



Federal Communications Commission



NATIONAL BROADBAND PLAN

U.S. National Broadband Plan

12.3.10

Agenda

- Background
- Spectrum
- Convergence of Broadband and Smart Grid
- Broadband Enabled Energy Innovation

BROADBAND.GOV 2

Overview

- Funded by the American Recovery and Reinvestment Act of 2009
- Goal is to accelerate broadband deployment across the U.S.
- FCC tasked with creating the plan with four statutory objectives
 - Analyze most effective and efficient mechanisms to ensure broadband access
 - Provide strategy for achieving affordability and utilization of such a service
 - Evaluate state of deployment
 - Provide a plan for use of broadband infrastructure and services to serve national purposes, including education, health care, public safety and energy independence and efficiency

BROADBAND.GOV 3

Process

- Set new precedents for government openness, transparency, and rigor
- Information for the plan was gathered in:
 - 36 public workshops
 - 9 field hearings
 - 31 public notices
 - 75,000 pages of public comments
 - 131 blog posts that triggered 1,489 comments
 - 181 ideas on IdeaScale garnering 6,100 votes
 - 69,500 views on YouTube
 - 335,000 Twitter followers
- Independent research and data-gathering
 - Industry (Utilities, Vendors, Communications, Web, Investors, etc.)
 - Federal and State Government
 - Non-profits, Academia, etc.

BROADBAND.GOV 4

Challenges and Opportunities

Challenges ¹	Opportunities
<ul style="list-style-type: none"> • Nearly 100 million Americans don't have broadband today, and 14 to 24 million don't have it even if they want it • The U.S. is outside the top 10 countries (closer to 17th) when it comes to broadband penetration and speed • The U.S. is ranked 6th in innovative competitiveness and 40th (out of 40 countries) in "rate of change in innovative capacity" 	<ul style="list-style-type: none"> • Broadband is essential to our global competitiveness - an engine for job creation, as well as innovation • Broadband is essential for opportunity in America - from rural communities to inner cities • Broadband is essential to solve many of the challenges facing our nation - including education, healthcare, and energy

¹ Prepared remarks of Chairman Julius Genachowski (February 24, 2010) FCC Press Release

BROADBAND.GOV 5

The National Broadband Plan Long Term Goals

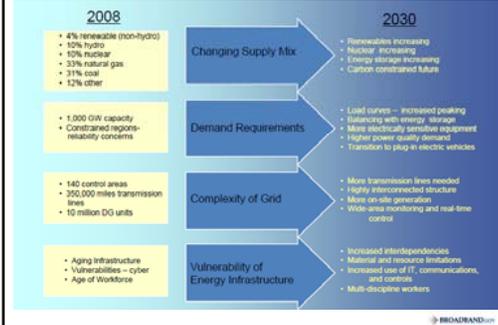
- Goal 1: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second
- Goal 2: The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation
- Goal 3: Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose
- Goal 4: Every community should have affordable access to at least 1 Gbps broadband service to anchor institutions such as schools, hospitals and government buildings
- Goal 5: To ensure the safety of Americans, every first responder should have access to a nationwide public safety wireless network
- **Goal 6: To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption**

BROADBAND.GOV 6

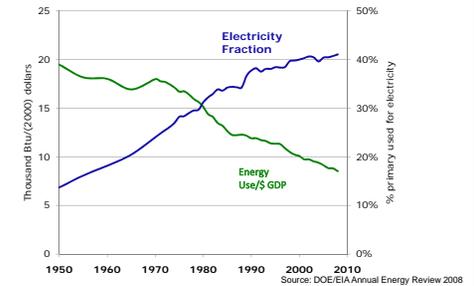
Role of Government

- Design policies to ensure robust competition and, as a result maximize consumer welfare, innovation and investment
- Ensure efficient allocation and management of assets government controls or influences, such as spectrum, poles, and rights-of-way, to encourage network upgrades and competitive entry
- Reform current universal service mechanisms to support deployment of broadband and voice in high-cost areas; and ensure that low-income Americans can afford broadband; and in addition, support efforts to boost adoption and utilization
- Reform laws, policies, standards and incentives to maximize the benefits of broadband in sectors government influences significantly, such as public education, health care, energy, and government operations

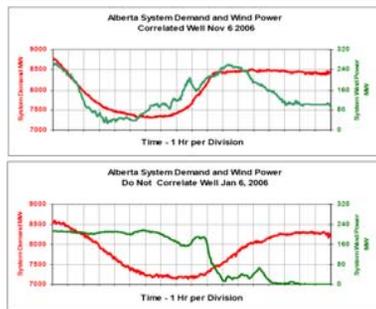
Demands of a 21st century economy will significantly affect nature of 2030 electric grid



US highly dependent on electricity – and growing



Variable generation resources can create challenges for reliable grid operations



National Energy Challenges and Opportunities

- | Challenges | Opportunities |
|---|---|
| <ul style="list-style-type: none"> Almost 50% of U.S. electricity is generated by coal-fired power plants, generating 2B MT of CO₂ a year¹ Our transportation sector relies on oil, almost 60% of which is imported² Our increasingly interconnected electric grid needs to be more resilient from natural disasters and terrorist attacks: up to \$150B lost each year due to blackouts³ The intermittency of renewable power and demand from electric vehicles will pose add'l challenges to the stability and reliability of the electric grid | <ul style="list-style-type: none"> The Smart Grid can reduce GHG emissions from electric generation by up to 12% by 2030 (equivalent to removing 65M cars from the road)⁴ Dynamic pricing and smart home technologies can reduce peak demand by up to 44%, limiting new power plant builds and the emissions they would generate⁵ Simply providing consumers with their energy information can lead to a 5-15% reduction in their energy use, and lead to billions of dollars in energy bill savings⁶ |

Broadband will play a major role in transitioning to a clean energy economy

Themes from Energy Chapter of National Broadband Plan

- Modernize the electric grid with broadband and advanced communications, making it more reliable and efficient
- Unleash energy innovation in homes and buildings by making energy data readily accessible to consumers
- Improve the energy efficiency and environmental impact of the ICT sector

Modernizing the grid with broadband and advanced communications – no one solution

Three Parallel Policy Paths

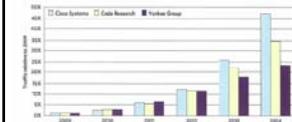
- Commercial Broadband
 - Removing impediments to using commercial networks, and working with industry to improve their reliability and resiliency for mission critical smart grid applications
- Public Safety Networks
 - Enabling utilities and public safety agencies to work together to build and operate networks together
- Private Utility Networks
 - Better coordinating and standardizing private utility networks through future spectrum policies, within the context of overall spectrum initiatives

Agenda

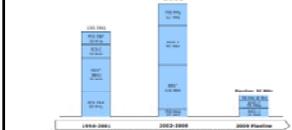
- Background
- Spectrum
- Convergence of Broadband and Smart Grid
- Broadband Enabled Energy Innovation

Trends in demand and supply suggest a looming gap

Forecasted Mobile Data Traffic in North America



Mobile Broadband Pipeline



Need to transform spectrum policy to meet wireless broadband demands

Spectrum policy recommendations

1. Ensure greater transparency in allocation and utilization
Spectrum dashboard
2. Expand incentives and mechanisms available to reallocate or repurpose spectrum
Incentive auctions
Spectrum fees
3. Make more spectrum available
Within 10 years, 500 megahertz total
4. Facilitate deployment of spectrum for wireless backhaul
More flexible rules
5. Expand opportunities for innovative spectrum access models
New unlicensed allocation
Opportunistic use
R&D
6. Increase comprehensiveness of spectrum policy
Work with NTIA
Tribes
International

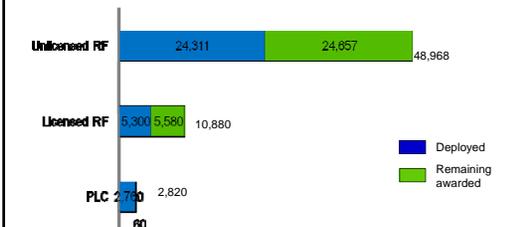
Spectrum options (non-exhaustive)

- | Unlicensed | Lightly Licensed | Licensed |
|---|--|--|
| <ul style="list-style-type: none"> • 900MHz • 2.4 MHz • 5.8 MHz • TV white spaces | <ul style="list-style-type: none"> • 3.65 MHz | <ul style="list-style-type: none"> • 1.9 GHz • 2.5 GHz • 1.4 GHz • 700 MHz • 1.8 GHz? • etc. |

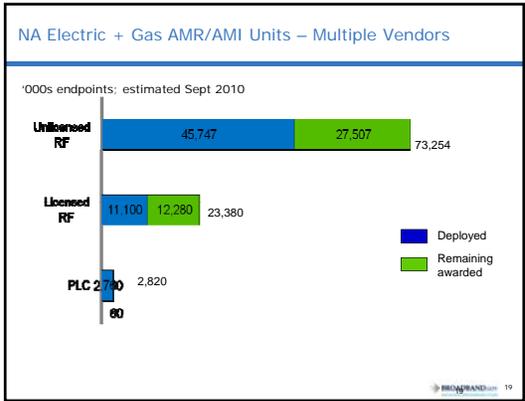
Bringing 500 megahertz to the market (licensed and unlicensed) will help the Smart Grid

NA Electric AMR/AMI Units – Multiple Vendors

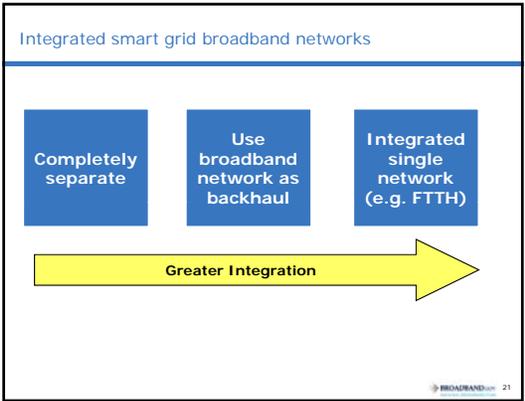
'000s endpoints: estimated Sept 2010



Deployed
Remaining awarded



- ### Agenda
- Background
 - Spectrum
 - **Convergence of Broadband and Smart Grid**
 - Broadband Enabled Energy Innovation



- ### ARRA funded examples of FTTH broadband + smart grid
- #### Electric Power Board of Chattanooga (TN)

 - \$111.6M DOE Smart Grid award: (total Project Value: \$226.7M)
 - Smart meter network to all 170,000 utility customers, complete fiber extension construction throughout the service area, automate subtransmission and distribution systems, enable customer systems, and allow modeling for dynamic energy pricing.

Kit Carson Electric Cooperative (NM)

 - \$63.8M USDA Broadband Award
 - The Kit Carson Electric Cooperative Fiber-to-the-Home project will deliver affordable broadband service to 29 communities comprised of approximately 20,500 households, 3,600 businesses and 183 critical community institutions, two Native American Pueblos within a 2,951 square mile, rural underserved area in Taos, Colfax and Rio Arriba counties. The network spans 2400 miles.

Community Broadband

Recommendation 8.19: Congress should make clear that state, regional and local governments can build broadband networks

Case Study: Bristol, VA

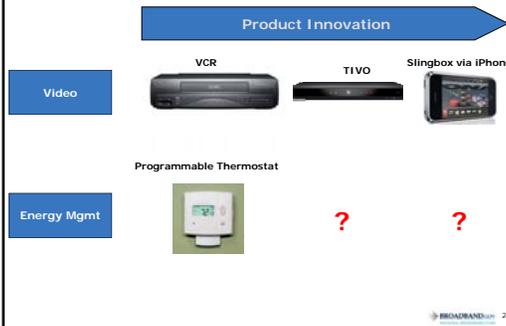
Bristol, Va., provides a good example of the potential of community broadband in rural America. This small town, which also operates the local electric utility, initially deployed a fiber optic network to connect its government, electric utility and school buildings. Local businesses and residents expressed interest in connecting to this high-speed network, so Bristol made plans to build a fiber-to-the-premises network. After overcoming a series of state legislative barriers and legal challenges by incumbent providers offering slower services, Bristol launched a FTTP service. Today, 62% of Bristol's residents and businesses subscribe to the service despite competition from the incumbent telephone company and cable.

- ### Agenda
- Background
 - Spectrum
 - Convergence of Broadband and Smart Grid
 - **Broadband Enabled Energy Innovation**

Broadband can help customers track and use energy more efficiently, and be a platform for innovation



The mass market of energy mgmt applications is still in the "VCR stage"– i.e. hard to program, unconnected, and fixed



Problem: Customers lack access to digital energy data

- Smart meters create new streams of energy data, in addition to existing bill information locked in proprietary systems
- Data enables smart home innovation – thermostats, appliances, vehicles, new devices and business models
- Virtually "zero" customers have access to real-time data and few utilities have "concrete plans" to provide access to this data in the future¹
- NIST Smart Grid standards are necessary but not sufficient – there is a policy gap

¹ National Assessment of Demand Response Potential, FERC, June 2009. «Motor survey of 25 utilities with plans to deploy 16-TN AMR meters in the next four years. Does not include California utilities.»

NBP Recommendations: Unlock energy data to allow private sector to innovate in homes and buildings

- States should require electric utilities to provide consumers and authorized third-parties with access/control to their data
- U.S. DOE should consider strong consumer data policies, report on progress of each state, and publish best practices
- If the states fail to act, Congress should consider consumer privacy and energy data accessibility legislation
- FERC should adopt consumer digital data accessibility standards
- The Rural Utilities Services should prioritize smart grid loans to rural electric co-ops with strong consumer data accessibility rules

Federal Legislation

- "e-KNOW Act" entered in both houses
- H.R. 5696 – Chairman Ed Markey
- S. 3487 – Senator Mark Udall

Both bills would require utilities to develop a plan for how to provide consumers with energy information, consistent with their existing technology plans

Support for access to energy data – letter to President

"We are writing to ask that your Administration adopt the goal of giving every household and business access to timely, useful and actionable information on their energy use."

"Mr. President, we think consumers should have access to information such as:

- The ability to see their power use in a manner that will enable them to discover the sources and causes of their consumption;
- Pricing and pricing plans; and
- Available information about generation sources of electricity."

Thank You – Questions?

- nick.sinai@fcc.gov
- www.broadband.gov