IRP - Natural Gas Stakeholder Session

Presented to the

Department of Energy and Environmental Protection

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Presented by

Yankeegas®

A Northeast Utilities Company

CNG

Southern Connecticut Gas

Service First!

Overview of Presentation

- Natural Gas Market Overview - Supply /Pricing
- Infrastructure - Regionally/Connecticut
- Generation - Repowering
- Summary

Natural Gas Market Overview

Changing Dynamics are Shifting Historical Supply Paths

- Historically, the Northeast has received the majority of its gas supplies from the Gulf Coast and Western Canada (i.e., "traditional basins")
- The recent exploitation of shale gas closer to the Market Area (E.G., Marcellus Shale in WV, PA and NY) is anticipated to provide large volumes of new production to regional markets
- As shale production increases, supplies from traditional basins will be displaced to a greater degree

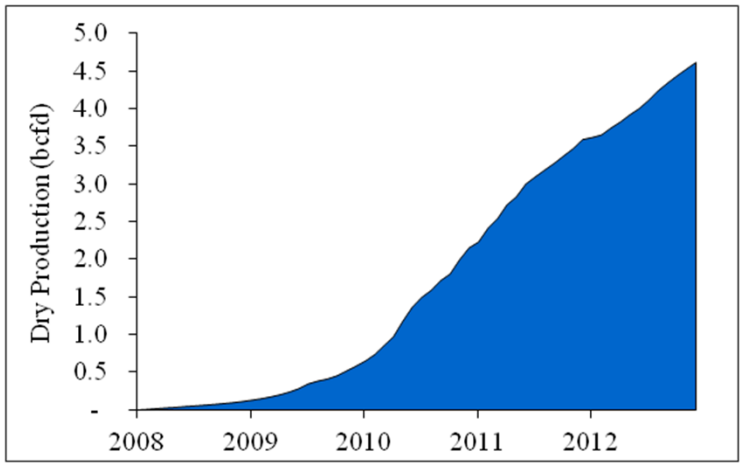
Source: U.S. Energy Information Administration based on data from various published studies. Canada and Mexico plays from ARI.
Updated: May 9, 2011

Natural Gas Market Overview

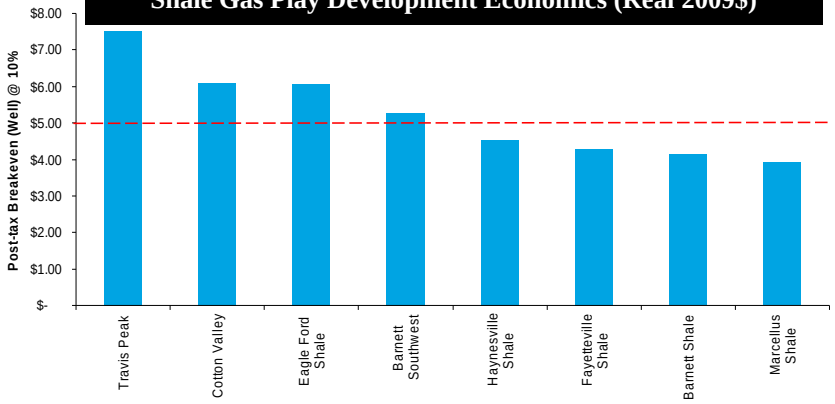
Marcellus Shale Production Forecast

- Initial development concentrated in the southwestern portion of the play along the PA-WV border
- WoodMac forecasts production growing to more than 4.5 Bcf/day by end of 2012
- Marcellus development economics make production viable even at low gas prices
  - Marcellus economics among the best of all shale plays due to production depths (lower well costs) better lease terms and premium market prices

Gas Production Forecast – Marcellus Shale Play



Shale Gas Play Development Economics (Real 2009$)

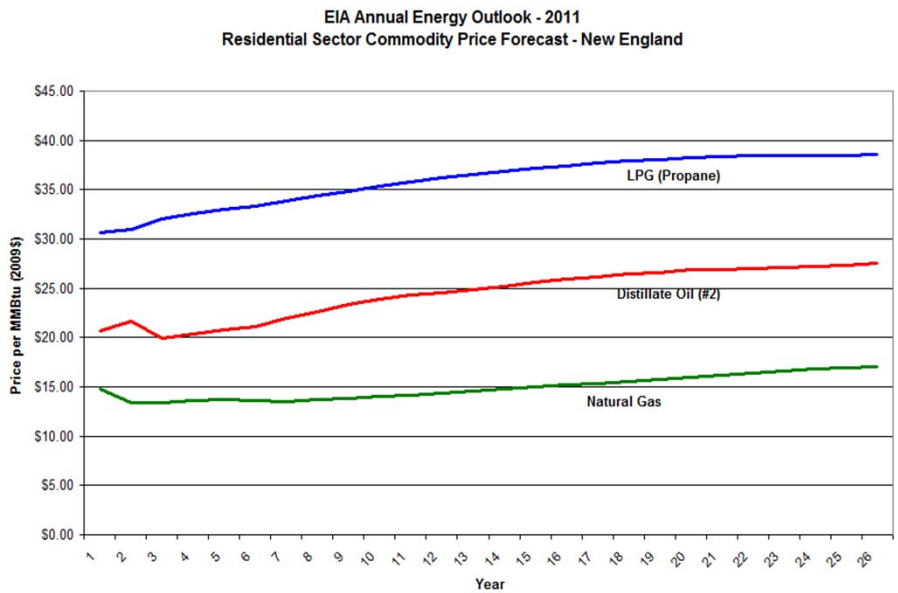


Source: Wood Mackenzie

Natural Gas Market Overview

Long-Term Price Advantage for Natural Gas is Forecast for New England Markets

- New (and growing) natural gas supplies from unconventional sources has fundamentally shifted the natural gas/oil price relationship
- Natural gas, an abundant domestic resource, is anticipated to maintain a 30+% savings over heating oil for residential customers for years to come



As shown above, this pricing advantage is anticipated to expand significantly over the EIA forecast period.

Natural Gas Market Overview

Shale Gas Production – Impacts on New England

- Technological advances in horizontal drilling and fracturing technology has unlocked vast resources of domestic natural gas and has fundamentally changed flow patterns and commodity pricing
- Without new storage and delivery infrastructure expansions into the market area, shale production will be limited to being a substitute supply for Northeast markets
- New production projections exceed capacity of existing forward haul infrastructure
- Connecticut requires incremental pipeline capacity, storage, and local distribution to fully leverage the benefits associated with the new supplies

Market Opportunities

About the Connecticut LDC's

- Provides natural gas distribution service to approximately 530,000 customers in Connecticut
- Customer base is heavily weighted to residential heating customers
  - Residential 88%
  - Commercial 11%
  - Industrial 1%
- Peak day sendout 950,000 dth/d
- Annual throughput 120 Bcf
- Primary Delivery Capacity Resource Sources
  - Algonquin Gas Transmission
  - Tennessee Gas Pipeline
  - Iroquois Gas Transmission
  - Three local LNG Facilities

Infrastructure/Supply

Connecticut is directly served by three of the six regional pipelines

- Algonquin Gas Transmission
- Tennessee Gas Pipeline
- Iroquois Gas Transmission

Lateral pipelines off mainline interstate system provide service to multiple areas of the state

Peak shaving facilities

- 3.5 Bcf of LDC-owned LNG storage
  - Yankee Gas Waterbury
  - Southern Connecticut – Milford
  - Connecticut Natural – Rocky Hill
- All Propane/LP Air being retired by 2011/12

Extensive underground storage under contract in PA, NY, WVA

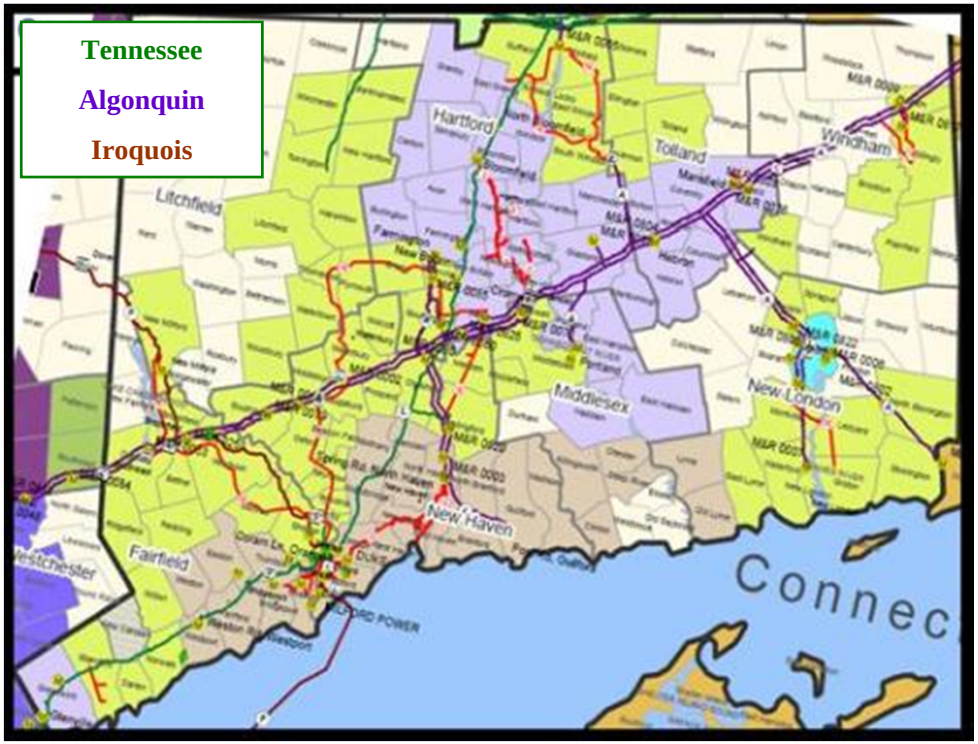
LNG supply sources

- Distrigas of Massachusetts
- Canaport

State Peak Day Demand

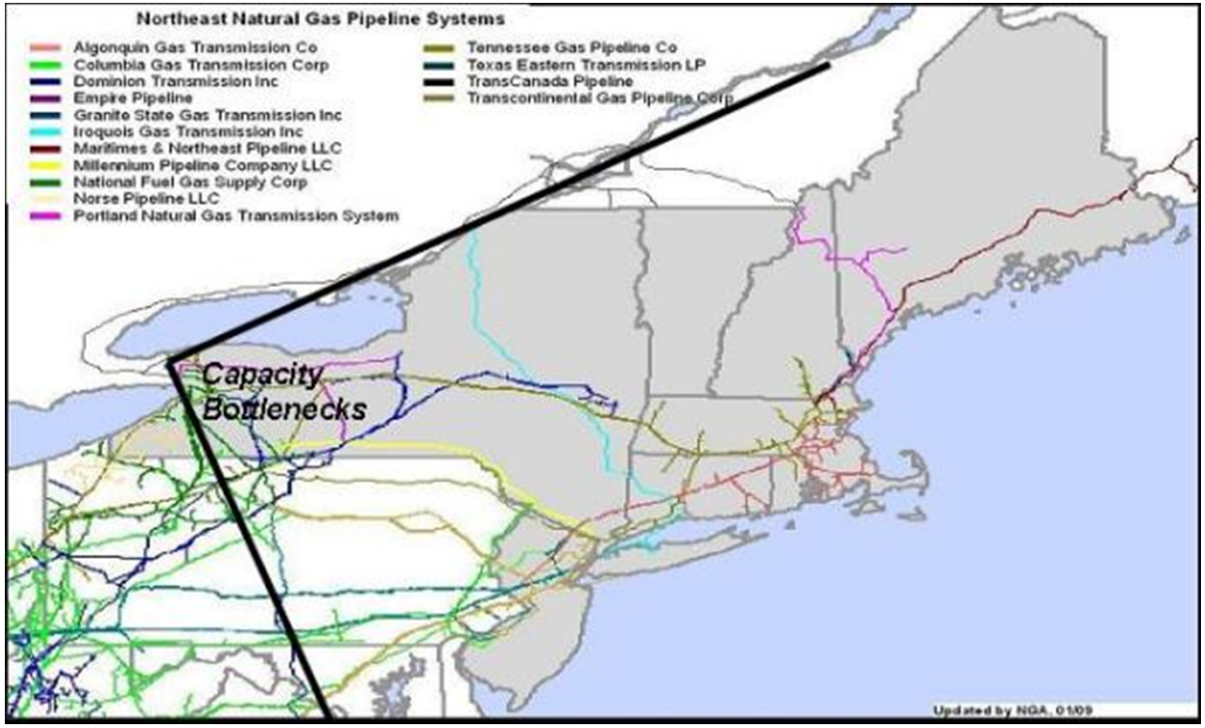
- LDC = ~0.95 Bcf/day
- plus generators

Pipeline Systems Serving Connecticut



Infrastructure - Challenges

- Critical pipeline bottlenecks to deliver gas downstream are just northeast of the new shale gas
- Flow issues will exist during winter demand periods at system bottleneck points and could constrain robust access to these new supplies – annual and peak utilization of regional pipelines growing
- Pending infrastructure projects do not provide CT incremental capacity



Generation/Repowering

Challenges for Connecticut's Natural Gas Market

- There has not been a major "forward-haul" expansion on the two major pipelines serving Connecticut since the 1990's
- There is a multi-year start to finish time line to develop and implement a pipeline expansion and critical mass is required
- Downstream LNG supply availability is subject to seller's world market alternatives
- Interstate pipelines are fully-loaded during winter months and the annual utilization is increasing rapidly
- Power generators "just in time" purchasing philosophy does not support large-scale infrastructure expansions
- The inability for generators to recover pipeline fixed costs in the current market environment provides no incentive for them to contract for pipeline capacity, thus traditional markets (e.g. LDCs), producers and gas marketers are left as the potential counterparties
- In Connecticut and elsewhere in the region, portions of the distribution system are served by smaller lateral pipelines that would require expansion

Generation/Repowering

Natural Gas Demand Growth for Power Generation

- On the Algonquin and Tennessee systems, winter power generation gas demand has steadily increased as natural gas prices have decreased and plant's are increasingly dispatched on economics
  - One-third increase: winter 2011 vs 2009
  - Gas pipeline operational Issues have arisen and being closely monitored/analyzed
  - Generators in large part rely on non-firm secondary market supplies
  - Timing, availability and structural issues
- Only incremental winter source of supplies is imported LNG injected into the eastern end of system
- One 500 MW plant uses 95,000 dth/day and increases CT peak day by 10%
- Existing infrastructure generally cannot accommodate unless supply source is downstream and plant located on mainline
- 95,000 dth of new capacity for CT requires a major expansion
  - Lead time 3-5 years
  - Market rules do not require gas generators to hold firm capacity, nor do they provide recovery of gas capacity costs

Summary

- Production technological breakthrough resulted in strong natural gas supply picture which triggers competitive advantages
- The economic advantage of natural gas is sustainable
- There are important and regional infrastructure challenges similar to those previously overcome by the industry
- Pipeline Infrastructure solutions are being advanced to accommodate high growth direct gas use
- Conversion opportunities are abundant with many benefits and need to be incorporated into planning process to allow for the efficient and manageable build out of systems and supply resources
- Repowering has spillover impacts that must be considered
- The gas LDC's look forward to working with the DEEP on these issues and opportunities