New England Energy Overview: Critical Challenges

New England States Committee on Electricity

IEGC 2013 Annual Meeting

December 13, 2013

Any views expressed should not be construed as representing those of NESCOE, or any NESCOE Manager.

Today's Discussion

- Capacity Markets
  - Performance Incentive Proposal
  - Sloped Demand Curve
- Gas-Electric Issues
  - NESCOE Gas-Elec Study
  - Hydro Analysis
  - New England Gas Electric Focus Group
- Future Winter Reliability Programs

Capacity Markets

ISO New England's New Performance Incentives - Varying Objectives

- **Variety of specific objectives**
  - Achieving better overall system operational performance
  - Encouraging some resources to invest in gas pipeline or dual fuel capability
  - Increasing payments for those resources that "perform"
  - General need to increase capacity payments
  - Creating mechanism to select better performers
  - Finding the least cost way to achieve appropriate level of reliability
  - Accessing faster ramp times
- **Preferred outcomes depend on one's priorities**

Uncertainty

- **PI is a novel approach intended to drive multiple outcomes**
  - Reasonable people can debate whether a ***novel approach*** is positive or negative
  - Reasonable people can debate the ***economic theory*** on which it is based
    - Consider Round I of the 2013/2014 Winter Program: from time to time, reasonable economic theory runs head on into business decisions

- **Market changes implemented and on horizon**
  - Reasonable people can debate extent to which changes will address performance challenges

- **There has been substantial debate on what outcomes PI would achieve and at what cost to consumers**
  - High probability that debate will extend beyond FERC filing given recent Participants Committee vote
  - NRG amendment to replace PI design received 80% approval
  - ISO proposal received 10.26%

NRG Proposal

- Increase the Reserve Constraint Penalty Factors (RCPF)
  - System TMOR from $500 to $1,000
  - System TMNSR from $850 to $1,500
    - Increase indication of scarcity conditions
    - Provides increased real-time incentives for production of energy
- EFORp mechanism replaces current FCM's 'Shortage Event' mechanism
  - Measures availability during four afternoon hours on summer weekdays and
  - Two evening hours on winter weekdays
- Additional incentive/penalty at 150% of the FCM clearing price
  - Base on deviation of a resource's current year availability to the prior five-year average

In the end, consumers are

Mitigating consumer costs is essential.

Sloped Demand Curve

- **ISO to start stakeholder process - 11/25/2013 FERC Filing:**

  "The ISO, beginning in the New England Power Pool ("NEPOOL") stakeholder process in January, will propose a downward sloping demand curve that will solve significant flaws in the FCM and should alleviate the need for these administrative pricing rules"

- **FERC Technical Conference on capacity markets**
  - **New England the only Eastern RTO without a sloped demand curve**
  - **FERC Commissioner asked NESCOE about the possibility of a sloped demand curve in New England**

Gas-Electric Issues

Black & Veatch Gas-Electric Study – Purpose, Limits

Study Period: 2014 - 2029

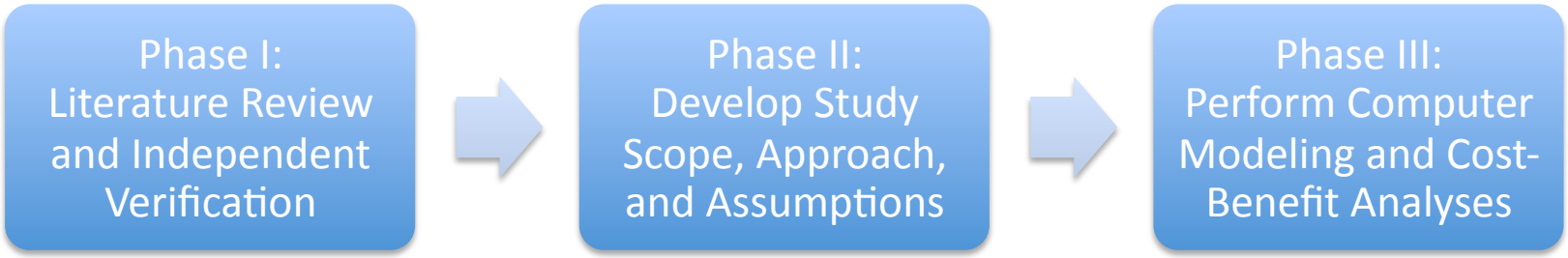
Purpose

- Assess sufficiency of gas infrastructure to support power generation
- Identify cost-benefit of solutions that could alleviate gas constraint

Limitations

The study is **not a plan**. It is based on hypothetical assumptions, any one or more of which history may prove wrong. Study **results are directional** and indicative. Studies are **not predictions of costs** that would emerge in a competitive solicitation, as the result of a negotiation, or that could be identified when a project becomes operational. The study does not pretend to have perfect foresight. It assumes policymakers will apply their judgment to the assumptions in each of the hypothetical scenarios studied, and their relation to policymakers' beliefs about of the future. The study should be viewed accordingly, and critically.

Gas-Electric Three Phase Study Overview



Phase I: Black & Veatch concluded that the **New England natural gas infrastructure will be increasingly under pressure from demand growth from the power sector** and that other previous efforts to study the issue had significant information gaps

In **Phase II**, Black & Veatch:

- Concluded that for the 14 New England sub-regions analyzed, *11 sub-regions will exceed the constraint capacity level by more than 30 days/year under current infrastructure*; and
- In consultation with the states, **identified scenarios and sensitivities** for analysis

In **Phase III**, Black & Veatch:

- Refined cost estimates associated with potential solutions; and
- Performed computer simulations to **estimate benefits of potential solutions**, the market price effects of extreme cold weather, and **customer cost savings associated with various levels of gas and electricity demand**

Gas-Electric Study: Three Possible Futures & Solutions

Base Case

Future with higher gas demand, reduced availability of other power sources

Future with low growth in demand for power & gas

Base Case Scenario 5 Solutions Studied (2, 3, 4a, 4b, 5)	High Demand Scenario 3 Solutions Studied (7, 8, 9)	Low Demand Scenario 3 Solutions Studied (12, 13, 14)
1. No New Infrastructure	6. No New Infrastructure	11. No New Infrastructure
2. Pipeline	7. Pipeline	12. LNG Peak Shaving
3. LNG Import	8. LNG Import	13. Imported Firm Canadian
4. Imported Canadian: a.) Economic* & b.) Firm	9. Imported Firm Canadian	14. Dual Fuel and Demand Response
5. Dual Fuel and Demand Response	10. Weather (Design Day)	15. Negative Demand Growth

*Amount of Canadian imports varies with market prices (economic), rather than a set amount of imports equal to the maximum capacity of infrastructure (firm)

Black & Veatch Findings

- In the **absence of infrastructure or demand reduction solutions**, New England will experience capacity constraints that will result in **high natural gas & electric prices**

- Gas-supply requirements driven by episodes of extremely cold weather can be very costly & create significant reliability risks

- **Short- & long-term solutions are needed** to relieve the natural gas market constraints **under the Base Case & High Demand** Scenarios

- **No long-term infrastructure** solutions are **necessary** under the **Low Demand Scenario**; The costs of measures that could bring about the Low Demand Scenario, an additional alternative, would require study

- **In the absence of demand reduction solutions**, a Cross-Regional Natural Gas **Pipeline solution**, after construction and operational costs, presents **higher net economic benefits** to New England consumers t**han** do **alternative long-term solutions** studied

Some State Observations

- A **new natural gas pipeline currently in process** toward operation **provides significant economic benefits** to **electricity customers under all scenarios** studied.

- An ***additional*** **hypothetical pipeline provides** the **most** substantial economic **net benefits** to electricity consumers of all solutions studied **under the Base Case & High Demand Case**.

- The **actual cost** to consumers for **incremental hydroelectric power** is currently **unknown**. Study assumes cost of service based pricing.

- **Reducing consumers' demand for electricity & natural gas to the extent assumed in the Low Demand Case eliminates the need for consumers to invest in infrastructure**. Further analysis would be required to determine whether policies that would result in a Low Demand Scenario are cost-competitive with infrastructure investments.

Hydro Analysis

Hydro Whitepaper

- Context for policymakers
- Overview of New England's competitive energy markets, New England & Eastern Canadian Provinces' generation resource mixes
- Power system synergies between Eastern Canadian Provinces & New England
- Potential benefits & risks associated with increasing hydro imports, need for resource tracking system
- Options for increasing hydro imports & implications for further consideration

Hydro Imports Analysis

- High level view of economic & environmental impacts of incremental hydro imports
- Assumes imports via 3 new *hypothetical*1200 MW lines from different points in Canada into different areas in New England
  1. New Brunswick to MA
  2. Quebec through NY to CT
  3. Quebec to VT
- Assumes 2 hydro supply outlooks
  1. Base Supply Case: existing, under construction
  2. Alternative Supply Case: Base Case + 5000 MW (permitted and proposed)
- Cost of Service basis. Does *not* reflect prices that would emerge in an RFP or via negotiations

New England Gas-Electric Focus Group

Purpose and Scope

✓Bridge communication gaps between electric industry, gas industry, states

✓Identify & evaluate challenges based on informed input from all interested stakeholders

✓Analyze, discuss & exchange viewpoints and facts regarding challenges and their solutions

✓**Issue a Report – Forthcoming**

✓Any recommendations in the Report will be in the form of **advisory recommendations for consideration** by entities with responsibility/authority for implementing such solutions

✓**Focus Group to act by consensus and disclose views of participants who do not support consensus recommendations (if there are opposing views)**

Report Approach Preview – Solution Discussion

1. **Describe agreed-upon challenges** that emerged in Focus Group
2. **List electric market-related** solutions ISO-NE is **on course to implement**
3. **List gas system and/or gas market-related solutions** the gas industry is **on course to implement**
4. **Identify potential solutions** that may have **appeal to some** stakeholders and/or states **but that require further analysis** before implications can be fully understood and judgments can be formed. Identify the appropriate entity able and/or willing to develop such analysis to inform future decisions.
5. **Identify those potential solutions** about which market participants and states broadly believe there is **adequate information available** and about which there is ***no consensus***
6. **Identify those potential solutions** about which there is **adequate information** available for decision-making and about which there is ***consensus***. Include information about next steps, authority to implement, forward-looking process.

Winter Reliability

Future Winter Reliability Programs

- No plans after Winter 2013/2014 program
- ISO noted the following:
  - Certain market changes will be in effect after this winter
    - Primarily energy offer flexibility changes – the ability to change offer prices hourly
  - Recent FERC ruling on generator obligations
  - ISO will implement certain rule changes to ensure more load clears in the day-ahead market
- Possible other changes based on Winter 2013/2014 observations but *not* an out-of-market type Winter 2013/2014 program

Thank You and Look Forward to the Panel Discussion

www.nescoe.com

Jeffbentz@nescoe.com