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Research Roundup: Top 10 Trends Shaping the Utility Sector in 2023

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Utilities are faced with unprecedented challenges and opportunities shaped by continued disruption. Utility CIOs should use this research to prioritize and align IT to the needs of the business, including architecture, roadmaps and resources, as they build a sustainable utility future.

Analysis

In 2023, power and water utilities will continue to face a variety of forces that will challenge their business and operating models and shape their technology investments. Disruptions such as the COVID-19 pandemic, economic recession, and the Russian invasion of Ukraine, as well as consequent energy crises cast a backdrop on an already challenging business and operating environment for utilities.

For energy utilities, challenges are primarily consequences of energy transition driven by 4D forces (decarbonization, decentralization, digitalization and democratization; see Note 1). For water utilities, challenges stem primarily from access to water and security management. Further, all utilities globally are facing increasing business costs, an aging and exiting workforce, expensive and hard-to-find talent, economic disruption and volatility, increasing physical and cyber-physical risk, and an unstable regulatory regime, contributing to a challenging environment.

Operationally, the pressure is mounting to maintain physical integrity and modernize aging grid infrastructure in the face of shifting consumption/production patterns, the accelerated deployment of renewable energy assets at utility scale, and at the grid edge. Water operations are being pressed to redress old issues like stemming leakage while addressing renewed concerns and capabilities to handle effluents and contamination. Natural gas faces the triple priority of infrastructure renewal, security management and network revision for the emerging hydrogen economy.

These challenges can be grouped into three key themes: lack of resilience to changes in physical and business environment, out-of-date technologies, and emerging customer needs that are underserved. For these reasons, creating new value propositions and improving engagement for a customer base that is awakening to more information, capability and agency continues to be one of the top goals for utility executives.

These pressures, coupled with regulatory uncertainty and political interference, are reshaping business and operating models, and requiring utilities to develop new ways of thinking, new skills and capabilities. As a result, utility organizations are redoubling their focus on delivering mission-critical, technology-furnished capabilities to supply commodities to their customer base, while enabling them to reposition for a sustainable future provisioning of energy and water.

Intelligent operations is a strategic goal for utility CIOs that must shape digital investments toward fit-for-the-future cyber-physical asset designs.

Utilities continue investing in digital technologies, according to the 2023 Gartner CIO and Technology Executive Survey. [1] The purpose of the investments is to ensure the ability to provide available, affordable and acceptable services to the customers they serve by increasing agility, performance and opportunities during the unpredictable and volatile energy and water transition period.

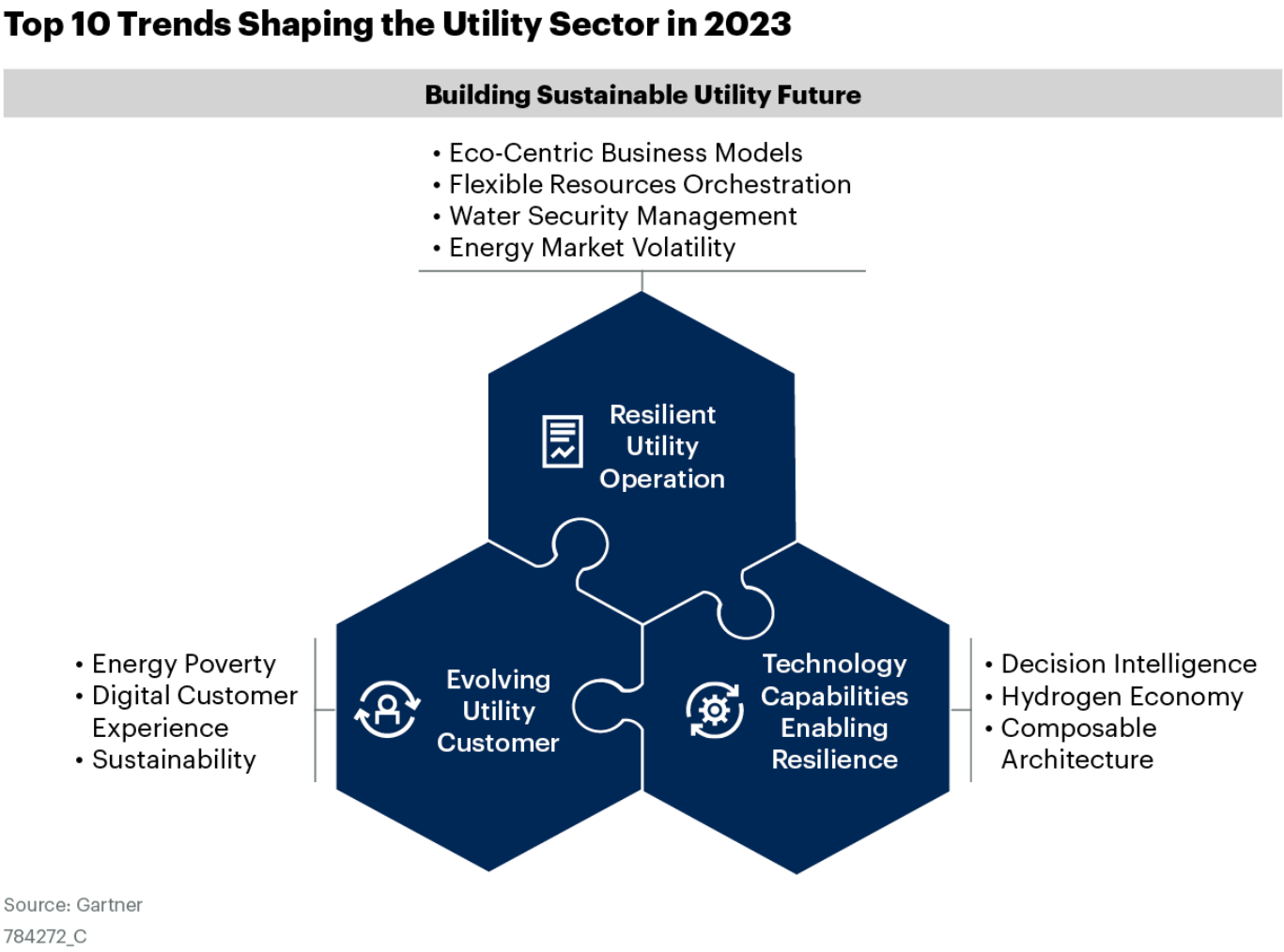
A sustainable utility future requires improved business resilience and the ability to quickly change to address new requirements arising from the energy transition and from increasing regulatory and political demands. Utilities must shape-shift to increase resilience while maintaining productivity and efficiency.

Utility technology leaders must confidently compose the future for their organizations in the midst of uncertainty during this energy transition volatile period — the future that requires your organizations to be both agile and resilient. This is where utility trends for 2023 can help. In this utility trend research roundup, we explore ten key trends that are shaping utility companies globally in 2023. These can help you set your priorities, explore technology investment directions and compare your position to others in the industry. We've selected these trends for their promise to facilitate your journey as you build a sustainable utility future.

Though these trends are global, they may have different relevance in different regions. They can translate very easily into specific utility domains (e.g., power generation, transmission and distribution, and water and wastewater). And they can fit to different levels of digital ambition (e.g., industry leader, moderate and tailing). Accordingly, not all trends have the same impact on every organization.

Figure 1 highlights the alignment between industry trends and the challenge they show promise to resolve. Trends that are building sustainable utility futures can be clustered into three strategic business imperatives: resilient utility operation, technology capabilities enabling resilience and evolving utility customers.

Figure 1: Top 10 Trends Shaping the Utility Sector in 2023



Utility CIOs and technology leaders must drive a sustainable future by clearly articulating the secure foundation, composable roadmap and momentum toward software-defined assets and intelligent operations that will fulfill business strategies and goals. Utility companies can map these trends to their business requirements by considering three strategic imperatives (see Note 2).

Research Highlights

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Each of the trends is explained in more detail in the documents highlighted and linked below. These documents assess the business context for the trend, clarify its description, explain why it is trending

now and justify its inclusion among the collection of top trends for utilities in 2023. Each note also clarifies the implications for utility CIOs and digital leaders, and provides recommended action steps. Utility CIOs can use this research to better understand the most relevant trends for their company and focus their technology decisions to keep pace with evolving business priorities.

Links to the research notes that analyze the top 10 trends for utility companies are grouped with their associated strategic business imperative. The order they are presented below does not designate relative importance, as each company will have unique priorities based on their asset portfolio, theater of operations and strategic plans.

Top 10 Trends Shaping the Utility Sector in 2023

Resilient Utility Operation

2023 Utility Trend: Utility Business Models Are Evolving From 'Ego-Centric' to Eco-Centric

Democratization of energy provisioning is forcing utilities to evolve business models from internally focused ego-centric business models to externally focused, collaborative, eco-centric business models. CIOs must ensure that their digital technology strategy and technology investments reflect this shift.

2023 Utility Trend: Orchestrate Flexible Resources to Maintain Power System Operational Integrity

Intermittent renewable energy is displacing large-scale fossil-fueled resources that provided inertia and stabilized the grid. With the diminishing role of fossil fuel resources, utility CIOs must support integration of consumer-owned resources with digital IT and operational technology (OT) services.

2023 Utility Trend: Water Security Management Is the Water Industry's Existential Imperative

Effluent management is the new disruptor for water security management in water utilities and the downfall for legacy water management strategies. Failures in water quality will break water utilities overall. Water utility CIOs should use this trend to evaluate how and why water security management is the key challenge and opportunity for water utility enterprises.

2023 Utility Trend: Evolving Markets Challenging Traditional Energy Trading Tools

Turbulent geopolitics and the energy transition are resulting in power outages and spot market price shocks that challenge the utility's existing operational and financial agility. Utility CIOs should consider the impacts of electricity market volatility on their IT strategy, operating model and spending.

Technology Capabilities Enabling Resilience

2023 Utility Trend: Establish Decision Intelligence Before Chasing Autonomous Business

Decision intelligence is an essential precursor to execution of automation, irrespective of decision execution technology to support intelligent operations. Utility CIOs can use this research to prioritize and manage business demand for decision automation.

2023 Utility Trend: Green Hydrogen Expectations Are High, but So Are Challenges

Hydrogen has great potential to ease the energy transition journey, but multiple challenges remain. This research will help CIOs gain a balanced view of opportunities created by government incentives and investors' interest, as well as challenges faced on the road toward a hydrogen economy.

2023 Utility Trend: Composable Architecture Delivers Business Agility

Diverse pressures like operational and business challenges, and disruptions triggered by global events, are forcing utilities to adopt new plans focused on agility and resilience. CIOs can use this trend to evaluate how composable architecture can enable flexibility in delivering business outcomes.

Evolving Utility Customer

2023 Utility Trend: Growth of Energy Poverty — Focus on Relief, Revival and Renewable Energy

A majority of the population, currently in the Northern hemisphere, is wrestling with the challenges caused by the lack of access to fuel, food and finance. Energy poverty is the core problem. Utility CIOs can use this research to understand approaches with a dual focus on addressing affordability concerns, as well as ensuring their financial and operational stability.

2023 Utility Trend: Digital Customer Experience Is Remodeling for the Energy and Water Transition

For years, customer engagement has been focused on customer service while managing a narrow scope of commodity transactions. But during this era of transition, customer experience (CX) will define the breakout enterprise. CIOs can use this research to design a CX/total experience (TX) that syncs with the energy and water transition.

2023 Utility Trend: Sustainability Is a Double-Edged Sword for Utilities

Tightening regulations, stakeholder scrutiny and climate change impacting assets and infrastructure frame environmental challenges, with changing customer attitudes making opportunities for utilities. Utility CIOs should align digital strategies and technology investments with climate change risks.

Evidence

This research was developed using a combination of evidence including information from analyst interactions with energy and utility companies and technology providers from 1 January through 15 December 2022, as well as analysts' secondary research.

[1] **2023 Gartner CIO and Technology Executive Survey.** This survey was conducted to help CIOs and technology executives overcome digital execution gaps by empowering and enabling an ecosystem of internal and external digital technology producers. It was conducted online from 2 May through 25 June 2022 among Gartner Executive Programs members and other CIOs. Qualified respondents were each the most senior IT leader (e.g., CIO) for their overall organization or some part of their organization (for example, a business unit or region). The total sample was 2,203 respondents, with representation from all geographies and industry sectors (public and private), including 71 from utilities. *Disclaimer: Results of this survey do not represent global findings or the market as a whole, but reflect the sentiments of the respondents and companies surveyed.*

Note 1: The Energy Transition Defined

The energy researcher, Vaclav Smil, has defined the energy transition as the structural change of energy provisioning systems. In this particular case, it refers to the shift from current energy production systems that rely primarily on nonrenewable energy sources (oil, natural gas and coal) to an energy mix based largely on renewable energy sources. The current energy transition is focused on decarbonizing the energy sector at a global level, reducing carbon emissions and ensuring climate stabilization by moving from fossil-based to zero-carbon fuel sources by the second half of this century. The shift will be enabled by a combination of policy frameworks, market instruments, innovation and technology.

Note 2: Strategic Imperatives to Consider When Mapping Utility Trends to Business Requirements

- **Resilient Utility Operation.** The four trends aligned to this opportunity show promise in resolving key challenges associated with nonresilient business models. The shift is from the traditional utility mantra of “built to last” toward one that is “built for change.” Resilience isn’t about short-term adjustment or “bouncing back” to a prior state following disruption; it is about being able to nimbly adapt in an ongoing dynamic business environment. The underlying assumption in resilient operation is that volatility in the utility sector will persist. Hence, it is vital to have the talent, capabilities, techniques, operational processes, architecture, tools and applications to constantly and dynamically adapt to evolving business patterns.

- **Technology Capabilities Enabling Resilience.** The three trends aligned to this opportunity show promise in resolving key challenges associated with out-of-date technologies and architectures. They also create opportunities to offer new products and services and support business model transformation. The global drive toward sustainability puts emphasis on new forms of energy generation that produce less pollutants, such as hydrogen and renewables. Though they have less impact on the environment, they create challenging operating conditions for utilities by reducing controllability of the supply and impacting reliability of the delivery infrastructure, subsequently increasing overall business volatility. To address those challenges, utilities have to invest into new capabilities, such as decision intelligence. However, it also means organizations must be composable with modular, adjustable and autonomous components. They must use technologies

and leverage technology domain integration to achieve sustained resilience. Business and IT processes must be automated — and digitalized, in particular — when it comes to work and asset operations.

- **Evolving Utility Customer.** The three trends aligned to this opportunity show promise in resolving key challenges, as well as capturing opportunities created by changing needs of technology-empowered and sustainability-driven customers. Democratization of energy provisioning and increased awareness of water customers on resource scarcity forces utilities to change their value proposition to a customer base that is environmentally aware and sustainability awakened. Providing new products and services to customers focused on reducing their carbon footprint, engaging prosumers and their contribution to energy balancing and grid firming needs requires new means of digital customer engagements. At the same time, utilities should not forget their social obligation and their key tenet to provide affordable, accessible and acceptable energy and water to all customers.

Actionable, objective insight

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Research

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Infographic

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