UBBA

Insights

> *Utilities are no longer just delivering power, they are managing a massive, real-time data exchange. They are choosing communications networks they can own, secure, and evolve – because the grid can't wait.*
>
> — Scott Lang, CEO, Anterix

Power Play: The Move Toward a Flexible Grid

For decades, the electric grid operated on a simple premise: one-way power flow supported by minimal, often intermittent communications. That era is over. As we accelerate into the 21st century, the explosion of Distributed Energy Resources (DERs) and the evolving demands of the modern utility customer have rendered "good enough" connectivity a catastrophic risk. To secure a resilient, carbon-free future, the industry is no longer just upgrading – it's undergoing a strategic shift toward utility-owned private wireless broadband.

Historically, many utilities relied on leased space from public commercial telecom networks, but those systems were built for consumer convenience, not the uncompromising demands of critical infrastructure. This reliance has created a dangerous "black box" risk: a lack of transparency and control that manifests as telecom network congestion during crises, unpredictable latency, and persistent security gaps. For a critical service provider, a telecom network that prioritizes a smartphone over a substation is no longer a viable option.

Rising demand from data centers and the on-shoring of manufacturing is rapidly outpacing broader electrification trends, making load growth and affordability central concerns—placing new urgency on maximizing the capacity of existing grid infrastructure to cost-effectively meet increasingly flexible and intensive power needs. The modern grid requires telecom network sovereignty. Transitioning to private wireless isn't just about better coverage, it's about establishing a private, secure, and dedicated foundation that the utility alone controls. It is the difference between being a guest on someone else's infrastructure and owning the platform that powers the community.

Note: This is the first article in a series from the Utility Broadband Alliance Insights Program highlighting the role of private wireless broadband in the electric grid of the future.

Adaptability is a Critical Success Factor

A number of factors are driving the movement towards a more flexible, adaptable grid. Among these are:

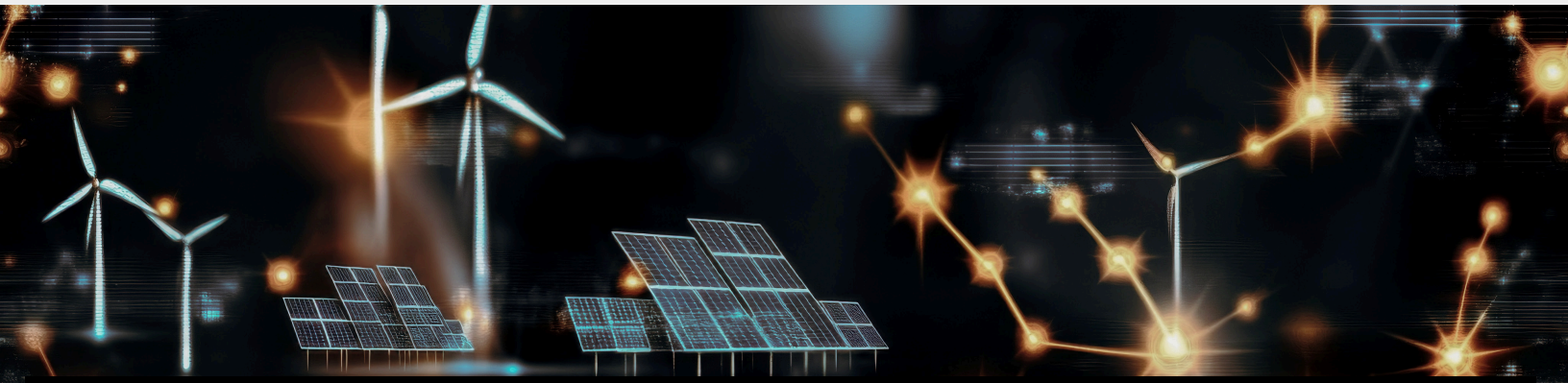
- **The continued growth of DERs:** residential and commercial solar continue to be the fastest-growing segment; electric vehicle (EV) infrastructure needs to be orchestrated to continue to manage load and to service the very dynamic and mobile customer needs; and battery storage is becoming viewed as the “missing link” enabling much of the new energy landscape.

- **Variable Generation:** Unlike nuclear, coal, or gas, solar and wind power fluctuate. A flexible grid uses Virtual Power Plants (VPPs) to aggregate thousands of small-scale resources, allowing them to act like a single, reliable power plant that can ramp up or down as needed.

- **Increased Demand Volatility**: The rapid growth of data centers, along with the electrification of everything from heating to transport, peak demand is rising. An adaptable grid uses smart thermostats and DER Management Systems (DERMS) to shift demand away from peak hours, preventing system overloads. This volatility will become more pronounced as data centers and AI continue to come online and increase demand

Jon Conway, Vice President, T&D and Managing Director of telecommunications and automation at global engineering giant Burns & McDonnell added this perspective in a recent discussion:

“*With the move towards a richer DER environment, and data and collection of info about assets out on the grid, it becomes more important to know what is happening on the grid so you can respond quickly and more efficiently. For a utility, they need to get more mileage out of their existing assets. Being more efficient with grid assets is really important. Of note, the assets are closer to the customers.”*



Jon also pointed out that *"perhaps the most important enabling technology for this new environment is the telecom network, and that it needs to be secure, controlled, and available, in many cases pointing to private wireless broadband solutions. [Utilities] agree on the importance of the telecom network in the grid of the future, so a good next step is to consider how to manage all of those deceives that will be proliferating the electric grid, enabling a myriad of critical, new customer and operational use cases."*

Managing Remote Devices, En Masse

Against this backdrop, utilities are turning their focus from macro-level capacity challenges to the practical question of how to efficiently deploy, connect, and manage the rapidly expanding ecosystem of grid-edge devices needed to support this growth. One key step that utility telecommunications and operational leaders and professionals are looking at is how to manage these massive device deployments like smart meters and line sensors.

Many are working to ensure that devices in their intelligence initiatives, from AMI 2.0 to grid management, are being managed with eSIM (embedded SIM) technology. Moving forward with eSIM enables remote provisioning and flexibility. eSIMs allow utilities to remotely activate, deactivate, or change network carriers for thousands or even millions of devices without visiting field sites. This enables seamless switching to the best available telecom network, which reduces downtime.

"Use cases are being rapidly developed and deployed as part of managing this new distributed energy environment. Standards-based solutions aligned with GSMA SGP.32 for IoT enable utilities and solution providers to integrate eSIM across a wide range of devices, supporting resilient, cost-efficient telecom networks. Advanced remote management capabilities such as an eIM (eSIM IoT Manager) provide a telecom network-agnostic source of truth for device and connectivity profile states—ensuring reliability when it matters most."

-- Jerry Jun, Director of Technical Services at Kigen

Additional eSIM benefits include reduced total cost of ownership (TCO), enhanced security and durability, simplified logistics for smart meters, improved connectivity & longevity, and environmental stability.

A Flexible Grid for the Ages

The grid is evolving faster than ever—but one truth remains: the telecommunications network is the backbone of the future grid. For utility operational leaders, this means investing in telecom networks that are secure, utility-controlled, and capable of low-latency performance for real-time operations. As demands grow and grid complexity increases, private LTE emerges as a strategic enabler—helping utilities scale, maintain control, and build the flexible, resilient grid the future requires.

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For more information on the Utility Broadband Alliance Insights Program, email the UBBA research lead, Mike Smith at services@ubba.com .