SEW SM

10 TRENDS

to Dominate the Energy & Utility Landscape in

2025 and Beyond

Terms of use and disclaimer

This report has been prepared by SEW.ai based on a combination of proprietary insights, market research, industry interactions, and publicly available information. It is intended to provide directional perspectives on emerging trends, innovations, and evolving customer expectations shaping the Energy and Utility sector in 2025 and beyond.

While every effort has been made to ensure accuracy and relevance, the information in this whitepaper is provided “as is.” SEW.ai makes no representations or warranties, express or implied, as to the completeness, timeliness, or accuracy of the information and assumes no liability for any decisions made based on this content.

The views expressed in this publication reflect SEW.ai’s interpretation of market developments at the time of writing. These views are subject to change without notice. Readers are encouraged to evaluate the content in the context of their specific business environment.

The SEW Take

THE BLUEPRINT

for Digital Transformation in the Energy & Utility Industry

This report presents ten key trends shaping the future of the Energy and Utility (E&U) industry in 2025 and beyond. Developed by SEW.AI, it is grounded in real-world insights gathered from 450+ global utility partnerships, as well as exclusive inputs from utility leaders through WE3 Summit and Smart Talk sessions.

The report explores how emerging technologies—especially Vertical AI and Human-AI collaboration—are unlocking new possibilities in customer experience, grid intelligence, and operational efficiency. It also examines sector-specific shifts such as digital acceleration in water utilities, infrastructure modernization, and proactive responses to grid volatility. Already, the #1 electric, gas and water utilities globally—and three out of four in North America—are powered by SEW platforms, demonstrating the scale and impact of this transformation.

Each trend is presented as a strategic lens to help utility executives, technology leaders, and policymakers align around innovation priorities. This report offers actionable guidance to chart a future-ready digital path—and build the next era of connected, intelligent utilities.

CONTENTS

Executive Summary

The global energy and utility landscape stands at a critical inflection point. Geopolitical tensions, regulatory shifts, economic volatility, rapid technological advancements, and evolving cultural dynamics have created a climate of deep uncertainty. Historical patterns are shading, and adaptability has become the new competitive edge. The recent arrival of AI is pushing the boundaries of what's possible. On the other, it introduces new layers of complexity, risk, and ethical concern further amplifying the unpredictability utilities must manage.

To manage this, the industry is turning to **vertical AI,** domain-specific AI-ML models purpose-built for the energy and utility sector. These solutions are designed to support **a full spectrum of capabilities covering predictive, prescriptive, descriptive, and diagnostic use cases across the energy & utility value chain.** With over **two third of utility leaders prioritizing industry-specific AI** over horizontal models, the momentum is clear. Ethical AI frameworks are also gaining traction to ensure fairness, transparency, and trust.

To fully realize the value of these models, utilities are shifting from siloed systems to fully connected, integrated technology ecosystems. **More than half of utilities are investing in system integration strategies** to enable real-time collaboration and operational visibility. This modern infrastructure unifies data, operations, and tools into a single intelligent platform, empowering decisions and transforming uncertainty into opportunity.

But success depends on more than just technology. The next frontier is the collaboration between **People + AI.** Driving scalable adoption requires a mindset shift, where humans and intelligent systems work together to co-create value. From copilots and agentic AI in customer service to AI-augmented field operations, the future lies in augmentation, not automation.

These advancements are enabling more resilient infrastructure, stronger cybersecurity, and real-time demand balancing, fueling the rise of the transumer economy.

At the core of this evolution is the convergence of **Customer + Grid + Workforce** — a 360° approach to transformation. It's about building a unified energy ecosystem where customer intelligence drives grid optimization, AI boosts workforce productivity, and every node, human or machine, operates in sync.

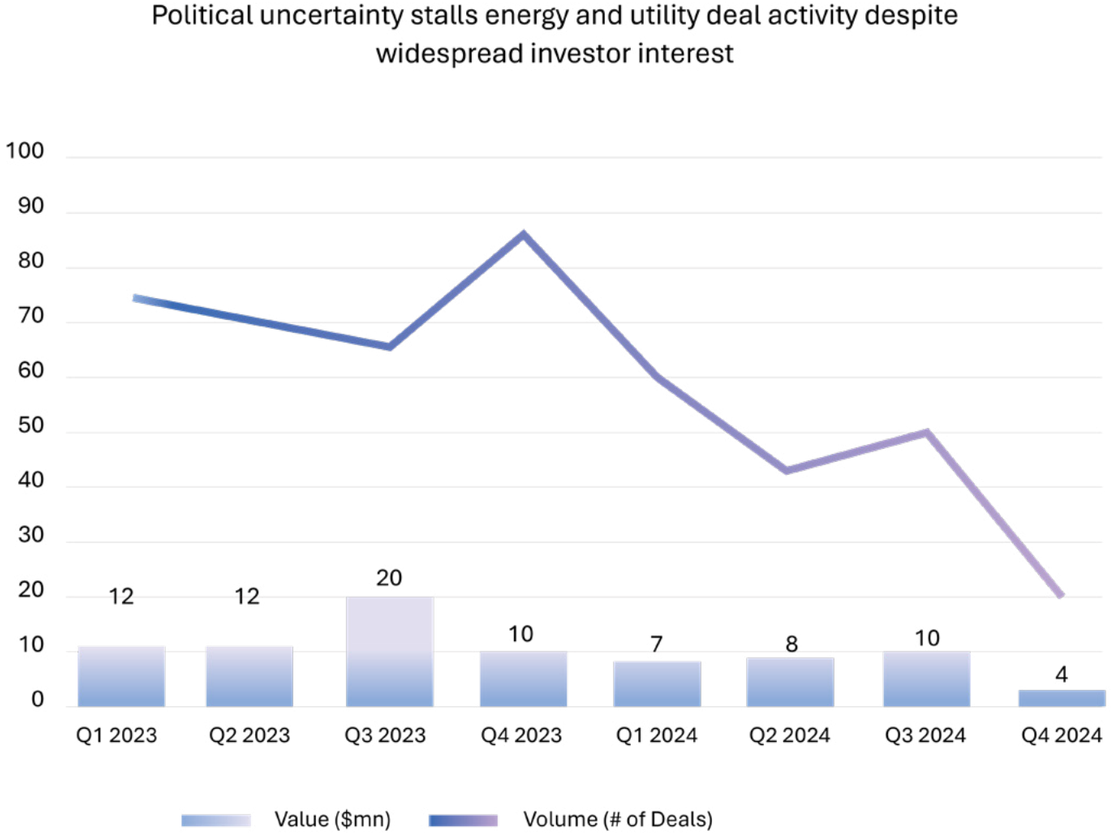
The coming few years hold extraordinary promise for the energy and utility sector—where those who lead with intelligence, integration, and intent will shape the future of energy.

01

TRENDING NOW

Battling the Tides of Uncertainty

In 2025, the Energy & Utility sector is operating in an increasingly complex environment, marked by rapid shifts in policy, regulation, customer expectations, investment priorities, and technology. Amid these changes, utilities are focused on staying resilient and adaptable. While uncertainty spans multiple dimensions, proactive response strategies and cross-sector collaboration are helping utilities chart a more stable course.



Source

PwC Analysis of S&P Capital IQ data

- **Policy reversals and political shifts** including 2025 executive orders supporting coal revival and limiting state climate actions, are disrupting long-term planning and forcing utilities to balance federal direction with ESG goals and state-level mandates.

- **Capital markets are shifting priorities,** as utility deal volume dropped 36% YoY in 2024, even while fossil fuel asset investment surged. This signals growing investor hesitation amid political ambiguity and rising infrastructure complexity.

- **Climate volatility and environmental shifts** are straining infrastructure reliability as extreme weather intensifies, pushing utilities to invest in climate-resilient infrastructure, flexible generation, and weather-integrated operational planning.

- **Emerging technologies and AI infrastructure** are creating unpredictable electricity demand curves, prompting utilities to adopt real-time forecasting, edge computing, and adaptive grid investments to manage rapid consumption surges.

- **Operational unpredictability and planning complexity** are driving a shift from long-term static forecasting to modular infrastructure, rolling budgets, and agility-based KPIs across utility operations and field execution.

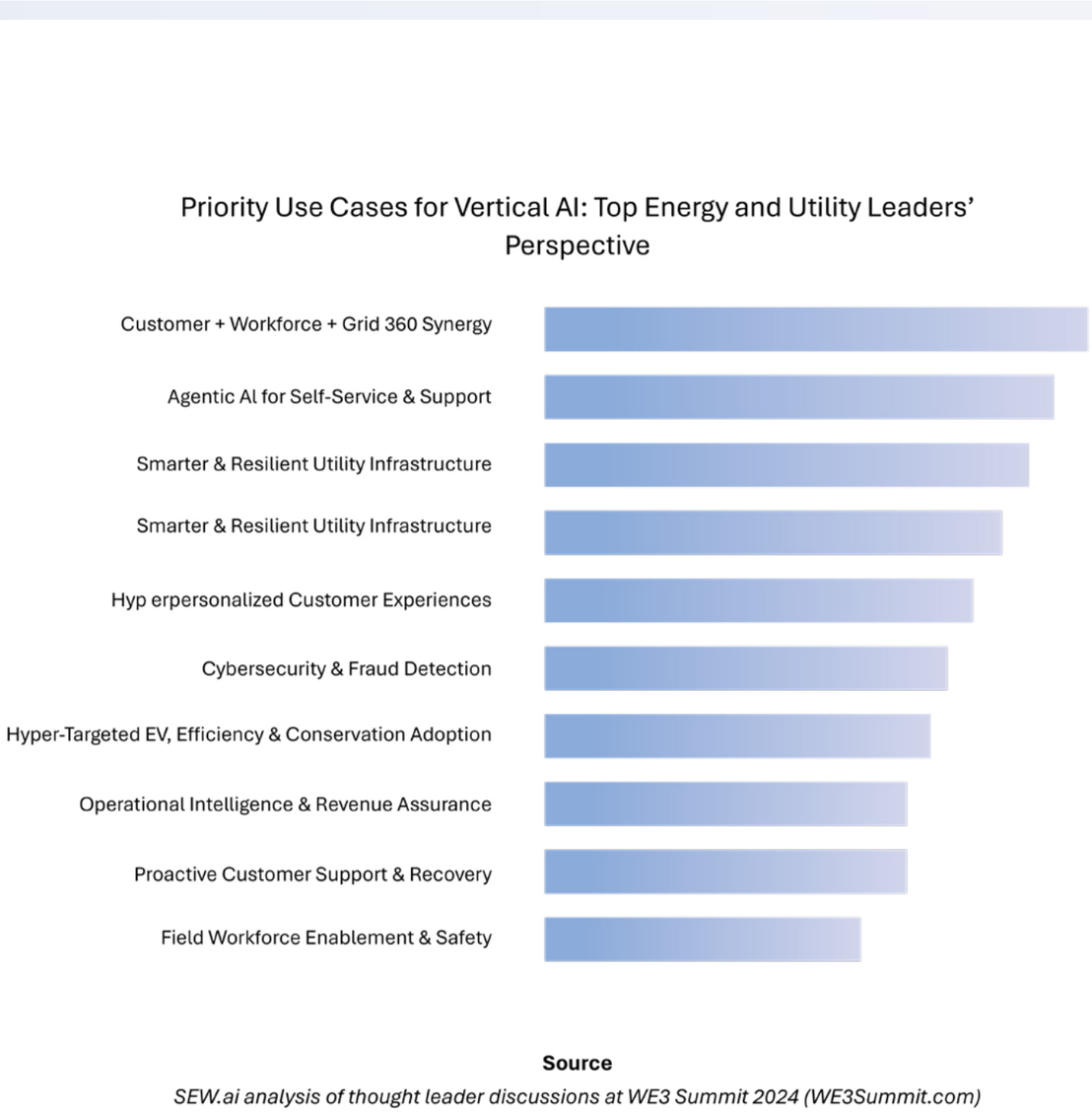
- **Social, cultural, and customer expectations** are evolving rapidly, especially among Gen Z and millennial consumers who expect climate-conscious, digital-first, and equitable utility services. Utilities are adopting AI-led personalization, multilingual access, and ESG-driven engagement models to remain relevant and trusted.

02

TRENDING NOW

The Rise of Vertical AI in Energy & Utilities

In 2025, utilities are moving beyond generic AI to adopt Vertical AI – Intelligent systems designed specifically for energy and water operations. With sector-trained models, domain-specific workflows, and compliance-aware algorithms, Vertical AI is enabling faster deployment, better accuracy, and smarter decision-making across utility functions.



Source

SEW.ai analysis of thought leader discussions at WE3 Summit 2024 (WE3Summit.com)

- **LLMs trained on utility-specific data** are being deployed to support a full spectrum of capabilities covering predictive, prescriptive, descriptive, and diagnostic use cases across the energy & utility value chain.
- **Predictive maintenance and asset failure forecasting models** are leveraging historical SCADA signals, load data, and transformer performance patterns to identify risks and optimize interventions.
- **Customer service AI tools** including chatbots, agent co-pilots, and intelligent IVR systems—are trained on utility-specific intents to improve resolution time and customer satisfaction.
- **Regulatory compliance-aware AI frameworks** are ensuring decisions and recommendations align with NERC-CIP, GDPR, CCPA, and other energy-sector mandates.
- **AI-powered load forecasting and DER optimization** models are helping grid operators manage real-time flows, improve dispatch efficiency, and plan for seasonal and localized variability.
- **Vertical AI platforms with plug-and-play integration** into CIS, OMS, MDM, and SCADA systems are reducing deployment friction and enabling use-case scalability across departments.

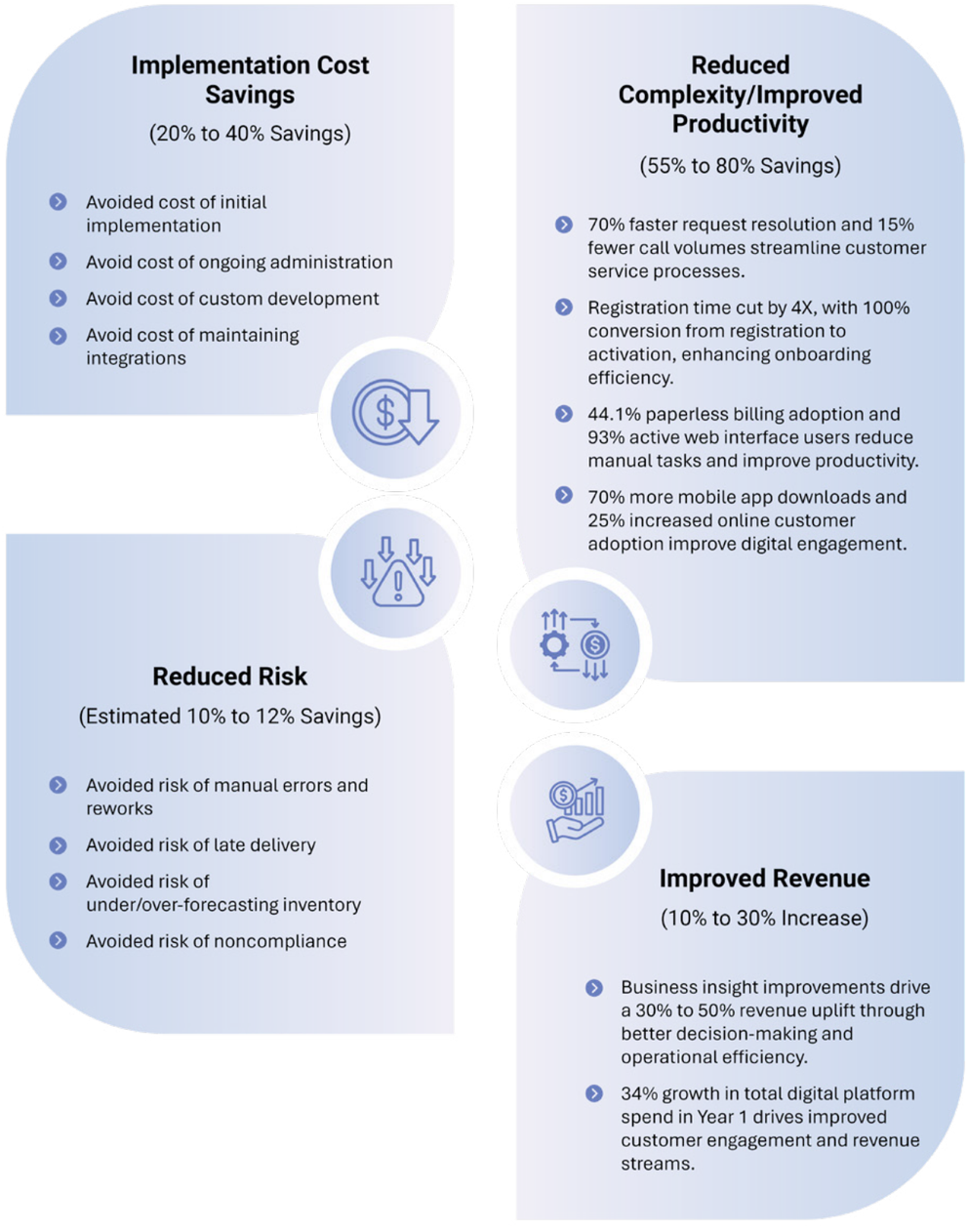
03

TRENDING NOW

From Siloed Systems to a Connected Utility Ecosystem

Utilities are moving beyond legacy silos and fragmented technology stacks toward a unified, connected ecosystem. The shift is being driven by the need for real-time data flow, operational efficiency, cross-functional collaboration, and a seamless customer-to-grid experience.

Potential Benefits of Connected Utility Ecosystems



Source

SEW.ai; SEW Connected AI Platform Benefit Report

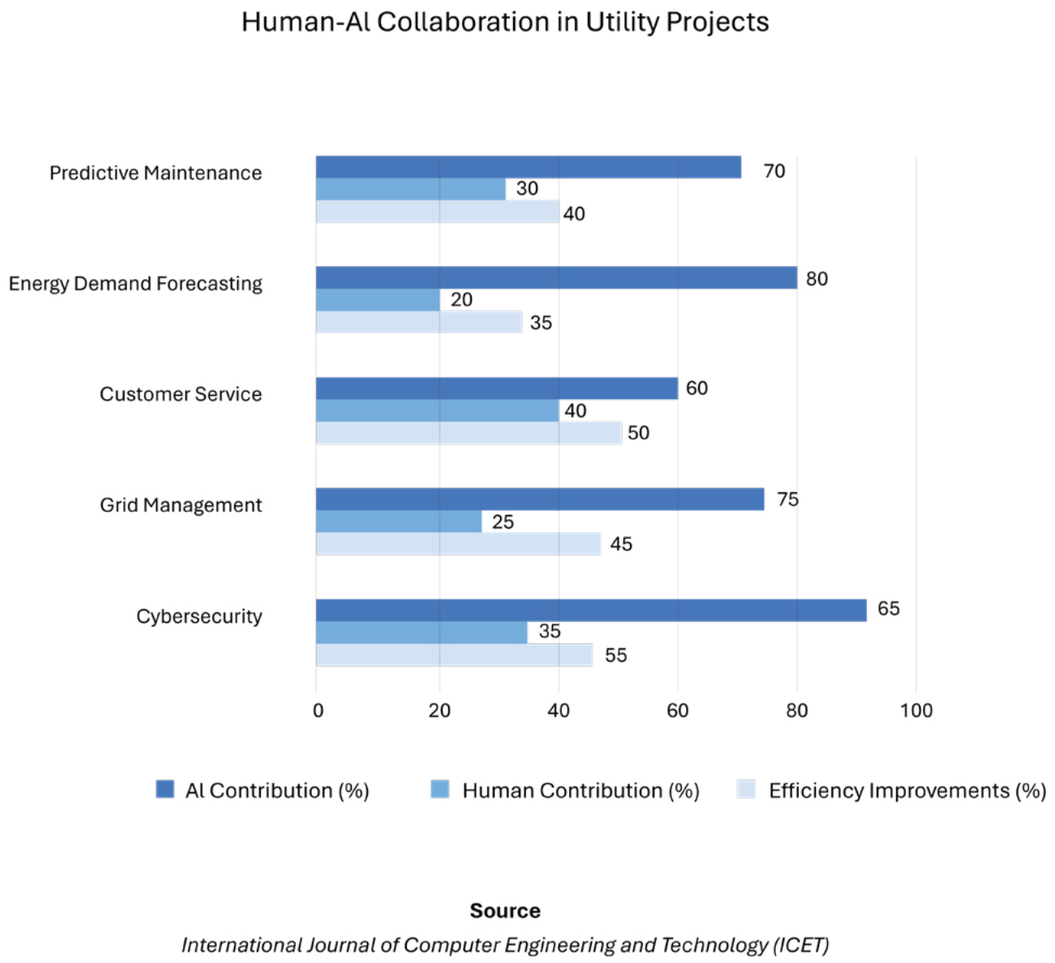
- **Platform-based integration models** are replacing legacy systems, enabling utilities to unify grid operations, customer experience, workforce management, and enterprise functions.
- **Real-time data interoperability** across customer systems, grid infrastructure, and field operations is enabling faster decision-making and better situational awareness.
- **Unified operational intelligence dashboards** are allowing utilities to break down silos, monitor KPIs holistically, and respond to anomalies across functions.
- **Connected workforce enablement** is improving coordination between field crews, dispatch teams, and service centers, reducing operational delays and manual handoffs.
- **Customer, asset, and grid systems are converging,** allowing utilities to link usage patterns, asset conditions, and customer behaviors into a single, actionable view.
- **Standardization and interoperability frameworks** are being adopted to ensure seamless integration across IT, OT, and IoT systems—critical for DER coordination and outage response.
- **API-first architectures and modular platforms** are enabling faster integration of third-party solutions and future-ready upgrades without the need for full system replacements.

04

TRENDING NOW

People + AI Synergy

The true potential of AI in the Energy and Utility sector lies not in replacing human capabilities – but in augmenting them. In 2025, utilities are accelerating the adoption of People-AI collaboration models to scale operations, personalize experiences, and empower both employees and customers through intelligent support.



Source

International Journal of Computer Engineering and Technology (ICET)

- **AI-powered agent co-pilots** are assisting contact center staff with real-time prompts, suggested actions, and knowledge surfacing—reducing average handling time and improving customer satisfaction.

- **Field workforce is being augmented by AI and mobile tools,** helping technicians access asset histories, automate reporting, and receive predictive maintenance alerts on the job.

- **Skill development and AI literacy programs** are being prioritized as utilities upskill employees to work effectively with AI tools—transforming roles rather than replacing them.

- **Human-in-the-loop learning models** are enhancing the accuracy and adaptability of utility AI systems—especially in complex cases like billing exceptions, customer sentiment, and outage classification.

- **Agentic AIs with seamless human handoff** are delivering scale and speed, while ensuring high-complexity or high-emotion cases are still handled by human agents.

05

TRENDING NOW

Customer Centricity and Service Experience Modernization

Customer expectations in the utility sector are rapidly evolving, shaped by digital benchmarks, demand for personalization, and real-time transparency. At the same time, utility agents, CSRs, and internal teams are facing rising pressure to deliver faster, smarter, and more informed service. In response, utilities are reimagining both the customer experience and the agent experience, becoming more proactive, personalized, omnichannel, and intelligent across every interaction point.

- **Hyperpersonalized engagement** is becoming standard, with utilities using AI to tailor communications, offer real-time usage insights, and deliver contextual recommendations.
- **Unified omnichannel experience** is a top priority, enabling customers to seamlessly interact across mobile, web, chatbot, IVR, and in-person channels with consistent support.
- **AI-powered virtual agents and co-pilots** are reducing service friction by handling FAQs, guiding complex requests, and assisting agents in real time for faster resolution.
- **Proactive service and outage communications** are expected by today's customers driven by real-time notifications, smart alerts, and geolocation-based updates.
- **Flexible billing and payment options** including pay-by-link, barcode payments, wallet integrations, and multi-account management are improving convenience and satisfaction.
- **Inclusivity and accessibility** are now core to experience design, with utilities expanding support for multiple languages, digital literacy levels, and underserved customer segments.
- **Energy efficiency tools** like AI-driven analytics, gamification, and carbon tracking help customers cut costs and reduce waste. Human-led workshops and outreach foster sustainable habits.
- **Customer feedback and sentiment analytics** like CSAT and NPS are being leveraged to continuously refine CX strategies, with utilities monitoring satisfaction trends across every touchpoints.
- **Skill development and AI literacy programs** are equipping utility agents, CSRs and supervisors to confidently work with AI tools, co-pilots, and new workflows.
- **Unified agent workspace tools** are consolidating multiple systems (billing, outage, CRM, service history) into a single pane of glass, boosting productivity and context.

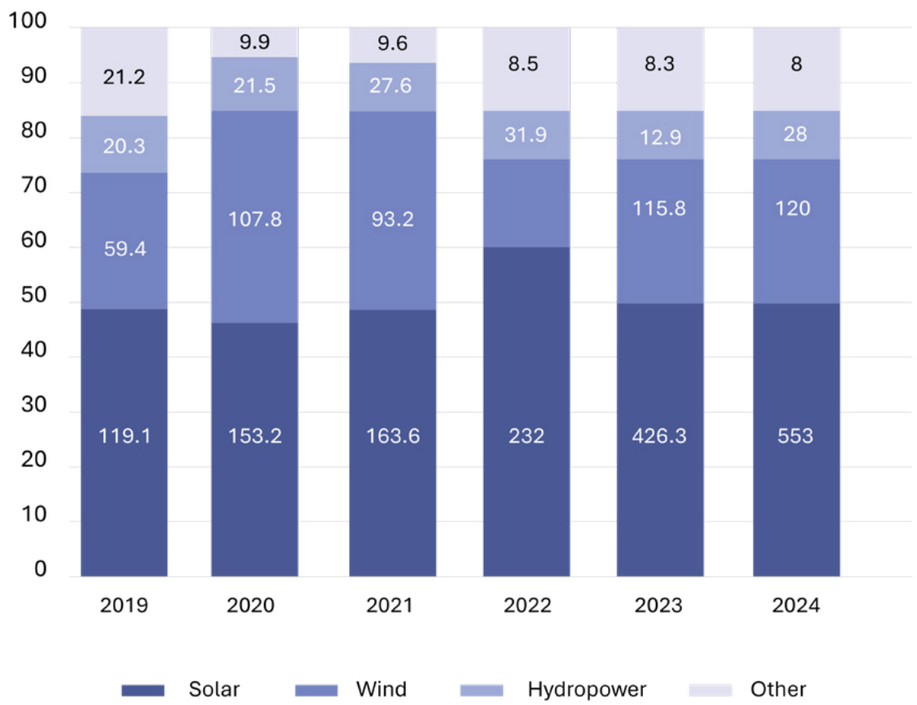
06

TRENDING NOW

Smart Energy Transition & Transumers Economy

The energy transition is entering a smarter phase—characterized by decentralized generation, flexible consumption, and bidirectional power flows. As EVs, DERs, and energy storage gain momentum, utilities are adapting to a new model where consumers become active participants, or "transumers," contributing energy, data, and flexibility to the grid.

Political uncertainty stalls energy and utility deal activity despite widespread investor interest



Source

PwC Analysis of S&P Capital IQ data

- **EV growth and charging infrastructure expansion** are reshaping utility load profiles, with over 14 million EVs sold in 2023 alone and public charger installations rising by 55% YoY.

- **V2G and V2X solutions** are enabling EVs to contribute energy to homes and grids. Utilities are piloting these technologies for load balancing, peak shaving, and resiliency enhancement.

- **Fleet electrification is accelerating,** with AI-driven telematics enabling predictive maintenance, route efficiency, and load optimization—key to reducing emissions and managing electricity cost variability.

- **DERs and Behind-the-Meter Energy** Are Going Mainstream with rooftop solar, residential storage, and community microgrids are becoming standard in new developments with DER's capacity is expected to exceed 1,000 GW by 2030.

- **Energy storage is becoming foundational,** with grid-scale batteries and residential systems ensuring reliability, firming renewable generation, and supporting load shifting during peak demand periods.

- **Smarter, alternative energy options** such as green hydrogen, hybrid solar-wind-storage systems, and thermal energy storage are being piloted for commercial and grid-scale applications—offering long-duration storage and decarbonized flexibility.

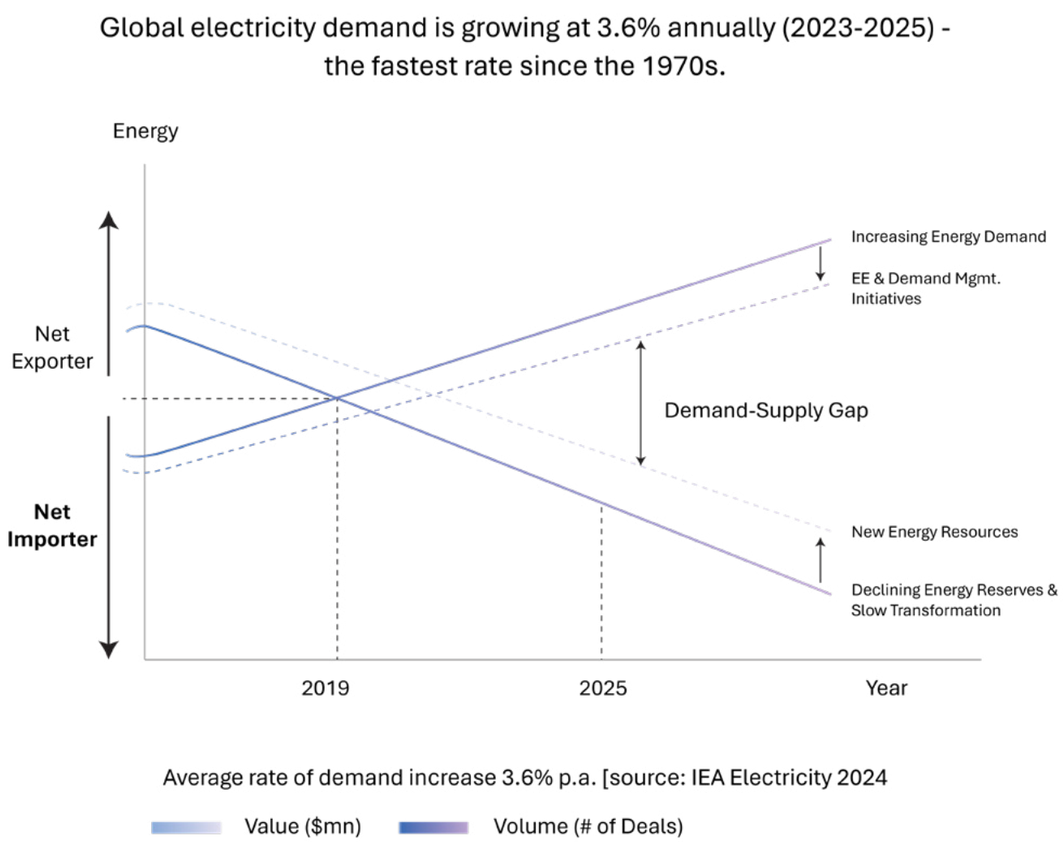
- **Rise of digital energy marketplaces and P2P energy trading** where customers can trade energy, earn from grid participation, or enroll in time-of-use programs—signaling a shift toward platform-based energy ecosystems.

07

TRENDING NOW

Navigating the Demand and Supply Imbalance

The energy sector is experiencing one of its most critical balancing acts managing a widening gap between soaring demand and constrained supply. Surges in WW, industrial growth, renewable integration challenges, and aging infrastructure are reshaping energy system dynamics across global markets.



Source
IEA (iea.org)

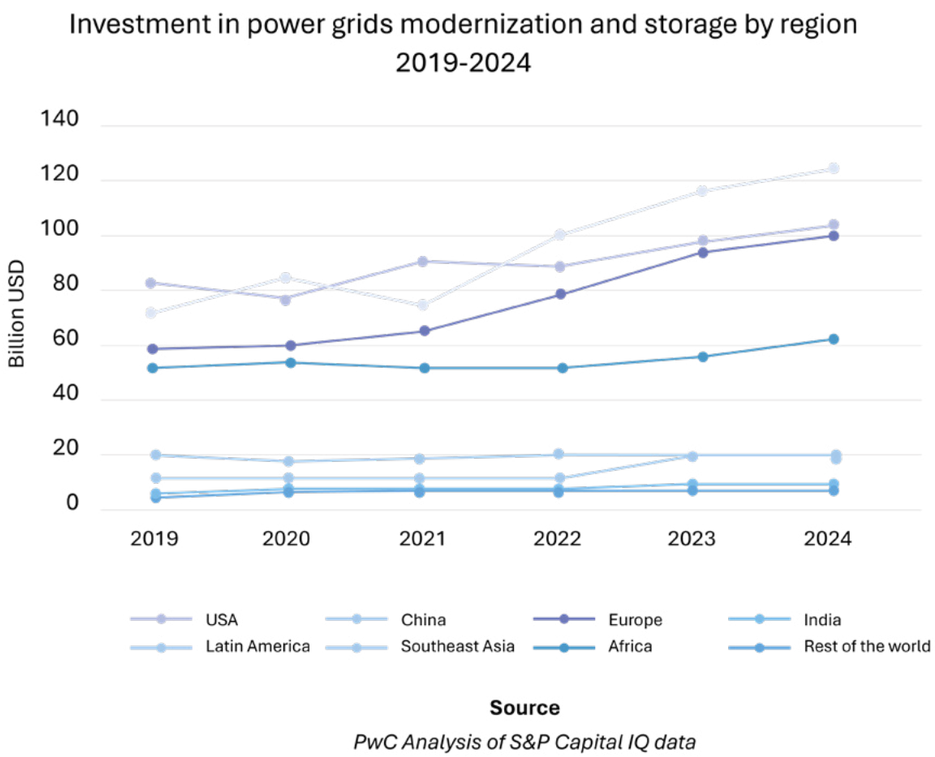
- **Electricity demand growth is surging,** with global demand increasing at 3.4% per year, driven by electrification of transport, heating, and manufacturing in both advanced and emerging economies.
- **AI data centers** are becoming major power consumers, with AI workloads alone projected to account for 2.3% of global electricity by 2026, matching the usage of millions of homes.
- **Rising energy needs** from industrial, manufacturing, and commercial sectors are accelerating overall demand, especially in regions reshoring production and expanding logistics infrastructure.
- **Renewable energy growth** is constrained by interconnection delays, with over 2,600 GW of clean energy projects stalled due to lack of transmission capacity and permitting backlogs.
- **Grid infrastructure limitations and aging assets** are creating bottlenecks, as legacy systems were not designed to handle modern, bidirectional loads or high-density urban demand.
- **Slow permitting and delayed interconnection** for new generation assets are contributing to supply bottlenecks, particularly for solar, wind, and battery projects.
- **Decommissioning of firm baseload generation** (coal, nuclear) in some markets is reducing reserve margins without equivalent replacements in flexible generation.
- **Electrification of adjacent sectors** including EVs, building heating, and green hydrogen is incrementally raising demand curves, with spikes in localized distribution loads.

08

TRENDING NOW

From Aging Assets to Adaptive Infrastructure

Utilities are making large-scale investments in modernizing grid and infrastructure systems to enhance resilience, reliability, and operational agility. Rising climate volatility, aging assets, and the growing complexity of distributed energy are driving the need for self-healing, intelligent networks that can detect, respond to, and recover from disruptions in real time.



Source

PwC Analysis of S&P Capital IQ data

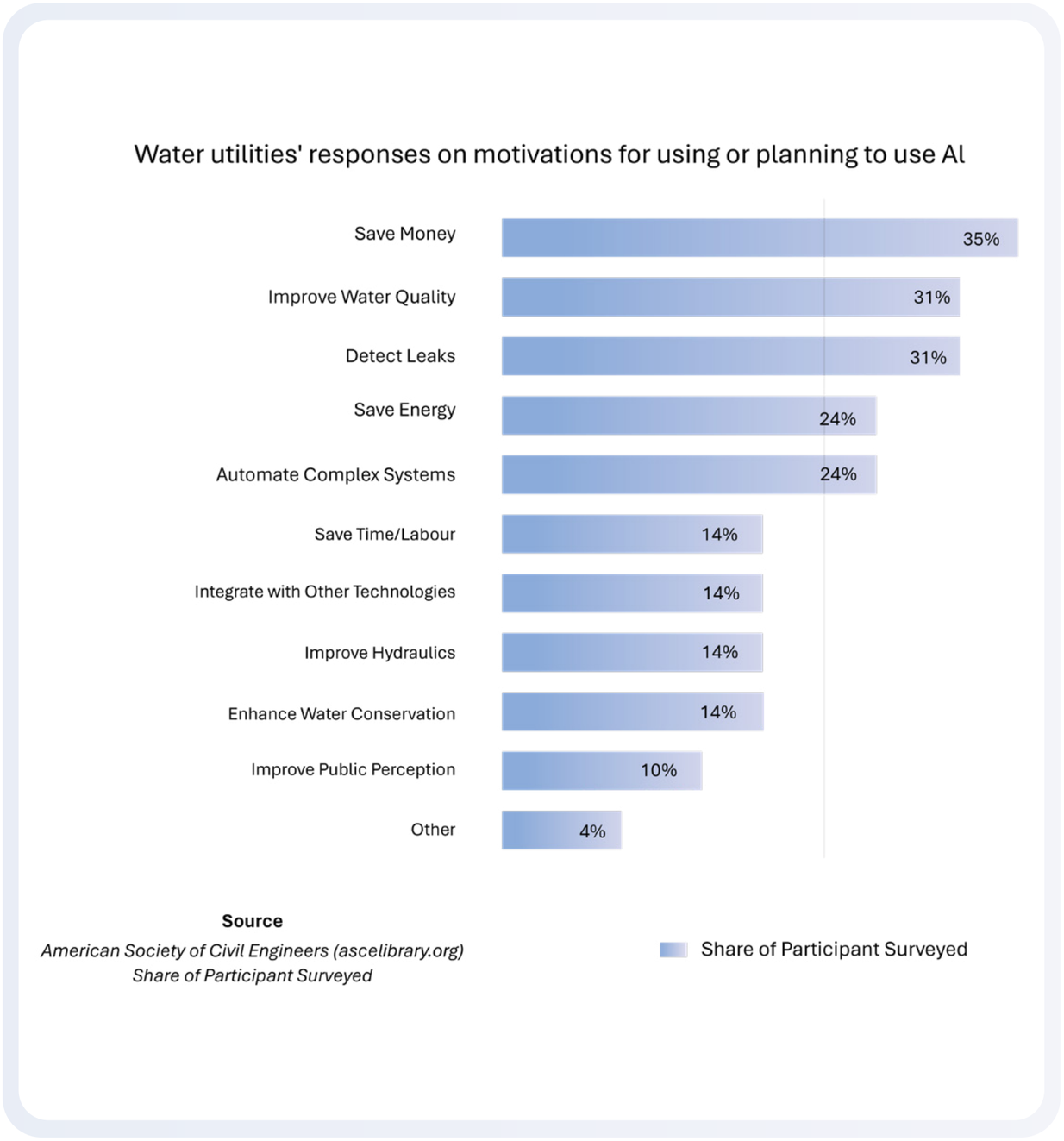
- **Aging grid infrastructure** is being replaced or upgraded to improve reliability, reduce technical losses, and extend asset lifespan, especially in high-risk geographies.
- **Self-healing grid technologies** enabled by sensors, automation, and AI are being deployed to detect faults, isolate issues, and automatically reroute power with minimal disruption.
- **Advanced Distribution Management Systems (ADMS)** are becoming a backbone for real-time monitoring, outage response, and intelligent fault location in electricity networks.
- **Digital substations and smart reclosers** are transforming transmission and distribution, offering enhanced visibility, remote diagnostics, and faster response to field conditions.
- **Gas infrastructure modernization** is advancing with smart pipeline monitoring, AI-based leak detection, and predictive maintenance to mitigate safety and operational risks.
- **Climate resilience** is a strategic investment priority, with utilities reinforcing infrastructure to withstand wildfires, storms, floods, and heatwaves using advanced materials and designs.
- **Utility automation investments** are focused on SCADA upgrades, intelligent grid edge devices, and IoT-based control systems for enhanced responsiveness and reliability.
- **Regulatory mandates and resilience performance standards** (e.g., SAIDI/SAIFI targets) are accelerating grid investments and shaping long-term capital planning.
- **Public funding and infrastructure** acts in several markets are unlocking capital for utility modernization, with increasing collaboration between utilities, technology partners, and regulators.

09

TRENDING NOW

Acceleration of Digital Transformation in Water Sector

Water utilities globally are entering a critical phase of modernization. Between 2025 and 2030, the sector is expected to experience accelerated digital investment, driven by increased climate pressures, aging infrastructure, and rising customer expectations. The convergence of AI, IoT, and cloud technologies is enabling a fundamental shift in how water is monitored, distributed, and managed.



Source

American Society of Civil Engineers (ascelibrary.org)
Share of Participant Surveyed

- **Strategic investments in infrastructure modernization** are being prioritized as utilities address aging pipelines, and compliance with environmental standards through digitally enabled asset strategies.

- The implementation of **advanced metering infrastructure (AMI)** is gaining traction, allowing utilities to manage non-revenue water (NRW) losses effectively and improve resource conservation.

- **Integrated AI, IoT, and cloud platforms are transforming water operations** –enabling real-time leak detection, predictive maintenance, demand forecasting, and enhanced operational control.

- There is a shift towards centralized, **autonomously run drinking water treatment plants (DWTPs)** that facilitate real-time monitoring and automated decision-making in wastewater treatment processes

- With increasing water scarcity, utilities are focusing on **water reuse strategies** and sustainable practices to ensure long-term water security. This includes investments in technologies for efficient water recycling in industrial applications as well as residential.

- As freshwater resources become scarcer, **desalination** is being recognized as a viable solution to mitigate water stress in arid regions

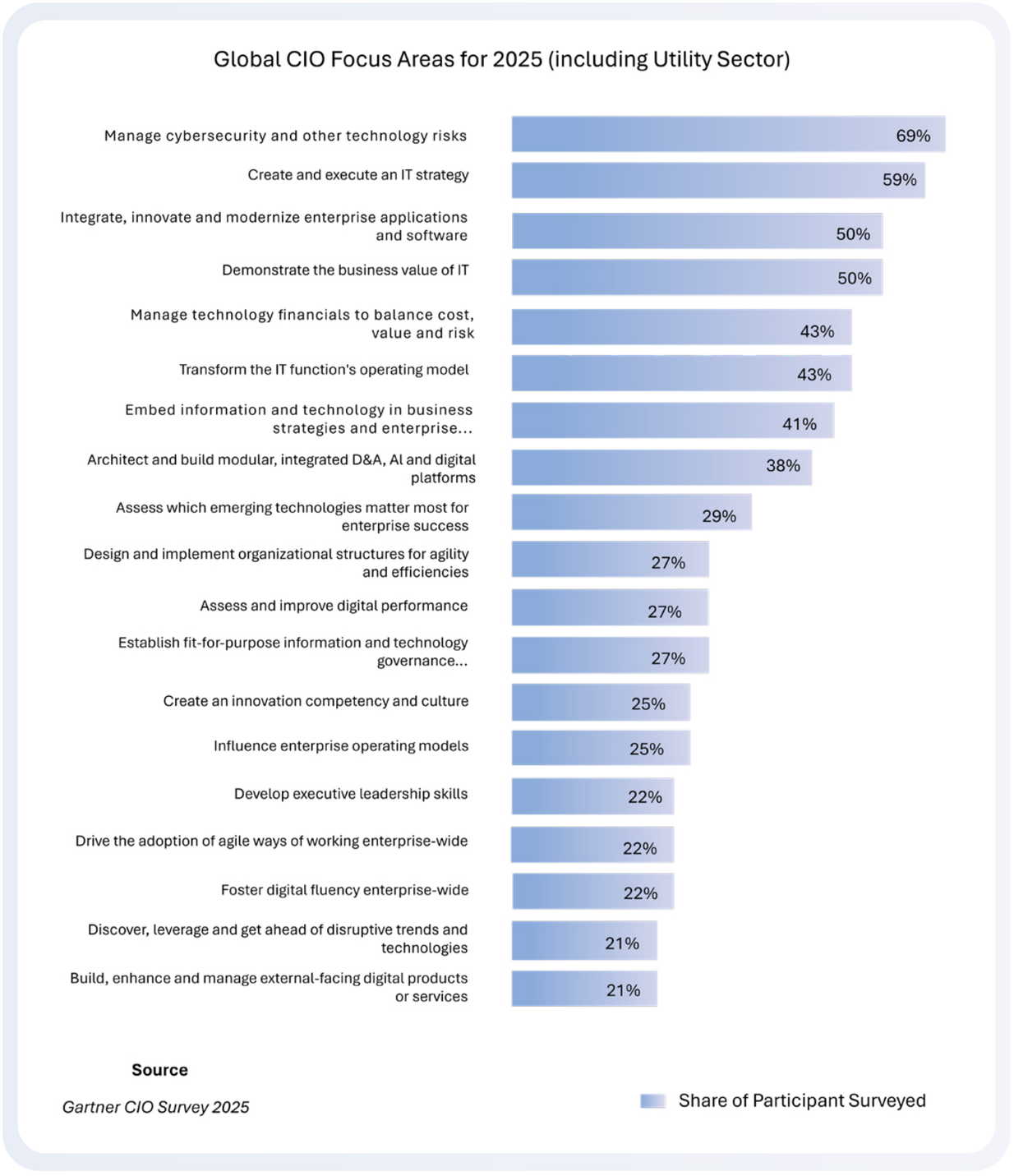
- **Public-private partnerships** and policy incentives are accelerating innovation by supporting pilots, expanding rebate programs, and encouraging technology adoption across municipal and regional water systems.

10

TRENDING NOW

Cybersecurity Moves to the Top of the Utility Agenda

As utilities digitize core operations, expand grid-edge intelligence, and integrate distributed technologies, cybersecurity has become a critical operational priority. Rising cyber threats, regulatory pressure, and the growing attack surface across IT-OT systems are placing cybersecurity firmly at the center of utility strategy in 2025 and beyond.



- **AI-driven cybersecurity platforms** are being deployed to detect threats in real time, leveraging pattern recognition, anomaly detection, and automated response to secure utility networks.

- **Zero Trust Architecture and role-based access control (RBAC)** are being adopted to enforce strict user validation and reduce the risk of internal and external breaches across IT-OT environments.

- **Cloud and SaaS security frameworks** are a key investment area as utilities migrate to digital platforms—requiring advanced encryption, data privacy protocols, and container-level threat monitoring.

- **Third-party and supply chain cybersecurity protocols** are being strengthened, with utilities enforcing secure integration practices and continuous compliance monitoring for vendor ecosystems.

- **Increased cybersecurity investment** is being prioritized at the executive level, with utilities allocating dedicated budgets to build resilient infrastructure, protect customer data, and ensure operational continuity.

- **Cybersecurity training and simulation programs** are scaling across the workforce, addressing phishing, credential hygiene, and operational risk awareness for all utility personnel.

- **Compliance with evolving cybersecurity regulations** such as NERC CIP, ISO/IEC 27001, and national cyber directives is driving structured audits, documentation, and reporting across utility systems.

- **Utilities are performing industry collaborations** by joining intelligence-sharing groups like E-ISAC to stay ahead of evolving threats.

WE3 Summit

5 - 7 November 2025 | Las Vegas

Presented By

SEW SM

Join the Movement

Thank You

WE3 Summit Executive Chair Committee

Paul Lau
CEO & GM
SMUD

Brian Bentz
President and CEO
Alectra Inc.

At WE3 Summit 2024, we announced the formation of the WE3 Summit Executive Chair Committee, led by the inaugural co-chairs Paul Lau, CEO and GM of SMUD, and Brian Bentz, CEO of Alectra. This strategic leadership duo is dedicated to driving innovation and impactful discussions in the energy and water sectors, shaping the summit's direction to inspire positive global change.

SEW, with its innovation and industry-leading cloud platforms, delivers the best Digital Customer Experience (CX), Business Experience (BX), and Workforce Experience (WX), powered by Vertical AI, ML, and IoT Analytics to the global energy, water, and gas providers.

At SEW, the vision is to Engage, Empower, and Educate billions of people to save energy and water. We partner with businesses to deliver platforms that are easy-to-use, integrate seamlessly, and help build a strong technology foundation that allows them to become future-ready. For further details, connect with us at info@SEW.ai.

Learn More

Corporate Headquarters

15495 Sand Canyon Ave. Ste. 100, Irvine, CA 92618

+1 (949) 409-6833 | info@sew.ai