KPMG

Plugged in

Power and utilities magazine

Third edition

Technological advancements have always played a vital role in shaping the power and utilities sector. This edition of Plugged In serves as a guide to this dynamic terrain, offering insights into cutting-edge technologies, strategic frameworks, and real-world implementations that have driven progress and strengthened resilience.

As the industry undergoes significant transformation — shifting from fossil fuels to low-carbon alternatives amidst a cost-of-living crisis — the need for innovative solutions has never been greater. This edition is particularly relevant for those interested in harnessing the transformative potential of technology, such as artificial intelligence and smart grids, and the pressing need for decarbonization to navigate these challenges.

How artificial intelligence and automation can transform power and utilities

Amidst a cost-of-living crisis and the shift from fossil fuels to low-carbon alternatives, power and utilities companies are undergoing a significant transformation. This transition brings new challenges, including intermittent output, system instability, reliability concerns, and the escalating impact of climate change-induced events.

Digital transformation, specifically emerging technologies like artificial intelligence (AI), will be essential for chief technology officers to navigate these complexities. Utilities can maximize the benefits of AI by scaling up projects and integrating them across the organization. Specific applications include investment decision-making, customer information and relationship management, regulatory workload management, validating schematics, and optimizing travel for field service engineers.

To mitigate risks and build trust in AI, utilities should address challenges such as data quality and accessibility, privacy concerns, cultural resistance, and responsible use of the technology. A values-led and human-centric approach to AI implementation is essential.

Smart grids: the forgotten key to decarbonization

The transformative potential of smart grids is a core theme of this edition. Smart grids are crucial for achieving net zero emissions by integrating digital technologies and data analytics into generation and distribution. They enable consumers to actively participate in the energy ecosystem and provide network operators with the means to maintain system adequacy. Their benefits include cost savings, enhanced decision-making, improved resilience and reliability for operators, and increased choice and flexibility for consumers.

Despite these advantages, some utilities lag in recognizing the significance of smart grids, hindering the energy transition. To successfully implement smart grids, utilities must transform their culture, enhance cybersecurity, consider ethics and data protection, integrate digital platforms, monitor and evaluate performance, and commit to collaboration.

From the point of view of infrastructure, digital technology-driven interventions can reduce the amount of copper wiring and hardware needed to decarbonize electricity grids. Real-time data, predictive maintenance, and digital twin technologies contribute to the resilience and self-healing capabilities of smart grids.

National Grid: decarbonizing electricity requires 'lots of grids' built much faster

Ben Wilson, Chief Strategy and Regulation Officer of the UK-based National Grid Group plc, shares his insights on how one of the world's largest network utilities plans to scale up renewables and integrate them into the energy mix. From overcoming technical challenges to navigating regulatory landscapes, Wilson provides valuable perspectives on taking the path towards a more sustainable and renewable-powered future.

From threats to anti-fragility: a framework for resilient utilities

Resilience is a critical consideration for chief information security officers at power and utilities companies, especially in the face of increasingly frequent and varied threats. Utilities can build resilience by implementing a framework that includes organizational, technological, financial, planning, and workforce and customer considerations. This involves embedding resilience in investment planning, enhancing network visibility, focusing on digital payments, implementing system strengthening measures, and ensuring customer and employee safety.

Developing a resilient organizational culture is crucial for effective resilience strategies. This includes strong governance processes, employee competency development, and change management. A culturally resilient utility can adapt to challenges and seize opportunities, even in the face of setbacks. The article includes a detailed framework for building resilience and an embedded culture of 'anti-fragility' to reduce the impact of disruptions.

As technology continues to reshape the power and utilities sector, Plugged In remains at the forefront, offering in-depth analysis, specialist insights, and actionable strategies to empower industry professionals in driving innovation and sustainability. Join us on the journey towards a smarter, more resilient energy future.

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