Meeting Connecticut’s Energy Goals

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How the energy world looks to us

CUSTOMERS/DEMAND
• Slow growth; contraction possible
  • Slow economic recovery
  • Expanding energy efficiency investment
  • Changing relationship with power requiring rethink of reliability standards and distribution business

ENERGY POLICY MAKERS
• Ongoing frustration with high retail rates
• Storm preparedness and response “top of agenda”
• Continued Federal support for transmission development (including economic transmission)
• Federal Energy Policy in flux

TECHNOLOGY DEVELOPMENT
• “Clean Tech” hype moderating
  • Google and Microsoft exiting
  • AMI deployments challenging
  • “Smart Grid” developing slowly
  • EV introductions successful
• Improving solar costs (China effect)
• Storage still a question mark

FUEL SUPPLY
• Sustained low/moderate gas prices
  • Continued supply expansion
  • Demand not keeping pace with supply
  • Changing pricing mechanisms
• (Lack of) fuel diversity concerns growing
Our Priorities

> What Policy Makers Want:
  › Primary: Cleaner, Cheaper, and More Resilient
  › Secondary: Technological Innovation

> How NU will further those goals:
  › Expand customer access to natural gas for heating and industrial processing
  › Facilitate the development of alternative fuel transportation
  › Increase access to clean and cost effective generation sources
  › Improve the resiliency of the electricity grid and storm response to meet customer expectations, not “good utility practice”
  › Strategically smarten the grid with digital technology
Natural Gas Plan Proposal

Summary of Plan

- **Expand customer access** to natural gas
  - Residential 35% → 50%
  - Commercial 35% → 75%
  - Industrial 54% → 75%

- **Phased approach** with initial focus on customers proximate to existing mains followed by expansion of gas main to attractive loads

- **Focus on key loads** with broad state benefits (e.g., schools and key employers)

- Working to **get key enablers in place**
  - Customer conversion incentives/financing options
  - Regulatory treatment of expansion capital
  - Transition options for fuel oil dealers

Benefits to Connecticut

- **54,000 job-years** of NET total employment
  - 8,000 craft labor jobs per year in the first 5 years
  - 3,100 jobs per year in years 6-10

- **$4.1 billion of increased net GDP**
  - $2.8 billion first 5 years
  - $1.3 billion in the later years

- **$0.4 billion of increased state revenue**
  - 86% in the first five years

- **$30-35 million of increased property taxes**

- **$12 million in additional natural gas energy efficiency funds** per year

- **1 million tons of CO2 emissions reduction**
Alternative Fuel Transportation

- Connecticut ideal for electric transportation
  - Short commute distances
  - Environmentally aware population
  - High percentage of hybrids in existing fleet

- “Away from home recharging” research project underway and evaluating expansion into a broader public infrastructure investment to cure “range anxiety”

- Developing a “home recharging” pilot with incentives to encourage off-peak recharging

- Natural Gas a better option for medium and heavy duty vehicles

- Developing proposal for 2-3 natural gas vehicle refueling stations for local fleets
Developing New Sources of Clean Generation

- 1200 MW HVDC interconnection with Quebec; participant funded transmission project with potential to import up to 10 GWh of low carbon intensity power at market prices (no premium and no subsidy)

- Public Act 11-80 Section 127 renewable generation: examining several potential projects to develop 10 MW of utility scale renewables

- In discussions with multiple renewable developers and other Transmission owners to develop a renewable collector transmission project in Northern New England

- Launching first solicitation of the LREC-ZREC program for small scale renewable and low emission resources
Improving the resiliency of the grid

> Implementing a comprehensive improvement program focused on storm response processes and practices

> Proposed an infrastructure hardening program focused on enhanced vegetation management, structural and electrical hardening

> Evaluating costs and benefits of alternative storm hardening approaches, including
  › Undergrounding key electric distribution assets
  › Expansion of back up generation for key municipal facilities (gas station, grocery, schools, shelters)
  › Deployment of micro grid approach with low emission generation

> Designing a micro grid pilot program with several partners to better understand the state of technology and costs

> Working with GM to explore the potential role Extended Range Electric Vehicles (like the Volt) could play in providing back up generation during a prolonged outage
Smartening the grid

- Deployed over many years an already smart grid that can isolate faults and minimize outages to about 70% of the circuit miles.

- Conducted a comprehensive dynamic pricing rate pilot using AMI technology; prospective roll out under consideration at DEEP.

- Examined cost-benefit of multiple smart grid technologies and currently designing a pilot to understand the real benefits of:
  - Optimizing voltage at the customer level
  - Improving outage detection and restoration
  - Integrating distributed generation resources to minimize power quality impacts
  - Sensing technology to improve asset management
Things we are concerned about

- Natural gas pipeline capacity expansion needs
  - LDC contracting risk
  - Power Generators’ reliance on non-firm capacity

- Natural gas dependence in generation sector, especially with potential solid fuel retirements

- Product life-cycle of digital technologies and “future-proofing” “smart-grid” investments

- Unintended rate payer impacts of various policies/programs and how to rethink rate design to ensure equitable distribution of costs