

Mountain Connect 2022

How Utilities Can Leverage Fiber Networks

May 25 | 10:30 a.m. (MDT)



Today's Panelists



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City of Colorado Springs



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Tantalus Systems



Colorado Springs Utilities
It's how we're all connected

Colorado Springs Utilities

Fiber Network Expansion

The Need for a Fiber Network

Energy no longer flowing in a single direction across the grid

Consumers of power are now potential producers of power

New technologies are needed to balance the grid; Technologies that best communicate with fiber networks

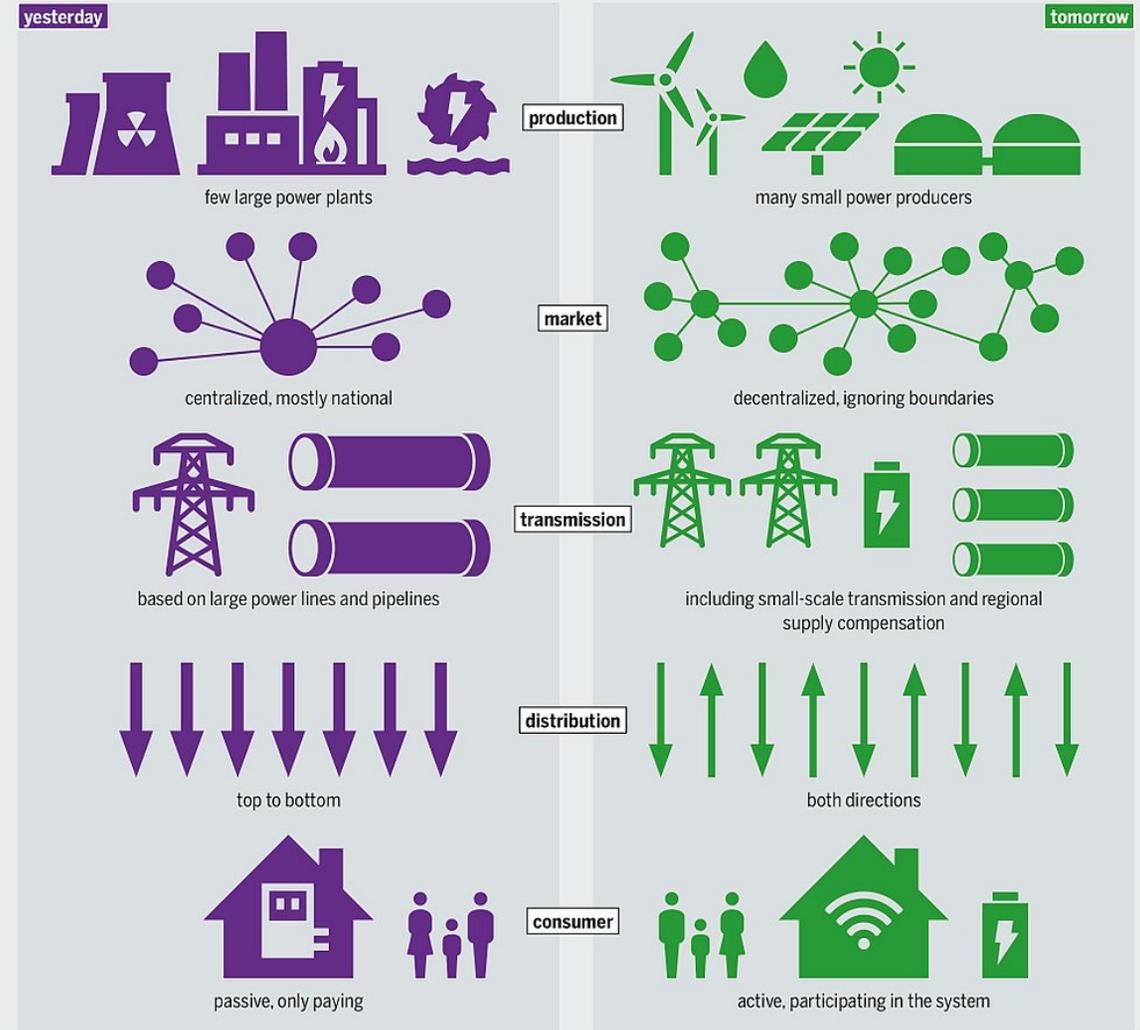
Fiber enables high-speed, low-latency, highly secure and reliable connectivity for utilities purposes

A more efficient grid reduces energy use and costs for rate payers

Colorado Springs Utilities

STAYING BIG OR GETTING SMALLER

Expected structural changes in the energy system made possible by the increased use of digital tools



The Utility Lease Model

The cost to put in a network for utilities purposes is substantial

The incremental cost to add capacity for other network tenants is minimal

Structure turns a cost-center (construction of fiber) into a revenue generating asset

Utilities maintains ownership of the infrastructure – no lease payments to others for internal connectivity needs

Utilities sees reduced energy costs and reduced water costs, with savings passed on to rater payers.

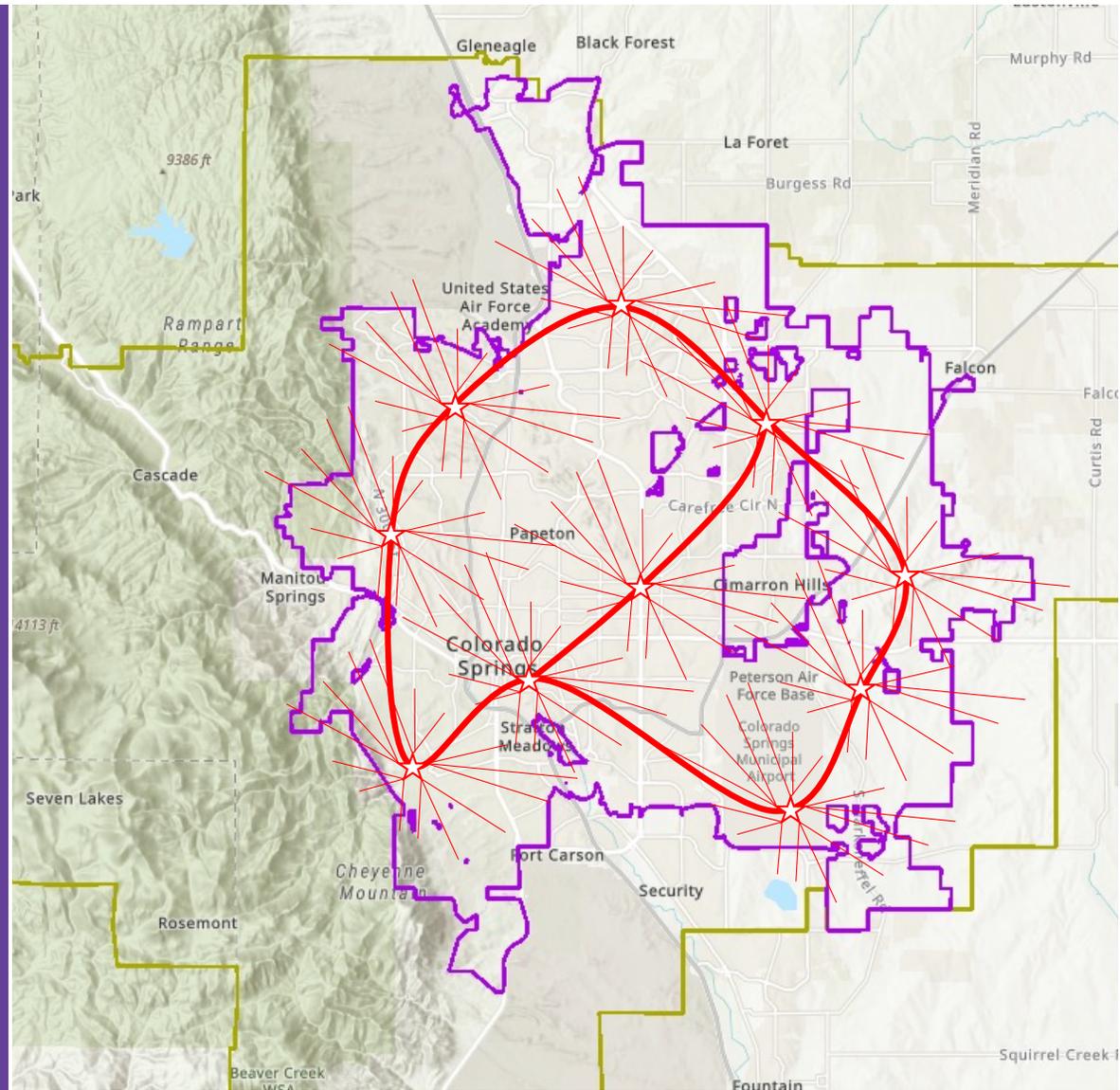


Network Overview

Drawing is conceptual

- Over 10 hut locations
 - Serve as the “hubs” for each area in a 'hub and spoke' network design system
- Connecting
 - ~ 90 miles of fiber backbone ring
 - 2000+ miles of fiber network
 - High performance connectivity throughout Colorado Springs.
 - Every neighborhood is covered.
- Timeline
 - Construction Begins Q3 2022

Colorado Springs Utilities





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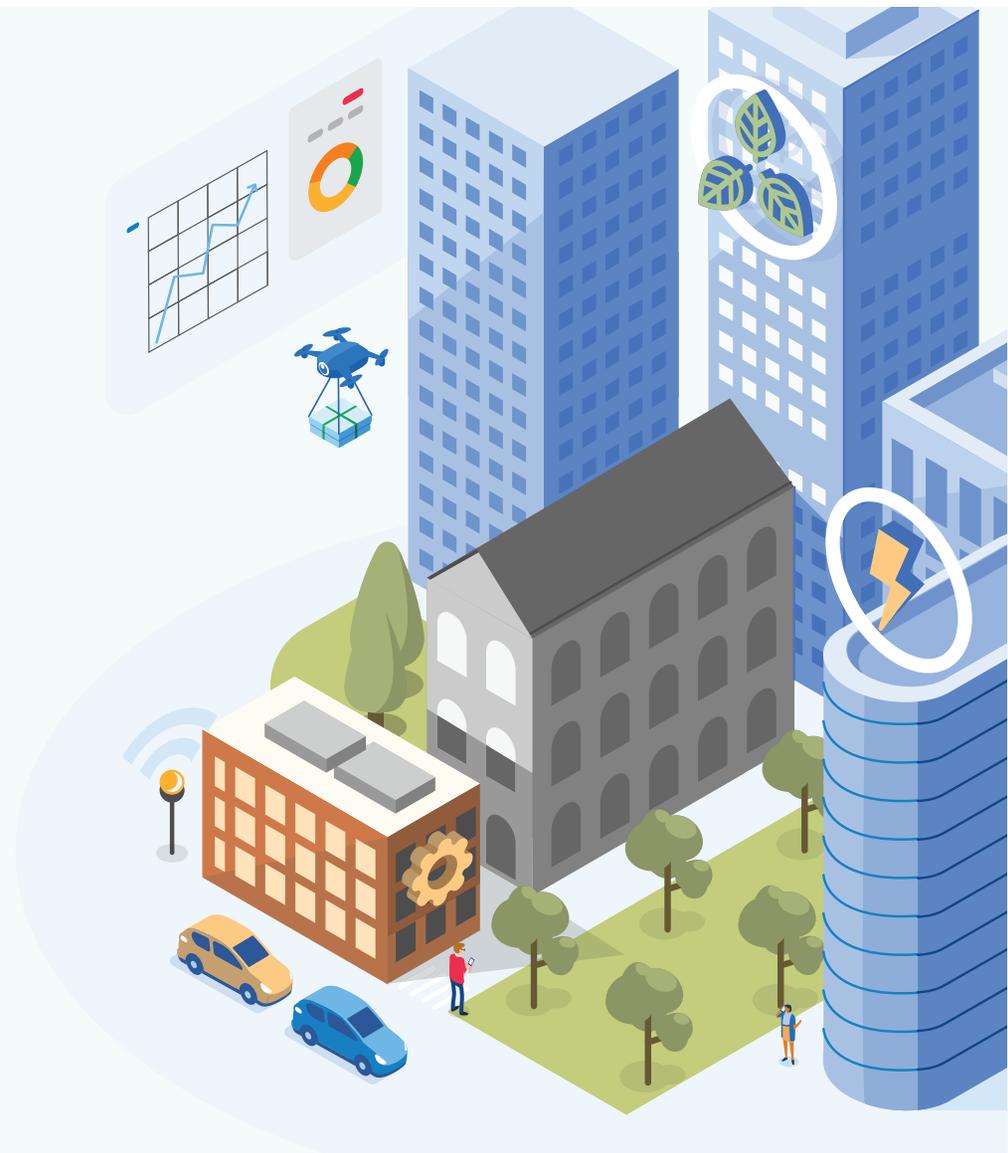


Ryan Trujillo

Deputy Chief of Staff, City of Colorado Springs

City of Colorado Springs

Office of Innovation



SmartCOS Roadmap



SMART DATA



SMART ENVIRONMENT



SMART ENERGY



SMART ECONOMY

Office of Innovation

Why this plan?

Our SmartCOS Roadmap launches a conversation in the City and community about how the Office of Innovation can;

- Improve organizational processes,
- Implement creative solutions to overcome organizational obstacles, and
- Ensure a sustainable and resilient future for Colorado Springs.



Office of Innovation

Smart Environment

Adopt practices that incentivize clean energy, investment in existing infrastructure, and new projects that are environmentally responsible to enhance the health and longevity of our City, its residents, and visitors.

- SustainableCOS
- Environmental Sensors
- Smart Waste





Office of Innovation

Smart Energy

Partner with Colorado Springs Utilities and other stakeholders to embrace energy choices that will allow the City to develop and thrive sustainably.

- Electric Vehicle Readiness Plan
- Smart Streetlights
- Advanced Metering Infrastructure





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Smart Economy

Foster an inclusive and sustainable economy that supports responsible resource use, diverse employment opportunities, and a resilient workforce.

- Multi-Modal Counters
- Smart Kiosks





Office of Innovation

Smart Data

Emphasize technology-enabled solutions that are data-driven and committed to democratic processes that maximize collaboration and trust between residents and local government.

- Digital Equity
- 5G (Cellular Wireless)
- Data Management Program



Broadband & Digital Equity



Bridging the Digital Divide

1. Affordable, robust broadband internet service
2. Internet-enabled devices that meet the needs of the user
3. Access to digital literacy training
4. Quality technical support
5. Application & online content designed to enable and encourage self-sufficiency, participation and collaboration



Office of Innovation





Office of Innovation





Matt Haile

**Director of Business Development & Content
Marketing, Tantalus Systems**



Tantalus

Opportunities to Leverage Fiber to the Home & Behind the Meter Solutions

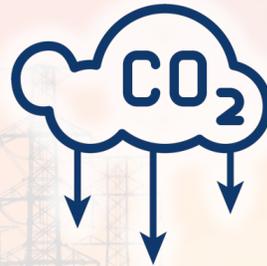
May 2022

Macro Trends

Utilities everywhere are facing unprecedented challenges that their grids were never designed to handle



**Extreme Weather
+ Outages**



**Decarbonization
Mandate**



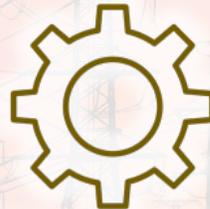
**Shifting Consumer
Behavior**

Everyday Pressures

And every day, amidst all this change,
utilities still have to perform well in four key areas ...



FINANCIAL



OPERATIONAL



COMMUNITY



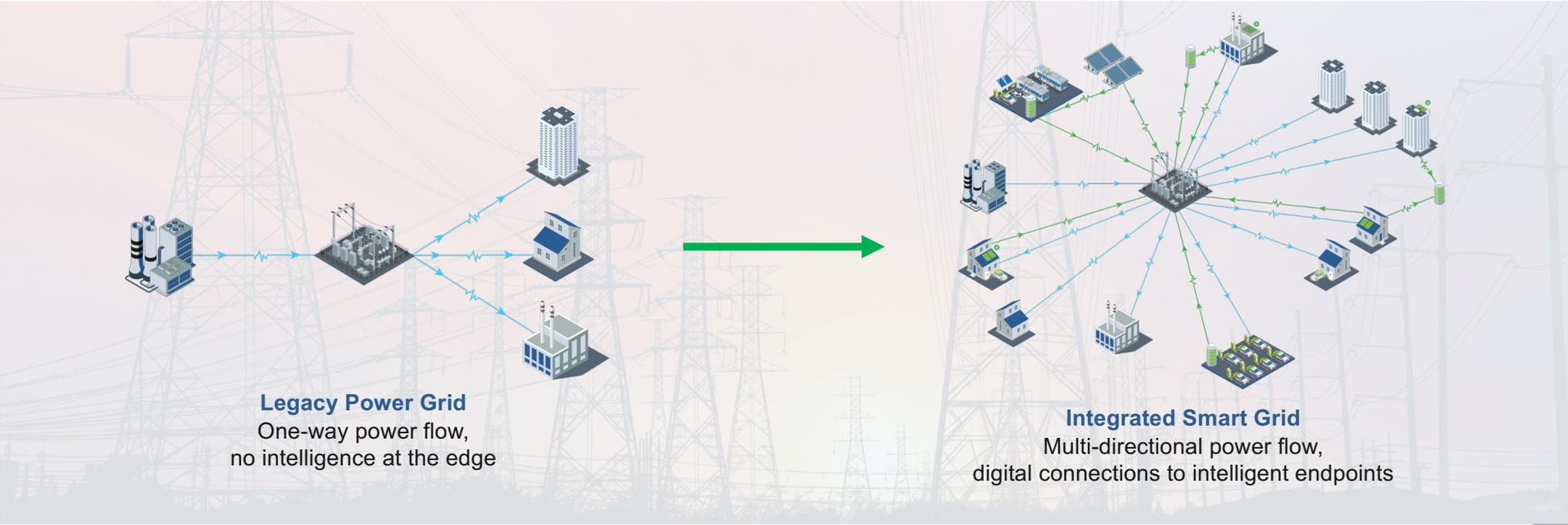
ENVIRONMENTAL

The Real Challenge

Digitizing the distribution grid

The Real Challenge: Digitizing the Distribution Grid

We must evolve from a one-way analog grid to a multi-directional digitized grid that delivers Connectivity, Command and Control

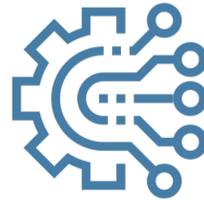


The Challenges of the Shift

All this change tests the resources of public power and electric cooperative utilities.



Legacy Infrastructure:
Leveraging investment or replacing with new technology.



New System Migration:
Adopting a new system while maintaining service levels.



Data:
The need to harness and utilize it in order to evolve.



Fiber Accessibility:
Bringing connectivity to underserved communities.



Distributed Energy Resources:
Adapting to the disruption of the grid from renewable sources

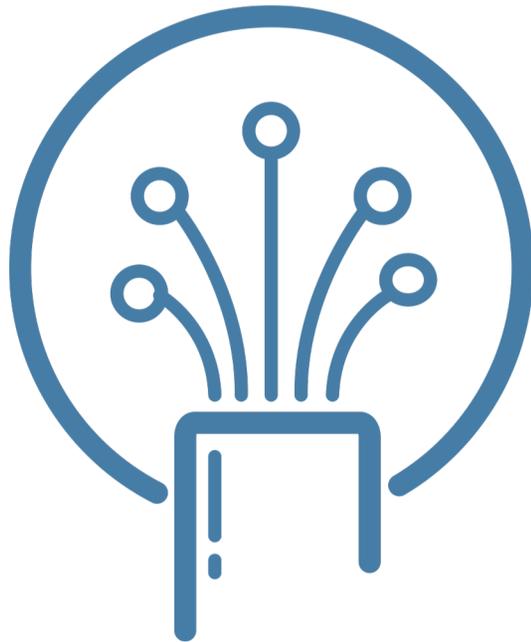


Sustainability Mandate:
Pressure from governments and regulators to reduce carbon



Upgrade and Access Through Fiber

Bringing connectivity to underserved communities.



Utilities who want to do more than just automate meter reads and gain value through data—utilities who want to simultaneously deploy the country’s most powerful fiber optic network and a Smart Grid system—and are getting additional benefits:

- *Deploy the nation’s fastest smart grid*
- *Bridge the digital divide*
- *Attract new business with powerful broadband access for everyone*
- *Become a test-bed for new innovations, such as electric vehicles*



The Need to Harness Data

The need to harness and utilize information in order to evolve.



With analytics, utilities are able to access information from the edge of their grid to provide the highest level of service to their customers, prepare for extreme weather events, and optimize workflows.

- Get ahead of grid vulnerabilities prior to extreme weather events
- Accelerate repair times in a crisis
- Maintain higher levels of reliability, resilience and service
- Reduce truck rolls and field work to solve customer issues
- Help customers proactively manage usage and stay on top of payments



DER Disruption

Adapting to the disruption of the grid from renewable sources



Customers are rapidly adopting DERs (solar generation, battery storage, electric vehicles, etc.). DERs pose many challenges to utilities, as they can put stress on lines that were not designed for two-way flow of power and generate demand spikes.

- Drive incremental revenue
- Achieve environmental impact goals
- Store energy for demand peaks
- Tap into more energy when distribution assets are stressed
- Incentivize customers with DER-specific rates in ways that create benefits for all customers

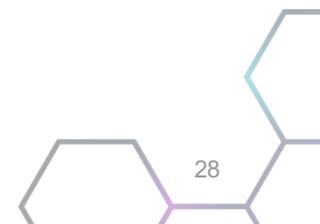




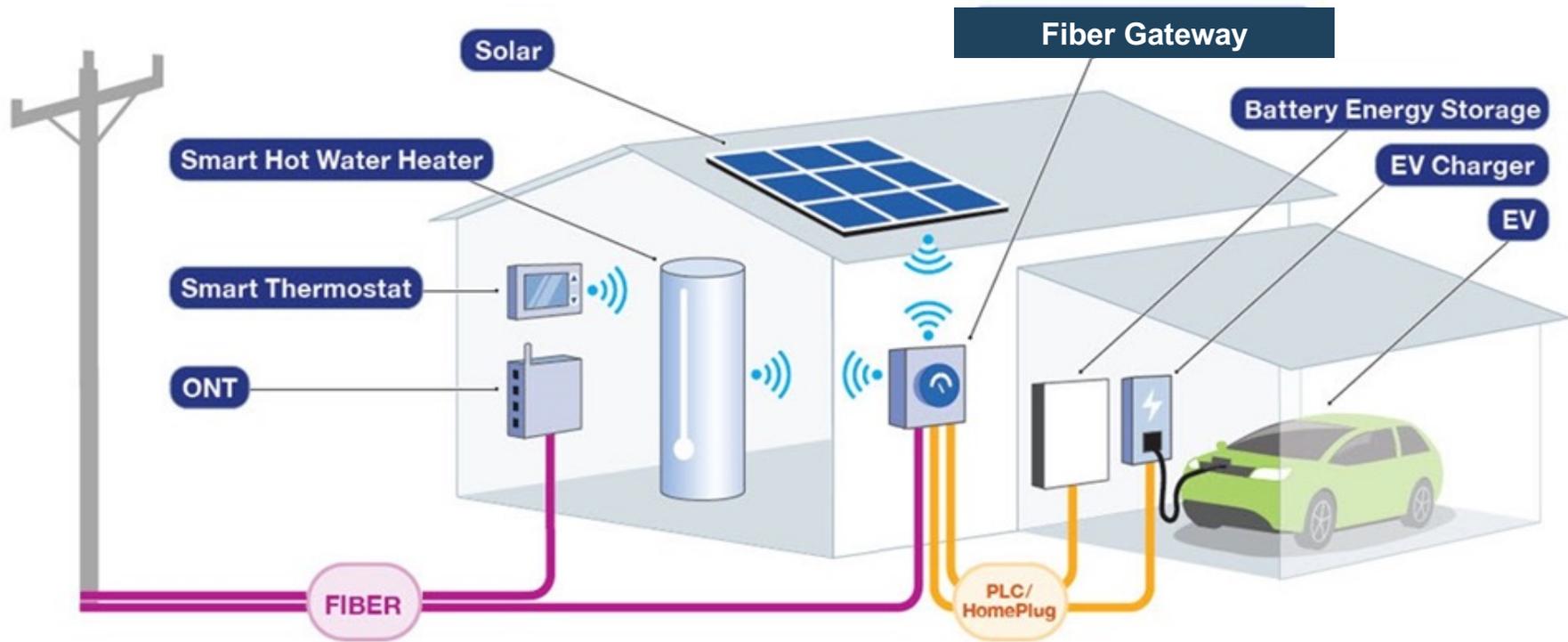
Leverage Your Fiber Investment

Go Beyond Rural Broadband

Utilities are making the investment in capital and manpower to bring broadband and all the associated benefits to your community, so why not leverage that massively capable communications network to help your utility make the transition to a cleaner energy future and a more resilient distribution system **at the same time?**



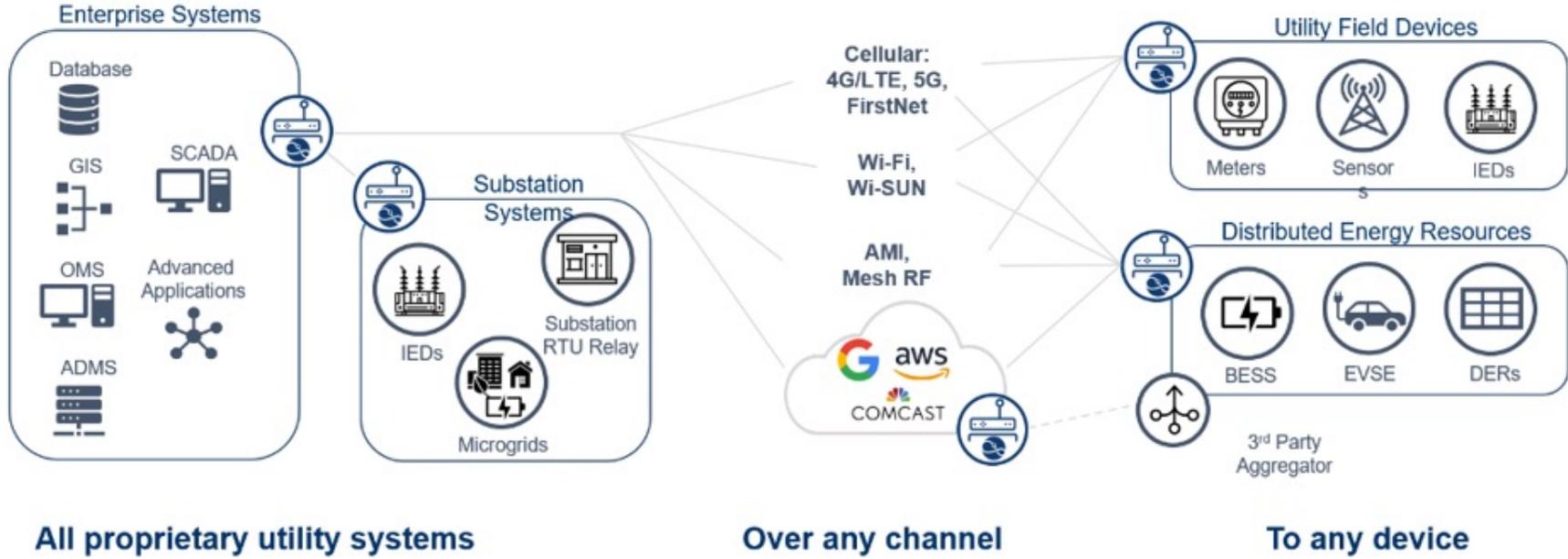
Integrate Applications





How this is done

Command and Control





Application Enablement

Fleet Management, Microgrids and Predictive Analytics



Electric Power Board of Chattanooga (EPB)

Chattanooga's EPB uses fiber as the backbone of America's fastest smart grid



Utility Overview



- Public, not-for-profit electric utility providing power, high-speed internet and phone services
- Founded in 1935
- Serves a 600-square mile area including Chattanooga, most of Hamilton County, and parts of surrounding counties in Tennessee and Georgia
- Part of Tennessee Valley Authority
- Approximately 177,000 homes and businesses
- **Leveraging Tantalus TUNet since XXXX**

Challenges



- Mix of urban and rural communities over mountainous terrain
- Need to upgrade to a Smart Grid to support a growing community
- Desire to open up greater economic opportunities through investment in the utility's capabilities
- Simultaneous rollout of fiber and AMI

Benefits Achieved

- One of the first community-owned utilities to install a 100% fiber optic network, with upload and download speeds 200 times faster than the current national average
- Tantalus Homerun™ Network leverages Fiber to the Home for triple play media and Tantalus Smart Grid
- 40% in outage reductions resulting from improved distribution system management and intelligent switch technology
- TOU pricing expected to result in savings of \$2.3 m a year for 22 manufacturers involved in time-of-use rate pilot

"The broadband communications network will enable EPB's electric system to be intelligent, interactive & self-healing – helping us provide our customers with the at-home tools and resources that will allow them to manage their energy use, increase power quality and much more."

David Wade, Executive Vice President & COO

Proprietary & Confidential



Tantalus

Transforming Utilities and Communities.

Thank you!



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TSX: GRID

Questions & Discussion

