

IDC FutureScape: Worldwide Utilities 2024 Predictions

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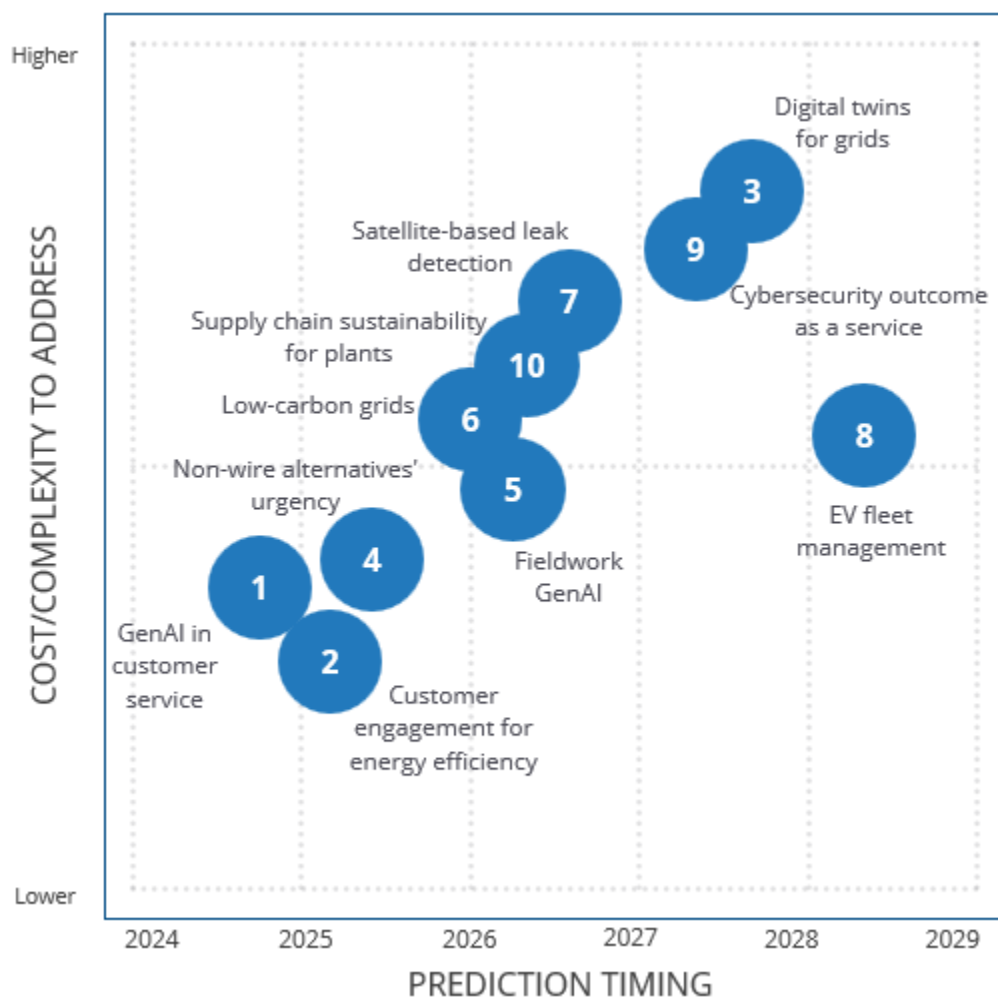
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IDC FUTURESCAPE FIGURE

FIGURE 1

IDC FutureScape: Worldwide Utilities 2024 Top 10 Predictions



Note: Marker number refers only to the order the prediction appears in the report and does not indicate rank or importance, unless otherwise noted in the *Executive Summary*.

Source: IDC, 2023

EXECUTIVE SUMMARY

Following a very difficult 2022, characterized by spiraling energy prices from the ongoing Russia-Ukraine War negatively impacting businesses around the world, this year had a more positive note. With receding energy prices, which are still not back to pre-energy-crisis levels and possibly never will, focus returned to long-term initiatives and planning related to the energy transition. According to IDC's *Worldwide Energy Transition Survey* (December 2022), almost 60% of organizations globally indicated they were steaming ahead with their energy transition plans, either proceeding at the same pace as before the energy crisis or even accelerating their plans (more than 1 in 10 in the latter case).

Additionally, the extreme weather events of 2023 – including the flooding in Libya and Eastern Africa, the blazing wildfires in Canada and Hawaii, the ice storm in Texas (U.S.), and severe heat waves that once again broke records all around the world – forced the spotlight back on mitigating climate change through decarbonization, electrification, and energy efficiency. Globally, 84% of companies still plan to become carbon neutral by 2040, and just under one-third plan to get there by the end of this decade. However, they admittedly need help as 60% consider their decarbonization plans challenging.

This is a tremendous opportunity for utilities – which have decades-long expertise around electrification, decarbonization, and energy efficiency – to drive the energy transition while growing their own businesses. Additionally, the energy transition, climate disruptions, and social sustainability have demonstrated that utilities are at the heart of economic resilience. Utilities are the only ones with experience managing the critical infrastructure the economy relies on to thrive, and they understand the implications of new disruptive technologies.

By using technology as a lever, electricity, gas, and water companies across the value chain will continuously optimize their operations, processes, and resources, offloading more and more non-core burdensome work, enabling utilities to focus on their core business and pursue new business opportunities. In the year of artificial intelligence (AI) everywhere, utilities have the power to advance further, helping to solve issues around procurement of flexibility, prioritizing connection queues and grid planning, addressing issues around integrated resource planning, and helping to unlock more active customer participation, just to name a few.

In this context, IDC Energy Insights analysts have developed 10 predictions that make up the framework for IT and line-of-business (LOB) decision makers' technology-related initiatives in the years ahead (Figure 1). IDC Energy Insights' top 10 predictions for worldwide utilities for 2024 are:

- **Prediction 1:** In 2024, 45% of frontrunner energy suppliers will leverage generative AI (GenAI) technologies, especially chatbots, to improve customers' digital journeys, cutting fallback calls to contact centers by over 60%.
- **Prediction 2:** In 2025, 55% of utilities will prioritize supporting customer engagement with personalized energy efficiency & demand response programs, helping customers save 15% on utility bills' energy component.
- **Prediction 3:** By 2027, 50% of utilities will implement digital twins, improving asset optimization of power grids, decreasing unplanned outages by 30%, and supporting simulations for network expansion.
- **Prediction 4:** By 2025, 60% of electric utilities will have integrated non-wire alternatives in standard planning, deferring up to \$7 in system capex for every \$1 spent on procuring distributed energy resources (DERs).

- **Prediction 5:** By 2026, 40% of utilities will implement GenAI, improving asset and equipment restoration times by 30% and establishing a knowledge management platform for the next generation of field technicians.
- **Prediction 6:** By 2026, 50% of utilities in advanced markets will invest in advanced distribution management system (ADMS) or distributed energy resources management system (DERMS) to optimize the influx of renewables and DERs coming online, decreasing their carbon footprints by 30% in the long run.
- **Prediction 7:** By 2026, 25% of water distribution companies will have operationalized multispectral satellite imaging and AI-powered computer vision, improving the efficacy of leak detection by a factor of seven.
- **Prediction 8:** By 2028, 35% of integrated electric utilities will offer integrated infrastructure, technology, and energy services for electric vehicle (EV) fleets, helping to accelerate public transport decarbonization.
- **Prediction 9:** In light of escalating hacking incidents, by 2027, 25% of utilities will turn to managed security service providers (MSSPs) for outcome-based services that align security performance with business outcomes.
- **Prediction 10:** Due to shifting regulations requiring greater supply chain transparency and due diligence, by 2026, 60% utilities will invest in environmental, social, and governance (ESG) data platforms to build sustainable supply chains and manage risks.

This IDC FutureScope provides the outlook of IDC Energy Insights' analyst team for the worldwide utility industry for 2024, as well as the planning horizon for the next five years.

"With their decades-long experience around electrification, decarbonization, and energy efficiency, utilities are not only in the driver's seat of the energy transition, but of the entire economy," said Gaia Gallotti, associate research director, IDC Energy Insights. "It is imperative they continue to use cutting-edge technologies as a lever to offload non-core burdensome work, enabling them to focus on their core business of steadfastly managing the critical infrastructure the economy thrives on and unleashing new business opportunities."

IDC FUTURESCOPE PREDICTIONS

Summary of External Drivers

- AI Everywhere – Generative AI Takes the Spotlight
- The Drive to Automate – Maximizing Efficiency and New Opportunities
- Cybersecurity and Risk – Building Resilience Against Multiplying Threats
- The Digital Business Imperative – Competitiveness and Outcomes
- Everything as a Service Intensifies – Transforming Models To Drive Change
- Dynamic Work and Skills Requirements – New Work Mode Era
- Operationalization of ESG – Measuring and Implementing Sustainability

Predictions: Impact on Technology Buyers

Prediction 1: In 2024, 45% of frontrunner energy suppliers will leverage GenAI technologies, especially chatbots, to improve customers' digital journeys, cutting fallback calls to contact centers by over 60%.

The COVID-19 pandemic spurred utilities around the world to invest in and rethink their digital channels (mainly mobile apps and customer portals). Customers recognize and appreciate the revamp

of these channels, which makes their experience more effortless and seamless. However, customers also recognize some tasks are still too difficult to complete on these digital channels, forcing them to call their energy suppliers' call centers after not being able to complete certain actions. According to the latest IDC Energy Insights' Utilities Consumer Survey, over half of energy consumers indicate they have to call into the call center (occasionally, half the time or most of the time) after failing to complete a task on a digital channel. This is inefficient and costly for utilities, which are obliged to support these customers (who are often upset after having wasted time to no end) on more expensive channels despite them wanting to self-serve.

With AI everywhere, namely GenAI, utilities see an opportunity to close this gap by supporting utility customers using their digital channels with personalized guidance to complete their desired tasks on self-serve channels. Since the advent of GenAI, the utility industry has been one of its most popular investors, with 41.7% indicating they are investing in GenAI in 2023 and over 61% indicating they expect conversational applications to be the most promising use case (IDC's *Future Enterprise Resiliency and Spending Survey* – Wave 6, July 2023).

By leveraging GenAI application chatbots, energy suppliers will be able to enhance the stickiness of their digital channels, avoiding more calls to their contact centers and associated costs. Additionally, it will improve customer satisfaction and customer effort scores for customers preferring to self-serve and support the business case for digital channel investments.

Associated Drivers

- AI Everywhere – Generative AI Takes the Spotlight
- The Drive to Automate – Maximizing Efficiency and New Opportunities
- The Digital Business Imperative – Competitiveness and Outcomes

IT Impact

- Utilities IT departments may not already house the skills necessary to deploy GenAI. Utilities' IT departments need to carefully assess existing internal skills to train and reskill staff if necessary. A skills map for core AI technologies, adjacent AI tech, as well as broader business applications and capabilities to deploy GenAI should be developed.
- Utilities IT departments are fundamental to holistically understand and evaluate which GenAI use cases are worth investing in and deploying. Foundation models need to be trained on massive volumes of existing, often diverse, unlabeled, or unstructured data. GenAI life-cycle workloads must also be evaluated and considered.

Guidance

- Utilities' IT departments should look to their technology ecosystems to close GenAI skill gaps. However, utilities should retain some knowledge and skills internally to support continuity in the long run. Utilities' line-of-business departments that understand the underlying process of their operations should also be key stakeholders in GenAI projects.
- Training foundation models, which are central to any GenAI application, has a significant impact on energy consumption and related carbon dioxide (CO₂) emissions. Utilities must carefully evaluate the environmental impact of deploying GenAI. This is particularly important considering utilities' sustainability goals and the leadership role they play in the energy transition.

Prediction 2: In 2025, 55% of utilities will prioritize supporting customer engagement with personalized energy efficiency & demand response programs, helping customers save 15% on utility bills' energy component.

The energy transition has put environmental and regulatory pressure on the utilities sector to do its part in fighting climate change by shifting to clean energy and reducing CO₂ emissions. The utility industry has a long uphill battle to get to net zero, and it will not be able to get to net zero without the help of its customers. As a silver lining to the energy crises spurred by the Russia-Ukraine War, which put the spotlight on utilities, customers are seeking to become more proactive regarding their energy consumption in efforts to also mitigate higher energy prices.

To this end, utilities and energy suppliers around the world are reprioritizing their customer engagement programs, focusing on personalized customer experiences. IDC's June 2022 *Energy Transition Survey* revealed that utilities are increasing investment in clean energy and energy conservation programs, as they are one of the most effective ways for utilities to engage with their customers and realize CO₂ reductions. One of the better ways for utilities to engage with their customers is through digital storefronts, which enable utilities to educate, offer, and inform their customers about clean energy programs and energy conservation initiatives. Through a combination of offerings – including energy-efficient appliances, incentives, and rebates for rooftop solar and electric vehicles, demand response programs, smart thermostats, clean energy tariffs, and home energy management systems – utilities help customers consume energy efficiently and reduce load and related energy costs, especially during peak times and seasons. It will also make a difference in the utility sector's energy transition plans and CO₂-reduction efforts.

With young generations – who are demonstrably more attentive to sustainability efforts and climate change – becoming the lion's share of utilities' customer base, utilities finally have real market opportunity for energy-related products and services. This appetite – in combination with web-based or mobile applications at customers' fingertips – will be essential to unlock energy and related cost savings for customers, as well as for utilities to meet their net-zero goals and support new revenue streams.

Associated Drivers

- The Digital Business Imperative – Competitiveness and Outcomes
- Everything as a Service Intensifies – Transforming Models To Drive Change
- Operationalization of ESG – Measuring and Implementing Sustainability

IT Impact

- IT departments will need to address the complexities of integrating new data types, including from external sources and enhanced by customer analytics tools, to ensure offers and bundles are personalized. This includes solutions to optimally price offers (such as configure price and quote solutions) to be competitive yet rewarding for the company.
- As marketing budgets remain tight, IT departments will need to support their companies in most efficiently creating awareness about these energy-efficiency and demand-response programs, digital storefronts, etc. This includes potentially enhancing the existing IT landscape with new GenAI technologies for content generation.

Guidance

- It will be difficult for most utilities to offer all energy-related products and services at a price point that makes it worth their efforts. Thus, it is important to leverage data and customer analytics to prioritize what is most appealing to customers and matches the company's strategy.

- Marketing campaigns to create awareness of programs are as important as the actual customer engagement initiatives. It's not enough to have a great product as well as a timely and competitive offer; it must also be supported by effective marketing (and sales and customer support) on customers' preferred channels to generate concrete revenues.

Prediction 3: By 2027, 50% of utilities will implement digital twins, improving asset optimization of power grids, decreasing unplanned outages by 30%, and supporting simulations for network expansion.

Utility companies provide critical infrastructure to support power generation, transmission, and distribution, fulfilling the ever-increasing energy needs for a modernized power system. The expectation is that "the power must always be on," and unplanned downtime of critical assets is not acceptable. To ensure operations and power grid remain reliable and uninterrupted, utilities are turning to innovative technologies, such as digital twins, to improve visibility over their operations and assist in anticipating potential asset or equipment issues before they occur. Digital twins are virtual replicas of physical assets or systems, such as power generation plants or grid infrastructure. By implementing digital twins, utilities aim to enhance the optimization of their assets and the components of the power grid. There are various types of digital twins that can be applied, from virtual replicas of plants and substations to individual assets or sets of equipment. Furthermore, digital twins can be digital replicas of systems and processes. It is also important to note that digital twins can also be used to create physical simulation models to evaluate the necessary expansion of the grid network during planning.

Power grids are vulnerable to extreme weather events or unforeseen asset failures, which can cause large-scale outages that cost utilities and the economies within their footprints billions of dollars. To address these challenges, a network digital twin can be used to significantly enhance the reliability and resiliency of the power grid, especially during extreme weather events. Using advanced analytics and artificial intelligence, a digital twin can predict the risk of power outages and potential asset failure during severe weather conditions. Digital twins can also leverage real-time detection capabilities, offering support for data-driven operational decision making. By leveraging digital twins as a tool in the planning phase, utilities can optimize capital planning by running simulations and executing network expansion projects more efficiently, ensuring they meet future energy demands without overextending or overspending.

Considering the current unpredictability of energy markets, digital twins are a powerful tool for utilities to support resilient grids and a reliable supply of energy, especially considering the impact of the energy transition.

Associated Drivers

- The Drive to Automate – Maximizing Efficiency and New Opportunities
- Cybersecurity and Risk – Building Resilience Against Multiplying Threats
- The Digital Business Imperative – Competitiveness and Outcomes

IT Impact

- IT teams will need to ensure their data infrastructure can handle and process the significantly larger amounts of data generated by digital twins, which includes ingesting data from various sources such as sensors and asset management systems. Robust data storage, processing, and analytics solutions to effectively manage this influx of data will be required.
- IT departments will need to upskill or hire engineers with expertise in advanced analytics, machine learning, and simulation technologies. Digital twins rely heavily on data analytics and modeling; therefore, IT will need new skills that are crucial for extracting meaningful insights from digital twins' output.

Guidance

- To deliver digital twins, utilities need to invest in data management solutions and scalable cloud-based data storage platforms as well as implement data governance frameworks. IT expertise will be needed to design and build data pipelines that automate data ingestion, cleansing, and transformation, ensuring access to clean and organized data for analysis.
- Utilities must foster a culture of innovation and cross-functional collaboration with data scientists and engineers. Training and development opportunities must be offered to acquire advanced analytics skills and facilitate knowledge transfer. If talent can't be sourced, utilities will need to partner with technology vendors and service providers.

Prediction 4: By 2025, 60% of electric utilities will have integrated non-wire alternatives in standard planning, deferring up to \$7 in system capex for every \$1 spent on procuring distributed energy resources.

Electrification and mass-market adoption of DERs are accelerating change in global power distribution systems, making it difficult for grid operators to forecast net demand and load shapes. This complicates the process of evaluating systems' needs and relative evolution over time, planning for reconfigurations, and making no-regret equipment upgrades or replacement decisions in specific areas. It is also speeding up the pace of the traditional grid planning process, with more frequent reviews needed during the annual cycle as new critical areas emerge in which the distribution system may be challenged by new loads and distributed generation. In certain advanced markets, the pace of electrification and DER adoption has accelerated to the point that grid operators and regulators simply don't have the time or rate capacity to keep up with projected capacity needs.

At the same time, DERs and digital grid technologies are expanding the definition of "active consumer" from traditionally large industrial interruptible loads and power-heavy businesses to potentially any residential energy customer. This is broadening the toolset available to electric distributors to meet rapidly changing system needs.

As distributors focus on defending system reliability while improving resiliency and flexibility, grid planning must leverage this expanded toolset of utility-owned, third-party-aggregated, non-wire resources. In other words, standard planning must evolve from a deterministic process based on forecast loads to one based on DER adoption scenarios that includes market-based or explicit mechanisms for guiding active consumers to provide alternatives to conventional investment.

Associated Drivers

- The Drive to Automate – Maximizing Efficiency and New Opportunities
- The Digital Business Imperative – Competitiveness and Outcomes
- Operationalization of ESG – Measuring and Implementing Sustainability

IT Impact

- IT must support the long-overdue transition toward a common, constantly updated network model that can be used by the business across its grid planning, operations, and control departments.
- IT will be tasked with supporting the selection of modern elements in grid planning, simulation, model management, and project management software landscape, and integrate it with legacy operational and asset management solutions.
- IT must facilitate the use of smart metering data beyond traditional use cases to enable grid observability for advanced grid planning.

Guidance

- Help eliminate departmental data silos by cleansing grid data assets and federating core repositories around a common data model. Do so based on a clear understanding of business priorities and achievable short-term use cases.
- Push for a platform approach to grid operations, promoting software that is modular (to support flexibility), interoperable (to integrate with legacy systems), and open for extensibility based on industry standards.
- Promote automation and business configurability as the core principles of smart meter data management to reduce manual effort, leveraging cloud to enable scalability, flexibility, and access to real-time data.

Prediction 5: By 2026, 40% of utilities will implement GenAI, improving asset and equipment restoration times by 30% and establishing a knowledge management platform for the next generation of field technicians.

In the utilities industry, GenAI is expected to gain the fastest traction in the areas of customer service and field services. Within field services, GenAI will be leveraged to provide real-time assistance to technicians while in the field. The use of GenAI during maintenance, replacement, and restoration of assets and equipment can provide technicians with valuable detailed information from previous work orders such as best practices, equipment, and tools that were needed to complete a job successfully. In the utility sector, there is mounting regulatory pressure on utilities to respond in a timely manner to power outages and equipment failure. Additionally, there has always been a great emphasis on employee and customer safety, particularly for technicians working in the field. Leveraging GenAI on job sites will not only improve safety, but IDC predicts GenAI will create a 30% improvement in asset and equipment restoration times. Gaining access to historical asset information, processes, and procedure documentation digitally in real time will significantly improve production and safety in the field.

The utilities industry has also been anticipating and struggling with a substantial portion of its workforce going into retirement and taking their knowledge with them. This is particularly true for field technicians. The industry also faces a major talent attraction issue and needs to recruit a considerable number of resources if energy-transition and net-zero targets are to be achieved. GenAI tools can provide utility companies an excellent opportunity to capture the knowledge of their subject-matter experts and talent who are leaving, while supporting the new workforce in a way that is faster and more efficient than in the past. This can help in recruiting and training the new generation of field technicians. GenAI has the potential to support energy-transition and net-zero goals significantly as new clean energy infrastructure is constructed, operated, and maintained. A knowledge management platform driven by GenAI can provide new technicians with everything they need to complete tasks without losing time and productivity and while onsite.

Investment in GenAI within the utility sector over the next few years is expected to grow, with several use cases being established across the utility value chain. In particular, field services is an area in which utilities can realize value immediately. GenAI has the ability to provide utilities solid ROI by increasing productivity, improving safety, and building a wealth of knowledge in repositories that new and seasoned field technicians can utilize to make their jobs easier, safer, and more productive.

Associated Drivers

- AI Everywhere – Generative AI Takes the Spotlight
- The Drive to Automate – Maximizing Efficiency and New Opportunities
- Dynamic Work and Skills Requirements – New Work Mode Era

IT Impact

- Utilities' IT will need to strengthen and unify IT and operational technology (OT) security. GenAI models in field services will utilize critical assets as well as customer data and information, which will require IT and OT security measures to be aligned. A holistic IT-OT integrated approach to security will require buy-in, education, awareness, training, and coordination across IT and OT leadership and departments.
- Utilities' IT will need the contribution from field technicians in defining desired GenAI model output, identifying KPIs to improve upon, and helping build a knowledge repository for the next generation of workers will be important in building the business case for investment and getting the most of GenAI tools.

Guidance

- Implement stringent security measures when deploying GenAI, particularly in the area of field services. Asset and customer data will be needed for GenAI to be effective in field services. Ensuring security of such data and information used in GenAI models is essential to deny bad actors access to data and information from critical assets and customers.
- Gain internal buy-in for investing and leveraging AI, particularly with seasoned field technicians. The information and contributions from veteran field technicians will be crucial in building a repository that can provide a wealth of knowledge from experienced field workers.

Prediction 6: By 2026, 50% of utilities in advanced markets will invest in ADMS or DERMS to optimize the influx of renewables and DERs coming online, decreasing their carbon footprints by 30% in the long run.

The proliferation of renewable and DERs has spurred investment and R&D efforts in creating innovative technologies that can enable utility distribution networks to manage dispersed and cleaner forms of energy in the most optimal and economical manner. ADMSs and DERMS are becoming essential software offerings to help utilities manage the power grid effectively. The momentum from the energy transition (i.e., moving away from fossil fuels and toward cleaner forms of generation) continues to make managing the power grid much more complex for many utilities.

Although the pace and penetration of renewable and DERs will vary in regional power markets across the globe, it is clear that decarbonization efforts and initiatives toward net-zero emissions are top priorities for the power and utility sector. The intermittency and unpredictability of renewable energy resources such as wind, solar, and hydro generation will require capital infrastructure and technology investments to support the production and delivery of clean, reliable, and affordable power. The future of power systems is one that is made up of vast amounts of decentralized generation at the edge of transmission and distribution networks, which requires an advanced set of technologies and assets to properly balance electric supply and demand. ADMS and DERMS are emerging software platforms that will provide utilities with the ability to manage the explosive growth of renewables and DERs more effectively.

ADMS can support in managing the growing number of utility connected renewable resources in front of the meter and includes core functions such as fault location and restoration as well as volt/var optimization of the distribution system, while DERMS primarily support behind-the-meter DERs such

as roof top solar, energy storage, and electric vehicles as well as provide demand response and grid flexibility capabilities. IDC's 2022 *Energy Transition Survey* revealed that over 70% of utilities respondents will invest in DER programs to advance their energy transition plans and goals toward net zero.

ADMS and DERMS will be essential tools for utilities as the renewable and distributed energy generation share of many regional power market supply stacks continues to grow. As the energy transition evolves and power systems adapt, it is certain that ADMS and DERMS will play a critical role in meeting net-zero emissions targets and help decrease carbon emissions in efforts to create a cleaner energy future.

Associated Drivers

- The Drive to Automate – Maximizing Efficiency and New Opportunities
- The Digital Business Imperative – Competitiveness and Outcomes
- Operationalization of ESG – Measuring and Implementing Sustainability

IT Impact

- IT departments will be tasked with supporting their organizations' selection of ADMS and DERMS solutions, meeting the requirements of the line of business, while complementing the existing and future IT landscape.
- IT departments will need to closely collaborate with the line of business to not only understand the immediate needs of their distribution system, but also to have a forecast and vision for future obstacles and challenges that will come in managing utility-connected renewables and behind-the-meter DERs.

Guidance

- Become familiar with the vendor ecosystem in the ADMS and DERMS space, which offers a wide range of capabilities. Closely evaluate ADMS and DERMS capabilities that can meet your utility's needs. A firm understanding of costs and capabilities of offerings in the ADMS and DERMS space can save a substantial amount of time and expenses.
- Take a holistic approach in managing all generation resources from green energy and traditional fossil fuels to optimize the power grid in the best economic and environmental manner. Most ADMS and DERMS offerings are flexible and modular, providing buyers the option to purchase as needed as they evolve and mature.

Prediction 7: By 2026, 25% of water distribution companies will have operationalized multispectral satellite imaging and AI-powered computer vision, improving the efficacy of leak detection by a factor of seven.

While leakage continues to be a key challenge for the water industry, climate change, the speeding up of water cycles, and longer periods of resource scarcity are pushing water regulators around the world to raise their leakage-reduction targets.

With unreported leaks accounting for more than 90% of water losses, traditional active leakage control (ALC) practices are falling short of water companies' commitment to achieving double-digit leak reductions in just a few years. This is leading many organizations to overhaul their leakage detection practices and improving the business case for more sophisticated detection technology.

In this context, progressive water companies are investing in many fronts, from long-term meter deployment to acoustic, pressure, and flow-logger programs; dynamic pressure modeling; and advanced analytics to help field workforces pinpoint potential leaks. Usage of airborne technology to

detect changes in ground conditions, vegetation color, and even chlorine levels from the sky across larger and harder-to-reach network areas is now mature and cost-effective. According to a major global water industry service and solution provider, advanced leak detection using satellite imagery has moved from niche to normal and has led to at least a threefold increase in survey effectiveness.

This technology uses spectral imagery generated by satellite radar (typically L-band radio) in combination with filters and algorithms engineered to detect the signature of drinking water mixed with soil. The algorithms can detect water leaks up to 3 meters below ground across rural and urban environments as well as different asset types. This data is overlaid onto the water company's GIS maps to display specific points of interest that need investigating by field teams. Compared with traditional ALC methods, satellite leak detection provides a step-change in the effectiveness and efficiency of water leakage surveys. Results from the field show survey teams typically only need to cover 5% of a district's metered area compared with walking it entirely with traditional survey techniques. Additionally, with satellite leak detection, the number of leaks identified by the average crew in a day is up to three times greater and the volume of leaks found is up to seven times greater.

Associated Drivers

- The Drive to Automate – Maximizing Efficiency and New Opportunities
- The Digital Business Imperative – Competitiveness and Outcomes
- Operationalization of ESG – Measuring and Implementing Sustainability

IT Impact

- For the business to outsource part of its leak operating model, IT must apply strict data access security policies to analytics service providers and survey contractors in addition to implementing identity and access management procedures.
- IT must support proactive use of leak management data, ensuring new data is collated, tagged, and integrated into the broader operations and management data life cycle to feed broader pressure management, network calming, and proactive asset strategies.

Guidance

- Evaluate potential threats; identify security gaps across the service supply chain to protect the most critical data, assets, and systems; and provide a safe and reliable service.
- Work in close contact with business operations to audit the leak data value chain to identify potential use cases, necessary data integrations, and additional analytics capabilities, and support multidisciplinary proof-of-value projects.

Prediction 8: By 2028, 35% of integrated electric utilities will offer integrated infrastructure, technology, and energy services for EV fleets, helping to accelerate public transport decarbonization.

The global shift toward decarbonization and sustainable mobility has placed public transportation systems under the spotlight. Governments and municipalities, as well as large organizations, are actively seeking ways to electrify their public transit fleets to reduce emissions and combat climate change. This transition not only requires EV adoption, but also a comprehensive ecosystem to support EV fleet management. Integrated electric utilities are poised to play a pivotal role in this transition. Leveraging their expertise in energy generation, distribution, and management, they are well-positioned to offer holistic solutions that address the unique challenges faced by public transit agencies in electrifying their fleets.

By providing transit agencies with turnkey solutions, thus eliminating their barriers to entry, utilities will help expedite the decarbonization of public transportation while supporting growth in revenue streams.

This includes the provision of EV charging infrastructure, renewable energy sources, and grid integration expertise. By offering advanced fleet management software and real-time monitoring, utilities can help transit agencies optimize routes, reduce downtime, and extend the lifespan of EVs. This in turn leads to enhanced operational efficiencies, improved cost savings, and increased sustainability.

Integrated electric utilities have unique expertise across the electric value chain to unleash benefits for their customers and to support their own business performance (for instance, managing charging and discharging to support meeting energy demand, while holistically evaluating the need for grid capacity build out). The EV revolution is finally here, and utilities must take the lead in supporting it, aligning with global sustainability objectives and delivering the best results for their customers and themselves.

Associated Drivers

- The Digital Business Imperative – Competitiveness and Outcomes
- Everything as a Service Intensifies – Transforming Models to Drive Change
- Operationalization of ESG – Measuring and Implementing Sustainability

IT Impact

- IT departments will be tasked with integrating various systems, including infrastructure management, vehicle monitoring, charging station networks, data analytics, as well as with other energy management solutions, especially around forecasting and planning. This integration will require robust data management capabilities and interoperability.
- Handling the data generated by EV fleets, charging infrastructure, and energy services will be a core IT responsibility. IT teams will need to leverage data analytics to provide actionable insights to lines of business to optimize EV fleet operations while improving energy efficiency.
- IT departments will need to implement robust security measures to safeguard sensitive information and to protect critical infrastructure, as EVs are another device that connects from outside their IT and operational technologies' boundaries.

Guidance

- To unleash benefits throughout the electric utilities value chain, a seamless integration framework between various components of the EV fleet ecosystem as well as the utility solutions working alongside it is critical.
- Leverage data analytics capabilities to unleash additional value in other areas of the business, especially around forecasting demand, grid congestion planning, etc. Additionally, use IT systems to measure, track, and report the environmental impact of integrated services provided to EV fleets to ensure alignment with ESG goals.
- Prioritize cybersecurity by implementing robust protocols, encryption methods, and access controls to protect data and infrastructure from potential threats.

Prediction 9: In light of escalating hacking incidents, by 2027, 25% of utilities will turn to managed security service providers for outcome-based services that align security performance with business outcomes.

In recent years, the utility sector has found itself increasingly vulnerable to escalating hacking incidents that have exposed critical infrastructure and customer data to unprecedented risks. These incidents have highlighted the need for new technology investments and strategic partnerships to fortify cybersecurity defenses. As utilities face the complex challenge of safeguarding their OT assets while ensuring the continuity of essential services, they are turning to MSSPs. Partnerships with MSSPs enable utilities to not only enhance their security posture, but also demonstrate a commitment to

ensuring the reliability and integrity of their services. They also provide utilities with access to cutting-edge security technologies and expertise.

By integrating advanced threat detection and response mechanisms, security information and event management (SIEM), next-generation firewalls, fortified security architecture, and rigorous testing protocols, utilities can effectively combat the ever-evolving threat landscape. In doing so, they safeguard and strengthen the resilience of critical infrastructure, protect sensitive customer data, safeguard customer trust, and ensure uninterrupted service delivery, reinforcing their commitment to reliable operations.

Organizations must take a strategic and holistic approach to cybersecurity and implement organizational and cultural change to address the challenges of a high threat environment. In this context, the establishment of a robust security operations center (SOC) emerges as a cornerstone for proactive threat detection and rapid incident response. If they do not have the resources to establish their own SOC, utilities can leverage SOC infrastructure and services provided by MSSPs that can showcase not only the technical features and benefits of their offerings, but also their expected outcomes. Utilities can explore new engagement models such as outcomes as a service (OaaS) in which the focus is on material KPIs (uptime, reduction in breaches, etc.) rather than simply offering a product or service. This approach emphasizes tangible results and ensures that cybersecurity efforts are firmly aligned with core business and operational objectives, including delivering secure operations so attacks have minimal or no impact on core activities; reducing the downtime to a minimum in case of breach; supporting management to clearly identify, contextualize, and prioritize risks; managing costs; ensuring regular maintenance of cybersecurity systems; and demonstrating improvement operational health and safety (OHS) outcomes. Compensation and bonuses of senior executives should be aligned with these outcomes to encourage strategic support as well as solid implementation and operationalization.

Associated Drivers

- Cybersecurity and Risk – Building Resilience Against Multiplying Threats
- Everything as a Service Intensifies – Transforming Models To Drive Change
- The Digital Business Imperative – Competitiveness and Outcomes

IT Impact

- CSOs, CIOs, and CISOs will be tasked with driving their organizations' search for partnerships with MSSPs, tapping into their expertise to integrate cybersecurity strategy and security planning as an integral part of their business strategies, shifting security to the left and ensuring proactive measures.
- IT will need to have a holistic approach to also cover operational technologies, including implementing best practices and OT cybersecurity frameworks, focusing on areas such as distributed control system configuration with SIEM, configuration change monitoring, next-generation firewalls, and hardening all systems and assets with MSSP approval.
- IT personnel need to be trained in OT security architecture and planning, and vice versa, to improve communication between OT and IT teams and ensure better alignment in security strategy and implementation.

Guidance

- Appoint MSSPs that have deep OT domain knowledge and can provide a full suite of managed services from their SOC, and promote a robust cyberculture across management layers.

- Select a set of integrated tools and capabilities to identify and address vulnerabilities that leverage threat intelligence and managed detect and response (MDR), advanced anomaly detection, and automated incident response capabilities.
- To promote cybersecurity skill development and teamwork, foster talent through company sponsored training, certification support, and events such as hackathons and capture-the-flag (CTF) events.

Prediction 10: Due to shifting regulations requiring greater supply chain transparency and due diligence, by 2026, 60% utilities will invest in ESG data platforms to build sustainable supply chains and manage risks.

Shifting regulations are placing greater emphasis on supply chain transparency and due diligence, requiring utilities to take proactive steps. For example, in Germany, the Supply Chain Act came into force in January 2023, requiring companies to identify, address, and report on human-rights-related and environmental risks in their supply and value chains. This type of regulation will be more prevalent as the drive for more sustainable supply chains and better visibility of scope 3 emissions is accelerated. Companies that supply utility organizations in regulated countries will need data platforms to deliver the required visibility and transparency for reporting on their products' carbon footprint. According to IDC's *FERS Survey* – Wave 4, June 2023, 92.8% of utilities companies indicate supply chain alignment and enforcement of sustainability practices with the organization's sustainability initiatives was important to extremely important.

Utilities will use ESG data platforms to integrate with customers and suppliers as well as extract information related to energy consumption, emissions, sourcing of materials, and compliance with ethical and environmental standards. These platforms will use advanced analytics and reporting tools that enable the visualization of ESG metrics, helping stakeholders make data-driven decisions.

Utilities will also be able to leverage ESG data platforms for risk management, helping them identify potential risks within their supply chains, such as disruptions due to environmental events, labor disputes, violations of ethical standards, or other materiality issues. With better visibility into these risks, utilities can develop strategies to mitigate them, ensuring the continuity of their operations. Utilities will be able to enhance their brand reputation and build trust by leveraging these platforms to give greater access and visibility to customers and suppliers and demonstrate their adherence to ESG goals.

Associated Drivers

- The Drive to Automate – Maximizing Efficiency and New Opportunities
- The Digital Business Imperative – Competitiveness and Outcomes
- Operationalization of ESG – Measuring and Implementing Sustainability

IT Impact

- IT will need to ensure data readiness and create sustainable supply chain data models, mapping various sources of data and ensuring they are fed into the ESG data platform. IT must ensure these platforms align their technology strategies with their business strategies, while delivering their desired sustainability-related outcomes.
- IT will need to invest in building data platforms that bring together supply chain and various ESG data as well as align with reporting frameworks to ensure ESG compliance is achieved and that performance indicators around emissions and other metrics are available to management.

Guidance

- Identify and partner with service providers that have deep domain experience with supply chains and can leverage know-how in building sustainability-related data models. Utilities must also develop in-house digital capabilities to ensure design and implementation can be carried out in line with requirements and within given timelines.
- Utilities must identify suitable ESG reporting frameworks (such as GRI, SASB, and TCFD) that align with their industry and sustainability goals. They must collaborate with vendors and leverage data analytics experts to design and implement data platforms that can collect, process, and visualize supply chain and ESG data.

ADVICE FOR TECHNOLOGY BUYERS

In summary, IDC Energy Insights has the following recommendations for utilities embarking on the energy transition journey:

- **Deliver on your purpose.** Now that immediate issues around security of supply and consumer protection have subsided, it is time for utilities to revamp momentum on long-term net-zero goals. Sustainability, decarbonization, and electrification offer endless opportunities, so focus resources and efforts on energy-transition use cases and initiatives that will support and enrich your company's future business portfolio.
- **Execute and communicate.** The industry must grasp the opportunity presented by the energy transition to make a positive impact on the fight against climate change and be recognized for it. Communication and drawing attention to related initiatives is as important as execution to support a change in perception of the utilities industry for the future.
- **Prioritize your people.** More than ever, companies must prioritize making the most of their workforces, which have an abundance of company and industry knowledge that cannot be lost. With less resources available, companies will need to support their workforces in leveraging the most advanced technologies to optimize operations and drive efficiencies.
- **Foster relationships with all energy transition stakeholders.** Whether it be peers in the utilities value chain, commercial and industrial or small and medium-sized business customers, technology providers, aggregators, research institutes, or private citizens, everyone must be involved to make the energy transition a reality in the necessary timeframes. Collaboration has never been more important, so listen well to what is being asked of you.
- **Harness GenAI.** Cautiously go beyond the hype to understand how this technology can really support your organization. Liaise with industry peers regarding GenAI use cases, the benefits it brings, and the challenges that emerge. GenAI has the potential to help solve many deep underlying issues the utilities industry has been facing, and it can help utilities move into a new era.

AI Everywhere – Generative AI Takes the Spotlight

- **Description:** With intelligence becoming the primary source of value creation, we are on the verge of the "Intelligence Revolution," in which artificial intelligence (AI) and automation-oriented technology will be the main accelerators of business change. In the realm of "AI everywhere," generative AI (GenAI) emerges as a transformative force, potentially revolutionizing the future. This branch of artificial intelligence enables a machine-driven autonomous creation of new content, from images to music to even written text, with remarkable accuracy. Early applications of GenAI have showcased its potential in fields such as creative arts, content and code generation, and personalized recommendations. However, it also raises concerns regarding bias and privacy; AI algorithms can inadvertently perpetuate biases and pose threats to personal data. As a result, regulation becomes crucial to ensure responsible and ethical use of GenAI. Despite these challenges, the possibilities are vast, ranging from improved customer experiences to innovative problem solving. Harnessing the power of GenAI and navigating its associated complexities have the potential to shape the future of industries and drive advancements in the AI-driven world.
- **Context:** Businesses are already jumping to get a piece of the AI pie, afraid to miss out on the opportunities it presents. Although we are in the early days, monetization and scale of AI solutions are expected to evolve rapidly. However, this comes during a time of relative economic uncertainty and increasingly constrained IT budgets. Furthermore, AI is not without risks, especially when it comes to ethical AI and data privacy, and companies need to carefully consider the best use cases in order to implement AI effectively.

The Drive to Automate – Maximizing Efficiency and New Opportunities

- **Description:** Broader automation use cases – beyond just generative AI – are now ubiquitous. Now that data is embedded in the core of strategic capability for every organization, automation is critical to scaling a digital business and is evident in three domains – IT automation, process automation, and value stream automation – leading to autonomous operations, digital value engineering, and innovation velocity. Industrial organizations have spent the past few years evolving toward the Fourth Industrial Revolution (Industry 4.0) through the use of industrial automation and intelligence. Thoughtful implementation is more important than ever as data becomes embedded in the strategic core of every organization. Automation technologies such as robots and drones are being used increasingly in the military and healthcare sectors. Given this boost in automation, data is increasingly precious, and privacy must be prioritized and security enhanced. In some cases, automation has also led to concerns over the future of work – whether it will enhance or take away.
- **Context:** Businesses are rethinking how to employ automation to maximize operational efficiency – from automating assembly in manufacturing to identifying opportunities for food waste reduction in hospitality to improving customer experience (CX) in digital banking. IT will need to continue to assess new technologies and approach automation investments strategically within the walls of the organization and in the field. Among industrial organizations, IT/OT convergence will necessitate shared responsibility across teams for automation priorities and implementations.

Cybersecurity and Risk — Building Resilience Against Multiplying Threats

- **Description:** The era of digital business has resulted in a significant increase in the interconnectedness of devices, people, applications, data, and networks alongside movement of workloads to the cloud. However, this progress has led to a broader vulnerability to cyberattacks. Ransomware attacks have multiplied exponentially; the dark web is teeming with low-cost, high-quality hacking services; and generative AI is threatening with more believable, humanlike phishing and pretexting attempts. A shortage of skilled cybersecurity professionals presents a continuous challenge for organizations to respond effectively. Cyberattacks have impacted all types of organizations, from governments to universities to businesses, and are oftentimes entangled in geopolitical motives. The increase in high-profile data breaches is furthermore leading to increased policy interventions regarding privacy and sovereignty.
- **Context:** An organization that is unprepared for cyberattacks may suffer various consequences, including data loss, financial implications, harm to the organization's brand reputation, decreased employee morale, and loss of customers. Cyber-resilience (i.e., the ability of an organization to anticipate, withstand, recover from, and adapt to any threats to its resources) is key for an organization to not only defend against cyberattacks but also prepare for swift response and recovery to attacks.

The Digital Business Imperative — Competitiveness and Outcomes

- **Description:** A digital business sees value creation based on the use of digital technologies for internal and external processes, including customer engagement, employee experience, and product and services development. Building and leading a digital business is imperative for organizations to become competitive. While certain operational aspects may always have a nondigital component, digital businesses prioritize a digital-first strategy that aligns all parts of the business and IT landscape with digital workflows to drive value and growth. The development strategies for digital and nondigital assets now require leveraging multiple channels for the digital business to obtain support or funding. This places a strong emphasis on providing digital experiences for customers and citizens, employees, and partners, in addition to necessitating a shift toward fully digital operating models and resilient supply structures enabled by digital technology. The focus of a digital business is increasingly on delivering measurable outcomes. Businesses that have recognized the value of digital anticipate maintaining or even increasing their investment in technology, even in times of economic uncertainty.
- **Context:** As more and more enterprises embrace digital strategies and technologies, they prioritize technology investments that drive innovation or enable competitive differentiation. Technology is no longer viewed as a tool to keep the business running, but it is the foundation for building new revenue-generating experiences and products. Laggards will need to adapt quickly and develop their digital road maps and embrace a digital business platform. Identifying top digital revenue opportunities that deliver value will be crucial for business success and the implementation of organizational digital-first strategies.

Everything as a Service Intensifies – Transforming Models to Drive Change

- **Description:** The concept of "everything as a service" ("XaaS") is driving change across all sectors and ecosystems, affecting the supply side and the demand side of businesses. Organizations are adopting as-a-service models at different speeds out of necessity, but complex delivery strategies make requirements more complicated and the impacts less predictable. The shorter decision cycles enabled by on-demand services enable industry leaders to approach things differently, but commitment models are fundamentally changing. On the supply side, there is rising demand and higher customer expectations. As a result, suppliers are compelled to convert and enable their offerings more quickly using a secure services-based model. Buyers are now making decisions based on commitments to measured outcomes in terms of optimization, reliance, and financial models. Architecture and solution strategies are now critical to the service provider, in which proprietary systems that are being maintained or migrated can materially impact the efficacy of the as-a-service solution. Leaders face the challenge of finding new financial, operational, and governance models that support successful transition to as-a-service approaches. Critical factors for organizations to thrive through the as-a-service change landscape include solution control, contractual clarity on roles and responsibility, and accountability alignment including geo-economic assurance and data.
- **Context:** To deliver optimally, companies are looking to better manage their as-a-service offerings. They're changing product design, delivery, and pricing alongside adjusting management and operations to best optimize as-a-service technology. This is the new model for the tech industry, and suppliers and buyers will need to adapt accordingly. This includes developing cloud-based control to manage provisioning, continuous usage tracking, and architectural efficiency.

Dynamic Work and Skills Requirements – New Work Mode Era

- **Description:** In the wake of COVID-19-driven accelerated work transformation, enterprises continue to face dynamic work conditions. These range from lack of skilled employees to codifying more flexible ways of working that rely on a broad range of technologies and services. In some regions, most notably in Asia/Pacific, organizations focus on building more secure and technically sophisticated office environments. In North America, remote and more flexible work models are driving investments in technologies that support collaboration across and within disparate work environments. Across this spectrum of work models, organizations are investing in infrastructure, hardware, software, and services to enable and manage increasingly automated ways of working. These include automated remote onboarding, learning in the flow of work, and use of AI and generative AI to facilitate basic tasks and workflows. While the pandemic drew much-needed attention to the employee experience, enterprises have shifted to aligning employee requirements more plainly to strategic business goals. The key challenge around the globe has been to find or upskill/cross-skill employees to scale and meet the demands of complex, automated work processes. Flexible work models continue to change to become even more agile, with digital workspaces highlighting skills, workforce management, automation, changing demographics, and as-a-service talent resourcing.

- **Context:** New modes of working are now intrinsic to leadership and organizational resilience and go well beyond traditional staff planning methods. They are also having an impact on frontline workers who have historically been neglected in favor of higher-paid front- and back-office peers. New work models require agile cross-functional teams – including HR, IT, LOB, finance, facilities management, and operations – to engage top talent and meet client brand expectations. While headlines debate the fate of ESG initiatives, it's clear that environmental concerns will be an embedded element of workplace design and implementation of flexible work models. C-suite leaders and their teams must collaborate to recalibrate work culture, augmentation, and space/place planning to enable more secure, dynamic, and refined work models of the future.

Operationalization of ESG – Measuring and Implementing Sustainability

- **Description:** ESG, a globally adopted framework supporting actions to achieve sustainability and a better future for all, is gaining more traction than ever. ESG laws are increasing; the EU launched the Corporate Sustainability Reporting Directive (CSRD) that requires companies to disclose and assure ESG metrics, the SEC's climate disclosure requirement is forthcoming, and Japan's GX Basic Policy implements an emissions trading scheme and carbon tax. There are also new international financial reporting standards. Given this, many companies are actively operationalizing ESG with AI-informed carbon accounting software, carbon budgets, and sustainability requirements into requests for proposal (RFPs) they send to tech suppliers. Many companies now have positions such as chief sustainability officer or are integrating sustainability into the responsibilities of the C-suite. Moreover, many enterprises are replacing redundant faulty and energy-heavy tech with newer, more efficient energy-saving counterparts. Businesses recognize that diversity, equity, and inclusion (DEI) are positively affecting profits and are therefore implementing DEI initiatives to include more women and minorities. In addition, ESG compliance is a form of long-term strategic business risk reduction. Given climate change and unstable energy prices, among other risks, ESG helps curb costs and hedge against risks caused by natural disasters and other shocks.
- **Context:** ESG is more than just a measure; it is foundational to business purpose and value. Businesses are increasingly beholden to ESG. More and more customers care about whether the companies they deal with behave sustainably and deliver sustainable products and services. ESG can also be a cost-saving measure and hedge against risks. Yet despite much progress, there is still work to be done, especially in complying with carbon footprint measuring and achieving high-quality data. As laws and regulations – as well as investment opportunities – amp up around ESG, the IT industry will increasingly require green talent and skills and better data modeling of ESG metrics to achieve maximum benefit.

LEARN MORE

Related Research

- *IDC Energy Insights: Energy as a Service - DX Use Cases and Horizons* (IDC #US51219323, September 2023)
- *Critical External Drivers Shaping Global IT and Business Planning, 2024* (IDC #US51057623, September 2023)
- *Cloud Deployment Trends in Utilities* (IDC #US51218823, September 2023)
- *How Are Utilities Approaching GenAI for Their Customer Experience Strategies?* (IDC #US50662223, September 2023)
- *Utilities Asset Operations Quarterly Update: April-June 2023* (IDC #US50062123, August 2023)

- *Utilities Smart Customer Operations Quarterly Update: April-June 2023* (IDC #US49143523, August 2023)
- *Turning Utilities' Purpose into Outcomes for People, Prosperity and the Planet: Highlights from the IDC European Utilities Xchange 2023* (IDC #US49141023, August 2023)
- *Future Challenges and Opportunities for Utilities Field Service Management* (IDC #EUR151010823, July 2023)
- *Energy Efficiency: Implications for European Utilities in 2023 and Beyond* (IDC #EUR151010523, July 2023)
- *Snam's Journey to Enhance Its Cybersecurity Activities by Ramping Up DEI Initiatives and Across EMEA, Are Energy Consumers Interested in Energy-Related Products or Services? How Likely Are They to Buy Beyond-Commodity Products and Services from Their Energy Suppliers?* (IDC #EUR150987523, July 2023)
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- *IT-OT Convergence Survey: Implications for European Utility Asset Operators - Part 2* (IDC #EUR150083923, July 2023)
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- *Utilities Economic and Tech Spending Outlook and IT Budget Expectations for 2023* (IDC #US46520121, April 2023)
- *IDC Survey: Future of Industry Ecosystems - Utilities Industry* (IDC #US50123523, February 2023)

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