



Digital@Utility 2021 — What is the status of digital transformation in the energy industry?

Content

Prologue	1
At a glance	2
The digitalization barometer	4
Fields of action	7
A) Change in value creation: Significant ambitions within the next three years	
B) Digital customer centricity: Weakness identified and banished?	
C) Digital company: Everything remains different	
Instruments	21
1) Data analytics and AI: Data treasures are often not exploited	
2) Partnerships: Success factor for large and small energy suppliers	
3) Process digitalization: Progress in making	
4) IT and data protection: Amplified build-up to be expected in the coming years	
Outlook	38
Contacts	39

Prologue

Dear readers,

A digital transformation is an important foundation for a successful energy transition and a driver for growth and new business in the energy industry.

To help companies recognize what this means in concrete terms and understand how their activities compare to the industry, the BDEW, together with Kearney and IMP³ROVE, developed the Digital@Utility study back in 2016.

Since then, utilities have been able to take part in our digitalization check once a year free of charge and receive valuable feedback and individualized suggestions for ways to improve their corporate practices. In addition, we gain exciting insights about the industry's digitalization status and have seen that the dynamics of energy suppliers are growing year after year.

Since the 2016 launch of our study, we have continued to develop this valuable offering and, among other features, have expanded our research internationally with the energy associations VSE and OE—because digital transformation and technical development know no national borders.

Energy suppliers of all sizes from all stages of the value chain from ten countries took part in Digital@Utility 2021. In addition to companies from Germany, Switzerland, and Austria, we also surveyed companies from other European countries, Asia and Australia. As a result, our digitalization check offers authentic insights into where the energy industry stands in terms of digitalization and, for the first time, enables participating companies to compare themselves to other international players.

Our study also puts a spotlight on exciting trends and opportunities for the utilities this year. In this report, we publish our results anonymously to provide an impulse for the utilities' digital transformation.

The results of this year's digital barometer clearly show that the industry is on the way to a digital future. The vast majority of participating companies have a digital strategy—a clear improvement compared to previous years. In addition, the COVID-19 pandemic has amplified awareness about the necessity and speed of a digital transformation.

The importance of a digital transformation for long-term economic success is high on the corporate agenda: more companies are developing new digital business areas and using these as the primary ways to grow sales. The companies in our study say they expect sales of digital products and services to grow more than 10 percent a year for the next three years.

We would like to take this opportunity to thank all participating companies and wish you, dear readers, an exciting read.



Kerstin Andreae

CEO
BDEW



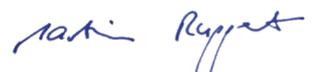
Michael Frank

Director
VSE



Horst Dringenberg

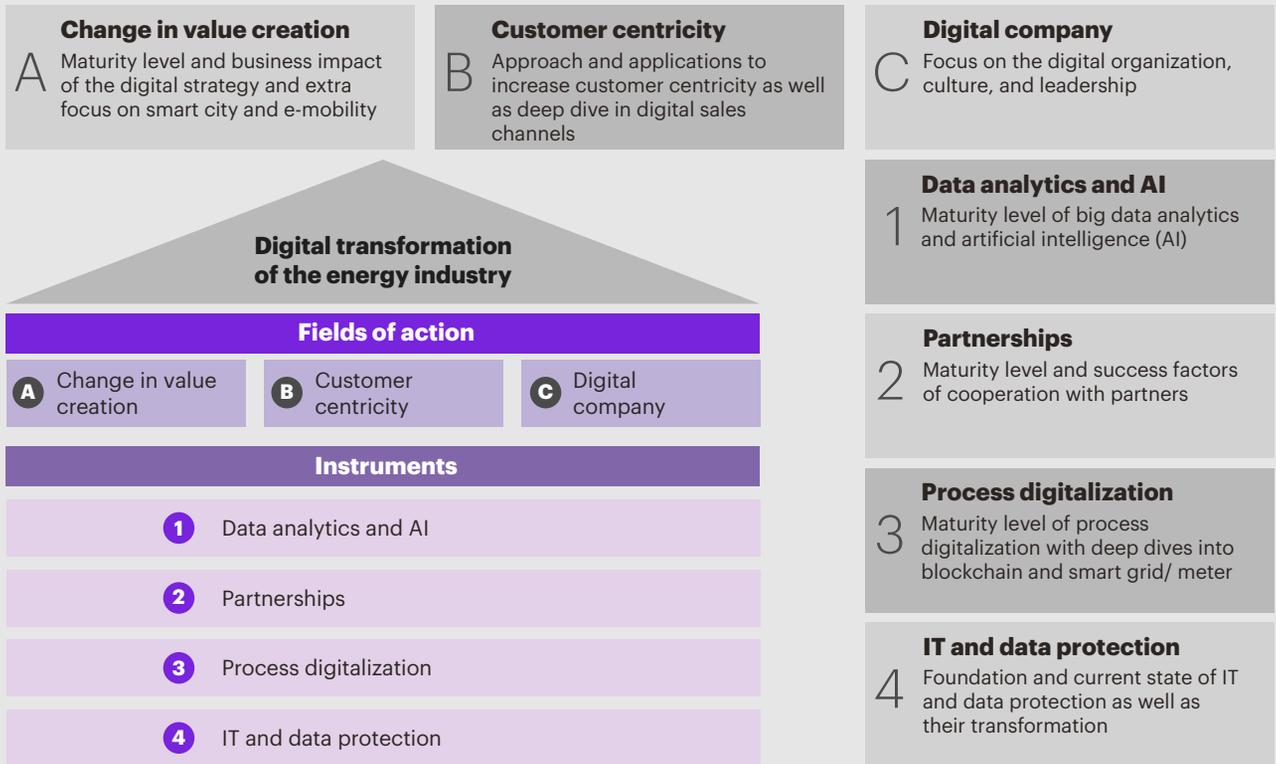
Partner
Kearney



Dr. Martin Ruppert

Managing Director
IMP³ROVE

At a glance



Source: Kearney, IMP²ROVE, BDEW, VSE (2021); Kearney analysis

7 dimensions have been assessed in this study: change in value creation, digital customer centricity, digital company, data analytics and AI, partnerships, process digitalization, and IT and data protection

Integrating new developments with legacies is most often seen as a challenge in the implementation of a digital strategy

56% of the companies assessed, and thus **12%** more than in the previous year, have a digital strategy in place

The revenue contribution of digital products or services was **1% for 53%** of companies in 2019

59% of companies are currently developing MVPs¹ or are within the pilot stage for at least one new digital product

5 business areas are primarily seen as levers for revenue growth:

- Offers for decentralized generation plants
- Automated electricity trading
- Smart city IT
- E-mobility
- Energy management solutions for municipalities and industrial companies

¹ MVP - minimal viable product

On average, companies expect revenue growth of **>10%** p.a. for digital-based products and services over the next three years



>15%

sales growth p.a. is expected for e-mobility and decentralized generation plants on average



Among the companies assessed,

62% offer smart city products and services

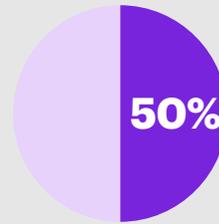
High activity in the area of **digital customer centricity:**

Almost **80%** of companies are not very satisfied with the dissemination of skills relevant for digitalization

78% of utilities are currently planning new use cases

71% of companies have introduced a new normal of working and plan on continuing this approach

76% of companies identify optimization and digitalization of processes as a top priority for skills development



50% have a clear picture of digital skills needed in the future

Advanced data analytics is most common in the trade and risk management of the value-chain stages and is least common in support functions and metering

12% of companies have a designated chief digital officer (CDO)

Almost **50%** of the surveyed companies with >€1 billion revenue plan on using blockchain

77% already use cloud services,

and another **18%** plan to use them in the next three years



38% have already replaced or plan to replace their outdated billing system in the next three years

The digitalization barometer

Digital transformation is a decisive enabler of the energy transition and a key driver for the growth and development of the industry's new business areas. But what does this mean for your company? Where does your company stand in comparison to the industry, and what is the potential for improvement?

Launched in 2016, our Digital@Utility study helps energy industry companies pinpoint their individual level of digitalization and identify ways to improve and is offered annually free of charge. First, focusing on companies in Germany, Austria and Switzerland and this year for the first time even beyond. Since then, we have enhanced the benchmark and expanded the study internationally.

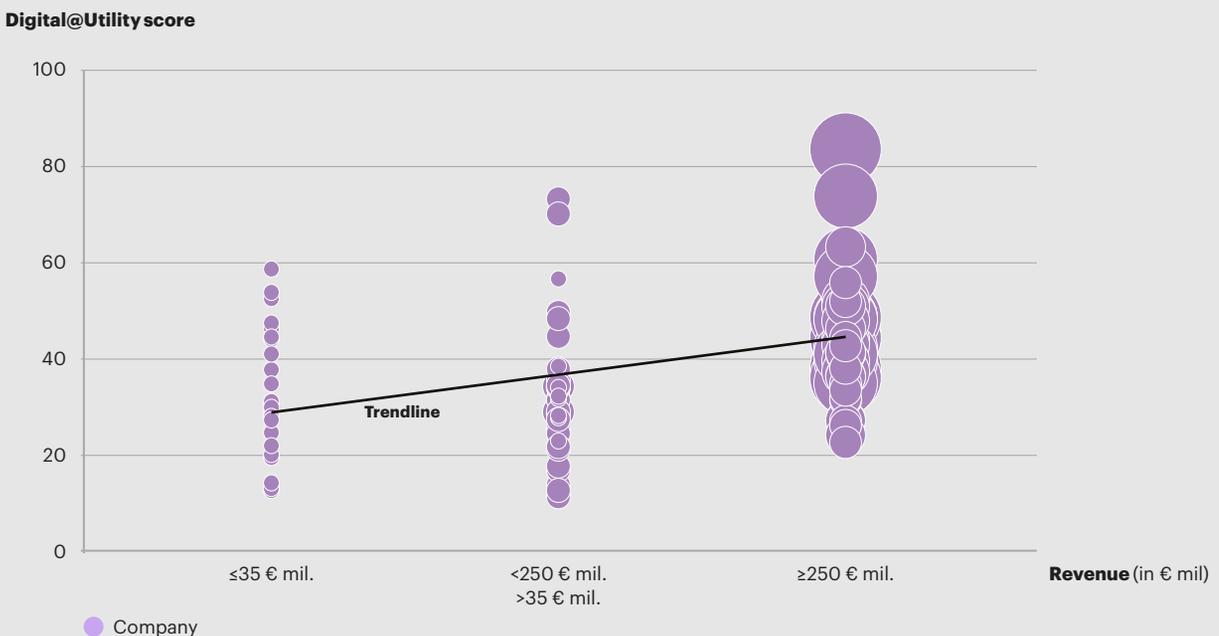
Our digitalization check consists of qualitative and quantitative questions about organization, key business figures, and concrete areas of action. The questions can be answered via an online questionnaire. After evaluating the responses, participants

receive an individual feedback session along with a comprehensive written analysis of their company's specific potential for digitalization.

In addition to the individual analysis, we summarize our survey data once a year in an aggregated, anonymized form to create an industry benchmark.

In total, 108 companies from 10 countries participated in our 2021 Digital@Utility study. Among these firms, 93 are from Germany, Austria, and Switzerland. We divided the companies into four groups: 42 large utilities (€250 million or more in revenue), 31 medium utilities (€35 million to €250 million), 21 small utilities (€35 million or less), and 14 pure grid operators. These categories will also carry on throughout this study. As in previous years, we analyzed companies' degree of digitalization based on questions referring to three fields of action and four dimensions. All data collected is self-reported by the surveyed companies. In last year's study, more than 100 companies with a similar size structure participated, enabling us to make selected comparisons.

Figure 1
Correlation between Digital@Utility score and revenue

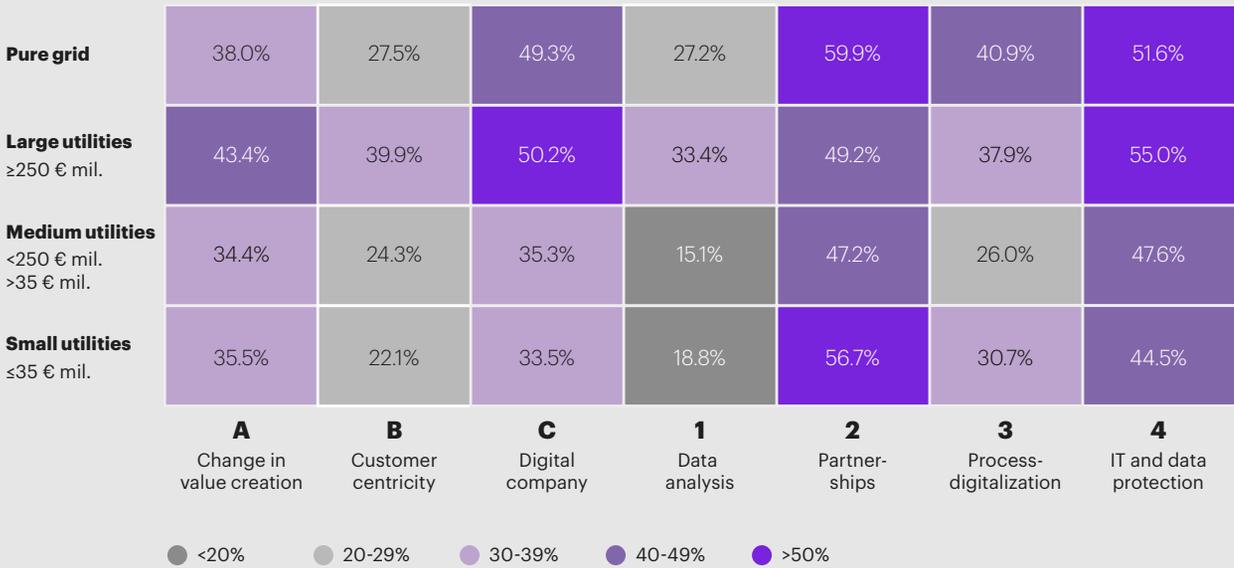


Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

Figure 2

Self-assessment of the companies per field of action

Scores of peer groups



Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

So how do energy suppliers and grid operators perform in our benchmarking? Our study reveals that size correlates to a higher score (see on page 4). This applies to the status quo and the planned development or implementation of various digital products, working methods, or applications. However, the figures show that company size is not the only decisive factor when it comes to maturity of digitization, as small and medium-size companies are also achieving remarkable results.

Among the top 10 percent, which we call the “top digitalizers,” 60 percent are large utilities. The greatest potential for improvement is in the areas of digital customer centricity (average score: 30.9 percent) and data analysis (24.7 percent) (see figure 2). This is substantiated by a high level of activity in these areas. For instance, 78 percent of utilities are planning new use cases in digital customer centricity. In contrast, the best performing fields of analysis are partnerships (average score: 52.9 percent) and IT and data protection (50.9 percent).

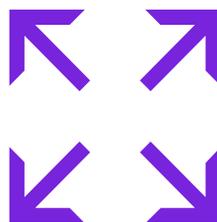
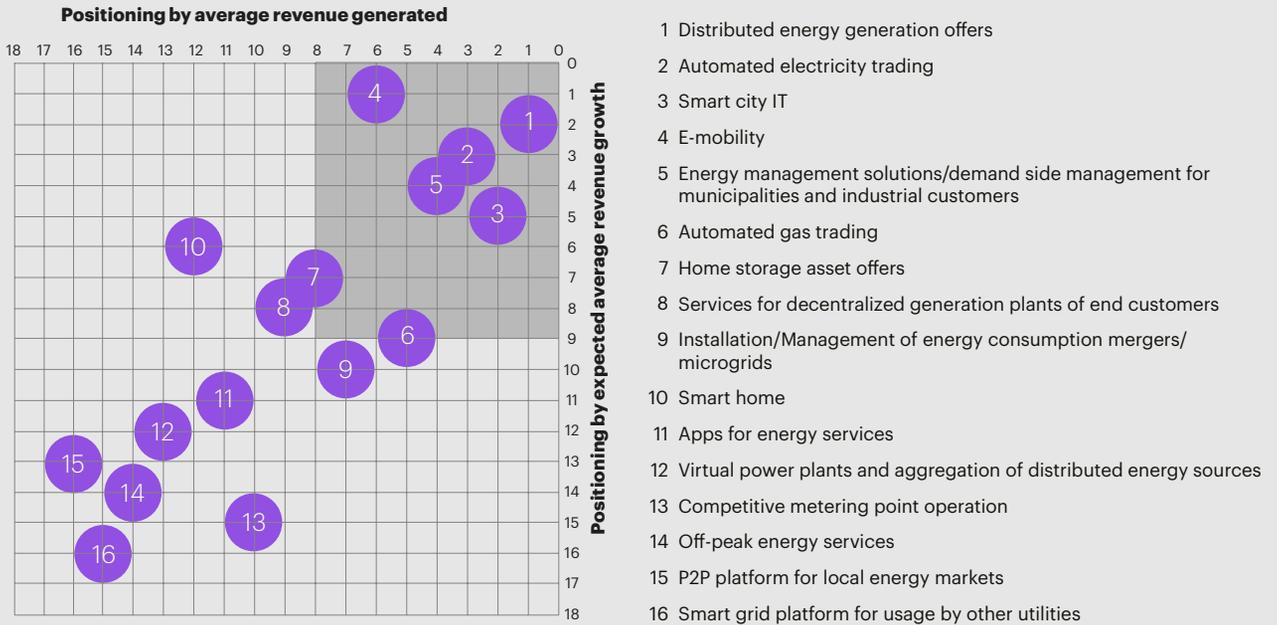


Figure 3

Digital products/services by current and expected revenue potential

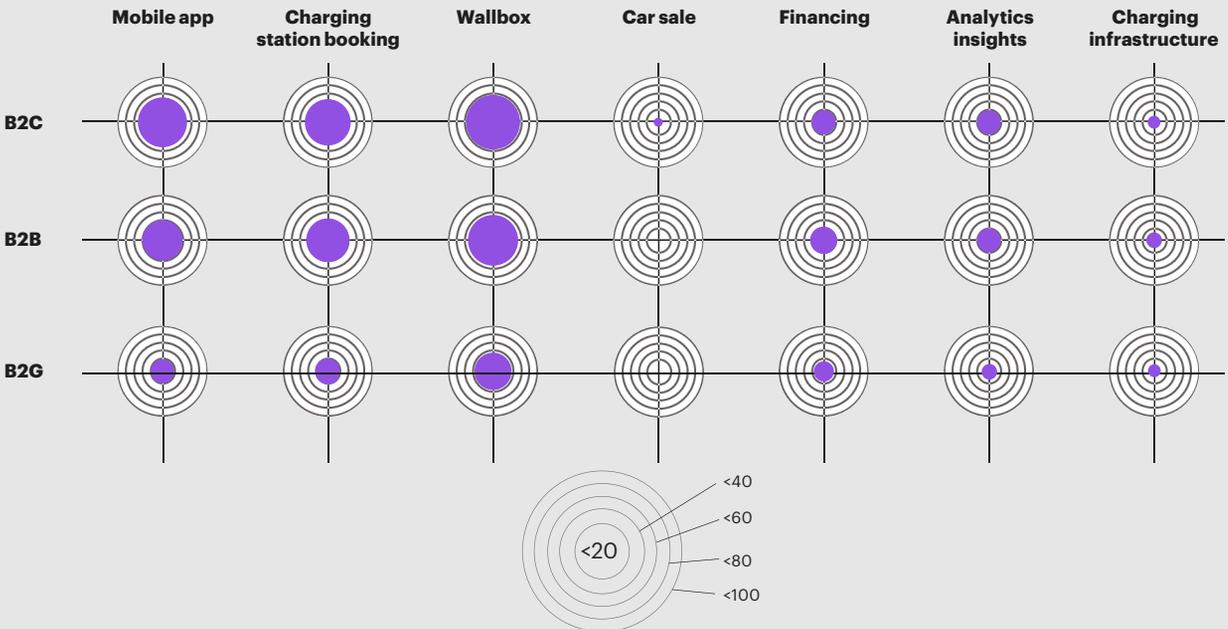


Source: IMP*ROVE, BDEW, VSE (2021); Kearney analysis

Figure 4

Additional e-mobility services by customer segment

% of respondents who are e-mobility service providers



Source: IMP*ROVE, BDEW, VSE, (2021); Kearney analysis

Fields of action

A) Change in value creation: Significant ambitions within the next three years

Overview

Digital strategies are becoming more prevalent among energy supply companies and grid operators. Fifty-six percent have a digital strategy in place already 12 percent more than the previous year, and only 6 percent do not plan to implement one in the future compared to 39 percent last year. The COVID-19 pandemic heightened this trend, with 36 percent of companies having largely or entirely updated their digital strategies to accelerate their digital transformations. With the advancing digitalization of customers and processes, companies have higher revenue expectations for digital products. About half of the surveyed companies measure their future financial developments. Sixty-seven percent of those forecast a share of more than 5 percent of the planned revenue growth in the next three years, and 47 percent forecast a share of even 10 percent. Concerning planned cost reductions for the upcoming three years, 81 percent forecast a digitalization share of more than 5 percent, and 57 percent forecast more than 10 percent. Further, companies that measure the monetary effects have already seen success in cost reduction: 53 percent have achieved an overall cost reduction of more than 2 percent, and 35 percent have achieved an overall cost reduction of more than 5 percent through digital optimization. More utilities are also integrating their digital strategies into their corporate strategies.

In terms of the potential for growth, the surveyed companies also identified the top five business areas as ways to improve their revenue (see on page 6):

- Offers for decentralized generation plants
- Automated electricity trading
- Smart city IT
- E-mobility
- Energy management solutions for municipalities and industrial companies

The business field that is considered to be the most important is decentralized generation plants, which already generate the highest revenue among all surveyed categories. Likewise, an average growth in revenue of 10 to 15 percent a year is expected. Another noteworthy field is e-mobility, which was also among the stronger revenue drivers in 2019 and for which the strongest growth is expected on average, with more than 15 percent a year.

Smart city IT and e-mobility

Smart city IT and e-mobility were focus topics of this study.

Sixty-two percent of the surveyed companies offer products and services in smart city IT, demonstrating the economic viability and potential. Companies that do not offer these services are the ones that most frequently say they lack resources to offer such products. The most prominent smart city product offerings are infrastructure for integrated communication platforms and decentralized generation plants. The latter has the highest success rate, alongside virtual power plants. Less advanced smart city products represent intelligent transport infrastructure and approaches for urban services and payments (smart chip cards and a one-ticket approach for mobility options). Both are offered by only 5 percent of the companies in our study.

The outlook is similar for e-mobility. Most companies—82 percent—offer products in this area (see on page 6). Frequently offered e-mobility products include roaming platforms, such as apps and services for integrating all public charging points in the geographic vicinity of the consumer, and sharing services, such as apps and solutions for renting e-bikes, e-scooters, e-motorbikes, or e-cars. Furthermore, we found that among additional services, wall boxes are offered most frequently in all the assessed customer segments: business-to-consumer (B2C), business-to-business (B2B), and business-to-government (B2G). Other prominent offerings include mobile apps and charging station bookings. These products are more present in the B2C and B2B areas than they are in B2G.

Case study: Gasnetz Hamburg GmbH (GNH)

Digital road map initiative

Question 1: Why was the digital road map initiative launched?

Answer: The digital road map focused on three topics: energy transition with hydrogen, demographic change, and digitalization. By the end of 2018, the company had already created a dedicated position in the corporate development department for the strategic development of its digitalization plans. In the following 1.5 years, a significant number of digitalization projects were initiated. Topics include modernizing workforce management, automating processes (robotic process automation), testing smart gas meters, remote reading of sensors via low-power wide-area network (LoRaWAN), and using more digital collaboration tools in office work. Beyond the ongoing projects, the need for digitalization increased in all areas of the company. In 2021, the company gave the go-ahead to design a digital road map, aligning future digital projects more closely with strategic processes.

Question 2: How did you proceed?

Answer: The project implementation followed a three-step approach:

1. Assess the present situation based on a maturity model and development of an action list.

The starting point was a detailed assessment, including a reflection on the organization's digitalization level. For this purpose, a status quo classification was carried out for all core and supporting processes (basic to world-class). Further, ongoing activities were compared with the strategy and future ambitions. As a result of the analysis, a list of 61 measures was extracted, and each one was linked to the core of the supporting business. Measures with an overarching character and a broad impact on the organization were also recorded. The systematic analysis of all processes also helped us identify the synergies between measures that target different processes.

2. Evaluate and prioritize the action list.

Next, we evaluated the measures and prioritized them based on the expected value contribution and the associated costs. Thus, all measures required a positive cost-benefit analysis. In addition, the prioritization differentiated whether a measure has a central value lever or solely a supporting character. A key success factor in this prioritization was involving various functions of GNH in the process, ensuring a comprehensive company perspective rather than a purely department-driven benefit.

3. Develop the Digital road map

Then, the final digital road map was developed, starting with the definition of a specific North Star vision for each process. The vision included five elements:

- Agile culture and modern working environment
- Data, analytics, and technology
- Cooperation
- Customers
- Process digitalization and automation

Outstanding measures included the development of sensor technology for the gas grid and the implementation of digital workforce management, as well as the introduction of new ways of working.

Question 3: What is the impact you achieved?

Answer: The project achieved the following results:

- The project analyzed 39 core and supporting processes and determined GNH's total maturity level.
- Specific North Star statements in five topic areas were defined, broken down into concrete visions for 15 core and supporting processes and operationalized by 61 detailed measures and measures of success.
- A final road map was created, including a timeline for 61 measures by 2024.
- Several fast-track measures were adopted for implementation in 2021, including LoRaWAN and an agile work environment "flex desk."

Question 4: What were the key success factors for you?

Answer: The central success factor in the implementation of the project was the consistent work on the maturity model. On one hand, this enabled a precise determination of the initial situation for the processes. On the other hand, the intensive work on the maturity model made it possible to record all activities in the most varied degrees of implementation. As a result, we revealed the organization's actual status quo. More importantly, the process enabled an overall view of all activities, which subsequently had to be structured.

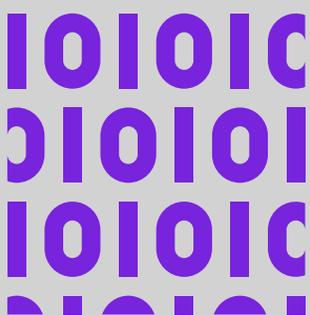
Question 5: What impulses were you able to take away from your participation in the Digital@Utility initiative?

Answer: Participating in the Digital@Utility initiative proved to be an ideal base for the initial assessment of the current situation and comparison with the industry.



**Christian Heine,
Managing Director,
Gasnetz Hamburg**

“We are positioning ourselves for the future with our new digital road map: With every step, Gasnetz Hamburg becomes more digital. This leads to simple processes, increases customer benefits, and is a central component for us to achieve our corporate goals.”



Case study: GEN-I

E-mobility innovation

Question 1: Why did you initiate this project?

Answer: GEN-I's e-mobility service was developed in 2019 as a response to the complicated user experience of registering and paying for charging sessions for electric vehicles at public charging stations in Slovenia and Croatia. We recognized an opportunity to play an essential role in the overall energy transition and mobility space.

As a highly innovative and forward-thinking company, we want to be different, bringing the best and most advanced solutions to our customers. Thus, we initiated a broad e-mobility strategy covering B2C and B2B offerings, including e-mobility infrastructure and e-mobility management. The innovation project was supposed to learn from the best global solutions, using fully digital solutions across all aspects of client interaction.

Question 2: What was your approach?

Answer: We approached strategy and business model innovation in an agile way. Three main program phases were planned: ideation, experimentation, and scale-up, each with several sprints. We developed clear milestones and expectations for each sprint, consulted internal and external experts, and engaged our existing and new partners to quickly come up with the first pilots to be tested on the market, such as B2B client pitches to refine value propositions. Using an agile approach allowed us to quickly adapt the project and strategy and come up with a market proposition in a record time of eight weeks. One of the project objectives was also for the new solutions and processes to be fully digitized, using advanced analytics and bringing the best customer experience on the market.

With the increasing capacities of electric car batteries and given the average distances driven in Slovenia, more than 80 percent of charging sessions are done at home. So we supplemented our offer of solar power plants for the self-sufficient supply of electricity with charging stations to give our customers complete e-mobility services.

Question 3: What is the impact you achieved?

Answer: Based on the project results, we upgraded our strategic ambition and accelerated the growth of the new business line. In 2020, GEN-I recorded growth in e-mobility services with more than 20,000 electric vehicle charging sessions—78 percent more users than in 2019. This is a sign that our customers recognize the advantage of electric cars and already drive faster, cheaper, and with less planning by using our e-mobility services. Moreover, our solution enabled us to form new partnerships. For example, in cooperation with Hrvatski Telekom, we have expanded the aforementioned services to 150 new charging stations across the border. GEN-I's users pay for e-mobility services as part of their monthly electricity bill.

Question 4: What were the key success factors for the project?

Answer: Systematic expert guidance across the process and early identification of hypotheses for market success that require testing accelerated the development of unique solutions, which have had to pass several internal and market testing activities throughout the project.

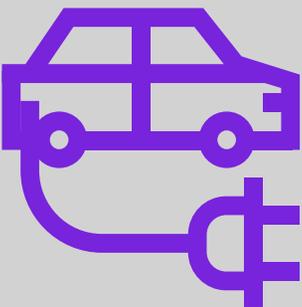
We always consider the user's perspective first to make sure we are offering an outstanding customer experience with simple registration, identification, and payment of services.

Another success factor was the direct sponsorship and engagement of the board. Thus, we were able to make decisions quickly and efficiently.



**Robert Golob,
CEO,
GEN-I**

**“Innovate,
experiment,
scale.”**



B) Digital customer centricity: Weaknesses identified and banished?

Overview

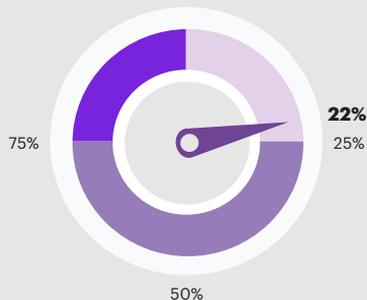
Similar to the last year's study, vast potential is yet to be unleashed in digital customer centricity, making this one of the less-advanced fields of analysis. However, companies are aware that improvement is needed. In a fraction of areas within this field, digital support is used only sporadically. For instance, only 17 percent of companies use data-driven prediction to forecast and prevent customer migration. Moreover, only 27 percent employ digitally enabled sales agents. We also see potential for improvement in basic data maintenance. For instance, more than 40 percent of companies do not store their customer data completely and accurately in a central database. Overall, there are substantial differences between larger and smaller companies (see figure 5). On average, large utilities score higher in their self-assessment on customer centricity compared to grid operators as well as medium and small utilities. Nonetheless, the top group of small utilities is still performing exceptionally well in implementing some of the use cases, including online payment options as well as customers' online access to consumption and billing data.

This shows that the company size is not the sole factor and that the potential of digital customer centricity can also be harnessed by small companies.

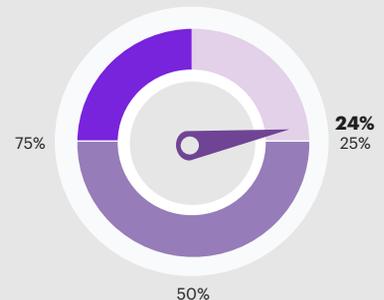


Figure 5
Self-assessment
digital customer
centricity

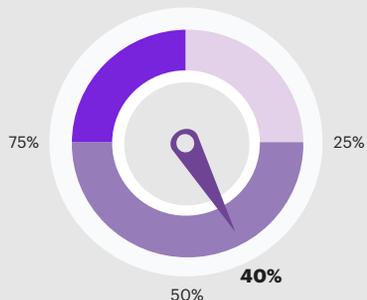
Utility ≤ 35 € mil. revenue



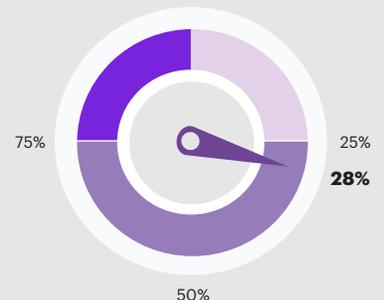
Utility > 35 € mil., < 250 € mil. revenue



Utility ≥ 250 € mil. revenue



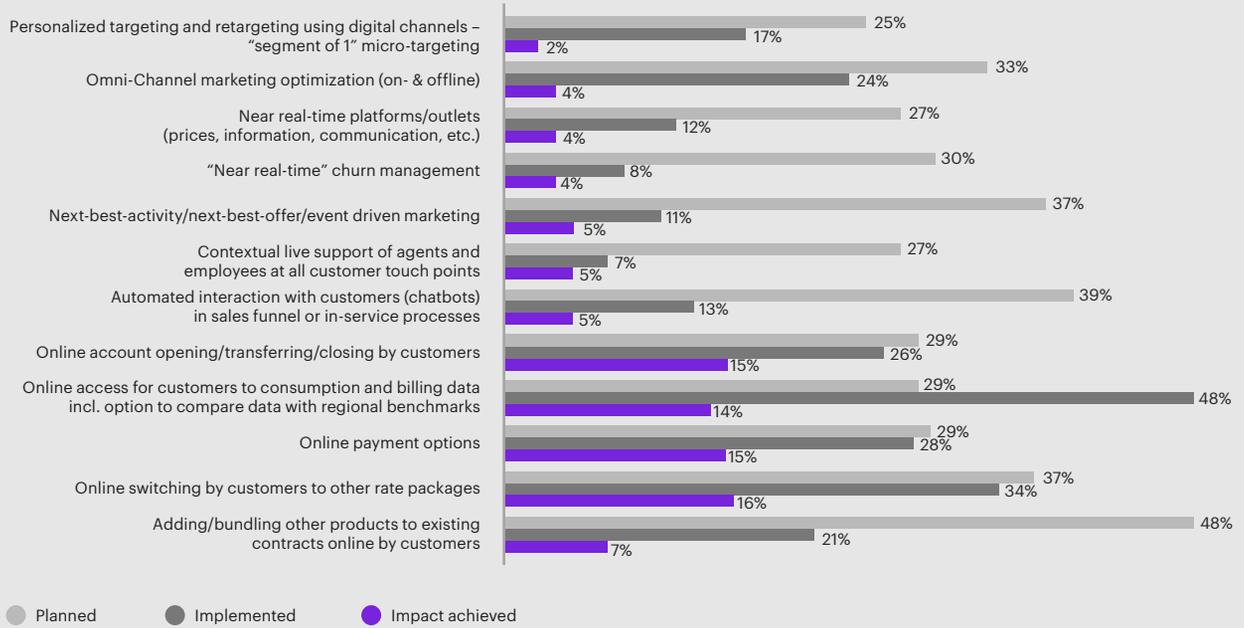
Pure grid



Source: IMP²ROVE, BDEW, VSE (2021); Kearney analysis

Figure 6

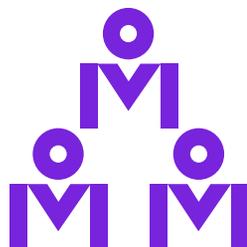
Digital customer centricity: status of individual instruments



Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

Positive signs for the future

Despite the aforementioned weaknesses, we see positive signs for the near future. Although an average of only 29 percent of the customer centricity instruments have been implemented so far, numerous implementations are in the making (see figure 6). On average, about a third of these are scheduled to be implemented in the coming years. If these implementations are successful, the big picture would change substantially since more than 60 percent of the instruments would be in use. Most frequently planned are the addition or bundling of new products to existing contracts entirely online (48 percent), followed by automated interactions with customers (39 percent), such as chatbots. This high degree of activity suggests considerable developments in customer centricity in the coming years.





Stefan Schröder, Product Owner and Specialist in Market Communication, e.kundenservice Netz GmbH

“It is impressive to see which technical possibilities exist to code the gut feeling and experience of colleagues into a logic. Thanks to good cooperation between experts and the engineers of our center of excellence in artificial intelligence, we were able to develop a great solution.”

Case study: e.kundenservice Netz GmbH

MaLoMat (market location matching)

Question 1: Why did you initiate this project?

Answer: In the supplier change process, incoming registrations are assigned to a market location based on the received parameters, such as delivery address, meter number, or name, or they are rejected if there is no identification. With our existing IT system, about 90 percent of the cases can be processed automatically. The remaining 10 percent were compared to our master data in a manual process to reject the registration or assign it to the correct market location. We launched the initiative to reduce the amount of effort required in terms of process time, efficiency, manual work, and quality optimization.

Question 2: What was your approach?

Answer: In a joint workshop between departments and our center of excellence in artificial intelligence, the use case was defined in detail, an initial pilot was developed, and the feasibility was proven. Then, we set up a project in which all decision options were considered. “Fuzzy matching” was used to identify the correct match (a fuzzy search for specific character strings). The threshold values for optimal decision-making, meaning whether a master data record can be assigned or rejected, were also optimized during the project.

Question 3: What is the impact you achieved?

Answer: The project is now in a benchmarking phase, meaning the system is working in a productive environment and the results are saved. However, the saved results are not yet used for the final decision. Possible results are identification of a market location, a rejection, or transfer to a clerk if no decision was made. In this phase, the degree of automation is checked along with to what extent the algorithm is making the same or better decisions than the clerk. False identifications or false rejections are not allowed. Once the results meet expectations, we plan to replace the manual process with the algorithm. At the current stage of development, we are achieving more than 95 percent automation, and the quality of the decisions is already comparable to those of the clerks. Including the 90 percent of applications already automated by the upstream system, we thus reach a total automation level of 99.5 percent.

Question 4: What were the key success factors for the project?

Answer: We have a close collaboration between departments and the center of excellence in artificial intelligence. Moreover, the balanced goal-setting helped us to automate the process while maintaining at least the same quality of decisions and avoiding wrong decisions.

C) Digital company: Everything remains different

COVID-19 as a driver for the “new normal” of working

In the wake of COVID-19, companies and their teams were forced to work and collaborate more flexibly and, if possible, online. The surveyed companies ultimately altered specific procedures as well: 71 percent say they replaced outdated ways and have continued with new ways of working that emerged during the pandemic. This includes the introduction of the “new normal” of working, such as with a mobile or home office or flexible work arrangements. Large utilities and grid operators seem to have adapted more quickly to a digital and changing environment, with more than 85 percent having implemented new ways of working. In contrast, less than 60 percent of medium and small utilities say they have done so.

Strategies for digital skills and human resources

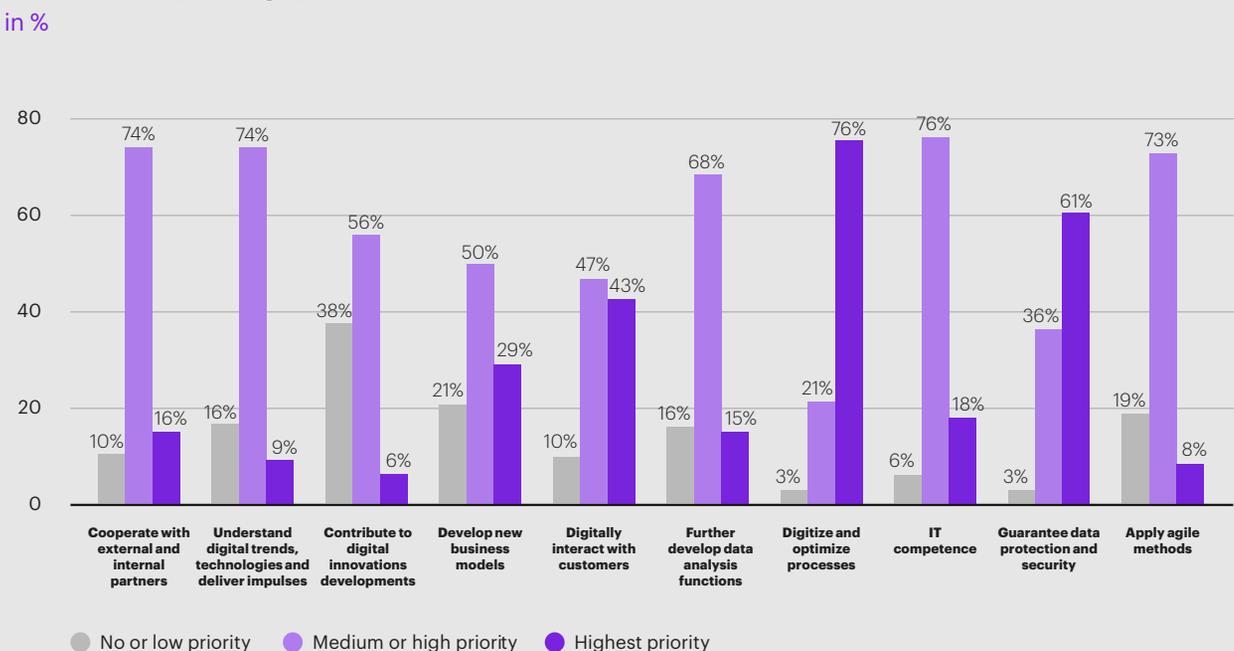
Generally, the digital culture in the energy industry has significant potential, with about 50 percent of companies saying they provide strong digital support to their employees, ranging from recruitment, onboarding, and self-service to training and personal development. However, we once again see

substantial differences by company size: 65 percent of large utilities and grid operators support their employees digitally, while this is only the case for 35 percent of small and medium-sized utilities. For general weaknesses in this area, almost 80 percent of the companies are not yet satisfied with the dissemination of skills that are relevant for digitalization. Simultaneously, many companies lack a plan forward, with only 30 percent having a clear HR strategy for developing the necessary skills and only 50 percent having a precise picture of what skills are needed. This is reinforced by a lack of training structure: only 22 percent have training curricula to develop their employees’ most relevant digital skills. Moreover, 65 percent do not yet define new job roles that will match the skills required in the future, such as solution architects, UI/UX designers, and product owners.

Concerning future developments for digital capabilities, most companies mention digitalization and optimization of processes, followed by data protection and security and digital interaction with customers as the highest priorities for development (see figure 7). However, it is striking that the contribution to innovation and the development of new business areas often needs improvement.

Figure 7

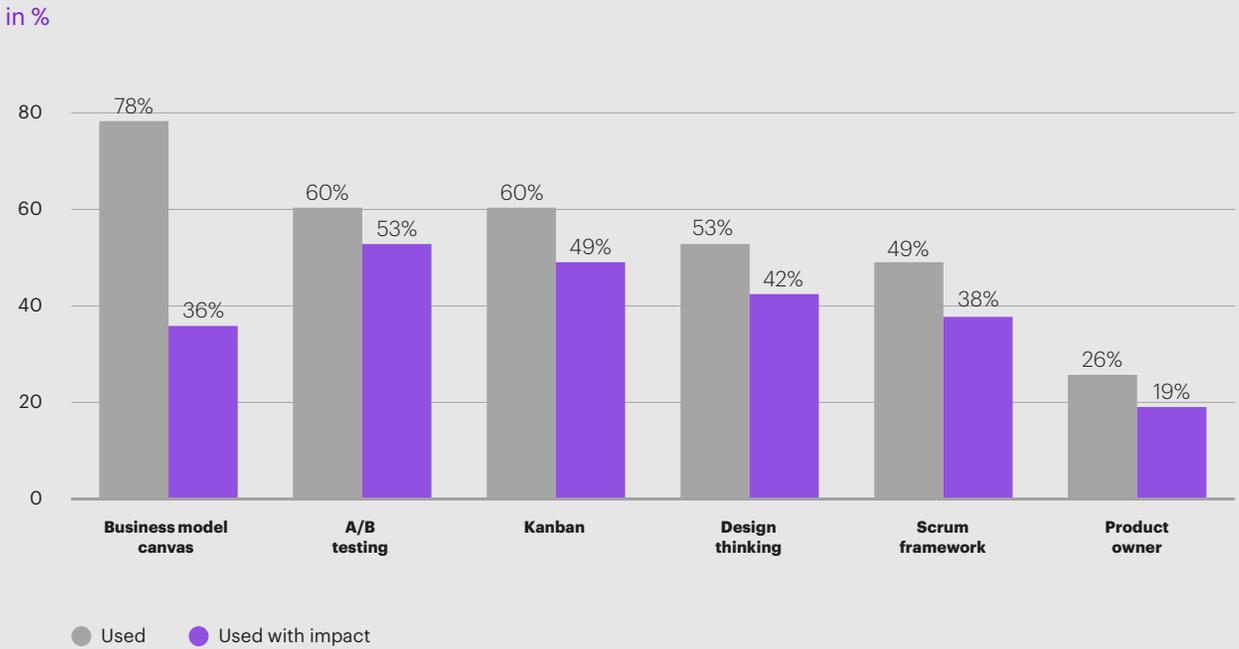
Utilities develop digital skills across a variety of areas; digitizing and optimizing processes currently is the most frequent high priority area



Source: IMP[®]ROVE, BDEW, VSE (2021); Kearney analysis

Figure 8

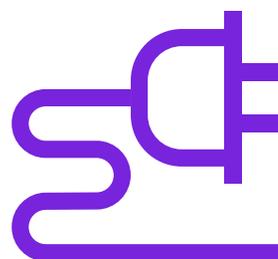
Application of agile methods



Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

Agile methods

Agile working has gradually become an industry standard over the past decades, including within the energy industry. Eighty-six percent of companies use agile methods. Once more, we see differences based on size. While 98 percent of large utilities and 86 percent of grid operators use agile methods, a comparably low 77 percent of medium-size utilities and 75 percent of small utilities use them. In terms of positive impacts, A/B testing, Kanban, and design thinking are the three most successful ones (see figure 8). Despite the positive appearance of these three methods, only about 60 percent currently use them, translating into additional potential.



Case study: Energias de Portugal (EDP)

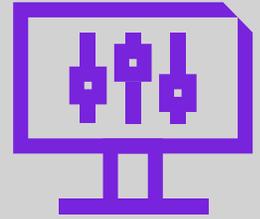
How EDP digitally transformed to succeed in a new era

Question 1: When did you initiate your digital journey, and what prompted it?

Answer: Digital has been front and center on our strategic agenda since 2017, back when very few utilities were talking about digital, let alone investing in it. At the time and acting upon the strong belief that incumbent early adopters will win while laggards will eventually fail, our board aspired for EDP to become a worldwide digital reference in the utilities space, committing meaningful resources and investments to it. Today, we are proud to be one of the few digital leaders in the power sector, as recently highlighted in the Digital@Utility benchmarking study.

Question 2: What was your approach?

Answer: From the start, we knew that going digital is a people-driven challenge, so we wanted to empower business units in the digital transformation rather than managing it as a big IT-driven project. We focused on three priorities: adopting agile ways of working, adding talent, and modernizing IT. First, we secured support from senior leaders to embrace change while running the business, and we built a digital factory where small teams, working closely with the business side in agile mode, functioned as a start-up accelerator. Second, we knew we had a digital talent gap to close if we wanted to fully exploit all the value pools offered by digital across business units and geographies. Finally, we leveraged the public cloud as the default option to host applications (85 percent of our total apps universe) while also shifting from all-in-one, monolithic systems to a modular API-based architecture and increasingly adopted DevOps as a way of delivering applications and services.



Question 3: What is the impact you achieved?

Answer: Since our digital journey began, we have developed hundreds of digital minimum viable products (MVP) to deliver on the three digital business streams of our intelligent power digital vision: customer, assets, and operations and enterprise. We have several flagship products, including the following:

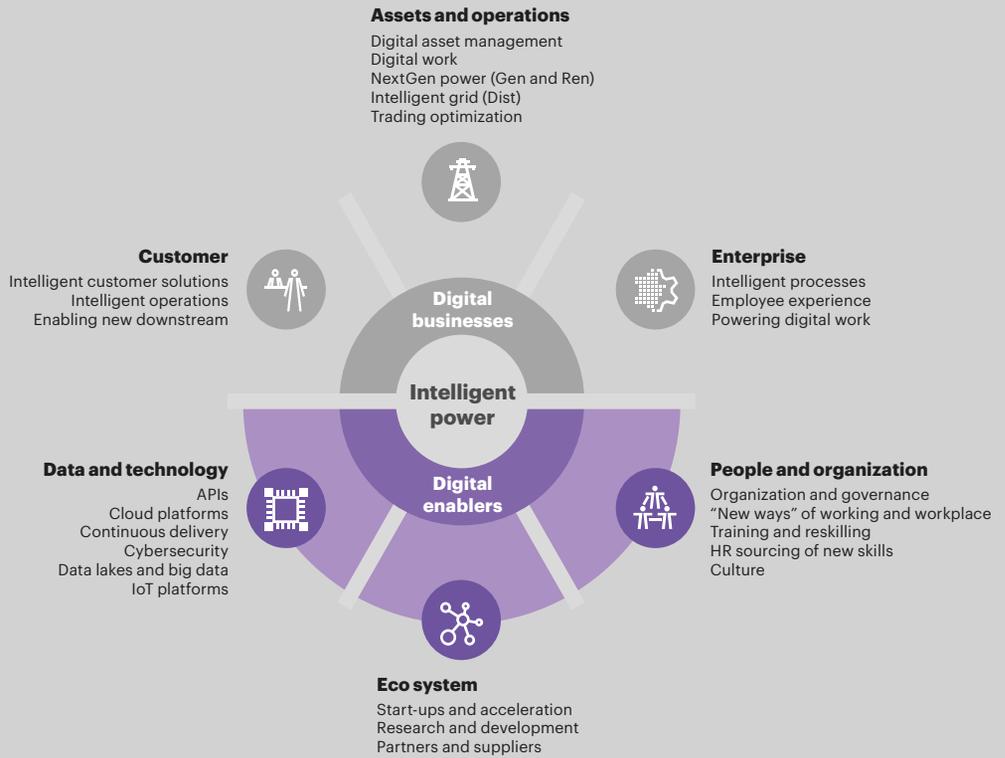
- Our EDP EV.X app, which allows customers to simulate the financial and environmental savings achieved by replacing a combustion vehicle for an electric vehicle of the customer's choice
- Analytics 4 Assets, which has two main segments: one to create a set of cloud-based data lakes to support the project along with future projects and analytical models and another to build analytical models and dashboards to support advanced asset management in the high-voltage overhead network, high-voltage circuit breakers, and high/medium-voltage transformers
- Our edpON, app which aggregates several tools used by EDP Group's employees on a single site, making it possible to book holidays, justify absences, and record incidents, among many other items

At this stage, we already delivered around 250 MVP to all business units within EDP Group and engaged with thousands of employees worldwide, including with digital training and knowledge sharing sessions.

From 2021 to 2025, we plan to invest €1 billion in digital capex to continue fostering EDP's digital transformation, allocating 1,100 employees to digital and innovation activities and training and reskilling 90 percent of our people in digital skills. Our digital transformation will enable new businesses in the e-mobility space. For example, 70 percent of customer interactions will be self-care, advanced analytics will be scaled up to 90 percent predictive maintenance in renewable and conventional generation, 95 percent of processes will be digitalized, and we will have 75 percent agile adoption in IT delivery.

Figure 9

Action streams and digital enablers to accelerate EDP's intelligent power digital vision



Source: EDP

Question 4: How did you set up EDPx, and what goals did you have?

Answer: EDPx was EDP's digital factory acceleration program. Launched in November 2017, the program was active until June 2018. Its purpose was to build the foundations of digital transformation across EDP's entire value chain, from conventional generation and renewables to energy retail, transmission, and distribution as well as in the corporate and support areas of the company. We had three fundamental goals in the beginning of the project:

- Understand the company's level of digital maturity. In order to do this, we assessed all of the digital initiatives running across all business units worldwide.
- Create a common vision for our digital transformation.
- Define a plan to implement that vision in a short period of time.

We identified and framed more than 500 digital initiatives into three action streams and three groups of digital enablers or tools to accelerate the group's intelligent power digital vision (see figure 9).

By 2020, we had restructured our applications portfolio, with the decommissioning of 124 legacy applications, the migration of 50 percent of the portfolio to the cloud, and aiming for 85 percent of its systems migrated by the end of 2022. API development has also been significant with 378 developed API by the end of 2020, connecting legacy systems with new digital applications. We have also built a partners ecosystem with 39 organizations to support the development of digital projects and to foster digital learning and new ways of working inside the organization. We completed 15 digital boost projects (high complexity and a six- to nine-month implementation), 255 MVPs, and another 218 quick-win projects (around a two-week implementation). Agile methodology is also spreading with more than 3,200 people working in agile and more than 1,200 people already trained.



**João Nascimento,
Head of EDP Digital
Global Unit, Energias de
Portugal SA**

“Digitalization has been front and center of our strategy, and we are proud of our digital journey so far. We are also very aware of the fact that digital transformation will be an ongoing effort for years to come. Keeping up with this transformation will require us to strengthen digital talent and culture, increasingly experiment and deploy new digital technologies seamlessly and at speed across the value chain, and deliver robust results that unlock new value for clients, shareholders, partners, and society as a whole.”

Question 5: What were the key success factors?

Answer: While the potential benefits of digital for utilities may be clear and substantial, transforming a utility organization is particularly difficult given the cautious culture from long-established working methods built around minimizing operational risks, complex legacy operations and IT architectures, and a perception of utilities as former public-sector companies, which makes it harder to attract digital talent. We knew this from the start, and that’s why we chose to focus on people at least as much as on technology. We defined a bold vision cascaded down to quantified targets, secured top management’s commitment, built the digital factory to empower people to work in completely new ways, and embraced partnerships with start-ups, universities, and technology vendors. We invested in technologies and completely rethought our vendor sourcing approach—all while maintaining a “think big, start small, but scale fast” approach.

Question 6: What did you gain by participating in the Digital@Utility study?

Answer: The study confirmed many of the areas where we already thought we were leading, but most importantly, it uncovered some key opportunities compared to our best-in-class peers, such as accelerating the monetization of digital products and services, raising the digital experience for both customers and employees, and escalating advanced analytics in both assets management (predictive maintenance) and commercial aspects, such as predictive migration. However, the value of the insights we received really came from the high level of detail in the digital practices that are benchmarked, the granularity of the comparisons, and the breadth of coverage—all in a quantified and intelligible way so that we could really understand our specific improvement areas. It was also useful to help us shape our digital agenda for the coming years while aligning the broader leadership and organization toward it. Our work in digital is never done; we are always looking for the things we can do better and new things to experiment with.



Claudia Bernard,
Project Manager,
Stadtwerke München
GmbH (SWM)

“In times of a shortage of skilled workers, it is helpful to relieve people of dreary typing jobs. They deserve better.”

Case study: Stadtwerke München GmbH (SWM)

Robotic process automation (RPA)

Question 1: Why was the initiative launched?

Answer: The impulse for using RPA at SWM came in 2017 at an external event on this technology. Subsequently, we decided to try it out since there are processes within our company that can be considered boring or time-consuming.

Question 2: How did you proceed?

Answer: We first described our requirements in a specification sheet and then carried out a tender. We robotized three small processes in a proof of concept and experienced the procedure and the possibilities. Then, we conducted an analysis to determine whether we could identify enough processes at our municipal utility that can be handled via RPA, making it worthwhile to permanently implement this technology and build up a team of experts. The result was positive, which is why we started with the intensive promotion of this automation option in the company and the establishment of an RPA center of competence.

Question 3: What is the impact you achieved?

Answer: We have a competence center with 2.5 employees who take care of all RPA processes: application, conducting initial and consulting interviews, recording the processes, building and testing the workflows, commissioning, change, and incident management. In the meantime, we have automated around 20 processes and five that only ran once but were simple to build (migrations and master data cleansing). The fact that the departments had to deal with processes, process optimizations were also stimulated in areas that were not candidates for RPA. In this respect, the benefit provided by the RPA team is greater than the sum of the FTE equivalents carried out by the bot.

Question 4: What were key success factors for you?

Answer: The open communication and involvement of the works council, the positive and intensive promotion of the topic: we created a small flyer, gave many presentations, presented the subject in the employee magazine, on the intranet, and at two in-house digitalization fairs. We also developed clear guidelines, such as on how to proceed, document the processes, make the business case, and define responsibilities. The cooperation with the departments was very constructive and is further described as very positive by the departments themselves.

Instruments

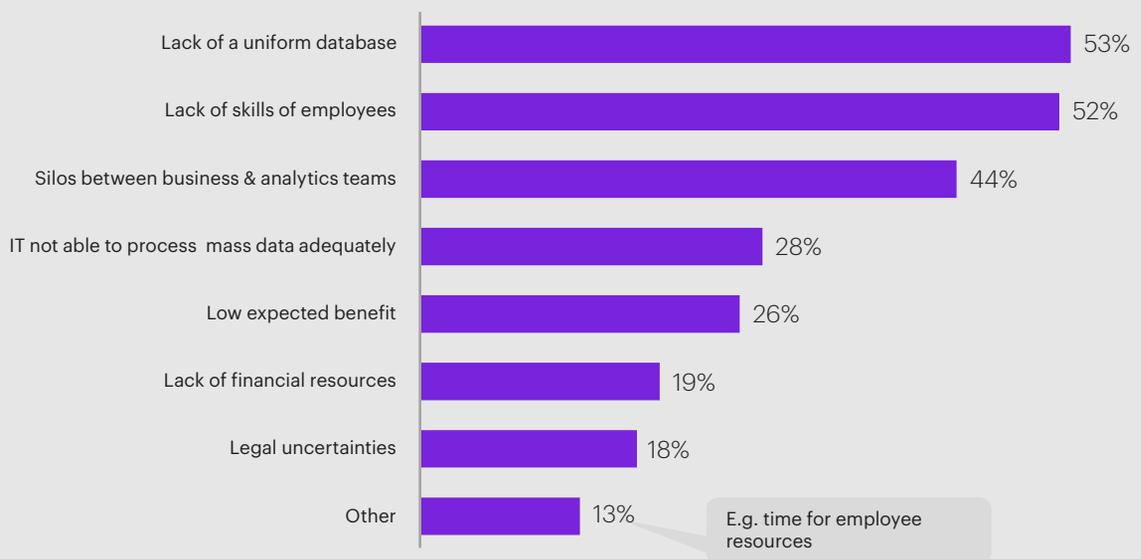
1) Data analytics and AI: Data treasures are often not exploited

Status quo and hurdles

The potential for data analysis and AI frequently remain unused or are rarely exploited because of substantial hurdles that many companies still face, which is hindering development in this field (see figures 10 and 11). The biggest hurdles are non-uniform databases, lack of staff skills, and silos between business functions and data analysis teams. The lack of digital skills has already been identified as a weakness in the context of the HR strategy and is consequently impacting this field. This hurdle could be overcome with an appropriate HR strategy or redefined job roles.



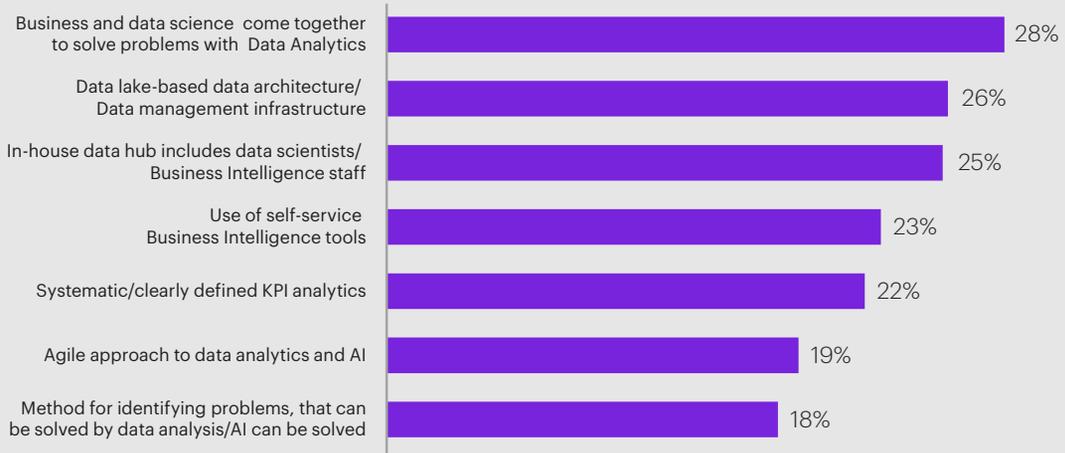
Figure 10
Hurdles for big data analytics



Source: IMP²ROVE, BDEW, VSE (2021); Kearney analysis

Figure 11

Status quo data analysis and AI



Source: IMP²ROVE, BDEW, VSE (2021); Kearney analysis

This captured impression can be confirmed after examining use cases more closely. Within this study's scope, we queried the maturity level of 38 use cases in the value chain elements power generation, transmission and distribution, trading and risk management, sales and service, energy services, metering, and supporting functions. Exclusively in retail and risk management for the use cases price analysis and demand forecasting, more than half of the assessed companies use predictive or prescriptive analytics. Regarding the other use cases, more than 50 percent do not use analytical optimization or optimization based on historical data (see figure 12). Within the value chain stages transmission and distribution along with power generation, we also analyzed the specific case of predictive maintenance. In the former, predictive maintenance is used by 13 percent of the companies surveyed, while this was the case for 33 percent of the companies operating in the field of power generation.

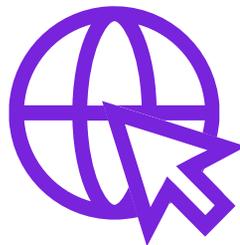
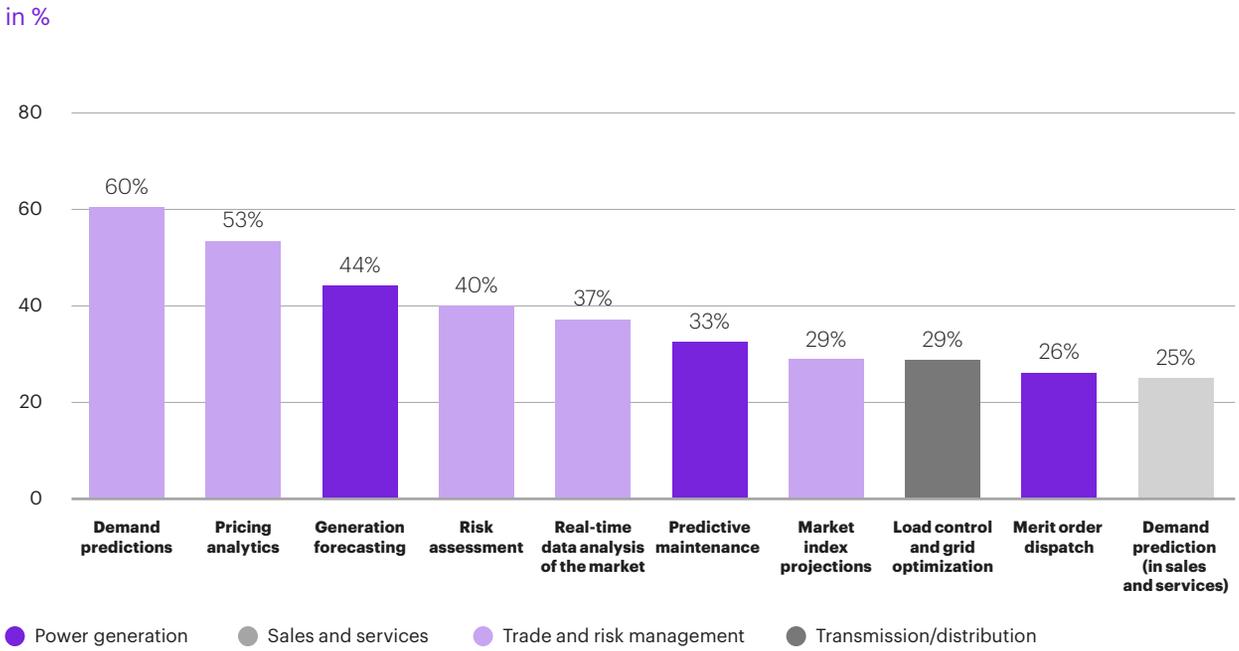


Figure 12

Most frequent applications of predictive or prescriptive analysis



Source: IMPROVE, BDEW, VSE (2021); Kearney analysis





Case study: Licht- und Wasserwerk Adelboden AG (LWA)

Energy in real time

Question 1: Why was the initiative launched?

Answer: The start-up aliunid AG is developing a digital offer for the breathing supply system of the future in cooperation with around 20 Swiss energy companies. As an energy supplier with various business fields on the open market, we are part of this community because it will move us forward on the path of our digital transformation, and we are convinced that we can offer our customers added value. With aliunid, we get the necessary tools to equip ourselves for the increasing demand for a more agile and sustainable energy supply.

Question 2: How did you proceed?

Answer: This specific project developed rather by chance for us. We became aware of aliunid as part of our market observation through the press, whereupon we contacted them. In the discussions that followed, we were able to demonstrate the added value that we can offer the aliunid community. Then we started. The community approach is of central importance. The energy companies are actively involved in the development and can thus contribute their experience and needs directly.

Question 3: What is the impact you achieved?

Answer: We are currently preparing the digital energy supply offer together with aliunid. In a first version, from 2022 we will offer our customers a new type of electricity product in which renewable energy can be used in real time and the CO2 footprint and costs can be effectively reduced. The electricity consumption can be viewed on an app at any time. We now purchase electricity from Valais hydropower plants at cost price: cheaper than on the market and at the same time transparent, without greenwashing. This leads to a new way of thinking in portfolio management. At the same time, the system is continuously being further developed in order to be able to control flexible consumers in a breathing supply according to the amount of electricity. In addition, we want to continuously offer our customers additional added value and take our employees with us on this journey. So the results of the last few months were mainly to be found internally. We learned a lot about using the IoT and about future energy supply. The knowledge gained with regard to our processes and organizational structures was particularly valuable.

Question 4: What were the key success factors for you?

Answer: Our short decision-making paths, the willingness to develop, and change as well as the knowledge of our strengths and weaknesses are certainly important in this initiative. In this way, we were able to bring our strengths to the aliunid community and learn from the community in areas in which we are even less good.

Question 5: What impulses were you able to take away from participating in the Digital@Utility initiative?

Answer: Digital@Utility offers us the opportunity, on the one hand, to consciously deal with our degree of digitization and, on the other hand, to derive targeted measures from it.



Pascal von Allmen,
Managing Director ,
Licht- und Wasserwerk
Adelboden AG (LWA)

**“Digitalization
doesn’t happen
overnight.
Therefore, it is
better to start
today together
with the
employees.”**

2) Partnerships: Success factor for large and small energy suppliers

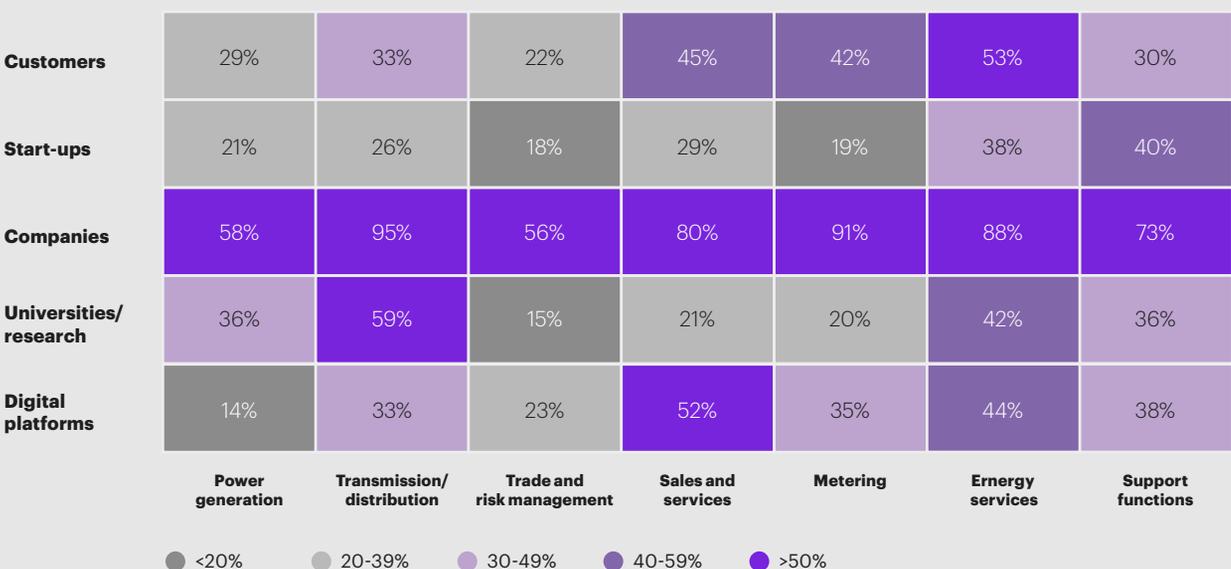
Overview

Partnerships are a success factor for many companies and complement digitalization within all value chain stages. Almost two-thirds of the surveyed companies say they have formed win-win partnerships to the greatest extent possible and show a high organizational and cultural willingness to work with partners (see figure 13). For instance, more than 50 percent say they continuously adapt partner networks to evolve partnerships. Likewise, more than 50 percent carefully and systematically consider different digital make-or-buy strategies. Nonetheless, partnerships are frequently not explicitly aligned with the overarching digital strategy, according to half of the companies in our study. Partnerships are primarily driven by the desire to optimize processes, with 80 percent of companies saying they form them to save costs. Almost 50 percent also report forming

partnerships to gain access to human resources and generate additional revenue. Regarding the type of partner, utilities of all sizes and grid operators cooperate most frequently with other companies. Further, the surveyed companies often manage collaborations with customers, particularly in the area of energy services. Top digitalizers, however, are characterized by also cooperating in less common fields. For instance, 80 percent have teamed with start-ups and 90 percent with universities and research institutions as well as with digital platforms. Considering company size, there are major differences in terms of the type of cooperation partner. For example, every company generating more than €1 billion in revenue cooperates with start-ups and more than 90 percent cooperate with universities and research institutions. However, 68 percent of companies with a revenue of less than €1 billion cooperate with the former and only 69 percent with the latter group of partners.

Figure 13
Cooperations between assessed companies and partners

Scores of peer groups

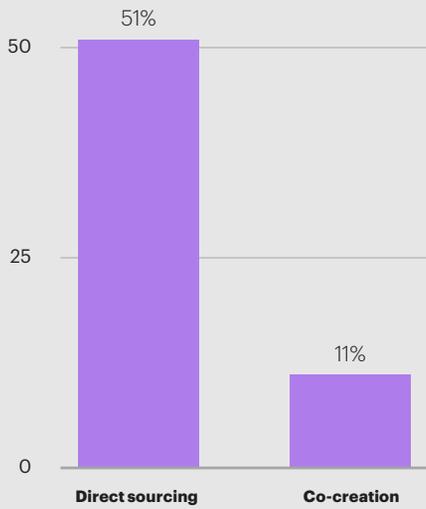


Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

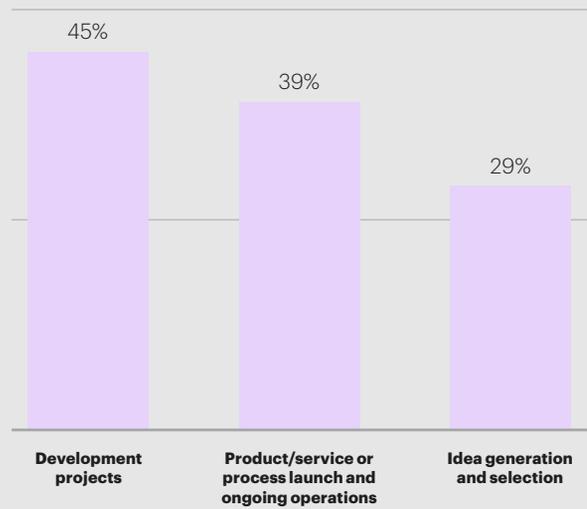
Figure 14

Cooperation models with start-ups

How are the companies working with start-ups?
in %



Where do they work with start-ups?
in %

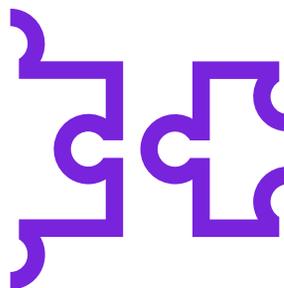


Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

Cooperation with start-ups

Despite the growing relevance of innovation, cooperating with start-ups is, on average, still comparatively rare (see figure 14). However, a positive overall trend can be identified. According to this year's survey, 75 percent of companies cooperated with start-ups in at least one area of the value chain. In last year's survey, this applied to only 60 percent of the companies. When collaborations are established, they are most frequently in support functions, followed by energy services and sales and service. Collaborations in the areas of trading and risk management as well as in metering are less common. In most cases, the

assessed companies work with start-ups via direct sourcing, and in relatively few cases, the companies are involved in the process of co-creation. Drivers of start-up cooperation are, as mentioned, large integrated energy supply companies. However, 93 percent of pure grid companies collaborate with start-ups. This impression is being confirmed once considering utilities with less than €100 million in revenue: only 50 percent have collaborated with start-ups.



3) Process digitalization: Progress in making

Overview

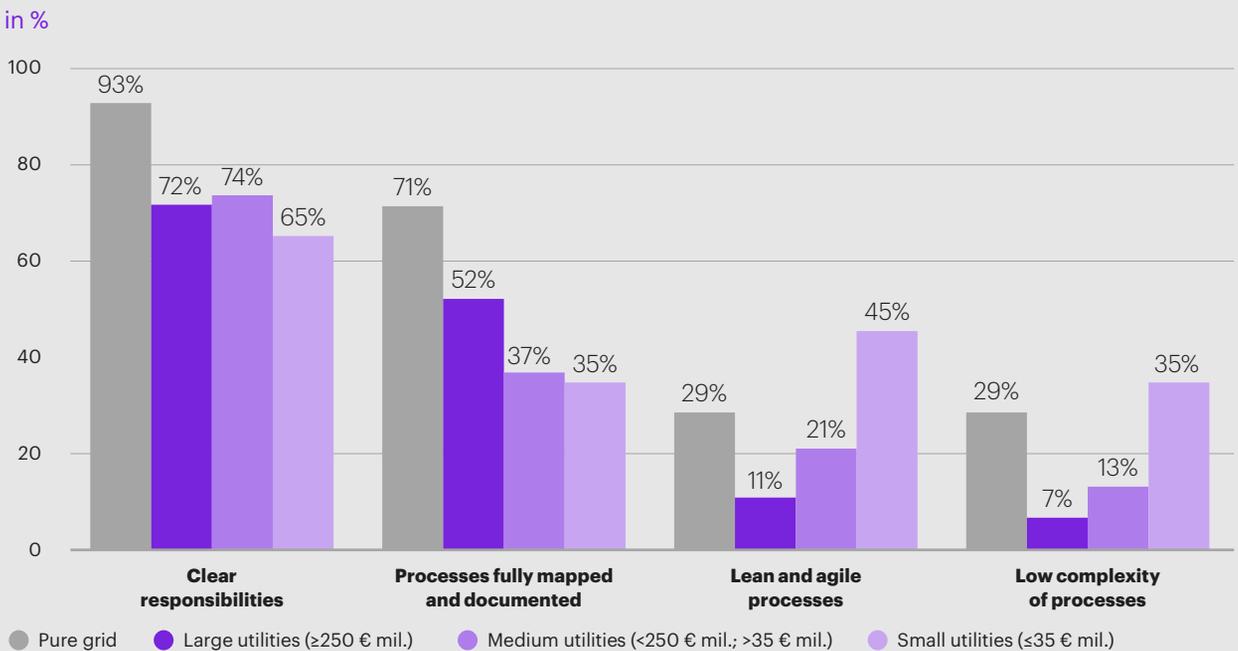
The competitive relevance of process digitalization has been repeatedly demonstrated in recent years, with players gaining efficiency and significant market share thanks to superior software.

Digitalization use cases in the network include, for example, network automation, analytics-based construction planning, automation in workforce management, credit note processes for subcontractors, use of drones for recordings and analyses, and self-service BI for regular independent preparation of business reports and analyses. In terms of technical maturity in the category of process digitization, large companies often perform better than small and medium-sized enterprises. However, the latter perform significantly better when it comes to agility, lean and less complex processes.



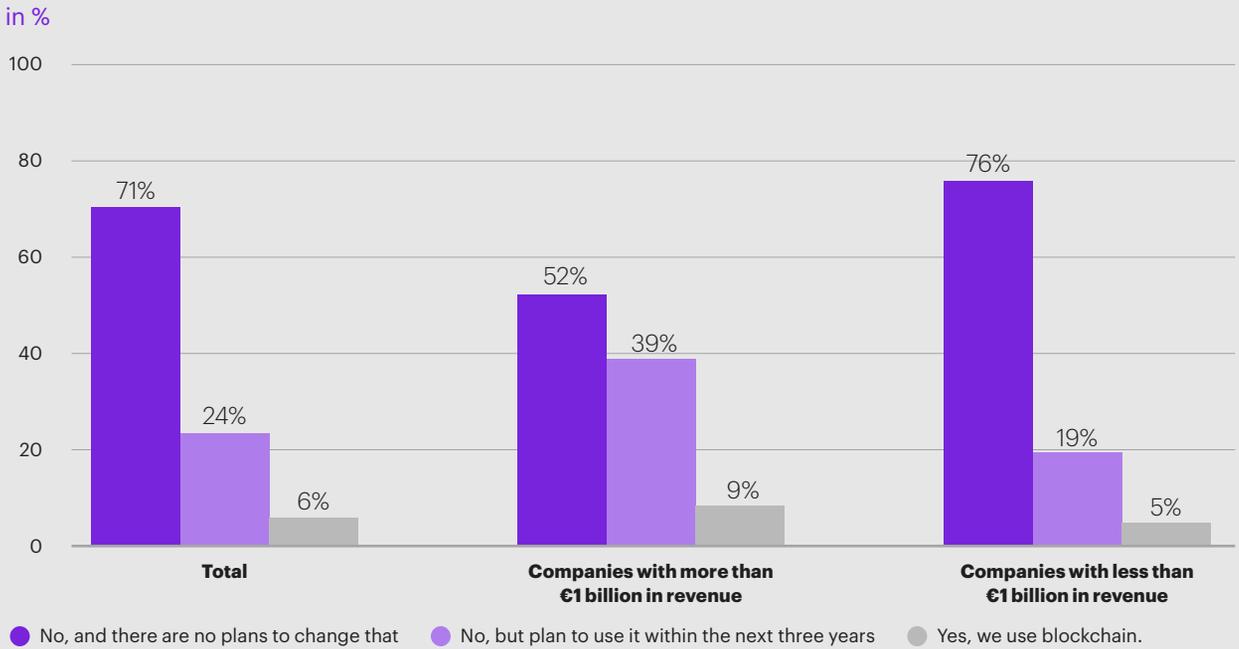
Figure 15

Organization of internal work processes



Source: IMP*ROVE, BDEW, VSE (2021); Kearney analysis

Figure 16
Leveraging blockchains



Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

Blockchain

Blockchain is among the newly emerging technologies, offering numerous interesting use cases for various industries, including the energy sector. Nonetheless, the technology is still in its infancy in terms of industrial momentum. Only 6 percent of the surveyed companies are using this technology (see figure 16). However, an additional 24 percent plan to use it in the near future. It's notable that large companies are pioneers regarding initial implementation. Almost 50 percent of the companies generating more than €1 billion in revenue plan to using blockchain, while this is not the case for a fourth of company generating less than €1 billion revenue. The most frequently planned blockchain use case among the assessed companies is the proof of origin. In this case, the energy used can be traced for the individual end consumer. The electricity consumption is evaluated at consumption times with the respective zip code and compared to the electricity mix at the corresponding times. Depending on an individual's green electricity consumption, crypto units are assigned. This ultimately provides information on how sustainable or green the actual power consumption was.²

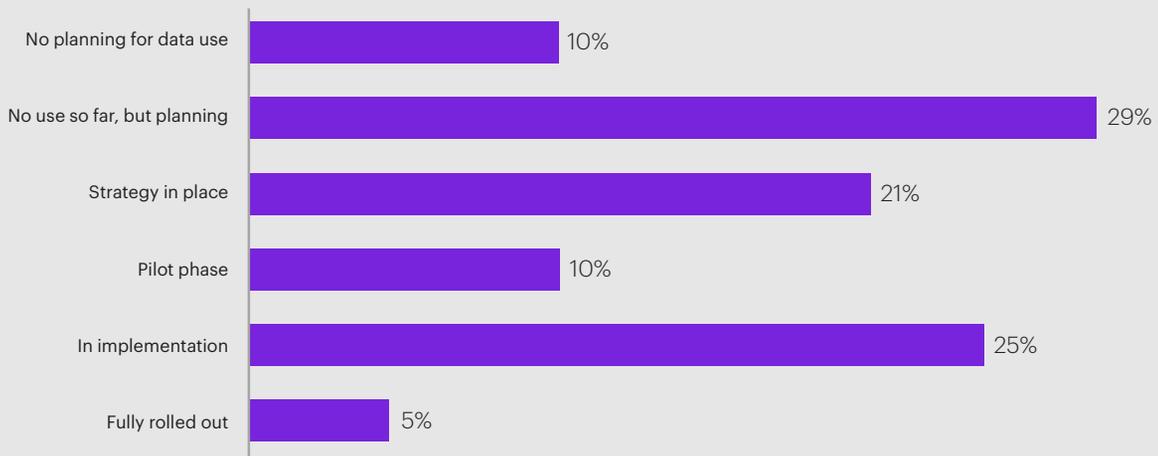
Smart grid

As part of this study, we investigated several smart grid use cases. Among the queried cases, a fault current limiter to protect installations was the most frequently used with 42 percent of the assessed companies. It is also notable that 32 percent of companies plan to use and 19 percent already apply predictive algorithms to forecast demand and avoid outages. Less common are self-healing networks (only 25 percent plan these or have already implemented them) and phasor measurement units (only 31 percent plan these or have already implemented them). Referring to advanced distribution management systems (ADMS), 29 percent of the companies are at least in the pilot phase for implementation.

² Source: Blockchain in the energy industry study, BDEW (2017)

Figure 17

About three in ten utility companies use smart meter data



Source: IMP²ROVE, BDEW, VSE (2021); Kearney analysis

Smart metering

Smart metering is another technology that has emerged over the past decade and is further fostered by governmental interventions. This ultimately affects utility companies. Nonetheless, substantial differences in the implementation progress exist by country. For example, Swedish households are among the most advanced when it comes to smart metering with a 100 percent coverage rate in 2016.

In terms of value creation, the acceleration of processes followed by operating cost savings for measurements and the cost reduction of network operation were most frequently named as the benefits of smart metering. In addition to these process-related gains, some companies were also able to benefit from the data that smart metering generates. More than 40 percent of companies were able to improve the quality of network data, and almost one in four has implemented solutions for energy efficiency recommendations for customers.

Despite these advantages, there are hurdles when it comes to implementation. Primarily, the high costs associated with setting up a smart metering infrastructure was cited as a major obstacle. Numerous participants also report acceptance and communication issues with customers.

Case study: AusNet Services (geospatial technologies)

Machine learning for asset defect identification and virtual asset assessment

Question 1: Why did you initiate the project?

Answer: Identifying and managing asset defects in an electricity network traditionally requires predominately field-based workforces conducting cyclical physical inspections and assessments. These are sometimes augmented by aerial inspection and image capture. Such processes are essential for maintaining network reliability and compliance. However, these processes also entail high operational costs, inherent productivity constraints, and safety and risk considerations.

Digitisation offers the opportunity to increase productivity, efficiency, and intelligence, so we initiated two parallel efforts to build a foundation for improvement:

- Machine learning models to automatically identify specific defects in imagery with high accuracy.
- A software capability to enable more efficient processing of assessments and as the basis for expanding and productionising additional machine learning models.

Question 2: What was your approach?

Answer: We had a vision to bring machine learning models into the process and provide the software platform for using and improving this over time. Machine learning development focused on high-value use cases. We conducted tests using real-world data to ensure the performance and quality of the models. The machine learning models, and associated data and image pipelines, were integrated through the software we developed to provide the user interface for more efficient and productive management of the processes.

As a developing capability, we are taking a long-term approach, with ongoing development set to take place over the next 2-3 years. Our next steps are to productionise and embed the capability into business

Example of virtual assessment: with pole cap defect featured in primary photo



Source: AusNET Services Holdings



Robert Fraser, Head of Data Science & Advanced Analytics, AusNet Services

“Machine Learning will unlock a step-change in productivity and asset intelligence.”

processes, continue delivery of the product road map, and use a ‘human-in-loop’ approach in the optimisation and application of machine learning models.

Question 3: What is the impact you achieved?

Answer: We have already achieved significant breakthroughs from our efforts to-date. We have trained our models to identify four key defects with an 80 to 95 percent accuracy rate. Further, we obtained production-ready software with integrated machine learning capability. We also improved image management and implemented automated asset linking.

Question 4: What were the key success factors for the project?

Answer: In my view, the four most relevant success factors were a strong vision, business buy-in, robust data, and of course, talented, and motivated people, especially in machine learning and software engineering.

Case study: Stadtwerke Essen AG

Management reporting 2.0

Question 1: Why did you initiate the project?

Answer: Our environment is characterized by a high frequency of change. The dynamics of changing challenges in the core business are increasing, as are business opportunities in new fields. Reporting as a pilot for decision-making must keep pace with this and simultaneously ought to be organized efficiently.

Question 2: What was your approach?

Answer: The conception was classic, and the implementation was agile. Similar to any other development project, we started by collecting what bothered us about the status quo, resulting in numerous fields of action. It was also vital to us that all areas of the company, ranging from marketing to network operations, were involved and could contribute to their needs. First, we concentrated on essential topics. In our case, these were quantities, contribution margins, and EBT. In terms of format and intervals, the balance between wishful thinking and efficiency was important. Another hurdle we faced was the COVID-19 pandemic since this project was one of the first major companywide projects to be run almost entirely virtually. Nevertheless, everything worked out well. The implementation was picture-perfect agile since we simply coded our digital reporting tool and adapted it constantly to the needs as a consequence of short review cycles.

Question 3: What is the impact you achieved?

Answer: We launched a new reporting format that has a higher information value than our many reporting pages before with just a few standardized evaluations. Thanks to extensive digitalization, we could also shorten the process, and there is more time for valuable analysis. Often, the quantity of information obscures the perception of what is essential. Our premiere was a success, with praise. Moreover, we received constructive suggestions for further development. Our management reporting 2.0 is not finished yet. The overall aim is to develop the system and constantly and flexibly adapt it.

Question 4: What were the key success factors for the project?

Answer: Dedication, communication, and playfulness. Dedication to the reporting topic, which is significantly less stodgy than widely assumed. I consider it a worthwhile art to limit oneself to the essentials given today's almost infinitely available mountains or lakes of data and to wring value from its condensate for decision-making.

Communication, since it not only creates acceptance among those who are to work with it later, and because a treasure trove of ideas slumbers in the breadth of the contributors from which one can draw.

It takes a playful spirit not to ponder the implementation forever at the "green IT table" but to execute simply. No doubt, occasionally, things do not work out or go wrong at first.

Question 5: What impulses were you able to take away from your participation in the Digital@Utility initiative?

Answer: For us, it is a wonderful opportunity to determine our position and to make progress visible over time.



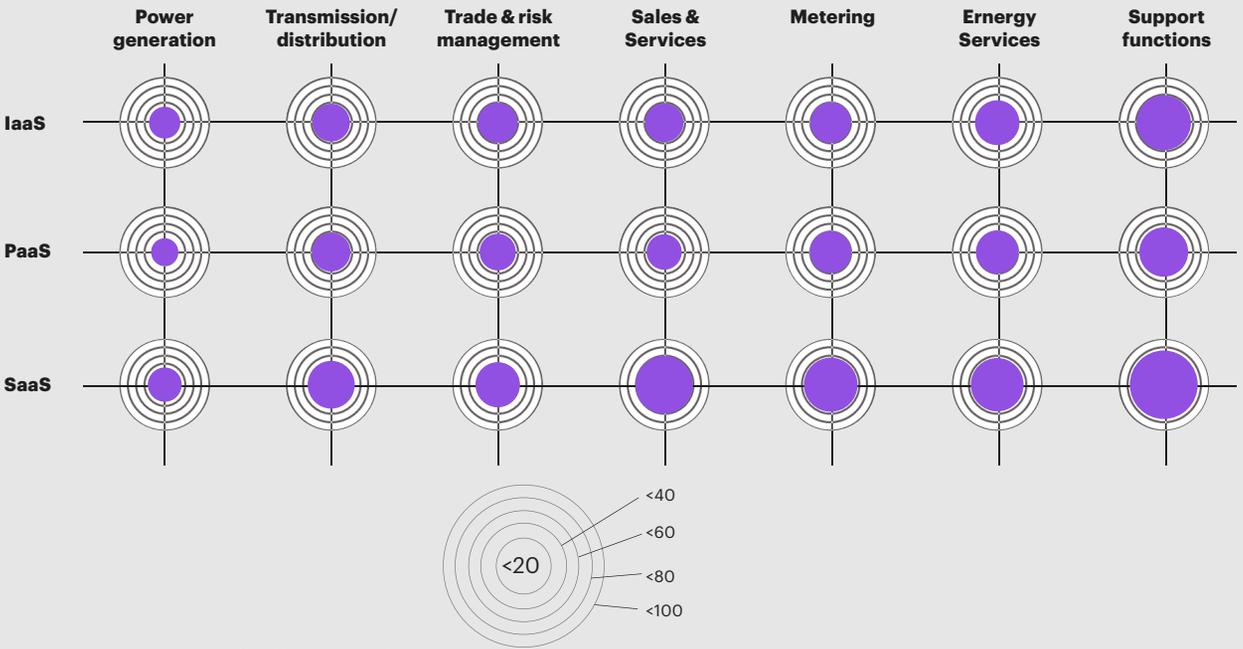
“Digitalization alone does not result in good reporting. However, it helps smart heads behind the reporting.”

**Tobias Grau,
Head of Finance,
Stadtwerke Essen AG**

Figure 18

Status of the use of cloud-based services

% of all companies surveyed



Source: IMP³ROVE, BDEW, VSE, (2021); Kearney analysis

4) IT and data protection: Amplified build-up to be expected in the coming years

Overview

IT development plays a vital role in the energy industry. Cloud services—IaaS, PaaS, and SaaS—are becoming business-standard, almost regardless of the size of the utility company. More than 90 percent of grid operators and large and medium-size utilities are already using or plan to use these services within the next three years. Small utilities stand out in this respect since almost 20 percent do not use any of these services and are not planning to. Along the value chain stages, IaaS, PaaS, and SaaS are frequently used for support functions (see figure 18).

Considering the general development of IT, two-thirds of companies say their IT department supports existing and new business well. Almost 80 percent say top management fully supports the strategy and road map for developing applications and IT infrastructure. Nevertheless, there appears to be room for improvement concerning more radical developments. For instance, less than 50 percent say IT provides an impetus for innovation, and only about 50 percent say IT drives new topics such as AI or data analytics.

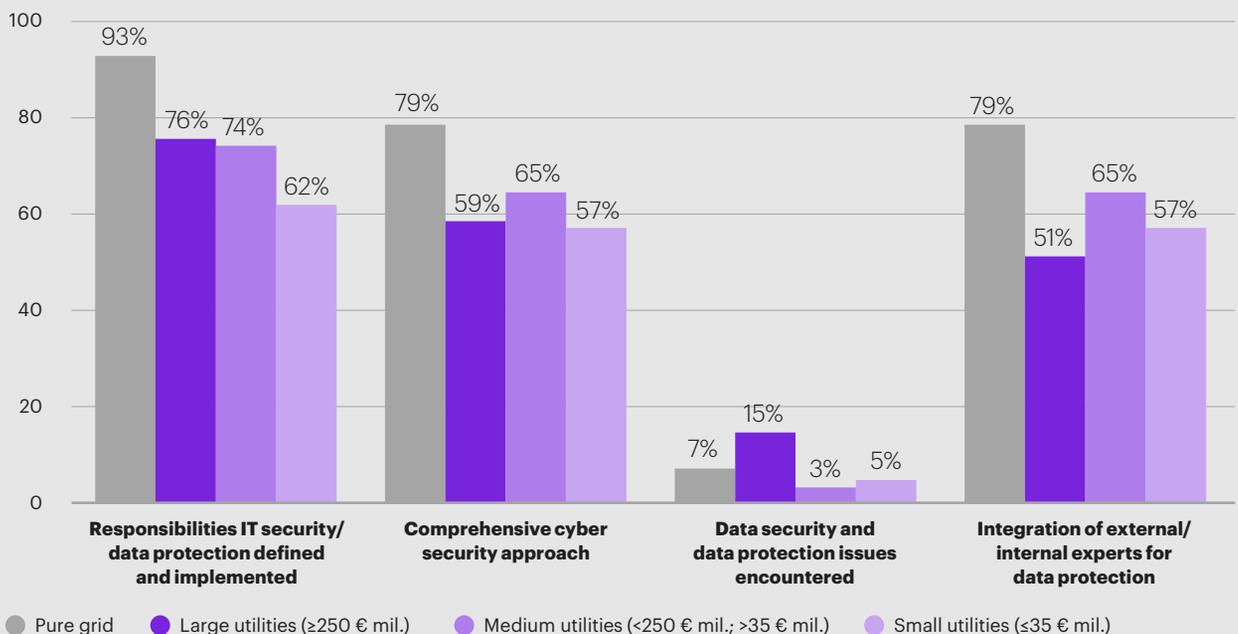
In terms of IT development methodologies, the most prominent approach is DevOps, with close collaborations among operations and development in IT delivery. More than 40 percent of companies use this approach. Not even a fifth of companies use low-code technologies for new developments or Agile@Scale¹ frameworks or have implemented a CI/CD pipeline. There are many potential advantages of the mentioned development methods, including enhanced cross-functional collaboration, broader participation in digitalization activities, and more time-efficient development. Low-code technologies are particularly interesting if one aims to simplify the coding of applications. Hence, non-experts can also create applications.

For internal IT development, numerous companies are in a transformation phase: 53 percent have a clear road map for their own IT transformation, and 56 percent estimate that SaaS will become more important than on-premise solutions. There are still weaknesses in the systematic investigation of IT capabilities. Only 36 percent say they evaluate capabilities, and only 30 percent say they have identified business areas and potential differentiators based on those evaluations. IT and data protection also merit more attention with many utilities not yet stating that they have a comprehensive cybersecurity approach (see figure 19).



¹ IaaS is infrastructure as a service; PaaS is platform as a service; SaaS is software as a service.

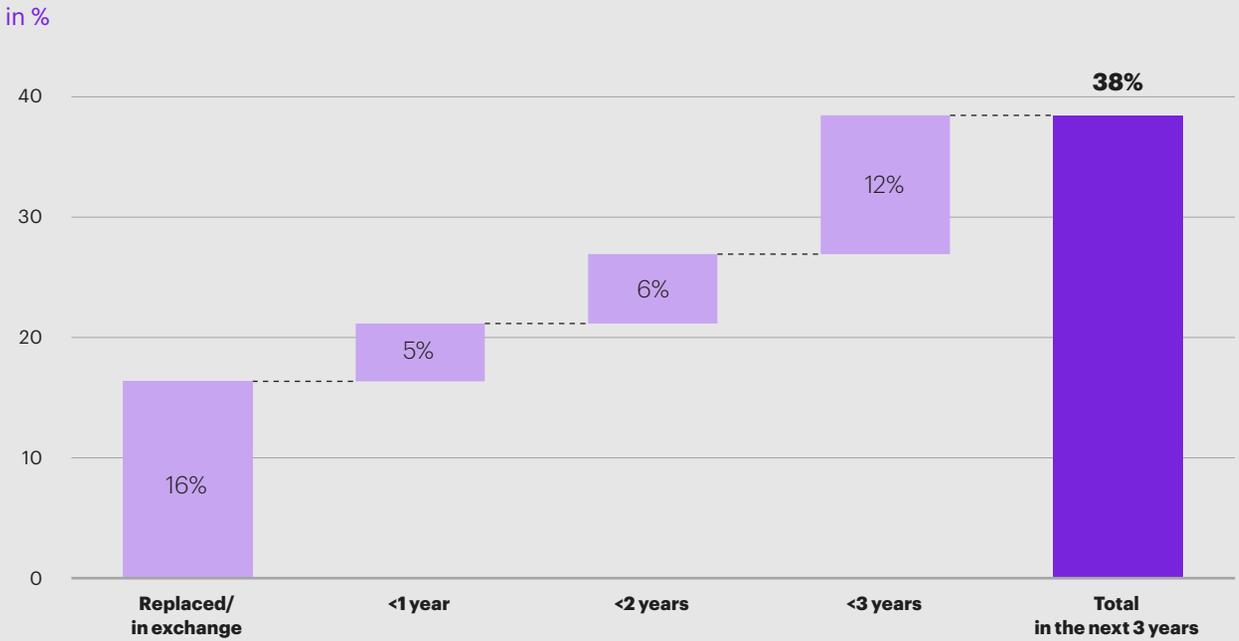
Figure 19
Status IT and data protection
 in %



Source: IMP²ROVE, BDEW, VSE (2021); Kearney analysis

Figure 20

Replacement of legacy billing systems in the coming years



Source: IMPROVE, BDEW, VSE (2021); Kearney analysis

Replacements for legacy billing systems are also becoming more frequent, driven by discontinued support of legacy software. Thus, among the surveyed companies, replacements for systems such as SAP IS-U are making progress. Sixteen percent have already replaced or are currently replacing these systems. However, over the next three years, another 23 percent plan to replace them. This gradual development indicates that in the near future, 38 percent of companies will have replaced their legacy billing systems (see figure 20). The remaining 62 percent say they are planning a replacement later than in the next three years or have not specified anything in this regard.



Case study: Verbund Netz Gas AG (VNG)

Empowering employees: “digital bridgeheads” and low-code platforms

Question 1: Why was the initiative launched?

Answer: Advancing digitalization awakens a wide range of wishes and expectations among our employees; a persistent request for digitalization is the desire to improve processes and procedures and to support them better with technology. Frequently, processes are mentioned that are very present in the daily work of VNG employees but do not necessarily represent central business processes. Examples of this are paper-based or administrative processes. Without a clear business case and limited IT resources, such processes are often postponed when it comes to implementation. Therefore, new paths must be taken to successfully digitalize these processes. The possibilities of no-code or low-code platforms are the means of choice for VNG. They enable even non-technical people to implement digital solutions quickly and easily without relying on external resources or violating applicable guidelines and governance. The departments are thus empowered to help themselves, and the employees are shown an individual development perspective to shape our digital future.

Question 2: What was your approach?

Answer: The starting point for this initiative is VNG's digital transformation. Since 2018, VNG has organized its digital transformation as a holistic project called the Digital Journey. Central aspects of digitalization were implemented in stages. Like most transformation topics, low-code process digitalization was also taken up as a focus topic in a journey stage. The staff was able to explore the new technical possibilities and learn about the tools' capabilities (and limitations) through “observed learning.” Frameworks and governance were created for the organization in a timely manner based on the learning experiences. This topic quickly developed a momentum of its own, and the users organized themselves into communities, implemented solutions together, and pushed the boundaries of what was possible. To further promote the positive effects, competence communities were created on the one hand, and interested colleagues were trained as multipliers and contact persons (“digital bridgeheads”) and established in the first departments on the other. Special training programs were designed and carried out for this purpose.

Question 3: What is the impact you achieved?

Answer: Decentralized process digitalization using low-code has now become a central element of the digital transformation at VNG. More than 900 workflows have been implemented using low-code in the past two years. In many cases, these are simple approval processes or personal productivity processes. Individually, these workflows often solve qualitative process deficits from the perspective of the respective employees. Overall, however, there are significant savings and quality improvements. The learning curve employees go through when they start with supposedly simple processes is impressive: the subsequent solutions become increasingly complex, innovative, and shared within our organization. Low-code has also become a catalyst for AI. While AI technologies were only used in isolated use cases in the past, more departments are using data-based functions to make their workflows smarter. A concrete example can be found in the finance department, which first converted an incoming mail process to a digital workflow during the pandemic and expanded it a little later with a module for form recognition. Since then, the manual entry of some forms is no longer necessary.

An unexpected result of the activities around self-determined process digitalization in the departments was discovering talent who were initially outside the radar for implementing digital solutions. These employees are developed in a targeted manner and ensure the multiplication of knowledge within the organization.

Question 4: What were key success factors for you?

Answer: The results presented would not have been possible without the following factors:

Technical progress. Only in the past few years have low-code tools in conjunction with cloud platforms developed to a maturity level that meets our usability, functional scope, and governance requirements.

Learning and error culture. The first activities with low code were motivated by an opportunity perspective. At the same time, all participants were also aware of the possible risks and consequential costs. By accepting mistakes and learning together, the organization has shown that it can take on entrepreneurial responsibility.

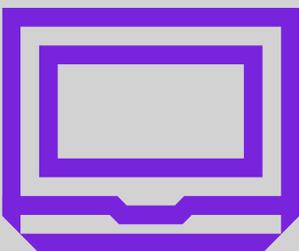
Employee engagement. Low-code platforms are primarily aimed at the functional level of an organization. This target group has also actively promoted the topic. At the same time, our managers have granted the necessary freedom and offered their support when needed.

Holistic change management. Simultaneously with using new technologies, we adapted the technical and commercial framework conditions. In addition, the corporate culture has evolved. The top level has committed to the digital transformation and makes sure that the change process combines technical, process-related, organizational, and strategic competence.



**Stephan Sachse, Manager
Digital Transformation,
Verbund Netz Gas AG (VNG)**

“One-off implementation of lighthouse processes or long-term empowerment of employees for independent process digitalization? It quickly became clear to us that our future could only lie in the latter.”



Outlook

Future developments: our offerings

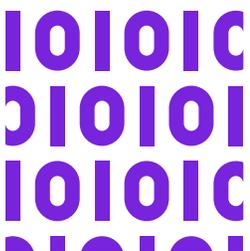
The results of our study demonstrate a high level of dynamics in the industry with 56 percent having a digital strategy, while another 38 percent have a digital strategy in planning or development. The industry is undergoing a transformation and digital products and services will continue to gain relevance in the future. In 2022, the initiative will include the following offerings:

Digital@Utility benchmarking

The Digital@Utility benchmark analysis for measuring the degree of digitalization will be offered again in 2022. We cordially invite all utilities to participate and to receive their individual benchmarking report free of charge. Contact digital-evu@bdew.de if you would like to participate.

Digital@Utility workshops

We are planning to conduct workshops for energy suppliers interested in determining the maturity of their digitalization, including cross-industry potential use cases as well as in-depth workshops on the sub-areas of Digital@Utility. We cordially invite you to an informational discussion on this topic. Further information is provided at: <https://www.bdew.de/energie/digitalisierung/digitalevu-workshopreihe-digitalkompetenzen-der-energiewirtschaft-staerken/>



Contacts

BDEW



Dr. Tanja Utescher-Dabitz
Head of Digitization, Business
Management
tanja.utescher-dabitz@bdew.de
+49 30 300199 1664



Elie-Lukas Limbacher
Unit Manager Digital
Transformation (project lead for
BDEW)
elie-Lukas.limbacher@bdew.de
+49 30 300199 1425



Lisia Mix
Unit Manager Telecommunication,
Broadband and Digitization
lisia.mix@bdew.de
+49 30 300199 1064



Lisa Möller
Analyst
lisa.moeller@bdew.de

VSE



Markus Riner
Head of Digitization
markus.riner@strom.ch
+41 62 825 25 27

Central Team Kearney and Kearney | IMP³ROVE



Hanjo Arms
Partner
hanjo.arms@kearney.com
+49 175 2659 782



Horst Dringenberg
Partner
horst.dringenber@kearney.com
+49 175 2659 437



Kai Engel
Partner
kai.engel@kearney.com
+49 175 2659 496



Dr. Martin Ruppert
MD IMP³ROVE
martin.ruppert@
improve-innovation.com
+49 175 2659 390



Dr. Nils Dülfer
MD IMP³ROVE
nils.duelfer@
improve-innovation.com
+49 175 2659 265



Manuel Seuffert
Manager IMP³ROVE
manuel.seuffert@
improve-innovation.com
+49 1752659761

Contacts

Central Team Kearney and Kearney | IMP³ROVE



Tobias Menzel
Consultant
tobias.menzel@kearney.com
+49 175 2659 583



Marc Ahlers
Consultant
marc.ahlers@kearney.com
+49 175 2659 356



Hannah Leighton
Consultant
hannah.leighton@
improve-innovation.com
+49 175 2659 746



Marius Müller
Consultant
marius.mueller@
improve-innovation.com
+49 175 2659 269



Philip Mattes
Analyst
philip.mattes@kearney.com
+49 211 1377 2263



Hannes May
Analyst
hannes.may@
improve-innovation.com
+49 175 2231 371

Kearney contributors



Robert Jekel
Principal, Germany
robert.jekel@kearney.com
+41 79 694 85 12



Paulo Goncalves
Partner, Portugal
paulo.goncalves@kearney.com
+351 917999313



Pedro Rezende
Partner, Portugal
pedro.rezende@kearney.com
+351 934000004



Pedro Vasques
Principal, Portugal
pedro.vasques@kearney.com
+351 911163502



Safia Limousin
Partner, France
safia.limousin@kearney.com
+33 687273910



Christof Ledermann
Partner, Switzerland
christof.ledermann@kearney.com
+41 44 487 4448



Martin Kuca
Partner, Czech Republic
martin.kuca@kearney.com
+420 724804326



Petr Materna
Principal, Czech Republic
petr.materna@kearney.com
+420 602 273 661



Onur Okutur
Partner, Turkey
onur.okutur@kearney.com
+90 5302341060



Andrea Roversi
Partner, Italy
andrea.roversi@kearney.com
+39 3357477297

Kearney contributors



Marco Andreassi
Partner, Italy
marco.andreassi@kearney.com
+39 3488064893



Claudia De Cesare
Partner, Italy
claudia.decesare@kearney.com
+39 3461461610



Nicola Ruffini
Partner, Italy
nicola.ruffini@kearney.com
+39 3336094595



Rogier Corthout
Principal, Belgium
rogier.corthout@kearney.com
+32 495 589 523



Ernst van Duijn
Partner, Netherlands
ernst.vanduijn@kearney.com
+31 650274617



Ola Engebretsen
Partner, Sweden
ola.engebretsen@kearney.com
+46 708 49 77 77



Ceyda Atay Haga
Principal, Norway
ceyda.atay@kearney.com
+47 90281144



Frederick Ihl
Senior global marketing lead,
Norway
frederick.ihl@kearney.com
+47 4770 97 96



Marko Derca
Partner, Slovenia
marko.derca@kearney.com
+386 41 555 055



Shinsuke Tsutsui
Partner, Japan
shinsuke.tsutsui@kearney.com
+81 80 4102 4856



Tsubasa Oshima
Principal, Japan
tsubasa.oshima@kearney.com
+81 80 4102 4761



Sandeep Biswas
Partner, Singapore
sandeep.biswas@kearney.com
+65 85695950



Peter Munro
Partner, Australia
peter.munro@kearney.com
+61 419 680 070



Enrico Rizzon
Partner, Australia
enrico.rizzon@kearney.com
+61 421 051 816



Saurabh Singh
Partner, India
saurabh.singh@kearney.com
+91 9810168532



Vikas Kaushal
Partner, India
vikas.kaushal@kearney.com
+91 9811096717

Contacts

Kearney contributors



Nishant Nishchal
Partner, India
nishant.nishchal@kearney.com
+91 9999341950



Sanchit Makhija
Principal, India
sanchit.makhija@kearney.com
+91 124 4590896



Praneel Jain
Consultant, India
praneel.jain@kearney.com
+912247970750



Claudio Goncalves
Partner, Brazil
claudio.goncalves@kearney.com
+55 11 9 76099006



Diogo Cunha
Principal, Brazil
diogo.cunha@kearney.com
+55 11 3040 6303



Patrick Haischer
Partner, USA
patrick.haischer@kearney.com
+1 917 748 6810



Balu Balagopal
Partner, USA
balu.balagopal@kearney.com
+1 713 560 0125



Oliver Zeranski
Partner, USA
oliver.zeranski@kearney.com
+1 347 302 4100



Brent Ross
Partner, USA
brent.ross@kearney.com
+1 773 350 1912



Brian Dunn
Partner, USA
brian.dunn@kearney.com
+1 4243326451

The authors would like to thank all participating companies who have used Digital@Utility.

We would like to thank Sarah Bremm, Hanna Kim, and Thamara Weiershaus Rodriguez for their ideas, valuable support and cooperation in the initiative.

For editing and graphics, we would like to thank Can Erdal, Axel Heuting, and Marco Zander.

BDEW

The Federal Association of Energy and Water Management (BDEW), Berlin, and its regional organizations represent over 1,900 companies. The spectrum of members ranges from local and municipal to regional and supra-regional companies. They represent around 90 percent of the electricity and over 60 percent of local and district heating sales, 90 percent of the natural gas sales, over 90 percent of the energy networks as well as 80 percent of the drinking water supply and around a third of the wastewater disposal in Germany.

bdew.de

IMP³ROVE

As Kearney's competence center for innovation management, IMP³ROVE is uniquely positioned to support clients in gaining a competitive edge by better management of innovation, including innovation to differentiate with digitization and sustainability.

www.imp3rove.de

VSE

VSE is the nationally and internationally recognized umbrella association for the Swiss electricity industry. Its members produce, transmit, distribute or trade in electricity and ensure over 90% of Switzerland's electricity supply.

strom.ch

Kearney

As a global consulting partnership in more than 40 countries, our people make us who we are.

We're individuals who take as much joy from those we work with as the work itself. Driven to be the difference between a big idea and making it happen, we help our clients break through.

kearney.com

For more information, permission to reprint or translate this work, and all other correspondence, please email insight@kearney.com. A.T. Kearney Korea LLC is a separate and independent legal entity operating under the Kearney name in Korea. A.T. Kearney operates in India as A.T. Kearney Limited (Branch Office), a branch office of A.T. Kearney Limited, a company organized under the laws of England and Wales. © 2020, A.T. Kearney, Inc. All rights reserved.

