Empowering the Energy Transition

Alliander's Digitalisation Vision and Strategy 2026–2030

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Preface

Empowering the Energy Transition

Alliander is facing a major social challenge: how to make the energy transition possible. We have realised that simply working harder will not be enough to achieve our goals. Today, grid congestion is having a significant impact on how we live and work, as well as on our prosperity, wellbeing and resilience. Demand for electricity is continuing to rise, with the result that many companies already find themselves on the waiting list for a new or higher-capacity grid connection. Low voltage grid applications will also be placed on the waiting list from July 1st 2026. The challenge we are facing here is not a sprint, but a marathon that is getting increasingly complicated. It is therefore important to identify how we can use digitalisation most effectively, how to best address the challenge and how we can sustain our efforts in this area.

> “All work packages linked to the energy transition involve digitalisation. Digitalisation is crucial to facilitate the energy transition.”

The importance of digitalisation is reflected in the increasing dominance of digital technology, both inside and outside Alliander. It is essential that we make more efficient use of our grid by allocating any remaining capacity, outside of peak hours, to parties who are able to use it flexibly. We were once an energy technology company, but today digital technology is every bit as important, if not more so. This is expressed in our digitalisation vision.

Digitalisation is crucial to the success of the energy transition:

- A Distribution System Operator (DSO) that works digitally is more productive and collaborates more effectively with its stakeholders.
- A digital energy system is more adaptable and more controllable.
- A digital energy market can resolve grid issues more quickly and boost economic activity in the Netherlands.

To achieve our goals in this area – whether we are talking about innovation or implementing new digitalisation functions – we need to get new things right first time and for everyone, rather than introducing them separately for each individual party, for example. That would be too costly to society in terms of both money and time, which we simply do not have. Our strategy is based around making sure that we operate as efficiently as possible. We must always ask ourselves: am I not reinventing the wheel here? Who is already doing something similar? Can I tie in with them in some way? Here we are talking about any party who has a relationship with the grid operator, e.g. consumers, local authorities, policymakers and knowledge institutions, as well as contractors and installation companies. We also pay attention to other sectors and stakeholders facing similar challenges. We can help our stakeholders much more effectively by understanding what they are looking for and by making our data and knowledge available to them.

Due to the energy transition, we are seeing huge changes in the way we generate and use energy. Electricity consumption is rising due to the electrification of homes, transportation and industry. The use of renewable energy sources means we need to find a place on the grid for peaks in generation and make sure the supply of and demand for sustainable energy are in balance. This is a major challenge for society and the greatest challenge Alliander has faced in its history.

Digitalisation is a transition in itself. We are moving away from automation and towards creation. From working with a computer towards forming a relationship with your virtual assistant, consultant or coach. Digitalisation is changing business sectors and society. Alliander has been investing in this change for many years now and consequently has a well-developed, strategically aligned digitalisation capability. Today, at a time when the world around us is changing so quickly, it is particularly important that we reassess this strategy regularly; you will find a summary of it in this document. How will we use digitalisation to help Alliander meet its energy-transition challenge? That is what Alliander's Digitalisation Strategy 2026–2030 is all about.

Rinke van de Rhee
Chief Digital Officer
Member of Alliander's Executive Committee

Empowering the Energy Transition

Alliander's Digitalisation Strategy 2026–2030

Our digitalisation vision

Digitalisation is crucial to the success of the energy transition.

- A DSO that works digitally is more productive and collaborates more effectively with its stakeholders.
- A digital energy system is more adaptable and more controllable.
- A digital energy market can resolve grid issues more quickly and boost economic activity in the Netherlands.

What are we facing?

The energy transition requires us to work faster. Digitalisation is essential to further increase the sustainability of the energy system.

Digitalisation is one of the major transitions of our time. What opportunities do we see? And also, what new problems and challenges do we need to tackle?

Where are we now?

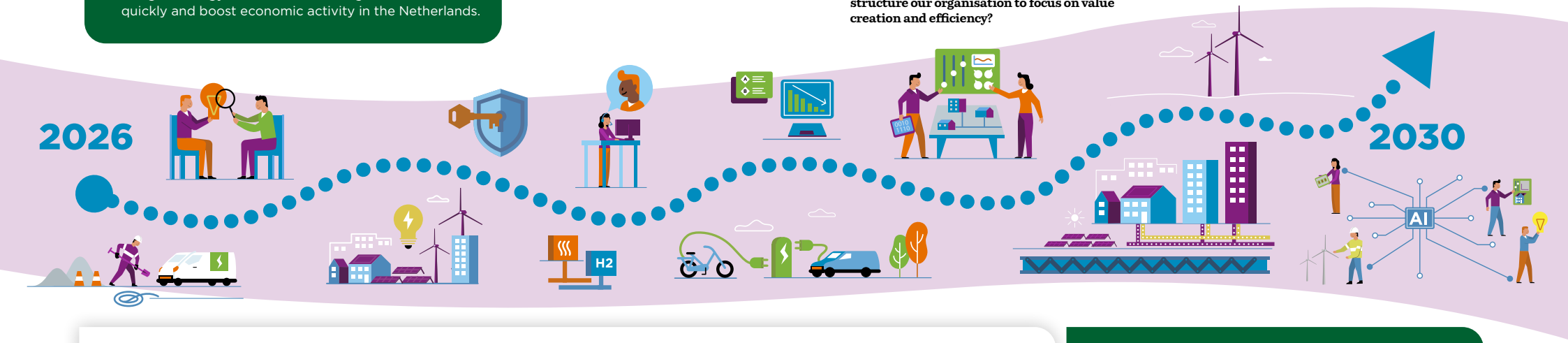
Digitalisation has been scaled up and is focused on delivering efficiency and added value.

We are approaching the limit of what Alliander can handle in terms of growth and digital innovation. Furthermore, we still face the challenge of speeding up production. How can we organise our people and resources and structure our organisation to focus on value creation and efficiency?

Where are we heading?

We have identified seven digitalisation themes. These will be used to set our course. Three themes have been identified as priorities.

These themes have been specified in further detail in a digitalisation roadmap and an associated plateau plan.



Digital priorities

Using artificial intelligence (AI) in ways that works for us

Alliander will use AI in a value-driven and people-centric way to achieve better work performance and solve the complex optimisation challenges presented by our new energy system.

In 2030 AI will be the key to optimal performance in the new energy system. We will use AI as a power tool in the hands of our employees and set clear priorities for how it is used.

Facilitating sharing of data and transactions

Alliander will make it easier for consumers, businesses and public authorities to access and share relevant data. This will open up opportunities for new services, such as dynamic capacity tariffs.

In 2030 we will have a robust ecosystem in which data and transactions are shared securely, in real time and in a user-friendly way. Customers, public authorities and market parties will have access to reliable information and services that will accelerate the energy transition.

Co-creation through collaborations and partnerships

Alliander will work together with DSOs, knowledge partners and the business community to prevent double work, benefit from economies of scale and use digitalisation capacity more effectively.

In 2030 we will be using our digitalisation resources in a demonstrably more effective way. By means of clear sourcing decisions and the joint development and management of digital products, we will make systematic savings. We will have a robust digital ecosystem at our disposal in which collaboration is the norm, innovation is accelerated and resource use is optimised.

Our journey to 2030

We want to use digitalisation to transform the energy system, the energy market and the way we work as a DSO. In 2030, the digital energy system will deliver an integrable, controllable and sustainable supply of energy – one in which digital resilience is embedded. A digital energy market will optimise the energy grid and generate economic activity. A DSO that works completely digitally will reduce its administrative burden. It will have control over its operating processes, will increase its efficiency and will work together with its stakeholders more effectively. With the help of digitalisation, we will reinforce Alliander's strategy and accelerate the Netherlands' sustainability transition.

Contents

Our Digitalisation Vision

Digitalisation is essential for a successful energy transition

Digitalisation is the driving force behind an energy system that is reliable, affordable and flexible. We want to transform the energy system, the energy market and the way we work through digitalisation. We are building a future in which digitalisation not only plays a supporting role, but also determines how we work, plan and collaborate with others.

A **Distribution System Operator (DSO) that works digitally** is more productive and collaborates more effectively with its stakeholders

As a DSO, Alliander's work is becoming increasingly digitalised. Together with the sector we are developing digital products and services that automate processes and improve decision-making. With the help of up-to-date data and smart algorithms:

- We are managing and optimising the grid continuously
- We are focusing in a targeted way on capacity, maintenance and investments
- We are increasing productivity, efficiency and collaboration

Digitalisation is helping us to implement projects more quickly, work more efficiently and maintain a better overview.

A **digital energy system** is more adaptable and more controllable

The digital energy system forms the basis for the energy system of the future. It connects the physical grid with digital technologies, such as smart meters, digital twins and AI-controlled algorithms. This system:

- Anticipates peak loads
- Supports decision-making
- Makes the energy system controllable and resilient

Digital resilience is crucial here: only a secure and stable digital basis will allow the energy system to remain reliable and future-proof.

A **digital energy market** can resolve grid issues more quickly and boost economic activity in the Netherlands

The energy market is developing into a digital ecosystem in which everyone can participate with the help of smart solutions, such as:

- Electric cars that charge automatically when grid capacity is available
- Solar energy that is shared immediately or stored
- Smart appliances that respond to grid conditions

By making optimal use of flexibility, we can create a dynamic, resilient and future-proof energy system.

Energy transition requires us to work faster

The Digitalisation Strategy reinforces Alliander's strategy

The Digitalisation Strategy complements Alliander's strategy. Its goal for 2030 is to offer customers solutions that are compatible with an affordable and reliable energy system. In this way we not only want to make the energy transition possible, but also accelerate it. How we plan to achieve this goal and what we need from others is set detailed out in Alliander's strategy. This strategy is made up of seven different pillars.

1. Excellent management. Optimising maintenance & improving customer experience
2. Reducing demand for transmission capacity
3. Improving network use
4. Scaling up
5. Sharing data and developing new market services
6. Developing infrastructure for heat and sustainable gases
7. Creating future-proof foundations

To allow us to offer timely solutions to accelerate the Netherlands' sustainability transition, Alliander's strategy focuses, amongst other things, on creating future-proof foundations:

- If we are to realise all our goals and carry out our activities successfully, we need solid foundations. We form those foundations ourselves as an organisation: through the way we work with each other and with our partners and the way we are supported in this by good financial management, accurate information and reliable underlying systems.
- Many of our strategic decisions and processes require digitalisation, based on a future-proof and robust IT environment.
- The major task facing us, as well as the challenges resulting from the scarcity of resources, call not only for a good strategy, but also, in particular, for an effective and agile organisation where processes, and the coordination within them, run smoothly. This applies within our teams, in our value chains and also in the working relationship with our partners.

Digitalisation is an essential foundation for our seven pillars, but also comes with its own external dynamic. The digitalisation themes described further on in this document form the basis for implementation plans and actions that will help us realise our strategy.

In-depth: Link between digitalisation and the future energy system

Alliander's Energy Vision and Strategy 2030 outlines a future in which the energy system undergoes a fundamental transition:

- from fossil fuels to sustainable energy
- from a demand-driven to supply-driven system
- with strong emphasis on flexibility, collaboration and social legitimacy

Digitalisation is vitally important to make this transition a reality.
The Digitalisation Vision shows how technology makes the energy system smarter, more robust and more inclusive:

Digitalisation bolsters our energy vision in five different ways:

1. **Smarter energy system**
   Use of digital technology, such as real-time monitoring, smart algorithms and Artificial Intelligence, creates a system that is self-learning and scalable.

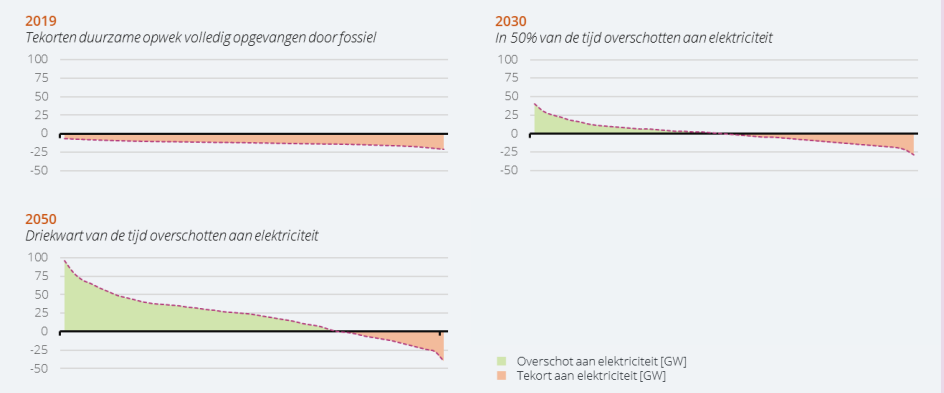
2. **Acceleration of infrastructure development**
   Digital grid maps, automated decision-making and capacity control make management of the system more effective and implementation faster.

3. **Custom solutions for each sector**
   Smart control and data-driven insights ensure the sustainability transition is optimised for each sector, from industry through to mobility and the built environment.

4. **Flexibility and participation**
   Digital platforms and smart appliances make it possible to participate actively in the energy market and make optimal use of flexibility.

5. **Reliability and affordability**
   Digital resilience, predictive maintenance and efficient grid management ensure that the energy system is robust, affordable and enjoys public support.

Digitalisation makes Alliander's Energy Vision and Strategy 2030 feasible and scalable. By combining technology and collaboration, we are building an energy system that works for everyone.



Source: Alliander's Energy Vision and Strategy 2030

What are we facing?

Digitalisation is one of the major transitions of our time

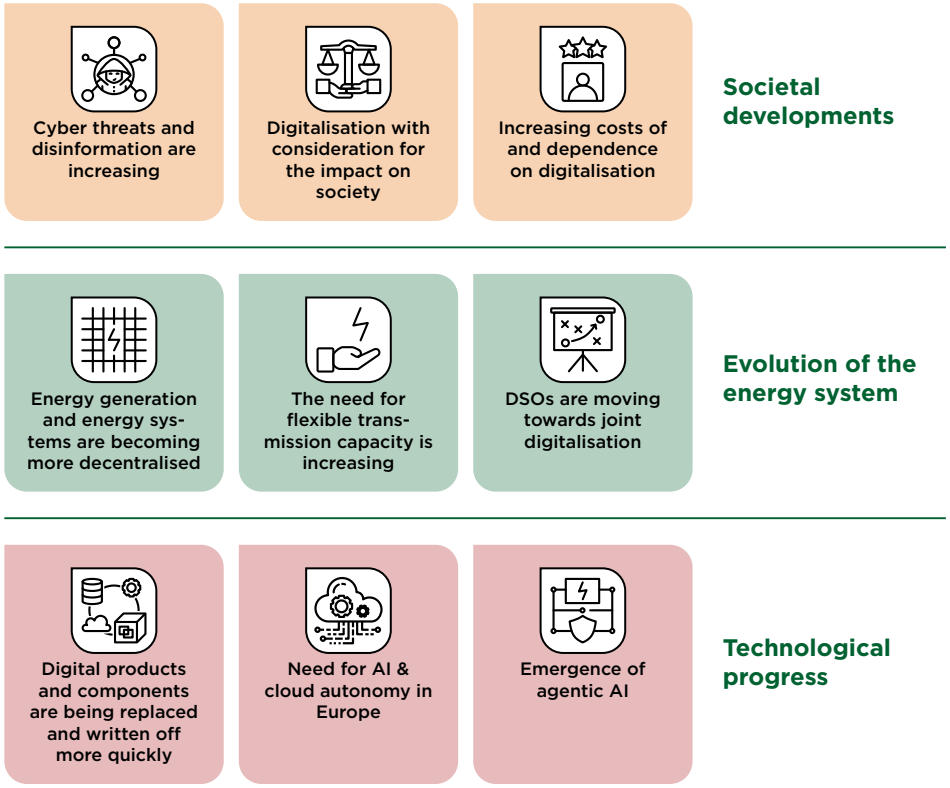
The possibilities offered by digitalisation are growing rapidly. In terms of our work, this means we can achieve greater speed and efficiency. This increase in speed requires us to enhance our Operational Technology (OT) and Information Technology (IT) capacities and use data smartly to allow more efficient control of the energy network. AI is developing into a mature technology: the hype is making way for practical, everyday use.

Opportunities and risks

Digitalisation offers countless opportunities, but also makes us vulnerable to data leaks, cyber attacks and disinformation. We are therefore increasing our digital resilience and making sure that our employees are able to identify risks at an early stage. International tensions and dependence on external technologies are making this more urgent, while increasing digitalisation costs are putting pressure on the affordability of our energy grid. This is giving rise to new issues relating to the life span, maintenance and resilience of our digital systems.

As we approach 2030, the future is both certain and uncertain

We do not know exactly what the world will look like, but it is clear that digitalisation, the energy transition and societal changes will follow each other in rapid succession and also be mutually reinforcing. To ensure we can respond to this dynamic situation effectively, we have assessed around fifty external trends and developments. Nine developments that are the most relevant to us in the area of digitalisation jump out from this assessment.



Societal developments

Society and Alliander are becoming increasingly reliant on technology. Digital solutions have become indispensable in our daily work and business operations. At the same time, our dependence on international suppliers of cloud services, AI and software is growing. This makes us more vulnerable to external influences and geopolitical shifts.

Geopolitical uncertainty

Power dynamics are changing internationally. This is creating uncertainty for Europe and for Dutch businesses. Supply chains are coming under pressure and are being used more and more often as a strategic instrument in geopolitical relationships, leading to uncertainty, higher prices and possible disruptions in the availability of digital technologies.

Digital resilience

The Netherlands Public Prosecution Service (PPS) took systems offline after hackers exploited a vulnerability in the public prosecutor's Citrix system. "Russian hackers may be behind attack on PPS systems"
Algemeen Dagblad, Thursday 24 July 2025.

Shifting priorities

Priorities are shifting in society. Long-term climate goals are coming under pressure as a result of the growing focus on energy independence and the short-term interests of parties. At the same time, sentiment in society is moving towards greater social inclusion and a focus on social legitimacy.

New transparency and resilience requirements

New European legislation and regulations, such as the NIS2 Directive and the Cyber Resilience Act, place DSOs under an obligation to ensure far-reaching transparency, control and resilience in the digital chain. This means that Alliander must invest in systems and processes that offer continuous insight into its digital resilience and its compliance with laws and regulations.

Strategic implications for Alliander

Digital resilience as a requirement: Due to the increasing threat of cyber attacks and disinformation, combined with stricter regulations, digital resilience is becoming ever more essential.

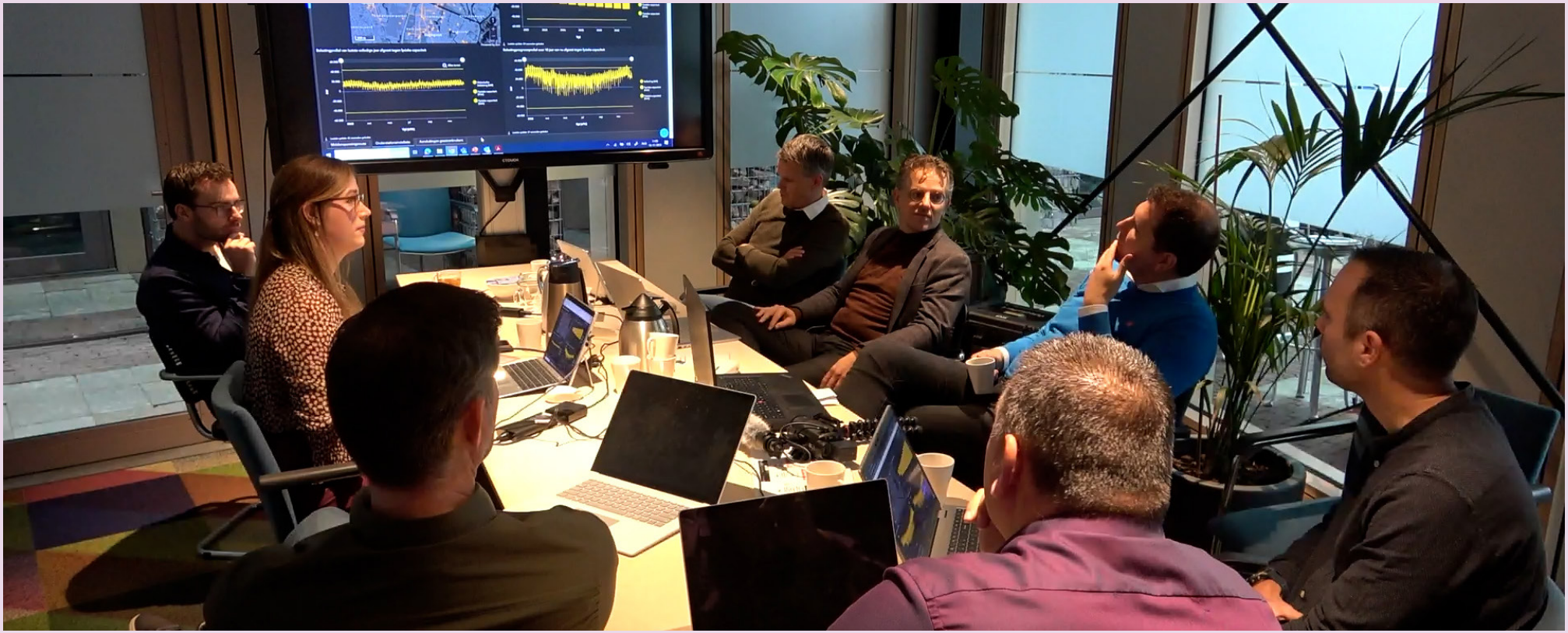
Digital autonomy: Ensuring control over our digital chain is gaining in importance. That means being less dependent on a small number of international suppliers and investing in our own knowledge, technology and partnerships within Europe.

Regulations and compliance: New legislation is demanding demonstrable transparency and control over digital processes and chains. This calls for investments in monitoring, reporting and governance.

Social legitimacy and costs: Digital choices not only have to be secure and efficient, but also contribute to social goals, such as sustainability, inclusion, public value and the affordability of the energy system.

Casestudy: Neighbourhood Energy Scan

The **Neighbourhood Energy Scan** will allow us to share more data than we have done as a company up to now. Interested parties (companies, consultancies, market parties) will be able to see energy data relating to their immediate vicinity within a congestion area, e.g. data about the capacity of the energy grid in the immediate vicinity or data about the capacity contracted and used by companies ('grid neighbours') located in the area. The Neighbourhood Energy Scan also provides an insight into the waiting list of customers who want to be connected to the grid in that particular area.



Evolution of the energy system

Over the coming years the energy system will change fundamentally, as described in Alliander's Energy Vision and Strategy 2030. We are making the transition from fossil fuels to sustainable energy sources. As part of this we are switching over from a demand-driven to a supply-driven system. Flexibility, collaboration and social legitimacy have an important role to play here.

Fundamental system change

Sustainable energy is increasingly being generated at a local, decentralised level, e.g. via solar and wind power. This is triggering an explosion in demand for transmission capacity on the electricity grid. Consequently, more and more often, the grid is becoming saturated (congestion). As sustainable sources are less predictable and controllable, there is a growing need for flexible transmission capacity and smart grid management.

Strategic system optimisation towards 2030 and 2050

System optimisation is essential to future-proof the energy system. This calls for:

- **Tiered optimisation of grid usage:** Smarter use of existing infrastructure, with the help of real-time data and algorithms.
- **Continued development of congestion management:** Proactive anticipation of peaks and troughs in supply and demand.
- **New tariff structures and standards:** Incentives for flexible behaviour and investments in the grid.
- **Analysis of impact on industry, the built environment and mobility:** Insight into the consequences of decisions for various sectors.

Strategic implications for Alliander

Digitalisation as the key: Digitalisation will play a central role in helping us achieve these optimisations. By using cutting-edge data analysis, AI and the Internet of Things (IoT), we will obtain a real-time insight into the grid and will be able to manage it more quickly and smartly. DSOs in the Netherlands and across Europe are facing similar challenges and are increasingly looking to work together.

Strategic collaboration as the catalyst: In the energy sector, DSOs and other parties are working together more and more actively. Together we are tackling complex issues, such as standardisation, interoperability and digital innovation. As part of this process, strategic partnerships are being formed with market parties, public authorities and knowledge institutions. By sharing knowledge and expertise, parties are able to learn from one another and speed up digitalisation.

2030: The energy system will be centralised and decentralised

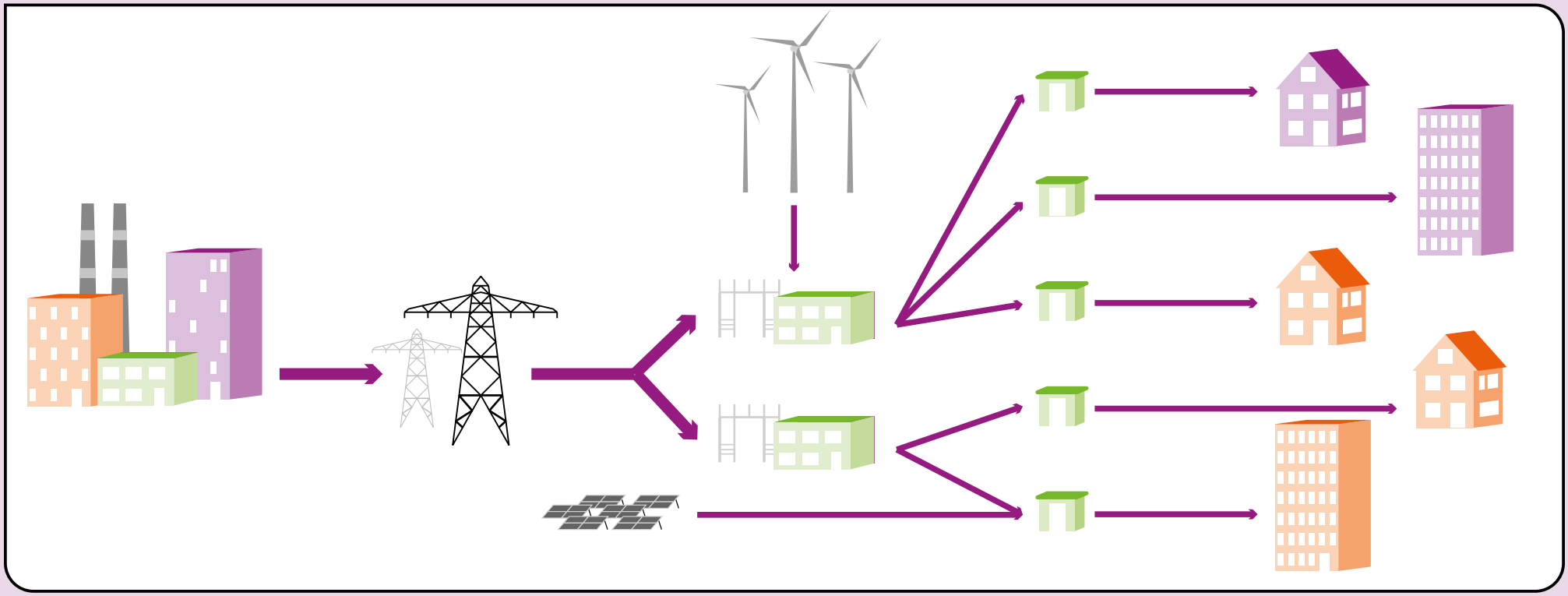
In 2030 there will be a layered energy system in which connections are optimised at regional and national levels. Locally, district heating systems with heat storage will help store energy for use in the colder months and help ensure security of supply, although full autonomy in the Dutch context is not realistic. The national system will retain its leading role in terms of pricing and international security of supply for both gas and electricity.
Alliander's Energy Vision and Strategy 2030.

Casestudy: Power Grid Model

The **Power Grid Model** is an example of the 'digital energy system'. This model simulates scenarios that can arise on the electricity grid. The model, originally developed by Alliander, will be further developed together with other parties on an open-source basis within Linux Foundation Energy. For us the model is crucial for identifying and preventing congestion problems.

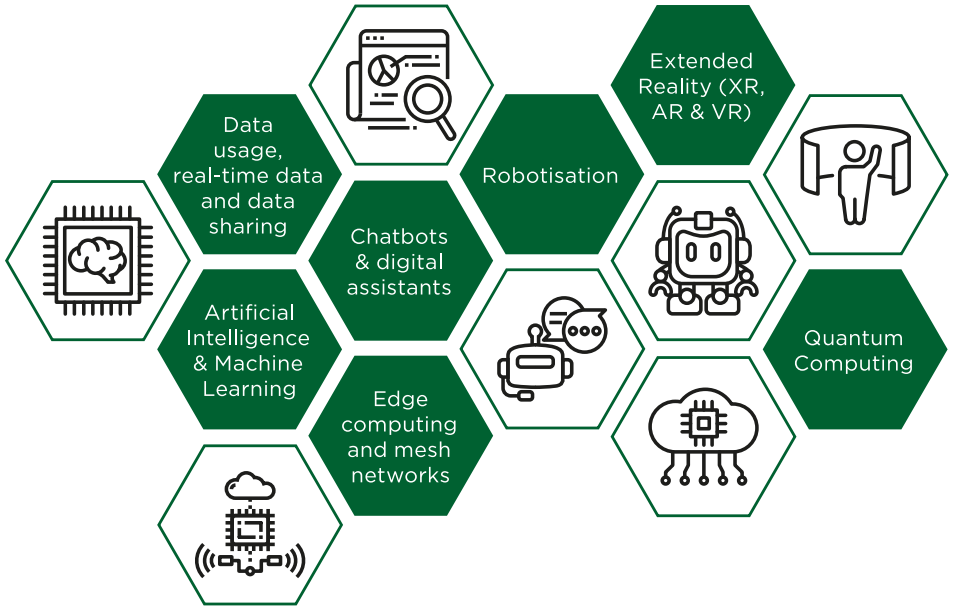
Due to its high computing speed and easy connectivity, it is also being used outside of Alliander for analyses, scientific research and calculation of grid congestion.

The model has now been downloaded more than four million times globally.



Technological progress

Technological innovations are following each other in quick succession, meaning that Alliander not only needs to stay alert, but in particular also needs to look ahead. We want to strategically anticipate the impact these developments will have on our organisation, the energy grid and society, while our research department continually monitors and evaluates new technologies. At the same time, existing digitalisation technologies are continuing to develop at a rapid pace, meaning that digital solutions are being replaced with increasing speed. This is being intensified by Europe's need to gain more control over digital systems – the cloud and AI in particular.



Strategic technological trends according to Gartner

Gartner has identified ten strategic technological trends that will be decisive for organisations such as Alliander over the coming years. These include agentic AI, AI governance platforms, energy-efficient computing, polyfunctional robots and ambient invisible intelligence, for example. Such trends not only present opportunities, but also introduce new risks and responsibilities.

AI and machine learning produce sophisticated algorithms that provide an insight into the status of our energy grid, predict outages and plan maintenance proactively. These algorithms form the digital core of our decision-making.

Data is widely available in real time, making automated decision-making possible. Sharing data with external parties promotes the development of innovative services and contributes to a flourishing digital ecosystem.

The Internet of Things (IoT) links together all appliances and systems that are connected to the internet. Using the IoT allows us to gather data from energy-grid components directly and securely. This enables us to make better decisions, have smarter control over the energy grid, and faster locate and remedy faults to promote the increasing sustainability of the energy system.

Strategic implications for Alliander

Acceleration of digitalisation: The lifespan of digitalisation solutions is getting shorter. Flexibility and adaptability are crucial features of our digital architecture.

Emergence of disruptive technologies: New technologies, such as agentic AI, quantum computing and robotisation, are changing the way we make decisions, manage our infrastructure and implement processes.

Importance of digital autonomy: The dominance of non-European technologies in the areas of AI and the cloud calls for strategic management. Alliander needs to respond actively to European legislation, such as the EU Cloud and AI Development Act, and collaborate on a sovereign digital infrastructure.

Data as strategic capital: Real-time data and sophisticated algorithms are becoming the core of our decision-making. Sharing data with partners will be a condition for innovation.

Responsible innovation: The social and ethical impact of technology is becoming increasingly important. Transparency, security, privacy and sustainability must form an integral part of Alliander's innovation and improvement processes.

Case study: Liander Customer & Control

At Liander Customer & Control we want to fix faults in our grid before they inconvenience the customer. Digitalisation has an important role to play here behind the scenes. This is an example of how we are becoming a ‘Digital Distribution System Operator’.

We help the customer investigate, in an automated way, whether the fault is inside or outside their premises. We do this by pinging the smart meter directly and providing the customer with relevant images and instructions by means of interactive voice response. This helps us deploy our service engineers to the places where they are really needed. Visits by engineers are scheduled fully automatically, taking into account their journey time, availability and the work they are permitted to carry out. Information about the faults provides input for our operational management and for drawing up maintenance and investment plans. Although our electricity grid is experiencing more faults as a result of the energy transition, customer satisfaction has remained the same level.

Where are we now?

Digitalisation focuses on efficiency and value

Over the past few years, Alliander has substantially scaled up its digitalisation capability. Our organisation is getting closer to the limit of what we can handle when it comes to growth and digital innovation. We are making a shift towards more conscious growth, a focus on value creation and efficient digitalisation. As part of this process we are critically examining how people and resources can be deployed responsibly.

What we are doing now

Our well-developed digitalisation capability is the starting point. The replacement of our core systems is progressing steadily: the SCADA* system is ready, while work on the ERP** asset management, data management and identity & access management systems is still ongoing. As a sector we will also be building a new smart meter head-end system to facilitate the next generation of smart meters.

AI has now come out of the experimental phase and is being used more frequently to make our work more efficient. We are building an AI platform for MLOps and GenAI. Copilot is being rolled out, company-wide our AI policy and governance are embedded in the organisation and almost all our employees have completed basic AI training. Follow-up training programmes for users and developers are being prepared. The AI support department is helping the business and our digitalisation team to identify opportunities and ensure that AI is used responsibly.

The reliability of the service we provide and the availability of our digital platforms remain very high (>98%). However, the increased complexity of our digital landscape requires us to continue working systematically on improving quality. We are doing this by broadening the scope of our SLAs, as well as through performance dialogues, validation gates, a tight architecture and a better structured Quality and Security Framework, amongst other things.

We have developed a clear structure for the change portfolio. This structure is linked to the organisation's strategic goals and has been documented in the plateau planning. That means we can achieve our goals step by step and, if necessary, make adjustments in good time to ensure we stay on course.

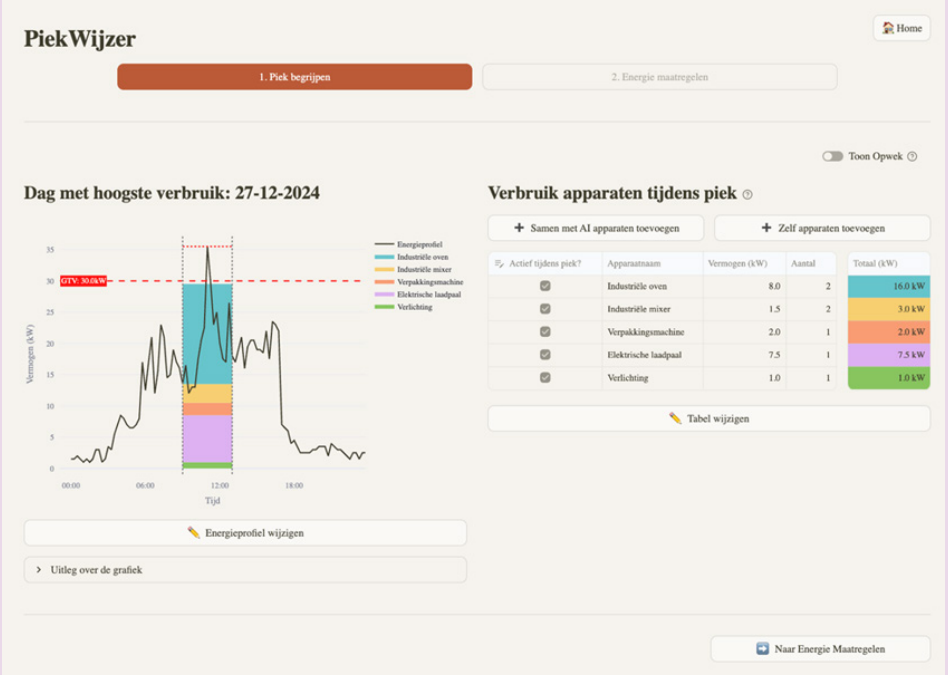
* Supervisory Control And Data Acquisition (SCADA)
** Enterprise Resource Planning (ERP)

Case study: Piekwijzer

Alliander is not currently able to provide prompt assistance to many of its customers who want to expand their existing connection or obtain a new connection. In the case of large consumers, this holds businesses back when they want to expand or improve their sustainability.

To enable them to continue operating, some of our customers are optimising their own consumption, often in collaboration with energy consultants or consultancy firms. This frequently costs considerable time and money and is therefore not always an option for smaller businesses.

Alliander has developed the Piekwijzer application for these businesses. This is a web application that, with minimal input and by automatically analysing capacity usage, generates an illustration of the equipment that consumes energy within a company. For this purpose we make use of generative AI. Based on the data gathered, the Piekwijzer generates recommendations for energy-saving measures and for balancing the energy profile, allowing the customer to continue operating within its existing connection capacity.



Our Digitalisation Strategy

Our strategy consists of seven themes with three priorities

Vision

Digitalisation is crucial to the success of the energy transition

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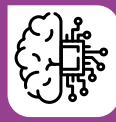


Using artificial intelligence (AI) in ways that works for us

Alliander will use AI in a value-driven and people-centric way to achieve better work performance and solve the complex optimisation challenges presented by our new energy system.

2030: AI is the key to optimal performance in the new energy system. That's why we use AI as a power tool in the hands of our employees.

Facilitating sharing of data and transactions

Alliander will make it easier for consumers, businesses and public authorities to access and share relevant data, making it possible to create new services.

2030: We will be a trusted supplier of scalable digital platforms and data products. By offering high-quality, transparent and well-managed solutions, we will enable ourselves, our customers and our stakeholders to make responsible and efficient decisions that will accelerate the energy transition.

Co-creation through collaborations and partnerships

Alliander will work together with DSOs, knowledge partners and the business community to prevent double work, benefit from economies of scale and use digitalisation capacity more effectively.

2030: By making clear sourcing decisions and focusing more on the joint development and management of digital products, we will use our limited digitalisation resources more effectively.

Resilient digital DSO

2030: We will secure continuity with a self-repairing digital landscape, so that the service we provide remains reliable, cyber-secure and resilient.

Socially Responsible Digitalisation

2030: We will digitalise in a way that is socially and ethically responsible and make decisions based on our values.

Growing towards joint cloud and platform engineering

2030: Our ARTs will use self-service technology platforms with sector reference architecture.

Investing in digital culture and delivery

2030: Digitally skilled employees, life-cycle management and a way of working on the digital landscape will be commonplace within Alliander.

Where are we heading?

Digitalisation themes

To take full advantage of the opportunities presented by external developments, while at the same time carefully managing any associated risks, we are introducing seven digitalisation themes. These themes form a common framework and compass for the further development of digitalisation within Alliander and provide direction in the way digitalisation is used by our organisation.

The themes are detailed in Alliander's plateau planning. In this way they guide the digitalisation of the organisation and play a key role within both the Digitalisation Strategy and the digitalisation portfolio.

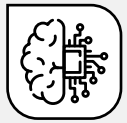
Digital priorities

When defining the themes we considered their transformative impact: what acceleration they enable and on what scale. Based on this analysis we have identified three priorities. Over the coming years we are committed to pay particular attention to these priorities, as they will make the greatest contribution to our digital transformation.

For each digitalisation theme we have specified what our ambition is for 2030, what challenges we face, what we need to do in broad terms and what initiatives we will define with this in mind. Development and implementation will be carried out in collaboration with Alliander's organisational units, DSOs, businesses, knowledge institutions and other stakeholders.

Using artificial intelligence (AI) in ways that it work for us

Digital priority 1



Alliander will use AI in a value-driven and people-centric way to achieve better work performance and solve the complex optimisation challenges presented by our new energy system.

Developments: Artificial intelligence and machine learning

What is our challenge?

Due to the energy transition, the energy system is becoming more and more complex and Alliander's workload and challenge is greater than ever. Our task is changing, resulting in complex optimisation challenges in the area of integrated system design, to allow better grid use and for activity planning. Our challenge is to seize, in a responsible way, the opportunities that AI technologies offer to solve these complex optimisation challenges and improve work performance in general. In so doing, we will actively take into account the risks that various AI technologies entail, such as biases, a lack of transparency, data-quality issues, and privacy and cybersecurity problems. There is also the risk of excessive dependence and undesirable social, financial and ethical consequences, including potentially high energy costs, due to the use of AI.

What is our ambition?

For us, AI is the key to solving the complex optimisation challenges presented by our new energy system. That's why we will use AI as a power tool in the hands of our employees.

What will we do to achieve this?

- We are investing in knowledge, skills and support for our employees, so that they can use AI responsibly and continue to evaluate it critically.
- We are making AI platforms and resources available for generic AI applications in each value chain. This includes tools and resources for ensuring key conditions are met, such as AI-ready data.
- We are investigating whether a Grid Foundation model is suitable for tackling the complex optimisation challenges faced by DSOs. In the future we will link AI systems across work fields in order to achieve integrated optimisation and enable us to make millions of decisions in real time.
- We will learn to make well-considered AI decisions with consideration for people, the environment and our organisation. We will also increase our flexibility and capacity to learn, so that we can respond quickly to opportunities and threats.

What will the result be in 2030?

In 2030 AI will be fully integrated into Alliander's work. Employees will be able to focus on the essence of their work, supported by AI tools that will take over routine work and provide them with insights. Domain-specific models will safeguard knowledge and autonomous systems will support grid planning, maintenance and customer processes. The organisation will be flexible, resilient and capable of learning quickly and adapting to new AI developments. AI will work for us: it will enhance our performance, support our people and strengthen our public role.

Facilitating sharing of data and transactions

Digital priority 2

Alliander will make it easier for consumers, businesses and public authorities to access and share relevant data, making it possible to create new services.

Developments: Energy generation and energy systems are becoming more decentralised. Data is widely available in real time and of edge and mesh computing are implemented.

What is our challenge?

The energy transition requires more: more data services as well as the better accessibility and faster availability of data. However, we often encounter limitations in our systems and collaboration, such as fragmented platforms, insufficient standardisation and difficulties in sharing data. Privacy, security and data quality are not always organised well, making it difficult to share data and transactions.

What is our ambition?

Alliander wants to make the sharing of relevant data and transactions simple, secure and reliable for consumers, businesses, public authorities and other DSOs. We will offer value that directly benefits the energy transition by providing access to real-time data, facilitating new services, such as dynamic capacity tariffs, and supporting decentralised energy management. Our platforms will be transparent, scalable and interoperable, and will form the backbone of an interconnected energy system.

What will we do to achieve this?

- We will require data to be used via central transaction and data platforms within all organisational units.
- We will bring existing initiatives together under a central accessibility programme with an API platform, developer toolbox, data catalogue, metadata tooling and linked data functionality.
- We will launch a programme to make OT data accessible in real time.
- We will develop apps and APIs for end users and automated connections, e.g. waiting-list status and geographical insight into grid capacity.
- We will guarantee privacy and security via GDPR compliance, authorisation models, IAM and digital signatures.
- We will gear strategic product management and platform functions towards business requirements.

What will the result be in 2030?

A robust ecosystem in which data and transactions are shared securely, in real time and in a user-friendly way. Customers, public authorities and market parties will have access to reliable information and services that will accelerate the energy transition.

Co-creation through collaborations and partnerships

Digital priority 3

Alliander will work together actively with DSOs the scientific community, businesses, start-ups and knowledge coalitions so that we can accelerate together and use our own resources more efficiently.

Developments: Growing shortage of digitalisation specialists. DSOs are moving towards joint digitalisation.

What is our challenge?

The energy transition is a huge task that we cannot handle alone as DSOs. It is not an option to keep reinventing the wheel; the challenge is too big for this and time is too precious. Although we are participating in initiatives such as Netbeheer Nederland, EDSN, the DSOs' Cooperation Agreement on Digitalisation (SOK), the Digitalising the Energy System Action Plan (ADE) and LF Energy, and have achieved successes with projects such as the Joint Cloud Platform and Power Grid Model, it is often difficult to get collaborations off the ground. Large projects are slow-moving and inflexible, while smaller initiatives often falter due to local interests and a lack of joint leadership.

What is our ambition?

We want to build a digital ecosystem in which collaboration and co-creation are both systematically embedded. Together with partners we want to develop joint initiatives with shared investments and ownership. This means:

- Accelerating innovation by bundling strengths.
- Preventing double work and creating maximum value.
- Developing a single digital energy grid for the Netherlands together.

What will we do to achieve this?

- We will enter into strategic partnerships with businesses and knowledge institutions to bring together joint investments, expertise and innovative strength.
- We will join forces with national and regional DSOs into one joint digitalisation portfolio. By acting more and more as a virtual digital DSO, we will create economies of scale and increase our joint impact.
- We will create a national DSOs' IT Shared Service Centre as strategic infrastructure for shared platforms and services.
- We will formulate clear sourcing frameworks, so that we can make conscious decisions: e.g. make, buy or ally.
- We will build a sustainable R&D ecosystem in which joint projects and the sharing of knowledge both inside and outside the energy sector will accelerate and embed innovation.

What will the result be in 2030?

In 2030 we will be using our digitalisation resources in a demonstrably more effective way. By means of clear sourcing decisions, the joint development of and service for digital products, we will make systematic savings. We will have a robust digital ecosystem at our disposal in which collaboration is the norm, innovation is accelerated and resource use is optimised.

Case study: DSOs' Cooperation Agreement on Digitalisation

To simplify collaboration, Stedin, Enexis, TenneT, Gasunie and Alliander have signed up to the DSOs' Cooperation Agreement on Digitalisation (SOK). This agreement provides a single legal framework that enables DSOs to launch joint ICT and digitalisation initiatives more quickly and more simply.

What is the SOK?

The SOK reduces legal and organisational barriers to collaboration. As a result, new agreements do not have to be drawn up for each initiative and the focus can be placed on joint development. The agreement is a response to the growing demand for digitalisation, the need to work cost consciously and a shortage of capacity.

What does it deliver?

The SOK makes it possible to:

- use public funds more efficiently
- achieve greater strength by bundling knowledge and capacity
- accelerate innovation
- collectively guarantee security and quality

Practical example: National Substation Sign-in System (LSIS)

The LSIS is a specific example of how the SOK works in practice. It is a joint registration system that will allow Enexis, Stedin, TenneT and Alliander to sign in and out at substations in a uniform way in future. In the past different systems and procedures were used, but a single joint system and procedure has now been created. This increases security at shared substations and makes the process of signing in and out more straightforward and efficient for all parties concerned.
In addition, the LSIS ensures that better, more consistent data is recorded, that development and management costs are lower thanks to joint investments and less double work which is carried out by the individual DSOs.

Definitions

Artificial intelligence is the problem-solving capability of computers/machines/installations based on the identification of connections and patterns.

Balancing the electricity grid is making sure that the generation, consumption and transmission of electricity are coordinated with one another. An imbalance can lead to an unreliable electricity supply.

Capability is a combination of the words 'capacity' (what is available to you, e.g. resources and data) and 'ability' (what you can offer/what you are able to do, e.g. knowledge, expertise, information and actions).

Critical infrastructure: Certain processes are so vital to Dutch society that an outage or interruption would lead to serious social disruption and pose a threat to national security. These processes constitute the Netherlands' critical infrastructure and include electricity, internet access, drinking water and payment systems.

Demand-response management aims to reduce the consumption of electricity at times when demand for electricity peaks. These peaks in demand may occur at particular times of day, but may also be due to weather conditions.

Digital inclusion: The emergence of the digital world has opened up many new and exciting opportunities. However, not everyone has equal access to them. For some people the digital world is still not fully accessible. It may be unaffordable for them or they lack the skills to participate in it fully.

Edge and mesh computing refers to the technologies that make energy-grid components with Internet-of-Things properties smarter and more autonomous. This is made possible through local data processing in the energy-grid components themselves (edge) and local, often wireless, networks between them that facilitate the exchange of data between these components (mesh).

Extended reality (XR) is the collective term for augmented reality (AR), mixed reality (MR) and virtual reality (VR): technology that enriches and replaces our view of the world. It involves overlaying computer text or graphics onto the real or virtual environment, or even a combination of these things.

Flexible transmission capacity: If parties move their electricity consumption or generation to a different point in time, this creates the necessary flexibility ('flex' for short) in usage to allow shifts in supply and demand. The temporary storage of energy in a battery can also help here. In this way it is possible to prevent or reduce temporary capacity shortages on the electricity grid.

Internet of Things (IoT): The Internet of Things describes all the devices (things) that are in contact with other devices or systems via internet connections and exchange data with one another over these connections. Everyday objects act as an entity on the internet, are able to communicate with people and other objects and make autonomous decisions based on these communications. The possibilities that arise when physical objects and the virtual world come together form an important aspect of the Internet of Things.

Low-voltage network is the section of the electricity transmission network with the lowest voltage. The voltage level is around 230V.

Medium-voltage network is the section of the electricity transmission network with a voltage level of around 1,000 to 100,000V.

Prosumers are active energy consumers and small-scale energy producers with, for example, solar panels, home batteries, heat pumps, electric cars and Home Energy Management (HEM) systems.

Quantum computing is based on quantum mechanics. Today's digital computers use bits (value: 0 or 1) to store and process information. Quantum computers use 'qubits' (value: 0, 1 or an indeterminate value). By linking qubits, and therefore their indeterminate values, quantum computers can perform complex calculations much more quickly than digital computers.

Real-time interaction takes place without any delays or waiting times resulting from the time needed to process data.

Robotisation refers to the growing number of tasks that were previously performed by people, but are now being performed by robots. These tasks may be taken over by: robots (industrial robots usually focused on a single task), cobots (robots who work together with human colleagues) and cloud robots (robots that perform human tasks at software level).

SOK stands for Samenwerkingsovereenkomst Netwerkbedrijven Digitalisering (DSOs' Cooperation Agreement on Digitalisation). This agreement has been drawn up to simplify cooperation between the DSOs. Stedin, Enexis, TenneT, Gasunie and Alliander are participating in it.

Transactive energy is the exchange of energy between local producers and consumers within an electrical energy system, based on an economic or market model that takes the flexible transmission capacity available on the energy grid fully into account.

Bibliography

1. Europese Commissie. Digitale Inclusie. [Online] 2024. https://digital-strategy.ec.europa.eu/nl/policies/digital-inclusion.

2. Alliander. De strategie van Alliander. [Online] 2025. https://www.alliander.com/nl/over-alliander/strategie/.

3. Alliander. Trendrapport 2025. [Online] 2025. https://intranet.alliander.com/trends-en-ontwikkelingen2.

4. Nationaal Coördinator Terrorismebestrijding en Veiligheid (NCTV). Vitale Infrastructuur. nctv.nl. [Online]. https://www.nctv.nl/onderwerpen/vitale-infrastructuur.

5. Foundation models for the electric power grid. Sciencedirect 2024. https://www.sciencedirect.com/science/article/pii/S2542435124004707

6. "Russische hackers zitten mogelijk achter hack OM-systemen". Algemeen Dagblad, 2025. https://www.ad.nl/binnenland/sterke-signalen-dat-russen-achter-hack-om-zitten-zaten-mogelijk-weken-in-systeem~a6bd3c60/

7. Gartner. Hype Cycle for Digital Grid Transformation Technologies. 2025.

8. Gartner. Hype Cycle for Utility Industry IT. 2025.

9. Gartner. Hype Cycle for Artificial Intelligence. 2025.

10. Alliander. Visie data delen en nieuwe marktdiensten. [Online] 2025.

11. Wikipedia. Internet der dingen. [Online] 2023. https://nl.wikipedia.org/wiki/Internet_der_dingen.

12. Wikipedia. Robotisering. [Online] 2023. https://nl.wikipedia.org/wiki/Robotisering.

13. EDSN. Het NBility model. [Online] 2025. https://www.edsn.nl/nbility-model/

14. Netbeheer Nederland. Nationale uitvoeringsagenda regionale infrastructuur. [Online] 2023. Nationale uitvoeringsagenda regionale infrastructuur | Netbeheer Nederland

15. Scaled Agile Framework. [Online] 2025. https://framework.scaledagile.com/#big-picture

16. Alliander energievisie en strategie 2030

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