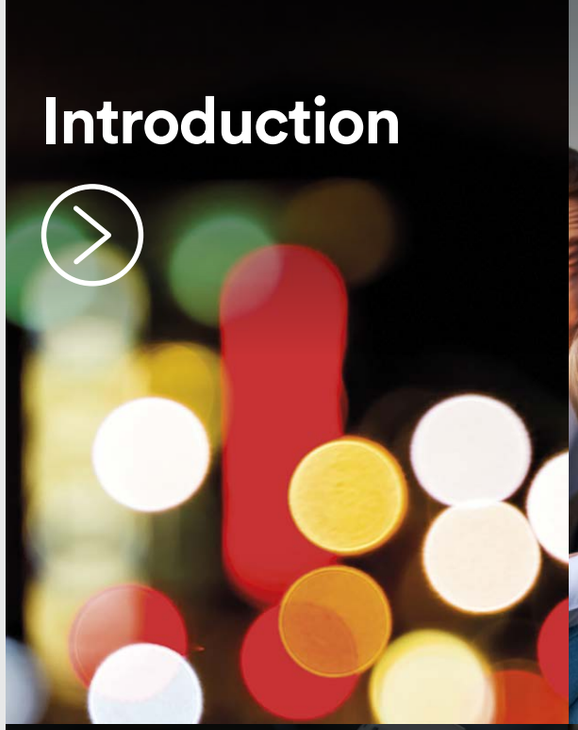
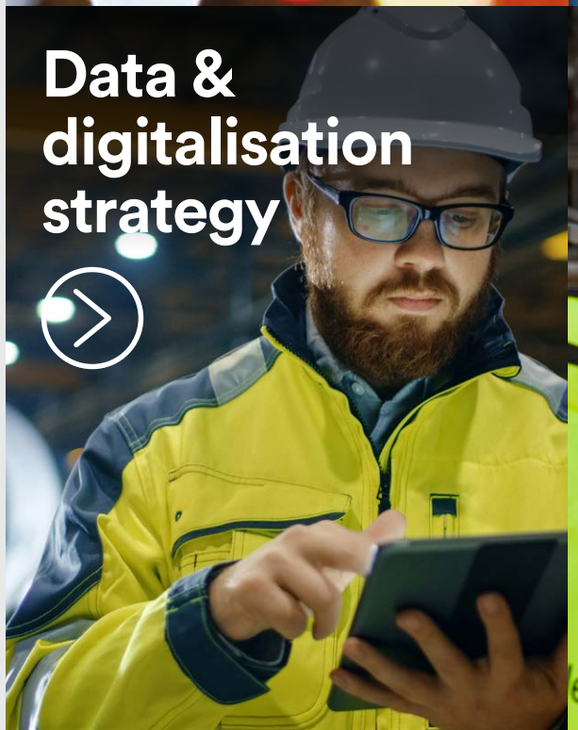
Digitalisation strategy and action plan

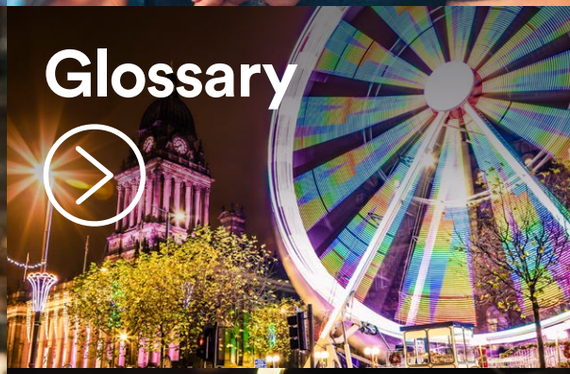
Version 4.0

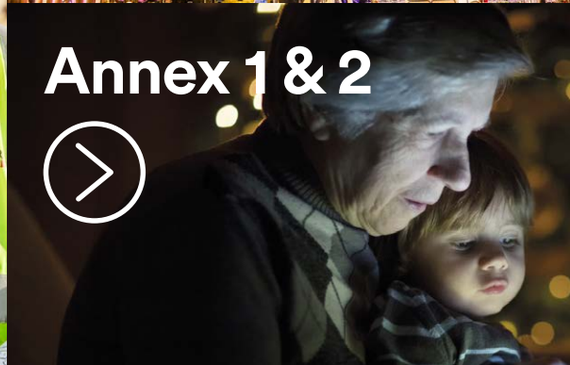
June 2021 >

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 Distribution System Operation. 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. It 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 APIs as well as dedicated portals to meet the needs of as many of our stakeholders as possible and 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 Application Programming Interfaces (API) 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 the feedback received from multiple sources, we have developed our fourth version of the DSAP.

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 benefits 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 license 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

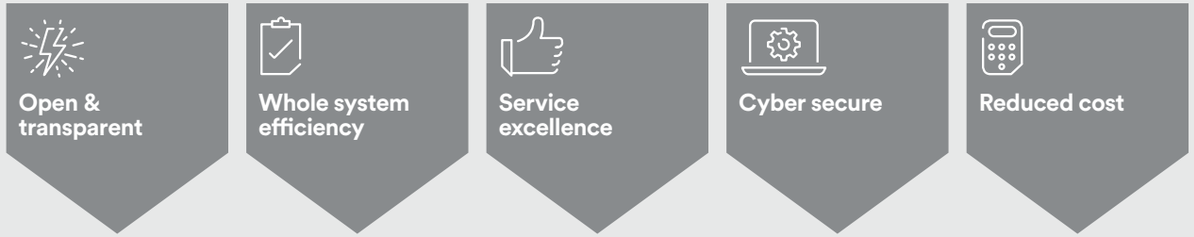
Whole system efficiency
preparing for both a cost and carbon optimised whole energy system

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



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

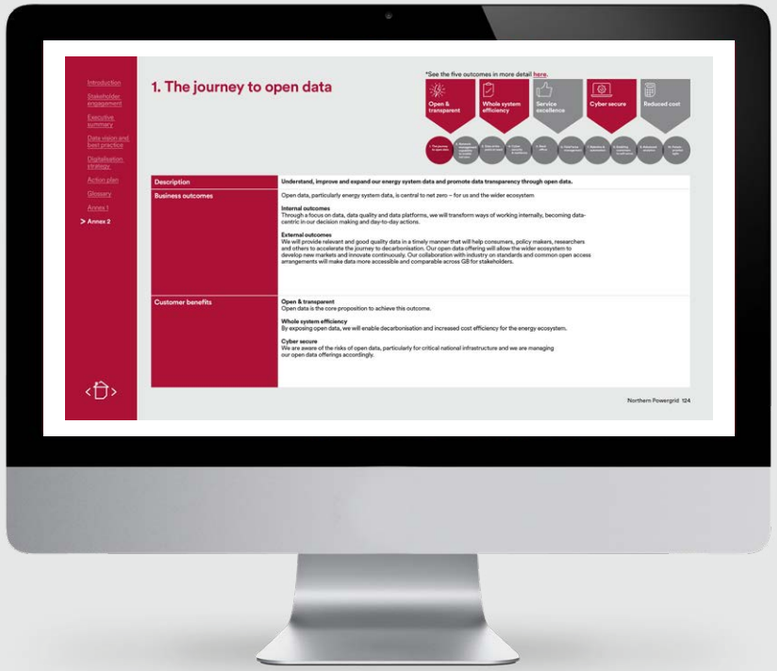
We have grouped our data and digitalisation initiatives into ten core areas that will deliver distinct capability to our organisation and our stakeholders. Each core area has an introductory page which details:

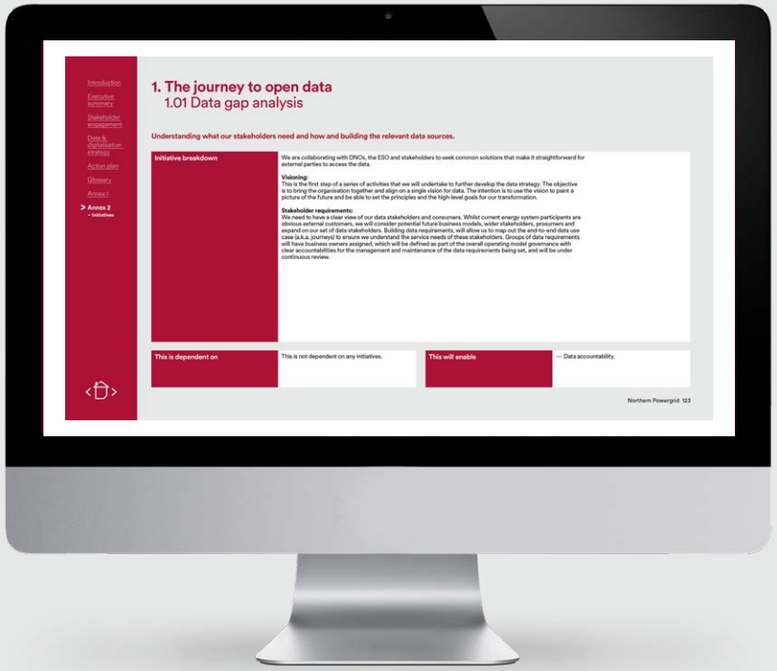
— the description of the core areas

— 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 fourth version of our DSAP, dated June 2021. 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

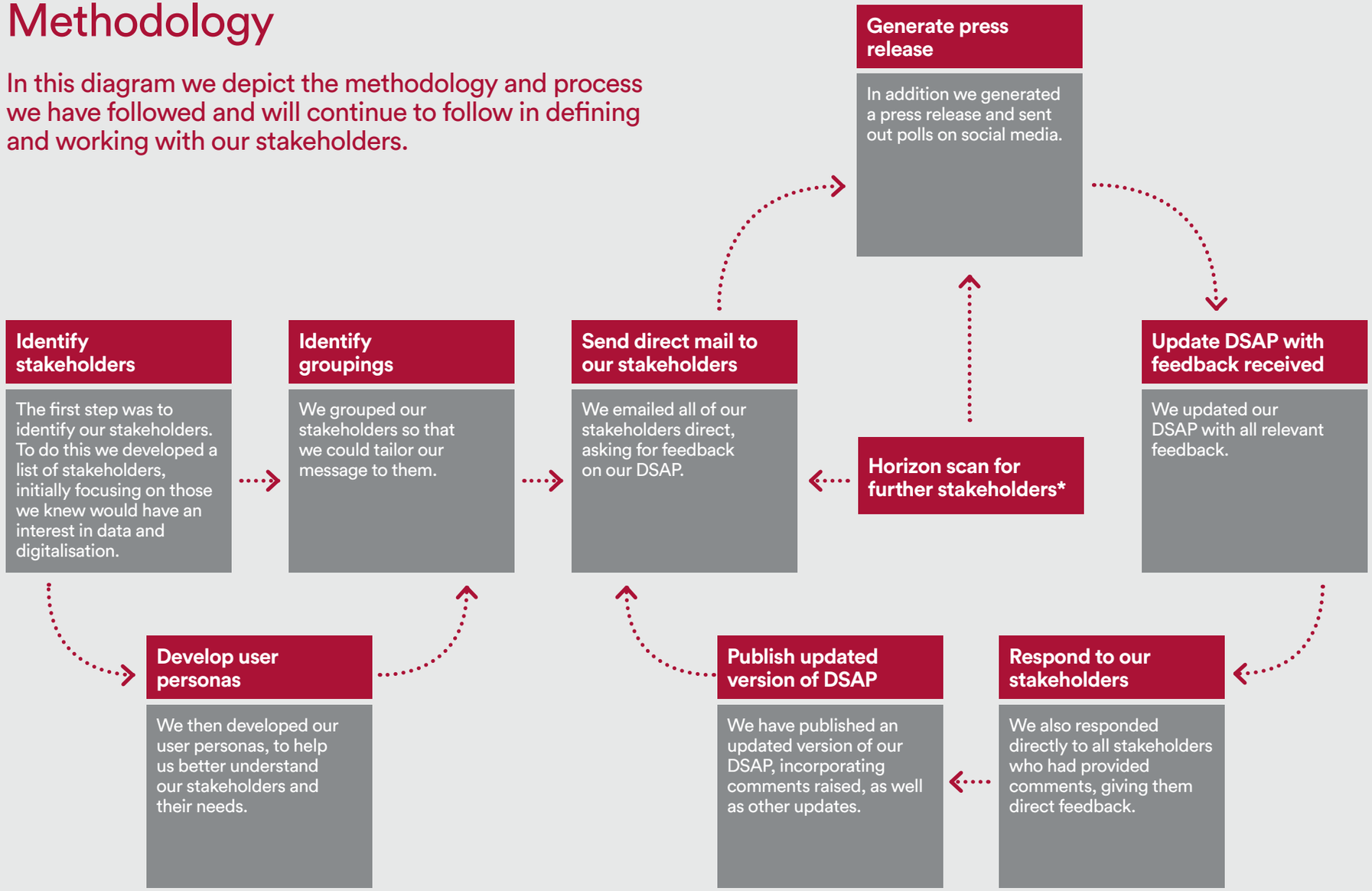
Please tell us what you think about our strategy, how you feel about some of the key themes and our ambition to underpin plans with technology and Open Data.

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 also see here for more information.

Developing our user personas

— To help us be led by customer needs and be socially inclusive we have started and will continue to develop user personas for our customers, stakeholders and colleagues in relation to data and technology needs.

— To achieve this we have 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 will continuously add to our user persona catalogue as we identify new users or our existing users' needs and wants change.

Case study

Jon Tamworth, age 32
Home owner requiring a service alteration

'As a homeowner I am building an extension and navigating my way through moving my connection'

Jon is a nurse whose family has outgrown their property. He has no construction experience and has a limited budget so is taking on the role of project manager for his extension himself. He is co-ordinating various trade groups. He knows his connection point needs to move but does not know how.

First time liaising directly with Northern Powergrid

Not experienced in construction

Working full time

Limited budget for works

Concerned about climate change for his family

Needs

— Experienced and knowledgeable support to ask questions, with easy to access guidance available 24/7.

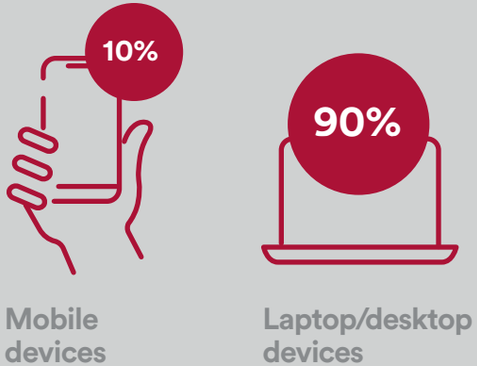
— A quick and transparent quotation process to help decision-making for his wider project.

— Flexibility on dates for the actual works to fit into his family's and the wider project's schedule.

— A fair and fixed price for the work.

— To understand current and future carbon impact and whether he can adopt any low-carbon technologies as part of his extension.

Access channels



Mobile devices

Laptop/desktop devices

Today's challenges for Jon

— Unsure of what to do and how to get support.

— Lack of engineering knowledge.

— Flexibility on dates for the actual works to fit into his family's and the wider project's schedule.

— No online booking system.

— Too many variables with estimates.

— Doesn't want to negatively impact carbon footprint.

Running stakeholder polls

As part of the stakeholder engagement methodology we have engaged with our stakeholders through a number of polls 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

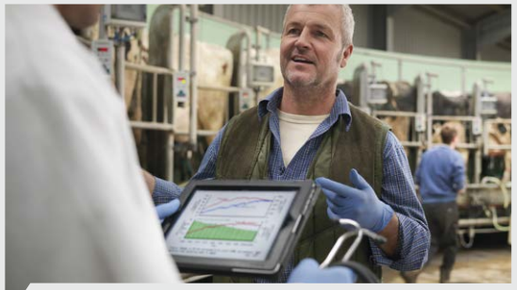
Others are better placed

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



‘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

‘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.

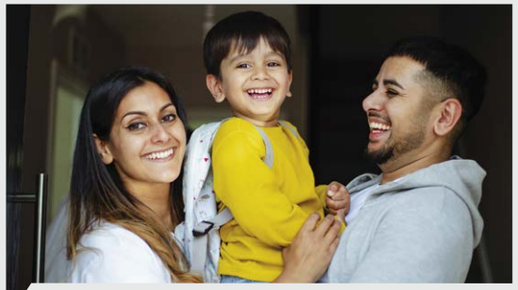
‘Can you clearly define your baseline set of initiatives?’

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



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

We are developing a data catalogue and common standards of data sharing with our peers.
As this is further refined we will add further detail on progress and how to access the data catalogue in future iterations.

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

Improving our data quality is an ongoing process and one we have begun. We will supplement our capabilities in this space with technology in ED2 but, before then, we expect to have undertaken 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?’

We are in the process of sector benchmarking and will provide more information on this in our next iteration of the DSAP.

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

Whilst we have addressed this in the current DSAP we will continue to refine this further as we create our ED2 business plans, supported by customer personas.

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.

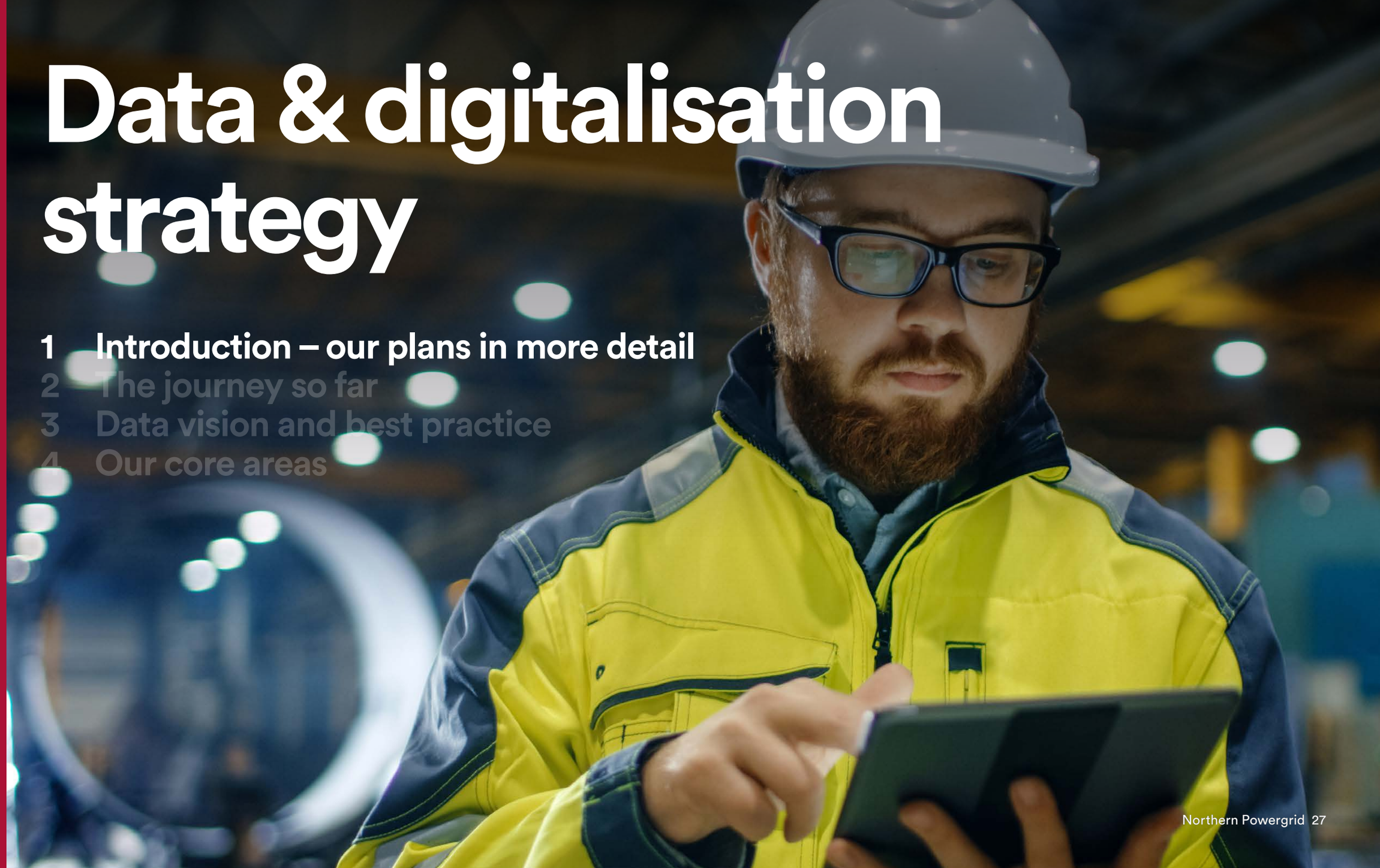
What we will do next

— 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 this in the future during our journey to net zero.

— We would like to introduce an interactive product roadmap to enable continuous feedback on our planned Open Data projects and services and provide visibility of our timelines. How you feel about some of the key themes and our ambition to underpin plans with technology and Open Data is important to us and we would welcome your views on the goals, objectives and principles we are setting out as well as our direction of travel.

— We are currently evaluating the optimal platform to achieve this aim: our roadmap should be fully shareable, insightful into release dates and project features and possess the capacity for easy commenting and upvoting on defined Open Data projects. We are planning to have the interactive product roadmap in place for the next iteration of the DSAP.

Data & digitalisation strategy



Our plan to deliver a digital transformation

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. 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.

Both of these initiatives are examples of work we have done in ED1 that has 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 estimates; 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. In the same respect, there are other areas that will take longer to adapt and adopt the new capabilities that digitalisation will bring and there will also be areas where digitalisation will bring forward no benefit. Therefore, we have taken an approach in this iteration of our DSAP to lay out the options as we see them. We will continue to refine these, working with the business and applying the consumer lens to focus on the highest value areas before confirming these in our action 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

Since we last published our DSAP in December 2020 we have expanded its content in a number of areas.

We have

— 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 Operational Technology solutions and planned accordingly.

In this strategy, we are setting 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**.

Drawing this to conclusion, hopefully this has provided useful insight into our progress towards digitalisation, where we are in relation to our wider business plans and what our philosophy is when it comes to digitalisation.

*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

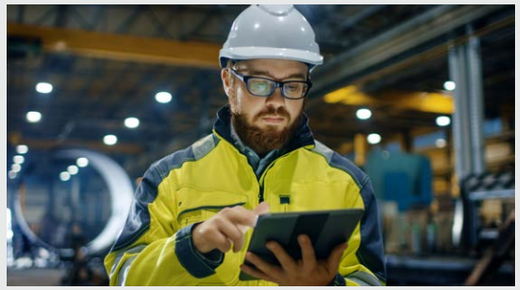
The development of our DSAP is underpinned by a set of clear design principles. This ensures that innovation and initiatives that we propose are focused on delivering the right outcomes for our customers, our stakeholders and our business.

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

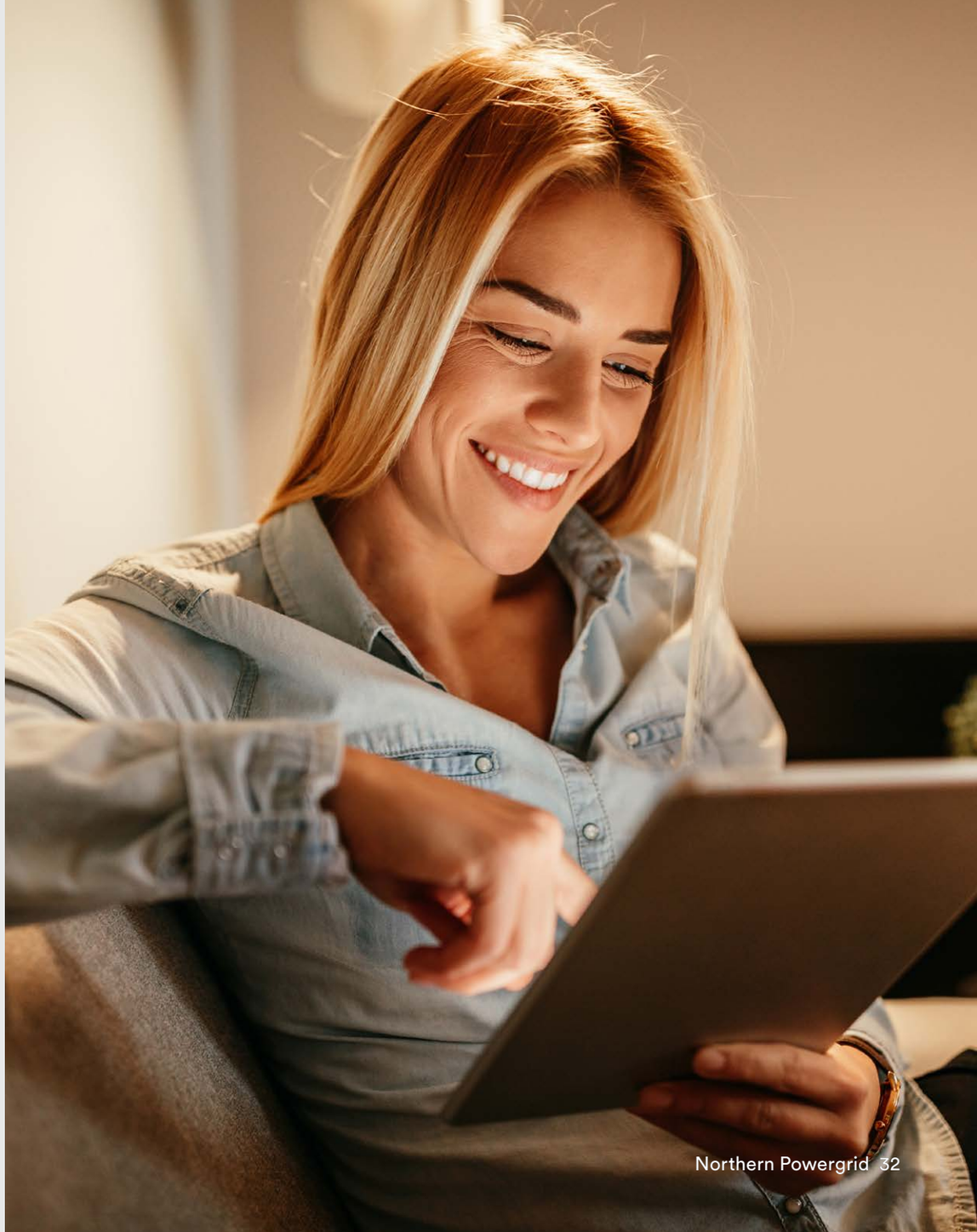
This document outlines our guiding principles for data and digitalisation, sets out our strategy, the outcomes we want to deliver and our vision for a data-empowered digital future of our network and business.

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

Design principles

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

Security is a hygiene factor:

— Aa a responsible network operator, we are obligated to ensure our systems are resilient to attack.

— Under the NIS directive (NIS-D) and GDPR, we are bound by a duty to take appropriate and proportionate measures in securing the network and Information Systems (IS) on which our customers' essential service relies.

— Our approach will focus on the continual reduction of risk. Throughout ED2 we will be recruiting more cyber specialists to our team and investing in our workforce to provide the skills needed to help them do their job in a cyber secure way.

— We will invest in security tools to protect our networks from unauthorised access or attack, part of which will include extending our Operational Technology network surveillance capability to detect unauthorised or abnormal activity on the control systems at all major substations.

— We will also invest in technology to identify weaknesses in near real-time and to detect and respond to cyber attacks on our controls system without the need for human intervention and to improve the systems that we use to hunt for active threats and weaknesses in our IT and distribution network control systems.

— In addition we will continue to expand our cyber security capabilities by establishing secure third party connectivity models, expand our cloud security prevention, detection and response capabilities, and manage our information security to the ISO27001 standard. We are working towards achieving ISO27109.

— More information on this can be found **here**.

Design principles

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

Customer led and socially inclusive:

— We are transforming our value proposition to deliver experiences led by customer needs and enabled by new colleague solutions.

— To build our culture of accessibility and to ensure that everyone can access our services we are making accessibility a priority for all aspects involved in delivering a service.

— Vulnerable customers will be at the centre of our thinking. We will use data and strong partnerships to provide tailored services to vulnerable customers. We will support customers in fuel poverty and support a socially inclusive transition to net zero by minimising barriers to enter the energy market so that no one is left behind.

— For everything from user research right through to usability testing, our key question is what is the user need?

— The answer to that question will formulate our designs, this will ensure that we deliver customer-centric solutions.

— We are introducing self-service solutions for our customers, as well as other non digital channels to ensure an inclusive approach that will include all of our customers, including those do not wish to or cannot use our digital solutions as well as those customers who are hard to reach.

— We will utilise industry best practice such as the government digital services accessibility recommendations see here.

Design principles

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

Facilitating efficiency:

— We will promote competitiveness in the market, driving efficiencies within our business to offer our customers affordable services.

— Through greater use of technology we can support self-service for those who require it, increasing capacity for personalised support via our contact centre for those who don't.

— We have implemented process improvement tooling to allow us to process mine and streamline processes, as well as identify suitable candidates for automation. We will expand this to include a wider range of our business processes.

— We are and will continue to make decisions in a more agile and data-driven way, as well as optimising and digitalising our core business processes.

— In addition investments into data and digitalisation are, and will continue to be, made efficiently – re-using capability where possible to reduce overall cost.

Design principles

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

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

— We envisage a world where data will improve our operations, allow us to manage the network and deliver decarbonisation at the lowest possible cost. By capturing, analysing and using this data we will create many new Open Data products and services that we can share with you, so you too can benefit from our investments in this area.

— We are committed to the 'presumed open' principle, utilising techniques such as anonymisation and aggregation, enabling us to share increasingly more products and services with you.

— For more information on this please see here.

Design principles

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

Keeping the future in mind:

— We believe that our task is to embrace uncertainty and chart a course through the technologies and data required on the pathway to decarbonisation.

— We are using agile ways of working to interweave adaptability and flexibility into our designs; allowing us to plan for the future as much as possible.

— We plan to adopt a scalable delivery model to build in inherent flexibility, allowing us to flex to meet both anticipated and unexpected business needs.

— We recognise that people are our greatest asset and plan to capitalise on this by upskilling our people as well as introducing further integration of IS into the business.

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.

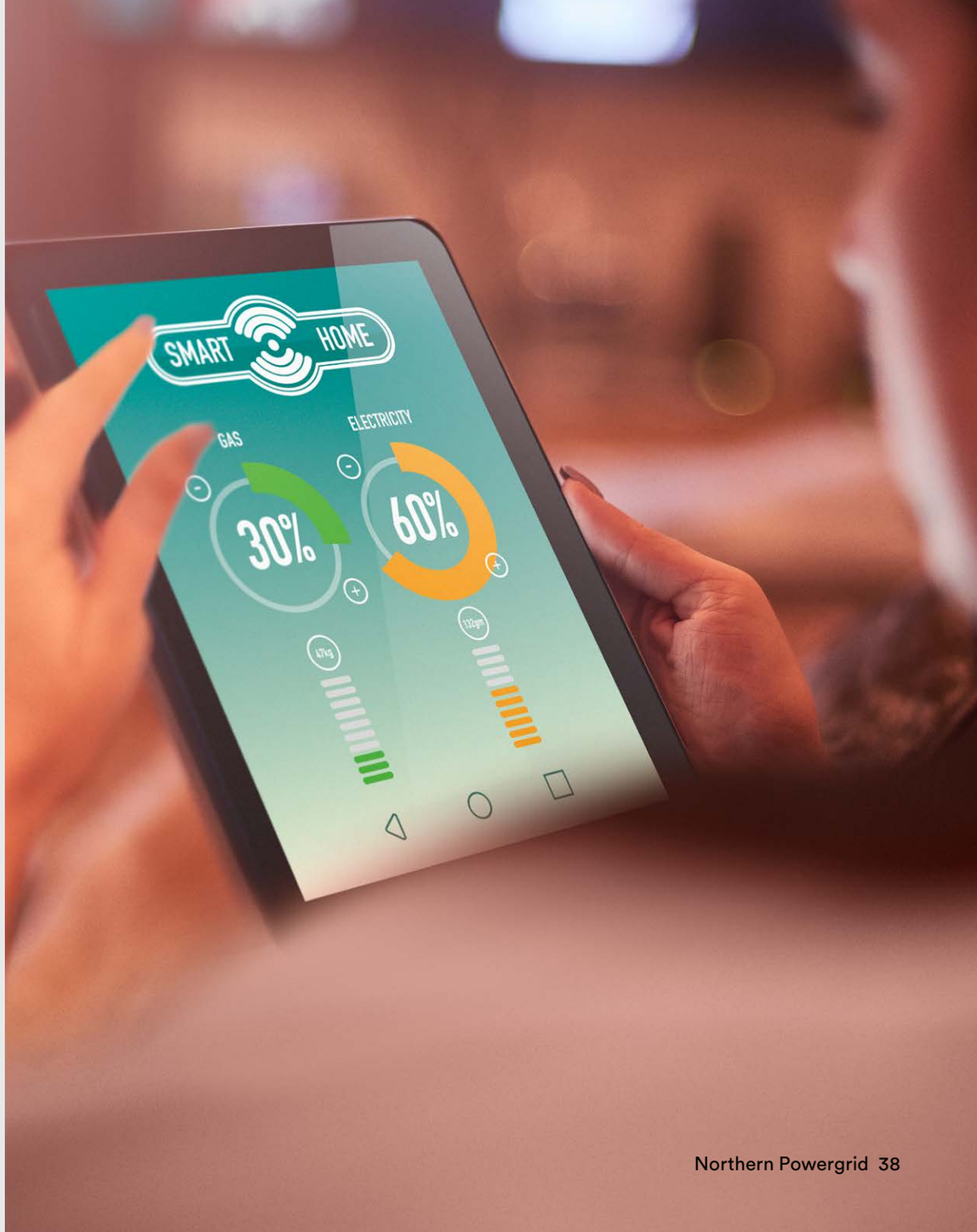
As with any strategy such as this, we will undertake thorough risk management throughout the programme to ensure all of these are mitigated and managed appropriately but at least acknowledging these high-level risks as we commence means that we will not lose this focus as we develop the plans further.

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.



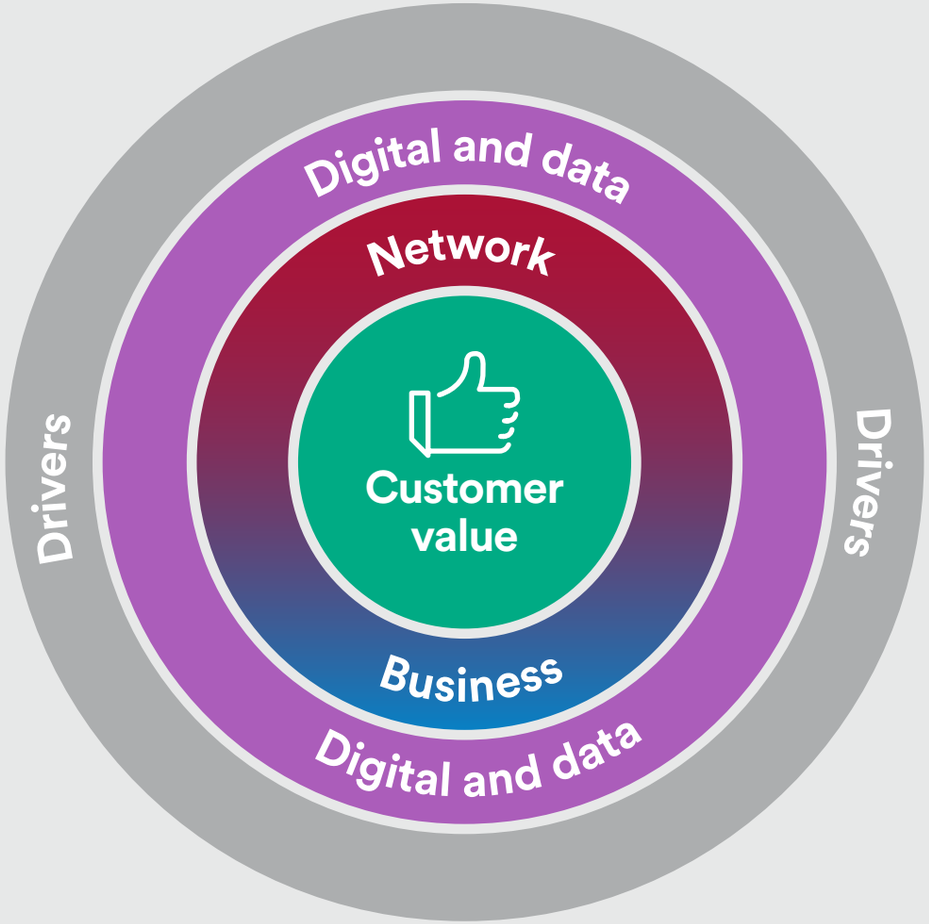
Brought to life...

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?

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: Self-service analytics toolkit
Build enhanced functionality on top of our open data platform to unlock additional customer benefits. This will include a set of free analytical tools to help process data, and enhance self-service.

CVP3: Dynamic voltage optimisation for domestic energy efficiency
Dynamically manage voltage on our system to achieve behind the meter benefits at 35% of domestic properties in ED2, rolled out to 80% by ED3. Our solution (currently in late stages of innovation trials) will improve energy efficiency delivering an annual reduction of up to £20 in customer energy bills and 29kg of carbon emissions per household each year.

CVP4: Phase 1 rollout of next generation energy system
Undertake 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, particularly for remote customers.

How will digitalisation link to our customer value propositions?

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

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.

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.

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 Iteration 1 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 allows 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 Northern Powergrid 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

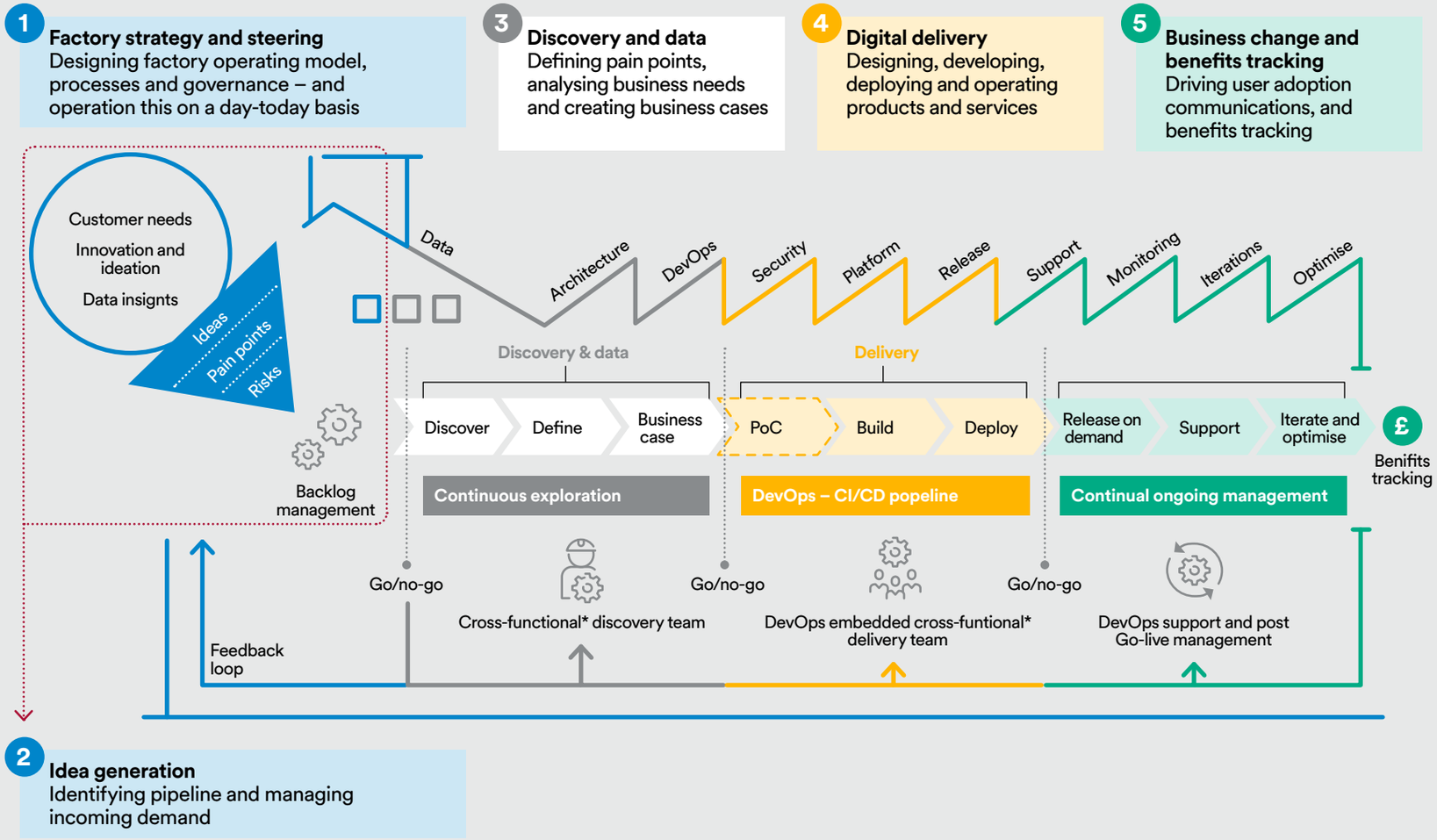
We are creating a Data and Digitalisation Transformation Office (DDTO) to enable us to accelerate the delivery of data products and services, while building out the capabilities required in ED2.

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.

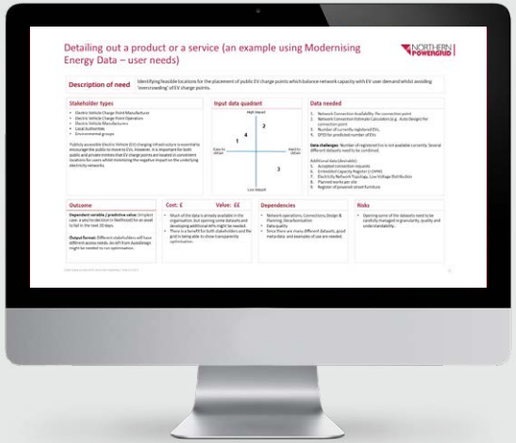
The below slide illustrates an example using Modernising Energy Data – user needs.

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.

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.

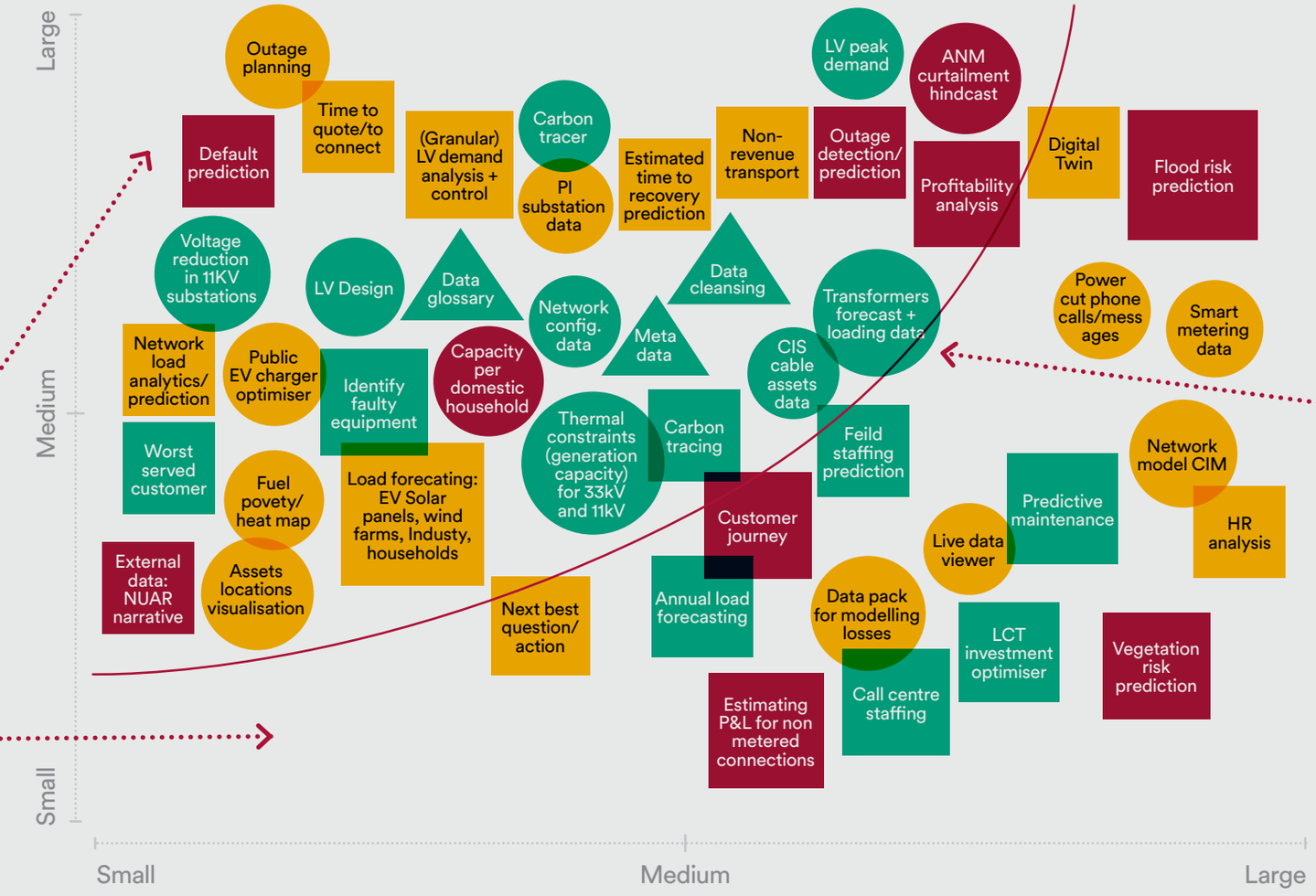
We have conducted an initial prioritisation by mapping data use cases to a cost/value grid

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 blue 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 to 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.

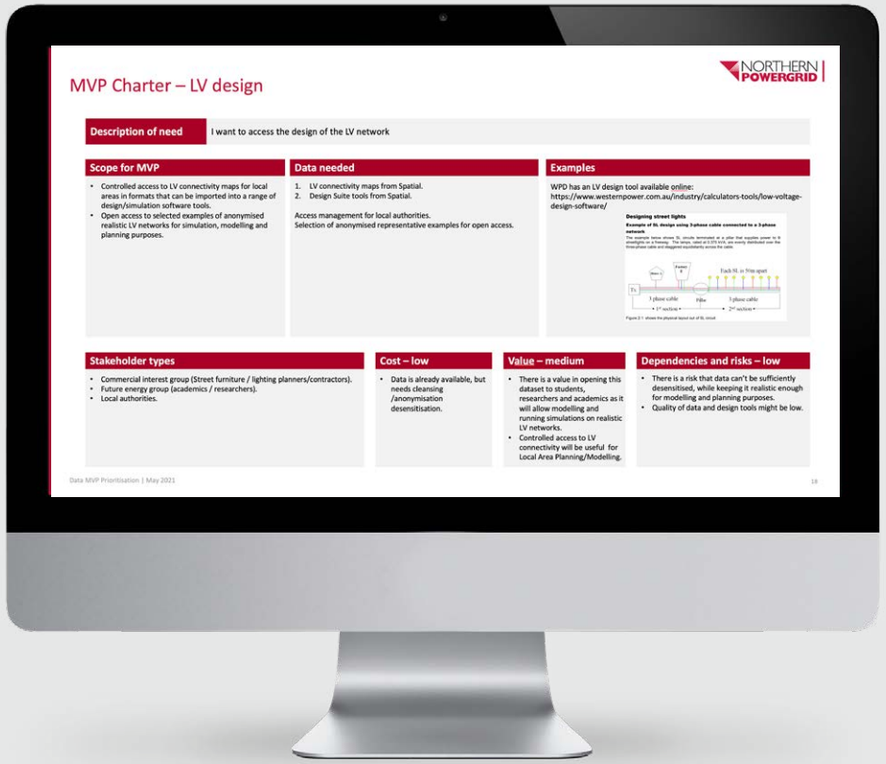
An example: LV networks – how data can help

— 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

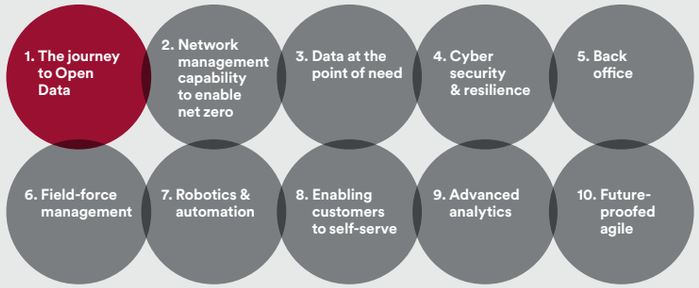
The digitalisation initiatives will deliver the new or additional business/technology capability required to deliver the DSAP.

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.

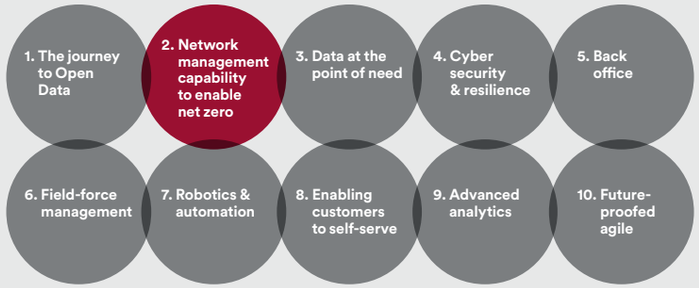
Consolidated initiative proformas provide further narrative. The reader is also advised to refer to the detail in the initiatives section.

1. The journey to Open Data



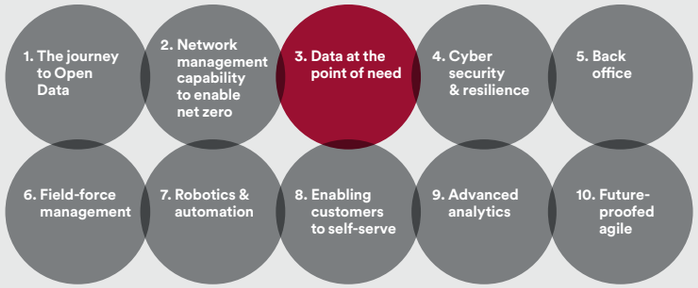
Objectives	Capabilities required	Initiatives	
Evolving the operating model to set IS as an enabling function for digitalisation	**Data quality management**	**Data governance**	
Focusing on data quality and leveraging technology to proactively ensure we have the right data standards in place	**Data strategy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

2. Network management



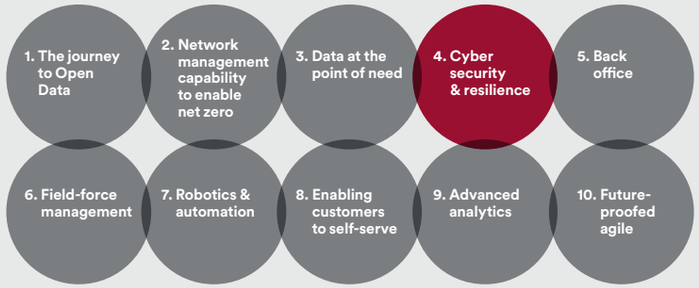
Objectives	Capabilities required	Initiatives	
Enabling real-time visibility of the network including energy flows and environmental conditions, down to the LV network level, to be able to forecast different load scenarios and predict faults	Network risk management	LV management technology	Microgrid management
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



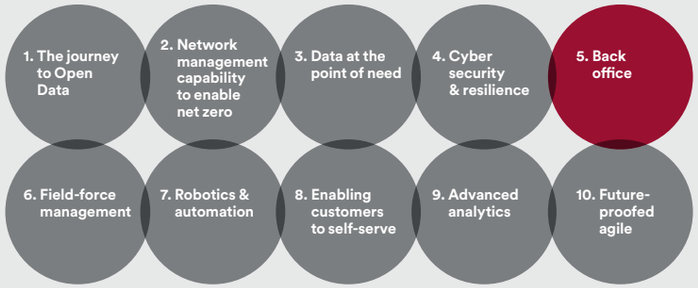
Business objectives	Capabilities required	Initiatives
Focusing on the end-user experience with platforms that foster collaboration and productivity	End-user experience and support capability	M365 basic use
		M365 extended use
Building our digital skillset to ensure our colleagues are ready for digitalisation		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



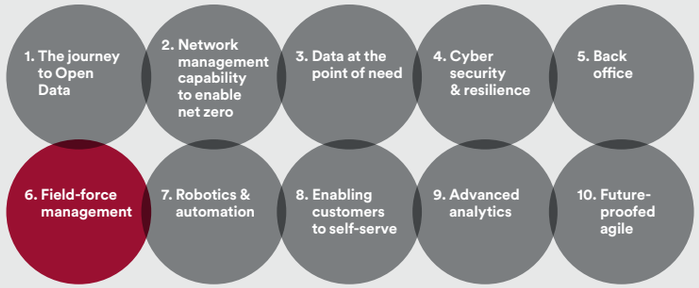
Objectives	Capabilities required	Initiatives
Transforming cyber security to deliver highly effective cyber security services in IT and OT	Cybersecurity capability	Implement EDR Additional cyber security tooling Enhance NIS-D
Enhancing the telecoms network to better manage the telecoms assets **Fully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

5. Back office



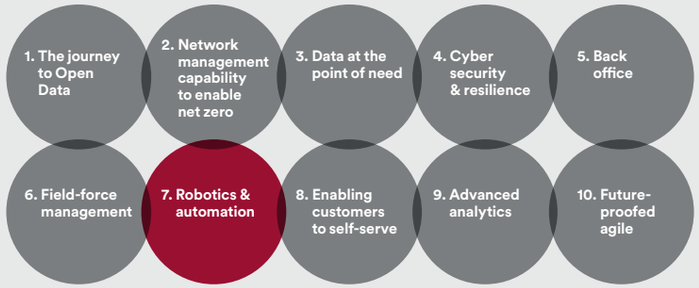
Business objectives	Capabilities required	Initiatives
Modernising back-office systems to build data driven insights whilst improving compliance	IT governance and architecture capability	Back-office standardisation
Improve back-office efficiency through the adoption of standard processes and system consolidation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

6. Field-force management



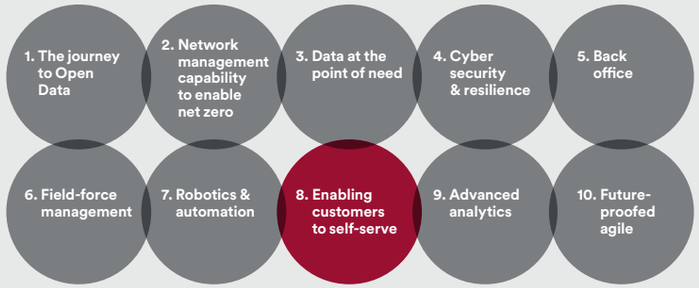
Objectives	Capabilities required	Initiatives
Enhancing our project management capability to enable better integration of project data with our systems	Engineering project delivery capability	Work and material management blueprint
		Work management solution
		Work management for connections
Digitalising work and material management to have more control over costs and optimise resources	Work planning and scheduling capability	Field-force mobile
	Material and inventory management capability	Supply chain tooling
		Material management solution

7. Robotics & automation



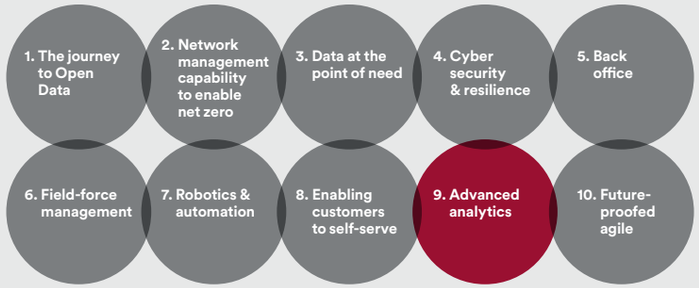
Objectives	Capabilities required	Initiatives
Using automation to standardise processes and remove manual tasks. This will be done across all business areas	Systems integration and process automation	Scaled RPA
		Customer and peoples services automation
		Operations automation
Integrating systems by leveraging 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

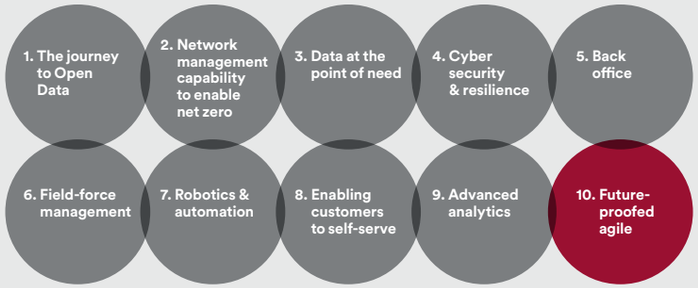
Capabilities required

- 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** **Initial cloud footprint** **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:

Embrace new technology

+

Cleanse and maximise our data

+

Change our 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.

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

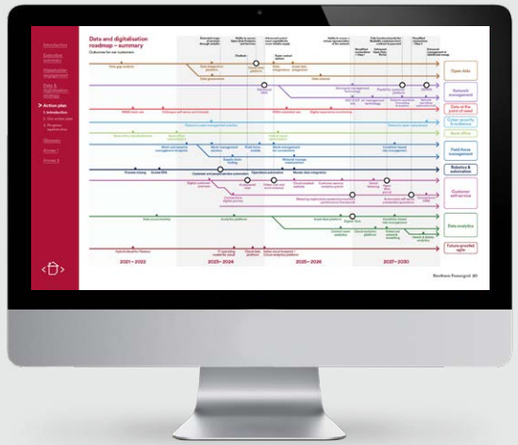
— **Enhance (2025–2026):** Initiatives that are either more innovative in nature or build on the previous work to complete a series of capabilities for full benefits realisation

— **Future vision (2027–2030):** 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

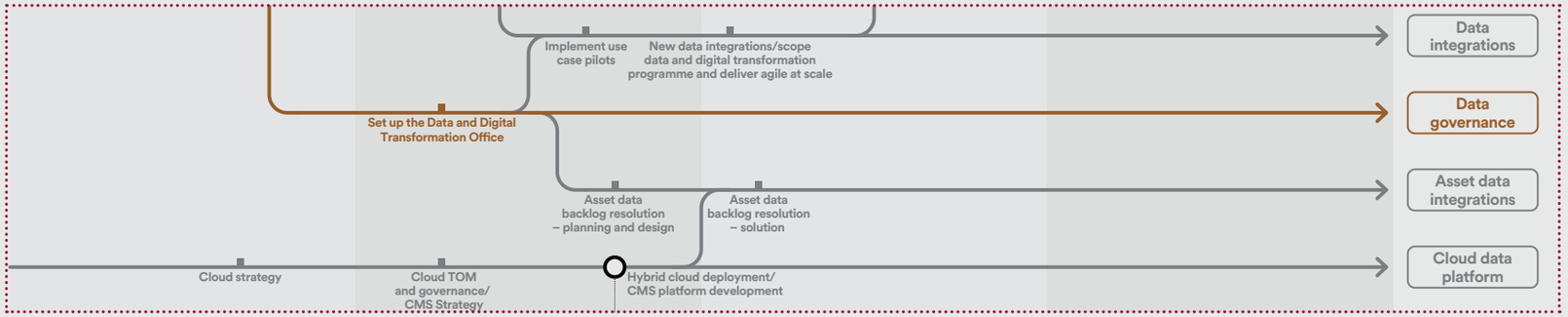


Transformation roadmaps – How to read

— 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.

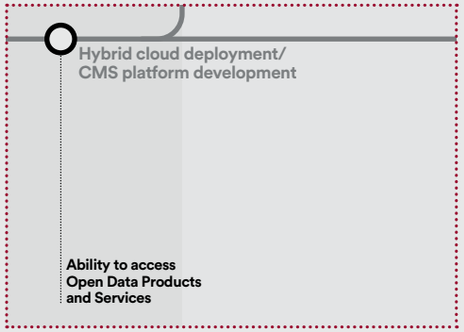
— At a summary level, we are showing capability that we will deliver to achieve the ten core areas, for example Open Data. The items on each line of the transformation roadmap denote an initiative within the core area, and the expected date for completion as per the timeline at the foot of the roadmap.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

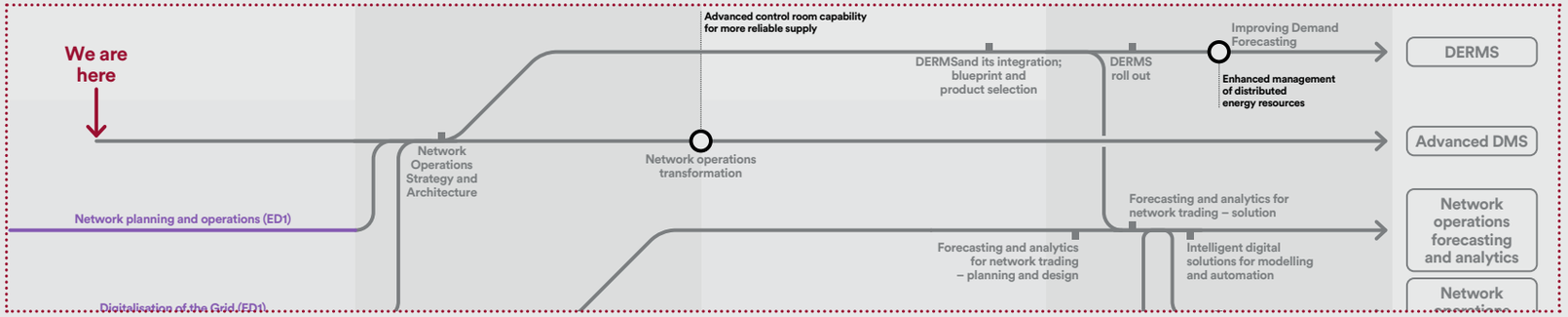
— There is a separate detailed roadmap for each of the ten core areas, the headings denote the initiatives which form the core areas e.g. DERMS.

— 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.

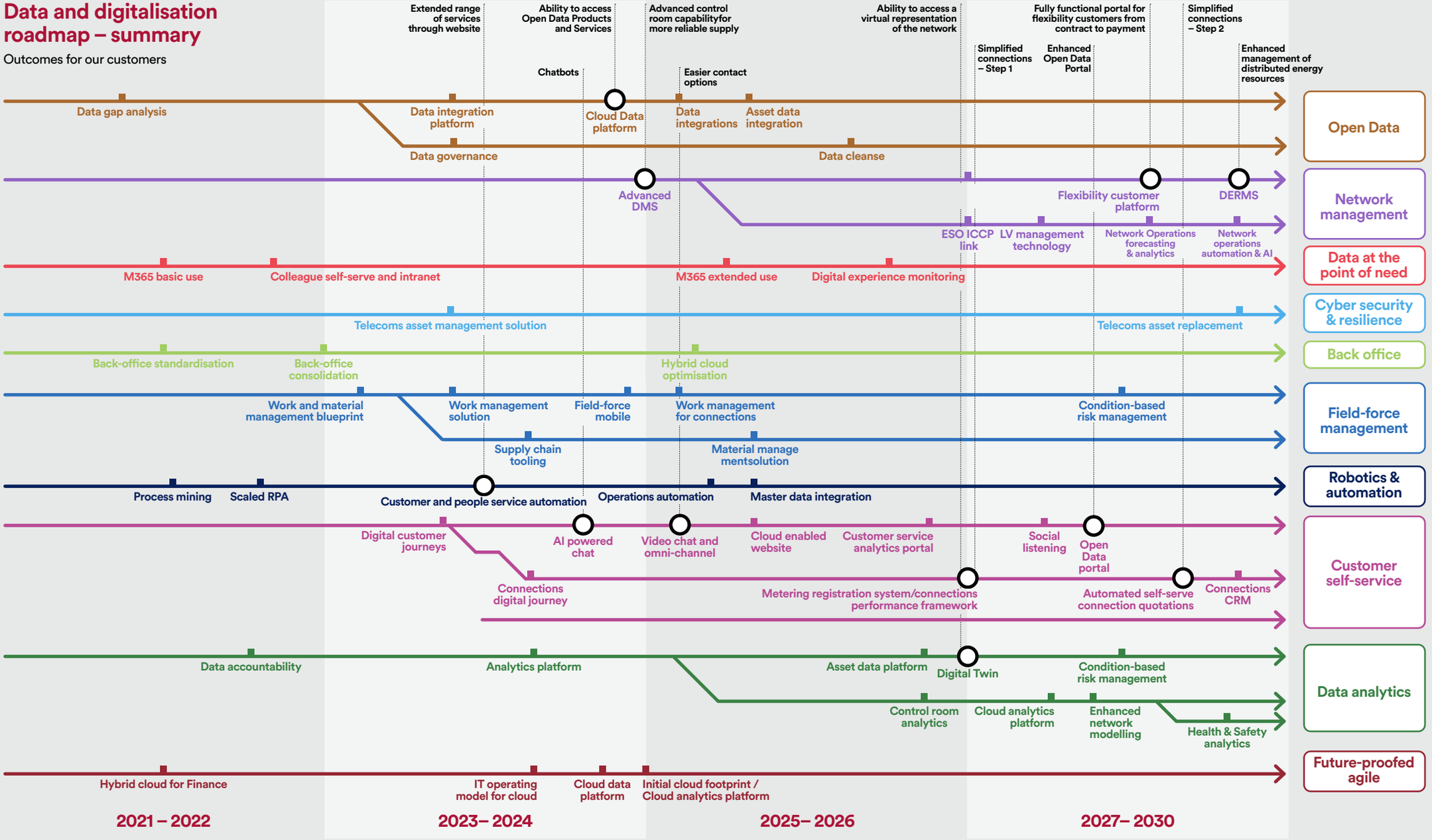
— Non-horizontal lines denote a dependency between initiatives e.g., the start date for the 'DERMS and its integration…'. enabling initiative is dependent upon the completion of 'Network Operations strategy and architecture'.

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



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 **Internal outcomes** 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. **External outcomes** 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.
Customer benefits	**Open & transparent** Open Data is the core proposition to achieve this outcome. **Whole system efficiency** By exposing Open Data, we will enable decarbonisation and increased cost efficiency for the energy ecosystem. **Cyber secure** We are aware of the risks of Open Data, particularly for critical national infrastructure and we are managing our Open Data offerings accordingly.

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

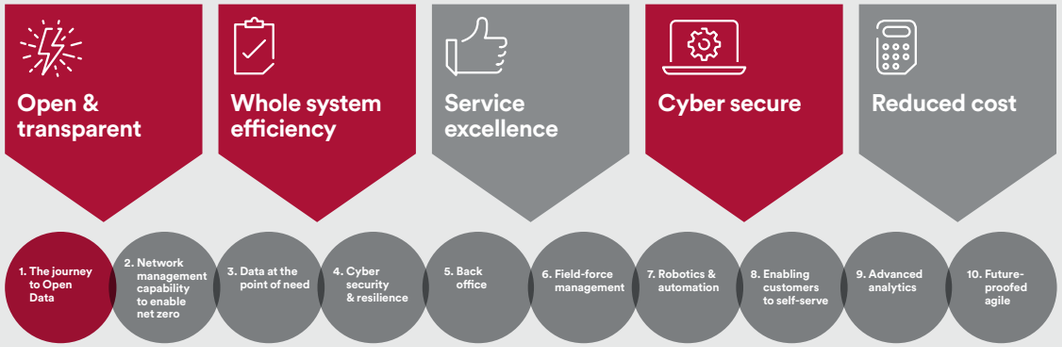
Enable advanced analytics to improve the planning, design and operation of our distribution network.

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.



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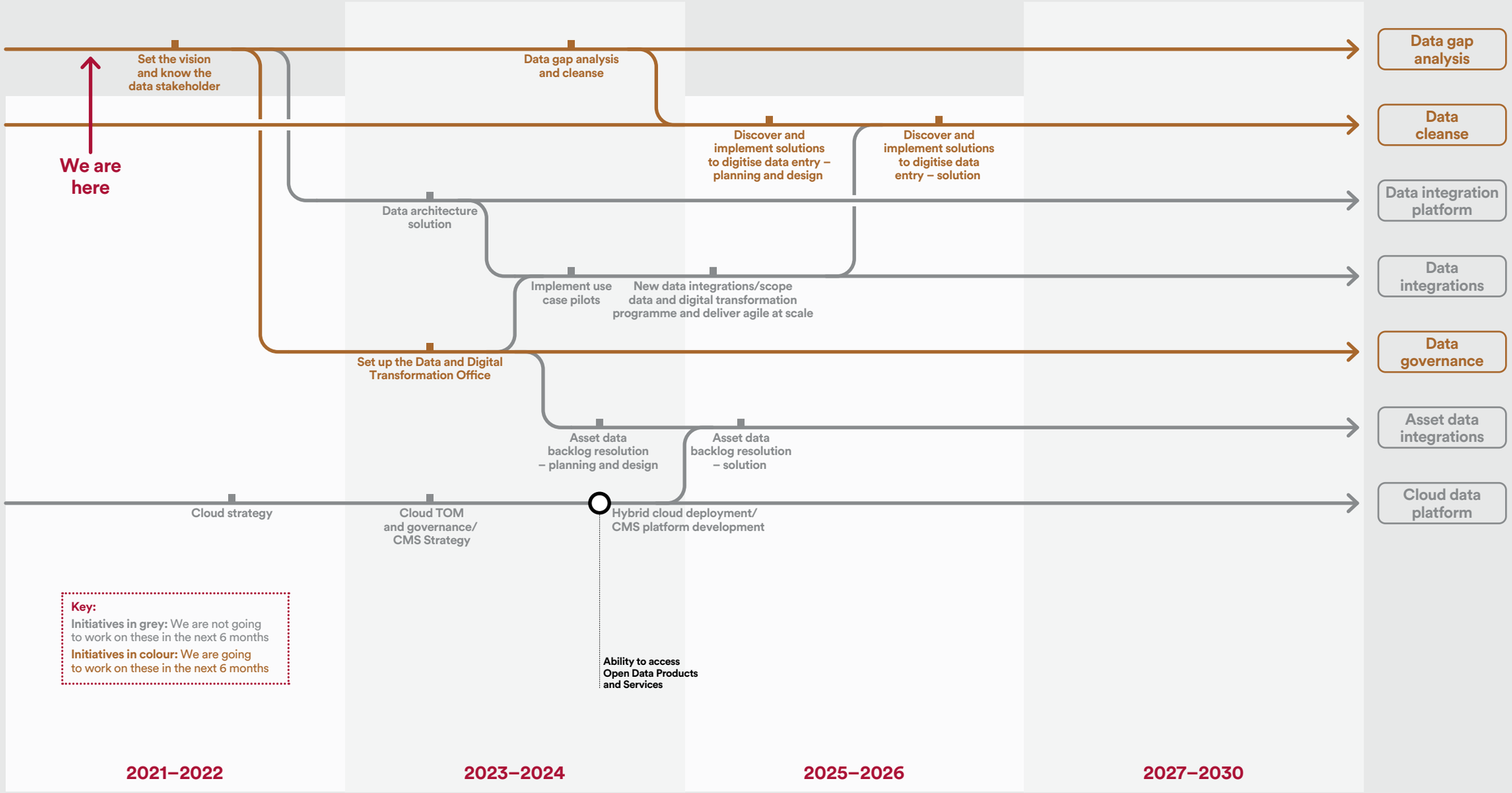
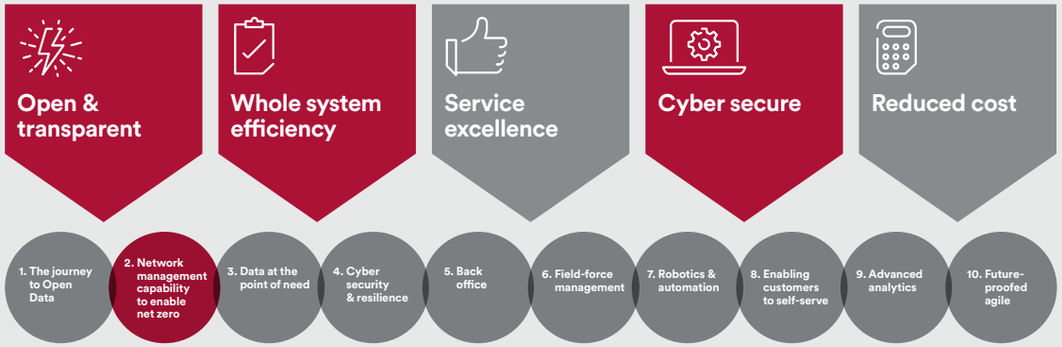
1. The journey to Open Data



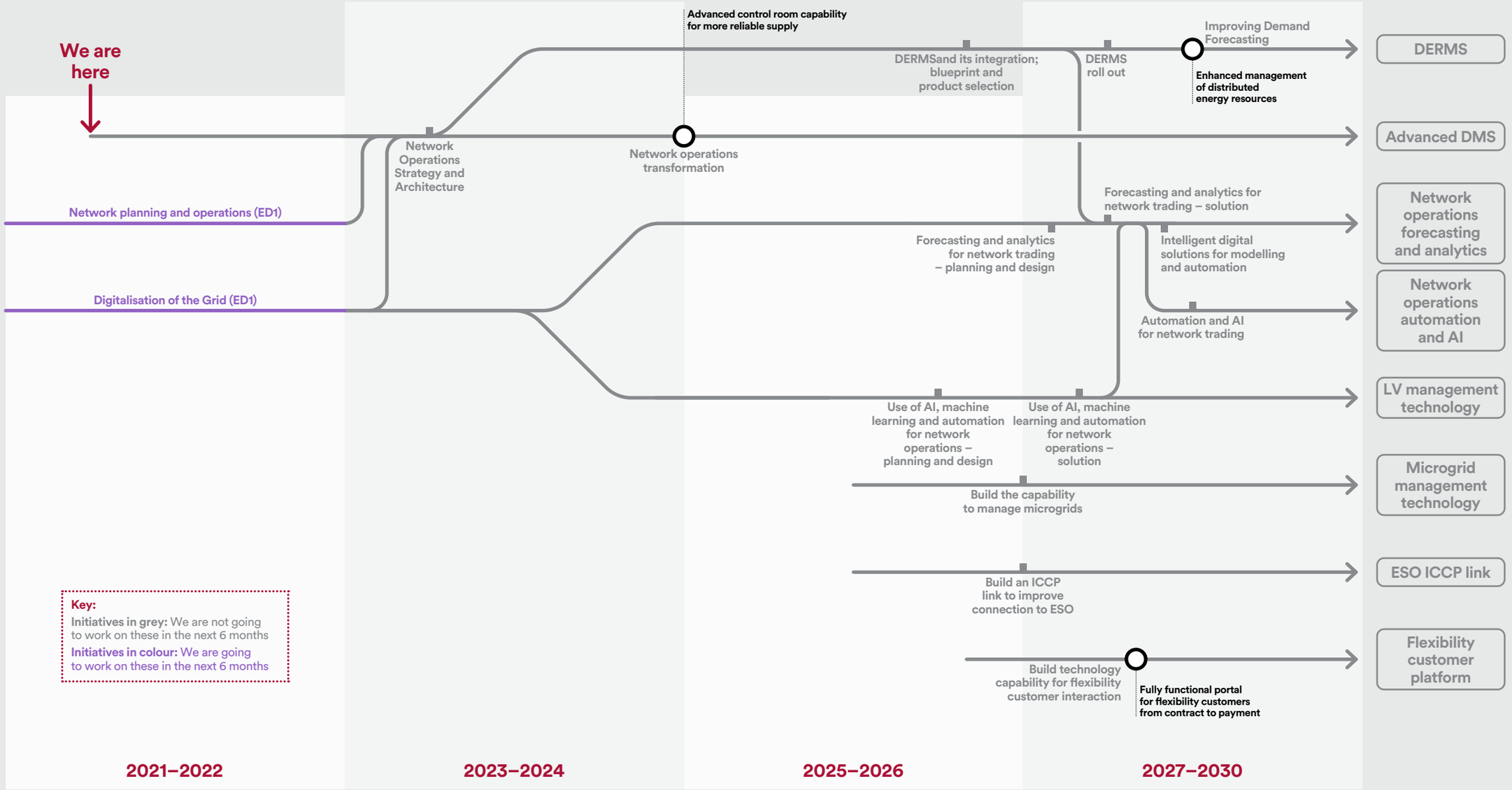
2. Network management capability to enable net zero

*See the five outcomes in more detail here.



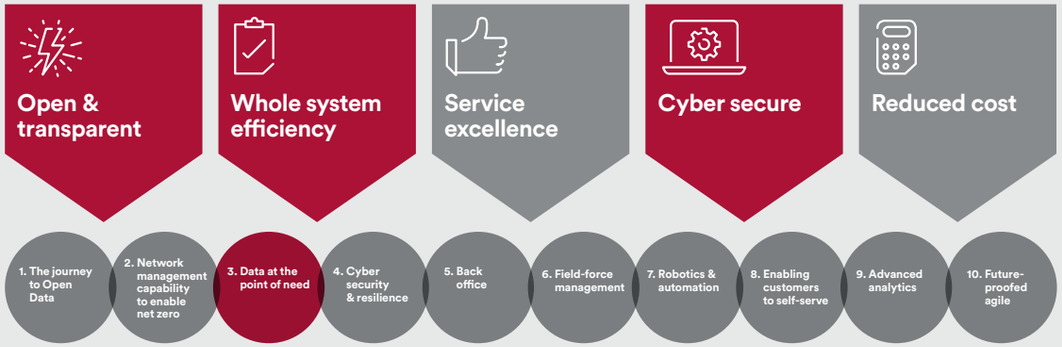
Description	**Upgrade and implement new IS systems to enhance network management and decision-making in real time to enable us to efficiently operate our distribution network in a decarbonisation era.**
Business outcomes	New ways of managing and balancing the network are key to DSO and ultimately our net-zero ambition. Those new ways are increasingly more complex and we need data and digitalisation at an unprecedented level to manage the complexity. 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. 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.
Customer benefits	**Open & transparent** Our new network management systems will be a key source for Open Data. **Whole system efficiency** Using new ways of balancing, we will be able to shift from carbon sources to carbon-free sources of energy. **Cyber secure** Protecting ourselves and our network against cyber threats is and remains a hygiene factor in everything we do.

2. Network management capability to enable net zero



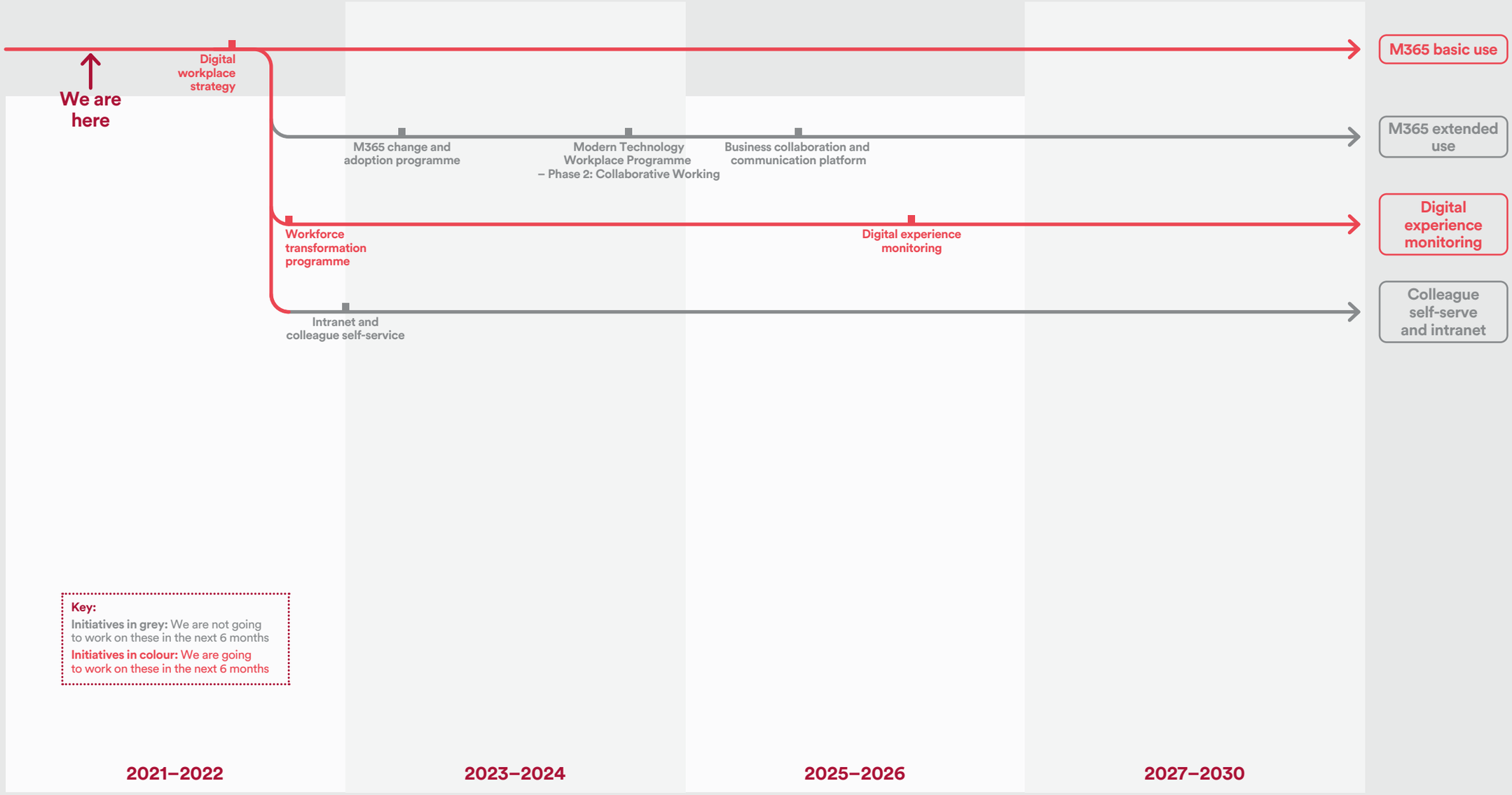
3. Data at the point of need

*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. 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.
Customer benefits	**Open & transparent** With internal data being captured in systems, it can be exposed more easily if needed. **Whole system efficiency** Being able to collaborate with others, our colleagues will be able to work towards greater efficiency of the system. **Service excellence** Having the right information, our colleagues will be able to provide a more seamless service to our customers. **Cyber secure** The use of collaboration platforms with built-in security will reduce cyber risks. **Reduced cost** Through the use of collaboration tools, we will increase overall colleague efficiency.

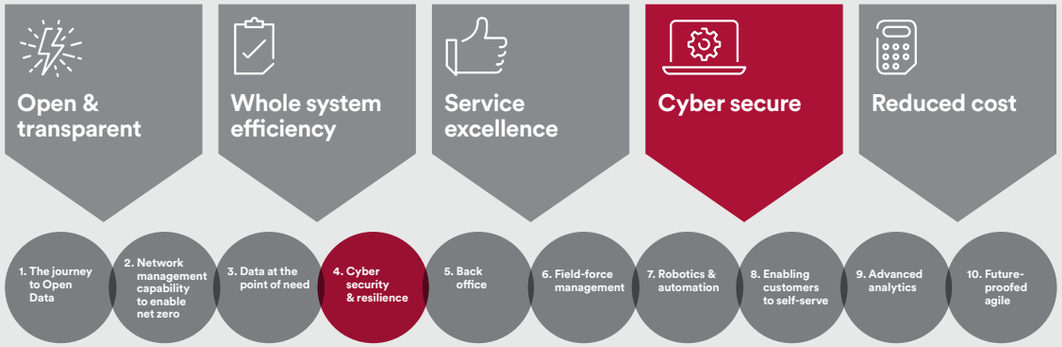
3. Data at the point of need



4. Cyber security & resilience

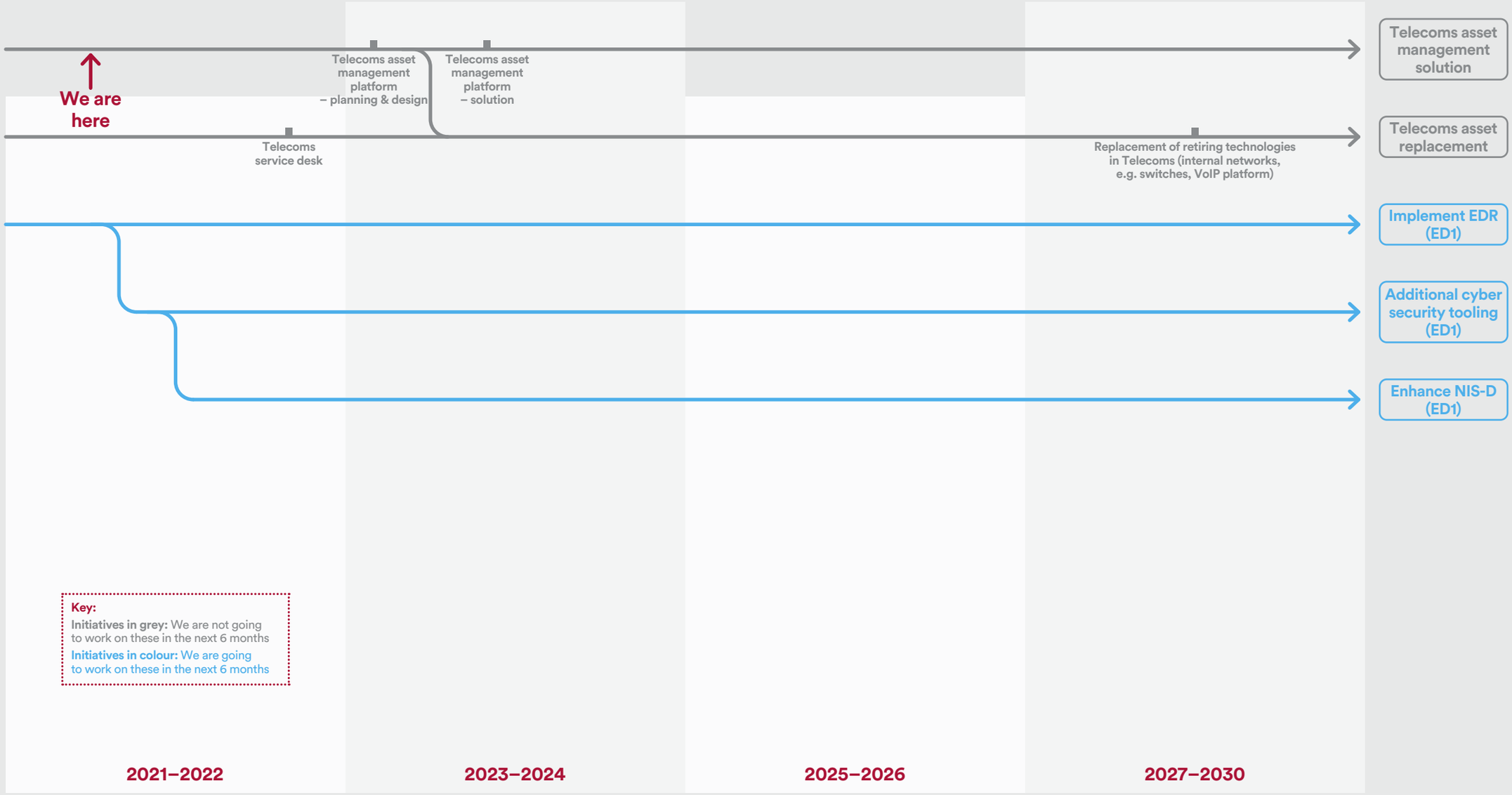
Note: Information included in this document on our plans for this area is limited due to its sensitive nature.

*See the five outcomes in more detail here.



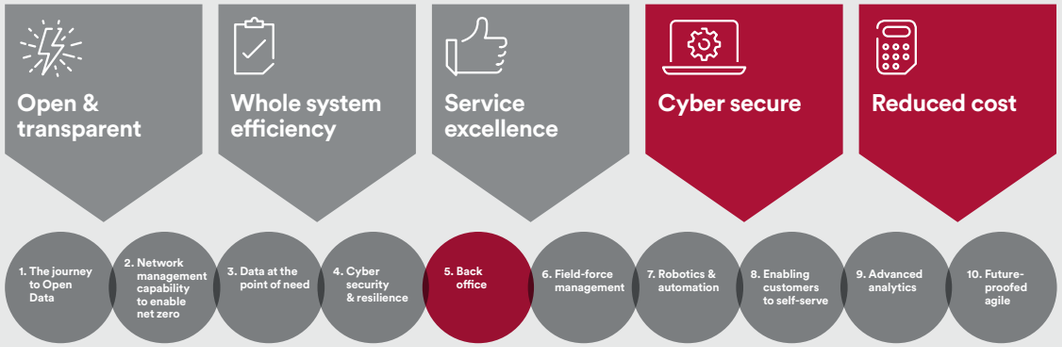
Description	**Continue to invest in advanced cyber controls and tools to maintain a robust cyber security posture, aligned to the threats emerging from increased digitalisation.**
Business outcomes	To have robust cyber security policies, processes and controls in place to maintain our strong security posture and continually reduce risk to protect our customers' personal data and operate a resilient distribution network through: — security tools and advanced threat monitoring that protect our network from unauthorised access or attack — skilled and competent cyber professionals — taking appropriate and proportionate measures to secure the network and IS in compliance with the NIS directive (NIS-D) — protecting our customers' and employees' personal information through compliance with the general data protection regulations (GDPR) — maintaining ISO 27001 — achieving ISO 27019
Customer benefits	Protecting our customers' information by investing in our people, processes and security tools to help us identify weaknesses, as well as detecting and responding to cyber attacks on our systems. Protecting our customers' power supply through continued investment in security and resilience to ensure that we minimise any disruptions on our distribution network.

4. Cyber security & resilience



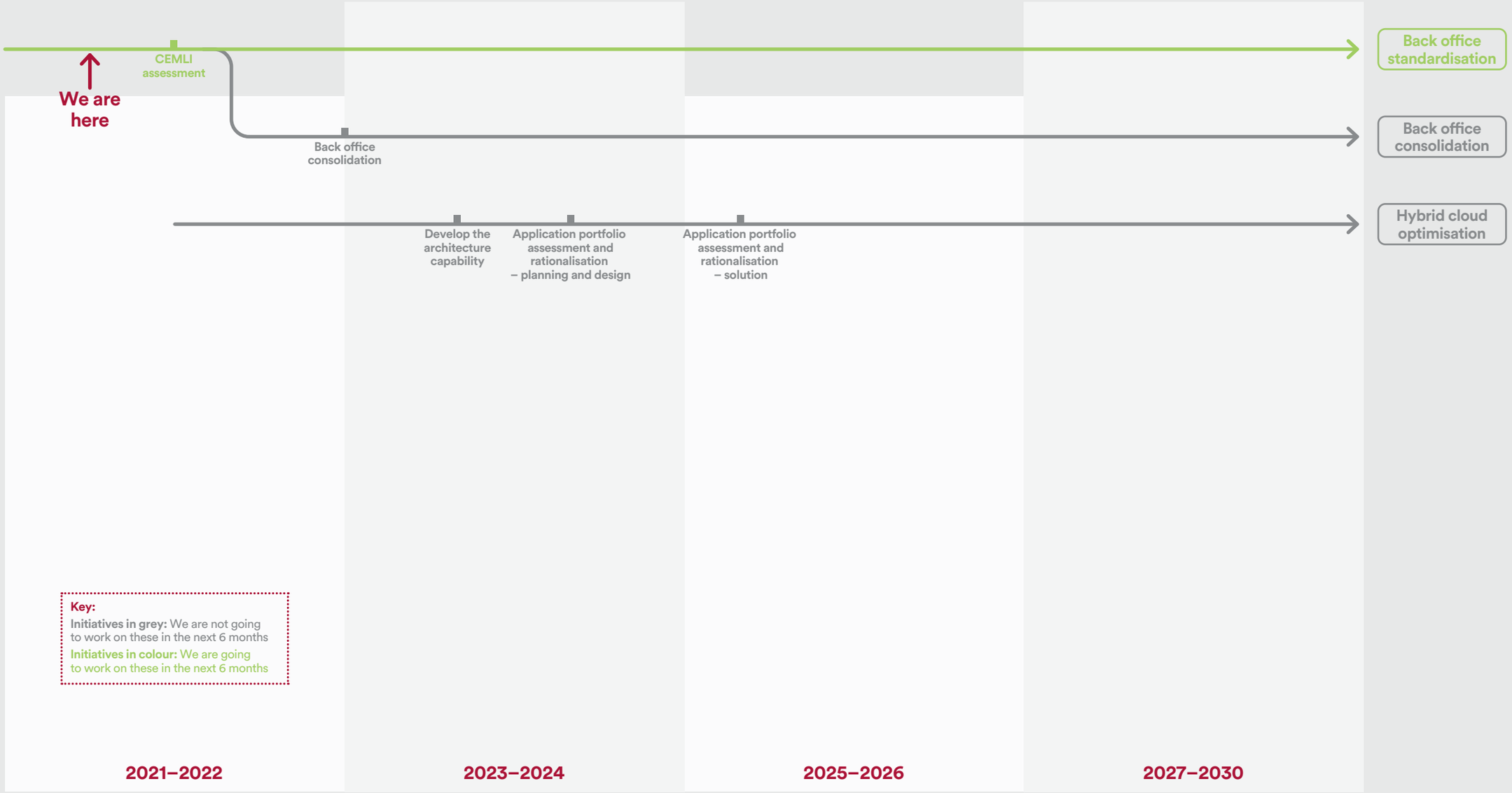
5. Back office

*See the five outcomes in more detail here.



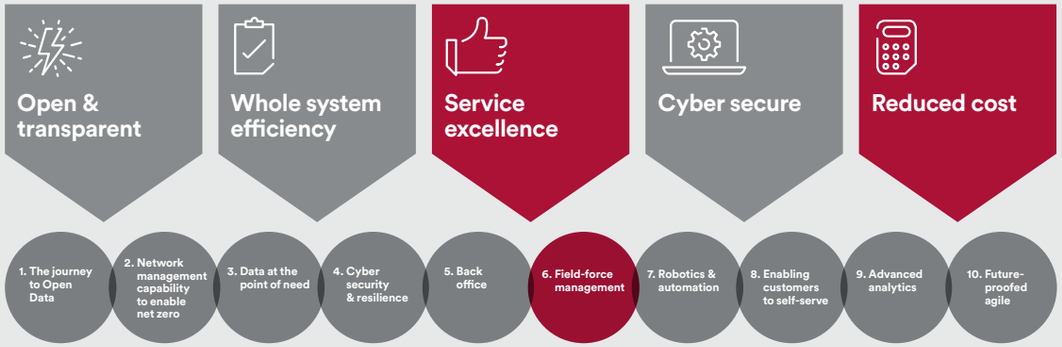
Description	**Modernise the back-office environment to reduce risk, secure information and improve colleague experience.**
Business outcomes	Our back-office environment ranges from finance, procurement and Enterprise Resource Management (ERP) to HR. By adopting cloud-based, 'evergreen' systems, we will 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. 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.
Customer benefits	**Cyber secure** Through modernising our back-office environment, we will be able to reduce cyber threats in this area. **Reduced cost** Back-office environments need to provide an efficient service – through implementing modern and evergreen systems, we will continue to benefit from new developments as they become available.

5. Back office



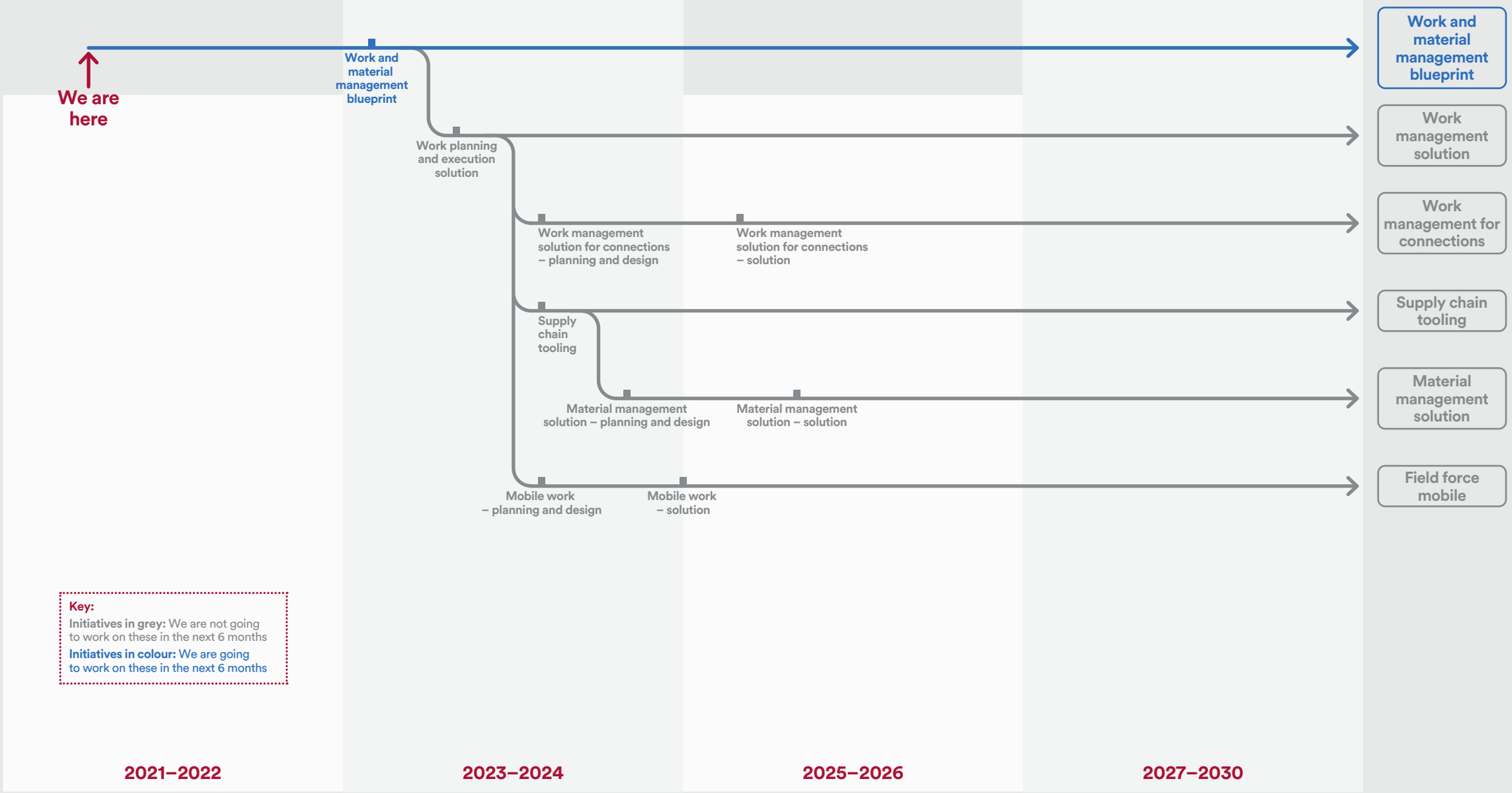
6. Field-force management

*See the five outcomes in more detail here.



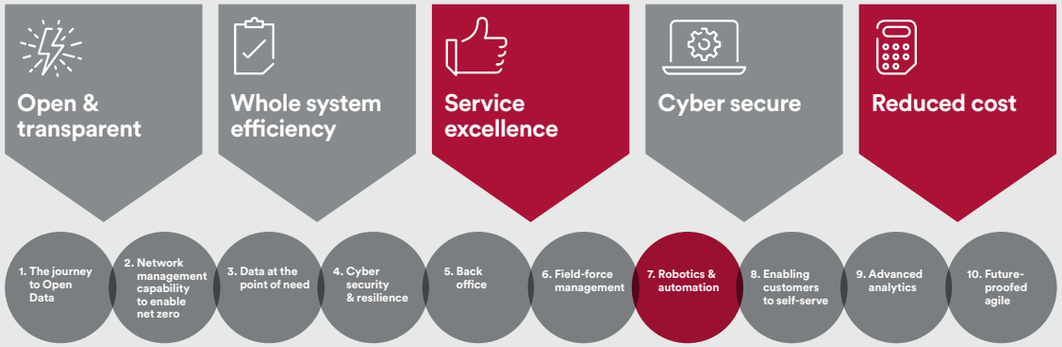
Description	**Introduce improved field-force, work and asset management processes to improve operational performance.**
Business outcomes	Our field-force is integral to our business. To increase our efficiency as a business, we need to improve the support we give to our field-force. Through this initiative 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.
Customer benefits	**Service excellence** With the new tooling, our colleagues will be able to provide faster and better service for our customers, e.g. in the event of an outage. **Reduced cost** A significant portion of our colleagues are part of the field-force. Introducing new work and material management tooling is a major efficiency driver.

6. Field-force management



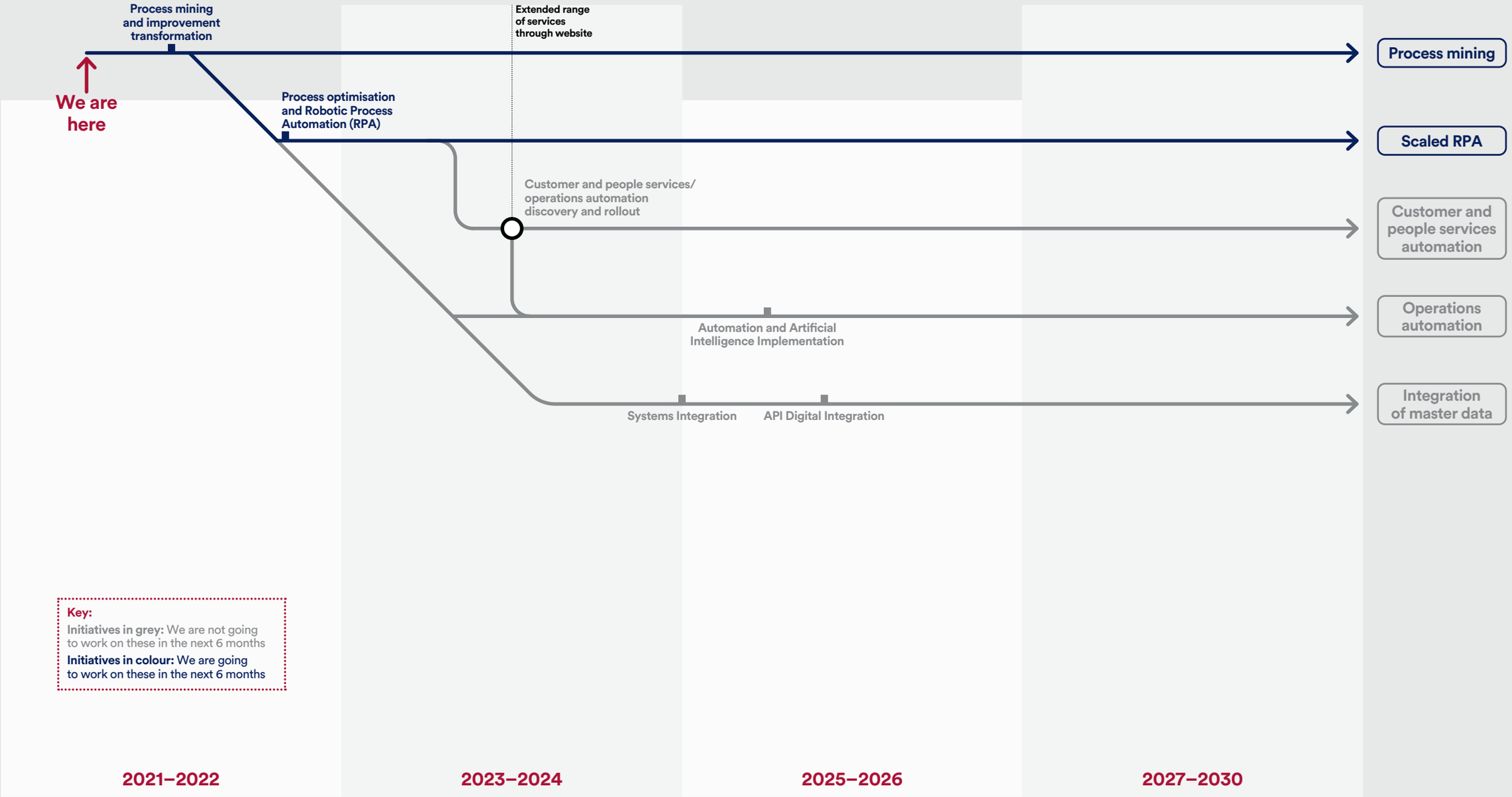
7. Robotics & automation

*See the five outcomes in more detail here.



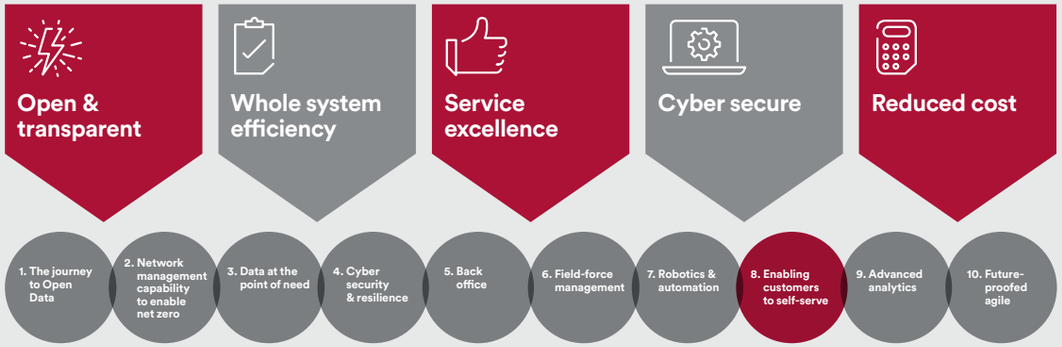
Description	**Deploy robotics and automation to reduce cost of low value, high volume tasks and improve customer and colleague experience.**
Business outcomes	Process mining will help us remove non-value-added activities from processes, improve our documentation and then provide a stable platform for automation. We will achieve further efficiencies by automating manual activities or speeding them up through Artificial Intelligence. 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.
Customer benefits	**Service excellence** Through the use of automation, we will be able to provide seamless and efficient service. **Reduced cost** Robotics and automation are primarily aimed at reducing the cost of highly standardised processes.

7. Robotics & automation



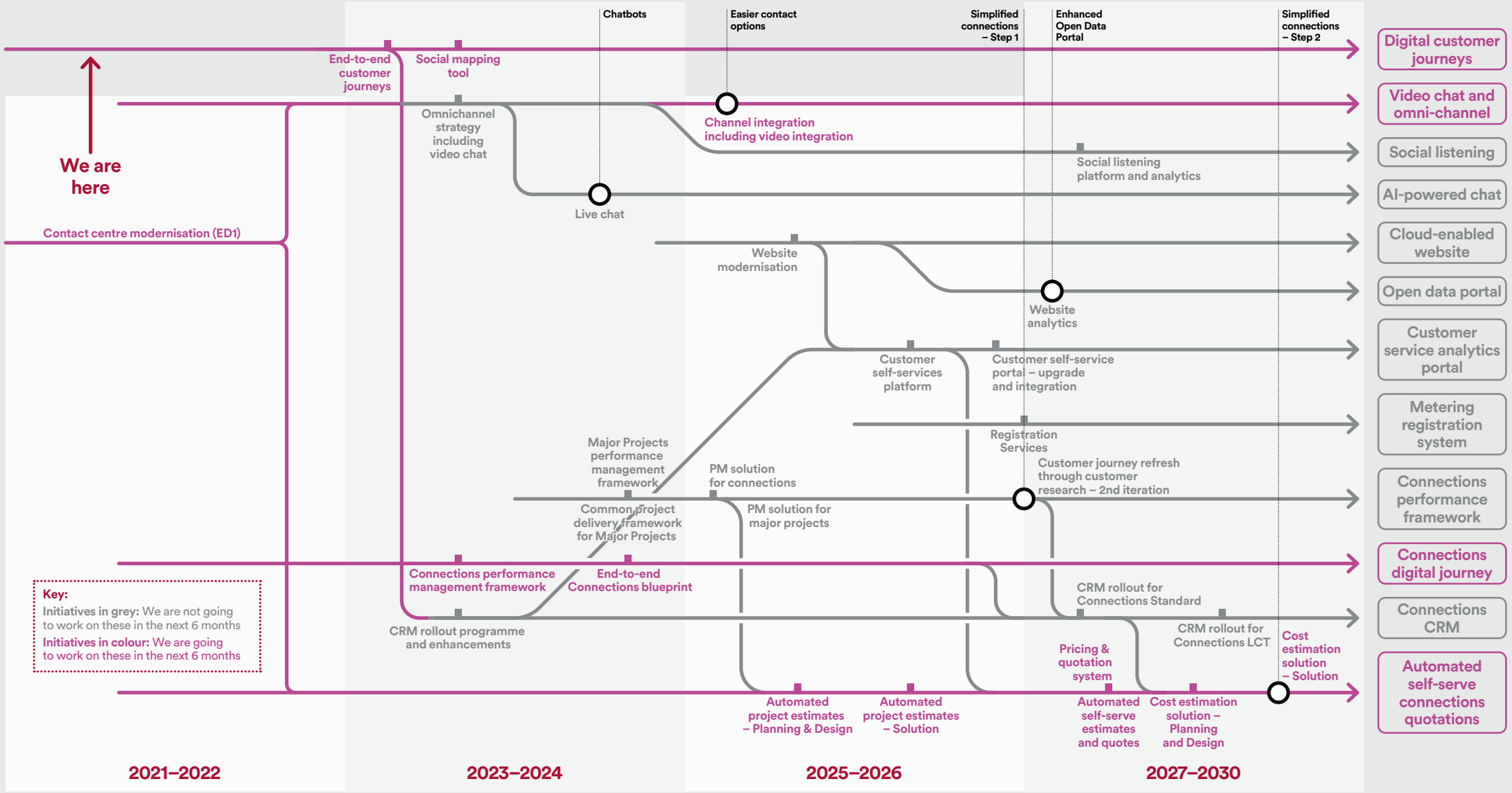
8. Enabling customers to self-serve

*See the five outcomes in more detail here.



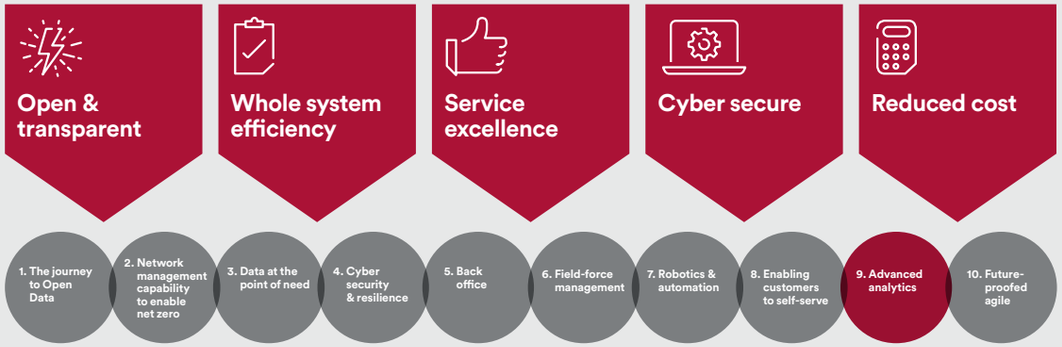
Description	**Implement self-serve, personalised services to meet customer demand and experience, implementing a customer insight and interaction portal and reducing the cost to serve.**
Business outcomes	As part of ED2, we have proposed a number of initiatives to improve our customer service. Data and 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. 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.
Customer benefits	**Open & transparent** As part of customer self-serve, we will provide better portals for Open Data. Accelerating and automating new connections will be crucial as the demand for them will grow significantly with low-carbon technology adoption. **Service excellence** Through delivering self-serve portals for customers who choose to interact with us in this way, we will increase service excellence. **Reduced cost** We will reduce cost by allowing customers to self-serve.

8. Enabling customers to self-serve



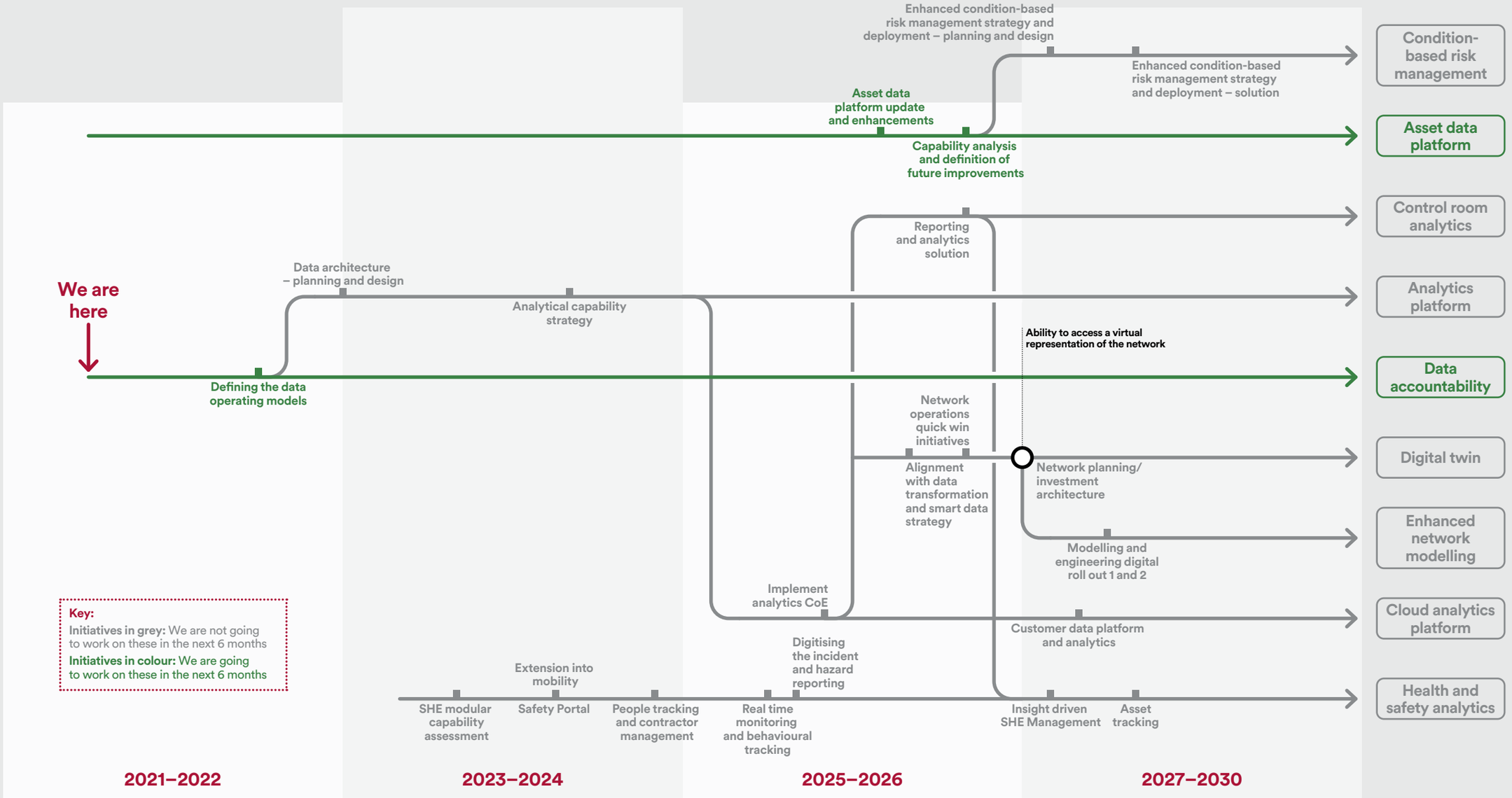
9. Advanced analytics

*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. 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.
Customer benefits	**Open & transparent** We will use advanced analytics to provide even more data to our stakeholders. **Whole system efficiency** Advanced analytics will be a key enabler for designing and operating a more efficient energy system. **Service excellence** Through customer analytics, we will be able to provide a better customer service. **Cyber secure** We will ensure that our analytics will not expose additional vulnerabilities to our system. **Reduced cost** Advanced analytics will help us make our operations more efficient.

9. Advanced analytics



10. Future-proofed agile

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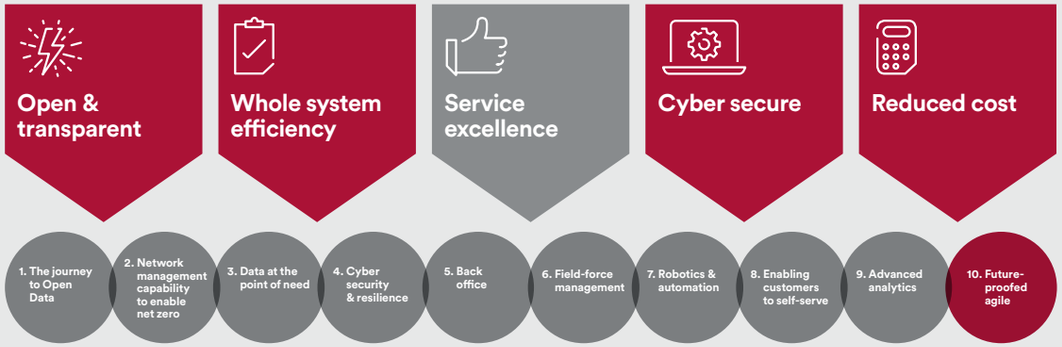
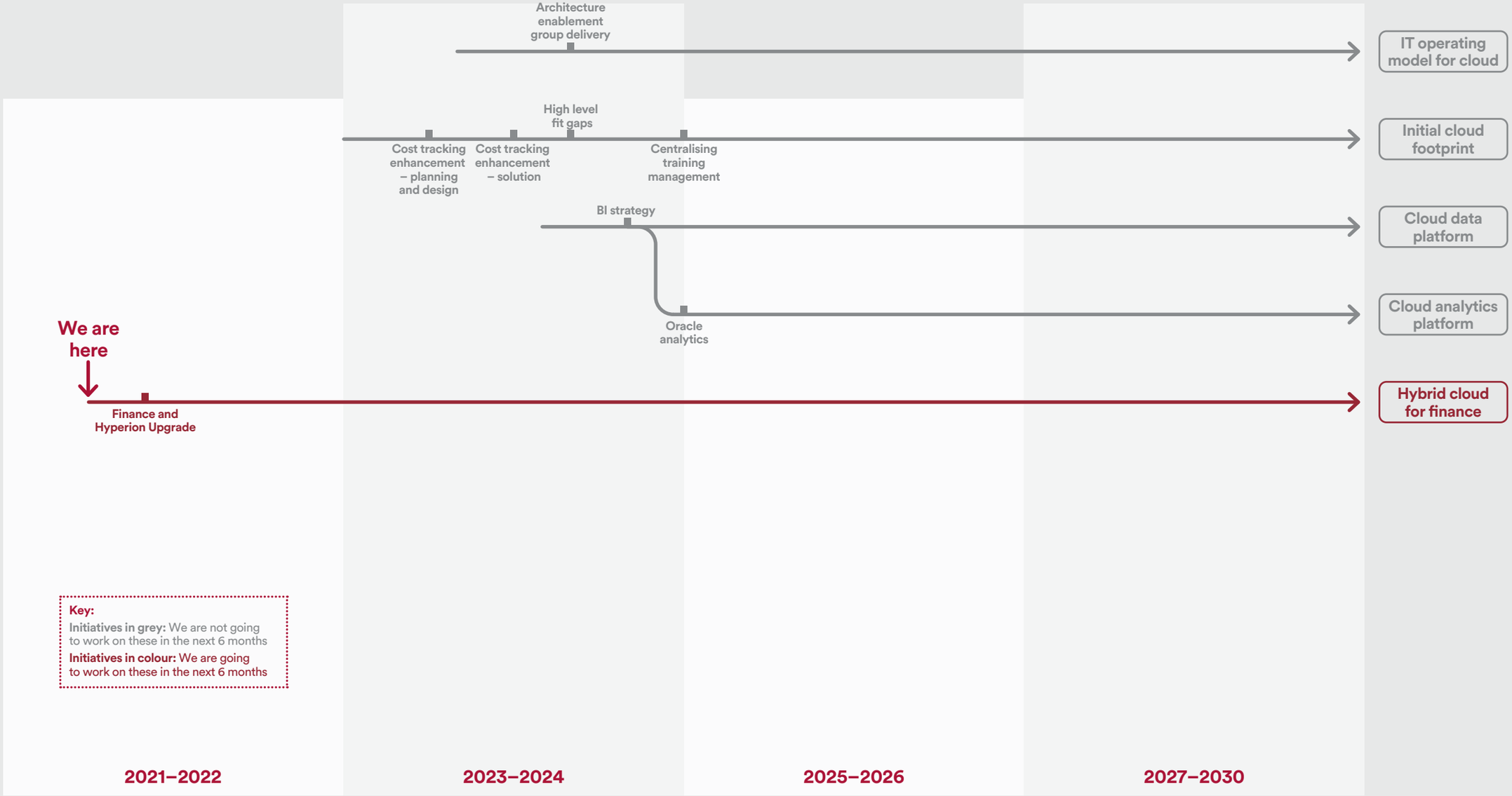


Description	**Provide future-proofed, agile solutions in order to be flexible enough to adapt to the change in the energy sector.**
Business outcomes	Our business, our industry and wider society are facing significant levels of change over ED2, particularly to enable decarbonisation. While we have identified 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. Agile ways of working will allow us to deliver capabilities faster and with reduced risk.
Customer benefits	**Open & transparent** We will employ agility to test and refine new Open Data propositions with stakeholders, making them more relevant. **Whole system efficiency** Our approach to our DSO proposition will be informed by agile ways of working, delivering on our promise faster. **Cyber secure** We will adopt DevSecOps to ensure that new technology is secure by design. **Reduced cost** Delivering selected capability in an agile way will significantly reduce the risk of sunk costs.

10. Future-proofed agile



Action plan

Progress against plan

This section details our progress against our action plan. As part of ED2 planning we have further refined our action plan, which means that some of the initiatives within our action plan have changed. The table below provides traceability from our previous action plan to this revised one.

DSAP v3 action plan	DSAP v4 action plan
Data strategy and architecture	Data gap analysis
Data quality	Data cleanse
Network planning and operations, existing initiatives	Network planning and operations, existing initiatives
Asset data platform upgrade	Asset data platform
DSO v1.1 development plan initiatives	Digitalisation of the grid
Omni-channel integration	Video chat and omni-channel
Contact centre modernisation	Contact centre modernisation
Customer strategy	Connections digital journey
CRM modernisation and rollout	Connections CRM
Automated estimate and quotation	Automated self-serve connections
Implement advanced threat detection tools	Implement EDR
Implement advanced threat detection tools	Additional cyber security tooling
Process mining and process improvements	Process mining
Robotics opportunity discovery and implementation	Scaled RPA
Modern technology workplace programme	M365 basic use
Safety, health and environment	Moved out of action plan until ED2

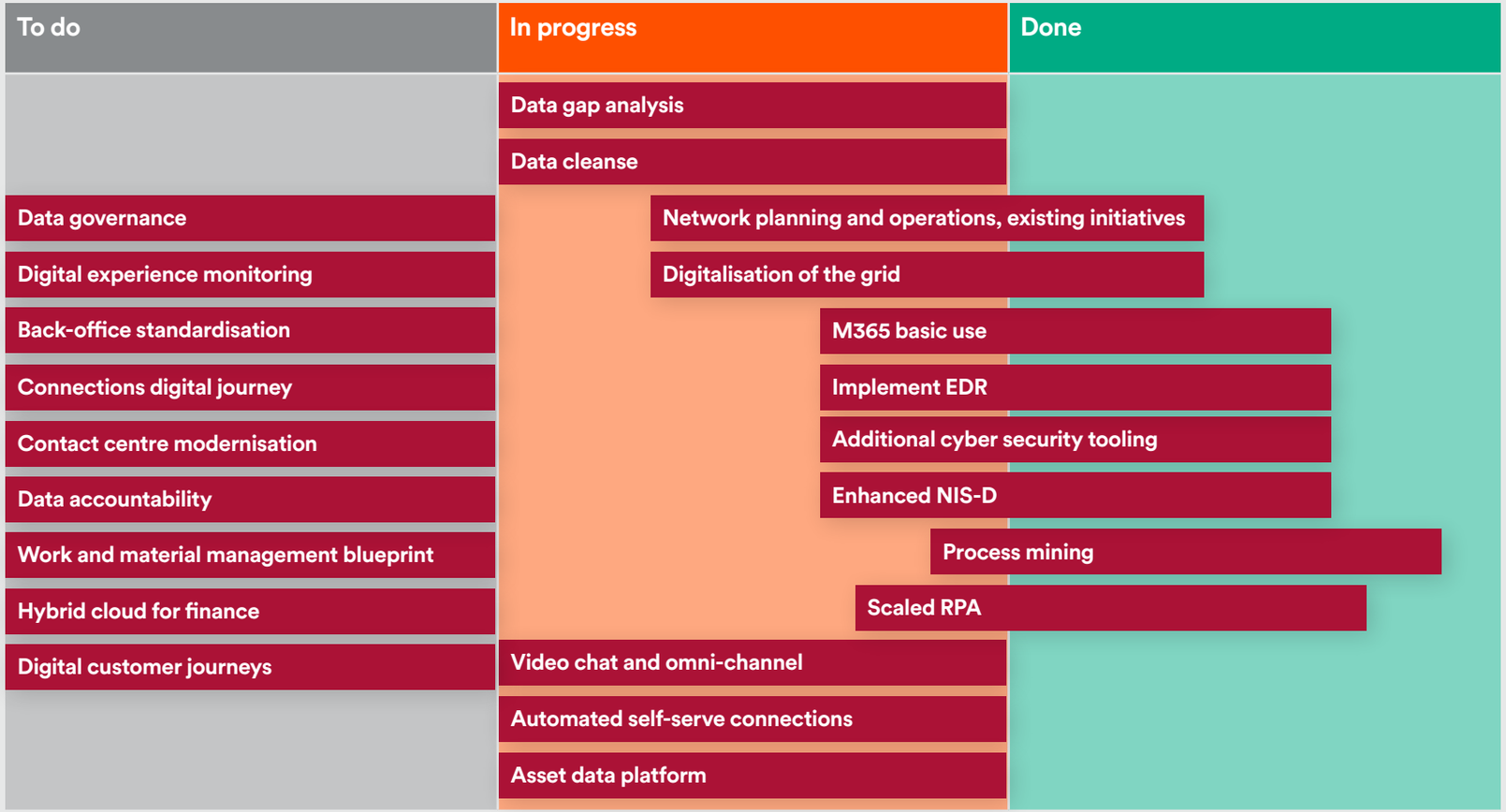
Progress against plan

The table below details the new initiatives that have moved into our action plan for this iteration.

DSAP v4 action plan
Data governance
Data accountability
Enhance NIS-D
Digital experience monitoring
Back-office standardisation
Work and material management blueprint
Hybrid cloud for finance
Digital customer journeys

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, as well as defining our data stakeholder process. Setting our vision and strategy has helped us identify additional subtasks, which are laid out in our initiatives.
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 thirty tables held within three key systems (asset, spatial and customer) to understand the data relationships, commonalities, data completeness and data inconsistencies. The output indicated where data quality issues could lie and we will build on this learning as we continue our work to expose high quality data.
Network planning and operations, existing initiatives	We have continued to support our operational colleagues as they deploy technologies in the field that allow greater insight into what is happening on our network. This collaboration has allowed us to update our DSAP with initiatives that are truly aligned to our journey to DSO. Such initiatives include ANM schemes and substation monitoring.
Asset data platform	We have defined the next steps we believe are appropriate but are performing the due diligence against future plans before commissioning the work fully.
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 have defined our requirements.
Contact centre modernisation	The upgrade to our contact centre telephony platform is progressing to plan. Network connections are currently being established with the new service provider whilst the software development and training phases of the project are underway. Attention is now turning to integration with the required data sources while project completion of Q4 '21 remains the target.
Connections digital journey	As we build out our unique AutoDesign solution we have defined several digital customer journeys to ensure that the enhanced solution meets the needs of the customer types we expect to want to use the system. These user journeys will be used to test the functionality of the system in order that user adoption will be high.
Connections CRM	We are building upon our current capability of self-service estimates to widen the scope to include quotations and acceptance of connections made to our distribution network.
Automated self-serve connections	Work has advanced as we build out our AutoDesign solution to provide self-service capability for estimates and quotations
Implement EDR	Implementation of this is currently underway.
Process mining	Phase one of process mining has completed, phase two is underway, with ten high level processes in scope.
Scaled RPA	We have rolled out some processes and are progressing with a cloud solution to enable us to automate a wider suite of processes.
M365 basic use	Our Windows 10 and Microsoft 365 rollout programme is progressing with our design work; proof of concept and testing having proven successful. We have chosen our hardware vendors for our end-user devices through a competitive tendering process and will see them being deployed during the second half of 2021 and into 2022.
Safety, health and environment	This has been moved into ED2 due to other priorities and funding.

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 this document uses terms that 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 DERs (Distributed Energy Resources), 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 this document uses terms that 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

The first 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	Impro six m
1. Identify the roles of stakeholders of the data	We have: – 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.		For our key (data) activities (enterprise architecture, asset data management, information management/privacy/ security, data analytics) we have attributed ownership to specific people. In addition, we have captured stakeholders and created groupings that are feeding user personas specific to data.	We will: – attribute the roles we have described to our people through the DDTO. – upskill our people where needed to suit the role throughout ED2, as to fit into our data-coherent organisation.	User comp develo data. conce cases us to stakel
2. Use common terms within data, metadata and supporting	We have: – created a data vision ('driven by people, empowered by data') and a set of supporting principles and		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	We will: – implement the metadata growth plan previously outlined, starting in 2021 and continuing throughout ED1 and ED2.	In the expec explo and a

The second section lists a number of **data projects that are currently on our backlog.** A few of them are **foundational** (e.g., around data quality), but most are **analytics or Open Data**. Based on stakeholder needs, synergies with other projects, and cost/value estimations, we have prioritised the projects.

Project Name	Project Type	Nature	Data Tower	Description	Overall Prioritisation
PI substation data	Open Data	DS / Open data	Asset / Operational	Historic data (but with fine granularity) First step toward opening real-time asset data.	
Worst Served Customers	Analytics	BI	Customer	An investigation into worst served customers, to gain a better understanding. Originally defined (Ofgem, 2008) around the number of outages a customer suffers, this could be looked at from a wider angle (e.g., slow response on issue resolution, type of outages vs. type of customer, etc.)	
LV Design	Open Data	DS / Open data	Connections / Network planning	Graphical tools and representations of LV design data.	
Outage planning	Open Data	App / Open data	Network Planning / Operational	Info about planned outages in advance - enhancement of current power cut live	
Voltage reduction in 11kV substations	Open Data	BI / DS / Open data	Asset / Connections / Network Planning	A historic data on voltage reduction in different substations for development of voltage optimisation and control algorithms	
Public EV charger optimiser	Open Data	App	Connections	Finding optimal place to install public EV chargers based on connection costs (autodesign) from several indicated alternatives.	
Time to quote / to connect	Analytics	DS	Customer	When a customer issues an RFQ, it is pivotal to customer experience to act fast and accurate. Predicting the TTQ / TTC can be important in prioritising actions. The challenge is in finding the right (data) drivers behind that prediction, as much of this experience is 'in our heads', rather than in databases.	
Identify faulty equipment	Analytics	DS	Asset / Network Planning	Could be part of 16 - predictive maintenance, but it is more on anomaly detection (e.g., excessive energy use) for still functioning systems. The interesting cases don't exhibit 'step changes', but rather slowly move out of line, e.g., over a year. Example: "Smart fuses" are used in subsystems, but it is unknown if that data is analysed (why did the fuse go? which part of the fuse). This topic is not looked at from broader perspective, which would be interesting.	
Data Glossary	Data Foundation	Manual	All	Develop, maintain and openly publish a Data Glossary providing data definitions, intended purpose of the data, how it is held, whether it is openly available or shared and an indication of completeness / reliability	
Carbon tracer	Open Data	App / Open data	Customer / Operational	Generation mix for local areas	
Data cleansing	Data Foundation	DS / Manual	All	High quality data is critical for data exploitation. Like meta-data, data cleansing is a laborious activity, that can be augmented with data science automation techniques. N.b. - this could be a collateral activity when migrating data to another platform; or when using datasets for a specific project.	

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	Position at the end of 2021
1. Identify the roles of stakeholders of the data	**We have:** – 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.		For our key (data) activities (enterprise architecture, asset data management, information management/privacy/ security, data analytics) we have attributed ownership to specific people. In addition, we have captured stakeholders and created groupings that are feeding user personas specific to data.	**We will:** – attribute the roles we have described to our people through the DDTO. – upskill our people where needed to suit the role throughout ED2, as to fit into our data-coherent organisation.	User persona development will complete allowing us to further develop the role of stakeholders in data. We will commence a proof of concept to develop some of our use cases for Open Data which will allow us to enrich the engagement with stakeholders.	
2. Use common terms within data, metadata and supporting information	**We have:** – 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). – 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:** – implement the metadata growth plan previously outlined, starting in 2021 and continuing throughout ED1 and ED2.	In the next six months we do not expect to have completed our exploration on metadata standards and as such, our position is unlikely to move forward significantly.	
3. Describe data accurately using industry standard metadata	**We have:** – used a data vocabulary that is consistent with industry standard (data management body of knowledge – DMBOK) and industry best practice. – outlined how we will use the DDTO to ensure interoperability with other DNOs and ESO published models and datasets.		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:** – 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. – 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 alignment when designing data models, adding more APIs, formats and reporting of our datasets.	In the next six months we do not expect to have completed our exploration on metadata standards and as such, our position is unlikely to move forward significantly.	

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	Position at the end of 2021
4. Enable potential users to understand the data by providing supporting information	**We have:** – identified the need for a data catalogue and data dictionaries and recognised the importance of this topic in current architecture and platform work.		In our 'update reporting tools' projects (move from crystal reports and business objects reporting to Microsoft Power BI) we have taken the opportunity – with current users – to 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.	**We will:** – create the data catalogue as a foundational component of the DDTO. – 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.	When running our planned proof of concepts for Open Data products and services, we will incorporate a minimum design standard for supplying supporting information which will give us the opportunity to begin providing this, but equally we will make this a key engagement step, allowing data users to feed back on products and services from the portals themselves.	
5. Make datasets discoverable for potential users	**We have:** – considered how we will ensure that our datasets are discoverable for potential users.		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 both access, understanding, and discoverability of data.	**We will:** – 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). – a curated data catalogue that is maintained and continuously updated will also contain classification of data into open, shared and closed.	Through continued stakeholder engagement and publication of our metadata and search engine optimisation planned as part of our data proof of value initiatives we will undertake in the next six months, we believe we can massively improve the discoverability of our data.	
6. Learn and understand the needs of their current and prospective data users	**We have:** – grouped stakeholders in several categories according to their sector, interest or activity and developed customised engagement plans with scheduled events. – shared Open Data through Data Mill North and Leeds ODI partnerships that allows us to engage stakeholders not typically associated with energy and utilities, expand the stakeholder 'searchlight' and enable cross-pollination from overlaying different datasets together.		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 will:** – 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 details 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 but we expect to implement some new digital tools to engage on a more real-time "product based" basis with our data users to develop an iterative, fail-fast approach to updating our roadmap.	

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	Position at the end of 2021
7. Ensure data quality maintenance and improvement is prioritised by user needs	**We have:** – outlined a data quality monitor across our 'data towers' that will result in a comprehensive overview at the end of ED2. – produced an MVP deliverable which demonstrates how projects may be prioritised by considering user needs (also covered in architecture deliverable). – set the priorities for 2022 and beyond by assessing (external) stakeholders' needs.		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:** – improve data quality and maintain it across the organisation through our data governance plans during ED2 and the end of ED1. – 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.	Our data quality improvements will commence to support the proof of value initiatives and will continue to be prioritised by ongoing engagement. New tools will also be introduced to help with data quality gap analysis and remediation.	
8. Ensure that data is interoperable with other data and digital services	**We have:** – 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 transcipts, free text fields in tools) to computer-readable data. We combine this data with other (internal and external) sources to created a predictive model. – 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. – Our Asset Management and Finance systems are built on comprehensive/ intertwined data models.	**We will:** – 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. – 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 do not expect to have interconnected with other digital services during this period.	

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	Position at the end of 2021
9. Protect data and systems in accordance with security, privacy and resilience best practice	**We have:** – defined security, privacy and resilience as a pivotal aspect to monitor and an underlying foundation for systems architecture in our architecture work. – 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:** – provide a resilient approach to moving data from a protected state as per GDPR to a 'presumed open' state. – 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.	
10. Store, archive and provide access to data in ways that maximise sustaining value	**We have:** – outlined our aims for data cataloguing and metadata provisioning and have started raising awareness across the organisation.		– 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. – 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:** – set up a data platform to enable interoperable data that is user-centric and well-governed. Will start in ED1 and continue throughout ED2. – 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. – 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.	Whilst we will address this in the future propositions, we are only starting up the implementation of our new data platform in the next six months, therefore our position is unlikely to move forward significantly.	

DBP principles

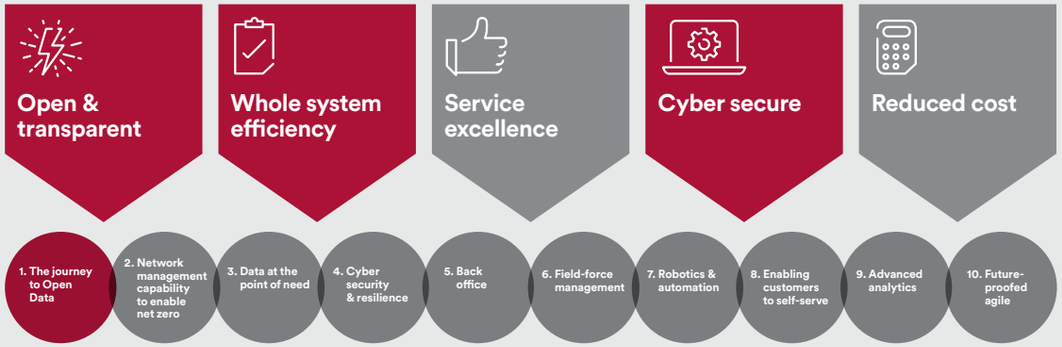
DBP principle	What we have done so far	Curent assessed position	Examples	Our long-term plans	Improvements planned in the next six months	Position at the end of 2021
11. Ensure that data relating to common assets is presumed open	**We have:** – defined our approach and started engagement on presumed open across the organisation.		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 will:** – 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. – achieve our goal through creating data analytics capability starting in 2021–2022 and continuously improving and becoming more efficient throughout ED2 period.	Whilst we will begin the process of fully adopting the presumed open approach and have buy-in from both the senior leadership and business teams, it will take time to work through the common assets and publish via the Open Data triage process. Some products and services are expected to be published as presumed open during the next six months.	
12. Conduct Open Data triage for presumed Open Data	**We have:** – defined 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.		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 will:** – open more datasets starting in Q3 2021 using some mitigation techniques. – 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). – ensure that issue mitigation is actively pursued, so more datasets can be open.	Open Data triage process expected to be adopted across all DNOs to centralise, standardise and coordinate data requests – these would feed directly into our products and services roadmaps and would be prioritised and dealt with in an agile way. We are seeking to trial this agile delivery methodology in our proof of value scheduled for the next six months.	

Annex 2

Initiatives

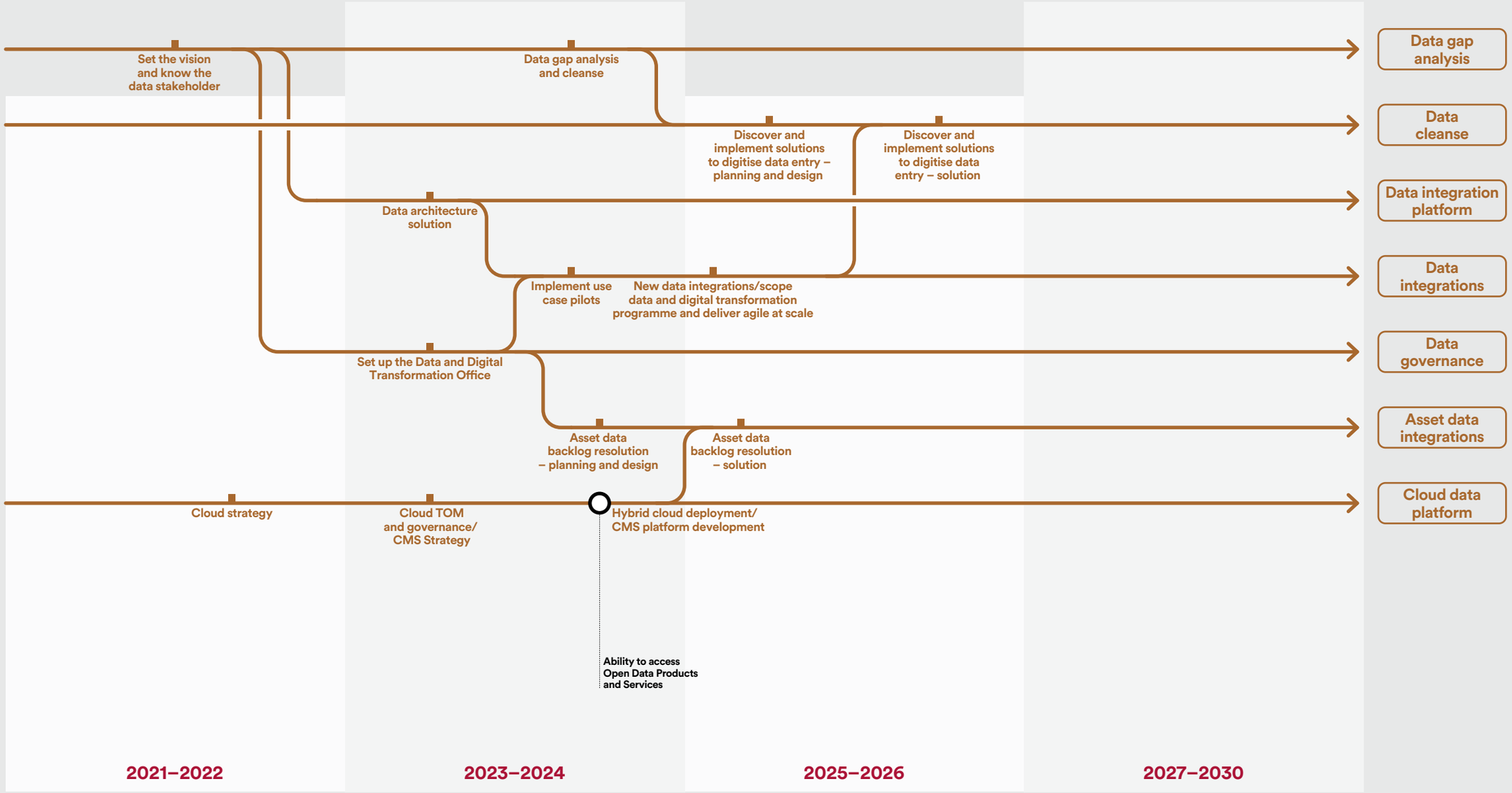
1. The journey to Open Data

*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. **Internal outcomes** 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. **External outcomes** 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.
Customer benefits	**Open & transparent** Open Data is the core proposition to achieve this outcome. **Whole system efficiency** By exposing Open Data, we will enable decarbonisation and increased cost efficiency for the energy ecosystem. **Cyber secure** We are aware of the risks of Open Data, particularly for critical national infrastructure and we are managing our Open Data offerings accordingly.

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. **Visioning:** 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. **Stakeholder requirements:** 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. **Key features for this are:** — **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. — **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. — **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. — **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. — **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. **We will need to enhance our quality of data and discover and implement solutions to digitise data entry:** — **Solution selection and design:** This step will identify the most appropriate solutions and create high-level designs and architecture for their implementation. — **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 — 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. 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: — Data catalogues (including metadata) — Data discoverability and triage process, especially in line with open network data requirements and the spirit of collaboration — Data models and data flows — Data technologies, and repositories, including consideration of data lakes — Access rights, security and privacy — Data management tools — Data formats and interoperability (i.e CIM). 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 — Asset data integrations — Cloud data platform (incl. Open Data) — Integration of master data — Initial cloud footprint — 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...

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: **Use of external data:** 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: — Working with the business to undertake market and horizon scanning to identify any external data opportunities and engage the business for their use. — 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. — Identify which data towers could deliver the requirements, and facilitate initial assessments. — Run appropriate pilot projects, ensure the data architecture is updated and make other appropriate adjustments as required, such as changes to procedures. 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. **Data triage** 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 — Data governance — Analytics platform	— Data cleanse — Health & Safety analytics — Cloud analytics platform

1. The journey to Open Data
1.05 Data governance

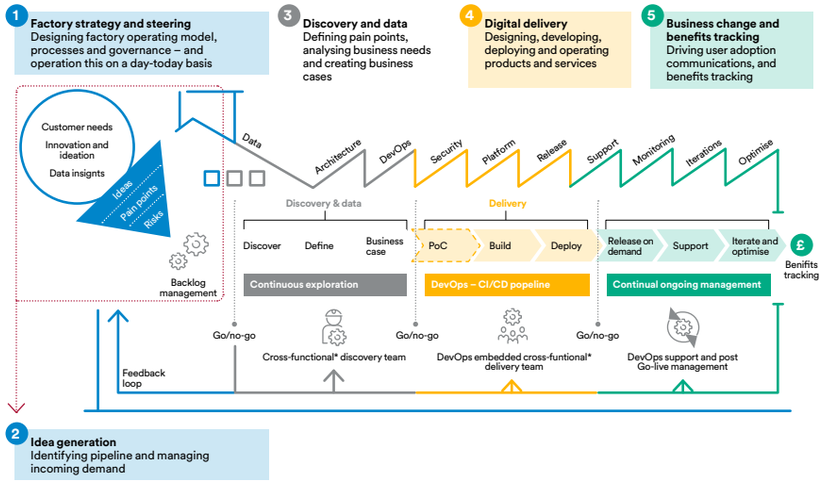
Establish a central function to own and manage data governance – the central point of accountability that plays a coordinating role for all data requests and deliveries as well as setting the rules for data quality and availability (openness).

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.



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. **Key features for this are:** — **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. — **Process automation:** A discovery exercise will identify opportunities for processes to be streamlined and automated so that, where possible, data entry can become automated. — **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 — 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

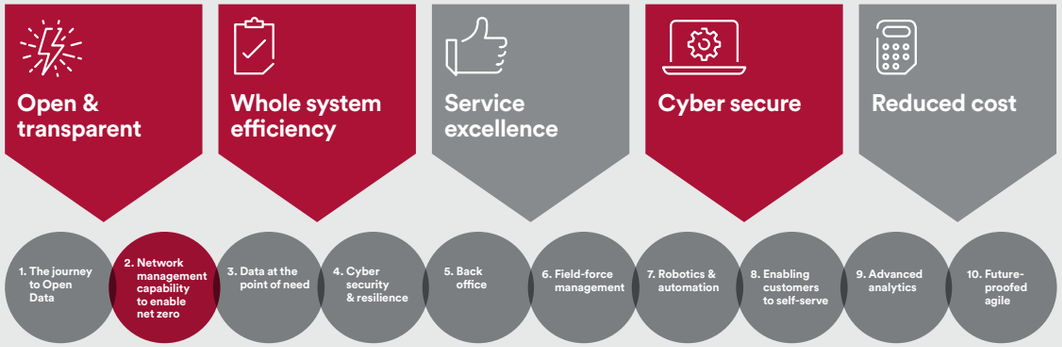
Implement cloud data platform – provision of a modern set of data capabilities, future-proofed and flexible enough to scale to demand.

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: **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. **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. **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. **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. **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. **Migrate workloads:** Migrate workloads with optimal change applied, considering cloud migration, cloud transformation and DevOps transformation impact. **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 — M365 extended use — Customer and People Services automation — Digital customer journeys		— Cloud enabled website

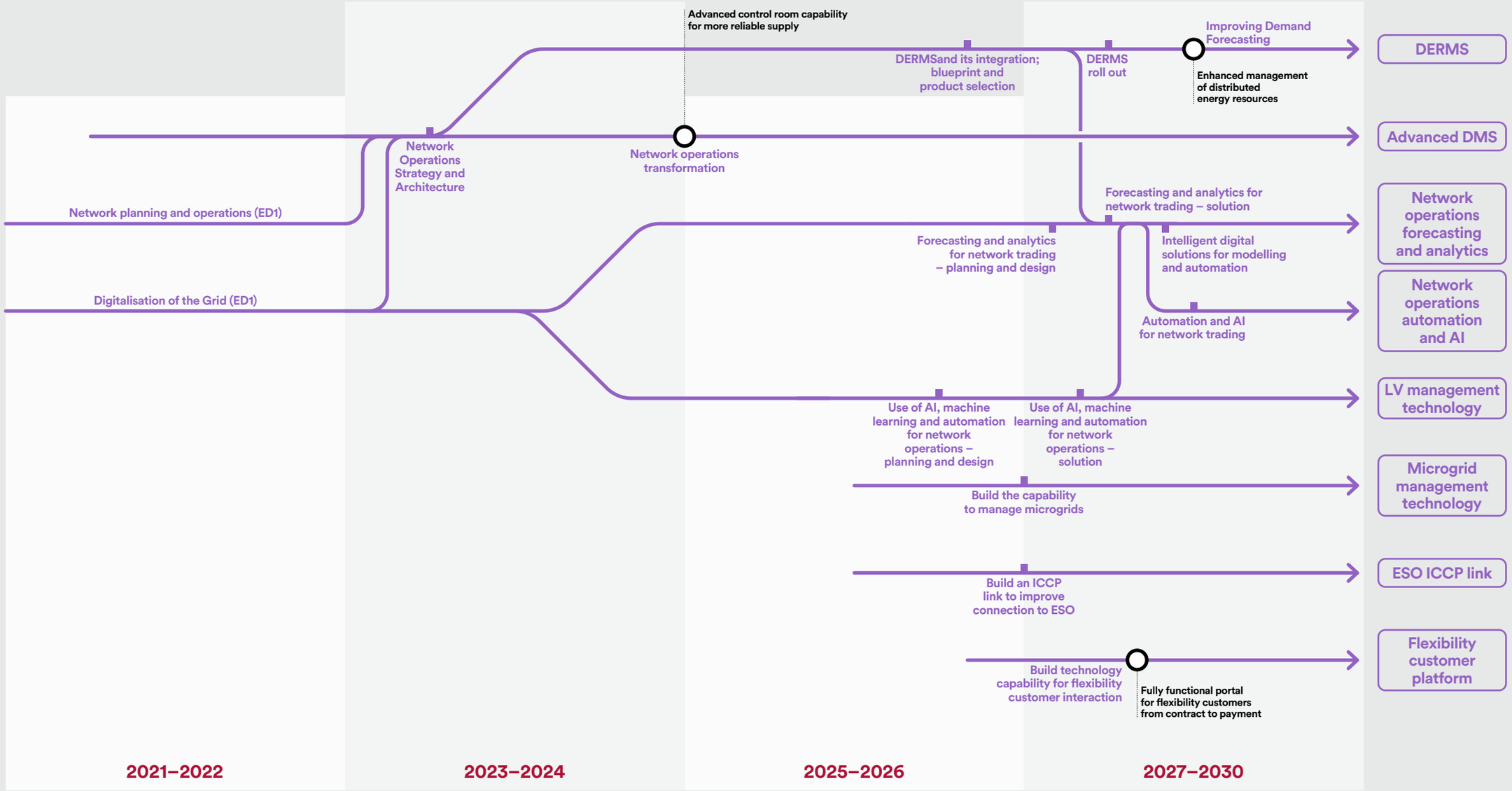
2. Network management capability to enable net zero

*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. 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. 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.
Customer benefits	**Open & transparent** Our new network management systems will be a key source for Open Data. **Whole system efficiency** Using new ways of balancing, we will be able to shift from carbon sources to carbon-free sources of energy. **Cyber secure** Protecting ourselves and our network against cyber threats is and remains a hygiene factor in everything we do.

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. 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 ESO and a DSO (see DSO4.4). 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 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: **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. **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 Distributed Energy Resources, or energy arbitrage. The prioritisation of use cases will depend on the alignment of the implementation approach with our DSO strategy development plan. **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. 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. **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 — Flexibility customer platform — 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). **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. **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. **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 enable flexibility services.

Initiative breakdown	Discovery of digital solutions to enhance modelling capabilities by the use of Artificial Intelligence, machine learning and automation. **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. **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: — where analytics can enhance modelling output — data requirements for the analytics, including use the of external data — detailed articulation of analytics use cases — integration with current modelling processes and systems. This initiative will be potentially executed using the analytics Centre of Excellence (CoE).

This is dependent on	— DERMS — LV management technology — Control room analytics	**This will enable**	— 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 enable flexibility services.

Initiative breakdown	Having enhanced forecasting for charge setting, the introduction of further automation and Artificial Intelligence will increase the speed and quality of forecasts. 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 Artificial Intelligence. 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: — Identify areas where automation can provide value. These are where there is stability in process activity. — Identify use cases where AI can produce better results than human assessment. — Identify pilot projects to asses these uses. — Produce solution architectures to align with existing systems, processes and tools.

This is dependent on	— Network Operations forecasting & analytics — 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. **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. **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 rollout at scale.

This is dependent on		This will enable	
	— Operations automation — 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). Given the current maturity of microgrids, we are in early innovation stages of developing the right technology to support for 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. 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 IPPC 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. 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'. 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. 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. 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. 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: — Network monitoring database and visualisation improvements — Active Network Management system rollout (flexible connections) — Network forecasting models — Distribution system analysis tools — Customer-led distribution system — Development of improved distribution load estimates — Improving demand forecasting — Flexible Power toolkit deployment — Smart network design methodologies. 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: **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. **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 dependant on any initiatives.	**This will enable**	— DERMS — Advanced DMS

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

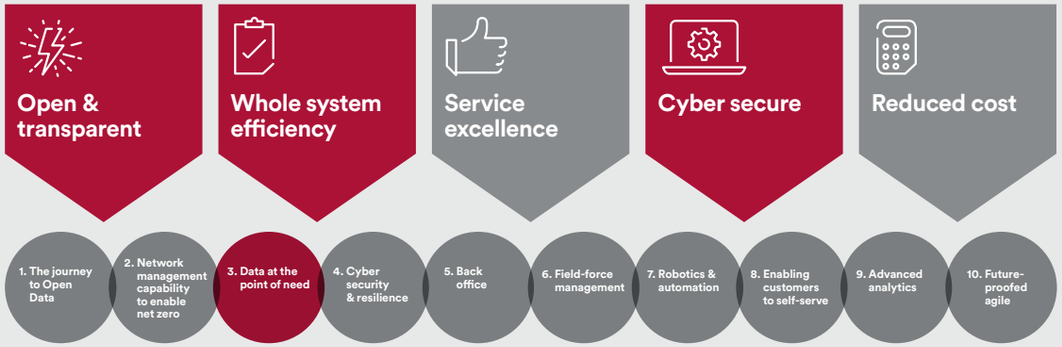
By implementing innovation projects in ED1, we will test and confirm opportunities to support the digitalisation of the energy system. Digitalisation initiatives will enable these to be deployed at scale in ED2 and maximise their benefit through the use of technology and data.

Initiative breakdown	
	Planning: Definition of a holistic model 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: — Auto voltage control and monitoring replacement at EHV — Primary substation remote terminal units' replacement (RTUs) — Primary and secondary operational telecoms system replacement for SCADA — Distribution monitoring of LV monitoring at local substation level — Secondary telecoms system — Control and operational systems. 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: **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. **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 dependant on any initiatives.	— LV management technology — Network Operations forecasting and analytics — Network Operations, automation and AI — DERMS — Advanced DMS

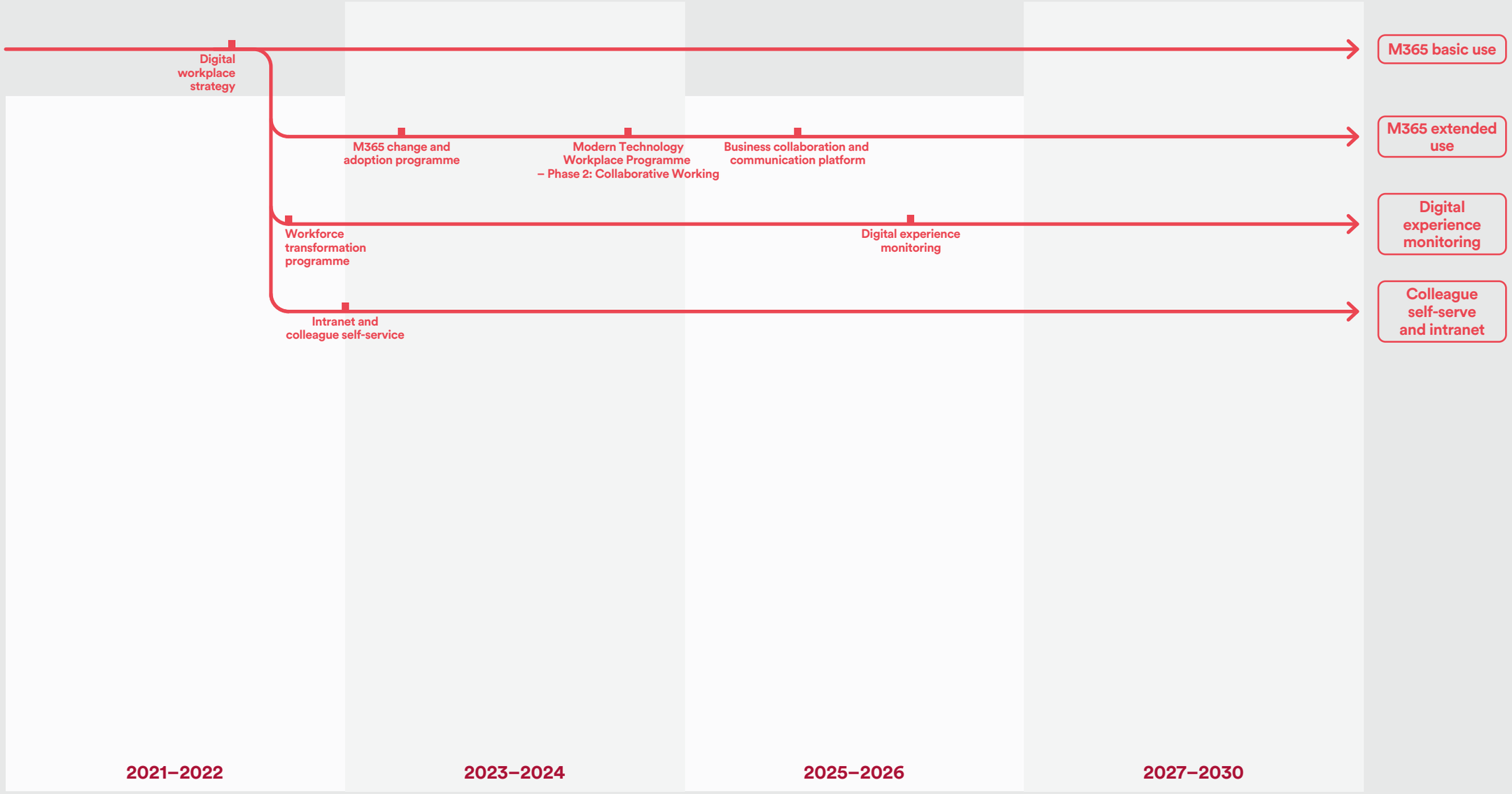
3. Data at the point of need

*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. 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.
Customer benefits	**Open & transparent** With internal data being captured in systems, they can be exposed more easily if needed. **Whole system efficiency** Being able to collaborate with others, our colleagues will be able to work towards greater efficiency of the system. **Service excellence** Having the right information, our colleagues will be able to provide a more seamless service to our customers. **Cyber secure** The use of collaboration platforms with built-in security will reduce cyber risks. **Reduced cost** Through the use of collaboration tools, we will increase overall colleague efficiency.

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). **Employee persona mapping:** Develop employee personas and conduct workshops with employees to understand journeys and pain points. The workshops will uncover key problem areas for colleagues to be addressed by digital workplace tools. **Define digital workplace capabilities required:** Understand the set of technology capabilities of digital workplace tools to meet the business needs. **Map capabilities to digital workplace tools:** 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: — whiteboarding and collaboration tools — idea management tools — project management tools — knowledge management tools. **Tool validation and deployment roadmap:** 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 — Digital experience monitoring — Colleague self-serve and intranet — 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. 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. **M365 rollout:** Migrate end-user Microsoft services to the cloud with Microsoft fast track support in the following services: — Exchange online — Office ProPlus — Teams — SharePoint online — OneDrive for business — Intune services, enterprise mobility and security (EMS E3). The deployment will be conducted in iterative waves supported by bi-weekly adoption surveys. 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: — **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. — **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. — **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 — Cloud data platform (incl. Open Data) — 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. **Workforce transformation programme:** Assess the current and future digital skills required and rollout 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: — 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). — 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. — Undertake a comparative analysis between the existing and future skills required and assign uplift priorities for every employee persona. — Develop and rollout a programme consisting of training pathways tailored by employee personas. **Digital workplace tools deployment:** Ongoing deployment of digital workplace tools. Tools will include, although not be limited to: — digital experience monitoring tools — virtual reality tools for training — whiteboarding and collaboration tools — idea management tools — knowledge management tools.

This is dependent on	— M365 basic use — 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.

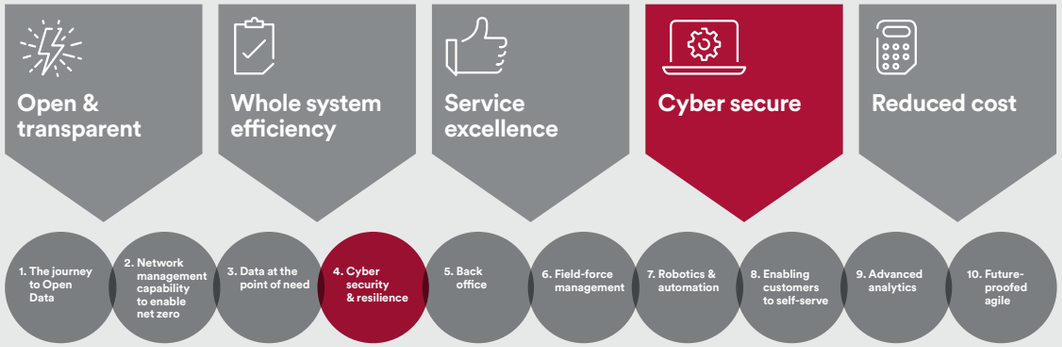
Initiative breakdown	Deployment of an intranet solution to provide colleagues with a channel for internal communications, self-service, knowledge management and other services to increase colleague engagement. **Intranet services discovery:** A discovery exercise to scope the colleague services to be 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. **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. **Deploy a modern intranet:** Conduct a requirement gathering to deploy a modern intranet. The functionalities will include, although not be limited to: — integration with the new content management system — integration with HR portal — knowledge management and learning management functionalities — colleague self-service functionalities to build a one-stop shop for our colleagues. **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

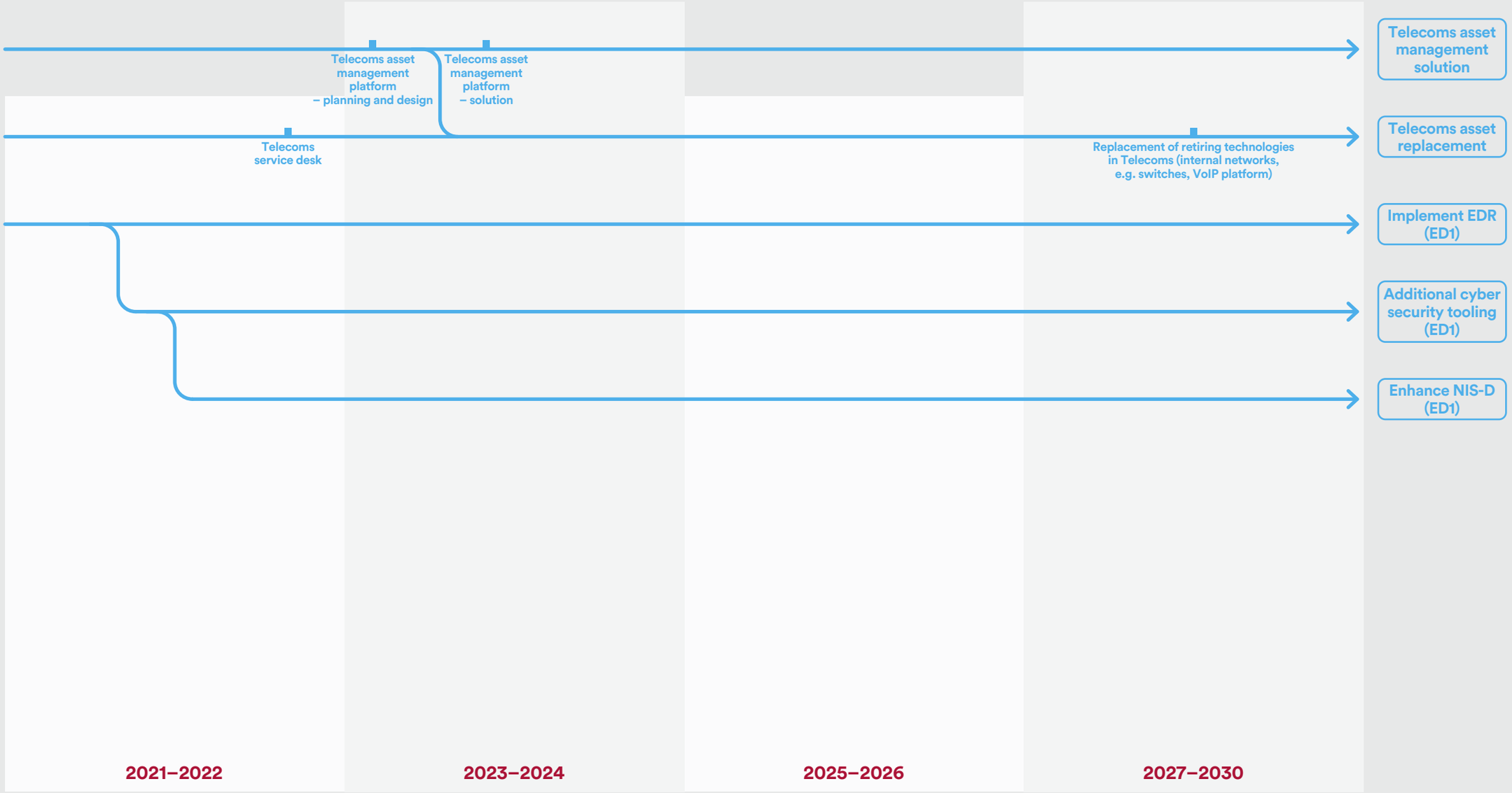
Note: Information included in this document on our plans for this area is limited due to its sensitive nature.

*See the five outcomes in more detail here.



Description	**Continue to invest in advanced cyber controls and tools to maintain a robust cyber security posture, aligned to the threats emerging from increased digitalisation.**
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: — security tools and advanced threat monitoring that protect our network from unauthorised access or attack — skilled and competent cyber professionals — taking appropriate and proportionate measures to secure the network and information systems in compliance with the NIS directive (NIS-D) — protecting our customers' and employees' personal information through compliance with the general data protection regulations (GDPR) — maintaining ISO 27001 — achieving ISO 27019.
Customer benefits	Protecting our customers' information by investing in our people, processes and security tools to help us identify weaknesses, as well as detecting and responding to cyber attacks on our systems. Protecting our customers' power supply through continued investment in security and resilience to ensure that we minimise any disruptions on our distribution network.

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. 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. 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. 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. **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: — **Centralised asset view:** The ability to track the lifecycle of all telecoms assets with advanced reporting capabilities. — **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

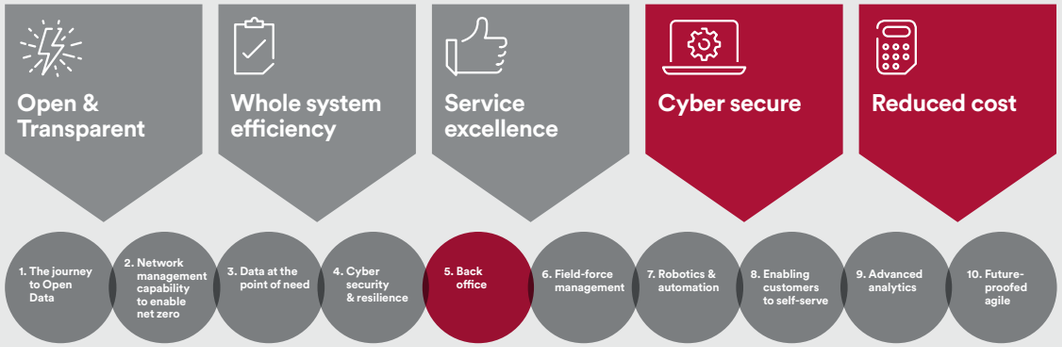
Telecoms asset replacement programme established.

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. **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). **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.

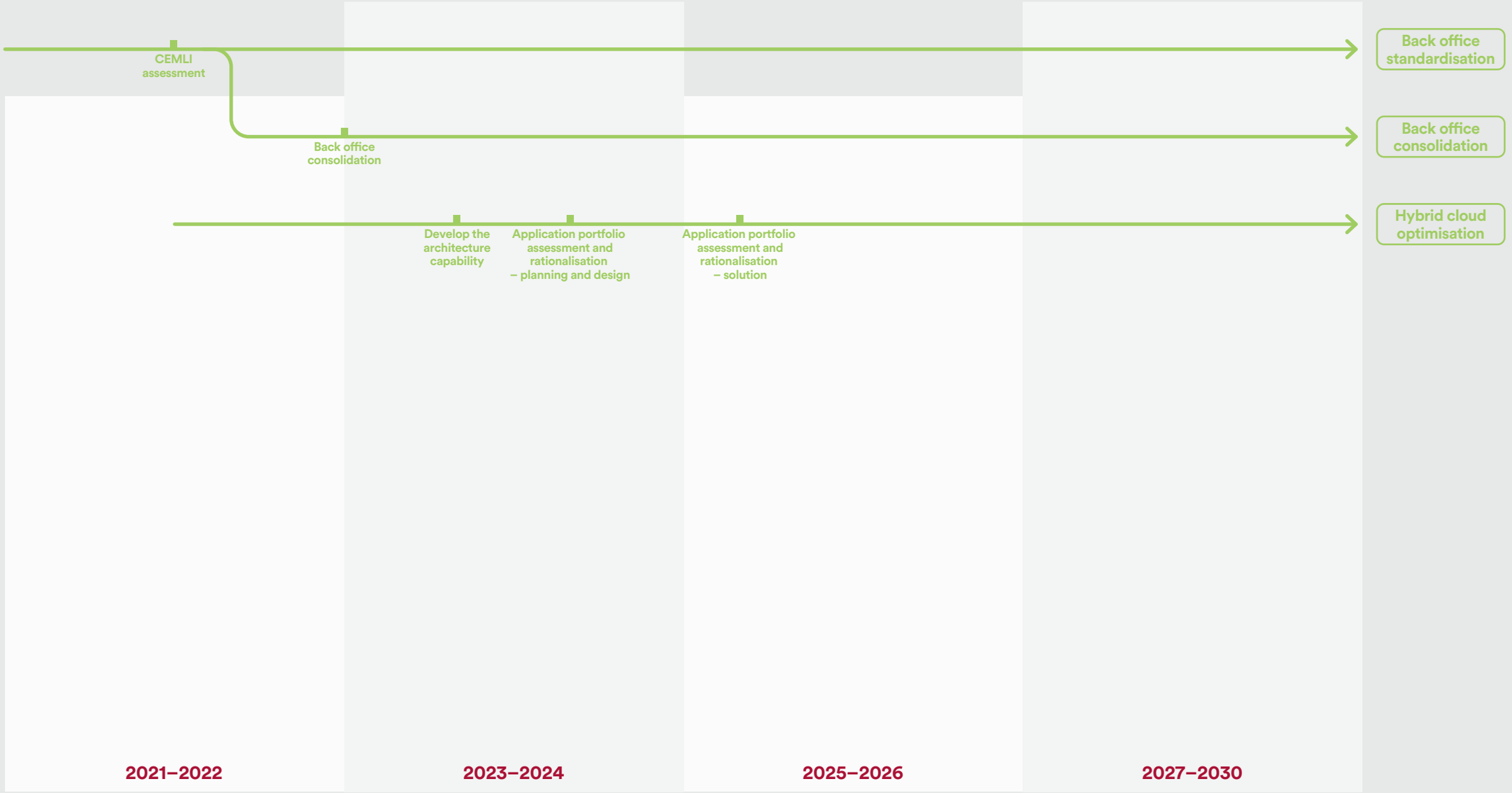
5. Back office

*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. 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.
Customer benefits	**Cyber secure** Through modernising our back-office environment, we will be able to reduce cyber threats in this area. **Reduced cost** Back-office environments need to provide an efficient service – through implementing modern and evergreen systems, we will continue to benefit from new developments as they become available.

5. Back office



5. Back office
5.01 Back-office standardisation

Prepare for back-office standardisation and migration.

Initiative breakdown	
	Back-office assessments 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. 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: — **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. — **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 license 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. 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 — Scaled RPA	**This will enable**	This does not enable any initiatives.

5. Back Office
5.05 Hybrid cloud optimisation

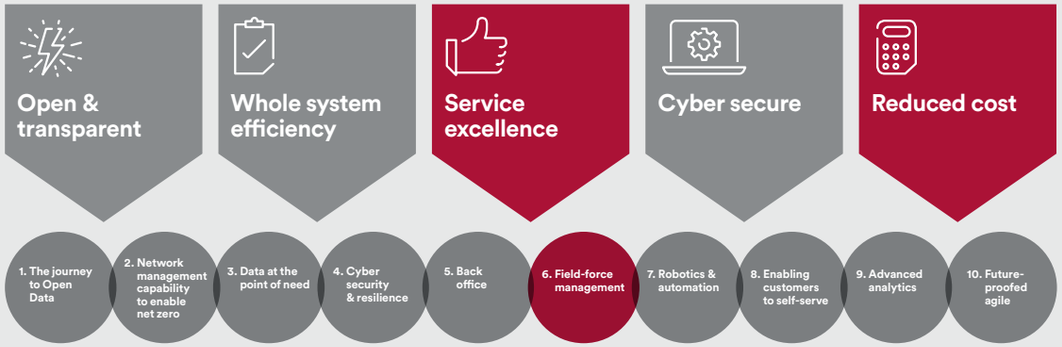
Deploy hybrid cloud tools and processes to continuously optimise IT spend in line with Technology Business Management (TBM) recommendations.

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. **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. **Rollout agile KPIs:** Develop and capture key performance indicators (KPIs) to measure the adoption of agile ways of working and our maturity. **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. **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. **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. **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. **We will begin to develop the architecture capability:** **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. **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

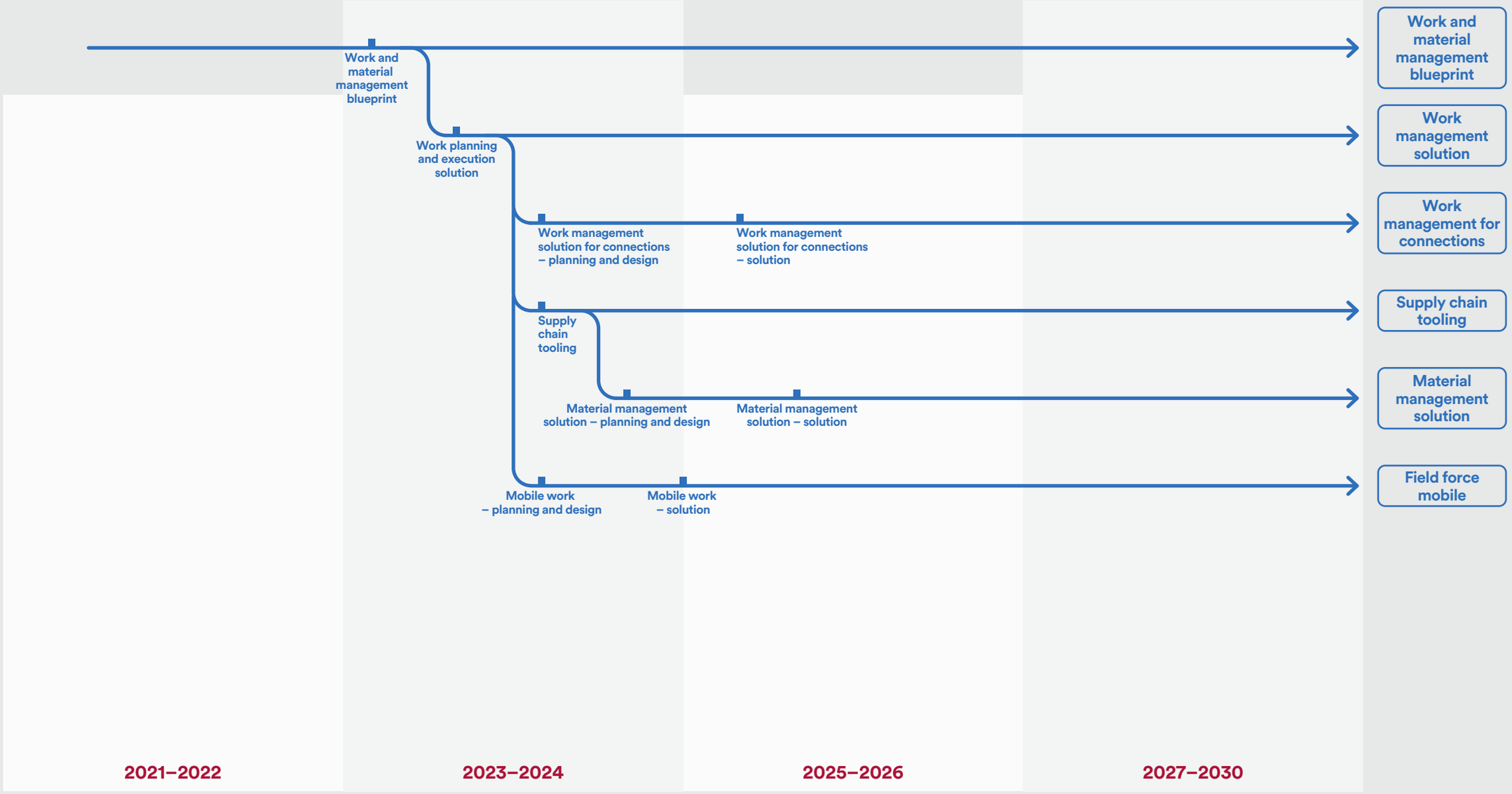
6. Field-force management

*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. 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.
Customer benefits	**Service excellence** With the new tooling, our colleagues will be able to provide faster and better service for our customers, e.g. in the event of an outage. **Reduced cost** A significant portion of our colleagues are part of the field-force. Introducing new work and material management tooling is a major efficiency driver.

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. **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. **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. **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. **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. **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: — ability to capture work demand centrally and assign jobs based on capacity and availability — job progress tracking functionality — identification of industrial colleagues who are closest to faults so as to improve response times — mobile functionalities for field workers — interface or portal for contractors to input availability and capacity — skillset based scheduler to take skills/qualifications into consideration to further optimise work scheduling and develop more flexibility — 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 — Supply chain tooling — 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. **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. **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. **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. **Rollout:** Rollout the solution in phases: — Work management solution for small connections. — Real-time field engineers calendar. — Automated scheduling and dispatch. — 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. **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. **Supplier ecosystem optimisation:** Consolidating/reducing the list of suppliers as well as standardising and cleansing the inventory data for an improved financial governance. **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. **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. **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. **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. **Deployment** **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. — Release 2: Full platform deployment for all job types and user personas. — Release 3: Full integration with relevant systems in order to send automatic orders to procurement systems. — 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

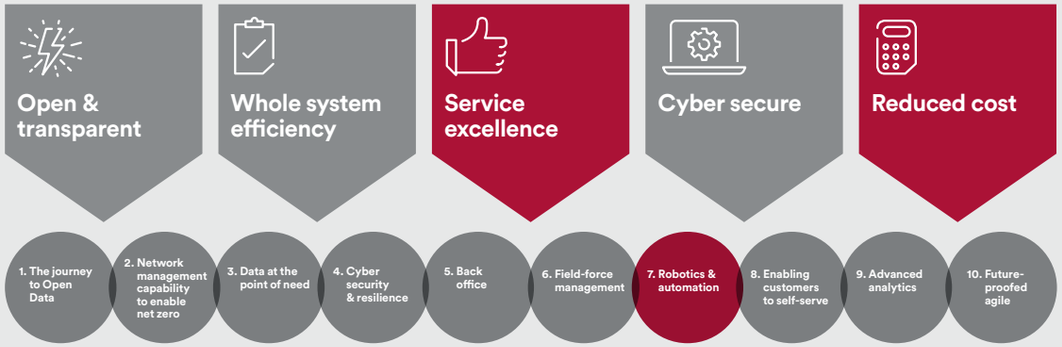
Introduce field-force management mobile applications.

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. **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. **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. **Design:** Provision of design for the work delivery capabilities including key integration points with existing/new systems. **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. **Rollout:** — Small connections. — Medium and large connections.

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

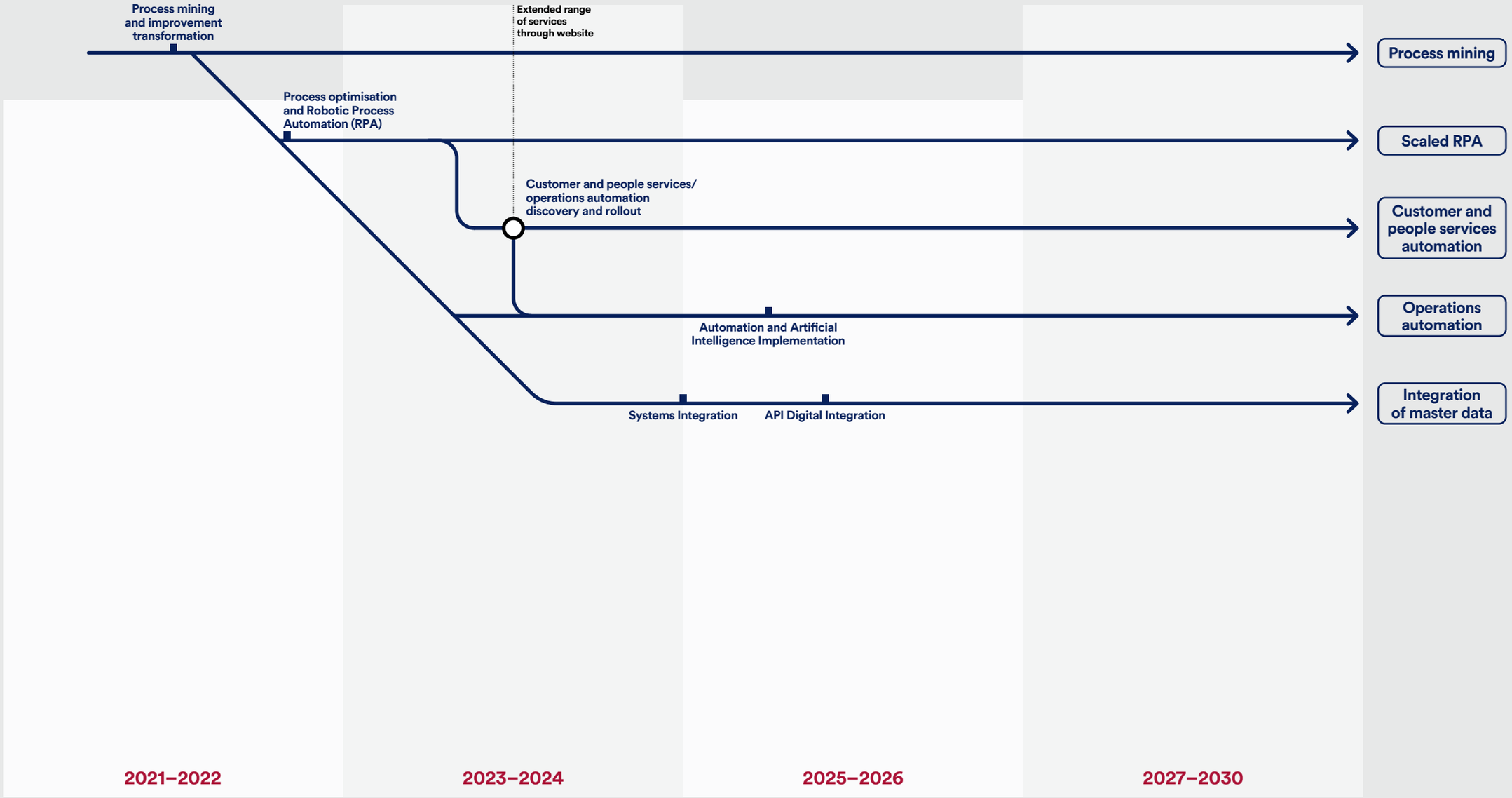
7. Robotics & automation

*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. 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.
Customer benefits	**Service excellence** Through the use of automation, we will be able to provide seamless and efficient service. **Reduced cost** Robotics and automation are primarily aimed at reducing cost of highly standardised processes.

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 colleagues requirements considered. **Discovery:** 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. **Improvement programme and planning:** 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. **Process optimisation and stabilisation:** The key objectives of process optimisation should be: — to achieve processes which have had waste and non-value-added activities removed and remain compliant. — to have clear documentation in which roles, data requirements, inputs and outputs are clearly identified. — that the material can be used for functional developments and training. — 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 — 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. **Automation discovery:** Conduct discovery on existing automation (RPA) initiatives within connections business to identify value cases. **Automation strategy:** Definition of an automation strategy (future architecture, operating model) to set the ambition of the level of automation desired across connections. **Candidate pipeline:** 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). **Deployment:** Phased deployment to allow Northern Powergrid to track and realise benefits iteratively.

This is dependent on	— Process mining	**This will enable**	— Back-office consolidation — 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. **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: — Customer and People Services — Connections — Material management — Modelling activities in Network Operations, including network investment and planning — Performance and reporting — Charge setting — 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) — 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. 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 — Customer and People Services automation	**This will enable**	— Network Operations automation & AI — LV management technology

7. Robotics & automation
7.06 Integration of master data

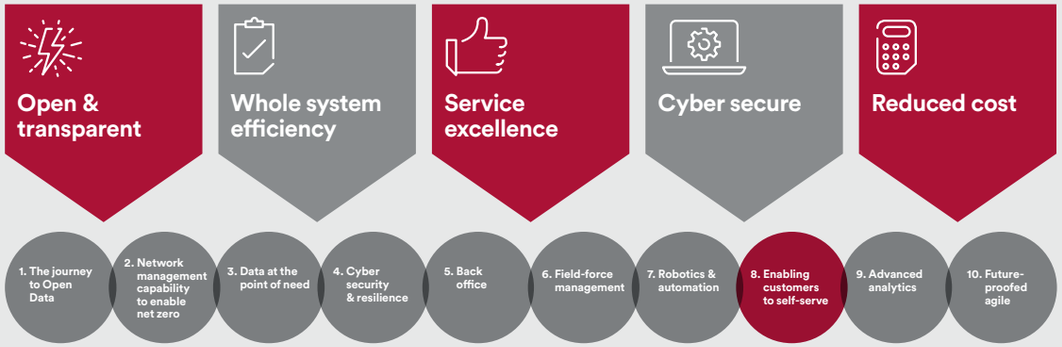
Integration of master data providing systems with integration platform.

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. **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. 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. Finally we will consider the wider integration technologies that are described further in the section on improving our technology capabilities (see the DSAP document). **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: — identification of the core integration requirements within our footprint, and understanding scalability and performance requirements — security considerations, as well as real time versus batch integration requirements — data volumes and concurrency — SLA targets, and management and monitoring requirements — integration analytics requirements and recommended integration platforms.

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

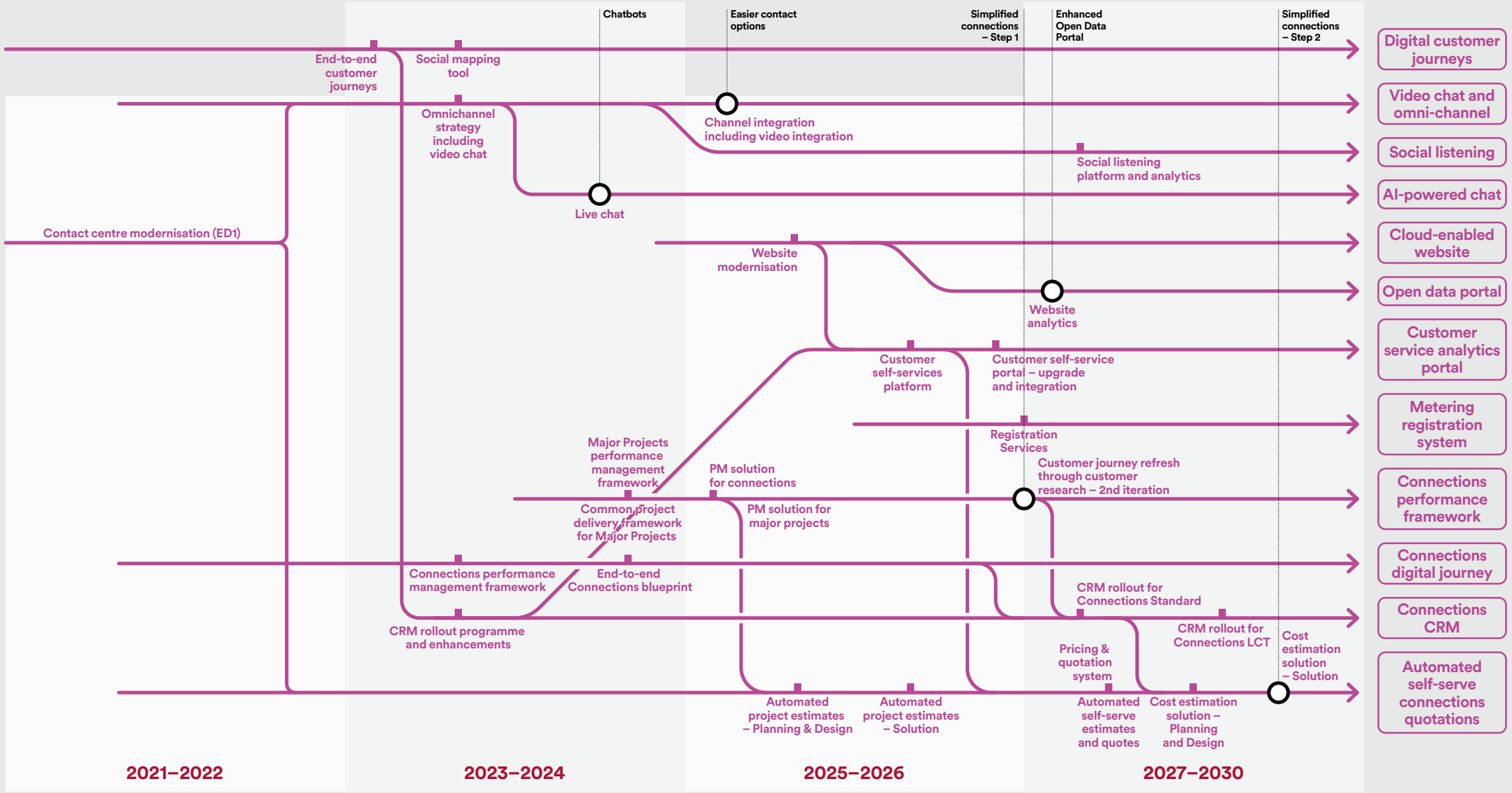
8. Enabling customers to self-serve

*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. 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.
Customer benefits	**Open & transparent** As part of customer self-serve, we will provide better portals for Open Data. Accelerating and automating new connections will be crucial as the demand for them will grow significantly with low-carbon technology adoption. **Service excellence** Through delivering self-serve portals for customers who choose to interact with us in this way, we will increase service excellence. **Reduced cost** We will reduce cost by allowing customers to self-serve.

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.

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: — **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. — **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. — **Customer improvement initiatives:** Define customer service improvement initiatives to scope CRM, website, and other digital tools improvements and developments in line with development plans.

This is dependent on	This is not dependent on any initiatives.	**This will enable**	— Cloud data platform (incl. Open Data) — Customer and People Services automation — Video chat and omni-channel — Customer service analytics portal — Connections performance framework — Connections digital journey — 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 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: — **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. — **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. — **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. **Channel integration** Implement workflow management capabilities to facilitate customer channel shift across all key journeys. The features of these activities should include: — **Channel customer journey:** Definition and mapping of customer journeys across channels with clear articulation of customer requirements. — **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. — **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 — 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. Key features include: — **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. — **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. — **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 — 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. The key features of website modernisation will include: — **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. — **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	— Cloud data platform (incl Open Data)

This will enable	— Open Data portal — 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: — **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. — **Architecture:** Architecture design and definition of functional and non-functional requirements of the live chat and chatbot functionalities, outlining integration and data requirements. — **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. — **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: **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. **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 — 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. This initiative will strategise and implement a customer self-service portal. The key steps recommended are: **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. **Pilot design:** Involvement of customers through design thinking for the portal design. **Deployment:** **Release 1:** Rollout of a fully integrated self-service on high priority journeys such as the connections journey. **Release 2:** Expansion of web chat and inclusion of chatbot. **Release 3:** Inclusion of emerging services. **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 — Cloud enabled website — 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. 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: **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. **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. **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 — 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: **Cross-industry best practice research** 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. **End-to-end connections to-be processes** 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. **End-to-end high-level business architecture design** Design the target architecture clearly showing key dimensions such as capabilities, functional systems, processes, data flows and integration points for the entire connections business. **End-to-end connections blueprint** 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	This will enable
— DERMS — Digital customer journeys — Connections performance framework — Connections digital journey	— 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. **Automate cost estimation solution** 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. **Automated self-serve estimates & quotes** 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. The detailed job types will be broken down into prioritised items to be deployed and rolled out in phases. The initiative then suggests: — extension of automated estimates for medium and large connections (automated estimates already in place for small connections) — automated quotes for small connections — extension of automated quotes for medium connections. **Pricing and quotation system** 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: — upgrade pricing and quotation system for small connections — migrate and enable quote on site through new systems — upgrade pricing and quotation system for medium and large connections.
This is dependent on	— Connections performance framework — Connections CRM — 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*

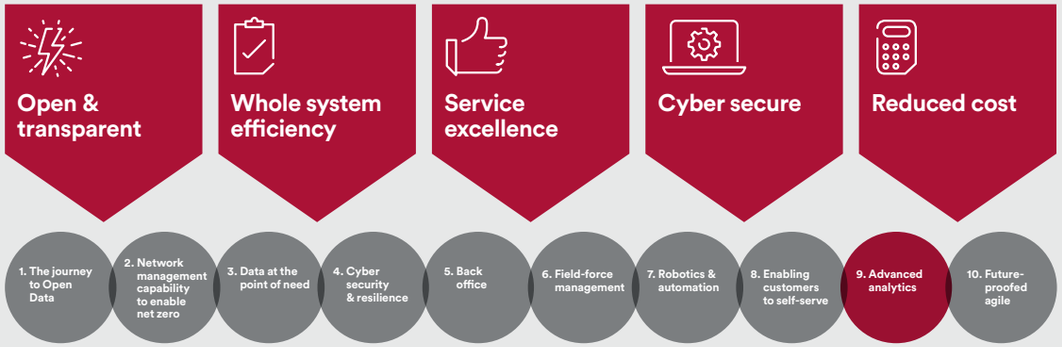
For us to offer Open Data services, we need to migrate workloads to the cloud, improving performance and allowing them to scale on demand.

Initiative breakdown	
	Planning — 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. **Integration and migration** — 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 — Video chat and omni-channel

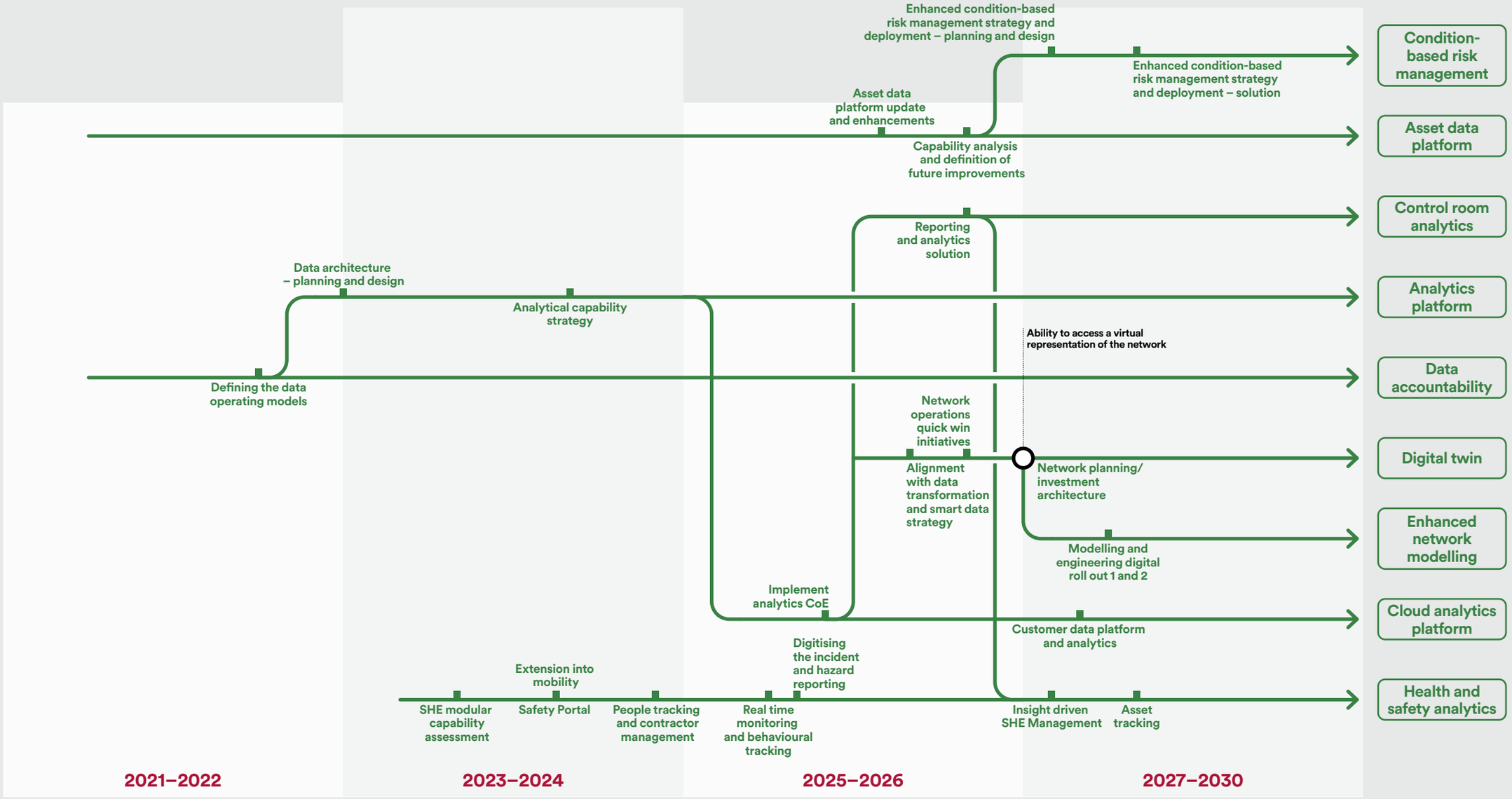
9. Advanced analytics

*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. 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.
Customer benefits	**Open & transparent** We will use advanced analytics to provide even more data to our stakeholders. **Whole system efficiency** Advanced analytics will be a key enabler for designing and operating a more efficient energy system. **Service excellence** Through customer analytics, we will be able to provide a better customer service. **Cyber secure** We will ensure that our analytics will not expose additional vulnerabilities to our system. **Reduced cost** Advanced analytics will help us make our operations more efficient.

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. **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. **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. **Deployment:** Algorithms will be deployed based on established prioritisation with pilot asset group undertaken first, then scaled across all asset types. **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. **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. From a technology perspective, there is a need to integrate those sensors into our control room and operational systems. 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. 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	— Condition-based risk management (CBRM)	**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. 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. **EAM/spatial upgrades** — **Database upgrade:** Upgrade underlying spatial database to release new database capabilities and improve performance. — **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. — **Database structure:** Normalise the asset database and create individual asset groups to drive efficiencies, create data check tools and implement a new partition logic. — **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. **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. **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. **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 — Social listening — Open Data portal — Cloud analytics platform — 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. The CoE will coach and champion the use of self-service analytics (e.g. power BI) and deliver more complex analytics requirements. This initiative aims to achieve two outcomes: **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. **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 requires 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 — Data accountability	— Data integration platform — Data integration — Advanced DMS — Cloud analytics platform — 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. **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 CNAIM (common network asset indices methodology) 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. **Network planning and investment architecture:** Provision of a target architecture for network planning/investment covering the following areas: — Capabilities required for the future of the network planning and development DSO role — Data requirements (align the delivery of these through use cases in conjunction with the SPA and DDTO) — Define to-be processes (required for process automation) — Define to-be system requirements — Integration and information flow — Network and security infrastructure — The target architecture will articulate any changes required to meet strategies and future objectives. 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. **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. **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 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. **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. **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. **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. **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. **Roadmap for implementation:** Using the DDTO, we will create a prioritised backlog for implementation. **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. 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. **Single view of customer strategy:** Assess the best way to centralise customer data. Implement customer data management strategies and implement ownership and governance. **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. **CDP release 2:** In future release, implement analytical capabilities. See line below on implementation of analytical platform. Also include within scope of future releases marketing and communications capabilities, such as PSRs, and social media. **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 — Analytics platform — M365 basic use — Control room analytics — Connections CRM	— LV management technology — Digital experience monitoring — Control room analytics — 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.

There are a number of activities suggested under this group of initiatives:

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.

People and contractor management: This capability will set our colleagues' and contractors' specific safety requirements 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.

— **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.

Continued on the next page...

9. Advanced analytics
9.12 Health & Safety analytics

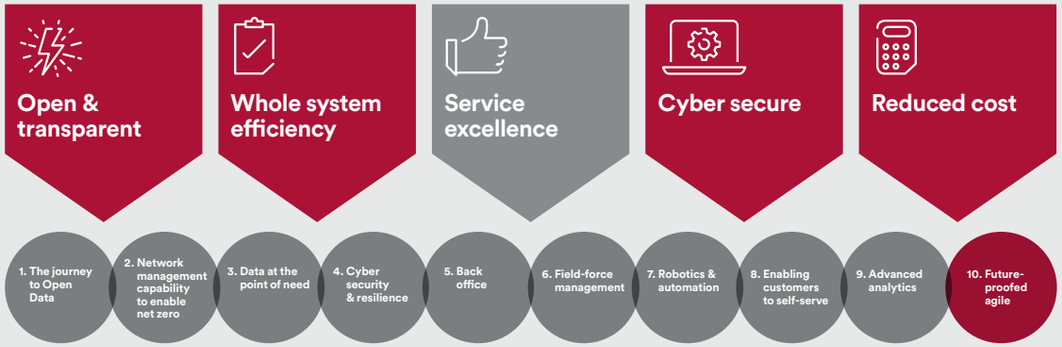
Centralising safety, health and environment to enable analytics and better reporting of incidents.

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. — **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. — **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 — Control room analytics		This does not enable any initiatives.

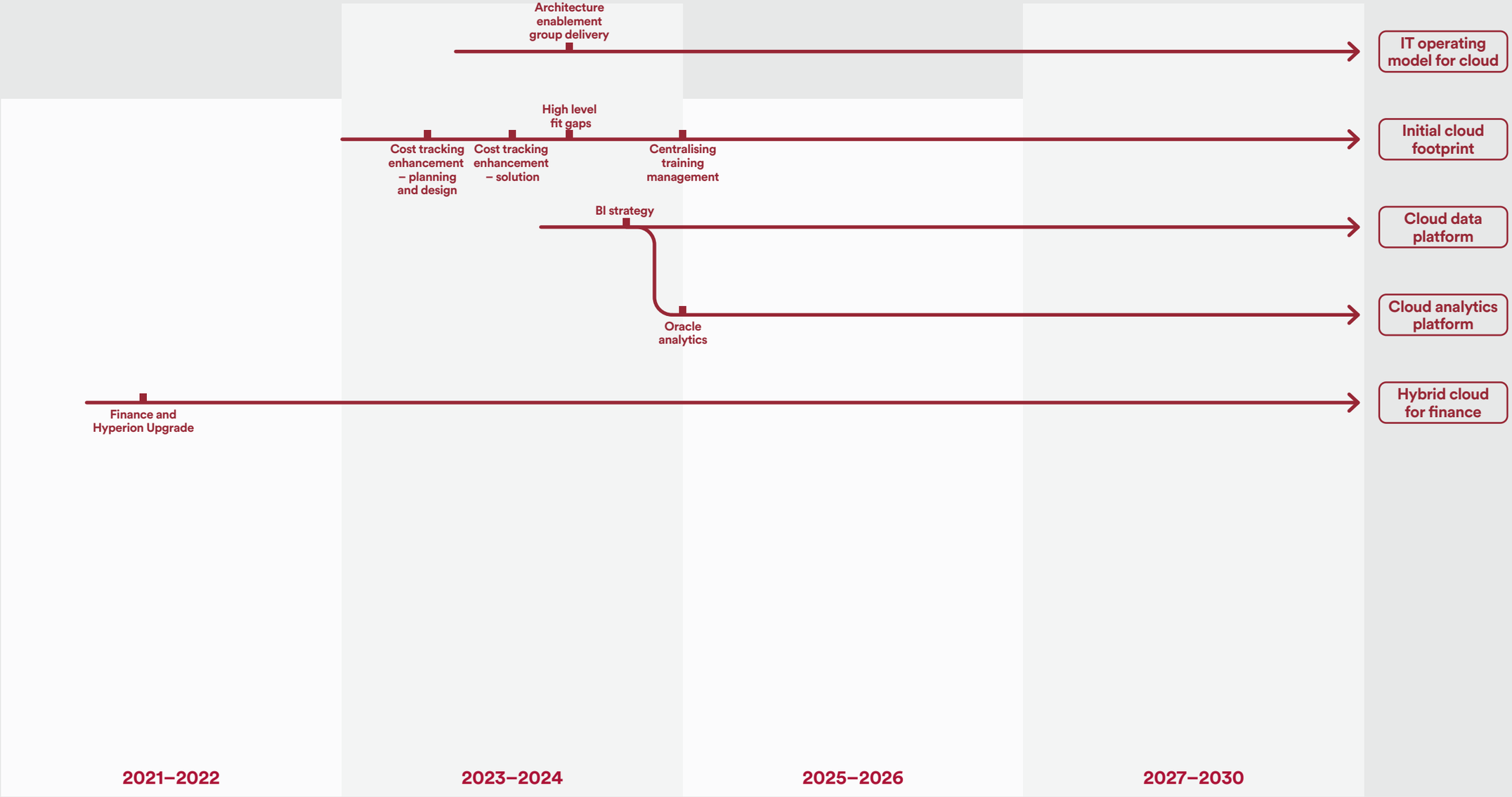
10. Future-proofed agile

*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. Agile ways of working will allow us to deliver capabilities faster and with reduced risk.
Customer benefits	**Open & transparent** We will employ agility to test and refine new Open Data propositions with stakeholders, making them more relevant. **Whole system efficiency** Our approach to our DSO proposition will be informed by agile ways of working, delivering on our promise faster. **Cyber secure** We will adopt DevSecOps to ensure that new technology is secure by design. **Reduced cost** Delivering selected capability in an agile way will significantly reduce the risk of sunk cost.

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. **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. Rollout communications to colleagues as well as stakeholders on the purpose and value of architecture. **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. **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. **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. **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. **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 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. **Impact assessment on EAM and CX** 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: — Assess impact of the Oracle asset maintenance cloud solution to replace Oracle EAM, including CX integrations. Includes impact of Oracle EAM retention. — 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.