



Insights

Episode 4



"The biggest drivers at SDG&E are the use cases, and cyber is a big one. We also needed more bandwidth at the edge to accommodate some of the newer technologies out at the edge. We also had 12 proprietary networks that were an operational nightmare.

As part of our efforts to address affordability, this was a good way to move into standards to support the network more efficiently and effectively.

Cyber is also a huge concern here at SDG&E, as of course it is across the industry. Being able to deliver a solution where we are in control is key. There is a sense of security knowing that you are in control."

Elaine Allyn

Sr. Manager, Enterprise Infrastructure
San Diego Gas & Electric

Powering the Grid: Why Private LTE Just Might be the Ultimate Utility Asset

In an era defined by decarbonization, grid modernization, and escalating cyber threats, owning private, licensed spectrum – private LTE ("pLTE") - is no longer a luxury. It is the foundational asset that guarantees grid reliability, security, and future-readiness for a grid that is facing new challenges in today's and tomorrow's new energy environment.

The challenges for the grid are many. For example, AMI 2.0, IoT sensors, and transformers are all part of a system that is increasingly reliant on leveraging data from millions of endpoints. This requires a high bandwidth and low latency network to manage this massive influx of data without bottlenecks.

Additionally, the mission-critical nature of utility operations demands that the network is "always up," which is not always the case when a utility is dependent on public networks from the large carriers. Public networks can fail during major storms or face congestion during emergencies. These challenges are compounded by the utility not always getting priority service as it is competing for service with everything from large industrial customers to individual cell phone users.

A Critical Pillar of Value: Operational Reliability and Grid Resilience

Ultimately, a utility's mission comes down to providing reliable, safe service, requiring a flexible, resilient grid and astute management of millions of assets across the grid over hundreds or even thousands of square miles.



“Utilities are responsible for managing mission-critical grid infrastructure and assets. By moving to private LTE, they have something new: their own network, no longer reliant on others to meet the performance and reliability demands of their operations. This control is essential for utilities to handle the massive, often real-time data streams that are part of managing today’s grid.”

But there is more to this story. Private LTE is fast becoming the foundation of the modern, resilient grid. The levels of innovation that our industry aspires to simply cannot happen without the value that private LTE brings to the ecosystem.”

*Koustuv Ghoshal
VP & Global Head of Utility Business
Ericsson*

A review of top use cases identifies how critical the network is for the 21st century grid and how pLTE provides the enabling foundation:

- **Hardening the Grid:** Private LTE allows utilities to build dedicated, ruggedized communication networks that stay online when the public commercial grid goes down.
- **Real-Time Grid Management:** Distribution Automation (DA) and Fault Location, Isolation, and Service Restoration (FLISR) enable the isolation of power outages and rerouting power in milliseconds.
- **Disaster Response:** Line crews must have guaranteed communication channels during hurricanes, wildfires, or severe winter storms.
- **Managing DERs:** Distributed Energy Resources (like residential solar panels, wind farms, and battery storage) make the grid multi-directional and unpredictable, requiring real- to near-real time data movement, analysis and action.
- **Balancing Act:** Private spectrum provides the real-time visibility required to balance supply and demand dynamically as more renewable energy comes online on the distribution circuits.

These are Bold Claims. Can Private LTE Deliver?

The short answer is “Yes!”

Consider pLTE’s cybersecurity and control features. As noted above, the utility has full network ownership. By owning the spectrum, the utility owns the network from end-to-end, with control of the encryption, physical security, and access protocols. Utility ownership of the network also means greatly improved isolation from public vulnerabilities, eliminating the risk of bad actors accessing utility controls like SCADA (another mission critical need) through public commercial cellular traffic.

There are also strong economic and regulatory cases for a utility on a pLTE journey. First is the age-old utility CapEx vs. OpEx conundrum. While buying spectrum and building a pLTE network requires upfront CapEx, it eliminates ongoing, unpredictable monthly subscription fees paid to commercial carriers, lowering OpEx for decades into the future. The TCO, or Total Cost of Ownership, for pLTE lands on the positive side of the utility's ledger.

Next, in a world of depreciating assets, pLTE is a potentially appreciating asset. Spectrum is a finite, scarce physical resource. Its value is likely to rise as demand for wireless data increases across all industries.

And not to be forgotten is the role of pLTE with regulators: regulatory alignment. Utility leaders can demonstrate how investing in spectrum aligns with regulatory mandates for increased grid safety, wildfire mitigation, and clean energy transition.

"It's all about visibility. For example, Distribution Automation low latency connectivity is a challenge. Connecting all the end points with fiber can be cost prohibitive. As an example, IEC 61850 IEC 61850 originally aimed to improve the interoperation of equipment from different vendors within electrical substations. It is now a key enabler for digital grid infrastructure. IEC 61850 applications rely on time-sensitive protocols such as GOOSE. pLTE (based on LTE/5G) enables much better real-time capability for GOOSEs (Generic Object-Oriented Substation Events). . Utilities will not be able to grow their DA footprint if not for pLTE. "

Ali Shah, Ph.D.
Head of Technology for Mobile Networks, North America
Nokia

As utilities have built out their intelligent infrastructure over the last couple decades, one refrain that is often heard is that "the data will become more valuable than the electrons." While this might be overstating the value of the data, this does make a point.

The 21st century grid and more specifically the new suite of use cases that are enabling the new, distributed, intelligent environment that utilities now work in, dictate that a high bandwidth, low latency network that provides a higher level of real-time coverage is a requirement. Reliability, resiliency, cybersecurity, and affordability are all reason why more and more utilities are making the case that pLTE is becoming the ultimate utility asset.

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