implement EDR | TBC |

Continued on next page

# Action plan progress detail

## Continued from previous page

| Initiative | Update |
|---|---|
| Process mining | We are moving into the benefits realisation phase of the process mining project and will continue identifying and implementing benefits over the next 6-12 months as well as establishing our centre of excellence. |
| Scaled RPA | The new production environment is available for our first automation, we are continuing design work on the next automation process. |
| M365 basic use | Our implementation of these new capabilities continues and is expected to complete in 2022. This will launch the new capabilities that will then be gradually rolled out to meet the expected milestone of all field-based colleagues having access to a new mobile collaboration platform by 2024–25. |
| Intranet and colleague self-service | We have started to look at the available tools within the market as well as pulling together the business case to justify implementation. |
| Back-office standardisation | We have reviewed our back-office systems and have defined our future requirements. A number of projects have been mobilised specifically looking at our technology systems for the following areas: core financials, human resources, supply chain and project delivery. |
| Data accountability | We have established data roles within the organisation by determining the DDTO operating model and a centralised data team. |
| Data governance | We have determined our “to be” governance model in preparation for ED2. We will progressively move toward this over the coming months. |

# Glossary

**Some of the words in this document use acronymns that might be unfamiliar so we have tried to explain some of these on the next page.**

# Glossary

Some of the acronyms used in this document might be unfamiliar so we have tried to explain some of these below.

**Advanced DMS**
Advanced Distribution Management System

**AI**
Artificial intelligence

**ANM**
Active Network Management

**API**
Application Programming Interface

**BMCS**
Broader Measure of Customer Service

**CoE**
Centre of Excellence

**CRM**
Customer Relationship Management

**DDTO**
Data and Digitalisation Transformation Office

**DER**
Distributed Energy Resource

**DERMS**
Distributed Energy Resources Management System

**DFES**
Distribution Future Energy Scenarios

**DNO**
Distribution Network Operator

**DSO**
Distribution System Operation

**EDR**
Endpoint Detection and Response

**EDTF**
Energy Data Taskforce

**EHV**
Extra High Voltage

**ESO**
Electricity System Operator

**ETR**
Estimated Time of Restoration

**HV**
High Voltage

**ICCP**
Inter-Control Centre Communication Protocol

**IS**
Information Systems

**IT**
Information Technology

**LV**
Low Voltage

**MVP**
Minimum Viable Product

**NIS-D**
The Directive on Security of Network and Information Systems

**OMS**
Outage Management System

**OT**
Operational Technology

**SCADA**
Supervisory Control and Data Acquisition

**RIIO-ED1 or ED1**
The current price control which runs from 1 April 2015 to 31 March 2023

**RIIO-ED2 or ED2**
The next price control which will run from 1 April 2023 to 31 March 2028

**RPA**
Robotics Process Automation

**TOM**
Target Operating Model

# Common terms

Some of the terms used in this document might be unfamiliar, so we have tried to explain some of these below.

## Advanced DMS

Advanced Distribution Management System (ADMS) at a high level is an enhanced Operational Technology (OT) management system that will allow the control of network and customer assets to provide whole system services and ultimately reduce the requirement to undertake traditional reinforcement. Control of network assets is achieved through systems that monitor and control network assets such as AVC (automatic voltage control) circuit breakers and switches.

## Customer

Customers that we supply electricity to or who are buying a service from us.

## DERMS

The control of customer assets, including Distributed Energy Resources (DERs), is achieved through a set of capabilities referred to as Distributed Energy Resource Management Systems (DERMS). DERMS enables optimised and proactive network management and stretches from planning to operations for the management and control of customer assets. These integrated processes encompass the appraisal, provision, procurement, dispatching and settlement of flexibility services through customer assets.

## Digitalisation

The process of converting information from a physical format into a digital one.

## Digitalisation/digital transformation

Digitalisation is a term we are beginning to use to describe the future of our digital and technology agenda. We recognise this can be an easily misinterpreted term so, to clarify, this is what digitalisation means to us and how it is being used:

Our digitalisation strategy (currently called roadmap for digitalisation) sets out our plans to:

- enable areas of business change using underpinning technology solutions
- bring together OT and IS to enable a greater value proposition
- introduce a cultural shift to support digital transformation, encouraging continuous improvement and agility.

This digitalisation strategy will become a high-level, simplified interpretation of our detailed 10-year technology strategy that will support our RIIO-ED2 business plan and the initiatives within it.

# Common terms

Some of the terms used in this document might be unfamiliar, so we have tried to explain some of these below.

**Estimated Time of Restoration (ETR):**
The estimated time given to a customer during an unplanned power cut to indicate when their power supply might be back on.

**Technical debt:**
Technical debt is a concept in IT that reflects the implied cost of rework or additional work caused by not keeping systems up to date or choosing an easy (limited) solution now instead of using a better approach that would take longer or cost more in the short term.

As with monetary debt, if technical debt is not repaid, it can accumulate 'interest', making it harder to implement changes. Unaddressed technical debt increases IT entropy. Similarly to monetary debt, technical debt is not necessarily a bad thing, and sometimes (e.g., as a proof of concept) is required to move projects forward.

**Technical Panel:**
The Technical Panel was established in June 2020 to thoroughly scrutinise, challenge and support the development (through advice and recommendations) of the technical aspects of our ED2 business plan. The panel is chaired by a Northern Powergrid non-executive board director and is made up of five other members whose areas of expertise span multiple technical disciplines including digitalisation, which is specific to this plan.

# Annex 1

## Data best practice principles

# How to read DBP assessment

This section discusses all **DBP principles** in terms of what we have done to set this up, specific examples of current projects doing this, and what we are going to do next.

| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvemen six months |
|---|---|---|---|---|---|
| 1. Identify the roles of stakeholders of the data | We have:<br>– produced a Data Vision and Roadmap to describe our progress in identifying the necessary roles feeding in the stakeholder feedback received and developing our view of the current and future data stakeholders.<br>– worked through our Open data requests, enabling us to develop our thinking regarding open data products.<br>– now defined the DDTO operating model and a centralised data team which forms part of it.<br>– sought feedback from open data requesters.<br>– initiated a data community internal to NPg where data experts across business areas discuss data driven topics. |  | For our key (data) activities (enterprise architecture, asset data management, information management/privacy/ security, data analytics) we have attributed ownership to specific people. We have also defined a Terms of reference for the Data Community & invite feedback on response email, engaged with requestor when open data requirements are not clear. | We will:<br>– attribute the roles we have described to our people through the DDTO. We have begun building this team with the first new role having been recruited in 2021.<br>– upskill our people where needed to suit the role throuhgout ED2, as to fit into our data coherent organisation. | Having ident of stakeholde we intend to through estab channels as w to evolve ove |
| 2. Use common terms within data, metadata and supporting information | We have:<br>– created a data vision ('driven by people, empowered by data') and a set of supporting principles and data roadmaps for Open Data, architecture and integration, governance, analytics (in Q1 2021).<br>– outlined a metadata growth plan that is not only focused on data |  | In our data projects prioritised list, we have defined specific projects for data cleansing and metadata enrichment. Moreover, in all other data projects, especially Open Data projects, cleansing and metadata enrichment is part of the plan, focusing on the data needed for that specific project. | We will:<br>– implement the metadata growth plan previously outlined, starting in 2021 and continuing throughout ED1 and ED2. | In the next six continue to e standards, inc to be able to our data sets We do not ex this fully depl dependent or deliverables. |

# DBP principles

| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvements planned in the next six months | Expected position at next publication |
|---|---|---|---|---|---|---|
| **1. Identify the roles of stakeholders of the data** | **We have:**<br>– produced a Data Vision and Roadmap to describe our progress in identifying the necessary roles, feeding in the stakeholder feedback received and developing our view of the current and future data stakeholders.<br>– worked through our Open Data requests, enabling us to develop our thinking regarding Open Data products.<br>– now defined the DDTO operating model and a centralised data team which forms part of it.<br>– sought feedback from Open Data requesters.<br>– initiated our own internal data community where data experts across business areas discuss data driven topics. |  | For our key (data) activities (enterprise architecture, asset data management, information management/privacy/ security, data analytics) we have attributed ownership to specific people. We have also defined a Terms of Reference for the Data Community and invite feedback on response email, engaged with requestor when open data requirements are not clear. | **We will:**<br>– attribute the roles we have described to our people through the DDTO. We have begun building this team with the first new role having been recruited in 2021.<br>– upskill our people where needed to suit the role throughout ED2, as to fit into our data coherent organisation. | Having identified the roles of stakeholders of the data, we intend to constantly review through established feedback channels as we expect this to evolve over time. |  |
| **2. Use common terms within data, metadata and supporting information** | **We have:**<br>– created a data vision ('driven by people, empowered by data') and a set of supporting principles and data roadmaps for Open Data, architecture and integration, governance, analytics (in Q1 2021).<br>– outlined a metadata growth plan that is not only focused on data internals (e.g., data catalogue, data dictionary), but also on alignment of business terms related to data (business glossary). |  | In our data projects prioritised list, we have defined specific projects for data cleansing and metadata enrichment. Moreover, in all other data projects, especially Open Data projects, cleansing and metadata enrichment is part of the plan, focusing on the data needed for that specific project. | **We will:**<br>– implement the metadata growth plan previously outlined, starting in 2021 and continuing throughout ED1 and ED2. | In the next six months we will continue to explore metadata standards, including how we expect to be able to deploy these against our datasets systematically. We do not expect, however, to have this fully deployed as it will be dependent on other data platform deliverables. |  |

# DBP principles

| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvements planned in the next six months | Expected position at next publication |
|---|---|---|---|---|---|---|
| **3. Describe data accurately using industry standard metadata** | **We have:**<br>– used a data vocabulary that is consistent with industry standard (data management body of knowledge – (DMBOK)) and industry best practice.<br>– actively engaged in the CIM working group to help drive interoperability and ensure a standardisation of data descriptions.<br>– started metadata exploration but inital focus has been on data cleansing. |  | In our data projects backlog, we have defined specific projects for data cleansing and metadata enrichment. Moreover, in all other data projects, especially Open Data projects, cleansing and metadata enrichment is part of the plan, focusing on the data needed for that specific project. | **We will:**<br>– use open standards such as RDF and XML, CGMES and CIM, and Dublin core metadata structure to maximise data value through wider participation when opening new datasets, data products and services in 2021 and beyond.<br>– ensure interoperability with other DNOs and ESO published models and datasets, and to facilitate use of our data. We will do this through DDTO, which is responsible for data standardisation and alignwment when designing data models, adding more APIs. | In the next six months we will continue our exploration on metadata standards, but do not expect to have completed it. We continue to engage on the CIM workstream with the ENA working group which is expected to move forward and will help us define the requirements to enable easy interoperability across the whole energy sector. |  |
| **4. Enable potential users to understand the data by providing supporting information** | **We have:**<br>– identified the need for a Data catalogue and Data Dictionaries and recognised the importance of this topic in current architecture and platform work.<br>– responded to Open Data requests and actively encouraged feedback to understand if supporting information is required. |  | In our 'update reporting tools' projects (moving from Crystal Reports and Business Objects reporting to Microsoft Power BI) we have taken the opportunity, with current users, to:<br>– enhance the metadata and set up training for new users. This is required as we are enabling ad-hoc' reporting (self-service), for which data understanding is key.<br>– invite feedback on response email, hold call with requestor to ensure requirements are defined.<br>– direct Open Data requestor to related data they may find useful. | **We will:**<br>– create the data catalogue as a foundational component of the DDTO.<br>– create data dictionaries (including meaning of data fields, permitted values, notes on missing values and data quality, data owners and stewards, etc.) and usage vignettes to maximise the value of the data. This will also avoid misuse and misunderstanding when using our data for reporting, analysis or as input into models and simulations. | We continue to receive requests for Open Data which we will feed into our existing proof of concept for Open Data products and services. Using our experience from responding to Open Data requests we can identify the type of requests where supporting information will benefit the user and offer it proactively. |  |
| **5. Make datasets discoverable for potential users** | **We have:**<br>– considered how we will ensure that our datasets are discoverable for potential users.<br>– made new datasets available using Open Data requests to select data points of interest.<br>– continued our exploration of underpinning technologies. |  | In three currently running data projects (two on reporting and one on analytics), we are moving data from separate on-premise databases to cloud solutions, and we are setting up the proper database connections for people to have direct access to that data. Combining this with user training and our shortly running data catalogue project, we are giving users access, understanding, and discoverability of data. | **We will:**<br>– ensure that our data products and services are discoverable through a data catalogue (initial version in Q3 2021) with an external interface added on in ED2 – sector Open Data aggregators (e.g. ENA/MEDA).<br>– introduce a curated catalogue that is maintained and continuously updated. It will also classify data into open, shared and closed. | We will continue to explore datasets we can publish that are not already in the public domain. We are looking at the Open Data requests received to date to help us identify high interest datasets. We continue to develop our metadata enabling us to identify the underpinning technologies to unlock searchability. |  |

# DBP principles

| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvements planned in the next six months | Expected position at next publication |
|---|---|---|---|---|---|---|
| **6. Learn and understand the needs of their current and prospective data users** | **We have:**<br>– grouped stakeholders in several categories according to their sector, interest or activity and developed customised engagement plans with scheduled events.<br>– shared Open Data through Data Mill North and Leeds ODI partnerships that allow us to engage stakeholders not typically associated with energy and utilities, expand the stakeholder 'searchlight' and enable cross-pollination from overlaying different datasets together.<br>– begun to receive and respond to Open Data requests which is bringing forward further data stakeholders with active needs.<br>– asked for feedback on the Open Data responses we make and invite conversation should the data requirements not be clear to us. |  | Engaged with (external and internal) stakeholders to elicit users' data needs and wants. We have used the MEDA (Modernising Energy Data access) methodology, whilst we have clearly identified data owners and are establishing data towers. We also invite feedback on response email and hold a call with requestor to ensure requirements are defined. | **We will:**<br>– use a dedicated portal to reach a wider range of stakeholders, to have more timely engagement and to be able to capture their needs and requirements in more detail through a mix of real-time, continuous and organised one-off engagements. This will be enabled by the DDTO in 2021 and by opening new datasets. | Continued stakeholder engagement is planned throughout the next six months, clearly focused on the Open Data products and services roadmap utilising our new digital product board to engage with them on a more real-time "product based" basis to develop an iterative, fail-fast approach to updating our roadmap. |  |
| **7. Ensure data quality maintenance and improvement is prioritised by user needs** | **We have:**<br>– outlined a data quality monitor across our data towers that will result in a comprehensive overview at the end of ED2.<br>– produced an MVP deliverable which demonstrates how projects may be prioritised by considering user needs (also covered in architecture deliverable).<br>– set the priorities for 2022 and beyond by assessing (external) stakeholders' needs.<br>– commenced data cleansing specific to our Asset data. |  | In our data projects backlog, we have defined specific projects for data cleansing and metadata enrichment. Moreover, in all other data projects, especially Open Data projects, cleansing and metadata enrichment is part of the plan, focusing on the data needed for that specific project. | **We will:**<br>– improve data quality and maintain it across the organisation through our data governance plans during ED2 and the end of ED1.<br>– focus on the data for which a high quality and appropriate metadata are most important: often-used data that is used in cross-departmental collaboration (and Open Data). Q3-Q4 2021. | We will execute a data exploration inititiative with an external partner on our network data due to this being an area of interest. As part of this initiative will explore quick and efficient ways to cleanse data and identify the root cause of data quality issues. This will demonstrate the value of data cleansing tools and help us determine where best to use them. |  |

# DBP principles

| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvements planned in the next six months | Expected position at next publication |
|---|---|---|---|---|---|---|
| **8. Ensure that data is interoperable with other data and digital services** | **We have:**<br>– defined how, for each data project in our prioritised list, we will ensure data is interoperable. |  | – In our 'ETR' machine learning project, we are carrying out an extensive natural language processing exercise to convert log data (phone transcripts, free text fields in tools) to computer-readable data. We combine this data with other (internal and external) sources to create a predictive model.<br>– In two of our reporting projects, we are moving data to the cloud, to aggregate it and offer it to users as 'ready to use' data marts.<br>– Our Asset Management and Finance systems are built on comprehensive/intertwined data models. | **We will:**<br>– set up a data platform that will be user-centric and future-proof and will continue to grow through the ED2 period, starting in Q3 2021 for internal and external data dissemination.<br>– ensure the data platform is not merely a storage place, but functions as a platform that facilitates governance processes, and all the stakeholders with their various needs, from owner to engineer and from internal to external Open Data user. It will facilitate a common way of working around data, and an elaborate data architecture will foster seamless integration of data assets throughout the organisation. | Whilst we will only be introducing new data products and services utilising modern, API driven web portals, some of which will be deployed in the next six months through the proof of value work, we expect to have interconnected only a small amount of proof of concept based digital services during this period. |  |
| **9. Protect data and systems in accordance with security, privacy and resilience best practice** | **We have:**<br>– defined security, privacy and resilience as a pivotal aspect to monitor and an underlying foundation for systems architecture in our architecture work.<br>– invested significantly in robust cyber security controls and resilience measures that will extend as our data footprint grows. |  | We are currently undertaking projects to increase our cyber security and privacy (GDPR) measures to go beyond DBP guidelines. | **We will:**<br>– provide a resilient approach to moving data from a protected state as per GDPR to a 'presumed open' state.<br>– through our new data platform and initial data analytics capability development in 2021-2022: (1) consider security, privacy and compliance as a key driver in our new data platform, (2) ensure a clear roles and responsibilities matrix is present in our new data governance structure and processes, (3) actively monitor it in our data management dashboard, and (4) take a continuous effort to empower all users with skills and awareness. | There are no immediate plans other than to apply the same rigour to our proof of value initiatives as we would any other system, having them fully pen-tested and applying the cyber security standards we have for any external facing system. |  |

# DBP principles

| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvements planned in the next six months | Expected position at next publication |
|---|---|---|---|---|---|---|
| **10. Store, archive and provide access to data in ways that maximise sustaining value** | **We have:**<br>– outlined our aims for data cataloguing and metadata provisioning and have started raising awareness across the organisation.<br>– explored the use of a data repository to bring all network data together, cleanse it and create a data schema. |  | – In two of our currently running reporting projects and one of our running data science projects, we are moving data to the cloud, to aggregate it and offer it to users as 'ready to use' data marts.<br>– Fully scoped a comprehensive/scalable data platform to support all current and future data requirements. This platform will support our plans for Open Data and so build data products and services in line with the recommendations in the Energy Data Taskforce report. | **We will:**<br>– set up a data platform to enable interoperable data that is user-centric and well-governed. It will start in ED1 and continue throughout ED2.<br>– adhere to a defined set of minimal standards for quality and metadata established during 2021–2022 for data entering the platform. This is a prerequisite for opening more datasets.<br>– ensure our data is understandable, correct and useful through collecting of users' feedback and active engagements, thereby leading to sustained data valuation for many years to come. | We are designing our data products and services with a user-first approach to ensure we maximise the value to our stakeholders. During the next six months we will build data products from our network data and test these against the needs of our data stakeholders. We will deploy Open Data products with ease of access for the end user being a leading requirement. |  |
| **11. Ensure that data relating to common assets is 'presumed open'** | **We have:**<br>– defined our approach and started engagement on 'presumed open' across the organisation.<br>– contributed as a member of the ENA, to the National Energy System Map (NESM) proof-of-concept launched in October 2021. The NESM will give customers information about energy network assets, where they are located and who owns them, which forms a key part of the Government's Energy Digitalisation Strategy and was also a core recommendation of the Energy Data Taskforce. |  | We are currently exposing data that is static or updated infrequently (e.g. Distribution Future Energy Scenarios) but have a clear plan to developing a strong Open Data proposition. | **We will:**<br>– comply with EDTF recommendations on coordination of asset registration and visibility of infrastructure and asset through a digital system map, by actively looking for mitigation strategies (such as aggregation, anonymisation etc.) to open as much asset data as possible without compromising safety, privacy, regulatory or commercial sensitivities.<br>– achieve our goal through creating data analytics capability starting in 2021–2022 and continuously improving and becoming more efficient throughout ED2 period. | We expect to continue to learn from our involvement in the NESM and the National Underground Asset Registar (NUAR) projects, both of which we contribute our asset data to.<br><br>These lessons will then feed into our development of our new data analytics capability which we expect to begin over the course of the next six months. |  |

# DBP principles

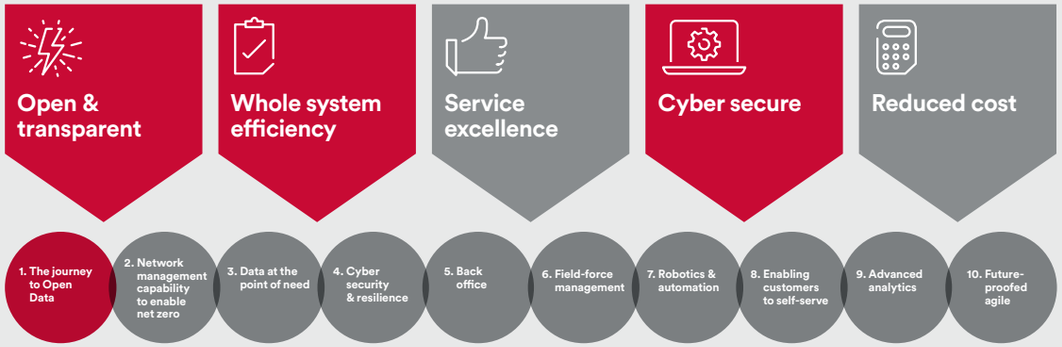
| DBP principle | What we have done so far | Curent assessed position | Examples | Our long-term plans | Improvements planned in the next six months | Expected position at next publication |
|---|---|---|---|---|---|---|
| **12. Conduct Open Data triage for presumed Open Data** | **We have:**<br>– defined and embedded our Open Data triage approach, which is a process to systematically identify issues (privacy, security, commercial, negative consumer impact or legislation and regulator barriers) with a dataset, thus limiting their potential openness and identifying techniques to be used to mitigate these issues.<br>– begun to receive and respond to requests for Open Data from our industry ENA process. These have followed our new triage process and lessons are continuing to be learned on this.<br>– dedicated resources in place to carry out Open Data triage and develop a centre of knowledge. |  | We are currently exposing data that is static or updated infrequently (e.g. Distribution Future Energy Scenarios) but have a clear plan to developing a strong Open Data proposition (see separate tab). We have also worked with business experts to build a knowledge centre within the Data team allow us to respond to Open Data requests. | **We will:**<br>– open more datasets starting in Q3 2021 using some mitigation techniques.<br>– initiate data analytics capability with the aim to grow it in ED2 (enabling more complex techniques such as differential privacy or composite AI – allowing for AI models to be trained on separate datasets, and then combined, without the need for datasets to be combined).<br>– ensure that issue mitigation is actively pursued, so more datasets can be open. | Continue to refine our Open Data triage process and implement a regular, independent review of this outside of the operational team responsible. This will help us understand whether the 'presumed open' approach is being followed and to help us understand where (if anywhere) we have had to reject requests and whether there are improvements we can make to prevent this being the outcome in the future. |  |

# Annex 2

## Initiatives

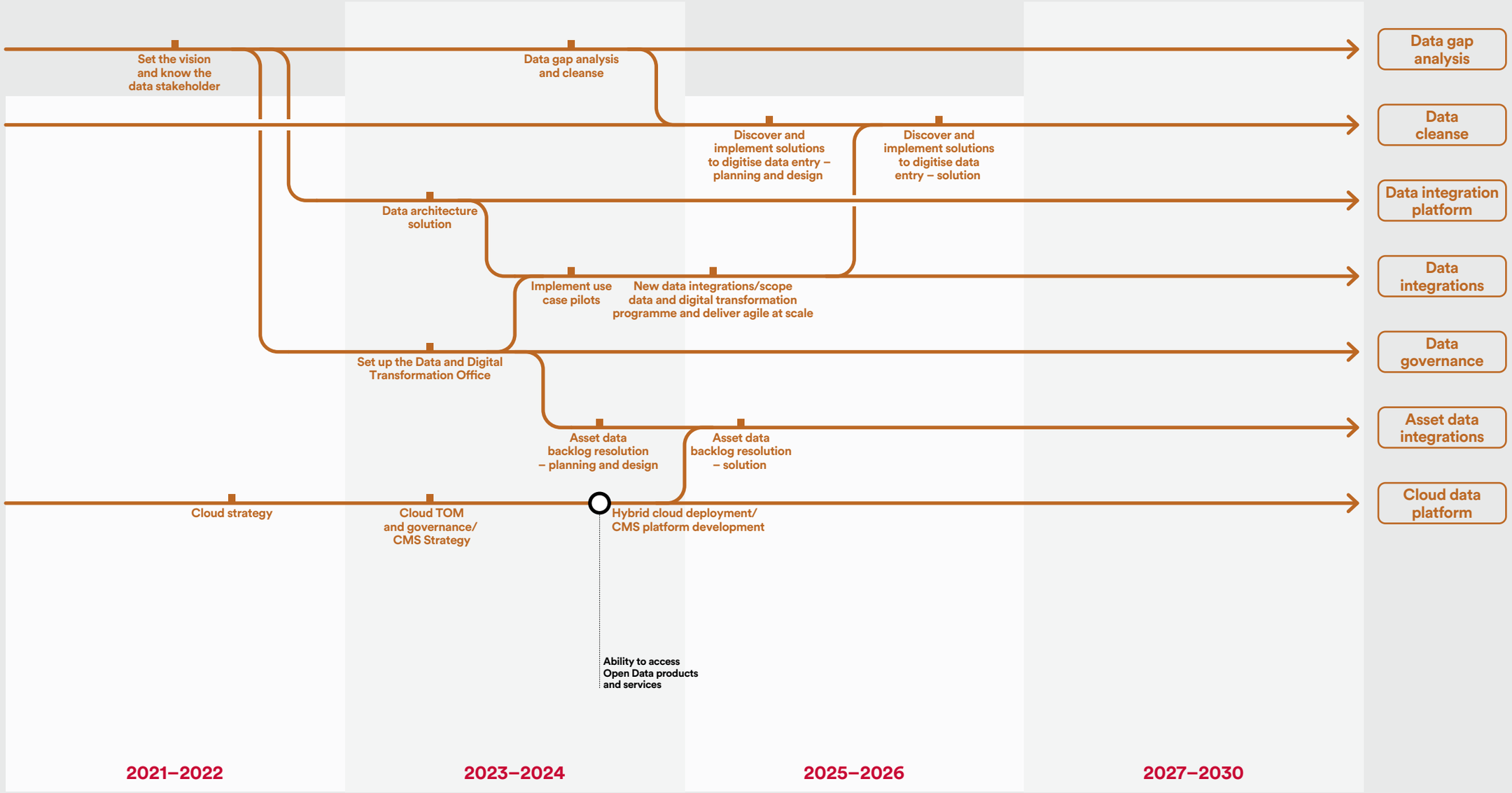
# 1. The journey to Open Data

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Understand, improve and expand our energy system data and promote data transparency through Open Data.** |
| **Business outcomes** | Open Data, particularly energy system data, is central to net zero – for us and the wider ecosystem.<br><br>**Internal outcomes**<br>Through a focus on data, data quality and data platforms, we will transform ways of working internally, becoming data-centric in our decision-making and day-to-day actions.<br><br>**External outcomes**<br>We will provide relevant and good quality data in a timely manner that will help consumers, policy makers, researchers and others to accelerate the journey to decarbonisation. Our Open Data offering will allow the wider ecosystem to develop new markets and innovate continuously. Our collaboration with industry on standards and common open access arrangements will make data more accessible and comparable across GB for stakeholders. |
| **Benefits** | Sharing our energy data with other organisations is a vital part of our transition to a DSO. By giving organisations the information that they need to adopt a "whole system" approach, the development and operation of the system can proceed in a way which delivers decarbonisation more efficiently.<br><br>Other stakeholders will also benefit from the availability of this data. For example, customers will find it easier to access data relevant to new connections, and we will be able to better co-ordinate with partners such as local authorities and other utility companies.<br><br>As part of this core area, we will also undertake a process of surfacing, cleansing and structuring data that we already hold, and will be able to make better use of datasets provided by other organisations. We will be able to use these datasets for a variety of purposes – for example, targeting support at vulnerable customers, or better forecasting where demand will grow on our network. |

# 1. The journey to Open Data



# 1. The journey to Open Data
## 1.01 Data gap analysis

**Understanding what our stakeholders need, how they need it and building the relevant data sources.**

| | |
|---|---|
| **Initiative breakdown** | We are collaborating with DNOs, the ESO and stakeholders to seek common solutions that make it straightforward for external parties to access the data.<br><br>**Visioning:**<br>This is the first step of a series of activities that we will undertake to further develop the data strategy. The objective is to bring the organisation together and align on a single vision for data. The intention is to use the vision to paint a picture of the future and be able to set the principles and the high-level goals for our transformation.<br><br>**Stakeholder requirements:**<br>We need to have a clear view of our data stakeholders and consumers. Whilst current energy system participants are obvious external customers, we will consider potential future business models, wider stakeholders, prosumers and expand on our set of data stakeholders. Building data requirements will allow us to map out the end-to-end data use case (a.k.a. journeys) to ensure we understand the service needs of these stakeholders. Groups of data requirements will have business owners assigned, which will be defined as part of the overall operating model governance with clear accountabilities for the management and maintenance of the data requirements being set, and will be under continuous review. |

| | | | |
|---|---|---|---|
| **This is dependent on** | This is not dependent on any initiatives. | **This will enable** | — Data accountability |

# 1. The journey to Open Data
## 1.02 Data cleanse

**Data quality understood and cleansed – deploy tooling to assess and manage the uplift of data quality.**

| Initiative breakdown | This initiative is to establish the scope of the data that we will examine, identify data cleanse requirements, data completeness gap analysis and mobilise activities to address the data deficiencies and improve the quality of that data.<br><br>**Key features for this are:**<br>— **Data discovery:** Discovery will look to build on our recent work to implement technology that can identify data quality issues. We will continue to use technologies of this nature to surface data into a digestible format that identifies what data is being held in each dataset.<br>— **Establish value of data:** Once the data has been identified, assessments will be undertaken to establish the value/importance that data may have to the internal and/or external stakeholders.<br>— **Ease of cleanse:** Based on high to low value data, assessments will be undertaken to establish the ease of cleansing data and correcting data gaps.<br>— **Prioritisation:** Once the value of data and ease of data cleanse has been established, a prioritisation matrix will be used to determine the priority order by which data cleanse activities will be undertaken on a given dataset. This priority assessment will be based around timescales, cost and benefit.<br>— **Implementation:** Based on the prioritisation, agile rollout plans will be produced. Implementation and adoption will align with other data and digitalisation transformation projects to identify dependencies and sequencing opportunities so that delivery can be maximised.<br><br>**We will need to enhance our quality of data and discover and implement solutions to digitise data entry:**<br>— **Solution selection and design:** This step will identify the most appropriate solutions and create high-level designs and architecture for their implementation.<br>— **Implementation:** Based on prioritisation, agile rollout plans will be produced. Implementation and adoption will align with other data and digital transformation projects to identify dependencies and sequencing opportunities so that delivery can be maximised. |
|---|---|

| This is dependent on | — Data integration<br>— Data governance |
|---|---|

| This will enable | — Asset data integrations |
|---|---|

# 1. The journey to Open Data
## 1.03 Data integration platform

**Implement data integration platform using standard data formats (i.e. CIM) and API driven to implement a hybrid solution of on-premise and cloud capabilities to integrate data across our own landscape and provide access to data with ease from outside our organisation.**

| Initiative breakdown | |
|---|---|
| | We are collaborating with DNOs, the ESO and stakeholders to seek common solutions that make it straightforward for external parties to access the data.<br><br>Based on the role that each data tower will execute and taking into consideration the data stakeholders' requirements and the TOM, we will create data architectures that cover the following aspects:<br><br>— Data catalogues (including metadata)<br>— Data discoverability and triage process, especially in line with open network data requirements and the spirit of collaboration<br>— Data models and data flows<br>— Data technologies, and repositories, including consideration of data lakes<br>— Access rights, security and privacy<br>— Data management tools<br>— Data formats and interoperability (i.e CIM).<br><br>As part of this initiative, we will consolidate the vision, operating model, data requirements, data catalogues and output of this initiative into a solution that can be used for internal and external uses. The benefit of this will be to provide external stakeholders with visibility of our data catalogues and triage process. |

| This is dependent on | This will enable |
|---|---|
| — Analytics platform | — Data integration<br>— Asset data integrations<br>— Cloud data platform (incl. Open Data)<br>— Integration of master data<br>— Initial cloud footprint<br>— Cloud data platform |

# 1. The journey to Open Data
## 1.04 Data integrations

**Build integrations between existing systems (e.g. APIs) where integration of data is required to provide Open Data services.**

**Initiative breakdown**

We are collaborating with DNOs, the ESO and stakeholders to seek common solutions that make it straightforward for external parties to access the data.

Given the changing landscape of data, there is a need to scope and prioritise the data transformation activities that we will undertake. We plan to start with a set of data pilots. These will include use cases that are externally and/or internally driven such as:

— triaging data requirements
— publishing of energy data to provide data into the national energy systems map
— publishing data for a connections heat map identifying where capacity exists or is in shortfall
— collection of data on LV network for improved Network Operations
— faster and more effective data entry
— availability of real-time energy flow information
— use of smart grid and meter data.

The sequence of piloting data requirements and scoping these into a transformation programme will be as follows:

**Pilots:**
— **Prioritisation:** Prioritise requirements to identify candidates for pilots using multiple internal and external criteria to establish the value proposition and prioritisation order.
— **Pilot scoping:** Gathering requirements from architecture, operating model and other designs to scope out pilot projects. Data towers and business owners will work together to implement process, system and people changes to deliver against the requirement using pre-defined and repeatable templates and processes and identifying defined outcomes.

Continued on the next page...

# 1. The journey to Open Data
## 1.04 Data integrations

**Build integrations between existing systems (e.g. APIs) where integration of data is required to provide Open Data services.**

**Initiative breakdown**

— **Pilot execution and validation:** Deliver pilot using agile methodology. Validate results against defined outcomes with customers and/or internal stakeholders, ensuring that the pilot has achieved intended outcomes. Document approach and ways of working to form a template.
— **Lessons learned:** Carry out lessons learned and provide feedback on the operating model, the architecture, execution of governance and role of DDTO to make improvements for scaled execution.

**Execution:**
— **Transformation programme execution:** Using agile methodology and the results of the pilot(s), we will prioritise projects and improvement activities to iteratively grow the data capability. The currently identified data initiatives are detailed within this document (see 'enabling data analytics and insights', and 'improving network planning and operations').
— **Continuous review:** We recognise that not all external and/or internal data requirements are known at this point so we have built the need for a level of flexibility into our action plan. For this reason we will generally start with pilot activities to enable the validation of the value proposition before committing to an enterprise solution and/or change priorities as new requirements emerge. This will form part of the continuous update process of our DSAP.
— **Set up agile at scale:** We will use frameworks such as SAFe to set up scaled agile capabilities. This will be required for the delivery of the data transformation roadmap below.
— **Data transformation roadmap:** Carry out a prioritisation and assessment exercise. Build an implementation roadmap. Ensure there is stakeholder buy-in and the value is agreed. Priority should be given to activities that enable key business areas and satisfy key data stakeholder requirements.
— **Programme scope:** Using the roadmap, scope a transformation programme. Where possible this is best delivered through agile. Create charters, backlog of products and set up agile delivery capabilities. The programme should be managed as a portfolio by the DDTO.
— **Programme execution:** Execute multiple sprints of agile projects to achieve the roadmap. Create business cases and benefits realisation plans. Test that the outcomes and benefits are achieved. Reprioritise the backlog if necessary to meet stakeholder expectations.

Continued on the next page...

Delete 'and insights' if this is pointing to p49 as the title on p49 is just 'enabling data analytics'?

# 1. The journey to Open Data
## 1.04 Data integrations

**Build integrations between existing systems (e.g. APIs) where integration of data is required to provide Open Data services.**

| Initiative breakdown | |
|---|---|
| | The DDTO will have two responsibilities:<br><br>**Use of external data:**<br>External data can be valuable sources for adding value in our operations and customer services activities. Examples of this would include the use of flood data to add resilience to specific assets or correlate weather patterns with incidents. We will proactively search for such sources of data and, as they are identified, assess the usability, value and impact of the data to enhance services. The DDTO will have the following responsibilities:<br><br>— Working with the business to undertake market and horizon scanning to identify any external data opportunities and engage the business for their use.<br>— Work with the business to understand the nature of the data and how it might add business value. Articulate these into scope for assessment and create data requirements.<br>— Identify which data towers could deliver the requirements, and facilitate initial assessments.<br>— Run appropriate pilot projects, ensure the data architecture is updated and make other appropriate adjustments as required, such as changes to procedures.<br><br>Manage implementation if business value is confirmed. Ensure data and business impacts are addressed including but not limited to changes to data catalogues, metadata, architecture and legal compliance (i.e GDPR). Implementation and adoption will align with other data transformation projects and will utilise agile ways of working to deliver benefit quickly.<br><br>**Data triage**<br>Digital channels will be built to capture data requirements and enquiries through our CRM solution or any national scheme. The SPA will be responsible for the management and delivery against such requests and will become the point of contact for any human contact required under the data request process. The DDTO will also be responsible for the identification and assessment of any external data requests that could be made readily available to external stakeholders under the Open Data principles. |

| This is dependent on | This will enable |
|---|---|
| — Data integration platform<br>— Data governance<br>— Analytics platform | — Data cleanse<br>— Health & Safety analytics<br>— Cloud analytics platform |

# 1. The journey to Open Data
## 1.05 Data governance

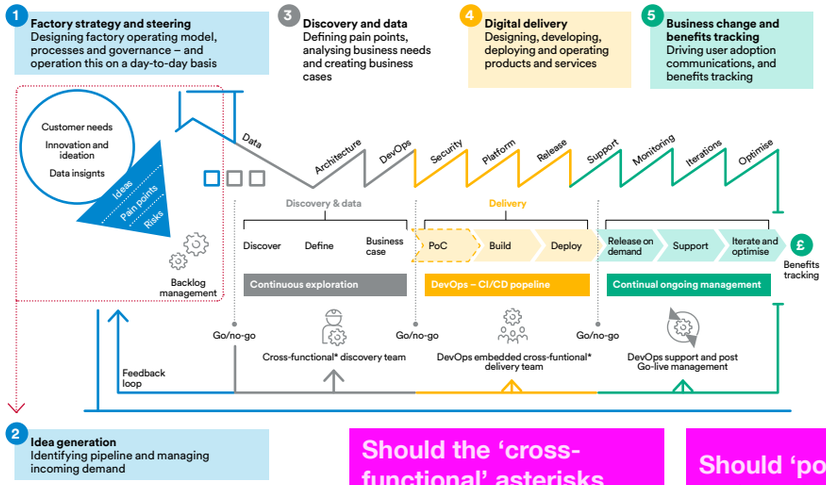
**Establish a central function to own and manage data governance – the central point of accountability that plays a coordinating role for all data requests and deliveries as well as setting the rules for data quality and availability (openness).**

### Initiative breakdown

The DDTO will become the central hub for all data activities. It will be the final escalation point for all key data-related programmes and will oversee the performance of delivery against data requirements. The DDTO will champion DBPs and face off to key stakeholders such as Ofgem, especially as it relates to the Open Data network strategies and vision.

The DDTO's role is both strategic and transactional. Strategic in the sense that it owns our overall data strategy and is there to create cohesion and alignment across the organisation, but transactional in the sense that it will oversee different initiatives, and will ensure we perform against external data requests. Final triage decisions can be given to the DDTO when it comes to providing data externally.

**This initiative will design a DDTO with the following features and put in place plans to start it up:**
— Team structure
— Roles and responsibilities
— Reporting lines and escalation routes
— Governance
— Portfolio management of all data transformation activities
— Communications and stakeholder approaches and plan
— Execution of data triage.




**Should the 'cross-functional' asterisks have footnotes?**

**Should 'popeline' be 'pipeline'?**

### This is dependent on

— M365 extended use
— Data accountability

### This will enable

— Data cleanse
— Data integration
— Analytics platform

# 1. The journey to Open Data
## 1.06 Asset data integration

**Asset data surfacing and integration – Connecting eAM spatial data to the new integration platforms to surface asset data on the data platform for open sharing of this information.**

| Initiative breakdown | |
|---|---|
| | Whilst our asset data is held in our central asset management and spatial solution forming an integrated network model, there are other datasets that require to be cleansed, improved and centralised. This initiative will see the transformation of our processes to reduce the use of spreadsheets, access databases, emails and paper as a means for collection, submission and data entry and move to digital solutions to expedite data collection, entry and sharing and will reinforce quality standards at the time of data collection and entry. This will include integration of work management and field service solutions with the data repositories and will be expanded into mobility solutions. Data and the quality of data will become an intrinsic part of any delivery and as such will be measured in that way in terms of process and governance.<br><br>**Key features for this are:**<br>— **Discovery and prioritisation:** With a focus on all the processes that collect and submit asset, operational and customer data, discovery will look at processes where data collection error rates can be improved, and submission or lead times streamlined. The discovery exercise will focus on where digital solutions can be used to enhance such processes, and where paper-based submissions can be digitised. Opportunities are prioritised at this stage.<br>— **Process automation:** A discovery exercise will identify opportunities for processes to be streamlined and automated so that, where possible, data entry can become automated.<br>— **Data quality:** As part of discovery, the value of data will be identified. Where auto data entry cannot be achieved, conditional controls will be applied to make the manual entry of high value data compulsory through logical system controls. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Data gap analysis<br>— Data integration platform | | — Asset data platform |

# 1. The journey to Open Data
## 1.07/1.08 Cloud data platform

**Implement cloud data platform – provision of a modern set of data capabilities, future-proofed and flexible enough to scale to demand.**

| Initiative breakdown | |
|---|---|

In order for us to offer Open Data services, we need to migrate workloads to the cloud, improving performance and allowing them to scale on demand.

**CMS strategy**
This will define our content management strategy so that content is secured, accessible and reusable through different channels. Two key features to be included are:

— **Content repository:** A clear definition of storage and repository locations for visual, audio and communication content in a manner that is secured and accessible through integration and accessed through appropriate channels. Collection of all content, potentially cleansing and storing in designated and defined hierarchy and structure.
— **Architecture:** High-level architecture design and definition of functional and non-functional requirements for a content management system, identifying key integration points.

**CMS platform development**
After appropriate product selection, deploy a CMS platform to provide the ability to build and share content effectively across channels. Key features should include:

— **Asset standardisation:** Cleansing and standardisation of assets in the catalogue to increase the re-use of material and reduce rework in the communications team.
— **Asset catalogue definition:** Creation of a clear catalogue of our assets (both for website and intranet) to be migrated to the central CMS platform, in a manner that increases productivity of the communications team by localising assets into a single place. Assets will include home pages, templates, links, images, videos and visual identity related to external communications.
— **CMS deployment:** Release 1 would be the migration of assets to the CMS platform and integration with the website, including communications workflows. In Release 2, the same activity will focus on migration of assets to our intranet and addition of associated workflows. Release 2 would also include integration with distribution lists to share content with all colleagues in an effective manner. See assumption on integration requirements in assumptions and dependencies.

Continued on the next page...

# 1. The journey to Open Data
## 1.07/1.08 Cloud data platform

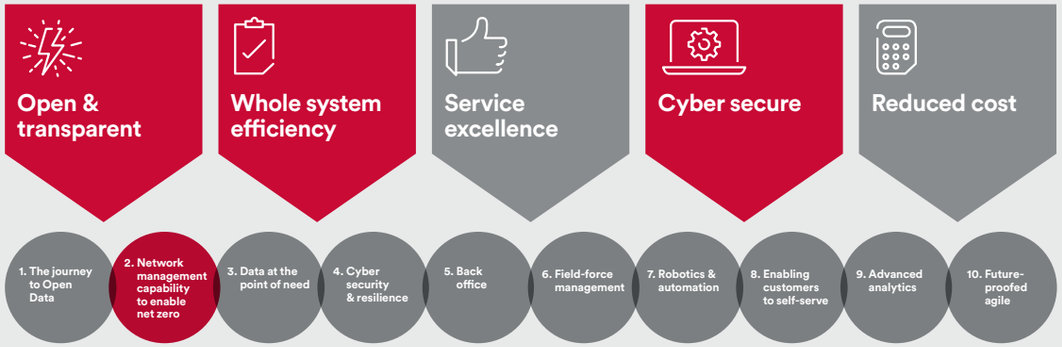
**Implement cloud data platform – provision of a modern set of data capabilities, future-proofed and flexible enough to scale to demand.**

| Initiative breakdown | |
|---|---|
| | We will need to migrate our workloads to the cloud to enable flexibility and scalability while reducing technical debt in a progressive manner:<br><br>**Define a cloud strategy:** Develop our vision for cloud environments, creating a target end-state as well as identifying foundational technologies required to support migrations. The cloud strategy will provide a high-level business case that captures the value, and costs, of migrating as well as identifying technologies and applications that must remain.<br><br>**Develop a cloud TOM:** Conduct a readiness assessment with IS and business stakeholders to map out the organisational readiness for the cloud migration as well as the impact generated. Based on the assessment, a TOM will define new roles and responsibilities, processes, security measures and KPIs to be deployed, aligned with the wider IS operating model, before any migration is progressed.<br><br>**Application assessment:** Review the applications, systems and services with key stakeholders in respect of their business value, technical fit and total cost of ownership (TCO). Develop a prioritised roadmap of applications to be kept, replaced, retired or consolidated.<br><br>**Design the hybrid cloud architecture:** Define a high-level architecture, and requirements, that will outline the standard hosting infrastructure for us, including on-premise and cloud environments.<br><br>**Minimum Viable Product (MVP):** Conduct a MVP for the architecture design, so that service integration and tooling can be validated against a small sample set of test migrations, prior to the full deployment and migration of workloads.<br><br>**Migrate workloads:** Migrate workloads with optimal change applied, considering cloud migration, cloud transformation and DevOps transformation impact.<br><br>**Optimise data centres:** As objects are migrated to the cloud, the existing data centres' capabilities can be rationalised for the appropriate balance of edge and data centres. |

| This is dependent on | This will enable |
|---|---|
| — Data integration platform<br>— M365 extended use<br>— Customer and People Services automation<br>— Digital customer journeys | — Cloud enabled website |

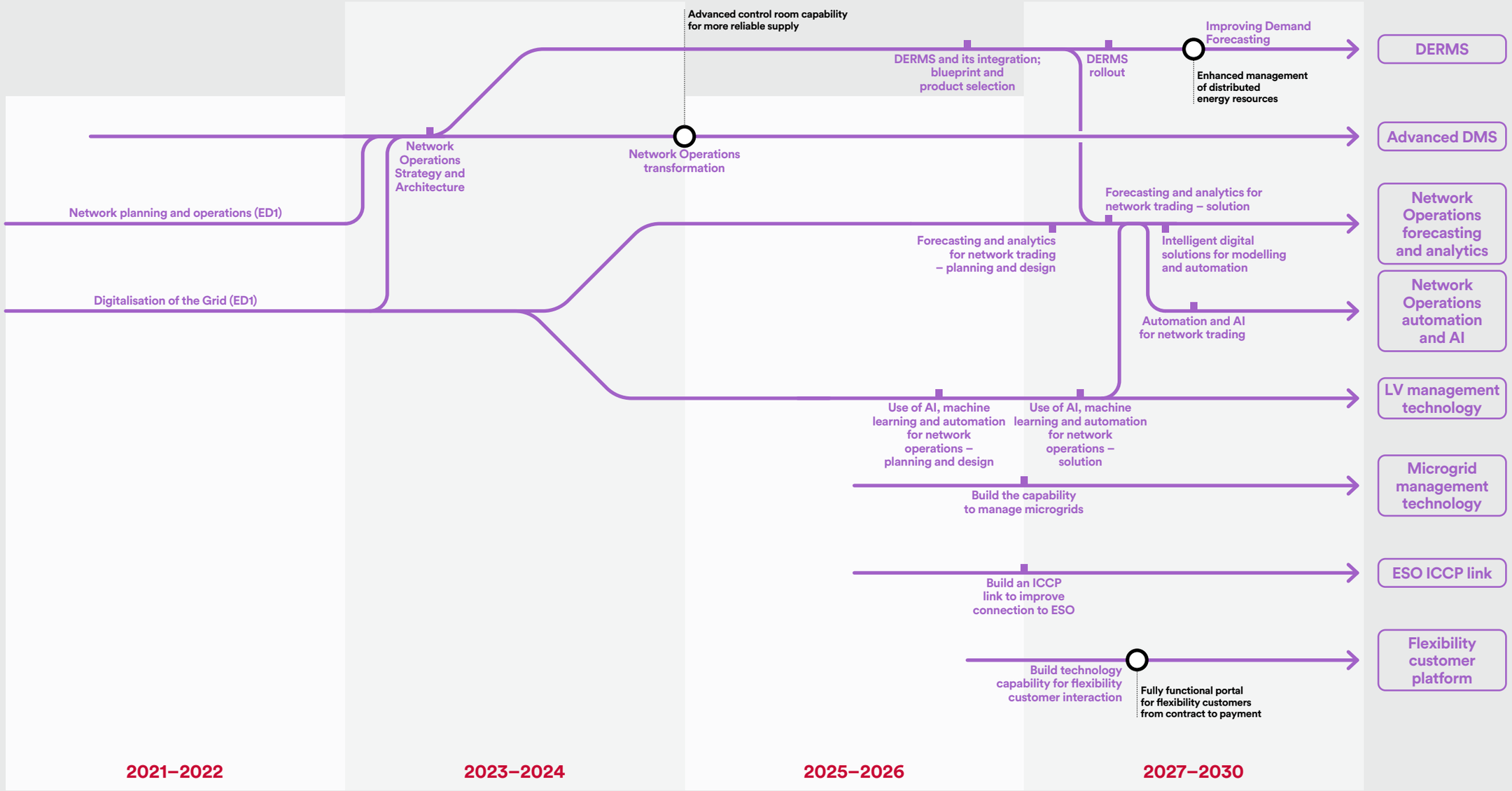
# 2. Network management capability to enable net zero

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Upgrade and implement new IS systems to enhance network management and decision-making in real time to enable us to efficiently operate our distribution network in a decarbonisation era.** |
| **Business outcomes** | New ways of managing and balancing the network are key to DSO and ultimately our net-zero ambition. Those new ways are increasingly more complex and we need data and digitalisation at an unprecedented level to manage the complexity.<br><br>As the foundation for our DSO strategy, data and digitalisation will provide the right capability to optimise the management of Distributed Energy Resources, customer flexibility, our LV network, the need for new connections and our interaction with the ESO and the wider market. We will provide our organisation with resilient and efficient technology to automate the distribution system.<br><br>The new capability will be designed to seamlessly integrate data between systems and expose the data through our Open Data proposition in the right way. |
| **Benefits** | This core area will allow us to better monitor our network, determining where interventions are required to increase network utilisation. We will then be able to adopt a “flexibility first” approach, integrating both customer flexibility and network flexibility into the day-to-day management of our network:<br><br>As a result, our network will be more reliable, better able to cope with the demands of increasing numbers of LCTs, and able to facilitate an efficient transition to net zero.<br><br>By bringing forward flexibility, our investments in this area are also likely to lead to benefits across the rest of the energy system. For example, flexible demand may be used to shift demand to times of lower wholesale market prices; reduce the nationwide peak, reducing the need for generation and transmission capacity; and provide national balancing services. We will develop a link to the ESO to facilitate these sorts of whole system benefits. |

# 2. Network management capability to enable net zero



# 2. Network management capability to enable net zero
## 2.01/2.02 DERMS

**Enhanced management solution for energy resources connected to our distribution network (DERMS for DSO).**

| Initiative breakdown | |
|---|---|
| | Expand our ED1 capability for managing DSO-contracted flexibility that is already being established in the 2015–23 period with the implementation of the Flexible Power toolkit with other DNOs and market collaboration.<br><br>The control of customer assets on the other hand, including DERs, is achieved through a set of capabilities referred to as Distributed Energy Resource Management Systems (DERMS). DERMS enables optimised and proactive network management and stretches from planning to operations for the management and control of customer assets. These integrated processes encompass the appraisal, provision, procurement, dispatching and settlement of flexibility services through customer assets (see DSO4.1, DSO5.4). DERMS also has a high degree of integration and automation activities such as ANM (see DSO4.2) and manages potential conflict between connection contract obligations and flexible service arrangements between the ESO and a DSO (see DSO4.4).<br><br>This initiative will identify an enterprise scaled solution to manage the energy resources connected to our system in order to execute our DSO role. As Distributed Energy Resources (DER) increase there is a need to understand and interact with them at an enterprise level so that we can deliver against our DSO plan. To do so we will undertake the following initiatives:<br><br>**Design and specification:** Using the strategy, high-level process design and architecture as input, this exercise will articulate the desired capabilities required from a system that will allow us to manage the energy resources connected to our network, and how it should integrate with connected energy resources and other internal and external systems. The design will map our DSO strategy development plan objectives and the capabilities required from such a solution. The design will be used as a key input into product selection and consolidates the findings of all the previous initiatives, such as strategy, architecture and operating model.<br><br>**Use cases discovery:** In order to carry out an effective product selection process, we will identify a number of key use cases that the management solution, and its integration, needs to satisfy e.g. forecasting, situational awareness of DER, or energy arbitrage. The prioritisation of use cases will depend on the alignment of the implementation approach with our DSO strategy development plan.<br><br>**Product selection:** We will run a product selection process. This process will leverage innovative approaches such as ‘value prototyping’ where we will ask potential vendors to showcase their products against defined use cases and specifications. The product vendors will have to invest in building end-to-end demonstrations, showing the overall capability of their products and highlighting key integration and data requirements as well as the availability of modules so as to enable flexibility of implementation. The outcome will be a chosen product with a set of prioritised business capabilities that will become the scope of deployment.<br><br>Continued on the next page… |

# 2. Network management capability to enable net zero
## 2.01/2.02 DERMS

**Enhanced management solution for energy resources connected to our distribution network (DERMS for DSO).**

| Initiative breakdown | |
|---|---|
| | **Implementation roadmap:** Based on the outcomes of the strategy exercises, we will have identified which of our DSO roles and capabilities we wish to realise first. On this basis, and considering any operational or organisational constraints, this initiative will create a roadmap for implementation. We will outline the content of different releases. For example, we may decide that in line with our DSO development plan, we wish to implement connection flexibility, and/or adopt the role of the neutral market facilitator early in the rollout. The implementation roadmap will articulate how many rollout programmes there will be, the sequence of capabilities and the benefits that will emerge.<br><br>**Implementation 1 and 2:** For the purposes of the action plan we have assumed there will be two major releases of DERMS but in practice this may change. This part of the initiative will design a programme delivery, using agile if appropriate. As part of this initiative, the details of systems integration points, or any process changes to existing network and asset management activities, are also implemented. The scope of implementation will also include integration and implementation of any commercial processes and operating model changes. The DERMS rollout is dependent on upfront strategy and architecture work as well as other potential changes to network and asset management systems. It is possible that scaled rollout would not commence earlier than Q2 2023. |

| This is dependent on | This will enable |
|---|---|
| — Advanced DMS | — Network Operations forecasting & analytics<br>— Flexibility customer platform<br>— Connections CRM |

# 2. Network management capability to enable net zero
## 2.03 Advanced DMS

**Expand current DMS capability to Advanced DMS (ADMS) capabilities within the control room to enable DSO roles to be fulfilled.**

| Initiative breakdown | |
|---|---|
| | The control of network assets is achieved through a set of capabilities collectively referred to as an Advanced Distribution Management System (ADMS), which monitors and controls network assets such as AVCs, circuit breakers and switches (see DSO4.3).<br><br>**Enhance network planning/investment data use cases:** In conjunction with our Network Operations and aligning with our DSO strategy development plan, we will define and articulate the future role of Network Operations and their requirements from digitalisation. This will cover, but will not be limited to an articulation of the role of the control room of the future, what key capabilities and services our Network Operations will need to deliver, and what key digital resources they will require.<br><br>**Use of smart data strategy:** As we are upgrading our telecommunications network and are increasing the number of data points that our network is capable of delivering, there is an opportunity to assess the extent to which such data can be utilised for Network Operations in both real and slow time. Using the term 'smart data' to collectively describe such data points, the use of Smart Data Strategy will identify how and where these data points will be used by Network Operations to become the control room of the future and identify what data points they may need to populate and operate the concept of an ADMS being formed through the integration of a number of digital systems. This initiative will align with overall data transformation initiatives. The outcome of this exercise will give us the ability to understand where measurement gaps reside, what the DSO direction is for expansion of sensor capabilities and identify where integration is required to present a single view of the truth.<br><br>**Network Operations architecture:** Based on the strategy exercise above, we will produce a Network Operations to-be architecture. In this stage, the future state application landscape is mapped to future capabilities, processes and standards. The architecture should align with overall architecture principles. There should be close alignment with data architecture as outlined in the data swim lane of this deliverable. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Analytics platform | | — DERMS |

# 2. Network management capability to enable net zero
## 2.04 Network Operations forecasting & analytics

**Implement forecasting and analytics capabilities for improved Network Operations efficiency and to enable flexibility services.**

| Initiative breakdown | |
|---|---|
| | Discovery of digital solutions to enhance modelling capabilities by the use of artificial intelligence, machine learning and automation.<br><br>**Automation assessment:** Assess candidates for automation in network investment/planning and build a pipeline of processes to be automated. The framework suggested to build the pipeline is ESOAR (eliminate, standardise, optimise, automate, robotise), not only to identify candidates for automation but also to eliminate waste, standardise and optimise processes.<br><br>**Analytics assessment:** Enhance modelling processes with analytics. Candidates such as forecasting, fault analysis, or safety scenarios (e.g.: storm impacts) are potential candidates. The analytics assessment will consider:<br><br>— where analytics can enhance modelling output<br>— data requirements for the analytics, including the use of external data<br>— detailed articulation of analytics use cases<br>— integration with current modelling processes and systems.<br><br>This initiative will be potentially executed using the analytics Centre of Excellence (CoE). |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — DERMS<br>— LV management technology<br>— Control room analytics | | — Network Operations automation & AI |

# 2. Network management capability to enable net zero
## 2.05 Network Operations automation & AI

**Design and implement automation and AI tools for improved Network Operations efficiency and to enable flexibility services.**

| | |
|---|---|
| **Initiative breakdown** | Having enhanced forecasting for charge setting, the introduction of further automation and AI will increase the speed and quality of forecasts.<br><br>Once use of analytics for enhanced and quicker forecasting is in place, this initiative suggests that a discovery and ultimately implementation exercise is carried out for the use of automation and AI. These would be innovation projects and, therefore, it is important to assess which emerging technologies, models or approaches can be used. The key features of this initiative will be:<br><br>— Identify areas where automation can provide value. These are where there is stability in process activity.<br>— Identify use cases where AI can produce better results than human assessment.<br>— Identify pilot projects to asses these uses.<br>— Produce solution architectures to align with existing systems, processes and tools. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Network Operations forecasting & analytics<br>— Operations automation | **This will enable** | This does not enable any initiatives. |

# 2. Network management capability to enable net zero
## 2.06/2.07 LV management technology

**Implement IS tools to support the LV management centre.**

| Initiative breakdown | |
|---|---|
| | As data improves, DERMS is implemented and integration with existing network management processes is achieved, AI and machine learning can be leveraged to add greater analytical capability and enhance modelling for decision-making. Automation is used for efficiency and reduction of error.<br><br>**Discovery:** Conduct a discovery exercise to identify the potential use cases for AI and ML. Examples could include forecasting processes, fault predictions, etc. Use cases for AI and ML are then identified to provide further modelling and assessment capability and enhance decision-making. These use cases must provide real value and, therefore, proof of concepts can be applied to test them before they are rolled out at scale. A key dependency is the availability of data. The use cases should be prioritised and agile capabilities could be applied in their rollout.<br><br>**Automation:** As processes are standardised and optimised, automation can be used to increase efficiency and reduce error. A key dependency is on the standardised level of processes. Again, a framework can be applied to identify processes that add value or are prone to risk and a discovery exercise is executed. Similar to AI and ML, proof of concepts can be applied to test the potential solutions and agile capabilities can be used to roll out at scale. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Operations automation<br>— Cloud analytics platform | | — Network Operations forecasting & analytics |

# 2. Network management capability to enable net zero
## 2.08 Microgrid management

**Build the capability to manage local microgrids.**

| | |
|---|---|
| **Initiative breakdown** | As outlined in our DSO strategy, we are looking for new ways to strengthen the resilience of our network through innovation projects that focus on helping electrically dependent customers (Resilient Homes), that examine the potential of microgrids (Microresilience), and that trial vehicle-to-grid technology and commercial models (e4Future).<br><br>Given the current maturity of microgrids, we are in early innovation stages of developing the right technology to support the management of local microgrids. While we are selecting solutions for DERMS and ADMS, we are considering the expandability of those solutions to the management of microgrids, but we recognise that a dedicated solution might be required.<br><br>We are currently trialling microgrids as part of our DSO strategy and will reflect the learnings into our technology roadmap. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — DERMS | **This will enable** | This does not enable any initiatives. |

# 2. Network management capability to enable net zero
## 2.09 ESO ICCP link

**Build an ICCP link to improve connection to the ESO.**

| Initiative breakdown | |
|---|---|
| | To improve interconnectivity between our control room and the ESO's control room, we are planning to develop an Inter-Control Centre Communications Protocol (ICCP or IEC 60870-6/TASE.2) connection with the ESO.<br><br>Concepts for the ICCP link are currently being developed through the Energy Networks Association Open Networks project, specifically through the stream WS1B P3 'real-time data exchange and forecasting'.<br><br>To manage transmission constraints post-fault using DER, a system is needed to curtail DER quickly by automatic action in the event of an N-3 condition reducing the transmission capacity available in real time. The approach being adopted extends the existing OTS capabilities in such a way that allows managed curtailment of DER. Signals will therefore be sent on a per GSP basis to DNO control systems to curtail generation behind the required GSPs. To enable the successful deployment and utilisation of this new capability, ESO will instruct the DNO on the requirements for generation curtailment via an ICCP link and DNO RDP partners are fully automating their response to such instructions.<br><br>While the architecture of the ICCP link will be mainly influenced by the ESO, we are expecting there to be a requirement to integrate our control room and DERMS systems with the ICCP connector. |

# 2. Network management capability to enable net zero
## 2.10 Flexibility customer platform

**Expand technology capability for flexibility customer interaction (information provision and engagement platform/service management – settlement and reconciliation).**

| Initiative breakdown | |
|---|---|
| | Expand our ED1 capability for managing DSO-contracted flexibility that is already being established in the 2015-23 period with the implementation of the Flexible Power toolkit with other DNOs and market collaboration.<br><br>Given the current adoption rate of flexibility and the growing number of DERs in our network, the degree of integration and automation that the Flexible Power toolkit delivers is limited. Depending on requirement for and adoption of flexibility offerings over ED2 and the development roadmap of the Flexible Power toolkit, we may be required to migrate to a different platform that is more integrated and allows us to automate interaction with flexibility providers, e.g. through our CRM system.<br><br>We are expecting the requirements for this to become clearer as we progress into ED2. |

# 2. Network management capability to enable net zero
## Network planning and operations – *ED1 initiative currently being delivered*

**By implementing innovation projects, we will test and confirm opportunities to augment modelling, analytics and measurement points for enhanced Network Operations and asset management capabilities, and improved customer service.**

| | |
|---|---|
| **Initiative breakdown** | We are currently executing a number of initiatives that are designed to improve our Network Operations capability. The specific initiatives we are currently working on are as follows:<br><br>— Network monitoring database and visualisation improvements<br>— Active Network Management system rollout (flexible connections)<br>— Network forecasting models<br>— Distribution system analysis tools<br>— Customer-led distribution system<br>— Development of improved distribution load estimates<br>— Improving demand forecasting<br>— Flexible Power toolkit deployment<br>— Smart network design methodologies<br>— Foresight rollout to improve fault detection.<br><br>After completion of the existing initiatives and subject to the scale they have been delivered to (i.e. scale versus proof of concept) we will undertake the following activities:<br><br>**Value analysis for scale:** At the end of each project the benefits and outcomes of the project will have to be clearly articulated. Projects that provide insight and analytics for asset management and Network Operations will be aligned with other analytics and modelling initiatives within the same areas to provide maximum benefits. Their fit within the wider architecture will also be assessed as will the suitability for integration with existing systems. Only if the value of the initiatives is clearly assessed, and agreed, will the scaling of the solution and their wider implementation be considered.<br><br>**Roadmap for further development:** Scaled rollout of the existing initiatives will become part of a wider roadmap. Where this is the case, these new scaled initiatives will be included in an updated action plan and will become part of the overall integrated plan to ensure alignment with similar and/or dependent projects. This ensures we manage a portfolio of initiatives in a coherent and holistic manner to maximise benefits. |

| | | | |
|---|---|---|---|
| **This is dependent on** | This is not dependent on any initiatives. | **This will enable** | — DERMS<br>— Advanced DMS |

# 2. Network management capability to enable net zero
## Digitalisation of the grid – *ED1 initiative currently being delivered*

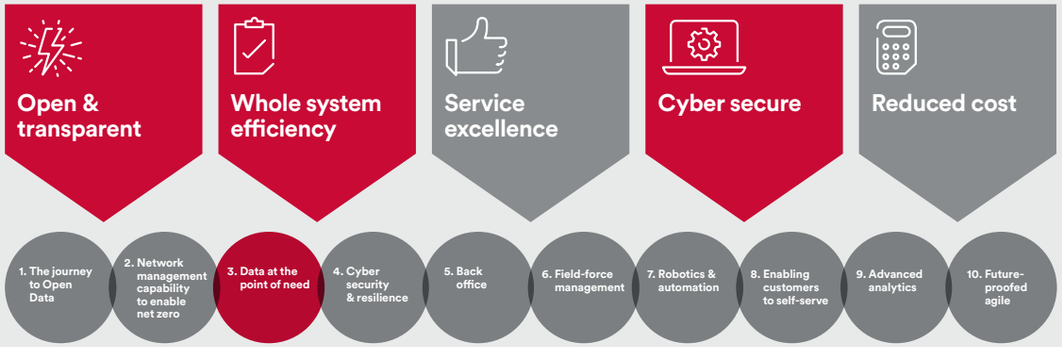
**By implementing innovation projects in ED1, we will test and confirm opportunities to support the digitalisation of the energy system. Digitalisation initiatives will enable these to be deployed at scale in ED2 and maximise their benefit through the use of technology and data.**

| Initiative breakdown | |
|---|---|
| | **Planning: Definition of a holistic model**<br>We are currently executing a number of initiatives under our DSO strategy which are designed to support the digitalisation of the energy system. The specific initiatives we are currently working on are as follows:<br><br>— Auto voltage control and monitoring replacement at EHV<br>— Primary substation remote terminal units' replacement (RTUs)<br>— Primary and secondary operational telecoms system replacement for SCADA<br>— Distribution monitoring of LV monitoring at local substation level<br>— Secondary telecoms system<br>— Control and operational systems.<br><br>After completion of the existing initiatives and subject to the scale they have been delivered to (i.e. scale versus proof of concept) we will undertake the following activities:<br><br>**Value analysis for scale:** At the end of each project the benefits and outcomes of the project will be clearly articulated and candidates for digital enablement identified. Initiatives that can provide insight and analytics for asset management and Network Operations will be aligned with other analytics and modelling initiatives to provide maximum benefits. Initiatives that can provide control and system management will be assessed for their fit within the wider architecture and assessed for their suitability for integration with existing systems.<br><br>**Roadmap for further development:** Scaled rollout of the existing initiatives or digital enablement will become part of a wider roadmap. Where this is the case, these new initiatives will be included in an updated action plan and will become part of the overall integrated plan to ensure alignment with similar and/or dependent projects. This ensures we manage a portfolio of initiatives in a coherent and holistic manner to maximise benefits. |

| This is dependent on | This will enable |
|---|---|
| This is not dependent on any initiatives. | — LV management technology<br>— Network Operations forecasting and analytics<br>— Network Operations, automation and AI<br>— DERMS<br>— Advanced DMS |

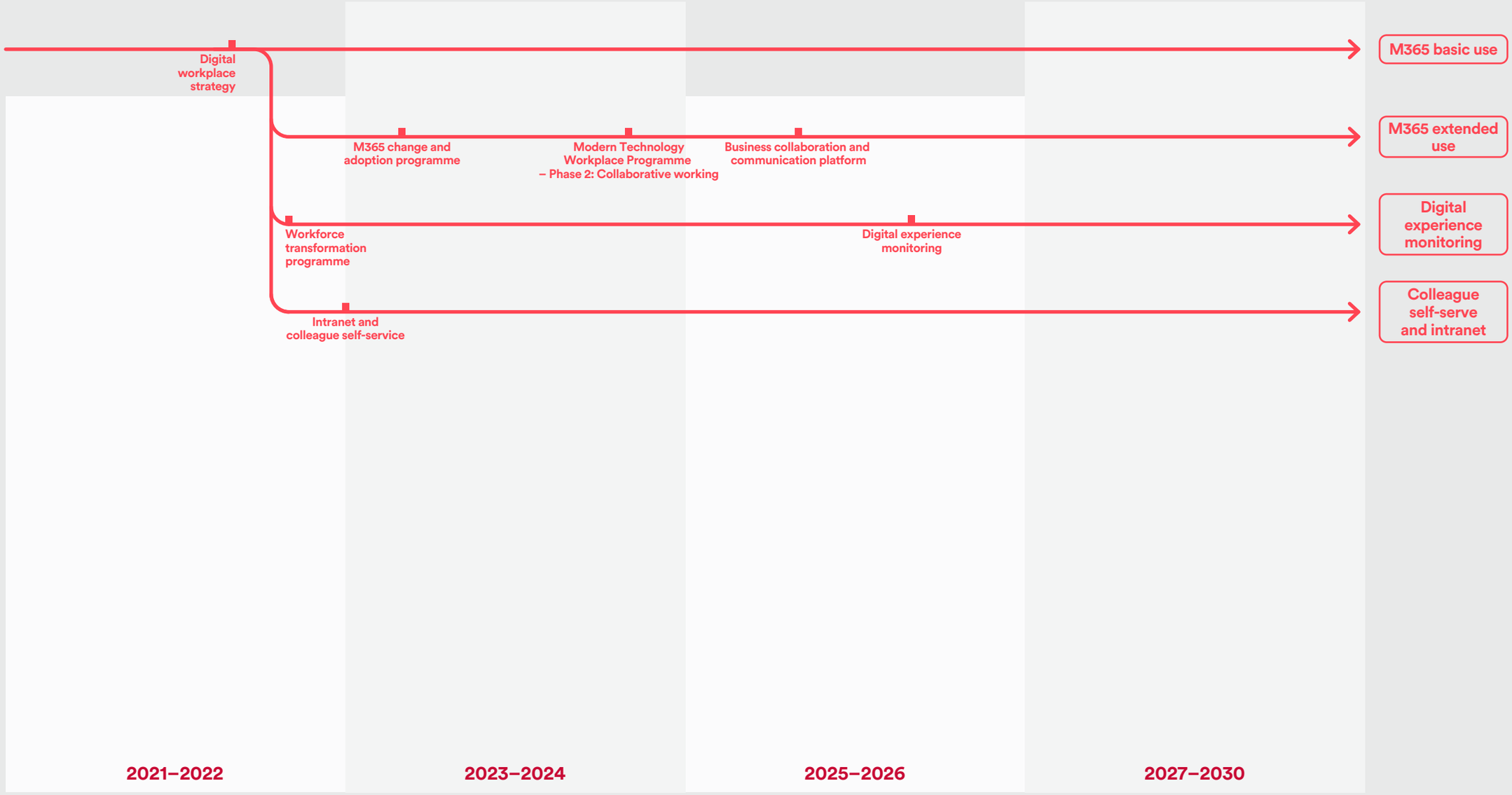
# 3. Data at the point of need

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Introduce data and applications at the point of need in order to improve colleague efficiency and effectiveness.** |
| **Business outcomes** | The nature of our work is changing in ED2 with an increased need for collaboration. The Coronavirus pandemic has helped us identify gaps in the way we make data and effective tooling for collaboration available to our colleagues.<br><br>Data at the point of need is aimed at providing new toolsets and simplified access to data to our colleagues, so that they can perform their current and future roles more efficiently and effectively. |
| **Benefits** | General purpose software such as email clients and office suites is used across all of our areas of work. Upgrading these systems will enable us to take advantage of new functionality and carry out our work more productively. For example, it will be easier for colleagues to access datasets from across the organisation, or communicate with one another. The digital experience monitoring tools will allow us to track the performance of our systems so we can continue to make processes more streamlined.<br><br>Some of these tools may also be applicable to our customer-facing activities. For example, the digital experience monitoring tools that we will implement could be used to track the availability and performance of services we provide our customers, such as self-serve tools used to request connections or report outages, or the flexibility customer platform that customers providing DER will interact with. This will improve the service to our customers, and may lead to a reduced requirement for call centres if more customers are able to successfully self-serve.<br><br>We are replacing the software and operating systems used by our colleagues with modern versions which are continuously patched and always in support. This will help avoid the build-up of technical debt and ensure that our systems are as secure as they can be. |

# 3. Data at the point of need



# 3. Data at the point of need
## 3.01 M365 basic use

**Establish use cases for the increased use of M365 portfolio of tools.**

| Initiative breakdown | |
|---|---|
| | Analyse colleague needs and develop a digital workplace roadmap to enable colleagues with digital workplace tools beyond the modern technology workplace programme (M365).<br><br>**Employee persona mapping:**<br>Develop employee personas and conduct workshops with employees to understand journeys and pain points.<br>The workshops will uncover key problem areas for colleagues to be addressed by digital workplace tools.<br><br>**Define digital workplace capabilities required:**<br>Understand the set of technology capabilities of digital workplace tools to meet the business needs.<br><br>**Map capabilities to digital workplace tools:**<br>Scan the market of digital workplace tools beyond M365 that meet the capabilities required. The categories of tools will include, although not be limited to:<br><br>— whiteboarding and collaboration tools<br>— idea management tools<br>— project management tools<br>— knowledge management tools.<br><br>**Tool validation and deployment roadmap:**<br>Select, prioritise and validate the tools required. A deployment roadmap will be delivered including training and change management activities that will support adoption and usage of digital workplace tools. |

| This is dependent on | This is not dependent on any initiatives. |
|---|---|

| This will enable | |
|---|---|
| | — M365 extended use<br>— Digital experience monitoring<br>— Colleague self-serve and intranet<br>— Cloud analytics platform |

# 3. Data at the point of need
## 3.02 M365 extended use

**Extend the use of M365 portfolio of products.**

| Initiative breakdown | |
|---|---|
| | Deliver a user-centric technology ecosystem based on M365 to enable teams to work and collaborate seamlessly.<br>Windows 10 device rollout: Procure Windows 10 device rollout in order to ensure a secure, stable and reliable desktop and laptop estate for colleagues. This will be accompanied by remediation of the existing software estate to ensure readiness for Windows 10.<br><br>**M365 rollout:** Migrate end-user Microsoft services to the cloud with Microsoft fast track support in the following services:<br><br>— Exchange online<br>— Office ProPlus<br>— Teams<br>— SharePoint online<br>— OneDrive for business<br>— Intune services, enterprise mobility and security (EMS E3).<br><br>The deployment will be conducted in iterative waves supported by bi-weekly adoption surveys.<br><br>**M365 change and adoption programme**: Conduct change and adoption activities to ensure awareness and adoption of the modern technology workplace tools and maximise the ROI of the programme. The programme will include:<br><br>— **Champions network deployment:** Create a network of advanced M365 users that build excitement, buy-in and adoption of the platform, targeted at all levels. Leveraging champions will also alleviate the dependency on IS for day-to-day change tasks, allowing them to focus on strategic and value-add activities.<br>— **Training:** Understand the training needs and providing several training options to end users to ensure the platform is adopted and used correctly. End users will be trained on how to use the platform and recognise how it can help them to collaborate with increased productivity.<br>— **Communications:** A range of channels and messages will be used to ensure the end users are aware, informed and enthusiastic about the new M365 capabilities. The communications workstream will agree on the high-level messaging and channels utilised. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — M365 basic use | | — Data governance<br>— Cloud data platform (incl. Open Data)<br>— Hybrid cloud optimisation |

# 3. Data at the point of need
## 3.03 Digital experience monitoring

**Implement digital experience monitoring to assure a high level of digital service for colleagues.**

| | |
|---|---|
| **Initiative breakdown** | Combine a digital workplace strategy with a workforce transformation programme in order to augment colleagues with skills and tools required for the future.<br><br>**Workforce transformation programme:**<br>Assess the current and future digital skills required and roll out a digital skills uplift programme consisting of training pathways that are tailored for specific groups of colleagues. The workforce transformation programme will consist of the following stages:<br><br>— Assess current and future business needs to understand the skills required by colleagues. The assessment will consider both technical skills (e.g.: data science, engineering, automation) as well as soft skills (e.g. agile, design thinking).<br>— Conduct a talent assessment to identify current skills. This will be done by categorising colleagues into employee personas that have similar responsibilities and conduct similar tasks.<br>— Undertake a comparative analysis between the existing and future skills required and assign uplift priorities for every employee persona.<br>— Develop and roll out a programme consisting of training pathways tailored by employee personas.<br><br>**Digital workplace tools deployment:**<br>Ongoing deployment of digital workplace tools. Tools will include, although not be limited to:<br><br>— digital experience monitoring tools<br>— virtual reality tools for training<br>— whiteboarding and collaboration tools<br>— idea management tools<br>— knowledge management tools. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — M365 basic use<br>— Cloud analytics platform | **This will enable** | This does not enable any initiatives. |

# 3. Data at the point of need
## 3.09 Colleague self-serve and intranet

**Deploy new colleague intranet and self-serve portal adopting a mobile first approach.**

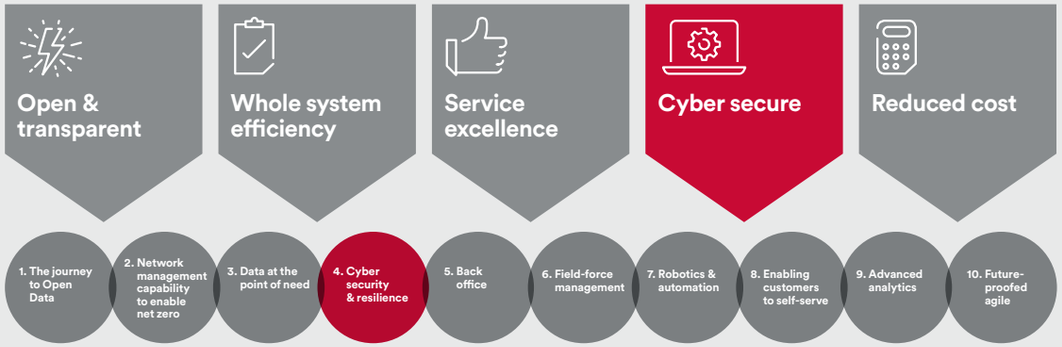
| | |
|---|---|
| **Initiative breakdown** | Deployment of an intranet solution to provide colleagues with a channel for internal communications, self-service, knowledge management and other services to increase colleague engagement.<br><br>**Intranet services discovery:** A discovery exercise to scope the colleague services to be added to the intranet (e.g.: benefits, health & safety, forms, policies, event) as well as opportunities to expand the services and/or refresh them, creating a front-end that pushes requests to back office and provides tracking functionalities.<br><br>**Design intranet and integration points:** Definition of the structure (tree of website routes) and architecture (platform/ applications) for the new intranet, identifying key integration points.<br><br>**Deploy a modern intranet:** Conduct a requirement gathering to deploy a modern intranet. The functionalities will include, although not be limited to:<br>— integration with the new content management system<br>— integration with HR portal<br>— knowledge management and learning management functionalities<br>— colleague self-service functionalities to build a one-stop shop for our colleagues.<br><br>**Deploy colleague self-service:** Continuously deploy new colleague self-service based on the intranet services discovery and new opportunities found. Opportunities will be prioritised based on benefits/costs as well as technical feasibility. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — M365 basic use | **This will enable** | This does not enable any initiatives. |

# 4. Cyber security & resilience

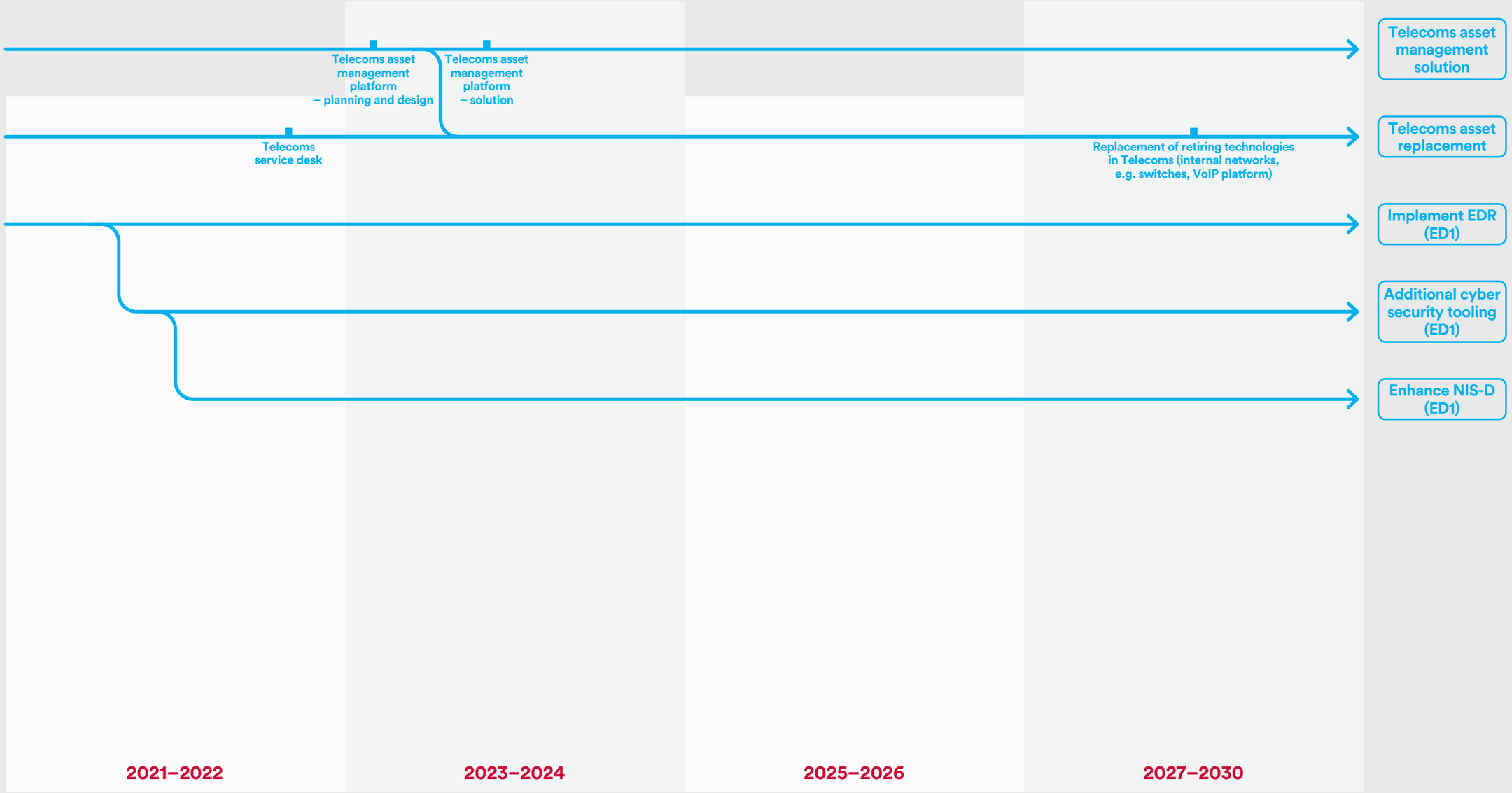
Note: Information included in this document on our plans for this area is limited due to its sensitive nature.

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **We plan to carry out a number of initiatives to maintain our strong security posture and reduce risks in line with the deliverables within the rest of our DSAP.** |
| **Business outcomes** | To have robust cyber security policies, processes and controls in place to maintain our strong security posture and continually reduce risk to protect our customers' personal data and operate a resilient distribution network through:<br><br>— security tools and advanced threat monitoring that protect our network from unauthorised access or attack<br>— skilled and competent cyber professionals<br>— taking appropriate and proportionate measures to secure the network and information systems in compliance with the NIS directive (NIS-D)<br>— protecting our customers' and employees' personal information through compliance with the general data protection regulations (GDPR)<br>— maintaining ISO 27001<br>— achieving ISO 27019.<br><br>This is subtly different to the initiatives covered within our cyber security main business plan section and annexes, where we describe the initiatives and investments required to materially improve our cyber security posture, responding to the ever-changing threat landscape. You can read more about this in the main plan section and the cyber annexes here, but it is important to note that we purposefully do not release all information in this area due to its sensitive nature. |
| **Benefits** | The implementation of these systems will increase our resilience to cyber breaches, allowing us to deliver a secure and reliable power supply to customers – and if a compromise occurs, we have the systems and processes in place to detect and respond accordingly.<br><br>They will ensure our ongoing compliance with GDPR – customers can be confident in sharing data with us, safe in the knowledge we will keep that data secure. Building confidence with our customers will also help us better support vulnerable customers who will be more willing to disclose any specific considerations if they are confident that we will not disclose data beyond what we have agreed to do. |

# 4. Cyber security & resilience



# 4. Cyber security & resilience
## 4.01 Implement EDR

### Endpoint Detection and Response.

| | |
|---|---|
| **Initiative breakdown** | Our endpoints (devices like laptops, desktop computers and servers) are the most vulnerable components in our IT systems as there's a greater risk that they will be infected with malware from a malicious email or website. With the growing threat, particularly in the form of ransomware attacks, we are taking further steps by installing additional security tools that can detect anomalous behaviours, report the incident and trigger an automated response. We are deploying tools that will only let known and tested applications run on our endpoints. Combined, these tools will prevent or limit the impact of most attacks. |

| | | | |
|---|---|---|---|
| **This is dependent on** | This is not dependent on any initiatives. | **This will enable** | — Additional cyber security tooling |

# 4. Cyber security & resilience
## 4.02 Additional cyber security tooling

### Deploy additional cyber security tooling

| | |
|---|---|
| **Initiative breakdown** | We will invest in security tools to protect our networks from unauthorised access or attack. Part of this will include extending our Operational Technology security capabilities as well as those which protect our corporate IT and telecoms functions.<br><br>We will invest in tools that employ artificial intelligence (AI) to help us detect and respond to active threats and weaknesses. In addition we will invest in risk management solutions that will help us improve our cyber risk management and governance processes.<br><br>These initiatives are all aimed at improving our capability to detect cyber attacks by monitoring at a more granular level. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Implement EDR | **This will enable** | — Enhance NIS-D |

# 4. Cyber security & resilience
## 4.03 Enhance NIS-D

### Enhanced networks and information security (NIS-D)

| | |
|---|---|
| **Initiative breakdown** | Under the Networks and Information Systems Directive (NIS-D), we are bound by duty to take appropriate and proportionate measures in securing the network and Information Systems on which the essential service we deliver to you relies. Information within this document on our plans in this area is limited due to its sensitive nature.<br><br>More information on NIS-D can be found here. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Additional cyber security tooling | **This will enable** | This does not enable any initiatives. |

# 4. Cyber security & resilience
## 4.04/4.05 Telecoms asset management solution

**Extend IT asset management into telecoms estate.**

| Initiative breakdown | Enhance our telecoms management capability with tools that centralise the end-to-end lifecycle management of telecoms assets.<br><br>**Deploy a telecoms asset management tool and portal:** Conduct a requirements gathering to deploy a telecoms asset management solution that manages the end-to-end lifecycle of telecoms assets in a single platform. The functionalities will include although not be limited to:<br><br>— **Centralised asset view:** The ability to track the lifecycle of all telecoms assets with advanced reporting capabilities.<br>— **Financial management:** As our telecoms assets are revenue generating assets, the platform will consolidate the revenue generating activity and optimise the monetisation of assets by renting unused capacity to customers. |
|---|---|

| This is dependent on | This is not dependent on any initiatives. |
|---|---|

| This will enable | — Telecoms asset replacement |
|---|---|

# 4. Cyber security & resilience
## 4.06 Telecoms asset replacement

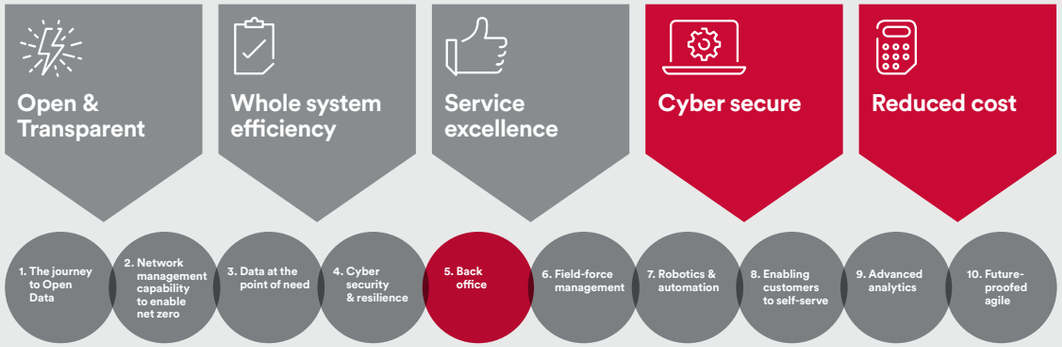
**Telecoms asset replacement programme established.**

| Initiative breakdown | |
|---|---|
| | **Deploy an integrated telecoms service desk:** Extend the service desk to include all telecoms-related service desk incidents. Existing service desk agents will be trained to extend their services to telecoms and the telecoms-related calls will be handled according to the standard service desk approach, logging the enquiries via the single point of contact and assigning the tickets to relevant resolver groups.<br><br>**Discovery of retiring technologies:** As telephony technologies get retired (e.g.: PSTN), we will scan the horizon on an ongoing basis to assess alternatives as a replacement (e.g.: VoIP and SIP).<br><br>**PSTN replacement and decommissioning:** As the PSTN network is retired, we will evaluate and pilot alternatives to ultimately de-install and decommission the obsolete telecoms network equipment. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Telecoms asset management solution | | This does not enable any initiatives. |

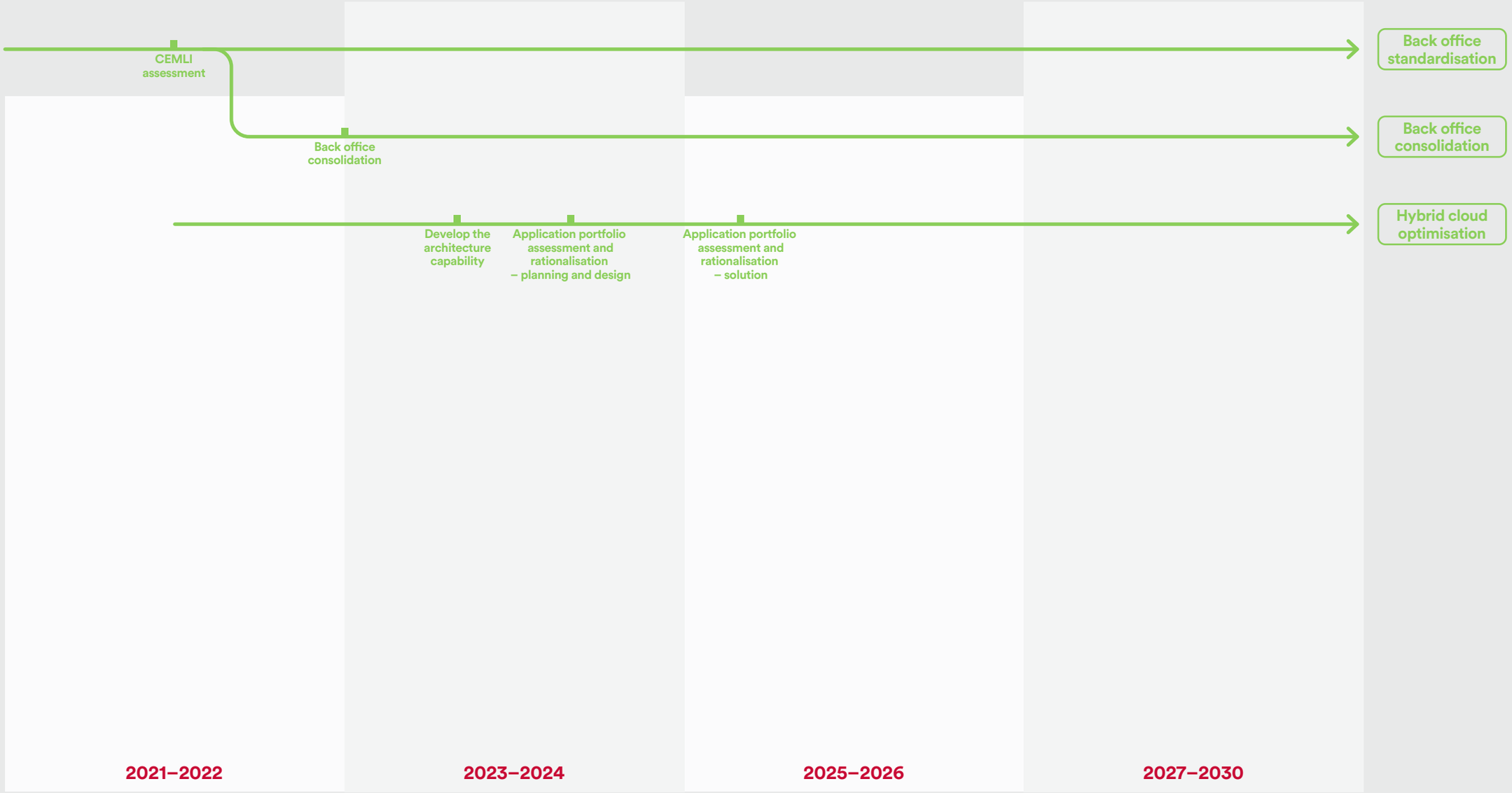
# 5. Back office

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Modernise the back-office environment to reduce risk, secure information and improve colleague experience.** |
| **Business outcomes** | Our back-office environment ranges from finance, procurement and ERP to HR. By adopting cloud-based, 'evergreen' systems, we will benefit from lower operational cost of running those environments, but we will equally have the latest functionality available to us, which will allow us to continuously increase the efficiency of our back-office processes.<br><br>By consolidating our ERP instances, we will not only reduce our operating cost, but also increase data integrity, helping our colleagues do their jobs more effectively. |
| **Benefits** | Standardising our back office functions and establishing a best-in-class data and digital transformation office will deliver several benefits. Firstly, by consolidating our ERP instances we will be able to reduce our operating costs and work more efficiently, this feeds directly into our commitment to holding our operating costs in line with where they are currently. It will also promote more seamless working, helping our colleagues do their jobs more effectively and ensuring the services we provide to our customers and stakeholders are efficient and secure. Looking forward, moving to evergreen cloud-based systems will provide the latest functionality without costly refresh programmes. |

# 5. Back office



# 5. Back office
## 5.01 Back-office standardisation

**Prepare for back-office standardisation and migration.**

| Initiative breakdown | |
|---|---|
| | **Back-office assessments**<br>Review the existing customisations, extensions, modifications, libraries and interfaces to assess whether these need to be migrated into the equivalent cloud or upgraded ERP products.<br><br>This initiative will perform an analysis against each of the Configuration, Extension, Modification, Localisation and Integration (CEMLIs) associated with the Human Capital Management (HCM) and ERP applications present in the current Northern Powergrid footprint to understand the approach to be taken against each CEMLI including:<br><br>— **Replacement** – Whether the custom functionality can be replaced with standard cloud functionality (HCM) or upgraded R12.2 EBS functionality (ERP). Where a CEMLI is identified as capable of being replaced, details of the replacement functionality will be documented including details of any potential configurations needed for deployment.<br><br>— **Retention** – Where the custom functionality is unable to be replaced with standard cloud functionality (HCM) or new R12.2 EBS functionality (ERP), investigation of the ability to re-implement the CEMLI within standard cloud functionality (HCM) or upgraded R12.2 EBS functionality (ERP). |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | This is not dependent on any initiatives. | | — Back-office consolidation |

# 5. Back office
## 5.04 Back-office consolidation

**Back-office consolidation to remove multiple instances of ERP.**

| | |
|---|---|
| **Initiative breakdown** | Based on the CEMLI assessment, we will fully understand our options for the consolidation of our current multiple ERP instances. Where beneficial, we will aim to use our licence agreement with Oracle to introduce their systems. Further we aim to adopt evergreen, cloud based software as a service solution that will eliminate the need for further costly refresh programmes and deliver new functionality as it is developed by the ERP vendor.<br><br>The first priority of this initiative is the replacement of the current finance system with Oracle Finance cloud. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Back-office standardisation<br>— Scaled RPA | **This will enable** | This does not enable any initiatives. |

# 5. Back Office
## 5.05 Hybrid cloud optimisation

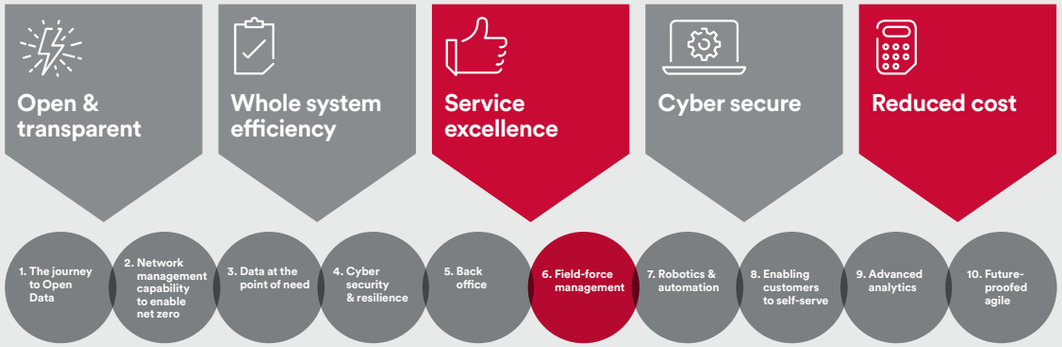
**Deploy hybrid cloud tools and processes to continuously optimise IT spend in line with Technology Business Management (TBM) recommendations.**

| | |
|---|---|
| **Initiative breakdown** | Deploy hybrid cloud tools and processes to continuously optimise IT spend in line with TBM recommendations. Promote the awareness and adoption of agile ways of working by setting up an agile delivery centre of enablement. As we mature in agile ways of working, product based delivery teams will be gradually deployed to build a best-in-class DDTO.<br><br>**Set up an agile delivery centre of enablement (CoE):** Deploy a CoE to promote agile delivery. The CoE will consist of a pool of agile SMEs (experienced agile practitioners within our business and/or external agile coaches), material and training that will be accessible across the organisation.<br>**Roll out agile KPIs:** Develop and capture key performance indicators (KPIs) to measure the adoption of agile ways of working and our maturity.<br>**Select an agile at scale model:** Conduct an evaluation on different models to select an agile at scale model (e.g.: SAFe and Scrum@ Scale) that suits our digitalisation strategy requirements and the existing operating model.<br>**Pilot agile at scale model:** Test and deploy product based delivery teams underpinned by agile at scale to accelerate digital delivery. The product based delivery teams will be structured around value oriented verticals (products) that innovate, drive digital delivery and renew legacy technology.<br>**Deployment at scale:** Deploy the value oriented verticals across several products in an iterative manner to ensure a gradual and organic adoption of agile at scale practices.<br>**Build and deploy a digital factory model through the DDTO:** Establish the DDTO to accelerate and industrialise the delivery of the DSAP aligned to leading industry practice. The DDTO will consider the processes and governance required to operate multiple cross-functional teams together on value oriented verticals (products and services) at scale.<br><br>**We will begin to develop the architecture capability:**<br>**Architecture strategy and vision:** Internal and ecosystem changes, particularly around data, integration, platforms and standards, will need a clear mandate and perspective. This will be defined in the strategy and vision, together with a set of guiding architectural principles to shape the nature, purpose and capability needed to sustain it.<br>**Develop governance:** Define the architectural governance process, artefacts and templates for the whole technology landscape and our interaction with our stakeholders. Test and validate that these are appropriate and aligned to the overall governance (business and IS) approach. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — M365 extended use | **This will enable** | — IT operating model for cloud |

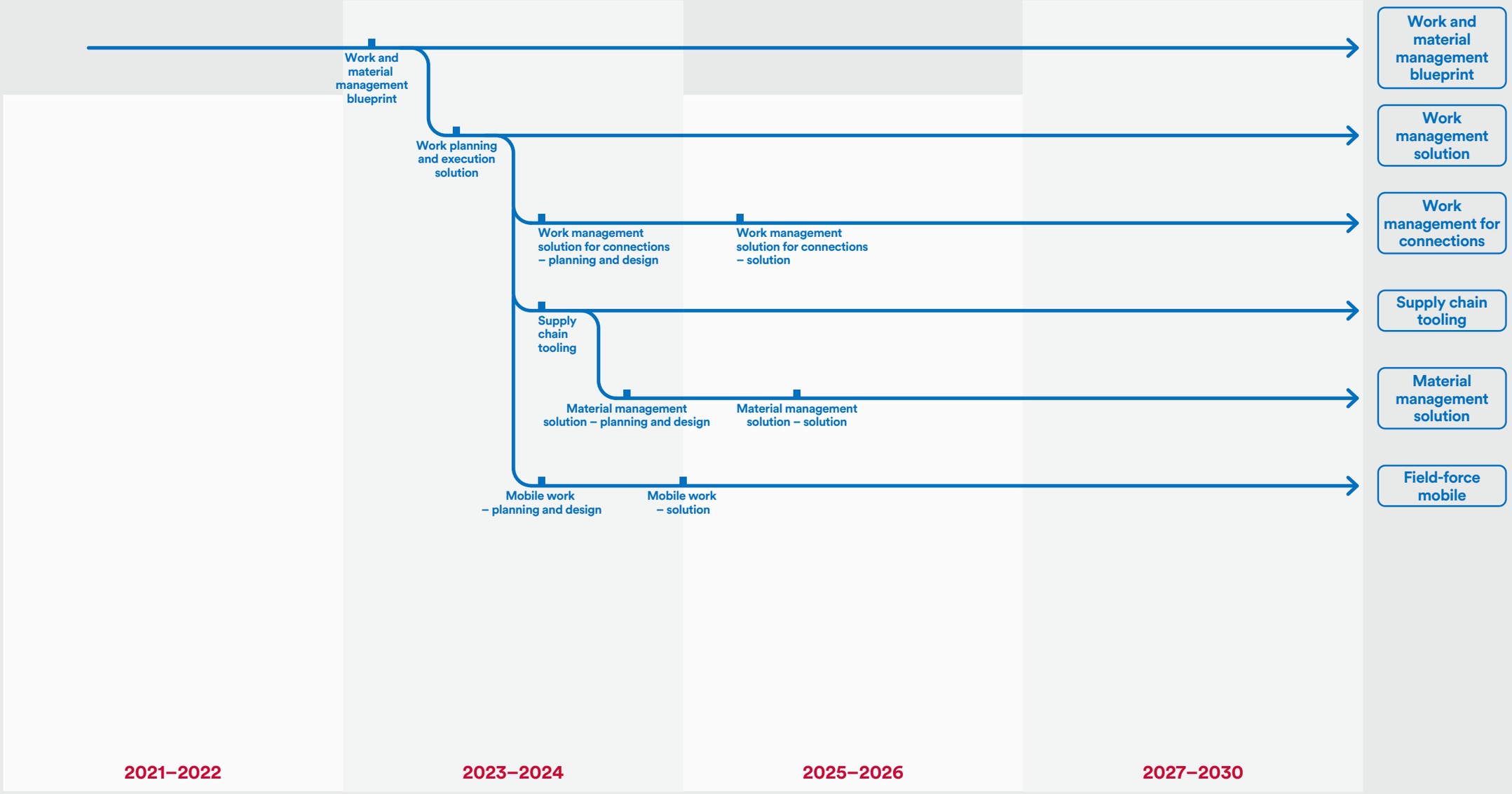
# 6. Field-force management

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Introduce improved field-force, work and asset management processes to improve operational performance.** |
| **Business outcomes** | Our field-force is integral to our business. To increase our efficiency as a business, we need to improve the support we give to our field-force.<br><br>Through this initiative we will enable operational efficiencies from streamlining and automating work scheduling and optimise material flows by automating the ordering of new materials based on predictions. |
| **Benefits** | By implementing improved field-force management solutions, we will improve our efficiency and ability to deliver. We will reduce lead times on connections, fix faults quicker and complete more work on a first-time basis by improving our coordination activities with third parties. By using new predictive analytics that allow us to take a more proactive approach e.g. forecasting part usage based on service requests and eliminating delays due to ordering lead times, we could expect to further improve efficiency and ultimately save money.<br><br>The move to an improved field-force management solution will also contribute to our environmental action plan. Our new supply chain tooling will replace our existing paper-based process, reducing waste. Optimising our routes for existing jobs so that the order of jobs minimises overall travel times and costs will also reduce our emissions as we transition to ultra-low emission/zero emission vehicles in our fleet. |

# 6. Field-force management



# 6. Field-force management
## 6.01 Work and material management blueprint

### Work and material management blueprint.

| Initiative breakdown | Develop a blueprint with user personas/journeys across work and material management to drive a set of user-centric solutions.<br><br>**Work and material management strategy:** Definition of a work and material management ambition, including objectives and high-level requirements for work and material management solutions.<br><br>**Definition of user personas:** Profiling the work management users (e.g. engineers, managers and schedulers) into user personas that represent user groups with common pain points and requirements. User personas will be built by collecting colleague data and conducting interviews and focus groups.<br><br>**As-is user journey mapping:** Mapping the current journey taken by user personas (including colleagues and contractors) within work and material management, including all types of works (e.g.: inspections, maintenance and faults). This will identify pain points to be solved by the new set of solutions.<br><br>**To-be user journey mapping:** Defining the new ways that users may interact with the new system. This will help identify the high-level benefits at each step and provide a document to easily communicate the new way of working to stakeholders.<br><br>**Work and material data discovery:** Mapping the key datasets that interact with work and material management solutions. This will inform the integration requirements for the new work and material management solutions as well as identify all sources related to work and material management. |
|---|---|

| This is dependent on | This is not dependent on any initiatives. |
|---|---|

| This will enable | — Work management solution |
|---|---|

# 6. Field-force management
## 6.02 Work management solution

### Work planning and execution solution.

| | |
|---|---|
| **Initiative breakdown** | Gather requirements to deploy a work planning and execution solution. The functionalities will include, although not be limited to:<br><br>— ability to capture work demand centrally and assign jobs based on capacity and availability<br>— job progress tracking functionality<br>— identification of industrial colleagues who are closest to faults so as to improve response times<br>— mobile functionalities for field workers<br>— interface or portal for contractors to input availability and capacity<br>— skillset based scheduler to take skills/qualifications into consideration to further optimise work scheduling and develop more flexibility<br>— functionality to permutate the optimal routes for existing jobs so that the order of jobs is optimised based on locations to reduce overall travel times and costs. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Work and material management blueprint | **This will enable** | — Work management for connections<br>— Supply chain tooling<br>— Field-force mobile |

# 6. Field-force management
## 6.03/6.04 Work management for connections

### Work management solution for connections.

| Initiative breakdown | |
|---|---|
| | **Discovery:** A discovery exercise to understand the as-is systems (work management system, core connections systems, etc.) and scope the requirements of the new work management system. This will also involve revisiting the requirements and capabilities already outlined in the current work management project overview. Finally, consolidation of the work management requirements across all work types such as connections, service requests, inspections & maintenance and faults to develop a common work planning system.<br><br>**Product selection:** Assess product options for work management solution with a detailed cost benefit analysis. A key criterion for product selection will be to meet the integration requirements across the core systems across planned and unplanned works.<br><br>**Design:** Design of the work management capabilities including key integration points with existing/new systems. This will also cover capabilities already outlined in the current work management project overview.<br><br>**Pilot:** Pilot the work management solution in a small region for a few weeks and assess results. Incorporate changes from the pilot into a finished system for rollout.<br><br>**Rollout:**<br>Roll out the solution in phases:<br><br>— Work management solution for small connections.<br>— Real-time field engineers' calendar.<br>— Automated scheduling and dispatch.<br>— Work management solution for medium and large connections. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Work management solution | | This does not enable any initiatives. |

# 6. Field-force management
## 6.05 Supply chain tooling

**Develop and deploy new processes and tools to optimise supply chain/materials management processes.**

| Initiative breakdown | |
|---|---|
| | We will deliver a solution for field colleagues to request materials via a hand device or desktop, replacing the existing paper-based processes.<br><br>**Requisition process analysis:** As-is mapping of the material requisition process in order to understand the current pain points/ bottlenecks and optimise the process by reducing waste. The analysis will also identify ways to improve stock identification and accessibility of material to enable stock levels to be established quickly and accurately.<br><br>**Supplier ecosystem optimisation:** Consolidating/reducing the list of suppliers as well as standardising and cleansing the inventory data for an improved financial governance.<br><br>**Product assessment:** The project will initially consider the use of existing applications/programmes that already form part of the current IT infrastructure in order to best utilise current investment but also potentially deliver cost efficiencies as a result of reduced licence costs, application development, staff training requirements and procurement costs. Otherwise, a product selection exercise will be conducted and a key criterion for product selection would be the adherence of the product to the evergreen principle that its components will be subject to continuous improvement and updated based on a predefined schedule and in line with an overall product roadmap.<br><br>**Integration:** The project will include an integration interface with the current finance system, leading to improved financial governance and control as well as inventory management. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Work management solution | | — Material management solution |

# 6. Field-force management
## 6.06/6.07 Material management solution

### Material management solution.

| Initiative breakdown | |
|---|---|
| | Deliver a solution that manages provision of materials to engineers and predicts the parts usage based on service requests. This initiative takes supply chain tooling to the next level by providing an end-to-end view and control of the supply chain related to Field Operations.<br><br>**Solution and architecture design:** Architecture design and definition of functional and non-functional requirements based on previously defined user journey maps (see work and material management blueprint initiative). The platform will connect to inventory data (see supply chain tooling initiative), as well as to service orders (see work management solution), to predict part usage and order new material automatically based on business rules.<br><br>**Product selection:** Execution of an appropriate vendor selection process against key requirements and principles defined in the work and material management blueprint initiative. A key criterion for product selection will be the adherence of the architectural principles such as the evergreen principle that its components will be subject to continuous improvement and updated based on a schedule and in line with an overall product roadmap.<br><br>**Deployment**<br><br>— **Release 1 (pilot):** Rollout of the platform with integration with stock levels (supply chain tooling) and work planning and execution solution to predict and order material needed for the job type (see work management solution) and user persona. Field engineers will approve such orders before sending to procurement.<br>— **Release 2:** Full platform deployment for all job types and user personas.<br>— **Release 3:** Full integration with relevant systems in order to send automatic orders to procurement systems.<br>— **Release 4:** Adding a warehouse management system functionality to control stock in specific locations (e.g. warehouse, shop), register material ins/outs and manage the location of material. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Supply chain tooling | | This does not enable any initiatives. |

# 6. Field-force management
## 6.08/6.09 Field-force mobile

**Introduce field-force management mobile applications.**

| | |
|---|---|
| **Initiative breakdown** | Mobile platform to record and manage details of work delivery of connections in a consistent and standard way while strongly aligning to the work management solution.<br><br>**Discovery:** A discovery exercise to understand the as-is systems and scope the detailed requirements of the new mobile work delivery solution. This will also involve revisiting the requirements and capabilities specifically for offline working when network connectivity is limited during the work delivery. Finally, consolidation of the mobile work delivery requirements across planned work types such as connections, service requests and inspections & maintenance.<br><br>**Product selection:** Assess product options for mobile work delivery solution with a detailed cost benefit analysis. A key criterion for product selection will be to meet the integration requirements across the core systems across planned works and also close integration/alignment with the work management solution.<br><br>**Design:** Provision of design for the work delivery capabilities including key integration points with existing/new systems.<br><br>**Pilot:** Pilot the mobile work delivery solution with a small group of field engineers for a few weeks and assess the results. Incorporate the changes from the pilot into a finished system for rollout.<br><br>**Rollout:**<br>— Small connections.<br>— Medium and large connections. |

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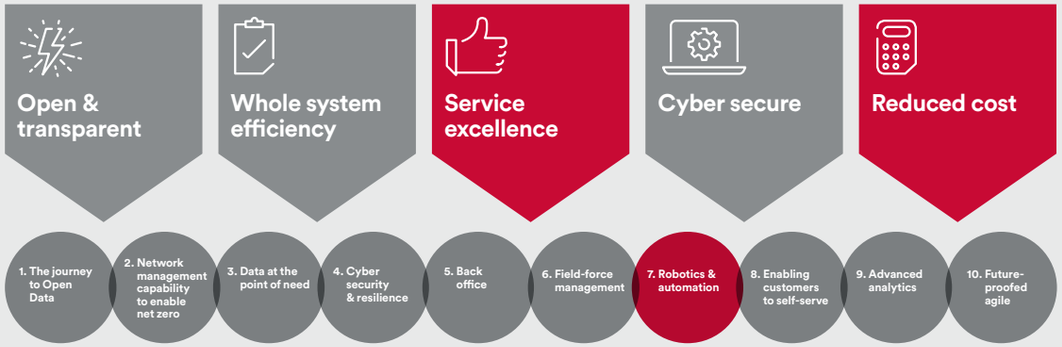
| **This is dependent on** | — Work management solution | **This will enable** | This does not enable any initiatives. |

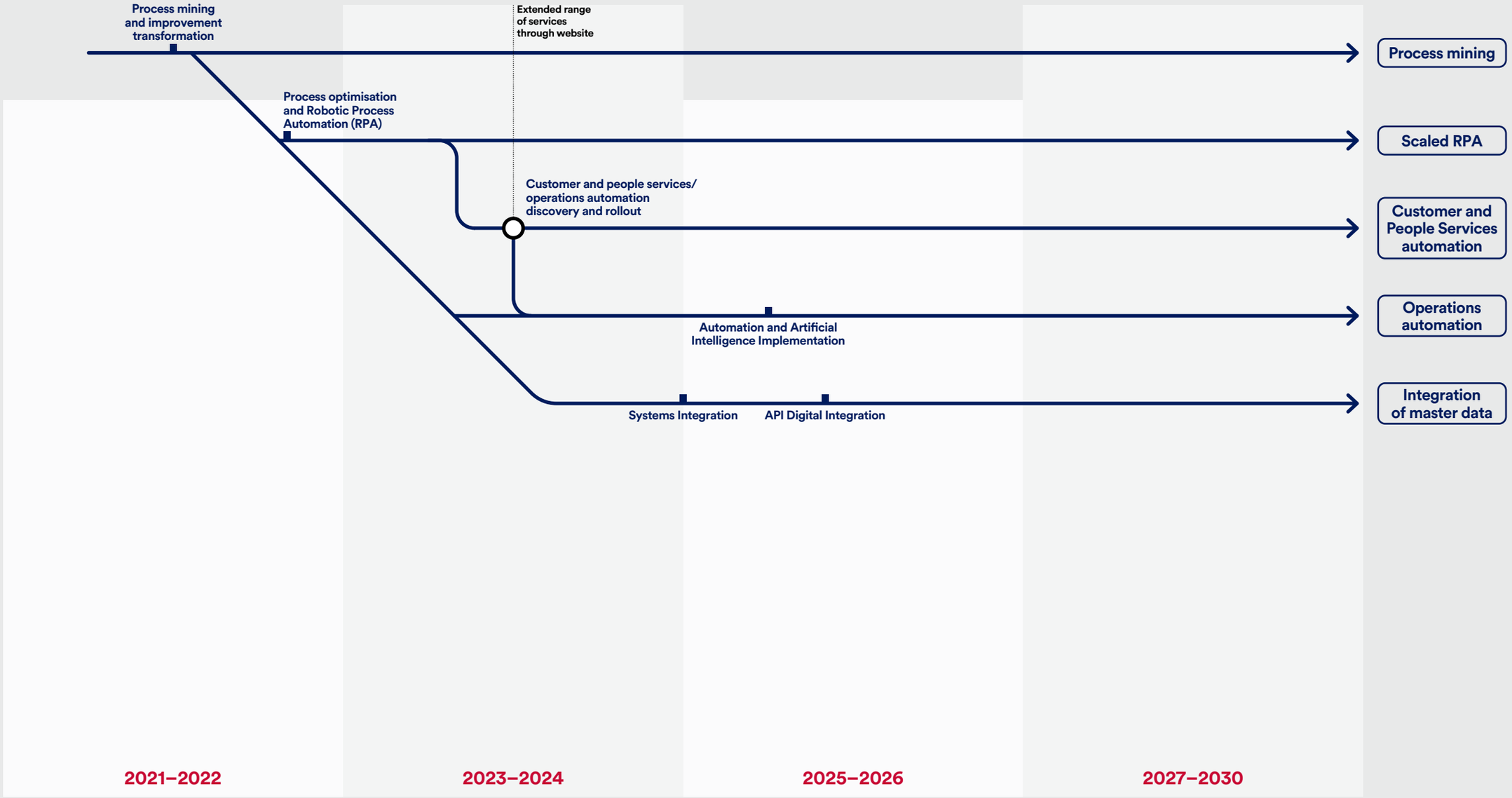
# 7. Robotics & automation

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Deploy robotics and automation to reduce cost of low value, high volume tasks and improve customer and colleague experience.** |
| **Business outcomes** | Process mining will help us remove non-value-added activities from processes, improve our documentation and then provide a stable platform for automation. We will achieve further efficiencies by automating manual activities or speeding them up through artificial intelligence.<br><br>We will deploy this technology both to the domains of customer service and operations, aiming to provide a faster, cheaper and more reliable service in both areas. |
| **Benefits** | Automation will allow us to meet increasing demand for connections as we move to a world of LCT, flexible connections, reducing the time and manual process required to register new connections and facilitating the transition to net zero. In addition, having this capability in place will mean we can deploy interim automated processes until full, end-to-end processes have been enabled by other digital investments.<br><br>More widely, process mining and automation will help us to work more efficiently, removing non-value-added activities from processes, streamlining them, and improving overall customer and colleague satisfaction without significant increase in costs. |

# 7. Robotics & automation



# 7. Robotics & automation
## 7.01 Process mining

**Continued investment and rollout of process mining into all process areas.**

| | |
|---|---|
| **Initiative breakdown** | The use of process mining to identify areas of process optimisation and improvement. Process improvements will aim for efficiencies and increased output and should have customer and colleague requirements considered.<br><br>**Discovery:**<br>As we have Business Improvement Managers within Customer and People Services and Operations, it is recommended that we build an enduring capability within those management areas to drive a process optimisation programme. This has already started and will be built on further. Discovery will be about taking process assessments, if needed, with the use of process mining to all key areas of the business. It is recommended that this is sequenced as Customer and People Services, Back-Office Operations, Field Operations and then Network Operations. A portfolio of assessment and improvement projects will be defined with clear objectives, showing intended outcomes.<br><br>**Improvement programme and planning:**<br>Process optimisations are best delivered through agile capabilities. In this document, we refer to us building an agile delivery capability for our initiatives. The process optimisation activities should have a roadmap of delivery so as to ensure business risk is minimised and areas where benefits can be realised are clearly identified and prioritised. Customer services and connections are two clear areas to provide early benefits. It is important to consider customer journeys and requirements when assessing the processes within these areas.<br><br>**Process optimisation and stabilisation:**<br>The key objectives of process optimisation should be:<br><br>— to achieve processes which have had waste and non-value-added activities removed and remain compliant.<br>— to have clear documentation in which roles, data requirements, inputs and outputs are clearly identified.<br>— that the material can be used for functional developments and training.<br>— to provide a source for further improvements. Achieving a stable set of processes is a key point for further automation. |

| | | | |
|---|---|---|---|
| **This is dependent on** | This is not dependent on any initiatives. | **This will enable** | — Scaled RPA<br>— Integration of master data |

# 7. Robotics & automation
## 7.02 Scaled RPA

**Scale out RPA deployment to address process gaps identified by process mining using AI capabilities.**

| | |
|---|---|
| **Initiative breakdown** | We will deliver the optimisation and automation of key process steps through RPA (robotic process automation) to reduce manual activities as well as interventions in the end-to-end connections lifecycle.<br><br>**Automation discovery:**<br>Conduct discovery on existing automation (RPA) initiatives within connections business to identify value cases.<br><br>**Automation strategy:**<br>Definition of an automation strategy (future architecture, operating model) to set the ambition of the level of automation desired across connections.<br><br>**Candidate pipeline:**<br>Definition of a pipeline of candidate processes that need to be automated. The pipeline will allow prioritisation of high-volume and low complexity process. The framework suggested is ESOAR (eliminate, standardise, optimise, automate, robotise) to not only identify candidates for automation but also to eliminate waste, and standardise and optimise processes. At a later stage, candidates will be defined not only for RPA implementation but also for AI deployments (e.g. machine learning).<br><br>**Deployment:**<br>Phased deployment to allow Northern Powergrid to track and realise benefits iteratively. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Process mining | **This will enable** | — Back-office consolidation<br>— Operations automation |

# 7. Robotics & automation
## 7.04 Customer and People Services automation

**Customer and People Services automation discovery and rollout.**

| Initiative breakdown | |
|---|---|
| | Automation is used to remove manual activities as much as possible. The result of automation will be faster operations, increased output, and freeing up of resources' time for carrying out more value activities, such as analysis.<br><br>**Discovery:** There is a dependency on the introduction of process automation, especially with the use of robotics, in that the processes in scope of automation should first be optimised. As such, we see this initiative running in conjunction with the process optimisation activities. Discovery for automation will be mainly focused on the use of robotics/AI tools where these technologies can be used. Given that process optimisation is under way in customer services then a good starting point is in associated processes. Suitable candidate areas for discovery are:<br><br>— Customer and People Services<br>— Connections<br>— Material management<br>— Modelling activities in Network Operations, including network investment and planning<br>— Performance and reporting<br>— Charge setting<br>— Back-office and transaction activities (information service, for example). |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Digital customer journeys | | — Cloud data platform (incl Open Data)<br>— Operations automation |

# 7. Robotics & automation
## 7.05 Operations automation

**Operations automation discovery and rollout.**

| | |
|---|---|
| **Initiative breakdown** | Using agile delivery approaches is suitable for delivery of automation projects, as these can be small, high value initiatives. It is important to manage these as a portfolio with incremental value being delivered through agile releases. Focusing and starting in one area of the business (such as connections) allows for building and growing the internal capability and provides for a template that can be repeated.<br><br>With the increased adoption of new processes to meet our new DSO role, we will identify new processes that would benefit from automation, e.g. for registering new connections or flexibility services. RPA technology will be an interim bridge response to rapidly growing numbers of processes, while we are building the target systems capable of handling the process. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Scaled RPA<br>— Customer and People Services automation | **This will enable** | — Network Operations automation & AI<br>— LV management technology |

# 7. Robotics & automation
## 7.06 Integration of master data

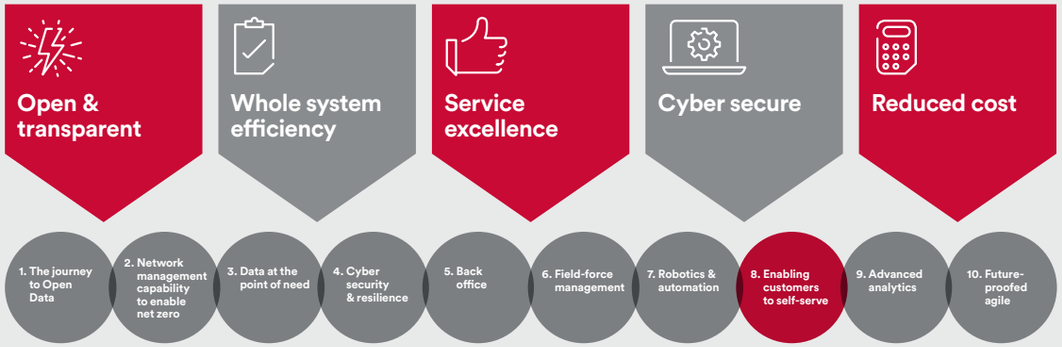
**Integration of master data providing systems with integration platform.**

| | |
|---|---|
| **Initiative breakdown** | Based on a relevant architecture, systems will be integrated to remove manual activities. At its core, this is about sharing data between systems for faster transaction and more effective analytics.<br><br>**Architecture and end-to-end process visibility:** Systems integration for intelligent automation should follow a broader architecture design. This should consider the complete user experience from modelling through task, workflow and decision mapping to content capture and presentation, as well as the governance, analytics and AI to support this. We should integrate our systems to facilitate data flows so that end-to-end processes can be transacted as automatically as possible and analytics can be performed, taking a process perspective.<br><br>As we produce an entire target architecture, integration for intelligent automation opportunities will be captured and clearly shown. Furthermore, when we upgrade or replace a system, or indeed introduce new systems, then integration for intelligent automation requirements should be designed, developed, built, tested and deployed with early consideration for their security and management throughout their lifecycle.<br><br>Finally we will consider the wider integration technologies that are described further in the section on improving our technology capabilities (see the DSAP document).<br><br>**Back-office integration:** This will also provide us with the ability to understand the integrations needed across the HCM, Finance and CX applications and how those can be correctly mapped within an integration layer. A wider analysis of the API integration across the whole of our estate will be required as outlined by the architecture enablement initiatives. The key capability areas in scope of this assessment are:<br><br>— identification of the core integration requirements within our footprint, and understanding scalability and performance requirements<br>— security considerations, as well as real time versus batch integration requirements<br>— data volumes and concurrency<br>— SLA targets, and management and monitoring requirements<br>— integration analytics requirements and recommended integration platforms. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Data integration platform<br>— IT operating model for cloud<br>— Process mining | **This will enable** | This does not enable any initiatives. |

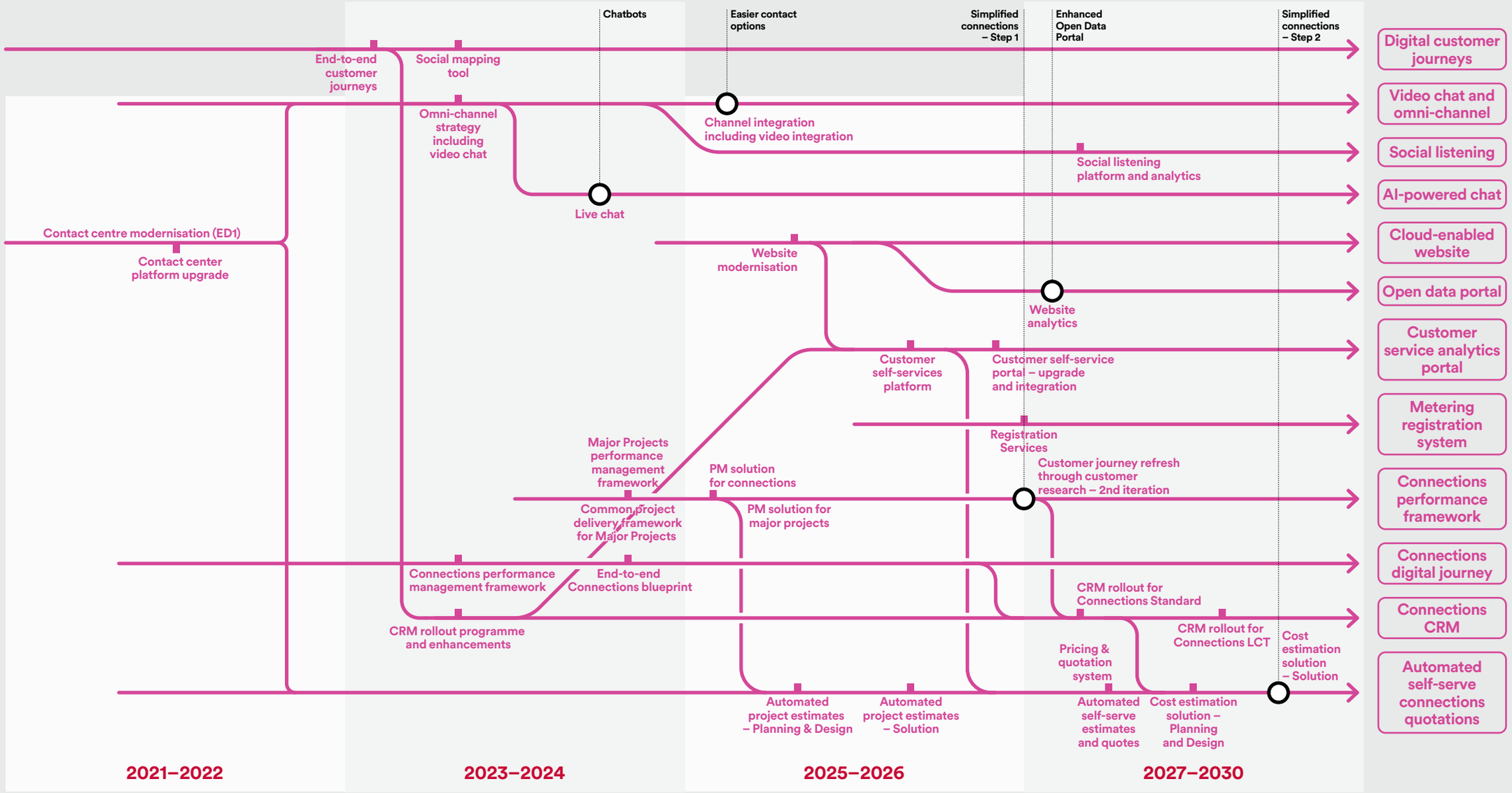
# 8. Enabling customers to self-serve

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Implement self-serve, personalised services to meet customer demand and experience, implementing a customer insight and interaction portal and reducing the cost to serve.** |
| **Business outcomes** | As part of ED2, we have proposed a number of initiatives to improve our customer service. Data and digitalisation will allow us to offer the four new communication channels. This initiative will deliver the foundations for offering enhanced self-service digital offerings. Finally, it will enable both proactive communications to customers for planned and unplanned power cuts and the provision of information and support on the transition to net zero.<br><br>We will develop customer journeys to understand how we can best support them. We will implement new ways of support through developing a modernised website including enhanced portals for Open Data, modern contact centre technology, and we will respond to the increased need for new connections. |
| **Benefits** | These initiatives will allow us to improve the customer experience, providing them with more choice as well as the opportunity to streamline our processes, freeing up colleagues to spend time with those customers who cannot or choose not to use our self-serve offering.<br><br>Taking a user-first approach, better performance monitoring, and developing a deeper understanding of the end-to-end customer journey will also allow us to provide tailored services to vulnerable customers. Vulnerability spans a number of dimensions and will vary by different groups. Research from other sectors has shown that some groups may prefer telephone-based services whilst others such as customers with mental health problems face 'serious difficulties' in using telephone services and prefer alternative communication channels. Our omni-channel approach offers alternative routes for these customers, whether it be fully self-serve or via our online webchat service.<br><br>Beyond customer experience, these initiatives will contribute to supporting decarbonisation. Streamlining processes from better integration will allow us to meet increasing demand for new LCT connections in a cost-effective manner. Expanding our self-service customer connections platform to allow the generation of quotations for LV demand connections, load increases, and budget estimates for new LV connections will allow customers to easily identify the most viable and cost-effective options, encouraging the mass uptake of LCTs, flexible connections, and network flexibility. |

# 8. Enabling customers to self-serve



# 8. Enabling customers to self-serve
## 8.01 Digital customer journeys

**Develop end-to-end digital customer journeys for products and services.**

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|---|---|
| **Initiative breakdown** | This is a continuation of existing activities to further build and refine customer journeys. Appropriate customer information and findings to define end-to-end customer journeys across all service types should be used. In connections, the work should also include medium and large connections types. During the development of customer journeys:<br><br>— **Customer journey mapping – Second phase:** Assess approach for customer journey mapping to identify ways to improve customer journeys and translate into tools to identify key features such as – experience requirements, channel touch points, data requirements, process maps, and performance criteria.<br><br>— **Customer performance management:** Put in place ways to measure end-to-end customer journey performance. Identify key metrics and implement ways to measure and report. Use bespoke reports from CRM, or other related customer systems. Integrate this step with analytical capabilities.<br><br>— **Customer improvement initiatives:** Define customer service improvement initiatives to scope CRM, website, and other digital tools improvements and developments in line with development plans. |

| | | | |
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| **This is dependent on** | This is not dependent on any initiatives. | **This will enable** | — Cloud data platform (incl. Open Data)<br>— Customer and People Services automation<br>— Video chat and omni-channel<br>— Customer service analytics portal<br>— Connections performance framework<br>— Connections digital journey<br>— Connections CRM |

# 8. Enabling customers to self-serve
## 8.02/8.03 Video chat and omni-channel

**Integrate video-chat with omni-channel solution for web, IVR and social media.**

| Initiative breakdown | |
|---|---|
| | **Omni-channel strategy**<br>In order to enable an omni-channel experience, a strategy will be produced so that customers can shift between preferred channels, when required, in a cost-effective manner. The key features here should include:<br><br>— **Channel costing:** Cost analysis on every channel (and potential channels for the future) where we provide a service in order to identify optimal cost-effectiveness.<br>— **Customer preference analysis:** Customer research (both secondary research and customer focus groups) to identify preferred channels by customer groups as well as analytical research to understand channel usage, effectiveness and customer sentiment. This can be done as part of customer journey mapping as well.<br>— **Cost benefit analysis and channel development roadmap:** Based on channel costs and preference, channels will be prioritised for further investment and development into a roadmap. This roadmap details the development and integration of channels.<br><br>**Channel integration**<br>Implement workflow management capabilities to facilitate customer channel shift across all key journeys. The features of these activities should include:<br><br>— **Channel customer journey:** Definition and mapping of customer journeys across channels with clear articulation of customer requirements.<br>— **High-level design:** Produce high-level design of the scenarios (personas and journeys) and produce architecture as key inputs. Consider key systems integration points such as CRM, OMS, etc.<br>— **Deployment:** Plugging our channels into the workflow management system to enable end-to-end case tracking. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Digital customer journeys | | — Social listening<br>— AI powered chat |

# 8. Enabling customers to self-serve
## 8.04 Social listening

**Deploy social listening platform and integrate with cloud analytics.**

| Initiative breakdown | |
|---|---|
| | **Social listening platform analytics:** Conduct an assessment with the current social media monitoring platform in order to create analytics based on customer interaction across social media channels and provide integration with the CRM.<br><br>Key features include:<br><br>— **Definition of analytics and integration requirements:** Setting the purpose, objectives and requirements for building analytics based on social media interaction as well as integrating the platform with the CRM.<br>— **Product selection:** Assess alternative analytics tool to build the social listening dashboards. A key criterion for product selection will be the adherence of the tool to the evergreen principle that its components will be subject to continuous improvement and updated based on a predefined schedule and in line with an overall product roadmap.<br>— **RM integration:** Integrating the social listening platform with the CRM to streamline the customer care team processes and reduce manual tasks. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Video chat and omni-channel<br>— Control room analytics | | This does not enable any initiatives. |

# 8. Enabling customers to self-serve
## 8.05 AI powered chat

**Continue to modernise web presence by adopting cloud capabilities.**

| Initiative breakdown | Building a new website with modern features and architecture and complementing our capabilities with website analytics to control traffic, usage and establish continuous improvement. The website is integrated with a modern content management system.<br><br>The key features of website modernisation will include:<br><br>— **Architecture:** Design and definition of a modern architecture for the website (e.g.: based on a containerised and serverless model) to replace the current architecture (presentation, web, content, platform and resource layers) to allow deployment of modular components and continuous development.<br>— **Product section and migration:** A key criterion for product selection will be the adherence of the product to the evergreen architecture principle. As part of Release 1, data and content from the existing website would be migrated. Release 1 will also include key applications (e.g.: Power cut look-up and logging) and integration with back office and CRM. Release 2 will consider further integration points (network data such as capacity maps and outage management) and provide additional web applications (e.g.: Safedig, Planned PowerCuts, My Services). |
|---|---|

| This is dependent on | This will enable |
|---|---|
| — Cloud data platform (incl Open Data) | — Open Data portal<br>— Customer service analytics portal |

# 8. Enabling customers to self-serve
## 8.06 Cloud enabled website

**Develop AI powered web and social chat platform for customers.**

| Initiative breakdown | **Live chat deployment:** Deploy live chat and chatbot functionalities in the website to enable a direct and immediate support for the customers, reducing the number and type of inbound contacts. Key activities will include:<br><br>— **Service catalogue and blueprint:** Definition of enquiry types to be enabled by live chat and chatbot functionalities (Service information, general enquiry, outage management, etc…). This needs to be prioritised and assessed against key inputs such as the availability of data and customer journeys.<br>— **Architecture:** Architecture design and definition of functional and non-functional requirements of the live chat and chatbot functionalities, outlining integration and data requirements.<br>— **Product assessment:** ensuring the current suite of products meet the functional capabilities described, otherwise initiating a product selection exercise. A key criterion for product selection would be the adherence of the product to the evergreen principle that its components will be subject to continuous improvement and updated based on a predefined schedule and in line with an overall product roadmap.<br>— **Integration:** Integration of the live chat functionality within Northern Powergrid's website, CRM and back-office systems (field-force information, Outage Management Systems). |
|---|---|

| This is dependent on | — Video chat and omni-channel |
|---|---|

| This will enable | This does not enable any initiatives. |
|---|---|

# 8. Enabling customers to self-serve
## 8.07 Open Data portal

**Integrate website with cloud analytics to provide stakeholder easy access to Open Data and insights.**

| Initiative breakdown | It is further suggested to implement a web analytics platform to collect, analyse and display data about website and intranet usage and implement continuous improvement initiatives. The key features here would include:<br><br>**Definition of KPIs:** Define KPIs to measure the website/intranet performance against business and technology requirements. At this stage all the web features are broken into every action that customers perform and these actions are then translated into operational KPIs aligned to business goals. The KPIs might include: URL visits (number of visits per URL), visit duration (time customers stay on a page), pages per visit (number of pages visited before the customer leaves the website/intranet). The KPI definition has a key dependency with the previous definition of end-to-end customer journeys.<br>**Tool deployment:** Integration of the analytics platform with the website, intranet and CMS. The implementation will consider creating different views and filters for different user personas. Such user personas will have different permission levels that will be defined according to security considerations. |
|---|---|

| This is dependent on | — Cloud enabled website<br>— Control room analytics |
|---|---|

| This will enable | This does not enable any initiatives. |
|---|---|

# 8. Enabling customers to self-serve
## 8.08 Customer service analytics portal

**Deploy customer facing data analytics portal for customer service.**

| Initiative breakdown | |
|---|---|
| | Provide a one-stop location for customers to enquire, track and manage their services and transactions. Integrate this capability with appropriate systems to give customers a high level of service.<br><br>This initiative will strategise and implement a customer self-service portal. The key steps recommended are:<br><br>**Customer self-service discovery and blueprint:** Definition of customer services to be made available in the self-service portal, building a blueprint for the customer self-services.<br>**Pilot design:** Involvement of customers through design thinking for the portal design.<br><br>**Deployment:**<br><br>**Release 1:** Rollout of a fully integrated self-service on high priority journeys such as the connections journey.<br>**Release 2:** Expansion of web chat and inclusion of chatbot.<br>**Release 3:** Inclusion of emerging services.<br>**Release 4:** Inclusion of a response time estimator to provide process visibility to the customer while allowing us to plan activities in an optimal manner. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Digital customer journeys<br>— Cloud enabled website<br>— Connections CRM | | — Automated self-serve connections quotations |

# 8. Enabling customers to self-serve
## 8.09 Metering registration system

**Metering registration services systems and processes.**

| | |
|---|---|
| **Initiative breakdown** | For registration services the next couple of years are dominated by two significant regulatory projects. Firstly the completion of central switching and then moving into the delivery of mandatory half hourly settlements.<br><br>Alongside these two projects we will be further reducing the level of technology debt, specifically through the replacement of the meter technical details solution and Grid Take Data Validation System (GTDVS). We will also be working to understand the impact of the BHE business transformation programme on registration services. |

| | | | |
|---|---|---|---|
| **This is dependent on** | This is not dependent on any initiatives. | **This will enable** | This does not enable any initiatives. |

# 8. Enabling customers to self-serve
## 8.10 Connections performance framework

**Deploy a digital performance management framework to track/optimise connections performance.**

| Initiative breakdown | |
|---|---|
| | We will produce a connection delivery performance framework. This will develop a robust connections and major projects delivery performance management framework to align the performance and SLAs of internal staff, as well as contractors, to the highest BMCS incentives for small connections and incentive on connections engagement (ICE) for medium and large connections. Key features that need to be implemented are:<br><br>**BMCS and ICE assessment:** Conduct a detailed qualitative and quantitative assessment of historic BMCS (and ICE) results, including customer feedback. Deep dive into jobs that caused delivery issues and/or poor customer satisfaction results. Assess our performance with other DNOs while also analysing the future requirements for highest BMCS and ICE rewards. Identify weak areas and provide mitigation plans. Execute these as a change programme.<br><br>**Design:** Design standard performance reports that map BMCS survey results to teams, service providers and key drivers of performance. Assign RAG status and put in place ability to socialise these through internal collaboration tools. Integrate reports with continuous improvement capability.<br><br>**Service providers:** Track the service provider performance and automate reports, ensuring they are socialised with service providers through appropriate workflows and tools. Use these reports to refresh/negotiate service contracts with delivery partners and introduce the SLAs in line with the performance management framework in order to improve delivery times. Incorporate pain/gain sharing mechanism for incentivising performance relative to the targets. |

| This is dependent on | This will enable |
|---|---|
| — Digital customer journeys | — Connections CRM<br>— Automated self-serve connections quotations |

# 8. Enabling customers to self-serve
## 8.11 Connections digital journey

**Develop end-to-end digital customer journey for connections services.**

| Initiative breakdown | |
|---|---|
| | Considered within customer strategy, it is recommended that a connections end-to-end blueprint is also produced. This will develop a blueprint/business guide detailing the end-to-end business processes, system requirements and technology architecture of the target connections business that leverages best practices for customer outcomes and operational efficiencies. The work should include:<br><br>**Cross-industry best practice research**<br>Develop a richer understanding of leading practices by drawing on experience in similar organisations within or outside the energy sector. Identify new practices, business models, or capabilities that can be leveraged within Northern Powergrid and define appropriate business relevance.<br><br>**End-to-end connections to-be processes**<br>Collate all documents providing details on end-to-end as-is processes. Ensure documents provide insight on roles, integration and data requirements. Use these as an input for process optimisation and articulation of to-be processes.<br><br>**End-to-end high-level business architecture design**<br>Design the target architecture clearly showing key dimensions such as capabilities, functional systems, processes, data flows and integration points for the entire connections business.<br><br>**End-to-end connections blueprint**<br>Consolidate above findings into a blueprint document that will serve as a live document and one that provides a baseline for change. This blueprint can always be updated should there be any further improvement initiatives or significant changes identified. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Digital customer journeys | | — Connections CRM |

# 8. Enabling customers to self-serve
## 8.12 Connections CRM

### Implement CRM for connections services.

**Initiative breakdown**

**Complete existing CRM rollout programme:** Deployment of CRM solution in four releases as per plan.

— **Release 1:** Disconnections delivery, unmetered repairs and quality of supply.
— **Release 2:** AFP rollout (contractor to CRM upload facility).
— **Release 3:** Connections, diversions, disconnections.
— **Release 4:** Site safety, OH maintenance, disconnections serv., substation maintenance, vegetation management, property services/cut out changes, unplanned power cuts.

**Complete CRM integration:** Testing and validation of all CRM integrations with front end (e.g.: website, EAPs) and back end (e.g.: AutoDesign, QPID), ensuring a fully-functional and end-to-end CRM deployment.

**CRM capability analysis:** Carry out a CRM capability assessment to identify areas for growth and improvement. Areas for growth and improvement could include but are not limited to complaints management, enquiry management, customer onboarding, campaign management, debt and credit management.

**CRM enhancement plan:** Based on CRM capability analysis, define a roadmap. This could be planned across multiple releases (suggest 2 or 3) and should be prioritised based on capabilities across all services and customer segments. For example, enhancing customer complaints across key journeys.

**Customer reporting and automation:** Further exploitation of CRM reporting and automation capabilities.

**This is dependent on**

— DERMS
— Digital customer journeys
— Connections performance framework
— Connections digital journey

**This will enable**

— Customer service analytics portal
— Automated self-serve connections quotations
— Cloud analytics platform

# 8. Enabling customers to self-serve
## 8.13/8.14 Automated self-serve connections

**Deploy automation and self-service for all connections quotations (AutoDesign).**

| | |
|---|---|
| **Initiative breakdown** | This initiative aims to produce quotes and estimates faster and on demand to connections customers. The capability will integrate with digital channels, including the customer portal, but also automate design and engineering activities to bring end-to-end efficiencies.<br><br>**Automate cost estimation solution**<br>This initiative is about automating and streamlining connections costs, especially for larger connections. This is important as it will be a key input into the pricing. The initiative calls for discovering the solutions that could provide appropriate functionalities and then implementing them accordingly.<br><br>**Automated self-serve estimates & quotes**<br>This initiative is about discovering and understanding the systems and processes and scoping the detailed connections job types that will be eligible for self-serve through automated estimates and/or quotes. The scoping will be aligned to the customer research and customer journey work to reflect customer needs accurately.<br><br>The detailed job types will be broken down into prioritised items to be deployed and rolled out in phases. The initiative then suggests:<br><br>— extension of automated estimates for medium and large connections (automated estimates already in place for small connections)<br>— automated quotes for small connections<br>— extension of automated quotes for medium connections.<br><br>**Pricing and quotation system**<br>This initiative is about a discovery exercise to understand the as-is systems and scope the detailed requirements of the new pricing and quotation system. This will involve revisiting the capabilities already outlined in the core connections systems proposals. Consolidation of the requirements across all connection types will be essential to develop a common pricing and quotation system. The proposal then proposes implementation as:<br><br>— upgrade pricing and quotation system for small connections<br>— migrate and enable quote on site through new systems<br>— upgrade pricing and quotation system for medium and large connections. |
| **This is dependent on** | — Connections performance framework<br>— Connections CRM<br>— Customer service analytics portal |
| **This will enable** | This does not enable any initiatives. |

# 8. Enabling customers to self-serve
## Contact centre modernisation – *ED1 initiative currently being delivered*

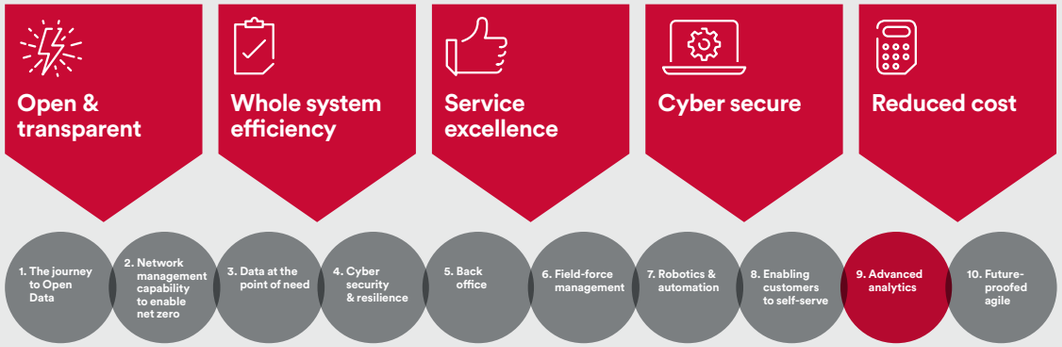
**For us to offer Open Data services, we need to migrate workloads to the cloud, improving performance and allowing them to scale on demand.**

| Initiative breakdown | |
|---|---|
| | **Planning**<br>— Definition of a holistic model for the new contact centre, including systems (IVR, contact centre systems, corporate voice platform, back-up voice platform), requirements (e.g.: voice recording, analytics, reporting) and integration points (CRM). The first release focuses on the IVR system (definition of a cloud-based architecture to replace the old IVR components), while the second release builds upon full functionalities (call recording, monitoring and reporting) and integration points.<br><br>**Integration and migration**<br>— Diversion of incoming calls to the cloud-based IVR, directing the output back to the contact centre via existing PSTN in the first release. Link the contact centre with the CCaaS solution and the cloud-based IVR to enable a fully managed and scalable customer service in the second release. |

| This is dependent on | This will enable |
|---|---|
| This is not dependent on any initiatives. | — Automated self-serve connections quotations<br>— Video chat and omni-channel |

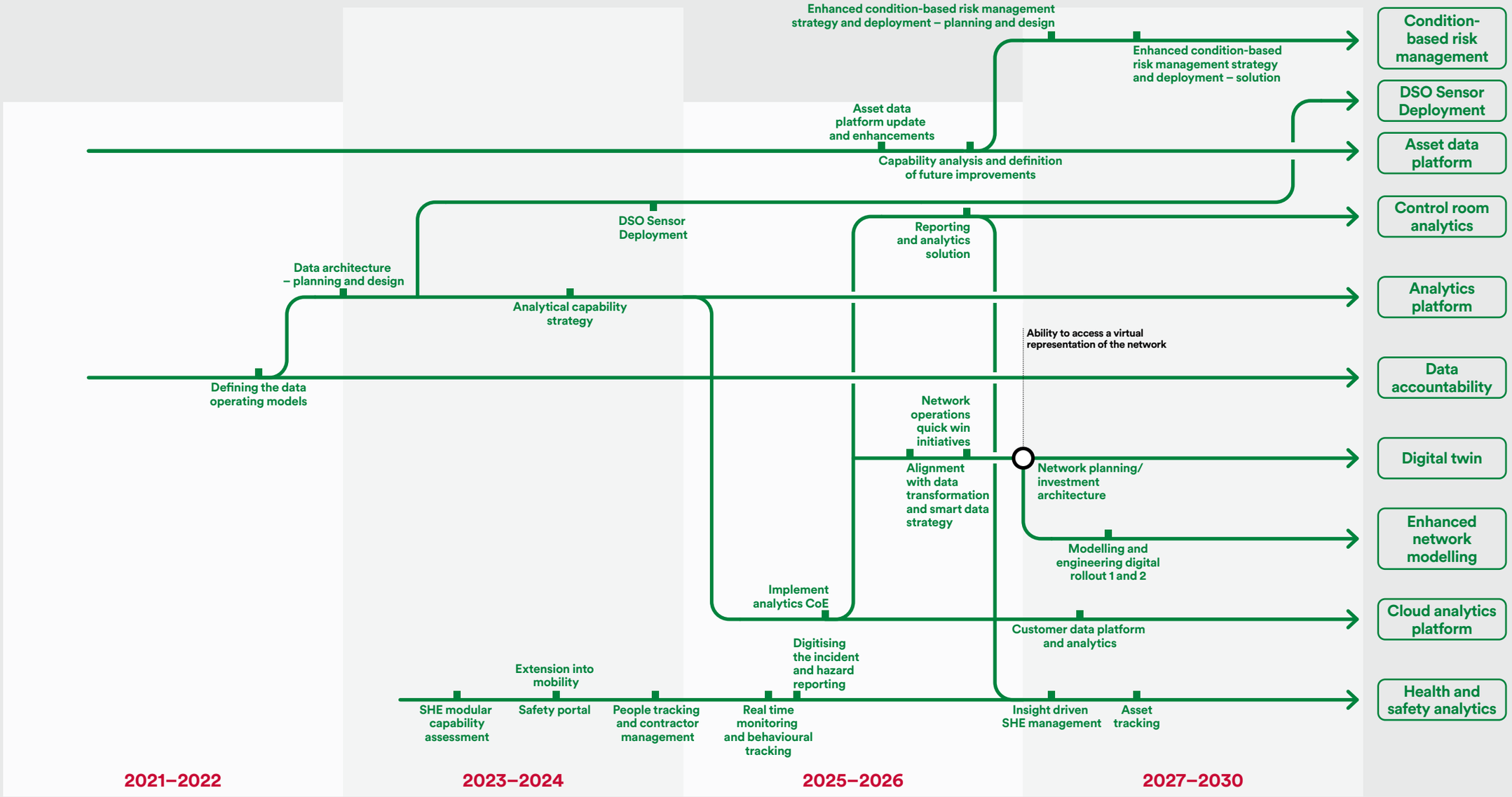
# 9. Advanced analytics

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Enable advanced analytics to improve the planning, design and operation of our distribution network.** |
| **Business outcomes** | As we are exposing more data products and services, we are focusing on gathering, cleansing and contextualising data. This makes the data we have more valuable, not just to external stakeholders, but also to us internally. We will deliver the right analytics capability to use the higher value data to improve our internal ways of working across our distribution network, our customers and our colleagues for Health & Safety.<br><br>We will build capability that enables us to manage asset risk based on condition to reduce maintenance spend and unplanned outages. Advanced control room analytics will enable more efficient distribution of energy, allowing us to reduce our dependence on carbon. We are building a digital twin to allow us to model the network and create sandbox environments to trial new concepts rather than having to physically build them, giving us a fast and low-risk option for innovation. |
| **Benefits** | Investing in advanced analytics is a critical step for managing our networks today and tomorrow, ensuring that we have the best data available when planning, designing, and operating our distribution network. This will deliver several benefits:<br>— Enabling decarbonisation and innovation. Improving our advanced analytics capabilities is key to taking a more flexible and data-led approach to decision-making. Our digital twin will provide a low-cost option to test new innovative ideas and allow us to flex our scenario modelling as new information comes to light. At the same time, improving our ability to analyse data from new sensors will help to forecast demand growth and lead to more efficient investment for decarbonisation pathways.<br>— Enabling asset and environmental resilience. Real-time monitoring combined with improved analytics to monitor and predict disruption will help us to make the most of existing infrastructure. New algorithms can help to predict future disruptions, facilitating the move to a more preventative approach and reducing disruption for our customers in the face of climate change. Analysis of our data will also guide long-term investment priorities, enabling better targeting to those areas with the greatest need and impact.<br>— Improving health and safety. The health and safety of our colleagues and contractors is a key priority. The centralisation of safety, health, and environment information will enable better incident prevention, for example through the expansion of real-time monitoring and asset tracking, and improved reporting of incidents when they do happen. Not only will this reduce the human cost of maintaining the network, reducing the number of accidents for our people, it will also deliver efficiency gains through streamlining our safety programme e.g. integration with asset management could trigger issue of work orders as they relate to safety inspection. |

# 9. Advanced analytics



# 9. Advanced analytics
## 9.01/9.02 Condition-based risk management (CBRM)

**Implement enhanced condition-based risk management tools and techniques.**

| Initiative breakdown | |
|---|---|
| | Enhancing our condition-based risk assessment capabilities will allow us to be more efficient in the utilisation of resources and target capital investment. This initiative runs in conjunction with the network planning and investment initiatives.<br><br>**Discovery and feasibility study:** Identify areas where condition-based risk assessment can be improved through the amalgamation and analysis of disparate datasets. Consider areas where AI, machine learning and robotic process automation could be used in conjunction with existing systems and distribution system analysis tools. Consult with the data analytics CoE and DDTO to identify use cases for enhanced capabilities in this area. Articulate the key requirements for those enhancements and prioritise.<br><br>**Predictive algorithm design:** Selection and testing of algorithms to be deployed for enhanced CBRM capabilities. Algorithms will be based on maintenance KPIs, asset data, failure history, environmental data, condition data, and common network asset indices methodology (CNAIM) protocols.<br><br>**Deployment:** Algorithms will be deployed based on established prioritisation with pilot asset group undertaken first, then scaled across all asset types.<br><br>**Additional sensor requirements gathering:** Taking input from discovery and other network analytics initiatives, identify requirements for additional measurement points from assets that could enhance CBRM still further. Work in conjunction with the use of external data SPA function to understand impact on existing data models and datasets, prioritise and establish benefits case and calculate return on investment.<br><br>**Additional sensor deployments:** Where a case exists to deploy additional sensor and/or monitoring capability to assets and enhance CBRM and analytics capability, work in conjunction with appropriate Northern Powergrid asset investment function to establish engineering programme for deployment of additional sensors and/or monitoring capability. Create an implementation roadmap and align release of benefit of enhanced capability to the engineering programme. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Asset data platform | | This does not enable any initiatives. |

# 9. Advanced analytics
## 9.03 DSO sensor deployment

**Support wider DSO sensor deployment initiatives by providing enterprise class back-end data handling capabilities and integrations.**

| | |
|---|---|
| **Initiative breakdown** | In our DSO business plan section and our DSO strategy, we have outlined the need for the deployment of further sensors to improve our situational awareness and granular level of required data.<br><br>From a technology perspective, there is a need to integrate those sensors into our control room and operational systems.<br><br>This initiative aims to support the actual deployment of the sensors by providing an enterprise capability to correlate the additional volume of data and new data points such that it can be fed into the master datasets and used as part of the Advanced DMS capability and advanced analytics platform.<br><br>The activity of deploying additional sensors is routinely performed, but given the number of sensors we are planning to add to the network, the effort, co-ordination and schedule will be noticeable across the ED2 period. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Cloud analytics platform | **This will enable** | This does not enable any initiatives. |

# 9. Advanced analytics
## 9.04 Asset data platform

**Update and enhance the current asset data platform and EAM tools.**

| Initiative breakdown | |
|---|---|
| | Enhance the existing asset data platform in order to provide improved access to system asset data. Enhance security and produce a new architecture that sets the foundation for building future functionalities.<br><br>We have made a significant investment and have delivered a single integrated network model that provides a single data repository for network asset information including asset attribution, spatial location and network connectivity for all our network assets. This set of initiatives are designed to upgrade the underlying database to release new capabilities and update the original architecture to ensure maximum value is obtained.<br><br>**EAM/spatial upgrades**<br><br>— **Database upgrade:** Upgrade underlying spatial database to release new database capabilities and improve performance.<br>— **Modernise architecture:** Modernise the architecture with a single master dataset and implement an improved read-only capability to improve user experience, further secure the master data through access control and improve synchronisation and exception logging.<br>— **Database structure:** Normalise the asset database and create individual asset groups to drive efficiencies, create data check tools and implement a new partition logic.<br>— **Interface upgrades:** Upgrade interfaces from DB link to Oracle ESB creating dynamic interfaces between different applications. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Asset data integrations | | — Condition-based risk management |

# 9. Advanced analytics
## 9.05 Control room analytics

**Integrate and enhance network monitoring and advanced analytics tools within the control room.**

| Initiative breakdown | |
|---|---|
| | Design and deploy a single reporting, analytics and information delivery platform that uncovers the true value of data through meaningful insight and enables data driven decision-making within Northern Powergrid.<br><br>**Discovery:** A discovery exercise to understand the as-is systems and scope the detailed requirements of the reporting and analytics solution across the organisation. This will also include identification of integration points to collect data which will drive the reporting engine.<br><br>**Product selection:** Assess product options for reporting and analytics solution with a detailed cost benefit analysis. A key criteria for product selection will be high compatibility and integration with the our solution landscape in line with the overall product roadmap.<br><br>**Deployment:** Deploy the reporting and analytics solution across the entire organisation in phases. |

| This is dependent on | This will enable |
|---|---|
| — Cloud analytics platform | — Network Operations forecasting & analytics<br>— Social listening<br>— Open Data portal<br>— Cloud analytics platform<br>— Health & Safety analytics |

# 9. Advanced analytics
## 9.06 Analytics platform

**Define and implement the data governance and data platform(s) to enable the delivery of advanced analytics across the distribution network.**

| Initiative breakdown | |
|---|---|
| | Design an analytics Centre of Excellence (CoE). The CoE will coach and champion the use of self-service analytics (e.g. power BI) and deliver more complex analytics requirements.<br><br>This initiative aims to achieve two outcomes:<br><br>**1) Analytical group of requirements –** Analytics requirements provide insight into trends or root causes. In that sense, they are different than data requirements. Using already built-in capabilities and approaches; define the analytical requirements, and group them appropriately. External stakeholders could also provide such requirements. The DDTO could provide overall governance.<br><br>**2) Analytics CoE –** This part would consider the resources, and the operating model of an analytics CoE, that would deliver the requirements. The CoE will be a central hub for coaching self-service analytics, such as use of power BI. However, where there are more complex uses cases that require bespoke coding, use of AI or machine learning, then the CoE would build and deploy such requirements. The CoE will work with already established capabilities within the business. The CoE will align with the overall data operating model to define its own operational processes, and dimensions. Our future data and analytical skills will reside in this CoE. |

| This is dependent on | This will enable |
|---|---|
| — Data governance<br>— Data accountability | — Data integration platform<br>— Data integration<br>— Advanced DMS<br>— Cloud analytics platform<br>— Cloud data platform |

# 9. Advanced analytics
## 9.07 Data accountability

**Identify the single point of accountabilities for data across the organisation. Define and implement the skills and capabilities required to ensure high standards of data quality, data management and information governance.**

### Initiative breakdown

The data strategy and architecture will provide us with a vision for managing data and our data stakeholders, an architecture and an operating model through which the whole organisation will come together for delivery of data requirements.

**Data operating model**
We will identify multiple data towers, where each tower will become a single point of accountability for the data it owns. There are a number of clearly obvious towers such as asset data and Network Operations data, however, the scope of the data operating model will expand to cover more than energy system data, it will cover business data which, subject to governing regulation, may be made available to external stakeholders.

**Data towers**
The Target Operating Model will define how the towers will operate and will define elements of data management such as, but not limited to:

— quality standards and terminology standards
— data collection processes and technologies
— data quality management processes
— roles, skills and capabilities
— performance management criteria
— information governance.

The towers will work collectively to deliver these data requirements. Whilst groups of data requirements can themselves have owners, the towers' accountabilities will be focused on delivering the governance against such requirements and ensuring they operate to appropriate principles and data remains consistent and fit for its intended purpose.

### This is dependent on

— Data gap analysis

### This will enable

— Data governance
— Analytics platform

# 9. Advanced analytics
## 9.09 Digital twin

**Define technical architecture for system operations and network planning (modelling/development of a digital twin).**

| Initiative breakdown | |
|---|---|
| | This initiative will define targets and goals for network planning and investment and will identify opportunities to enhance modelling.<br><br>**Enhance network planning/investment data use cases:** How we take data out of our systems that form our integrated network model, other internal sources, smart grid, smart meter and industry data sources, environmental (corrosivity areas, flood planes, lightning hotspots) and to combine such data from these varied sources will enable us to make enhanced and informed decisions and is paramount to us. Such enhanced capability will allow decisions to be made in support of common network asset indices methodology (CNAIM) protocols and in particular will allow us to be more efficient in the high cost area of asset replacement planning. Provision of more data points (such as those we are collecting under our Foresight project) will enable growth of network planning and investment analytics. This calls for alignment with our data transformation initiatives to articulate network planning data requirements, enhance existing data use cases and define new ones through the creation of a digital twin for both internal and external stakeholder benefit.<br><br>**Network planning and investment architecture:** Provision of a target architecture for network planning/investment covering the following areas:<br><br>— Capabilities required for the future of the network planning and development DSO role<br>— Data requirements (align the delivery of these through use cases in conjunction with the SPA and DDTO)<br>— Define to-be processes (required for process automation)<br>— Define to-be system requirements<br>— Integration and information flow<br>— Network and security infrastructure<br>— The target architecture will articulate any changes required to meet strategies and future objectives.<br><br>Continued on the next page... |

# 9. Advanced analytics
## 9.09 Digital twin

**Define technical architecture for system operations and network planning (modelling/development of a digital twin).**

| Initiative breakdown | |
|---|---|
| | This initiative describes quick win opportunities that can be conducted in the short term, resolving immediate issues and providing near term benefits.<br><br>**Data quick wins:** Growing Network Operations capabilities are dependent on availability of data. This initiative calls for an analysis of existing data to identify where data within systems can be extracted, cleansed and reloaded. It also calls for areas where there is a backlog of data, especially if they reside on paper. Digital technologies such as machine learning can be used for reading of data from paper. The initiative must align itself closely with wider data initiatives as proposed in the data swim lane of this deliverable.<br><br>**Work tracking:** Aligned closely with overall work management, this initiative looks at accurate identification of industrial colleagues who are closest to faults. The control room will be able to allocate work to the closest colleague(s) so as to improve response times. The objective calls for a system that provides the network room with an availability list of colleagues, with such a list taking into consideration any logistical constraints. The network team will be able to quickly and effectively allocate the work to colleagues, and have the ability to track progress of the allocated work for fault restorations.<br><br>**ETR accuracy and end-to-end integration:** This initiative will discover opportunities to use machine learning, or AI, to more accurately assess the estimated time to restoration. Historical, third party, or data from a wider set of systems will be used to arrive at a more accurate ETR. The opportunity will also assess the integration of ETR results to CRM and ensure mobility technology plays an effective role in communicating accurately with customers. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Cloud analytics platform | | — Enhanced network modelling |

# 9. Advanced analytics
## 9.10 Enhanced network modelling

**Provide enhanced network modelling capabilities including probabilistic assessment.**

| | |
|---|---|
| **Initiative breakdown** | Having identified opportunities to enhance modelling and incorporate automation into engineering processes, these initiatives will implement such opportunities based on a prioritised plan.<br><br>**Run pilots:** Having made discoveries on the use of intelligent digital solutions to improve modelling, and having identified automation opportunities, this initiative will shortlist priority processes to pilot and then scale. The pilots will confirm the applicability of technologies, provide tested approaches and outline the requirements to scale. Change management and business engagement can start at pilot stage.<br><br>**Prioritise implementation:** Create a comprehensive list of all processes to use analytics for modelling improvement. Also provide a list of all in-scope processes for optimisation and automation. Prioritise the processes based on criteria that provide early and maximum benefit and avoid risk to business. Based on the priority, and whilst considering business constraints, produce an implementation plan. Agile can be used for iterative delivery.<br><br>**Implement releases 1 and 2:** Design a delivery programme. Execute iterations of the programme to implement initiatives. Use the prioritisation achieved in previous step. Conduct business change to reflect and manage the impact on processes and people related to automation. Track benefits delivered by automation. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Digital twin | **This will enable** | This does not enable any initiatives. |

# 9. Advanced analytics
## 9.11 Cloud analytics platform

**Implement cloud analytics platform and deliver scalable capacity to meet analytics workloads.**

| Initiative breakdown | |
|---|---|
| | The cloud analytics platform is one of the re-useable platforms we are planning to create. Once established, it will be able to support multiple use cases across the operations, customer and back-office domains. It will be built in the cloud using trialled analytics solutions off the shelf. The build of analytics capabilities specific to our requirements will use an agile and iterative approach.<br><br>**Roadmap for implementation:** Using the DDTO, we will create a prioritised backlog for implementation.<br>**Execution:** Execute multiple sprints of agile projects to build and implement analytics requirements. Also build a programme for extending coaching in the use of tooling and implement self-service analytics capabilities. Align with the rest of the data transformation programme to leverage economies of scale and reduce dependencies.<br><br>Implement a customer data platform (CDP) to centralise customer data and provide a single view of the customer, building the ability to undertake customer analysis and drive wider use of AI.<br><br>**Single view of customer strategy:** Assess the best way to centralise customer data. Implement customer data management strategies and implement ownership and governance.<br>**CDP release 1:** Implement CDP and integrate with customer data sources. Focus on data management and customer profiling capabilities to begin to create foundational capabilities.<br>**CDP release 2:** In future release, implement analytical capabilities. See line below on implementation of analytical platform. Also include marketing and communications capabilities, such as PSRs, and social media within scope of future releases.<br>**Analytics platform:** Assess in-house analytical platforms and capabilities to rationalise. Implement analytical platform to provide customer insight and reports. |

| This is dependent on | This will enable |
|---|---|
| — Data integrations<br>— Analytics platform<br>— M365 basic use<br>— Control room analytics<br>— Connections CRM | — LV management technology<br>— Digital experience monitoring<br>— Control room analytics<br>— Digital twin |

# 9. Advanced analytics
## 9.12 Health & Safety analytics

**Centralising safety, health and environment to enable analytics and better reporting of incidents.**

| Initiative breakdown | |
|---|---|
| | Digitise safety, health and environment processes with a suite of solutions that deliver a one-stop shop for our colleagues and contractors.<br><br>There are a number of activities suggested under this group of initiatives:<br><br>**Incident reporting and analytics:** We are in the process of implementing a new system for incident and hazards reporting. A cloud-based modular solution could be a fit in this respect and we have pursued the same approach (Airsweb). The implementation of this capability allows us to digitise the reporting channels. At the same time, it allows us to collect hazard and incident data in one source of truth and therefore provides the ability to carry out analytics. Modular solutions are available to complement and provide this analytical capability and provide standard reports, visualisation and insightful analytics. But equally, self-service analytics through solutions such as power BI can be used. The analytical capability suggested for SHE should be worked alongside and leverage any CoEs built for analytics.<br><br>**People and contractor management:** This capability will set our specific safety requirements for our colleagues and contractors and will track that they are always competent. If integrated with operational activities, we will be able to highlight constraints, for example, which teams or contractors do not have certain competencies and, therefore, where operational bottlenecks may reside. The capability should also have the ability to integrate with training, as many of the competencies are realised through training. The SHE team will have visibility of training plans, progress of the training and be able to assign specific training to individuals whilst notifying managers.<br><br>— **Safety portal:** The portal will provide our colleagues and contractors with one easily accessible central location for SHE activities. The portal provides colleagues and contractors with the ability to report events, complete inspections, checklists and audits, and access safety information. This initiative should align with intranet activities.<br><br>Continued on the next page... |

# 9. Advanced analytics
## 9.12 Health & Safety analytics

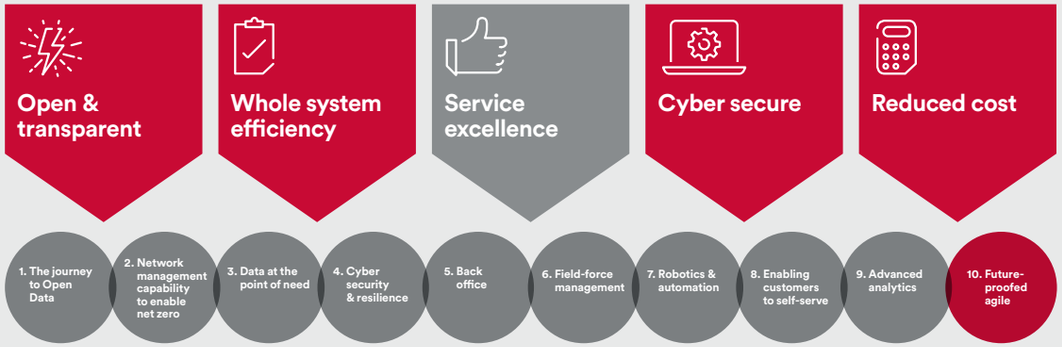
**Centralising safety, health and environment to enable analytics and better reporting of incidents.**

| Initiative breakdown | |
|---|---|
| | — **Asset tracking:** There needs to be one source of truth when it comes to safety standards and tests of assets. This initiative will consider implementation of a digital technology that captures all safety and compliance requirements for assets and tools, considers integration with our asset management system and ensures that all asset safety and compliance requirements are met. Integration with asset management could trigger issue of work orders as they relate to safety inspection, whilst all test records are centrally registered and traced for compliance and audits. Key assets that fall under such categories could be: harness equipment, lifting equipment, or vehicles.<br>— **Real-time monitoring:** Real-time monitoring will be about expanding our alarming capability for safety purposes. It would include alarms to drivers, stakeholders or colleagues during work and leverages mobile technology at its core. Its use cases must be discovered and these are innovation projects in nature.<br>— **Mobility:** With incident reporting systems in place, mobility solutions can be provided so that our stakeholders have the ability to provide incident and hazard reporting 'on the go'. There are two avenues to pursue here: 1) we can leverage existing mobility solutions, such as OM mobile, and build in functionality to report incidents which integrate directly with the above mentioned systems, or 2) build bespoke apps or leverage the apps that incident reporting solutions provide. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Data integrations<br>— Control room analytics | | This does not enable any initiatives. |

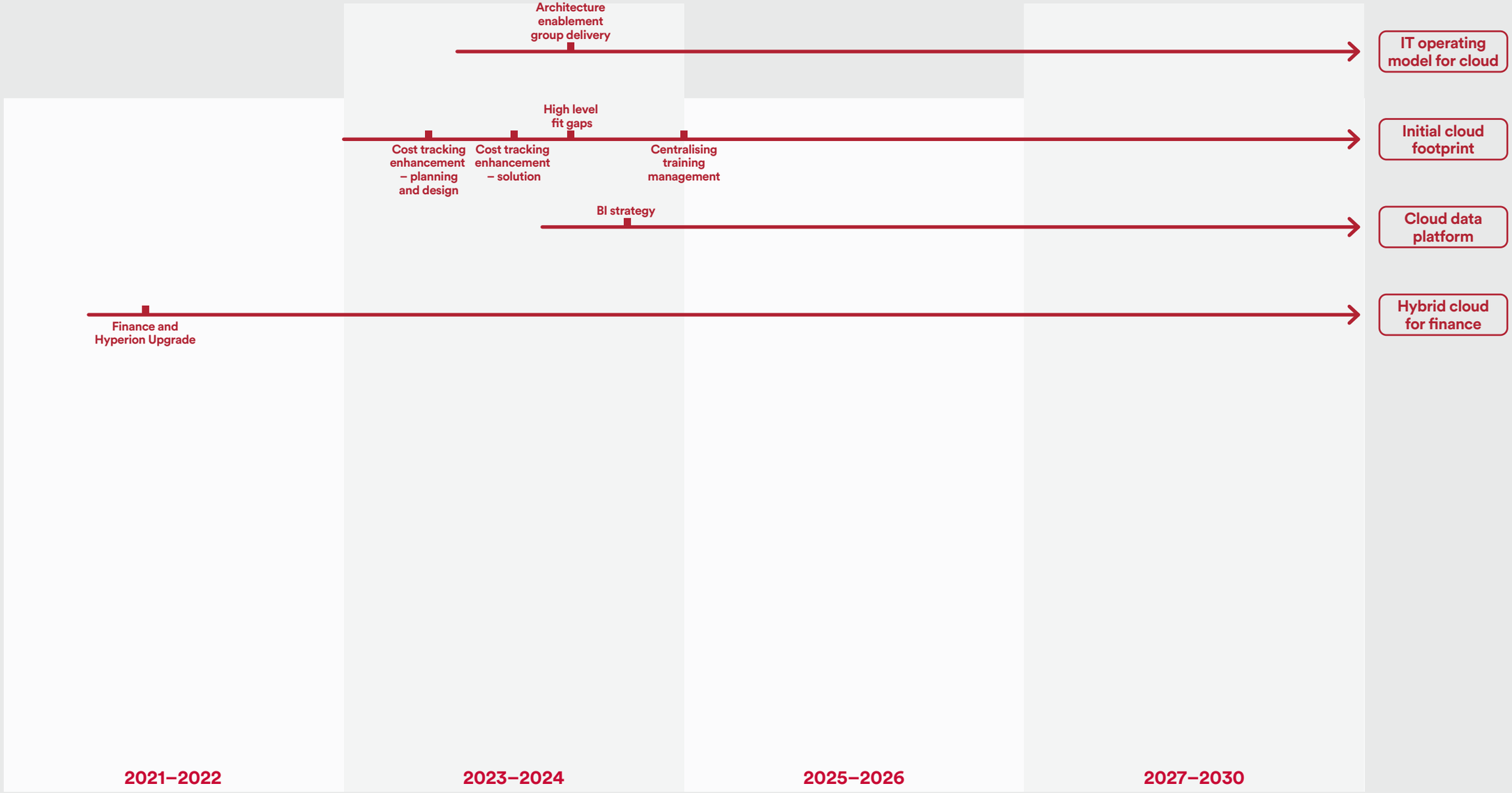
# 10. Future-proofed agile

*See the five outcomes in more detail here.




| | |
|---|---|
| **Description** | **Provide future-proofed, agile solutions in order to be flexible enough to adapt to the change in the energy sector.** |
| **Business outcomes** | Our business, our industry and wider society are facing significant levels of change over ED2, particularly to enable decarbonisation. While we have identified some levers and capabilities that will help reduce our carbon footprint, we appreciate that there is a need for more agility and new ways of working, allowing us to cope with the uncertainty by adopting a 'sense and respond' approach.<br><br>Agile ways of working will allow us to deliver capabilities faster and with reduced risk. |
| **Benefits** | These initiatives will enable a fundamental change to the way in which we work across our whole business, supporting a 'sense and respond' approach and avoiding prescriptive approaches that cannot adapt to new innovative solutions. The benefits this will bring will extend across almost every output area, with the greatest gains felt in areas that face the most uncertainty such as the path to decarbonisation. Whilst we have a detailed plan based on projections that tie to the Government's current 10-point plan for decarbonisation, the latest Net Zero Strategy recognises that there is significant uncertainty and the final solutions may be very different from what we predict today.<br><br>For example, the Government has recently published the UK hydrogen strategy which aims to achieve 5GW of low-carbon hydrogen production capacity by 2030. However, the UK currently has almost no low-carbon hydrogen production today and several trials are currently planned for testing new technologies. We will need to be able to adapt our network planning, resourcing, and investments to the final solutions for industry, power, heat and transport.<br><br>In order to meet our decarbonisation targets in the most efficient way, we must adapt our ways of working to manage this uncertainty through an agile flexibility-first approach. This will allow us to select solutions that are scalable, extensible, and interoperable, and ensure the network is positioned to support all credible pathways to net zero. These flexible solutions will in turn require flexible ways of working and better integration of data to guide continuous decision-making. This can be achieved by adopting a hybrid cloud approach to our technical landscape, and adopting agile ways of working more widely across our data and digitalisation activities. |

# 10. Future-proofed agile



# 10. Future-proofed agile
## 10.02 IT operating model for cloud

**Establish IT operating model to support and manage hybrid cloud.**

| Initiative breakdown | |
|---|---|
| | Deliver and enable the architecture and capability to guide and accelerate the implementation of the digitalisation roadmap.<br><br>**Architecture Enablement Group:** Create an Architecture Enablement Group that supports colleagues and external stakeholder teams with standard system, integration and data patterns and frameworks that deliver architectural value. Roll out communications to colleagues, as well as stakeholders, on the purpose and value of architecture.<br><br>**Establish architecture capabilities:** Identify the roles and responsibilities, and develop a roadmap to address any skills gaps in the team. Validate the business and stakeholder sponsorship and deploy any processes, tools or technology needed to support the team.<br><br>**Baseline architecture:** Develop an understanding of the current business, information and technology landscape that supports us and our interactions with external stakeholders. Leverage appropriate tools to accelerate the capture of our current state.<br><br>**Target architecture:** Identify the contextual, conceptual and logical services (why, what and how) and capabilities, together with the appropriate standards, systems, platforms, integration and data principles, patterns and frameworks that deliver the digitalisation initiatives and capabilities.<br><br>**Roadmap architecture:** Establish a roadmap that identifies transitional architecture that achieves our digitalisation strategy, clarify the required technology, data and interconnections (API) and incorporate any new regulatory, business strategy and technological capabilities, constraints or requirements. Continue to progress reference patterns, tools and environments that support the roadmap. |

| This is dependent on | | This will enable | |
|---|---|---|---|
| | — Hybrid cloud optimisation | | — Integration of master data |

# 10. Future-proofed agile
## 10.03 Initial cloud footprint

**Establish initial cloud footprint with tier 1 public cloud providers.**

| | |
|---|---|
| **Initiative breakdown** | Assess the existing back-office platforms to deploy a series of upgrades including further integration, analytics, better processes and cloud functionalities.<br><br>**High-level fit gaps:** This initiative will evaluate each functional area and associated business process contained within the existing HCM, service and financial system footprints to identify any high-level gaps between existing and future process requirements in these areas and the functionality available in the HCM cloud, service cloud and finance e-business suite R12.2 functionality. |

| | | | |
|---|---|---|---|
| **This is dependent on** | — Data integration platform | **This will enable** | This does not enable any initiatives. |

# 10. Future-proofed agile
## 10.04 Cloud data platform

### Implement Oracle cloud data platform.

**Initiative breakdown**

This initiative will conduct an assessment in relation to Northern Powergrid's BI strategy and the use of HCM cloud, service cloud and upgrade of the Finance ERP applications to Oracle R12.2. This initiative should be aligned with data initiatives in sprint 2.

BI refers to the technologies, applications and practices for the collection, integration, analysis and presentation of business information to support better decision-making. A strong BI strategy is essential for business growth and to maintain competitive advantage. A business intelligence strategy will provide us with a goal and direction, allowing us to gather the greatest insight out of our HCM, Finance and CX data. This assessment will focus on the core Oracle systems and will be aligned to the wider BI strategy analysis outlined by other initiatives.

The key capability areas in scope of this assessment are:

— Confirmation of BI scope for HCM, Finance and CX business areas
— Identify the key stakeholders included in our BI strategy
— Clarification of our BI solution structure – type of deployment, on-premise v hosted, user permissions
— Training – determine related BI training requirements
— Alignment with the wider architectural blueprint
— Oracle capability improvement – what needs upgrading, re-developing, decommissioning
— Implementation of work-breakdown structure definition.

**This is dependent on**

— Data integration platform
— Analytics platform

**This will enable**

This does not enable any initiatives.

# 10. Future-proofed agile
## 10.06 Hybrid cloud for finance

**Deploy hybrid cloud for finance.**

| Initiative breakdown | |
|---|---|
| | **HCM, Finance, and Hyperion upgrade**<br>As we progress with upgrading our HCM applications into the cloud, there is a need to ensure that the HCM cloud implementation delivers the training functionality that we require for our success. To this end, this initiative is aimed at reviewing the proposed HCM cloud releases to ensure they are able to provide us with an optimal understanding of the training requirements needed, allow us to design colleague journeys, provide us with the ability to cover end-to-end people processes, and with the ability to measure how our colleagues perform. Equally, there is a need to provide our colleagues with a portal for one-stop colleague enquiries. We will also upgrade our Finance and Hyperion solutions as they reach end of life.<br><br>**Impact assessment on EAM and CX**<br>As we reach a stable state with our upgrades, we will carry out an assessment that assesses the implications on current EAM and CX systems. This will include:<br><br>— Assess impact of the Oracle asset maintenance cloud solution to replace Oracle EAM, including CX integrations. Includes impact of Oracle EAM retention.<br>— Assess impact of implementing Oracle Finance cloud on same cloud platform as HCM cloud to replace Oracle Finance ERP applications. |

| This is dependent on | This is not dependent on any initiatives. | This will enable | This does not enable any initiatives. |
|---|---|---|---|