



# Spectrum for Smart Grid

National Spectrum Management Association

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# Introduction

- ▶ About UTC
- ▶ What is Smart Grid?
- ▶ Why is Smart Grid Important?
- ▶ Issues for Smart Grid
  - Communications Requirements
  - Communications Gaps
  - Spectrum for Smart Grid
- ▶ Sharing Spectrum for Smart Grid
- ▶ What Has Been Done So Far?
- ▶ Where Do We Go From Here?

# About UTC

- ▶ UTC is the international association for the Telecom and IT interests of utilities and other critical infrastructure industries.
- ▶ Since 1948, UTC has advocated for policies that promote utilities' private internal communications to support their core missions.
- ▶ UTC's members include all kinds of utilities, from large investor-owned utilities to relatively small municipal and cooperative utilities.
- ▶ Visit [www.utc.org](http://www.utc.org) to learn more!

# What is Smart Grid?

- ▶ Fundamentally Smart Grid is the use of two-way communications to improve service reliability, safety and efficiency.
  - Examples include AMI, advanced SCADA, DG, video monitoring.
- ▶ Smart Grid will require more robust, reliable communications.
  - Current communications systems are typically one-way, slow speed systems, and/or subject to interference and congestion from other radio users.
  - High capacity, low latency, highly reliable communications needed all across utility service territories.

# Why is Smart Grid Important?

## ▶ State of Industry

- Demand expected to increase by >20% (down from 40+%) by 2030
- Many utilities dangerously near reserve margins
- New generation options have challenges
  - Siting, technology, cost, remote locations
- Congress imposing climate change requirements
  - Emissions, Renewable / Energy Efficiency Standards
- Utilities need greater ability to balance the grid from new sources of load from DG and PEVs
- Utilities prepared to leverage investment for other uses
  - Water, gas billing and or control

## ▶ Future of Industry

- Billions of smart devices, sensors, resources
- Utilities required to micro-manage supply and demand at fringes of grid to optimize all resources for the benefit of all consumers

# Why Is Smart Grid Important?

- ▶ National Public Policy Goals
  - Smart Grid promotes overarching national policy goals for energy independence, environmental quality and national security.
    1. Energy Independence and Security Act of 2007 encourages utilities and states to implement smart grid solutions.
    2. American Recovery and Reinvestment Act of 2009 provides \$4.5 Billion in grants through DOE for Smart Grid.
    3. FCC's National Broadband Plan to Congress recommends broadband policies to promote Smart Grid.

# NBP Recommendations for SG

- ▶ **Recommendation 12.1:** FCC should start a proceeding to explore the reliability and resiliency of commercial broadband communications networks.
- ▶ **Recommendation 12.4:** Congress should consider amending the Communications Act to enable utilities to use the proposed public safety 700MHz wireless broadband network.
- ▶ **Recommendation 12.5:** The NTIA and the FCC should continue their joint efforts to identify new uses for federal spectrum and should consider the requirements of the Smart Grid.
- ▶ **Recommendation 12.6:** The DOE, in collaboration with the FCC, should study the communications requirements of electric utilities to inform Federal Smart Grid policy.

# DOE RFI on Utility Comm's

- ▶ DOE issues request for information on communication needs of utilities (5/11)
- ▶ RFI seeks to quantify current and future communication requirements of utilities.
- ▶ Questions ask for the functional requirements for different SG use cases and recommendations for technical solutions based upon requirements and other factors.
- ▶ Questions also ask whether commercial networks could support SG, and what if any improvements are needed.

# Issues for Smart Grid

- ▶ **Smart Grid Requirements**
  - Latency (20 ms or less)
  - Coverage (to remote areas, e.g. transmission)
  - Reliability/Availability (e.g. backup power, independent from commercial networks)
  - Throughput (e.g. 10 mbps or higher)
  - Security (virtual and physical)
- ▶ **Smart Grid Gaps**
  - UTC Survey Report finds that
    - 49% of substations lack any communications, and only 13% have broadband.
    - 72% of all SG devices will need upgraded communications to support SG functionality, and that figure increases to 91% at the customer premises.
- ▶ **Spectrum for Smart Grid**
  - Spectrum is a key component for cost effective, quick deployment of SG.
  - UTC Spectrum Crisis Report estimates that utilities need 30 MHz to support SG and other critical infrastructure communications.
  - Spectrum at 1800–1830 MHz, which was allocated for SG in Canada, is allocated to Federal Government in the U.S.
  - Spectrum at 700 MHz allocated for Public Safety, includes 10 MHz for broadband, which could be combined with 10 MHz in the D-Block.

# Sharing Spectrum for Smart Grid

- ▶ Sharing 1800–1830 MHz band w/Federal users
  - Spectrum can be used efficiently and compatibly between Federal and utility operations.
  - Would avoid relocation of Federal users, and speed access to spectrum for utilities.
  - Would create a single spectrum band from which to develop SG equipment, thereby lowering costs and promoting interoperability.
  - Access to classified Federal spectrum would provide additional security for critical infrastructure communications, which is currently a concern within industry.

# Sharing Spectrum for Smart Grid

- ▶ Sharing 700 MHz band(s) with Public Safety
  - PS and utilities have similar needs and are compatible users of spectrum.
  - Would accelerate the build-out of broadband PS/utility network.
  - Would make more efficient use of spectrum and other resources.
  - Would promote goals of NBP.

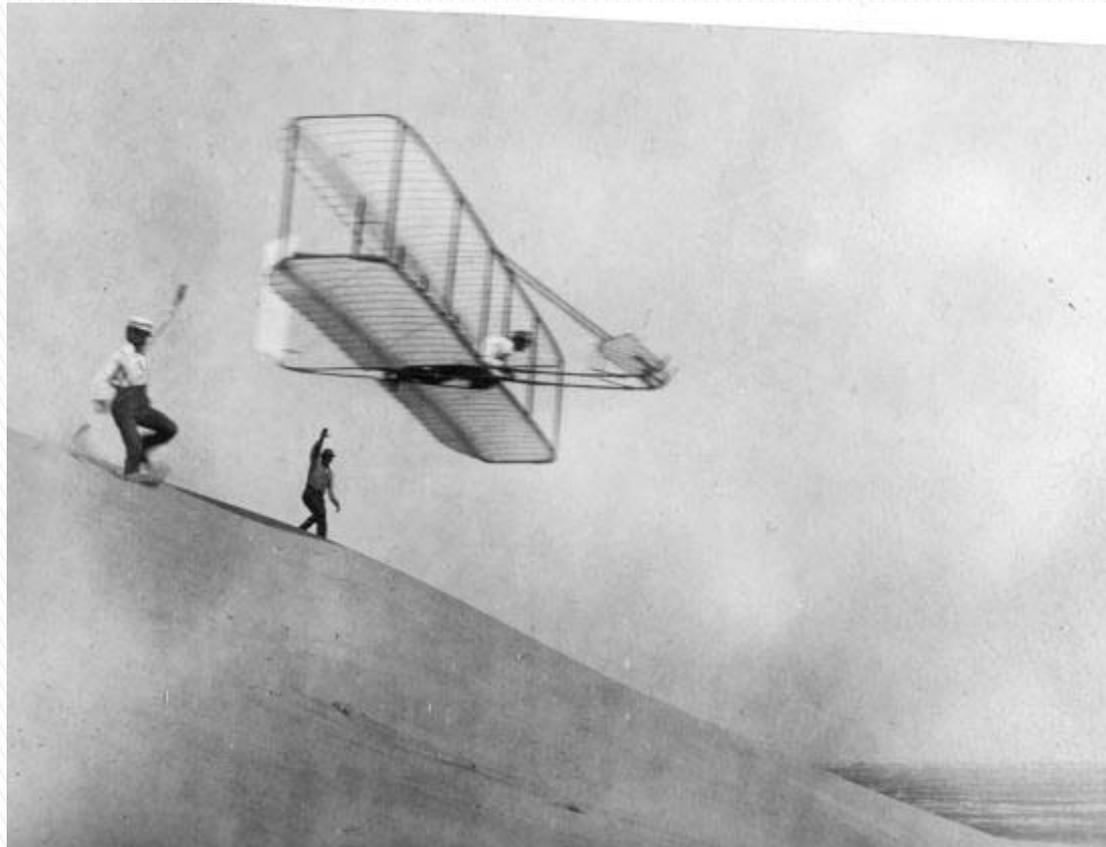
# Sharing Spectrum for Smart Grid

- ▶ Sharing 14.0–14.5 GHz band with Satellites
  - Spectrum could be shared on a 2dary basis for terrestrial short range point-to-point and point-to-multipoint communications.
  - Would make more efficient use of spectrum
  - Would support wideband SG applications

# Where Do We Go From Here?

- ▶ Engage with DOE on identifying SG requirements and solutions.
- ▶ Work with NTIA, FCC and other agencies managing the spectrum.
- ▶ Work with technology providers to develop equipment that meets industry specifications and standards.
- ▶ Develop sharing arrangements with interested stakeholders.

▶ THANK YOU!



For more information, contact:

*Michael Oldak, [mike.oldak@utc.org](mailto:mike.oldak@utc.org)  
Brett Kilbourne, [brett.kilbourne@utc.org](mailto:brett.kilbourne@utc.org)  
Prudence Parks, [prudence.parks@utc.org](mailto:prudence.parks@utc.org)*