

# Smart Grid Communications



Digital Energy  
Communications

**Mike Brown**  
**Industry Segment Manager – Power  
Utilities**  
**GE Communications**

# Addressing Communications for the Smart Grid

**Self-healing...** ensures electric delivery in light of fault conditions by proactively isolating and then re-routing the delivery of electricity

**Interactive...** enable two-way communication between the consumer and the utility, allowing for more insight, control and choices over demand and costs

**Optimized...** delivers the intelligent network to monitor and make best decisions on how to effectively utilize assets

**Secure...** secure network topology for your critical communication infrastructure

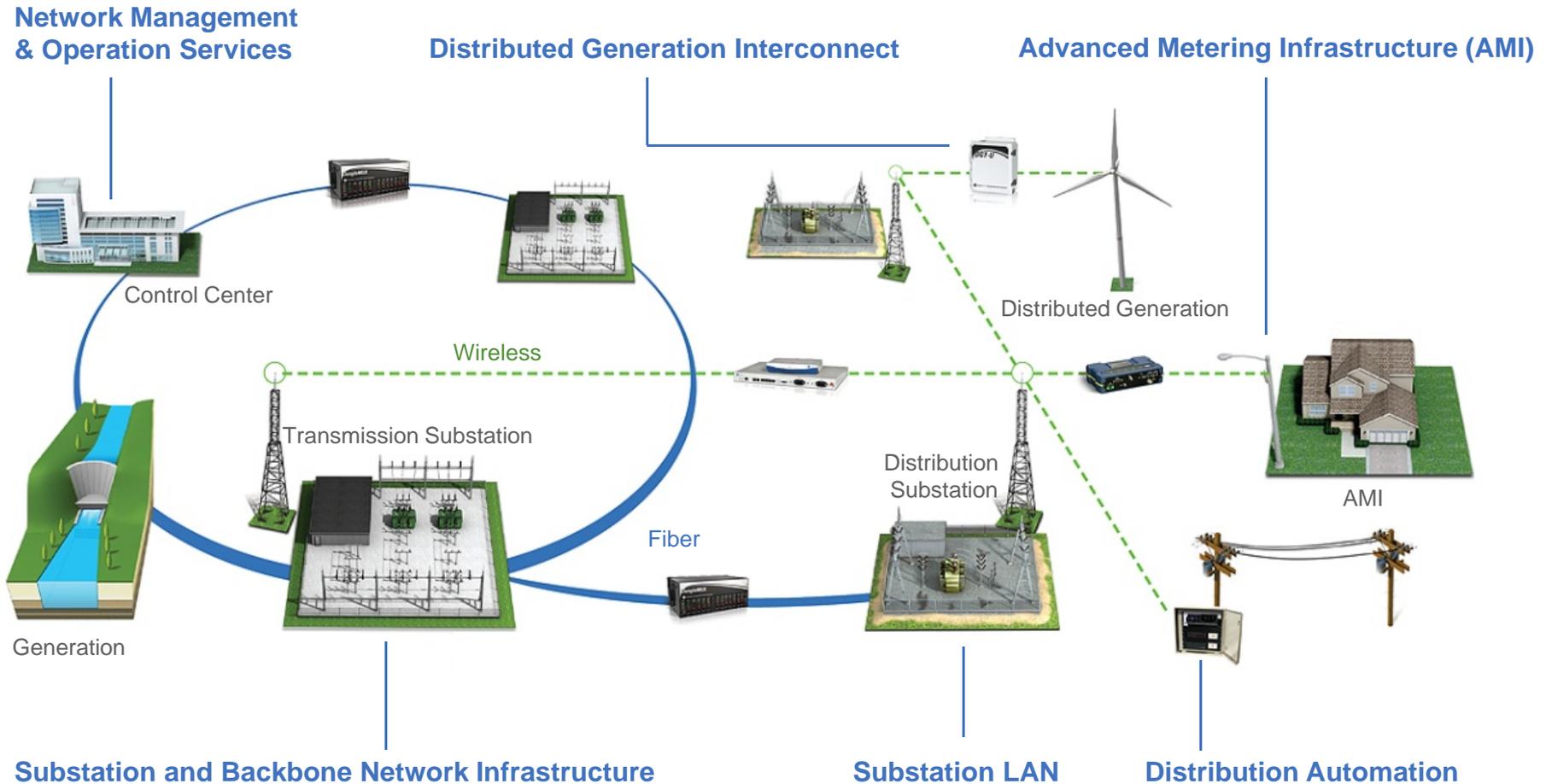
**Predictive...** provide network management, event alarming, ongoing monitoring and root cause analysis to ensure availability

**Distributed...** information enable remote assets throughout the electric delivery system, supporting automated processes for reliable power.

**Integrated...** enable a proactive and automated approach to collecting critical information, to enable real-time decision making



# Smart Grid – Communications Infrastructure



# Reliable, Secured Network Infrastructure for Smart Grid

## System Reliability

- ✓ Higher Network Availability - during emergencies
- ✓ User Manageable
- ✓ Troubleshooting - Root Cause Analysis

## Security

- ✓ Broken chain-of-custody
- ✓ Encryption and Authentication - Layered Cyber Security, NERC CIP

## Deterministic

- ✓ Adaptive Latency – Application Dependant
- ✓ High Throughput
- ✓ Management of network traffic loading
- ✓ Single Infrastructure

## Life Cycle Costs

- ✓ Fast ROI
- ✓ Future Proof - Open Standards Based, WiMAX Technologies
- ✓ Leveraging existing private network infrastructure
- ✓ Support for legacy equipment

## Technology

- ✓ Open Standards
- ✓ Industrial WiMax

# Frequency Spectrum for Wireless Networks

## Critical Assets for Decision Making Processes

- ✓ Millions of Consumer Meters
- ✓ Distribution Automation - Tens of thousands of devices within a Utility –  
Switches, Capacitor Banks, Regulators, etc
- ✓ Substation-Telemetry, Protection & Control
- ✓ Video-Security

## Private Network Infrastructure

## Wireless Communications

- ✓ Cost effective and ease of deployment

## Need for Dedicated Spectrum

- ✓ Recognize the decline in availability of Spectrum
- ✓ FCC Auctions-At a high cost, affordable only by “for Profit” Commercial Networks
- ✓ *The Utility Spectrum Crisis: A Critical Need to Enable Smart Grids*, January 2009, Utilities Telecom Council
- ✓ Industry Canada – 1.8 GHz – Spectrum for Utility Infrastructure



# Addressing Communication Needs

## Cyber Security Standards... NERC-CIP

- ✓Parameters for NERC-CIP
- ✓Cyber Assets

## Frequency Spectrum for Wireless Networks... Need for Dedicated Spectrum

- ✓Support for UTC
- ✓1.8 GHz band

## Open Standards... NOT Open Networks

- ✓Open standards
- ✓Protocols IEC 61850 and DNP-3
- ✓Standard interfaces such as Ethernet and serial

