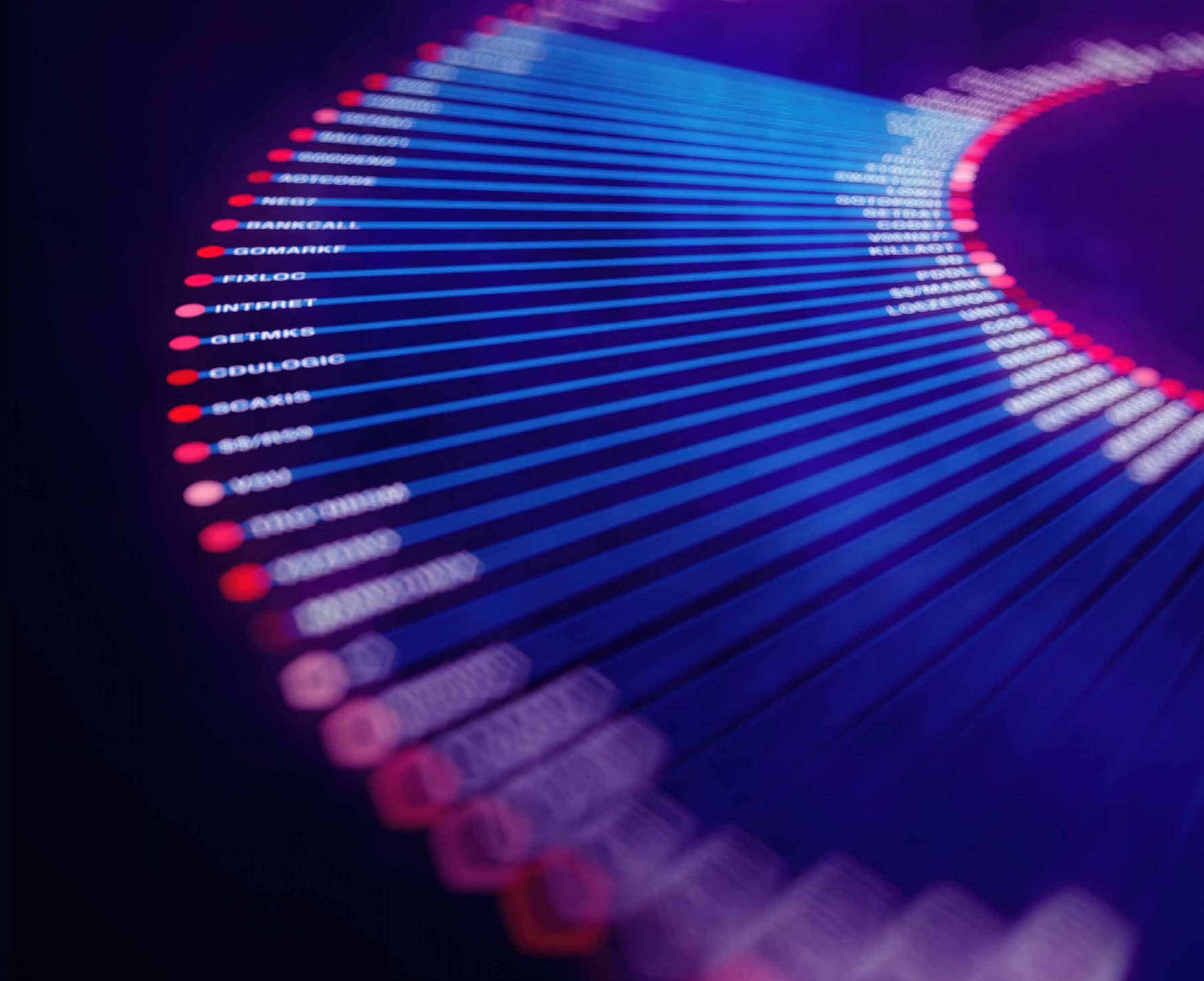
Digitalisation Strategy and Action Plan

July 2024

Enabling a clean, secure, smart energy system through digitalisation and data



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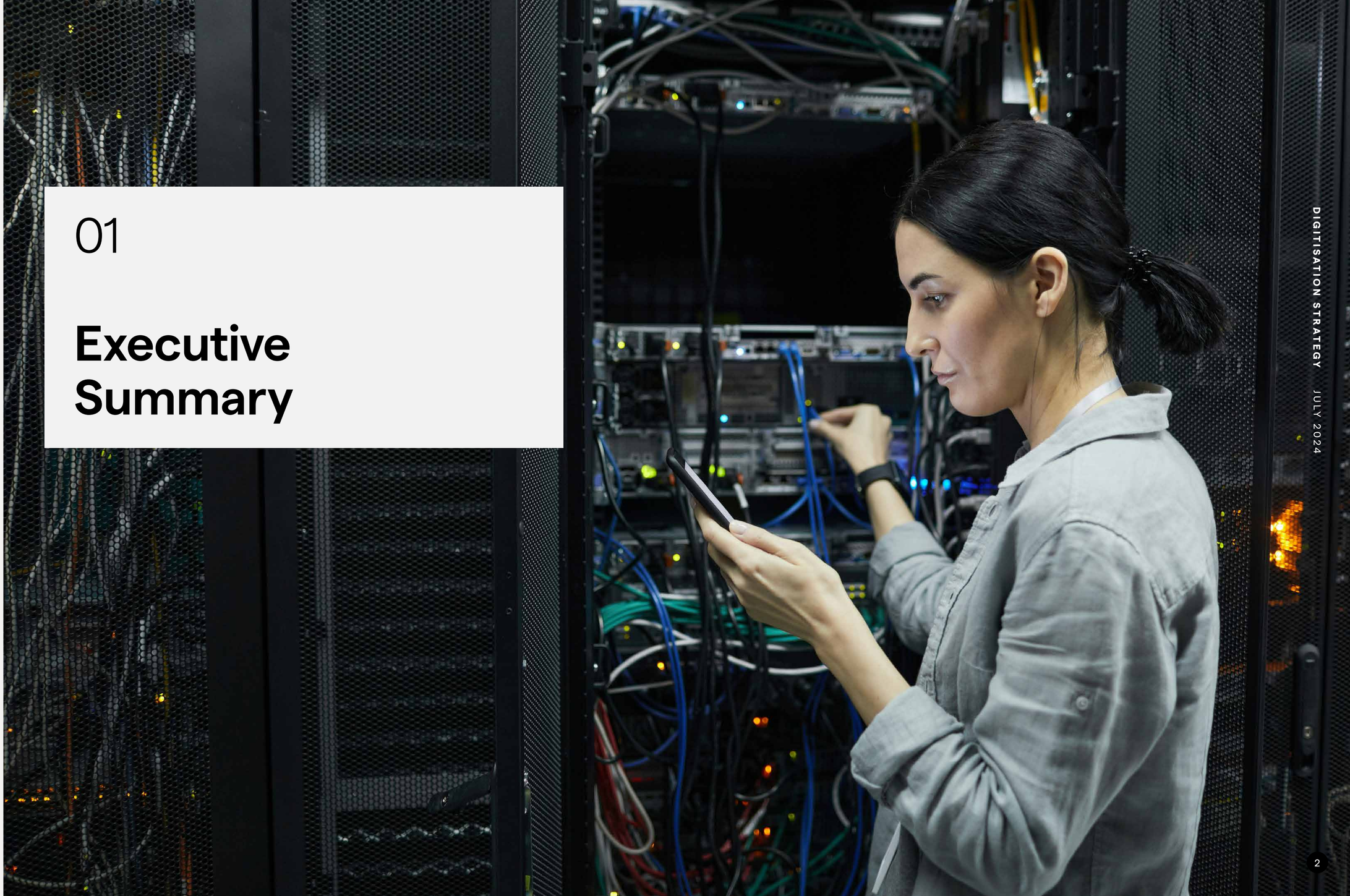

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In the coming years thousands more assets, including household microgeneration units and smart devices, will connect to the electricity networks. Increasingly, these technologies are giving consumers opportunities to be more flexible about when and how they use electricity.

Greater use of storage, including household power walls and electric vehicles will be used to provide top up services to smooth out demand peaks. Nobody can predict exactly what the future electricity system will look like, but we do know that it will greatly depend on access to, and effective use of data.

Elexon already plays a central role in providing data to the sector, and this role will increase exponentially when Market-wide Half Hourly Settlement (MHHS) is fully implemented in late 2026.

The half-hourly data that we will obtain, and make available will act as a lever to support the development of new tariffs and products, which will help consumers to play a much bigger role in national and local electricity system balancing.

Network companies are obliged by Ofgem to publish a digitalisation strategy and action plan (DSAP). As a code manager, Elexon is not covered by this requirement, however, we want to be clear with our stakeholders and users of our data on what they can expect from us, as our data and digitalisation plans progress.

We firmly believe that actively participating in the digitalisation journey is essential for us to fulfil our corporate purpose, to serve at the heart of the energy industry and build a path to Net Zero. We want to use our DSAP as a basis for continued (and new) collaboration with stakeholders in the sector. By sharing and learning from best practices on data, we believe we can unlock a new wave of creativity and innovation in the sector. To support that, in our corporate strategy for 2023-2026, we have set a goal of delivering 'Data as a Service', where we will provide valuable data products to the industry.

In order to deliver our digitalisation vision we have divided our strategy into three strategic objectives:

- Data as a Service
- Enhanced Digital Capabilities
- Customer Experience.

We explain more about these objectives from Page 15 onwards and you can navigate to the relevant sections using the panel on the left of the page.

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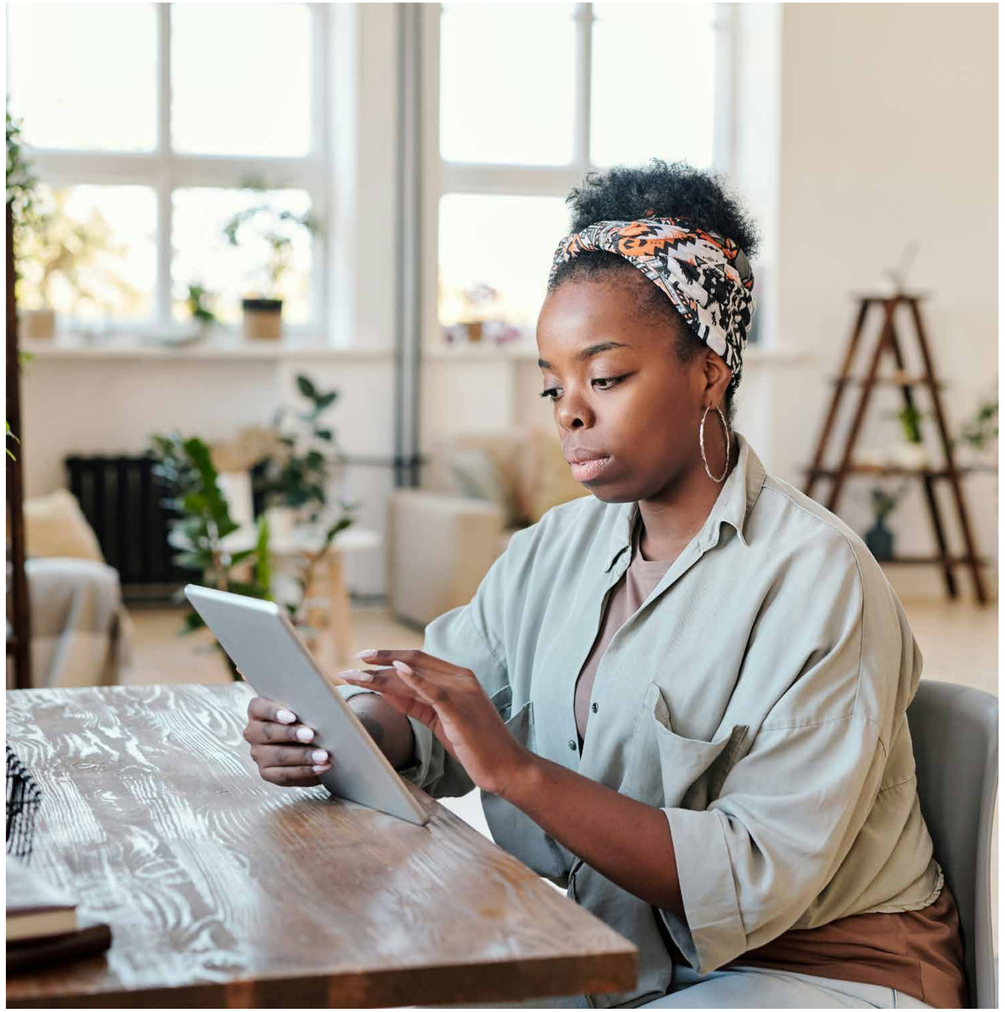

The transition to a smarter system will not happen unless energy data is openly available to all companies that are playing key roles in delivering the energy transition. We are a not-for-profit company, and one of the early adopters in the sector of 'open data' principles. All of the work that you will read about in our DSAP retains those principles as a prerequisite. Therefore everything we are doing on our digitalisation journey will be of equal benefit to all BSC Parties and people who depend on our data.

Elexon is recognised for being one of the leaders among code bodies for listening to (and acting on) stakeholder feedback.

In June 2024, Elexon hosted a roundtable with experts from across the energy sector to discuss digitalisation. The main points raised included the need for greater coordination and strategic planning for digitalisation, as well clear accountability. Attendees also believe that further action is required on governance, standards, and best practice to progress delivery in a way that benefits consumers and the market. There was encouragement for Elexon playing a greater leadership role in digitalisation through our DSAP.

We will share these views with Ofgem and Government and will progress work on delivering the data products and services that users need. We see the publishing of the DSAP as part of a conversation we will continue to have with all of our data stakeholders. If you have any views you want to share, please contact:

communications@elexon.co.uk

Peter Stanley
Chief Executive, Elexon

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Elexon is an independent, not-for-profit, expert delivery body that operates at the heart of the energy sector in Great Britain. We are a partner for government, Ofgem, and industry to help deliver a more secure, flexible, efficient, and clean energy system.

Governance, balancing and Settlement
Elexon provides best-in-class independent governance, assurance and balancing services for the wholesale market. This includes managing the Balancing and Settlement Code (BSC), which provides a clear set of rules for the electricity wholesale market to operate effectively. We manage electricity Settlement and incentivise the balancing of supply and demand by redistributing the costs of balancing the system across market participants.

Data
Our data is independent, and openly accessible via our market leading solutions. It provides a trusted reference relied upon by the entire sector. Our data and expertise helps businesses, the regulator, system operators, government, analysts and other stakeholders to understand the sector. Elexon provides vital information on pricing, demand, the generation mix and other indicators.

Facilitator and delivery body
Elexon has a 25-year track record of delivery, offering the practical solutions that turn Net Zero policy into reality.

- **Opening up markets for flexibility providers:**
  Elexon has led successive rule changes for the BSC that create more opportunities for flexibility providers to compete in provision of balancing services.

- **Programmes:**
  Elexon is playing a central role, working with over 200 market participants to implement MHHS in 2026, a key enabling reform for Net Zero.

- **Payments:**
  We calculate collect and distribute payments for the Contracts for Difference and Capacity Market schemes on behalf of the Low Carbon Contracts Company (LCCC) and the Electricity Settlements Company (ESC). We are also administering a network charges discount for energy intensive industries, and the Government's regulated asset base approach to developing new nuclear plant.

Find out more at www.elexon.co.uk

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Elexon's strategy

Elexon is delivering year two of its 2023 – 2026 Strategy, delivering vital services to the electricity wholesale and energy markets, as it transitions to Net Zero.

Elexon's strategy builds on the best of what we do as a central markets delivery body delivering governance arrangements, market design, Balancing and Settlement and essential data services, enabling the GB energy industry to operate effectively.

Under Ofgem's energy code reforms, we expect to become the licensed code manager for the BSC by early 2026. This is an enhanced role giving us more powers to coordinate and prioritise changes to the code to support the transition to a more secure, flexible, efficient, and clean energy system.

Elexon has six key areas of strategic priority this year:

01
Build
our performance culture

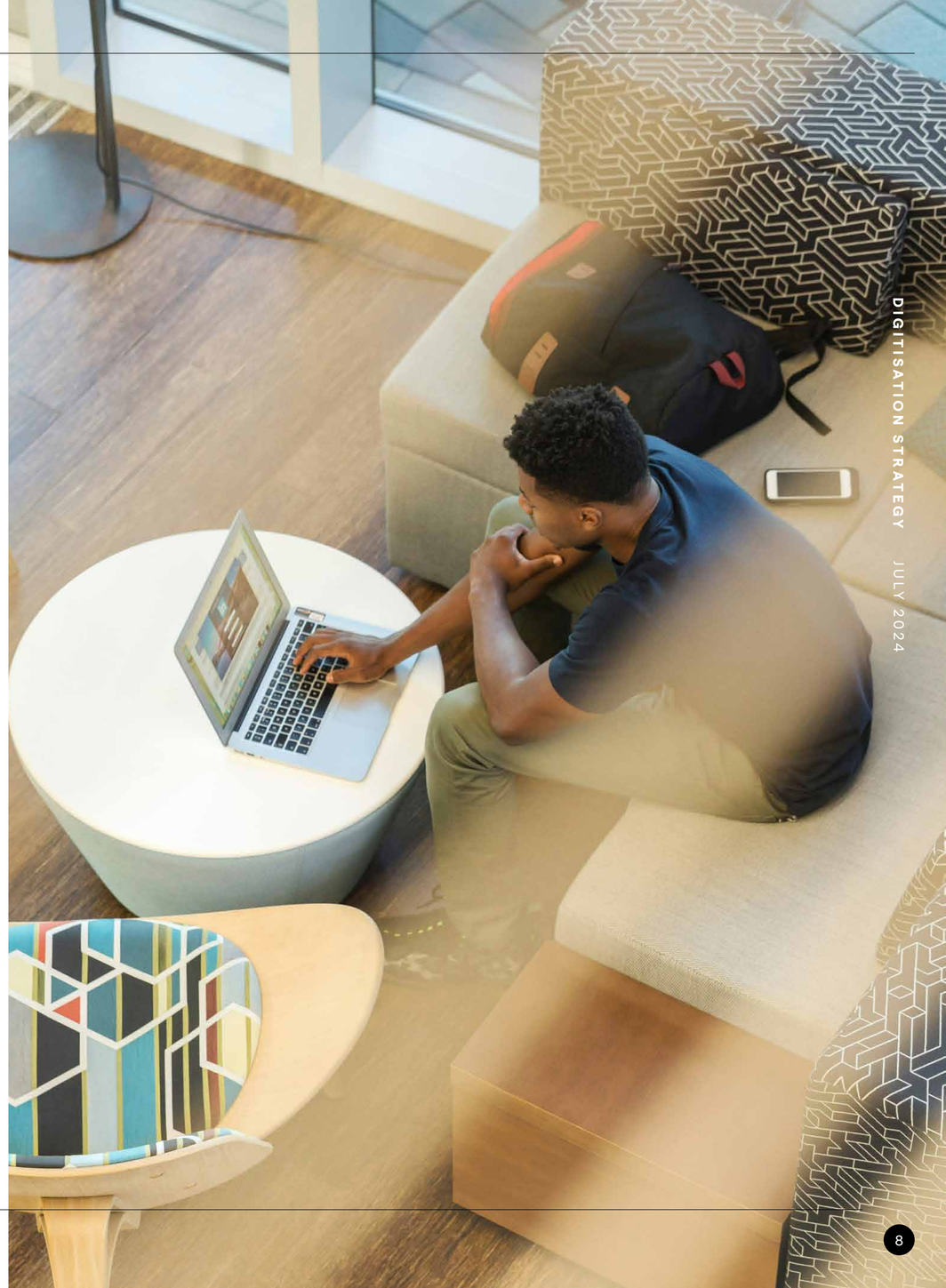
02
Deliver
value for money

03
Unify
our customer experience

04
Transform
Code Management

05
Provide
Data as a Service

06
Implement
Half Hourly Settlement



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The Government has set challenging targets for the electricity sector to be carbon-neutral by 2030 which is just six years away. To achieve this, the shift away from fossil-fuelled to low carbon generation must continue, and the role that flexibility plays needs to increase.

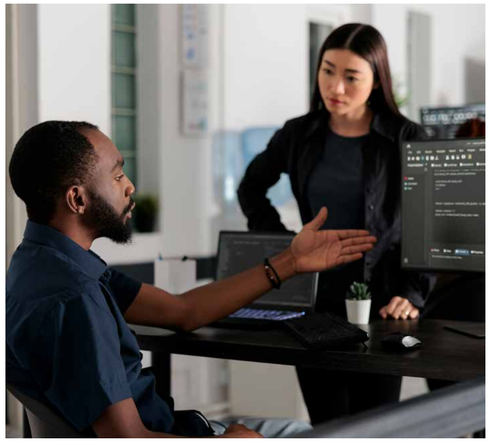
Leveraging data and digital technologies is a key enabler for reaching this decarbonisation goal. And as our reliance on renewables grows, the use of digital technologies will be essential for forecasting, managing fluctuations, and optimising the grid to ensure a stable power supply. The proposals from the Review of Electricity Market Arrangements (REMA) have the potential to bring about the most substantial changes to the UK energy markets in decades. While REMA outcomes are still uncertain, it is expected that the level and detail of data resulting from them will increase dramatically.

There has been progress to ensure that energy data is open, accessible, and interoperable, as a result of the recommendations of the following initiatives:

- The 2017 Reshaping Regulation: Powering from the future report.
- The Government's first energy sector digitalisation strategy and action plan published in 2021.
- The 2019 Energy Data Taskforce report
- The 2022 Energy Digitalisation Taskforce report

However challenges still persist in navigating the data and digital landscape, including a siloed approach and fragmented data landscape within the energy sector.

We need a collaborative approach across the sector within the next two to three years to resolve these. Without this, we will not be in a position to use emerging technology including artificial intelligence, or the Internet of Things (IoT) to the fullest, to assist in meeting Net Zero.



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The Digitalisation Challenge for the Electricity Sector

In our view, the most significant challenges are:

Interoperability of electricity data

Interoperability is the ease of sharing, and the portability of data between different systems. In August 2023, Ofgem published regulations (Data Best Practice Guidance) for data governance. Initially, only network companies were mandated to follow these rules however Ofgem announced in March 2024 that they intend to extend it to wider market participants including the energy code managers (which is something that Elexon called for).

→ Elexon voluntarily complies with some of the 11 guidance principles already, including using metadata standards and open data principles, and we are working towards compliance in outstanding areas.

The Virtual Energy System

The energy sector needs 'digital twins' to be developed to achieve full digitisation. In simple terms a digital twin is a virtual replica of assets, processes and systems which can be used to make informed decisions in real time, to better manage and optimise decisions. The National Energy System Operator (NESO) is currently developing a digital twin, and Government is also encouraging these developments through the National Digital Twin Programme. Ofgem is also considering whether to consult on the need for a facilitator role to support the development of digital twins.

→ Given the role Elexon plays in managing data, we are closely monitoring these initiatives and we are ready to share our data quickly, to fully participate in the development of future digital twins.

Registration of assets

→ To have a fully digitalised system, we will need a register of the capabilities of the widest possible range of assets from household level microgeneration to larger assets which provide flexibility. These assets will need to be visible digitally, to inform system planning and management. DESNZ awarded funding to develop an Automatic Asset Register (AAR) for all assets under 1MW.

→ Elexon is closely monitoring developments on asset registration.

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Elexon's Digitalisation Vision

Journey so far
Elexon is widely recognised and respected as an expert in managing wholesale market arrangements and energy Settlement. Recently, we have delivered a number of high profile data and digital projects and programmes that are rapidly transforming our business model.

These include:

A complete re-architecture and migration of our Settlement systems to the cloud (development of our Kinnect platform) which allows us to harness the full potential of cloud technologies.

Designing and implementing the new Data Integration Platform (DIP) which is a 'next generation' messaging infrastructure enabling the exchange of data, including half-hourly readings. The DIP will play an essential role in managing the vast increase in the volume of data that Elexon will process once MHHS is implemented. Also, we have designed the DIP in a way that allows it to deliver additional services beyond those needed for MHHS, and we want to further leverage this infrastructure to deliver greater value for industry

Digitalising more than 400 BSC documents, equating to around 9,000 pages through our Digital Code. This improves accessibility of the documentation and makes it more easily searchable. It also makes the documentation easier to update when rules are changed.

Restructuring our business by building product teams that can fully leverage agile development practices.

Full system View
Following our recent digital initiatives we are in the enviable position of having comprehensive visibility across the electricity system from gathering data from the largest assets, such as renewable operators connected to transmission network, down to individual household consumption and distribution level generation.

Yet the UK electricity market is continuing to transform. BSC Modifications that Elexon has implemented such as P344 'Wider Access' (2019) opened up the Balancing Mechanism so that aggregators that are not affiliated with a Supplier can help flexibility providers to compete in providing balancing services. P375 'Settlement of Secondary BM Units using metering behind the site Boundary Point' implemented in 2022 has increased visibility of smaller-scale flexibility providers through individual 'asset meters.

When Elexon implements P415 'Facilitating access to wholesale markets for flexibility dispatched by Virtual Lead Parties' in November 2024, it will be a major breakthrough for independent aggregators (Virtual Lead Parties) as they will be able to offer flexibility services in the wholesale market, in addition to the Balancing Mechanism. This trend will accelerate in a post-MHHS world, especially for homes and businesses. To capitalise on this opportunity, we must significantly enhance our data and digital capabilities.

Data and collaboration
To unlock the power of the exponential growth of data in the future, we are actively transforming our data ecosystem. We are making our vast data assets not only accessible, but also discoverable and usable. Our goal is to become the energy sector's go-to resource for data governance, data interoperability, and insightful analysis. By playing this key role, we can support the whole industry in delivering our shared goals.

An example of this is the smart meter data repository which we have developed. This initiative goes beyond just gathering data for Settlement purposes. We will be making the half-hourly data readily available for analysis, empowering energy companies to unlock valuable insights. This collaborative approach fosters a trusted partnership, where we work together to develop innovative solutions and products that propel the energy sector forward.

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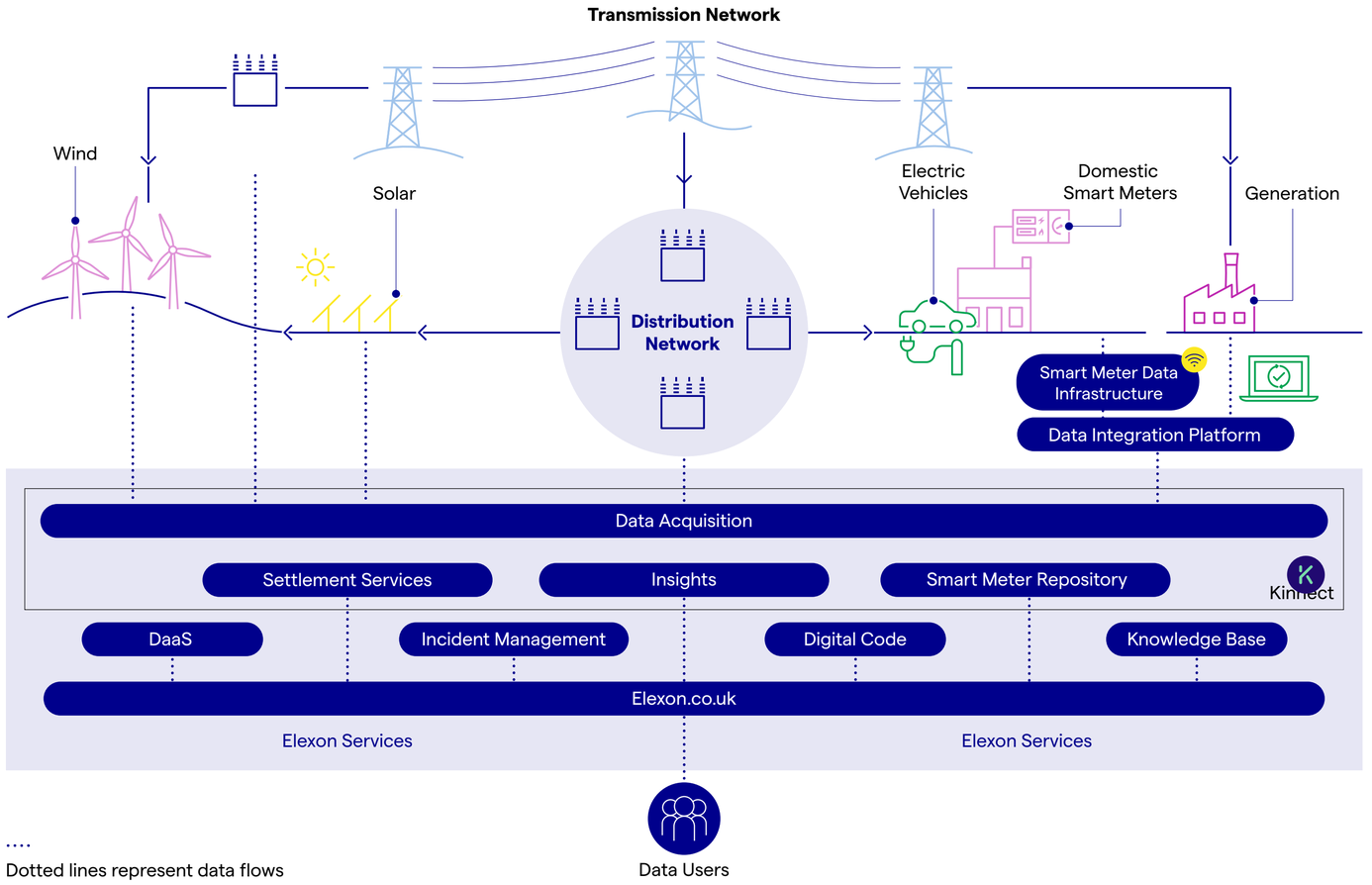
Elexon's Digitalisation Vision

Our digitalisation strategy goes beyond simply enhancing our internal capabilities. We are leveraging our data and platforms to actively support the energy transition and Net Zero goals. This commitment extends to the entire sector. We will be seeking opportunities to collaborate with Government, Ofgem, and industry stakeholders to address the key digitalisation challenges outlined previously.

Customer Experience
Customer experience is paramount to us. As we innovate across various fronts, our top priority is ensuring our expanding service portfolio remains easily accessible, reliable, and intuitive for our growing customer base. This commitment is reflected in our Kinnect platform. Kinnect is designed to be the central hub for providing our services to all BSC Parties. It provides a seamless user experience, giving effortless access to our expanding services.

Diagram A



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Our Digitalisation Approach

In order to deliver our digitalisation vision we have divided our strategy into three strategic objectives which are set out below.

These objectives are backed up by tangible delivery plans which we are available from Page 44 onwards.

01

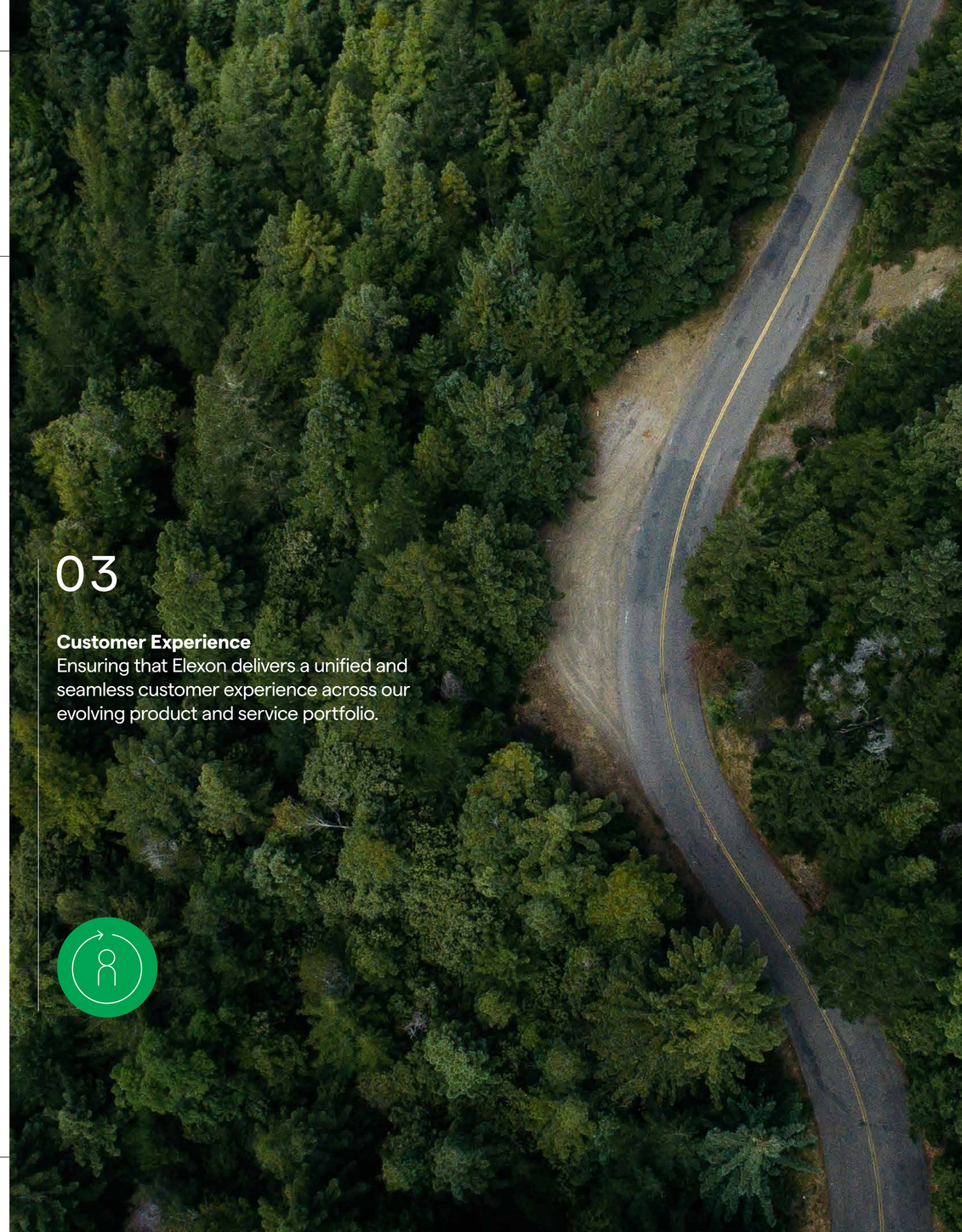
Data as a Service
How Elexon can unlock and provide access to the valuable data flowing through our systems, especially in a post-MHHS world. It also highlights our commitment to developing robust data governance and ensuring interoperability with other systems, maximising the value of the data we hold.

02

Enhanced Digital Capabilities
Focusing on how Elexon will develop the capabilities to deliver new services and manage the exponential increase in data flowing through our systems, once MHHS is live. One aspect of this involves ensuring we have the necessary skill set to leverage the data we hold, with a key emphasis on upskilling our workforce.

03

Customer Experience
Ensuring that Elexon delivers a unified and seamless customer experience across our evolving product and service portfolio.



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Data as a Service

Our 'Data as a Service' strategic objective centres on unlocking the potential of Elexon's vast data assets. We hold one of the most comprehensive and valuable datasets within the electricity industry and this initiative aims to leverage it for the benefit of both our customers and the industry as a whole. By creating, delivering, and operating a holistic data strategy, we will establish a clear roadmap for how we can utilise and share our data as a strategic business asset.

Data Interoperability

Across the industry, data sharing is essential for developing innovative products and services that drive Net Zero. We support Ofgem's leadership in mandating standards for metadata and data catalogue sharing. We have implemented this approach in recent developments including the building of our Helix Programme services so that BSC systems can receive, publish and process half hourly data.

We explain more about the Helix services on Page 29. However, industry-wide adoption is crucial as only then can our digital vision become a reality. Elexon's data is a powerful asset for emerging digital twin initiatives, especially our smart meter dataset. By fostering increased data sharing across all stakeholders, we can collectively unlock the potential for a Net Zero future.

Data Governance

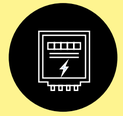
Effective data management has always been critical to the services we provide to industry, and we have consistently prioritised strong data governance practices.

With the growing importance of data as a strategic asset, it is crucial to further expand our governance capabilities. The implementation of the DIP and ingestion of personally identifiable information (PII or smart meter data) has led us to develop a comprehensive data governance framework which we explain on Page 20. The successful adoption of this framework will be a central pillar of our Digitalisation Action Plan.

Smart Meter Data Repository

Central to our Digitalisation Strategy is leveraging smart meter data through our Kinnect platform. This vast dataset, which will encompass readings from over 40 million meters, holds immense value in developing innovative products and services that will drive us towards achieving net zero.

We will ensure that this will be aligned with emerging consent frameworks and will implement robust data governance and security measures to protect sensitive personal information (granular PII).



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Data as a Service

Trust and Consent Frameworks

Consumer control over their data is fundamental to our vision of seamless data exchange across the energy industry. We echo Ofgem's emphasis on consumer consent in data sharing. They advocate for a unified technical solution that adheres to data protection regulations like UK GDPR, while empowering consumers to manage their data.

We fully embrace this approach. Our Digitalisation Action Plan will incorporate steps to integrate our Kinnect platform with Ofgem's proposed single technical solution for managing consumer consent. Unlocking the potential of our smart meter data through collaborative data sharing solutions is a key focus for us.

Data Analytics

We have recently implemented a new data analytics platform in Microsoft Azure. This powerful foundation leverages Apache Spark through Databricks, a cloud-based solution designed for large-scale data processing. Currently, we are in the process of completing the migration of existing data pipelines to this environment.

With this migration, targeted for completion in 2024, we'll unlock even greater potential for our data science community. The new platform will empower them to develop advanced data pipelines, ultimately leading to richer insights and a deeper understanding of our ever-growing data landscape.

DIP Roadmap

The DIP is 'next generation' messaging infrastructure enabling the exchange of data, including half hourly readings. It will play an essential industry role in managing the vast increase in the volume of data that we will be required to process, once MHHS Implementation is completed in late 2026.

We are developing a future roadmap for the platform, which prioritises expanding the DIP catalogue with new data flows. We will look to achieve this by strategically replacing legacy data flows from older platforms and creating entirely new ones. This two-pronged approach ensures the DIP capitalises on industry investment and delivers the most wide-ranging data integration solution possible.

The Insights Solution

Part of the Kinnect platform, the Insights Solution provides users with multiple access points to a rich data repository. It provides a more visual, customisable and granular wholesale market data service.,empowering users with self-service data access and improved system performance.

Notably, all data available through the Insights Solution is completely open for public access, modification, and distribution. The solution replaced the legacy Balancing Mechanism Reporting Service (BMRS) from the end of May 2024 and we will continue to enhance the solution with new data feeds, including integrating data from the MHHS DIP.

Data Governance

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Our digital transformation, particularly the shift from traditional file-based processing to event-driven data architectures, has significantly increased the complexity of ensuring good data governance.

The industry's demand for seamless data sharing through standardised practices, added to the challenge of managing PII data, further amplify the need for a comprehensive data governance approach.

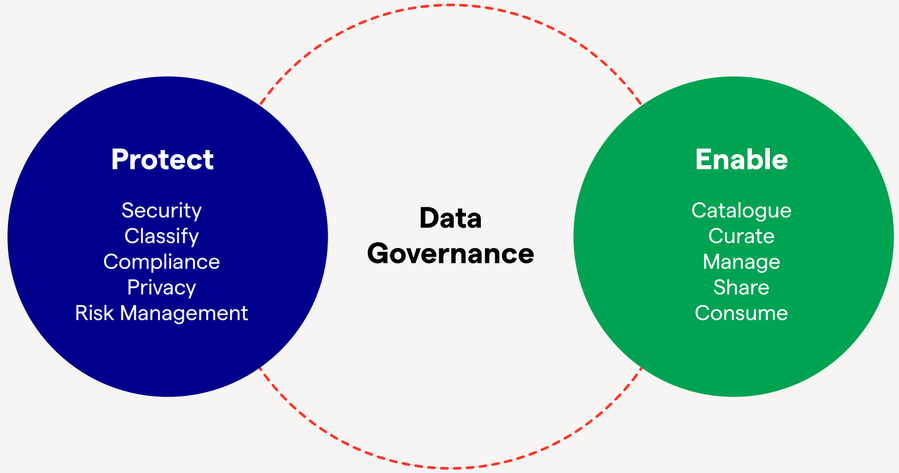
Data Governance Framework
This year, in readiness for taking up operational responsibilities for the new DIP service in 2025, we have engaged with a third party to fully review our existing data governance practices.

In this review, we categorised our existing data governance, data security and data protection processes as either 'protecting' or 'enabling', which has guided the development of our expanded data governance framework.

To effectively manage the additional workloads from the DIP and smart meter data ingestion, our augmented data governance team will take ownership of implementing this comprehensive framework.

Compliance Considerations
Ingesting smart meter data from the DIP, into our Kinnect platform, and sharing it through our Smart Meter Repository, introduces new UK GDPR compliance considerations for Elexon.

The repository is being developed to align with MHHS implementation and will share data via our Insights Solution. In our role as Data Controller for this personally identifiable information (MPAN readings), we are implementing new processes to fulfil our compliance obligations and integrate with Ofgem's planned consumer consent framework.



Source: Valcon

Data Governance

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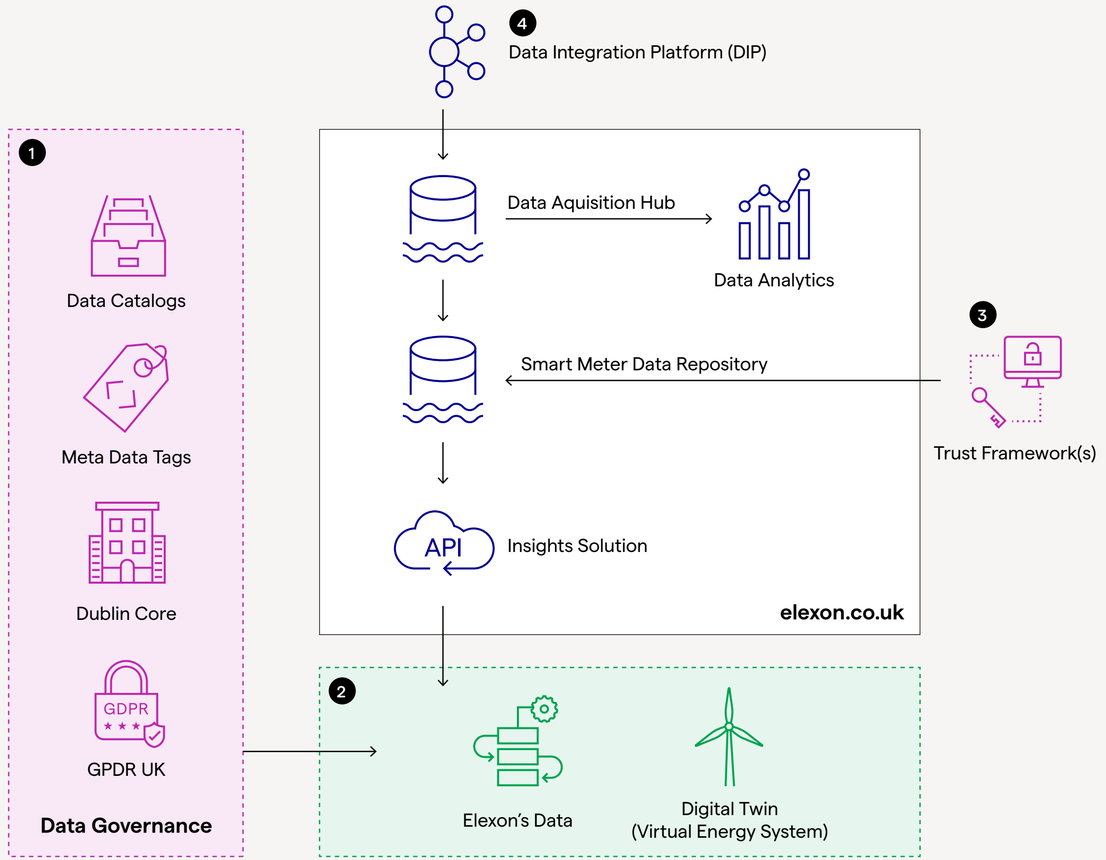
How Governance impacts wider industry initiatives

Adopting Ofgem's Data Best Practices and Standards unlocks significant opportunities. By standardising metadata and implementing our new Enterprise Data Catalogue we will help pave the way for seamless industry-wide data sharing and interoperability. If this same approach is adopted across all stakeholders, it will be a game-changer for the energy sector. By proactively applying Ofgem's standards to our recent digital projects, we have laid the groundwork for wider data catalogue sharing and future collaborations on industry-wide digital twin initiatives, such as NESO's Virtual Energy System.

How data governance supports data interoperability

1. Our data governance best practices include the adoption of Dublin Core meta-data standards and the sharing of our data catalogues externally.
2. The sharing of data catalogues across industry, using standard meta-data, will support interoperability and allow the development of digital twins to model the sector digitally.
3. The sharing of the smart meter data we hold in Kinnect will be aligned to the (as yet to be developed) consumer consent framework.
4. The Data Integration Platform (DIP) was developed for MHHS but will be leveraged across the sector in the future.



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In 2021, Ofgem appointed Elexon to act as the Senior Responsible Owner (SRO) and Implementation Manager (IM), for the MHHS Programme.

In carrying out these roles, we have been responsible for the design and implementation of the new DIP, a scalable cloud integration solution that allows data sharing across the industry using the latest data integration protocols.

MHHS marks a fundamental shift in how Settlement is calculated. Rather than relying on aggregated consumption data from data aggregators, the process can now go directly to the source of consumption data – the smart meters. Therefore, in addition to our role in implementing MHHS across industry, we have been carrying out major enhancement to our Kinnect platform, in readiness to receive the 1.5 billion daily readings we anticipate from smart meters.

The centrepiece of our new data preparation services is the Data Acquisition Hub (DAH), a data lake which has been implemented within Kinnect. We have developed data pipelines integrated to the DIP, which allow the ingestion of key consumption and registration data flows into the DAH. Following this, steps to validate and aggregate the data are undertaken, in readiness for settlement.

There is wide recognition that gaining access to granular smart meter data will be a key enabler in understanding energy usage patterns in the UK, and a key resource in developing solutions to achieve the government's Net Zero targets. We are also aware of some initiatives underway currently looking to collate and leverage the potential of smart meter data. MHHS implementation has offered Elexon a great opportunity to add value to the sector by sharing this rich source of data. At the point of cut over to the new MHHS arrangements, all GB smart meter data with be stored in our Kinnect platform.

While data collection is straightforward, sharing it effectively requires careful consideration of accessibility, governance, and compliance.

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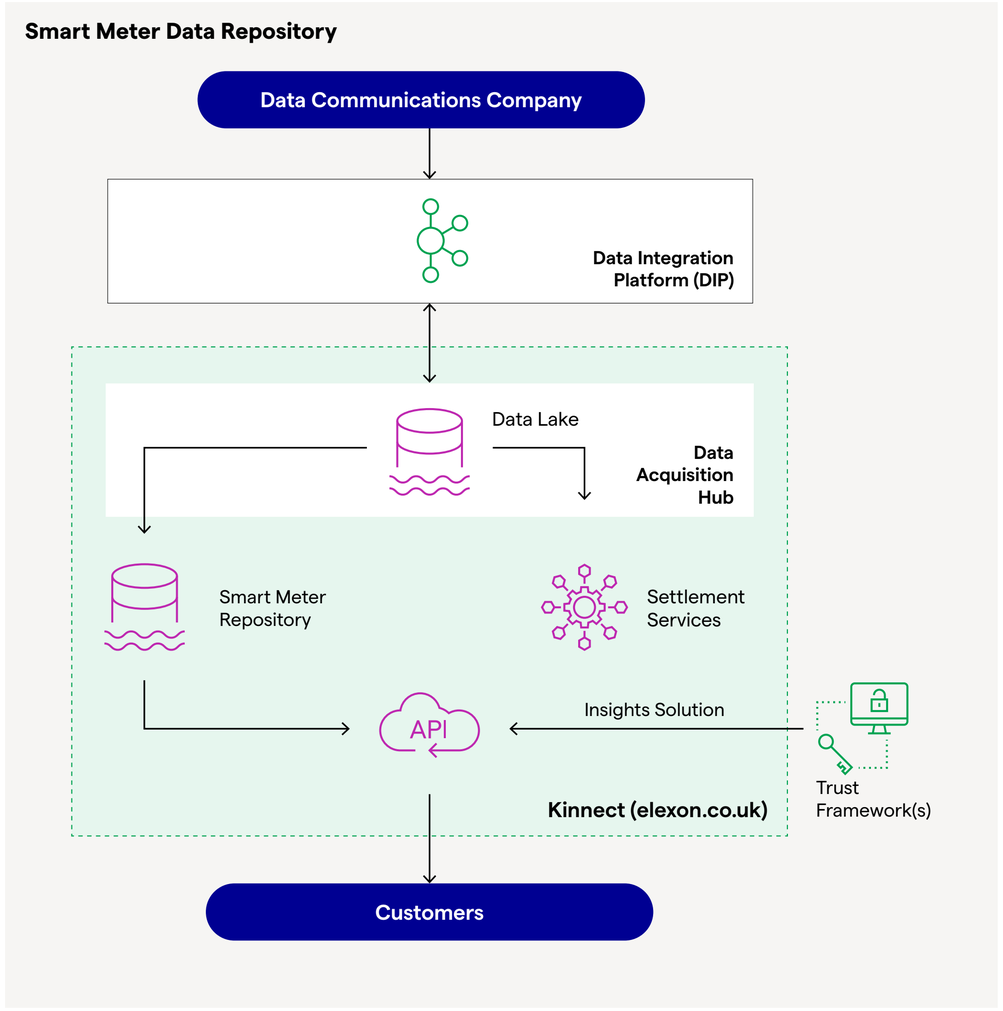
Earlier this year we responded to Ofgem's call-for-input (CFI) on 'Data Sharing in a Digital Future'. The CFI recommends a single technical solution to act as a trust framework to manage consent for the use of individual smart meter data. We support this approach and are committed to integrate our smart meter data repository with whatever consent solution is developed.

Additionally, our digitalisation roadmap will include the further development of our data governance and compliance capabilities. These enhanced disciplines and processes, underpinned by our core data principles will ensure the long-term viability and security of the smart meter repository.

Collaboration
To fully unlock the data's potential, we actively seek partnerships with a broad range of stakeholders, including Ofgem and DESNZ, to develop innovative use cases for smart meter data. Interoperable data is crucial for achieving Net Zero, and smart meter data is a prime example.

We will incorporate this focus on collaboration into our digitalisation roadmap.



Funding
A final consideration of implementing our smart meter data repository is considering the best options for funding the solution in the long term. We will look to seek the right balance in how we fund the ongoing costs associated with hosting and operating a key energy sector resource.

Overall, the smart meter data repository is a great example of how Elexon is continuing to add value to the industry.

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Enhanced Digital Capabilities

This pillar centres on building and deploying our key strategic digital platforms. We are also prioritising the development of crucial capabilities to support and manage our new cloud solutions in a multi-vendor environment. Both aspects require skilled digital resources, who will be instrumental in the future growth and enhancement of our platforms.

Kinnect

A five-year project to rebuild Elexon's core BSC Settlement systems, which has been achieved through the roll out of our Kinnect platform.

We are turning our attention to optimising data exchange and will assess our current processes with external stakeholders and identify areas for improvement. This will streamline data flows and enhance collaboration across the board.

Furthermore, leveraging advancements in automation technology, we will be evaluating its potential within our offshore data handling teams. This holds significant promise for streamlining workflows and enhancing our overall operational efficiency.

MHHS Data Integration Platform (DIP)

Elexon has played a central role in the MHHS rollout. We led the initial design work with Ofgem and industry on what has subsequently become the DIP This cloud-based platform acts as a dedicated data exchange for seamless transfer of half-hourly smart meter data.

Elexon was selected to oversee the development and roll-out of the DIP, which is scheduled to launch in 2025, after which we will take up our operational responsibilities for the platform.

As the industry transitions to half-hourly Settlement, the DIP will be instrumental, using its event-driven architecture to manage the increased data volume. With these critical milestones approaching we are actively building our internal expertise to ensure the DIP's ongoing operation, maintenance, and enhancement as a critical energy sector platform.

Service Management

We have adopted a multi-vendor approach for developing cloud platforms. Alongside this we have built our internal service management capability acting as the central hub for managing incidents and problems.

To facilitate this approach, we have launched Elexon Support – a new customer service gateway which provides a comprehensive Service Management solution. We are currently extending this successful model to encompass the service management needs of the DIP.

Enhanced Digital Capabilities

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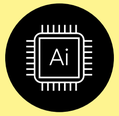
Technical Consolidation

In addition to our Kinnect and DIP initiatives, we are making a final push to migrate all remaining on-premise internal applications and infrastructure to the cloud. This includes phasing out local file shares and SQL Server databases. To achieve this full cloud adoption, we are investing in expanding our Microsoft SharePoint capabilities. This will allow us to tap into our existing knowledge base and maximise the benefits of Microsoft Copilot upon implementation.

Knowledge Management

The massive increase in use of Large Language Models (LLMs) and Generative AI (GenAI) has us excited about unlocking the potential of our vast knowledge base.

Our BSC documentation is extensive, and implementing Kinnect has generated a wealth of system and project artefacts spread across various tools like Microsoft SharePoint and Azure DevOps. To leverage GenAI effectively, we see a clear need to streamline and prepare these knowledge bases. This will not only empower us to share knowledge seamlessly with customers but also foster knowledge exchange within our internal teams.



Cloud Management

The development of our Kinnect platform has allowed us greater control of our cloud environments. Building modern applications requires managing a complex ecosystem of infrastructure, tools, deployment pipelines, testing, networking, monitoring, and security.

We are growing our own internal platform services teams to establish standardised cloud infrastructure, automation of tasks, and provision of a centralised toolset. This will provide a unified development environment where teams can leverage the same resources and work together seamlessly, whilst allowing us to manage resources and costs with greater control.

Digital Skills

The digital skills gap presents a significant risk to our ability to manage and enhance our new cloud platforms. Instead of competing for scarce and expensive talent in a crowded market, we are taking a proactive approach by investing in our own workforce.

Our competency frameworks provide a clear path for employees to develop their digital skills, opening doors to new opportunities and roles. This empowers our workforce to take ownership of their professional development, while simultaneously building the internal expertise we need to manage and enhance our increasingly complex cloud environments.

Kinnect

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Over recent years, we have focused on delivering our new Kinnect platform. Kinnect is a 'cloud native' platform, designed to replace the entirety of our core BSC Central Systems application stack and provide us with the flexibility to we need to continually enhance our customer offerings.

Kinnect is deployed across various public cloud platforms, including Microsoft Azure, Oracle Cloud infrastructure and Salesforce, to benefit from the scalability, flexibility, and resilience inherent to cloud solutions.

Kinnect was designed in anticipation of the evolving industry needs related to the energy transition, in particular, the ability to handle the large data volumes generated by MHHS. MHHS requires our Settlement process to be capable of ingesting 1.5bn meter readings from smart meters each day. This is in contrast to the aggregated meter readings we receive at present.

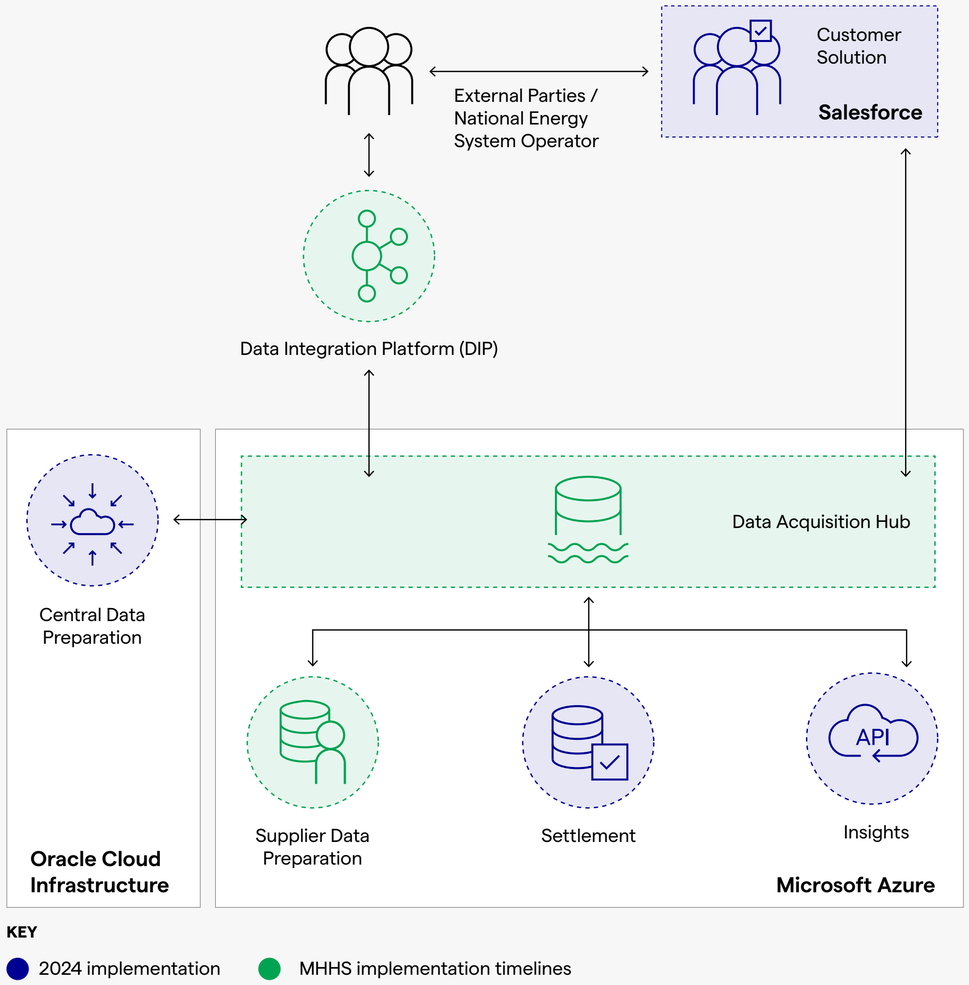
To deliver this fundamental shift of approach, we set up an internal Elexon programme, Helix which, running alongside the MHHS implementation Programme, has incorporated into Kinnect all the functionality necessary to carry out wholesale Settlement in the new MHHS paradigm.

Helix will replace all of our existing supplier volume allocation applications with new cloud solutions in Kinnect. This includes a large scale, cloud Data Acquisition Hub (DAH) for ingesting the data from 40 million smart meters. This is supplemented with additional applications which aggregate and process the consumption data in readiness for Settlement.

Kinnect is comprised of four component parts which are explained on the next page.

"MHHS requires our Settlement process to be capable of ingesting 1.5bn meter readings from smart meters each day."

Kinnect Transition Architecture



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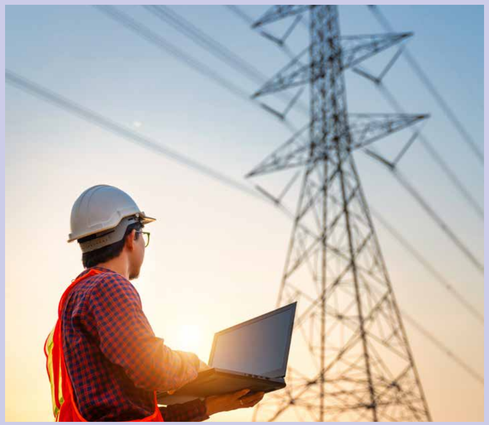
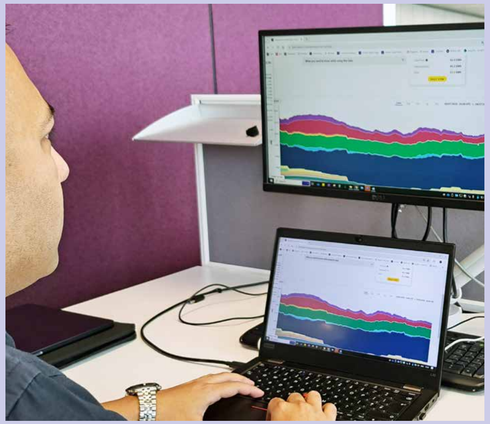
Customer Solution
Provides a simple online process for our customers entering the market. Replacing the need for manual form filling. Companies active in the market can manage their Settlement account online, including registering assets, or registering for new roles. Processes that previously took days now take minutes, effectively removing barriers and speeding up the entry process.



Data Preparation Services
These services collect, process and aggregate data ready for wholesale Settlement. This includes data on both the transmission and distribution networks:

1. Central Volume Allocation – meter data covering flows of electricity at boundary points to the transmission system
2. Supplier Volume Allocation – meter data focusing on the electricity supplied by a specific supplier to its customers at individual metering points.
3. Contract data – we also collect and manage data on bilateral electricity trades.

Settlement Solution
Carries out the core Settlement calculations. This application has been re-architected using micro-service design patterns, which allows more frequent granular change deployment. As a result, we can respond more quickly to deliver regulatory changes and the services our customers need.



Insights Solution
A comprehensive data and insights service to replace the BMRS. This is our core data publishing solution, based on open-data principles and is accessible to everyone. This re-architected cloud solution allows us to respond quickly to customers' data needs and allow them to 'self-serve' data requests and draw insights to make more effective business decisions.

MHHS Data Integration Platform

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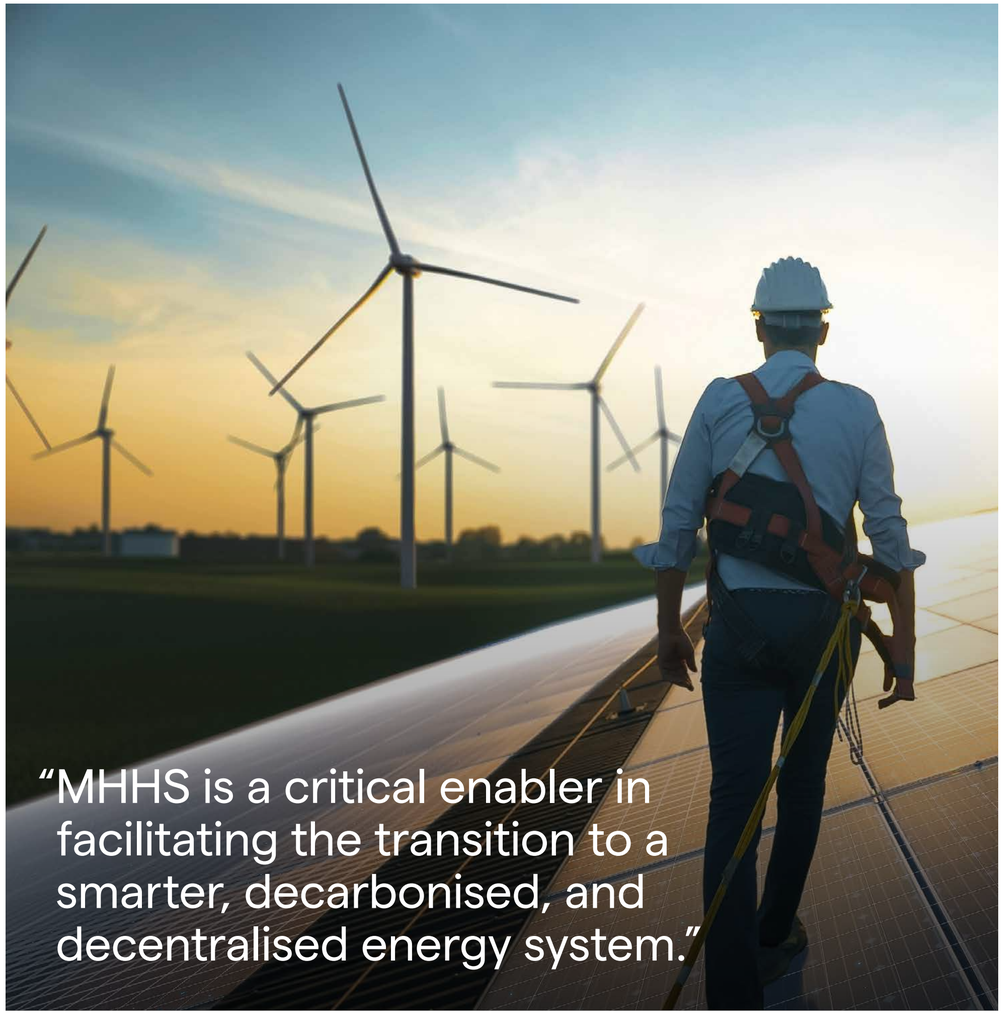
Background
The implementation of MHHS is widely acknowledged as a critical enabler in facilitating the transition to a smarter, decarbonised, and decentralised energy system.

MHHS offers many benefits including:

- Cost savings for consumers – estimates from Ofgem suggest consumer savings between £1.6bn to £4.6bn by 2045
- Environmental benefits – more efficient use of generation, encouraging smarter energy use and allowing the integration of renewables more effectively
- Grid flexibility – more accurate electricity usage data will follow for better planning and investment in grid infrastructure
- Innovation – MHHS allows for the development of new products and services
- Faster and more accurate Settlement – electricity Settlement will take place within four months (compared with the current 14 months). Settlement will also be more accurate.



Elexon has worked closely with Ofgem and the industry throughout the whole MHHS journey. In the initial Target Operating Model (TOM) design phase, Elexon chaired the industry-wide Code Change and Development Group (CCDG) working group where we provided technical leadership in developing the MHHS TOM.

Data Integration Platform
In addition to leading the CCDG, Elexon also headed the Architecture Working Group (AWG) on behalf of Ofgem. The AWG's responsibility was to identify the optimal technical solution for integrating data within the MHHS operating model. In 2021, it advocated an event-driven architecture to meet MHHS needs.

Following approval of these recommendations, Ofgem selected Elexon to oversee the design, development, and industry-wide implementation of the new DIP. This platform functions as a data exchange service specifically designed for the seamless transfer of half-hourly smart meter data.

MHHS Data Integration Platform

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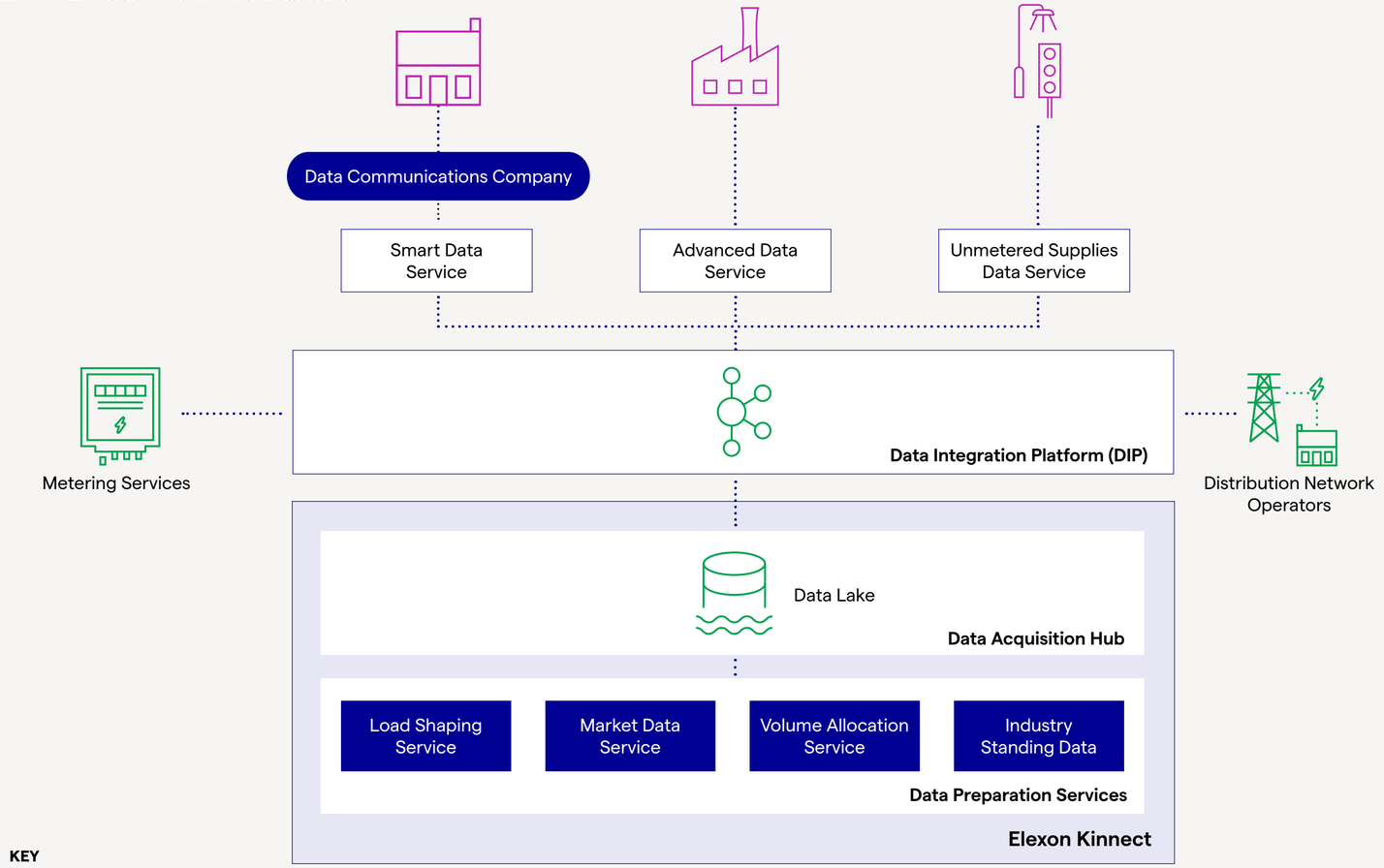
DIP Operations
Elexon was selected by Ofgem in 2022 to take over operation of the DIP in March 2025. As we gear up for this critical industry role, we are currently evaluating the essential capabilities needed to effectively manage the DIP. Data governance presents the primary challenge, and we are measuring ourselves against a set of core principles: data accessibility, quality, stewardship, protection and compliance.

Maximising the potential of the DIP
While the DIP will not be fully operational until 2026, we are already planning its future development, as it is crucial to maximise industry's investment by fully using the DIP's capabilities. Beyond migrating existing data flows, the DIP presents exciting future opportunities, which are outlined in the DIP roadmap section on the next page.

DIP / Kinnect / Helix Architecture



MHHS Data Integration Platform

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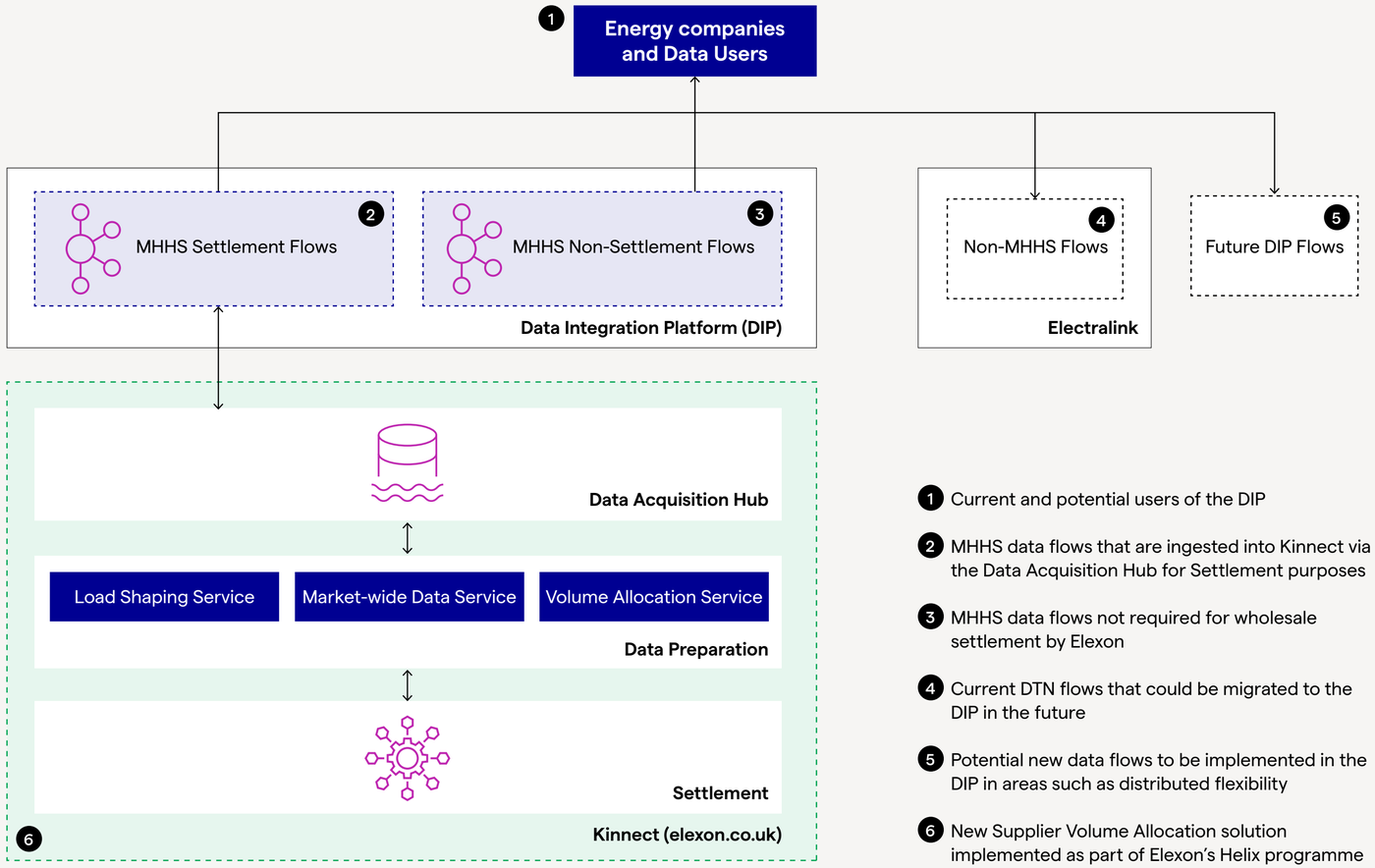
DIP Roadmap
As the DIP Operator, we are committed to maximising the platform's value. While our initial focus is on managing the 40 data flows implemented during the first phase, we have a clear vision for the DIP's future.

Our initial priority is to focus on migrating the remaining Data Transfer Network (DTN) flows to the DIP. The DTN transfers data relating to business-critical energy market processes, including customer switching, Settlement, agent management and meter administration. This migration will significantly reduce costs for industry.

We also see significant potential for the DIP to be used in other markets beyond the domestic smart meter arena. This expansion will involve incorporating new data flows as the platform matures, ensuring a strong return on investment.

The expansion could be applied to sectors with a smaller asset base, like the flexibility market. The DIP's messaging capabilities could be leveraged for functionalities like dispatch notification, demand side response and other scenarios requiring real-time or near real-time messaging.

DIP Roadmap



1. Current and potential users of the DIP
2. MHHS data flows that are ingested into Kinnect via the Data Acquisition Hub for Settlement purposes
3. MHHS data flows not required for wholesale settlement by Elexon
4. Current DTN flows that could be migrated to the DIP in the future
5. Potential new data flows to be implemented in the DIP in areas such as distributed flexibility
6. New Supplier Volume Allocation solution implemented as part of Elexon's Helix programme

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This objective focuses on ensuring that Elexon delivers a unified and seamless customer experience across our evolving product and service portfolio.

Accessing our platform

We are committed to making it easier to interact with Elexon. Our new approach will provide a unified customer experience (CX) which allows access to all of our services, all through one convenient interface. This includes:

- Kinnect
- Knowledge bases
- Digital Code services
- Incident management process.

To achieve this, we are implementing a new Identity and Access Management (IDAM) solution with Microsoft Entra ID. This will simplify authentication for customers and allow us to manage user access more effectively.

A unified CX is a cornerstone of our overall strategy, and this initiative reflects our commitment to that goal.

Seamless Customer Journey

In line with our commitment to delivering a unified customer experience over the next year we will be consolidating the number of external websites and portals we currently provide. In doing this we will be evaluating new technology options that allow us to manage our publication process better and tap into our knowledge base more easily.

Automation and AI

Automation is a key pillar of Elexon's Digitalisation Strategy. We see immense potential in leveraging new automation tools to streamline our operations and unlock significant efficiencies. A major focus for automation efforts will be eliminating remaining manual data handling processes. This will not only free up valuable resources but also minimise errors and improve overall Settlement accuracy.

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Optimised Customer Experience

Digital Code

We launched the Digital Code in March 2022 as a centralised online hub providing easy access to the BSC, and its associated documents. This is not just an incremental upgrade – it is the first step towards a transformative journey.

The Digital Code paves the way for a future where we not only revolutionise code access but also simplify maintenance and streamline handling of multiple, simultaneous code changes. Transforming code management is a cornerstone of our corporate strategy, and the Digital Code is the key enabler that unlocks this goal.

Customer Analytics

We have enhanced the way we share data with BSC Parties and external users with the introduction of our Insights Solution data platform, a key component of the Kinnect platform. The next evolution of this will be the incorporation of a self-service data analytics functionality.

This will allow our customers to fully leverage our vast datasets and create their own bespoke insights. Customers of all types will be able to access, analyse, and explore their data independently in our secure cloud-based analytics environment.

Customer Experience

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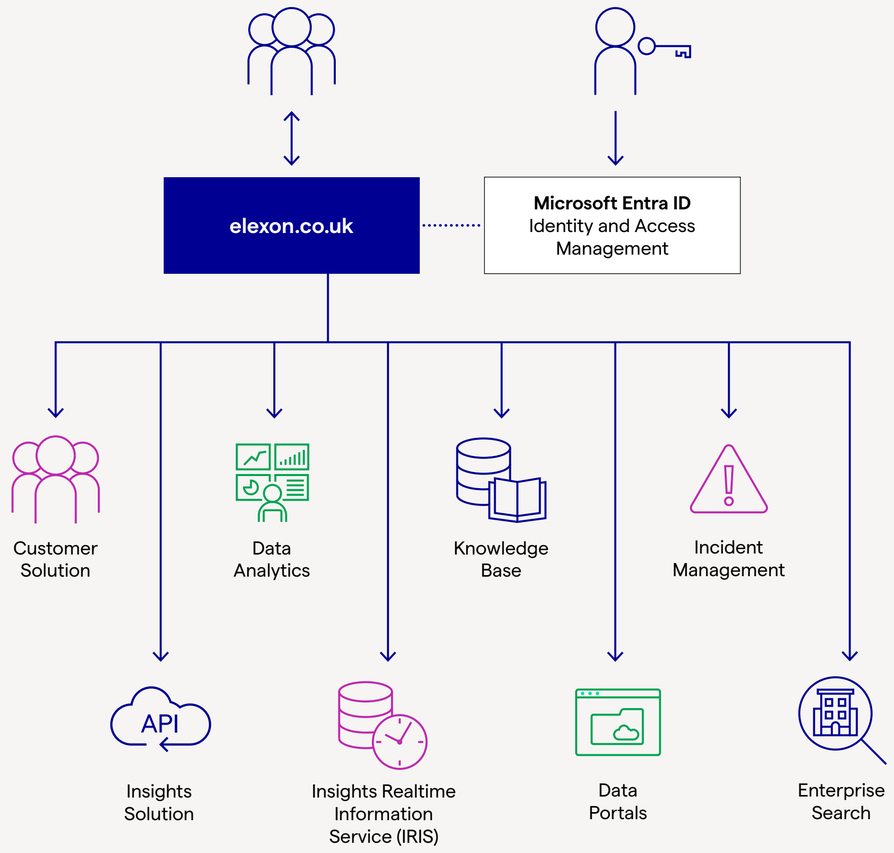
Customer Experience



Delivering a unified and seamless customer experience across our evolving product and service portfolio is a core strategic objective.

We have identified three main personas for the customers who are using our data, explained on the next page.

Our rapid digital expansion has brought a wealth of new services like the Customer and Insights Solutions and the Digital Code. However, this growth has not fully considered the customer experience of integrating these offerings. Prompt action is crucial as we continue to introduce new services, including a Service Management portal (Elexon Support) and the government's Network Charging Compensation (NCC) scheme, bringing Energy Intensive Industry (EII) users on-board.

Identity and Access Management (IDAM)
This year marks a significant upgrade in user management processes. We are migrating to Microsoft Entra ID, a powerful IDAM solution. Entra ID streamlines user cohort management for our platform services team. By leveraging its capabilities, we can also retire our previous tool, OKTA, and streamline the number of external user accounts we manage. This simplifies administration and enhances security.

With Microsoft Entra ID, we gain granular control over cloud service access for different customer types. Additionally, we can centrally manage our user base and secure access for software development partners, streamlining collaboration.

Streamlined access
Our vision is for all customers to access every Elexon service through a single, convenient entry point: elexon.co.uk. From this central hub, they will be able to:

- Browse our corporate website and knowledge bases for valuable information
- Access the existing Digital Code and, in the future, explore our exciting AI tooling – both key elements of our digitalisation strategy.

Registered customers will experience additional advantages, gaining access to the following services from the same entry point using the single sign on:

- Customer Solution
- Insights Solution
- IRIS (Insights Realtime Information Service)
- Data Analytics
- Service Management
- Data Portals.

This not only simplifies navigation but also saves valuable time. Additionally, an enhanced single enterprise search capability is planned, making it even easier to find information.

Customer Experience

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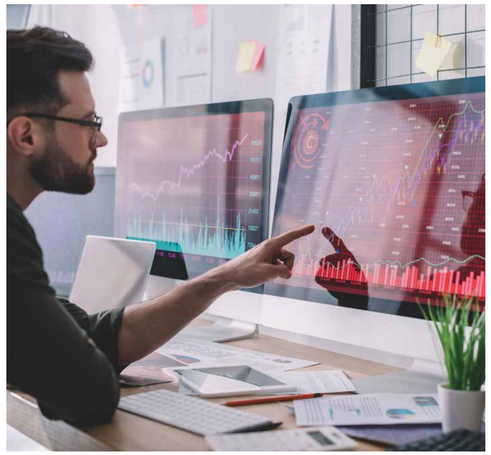
Customer Personas
We have identified three main personas for people who access our services:



Market Participants
Includes energy Generators, Suppliers, and traders who actively participate in the Balancing Mechanism for electricity in Great Britain. They would rely on Elexon's data and services to manage their positions and optimise their participation.

Data Analysts and Researchers
Includes individuals or companies working both inside and outside the energy sector who use Elexon's open data (via the Insights Solution) for market analysis, research purposes, and developing innovative energy solutions.

System Operators and Regulators
The NESO and other regulatory bodies who use Elexon's data and services to monitor the electricity market, ensure its smooth operation, and develop policies.

Digital Code

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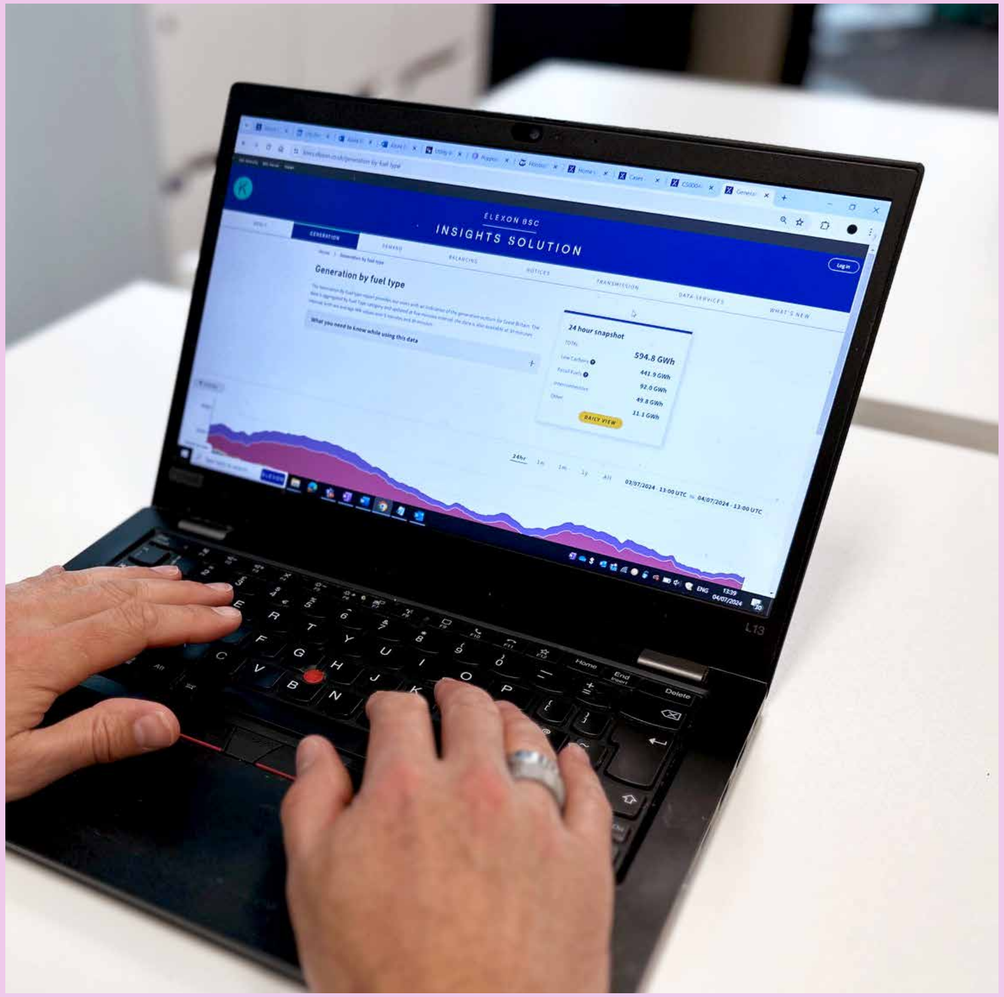

The Digital Code is a comprehensive platform designed to help our customers navigate the electricity wholesale market arrangements and better understand their obligations. Originally launched in 2022, we are now working to expand the Digital Code beyond the core BSC documents.

Our vision is for the digital code to:

- Be the master version of all customer-facing Elexon documents ensuring a single, authoritative source for customers
- Integrate with Elexon's other product offerings to provide a consistent and seamless customer experience through Elexon's product portfolio
- Radically simplify the BSC document and change management processes and provide clear, accessible communication regarding updates and changes
- Empower customers to understand their BSC obligations in a dynamically changing electricity market to make the best decisions for their businesses and customers
- Continuously improve, based on customer feedback
- Offer training and support to help customers leverage the platform to its fullest potential.

Our goal with the Digital Code is to transform the way we manage change, enhance customer support throughout the change processes, and offer a cohesive, user-friendly product for interacting with our documentation. Ultimately, we aim to deliver a product that meets and exceeds our customers' expectations, providing them with the tools they need to succeed in a rapidly evolving electricity market.

The diagram on the next page describes our roadmap for developing the code with new features and enhancements over the next three years.

Digital Code

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Delivering in 2024

Basic role filtering:
Which will allow customers to use filters to obtain all the BSC documents relevant to their role.

Digital Code Log in:
Currently there is no authentication needed to access the Digital Code. We are looking to integrate with Elexon's single sign on solution. Accessing the Digital Code via a user account offers benefits to users such as retention of search history, favourites, and personalisation of their experience.

Delivering in 2025

Chat bot
A chat bot will further speed up searching and allow customers to 'self serve.'

API development
API documentation will allow users to automatically extract documentation that is relevant to their role.

Delivering in 2026

Integration of the BSC change management
This will allow Parties that have raised proposals to view progress and development, and see 'red line' text changes on relevant legal documents, all of which helps transparency.

Advanced role filtering
This will allow users to retrieve more precise information (individual paragraphs from documents, rather than just the document itself).

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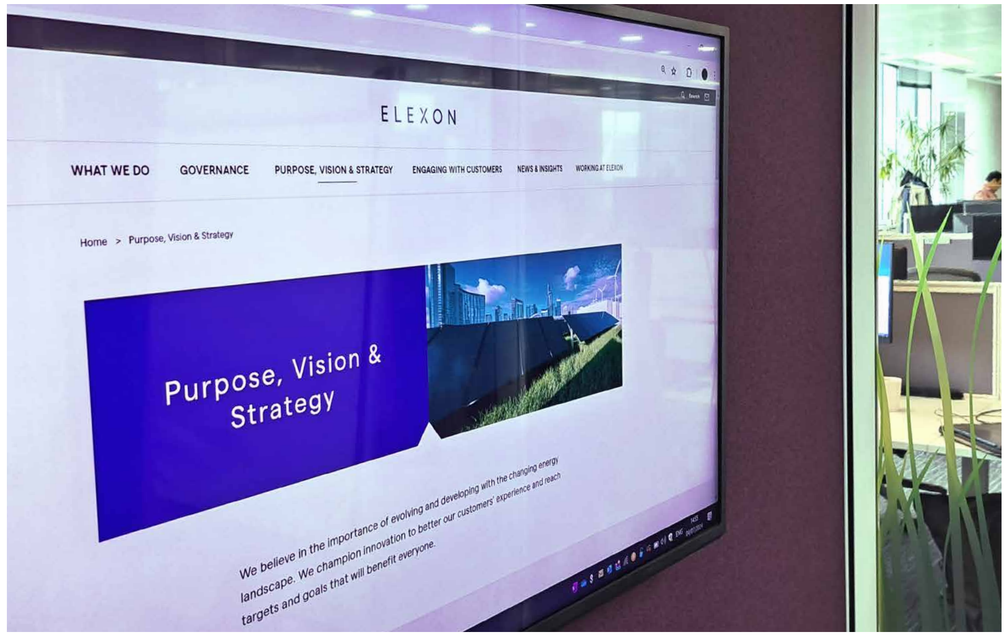

Embracing Agile from the Start: Building a Collaborative Delivery Model for Kinnect

Kinnect's development kicked off with a commitment to agile methodologies. This meant a fundamental change: transitioning from a single, all-encompassing system integrator to a more collaborative model. We now leverage multiple specialised suppliers across our infrastructure, with our own internal teams orchestrating and managing this network.

This shift was not simply a matter of changing vendors. It required building strong relationships with new partners and restructuring our organisation to be more adept at product development. We established a highly skilled change practice specialising in the SAFe agile framework. This involved creating cross-functional product teams that combine internal expertise (delivery managers, architects, business analysts, and testers) with the capabilities of embedded third-party development teams.

The Helix Programme: Putting Agile to the Test

The true test of our new delivery model came with the Helix Programme. This internal initiative aimed to adapt Kinnect to the complexities of the MHHS regulations. It was a demanding cloud-based project, spanning multiple cloud environments and involving three software development partners working across five distinct work streams.

Initial design challenges arose, but we successfully navigated them by establishing an internal architecture and infrastructure team within Elexon. This team took the lead on design and planning activities, ensuring a cohesive overall design that unified all five work streams.

While the multi-year delivery was not without its obstacles, our commitment to agile practices proved instrumental. Agile methodologies allowed us to deliver this complex project within the strict timelines of the MHHS programme.

The Future: A Product-Centric Delivery Model for Elexon

The evolution of our delivery model continues. Our next steps involve seamlessly integrating the DIP into our product structure. This signifies a strategic shift towards a product-centric model. In this model, dedicated, fixed-capacity teams will be fully invested in the product's entire lifecycle.

From initial development and ongoing maintenance to comprehensive user support, these teams will be the cornerstone of our product's success.

We remain committed to an agile and lean delivery approach, and we are increasing Elexon's ownership of the delivery model by actively developing the necessary technical and leadership expertise within our organisation.

Finally, we are taking control of governance for all Information Technology Infrastructure Library (ITIL) processes. This will be delivered by leveraging the capabilities of our enhanced Service Management Team and our new Elexon Support platform. By bringing ITIL process governance in-house we will ensure greater ownership and efficiency.

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As we continue our journey of digital transformation, we recognise the importance of anticipating and mitigating potential risks. This dedicated risk section shows how our digitalisation roadmap initiatives remove and mitigate these potential challenges. By proactively addressing these risks, we can ensure the smooth implementation of our digital strategy, maximise its benefits, and ultimately achieve our ambitious goals.

Risk	Detail	Mitigation
Cybersecurity threats	Increased reliance on digital systems makes organisations more vulnerable to cyberattacks, data breaches, and theft.	• We are currently working towards full ISO27001 compliance across entire cloud estate by 2025. • An enhanced cloud monitoring and auditing capability is being introduced into our Platform Services team
Data privacy	New technologies and data collection methods raise concerns about data privacy compliance and potential misuse of customer information.	• Following a full data governance assessment by a third party, we are introducing new data compliance roles, including a DPO in our Legal team. • Elexon is ensuring industry data best practices and standards are adopted and managed across the company. • Access to PII data from MHHS will be controlled by integration with new consumer consent framework.
Skills	Implementing new technologies may expose a lack of skilled personnel within the organisation to manage and maintain these systems.	• Full business capability review to support our 2025/26 Business Plan has focused on digital skills gaps. • A number of data and digital training initiatives are currently underway.
Compliance	New technologies and business models may introduce unforeseen regulatory hurdles and compliance challenges.	• Following a full data governance assessment by a third party, we are introducing new data compliance roles, including a DPO in our Legal team. • New compliance processes will be introduced to support the operation of the DIP and the smart meter repository.
Technology dependence	Over-reliance on specific technologies or cloud platforms can create vulnerabilities if systems fail, become obsolete, or experience vendor lock-in.	• Elexon have adopted a multi-cloud architecture for the Kinnect platform to promote future flexibility. • Our platforms are developed and supported by a number of trusted software development partners, which has reduced our reliance on a single supplier.
Integration	Integrating new digital tools with legacy systems can be complex and lead to compatibility issues or data silos.	• Our data strategy for Kinnect introduced a single data acquisition hub for data, allowing data to be stored once and then shared across applications. • The consolidation of analytics tooling within MS Azure has allowed the decommissioning of numerous legacy database solutions.
Resistance to change	Digitalisation can disrupt existing workflows and require employee retraining, potentially leading to resistance and decreased productivity.	• Elexon organisation change to product teams has promoted widespread ownership to digital change. In particular, the Digital Code product has focused on transforming legacy processes. • Our corporate strategy has encouraged innovation across Elexon as we look to digitalise our business and build a performance culture.
Project mismanagement	Poorly planned digitalisation projects can lead to cost overruns, delays, and failure to achieve desired outcomes.	• Elexon's Programme Management capability has developed over a number of years delivering complex, major change programmes with lessons learnt.

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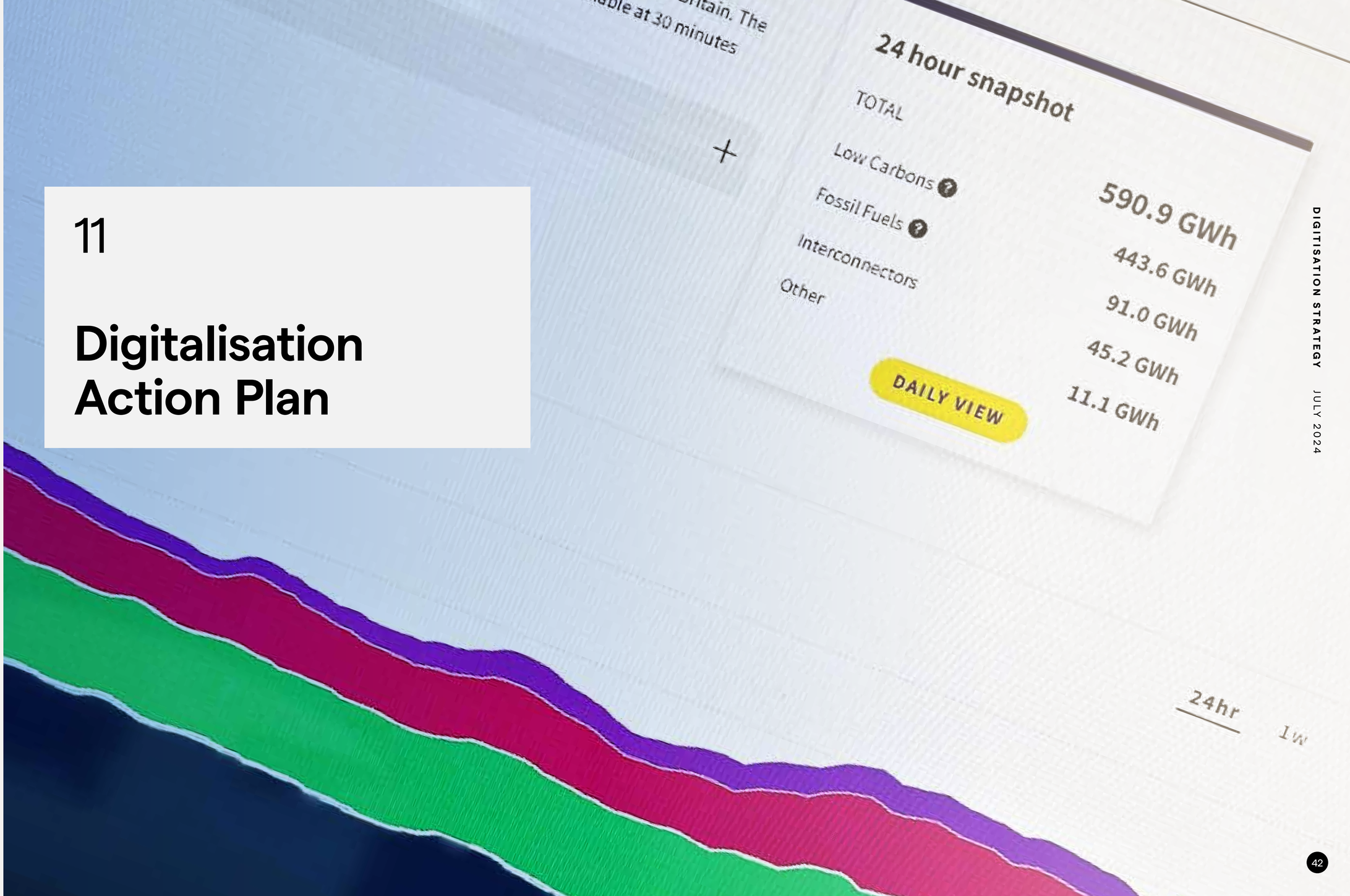

Data as a Service (DaaS)

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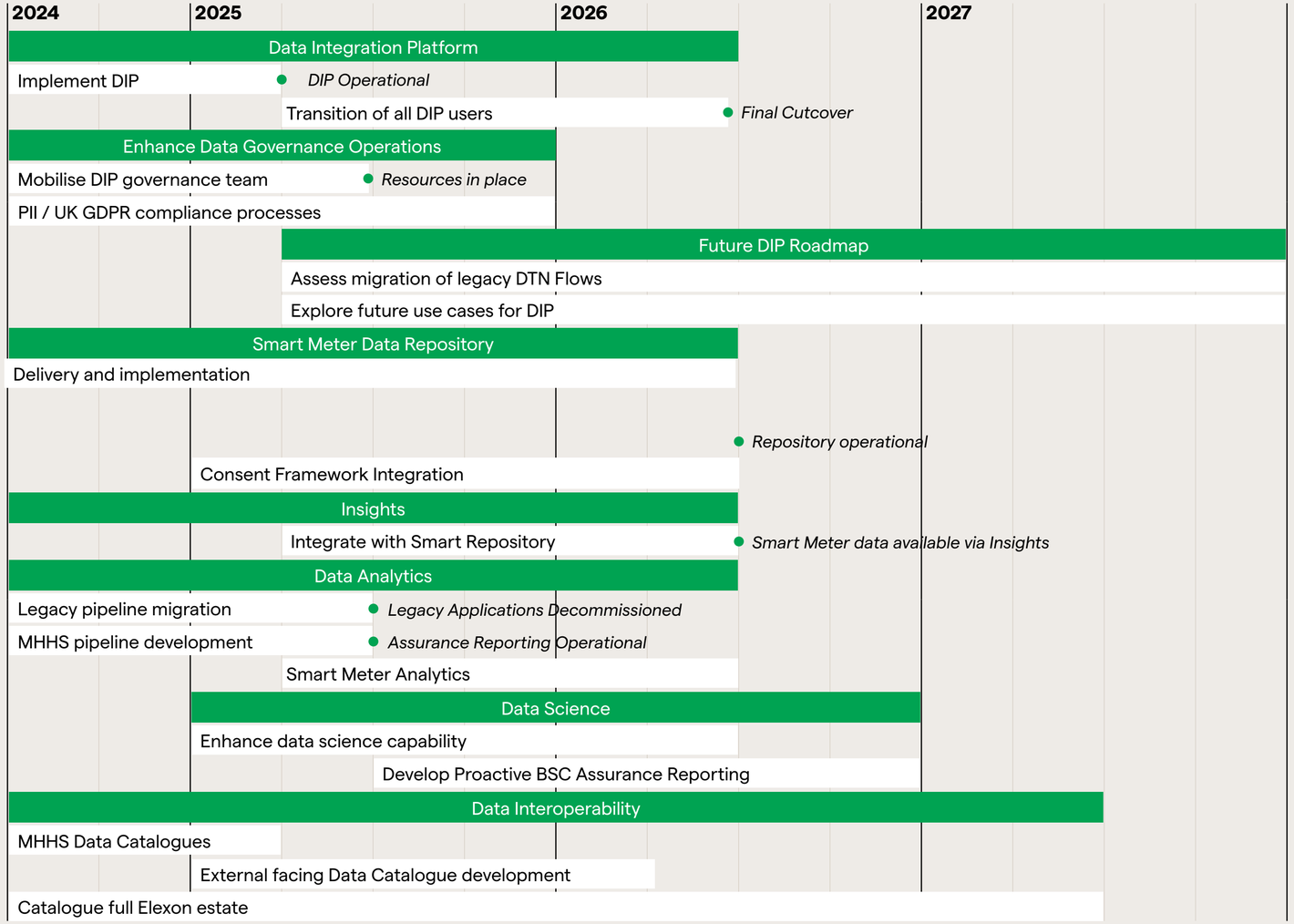

Enhanced Digital Capabilites

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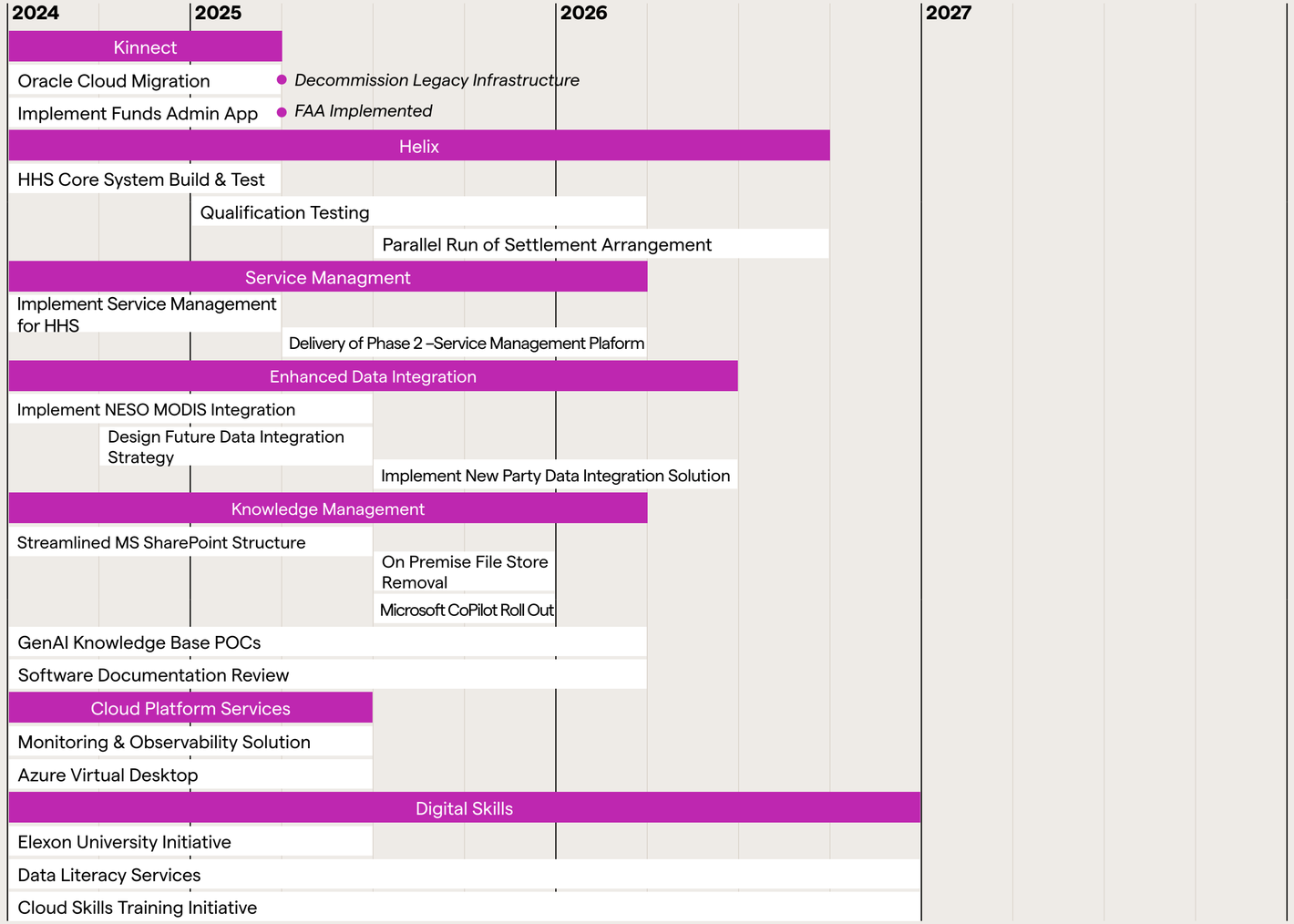

Optimised Customer Experience

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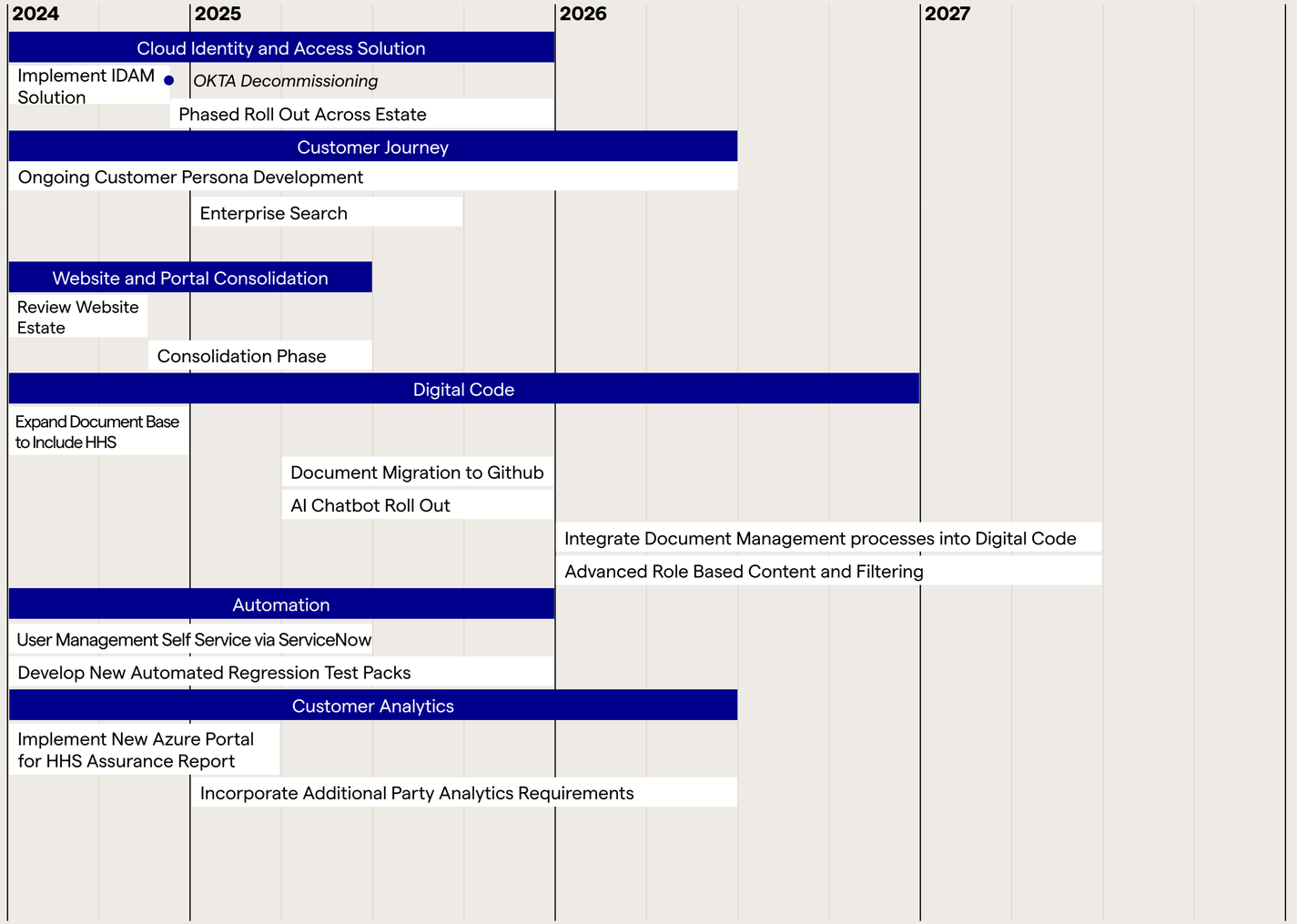

Elexon
350 Euston Rd, London
NW1 3AW, United Kingdom

Tel: 020 7380 4100
Web: elexon.co.uk

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