

Forecasting Future Energy Infrastructure Needs in the Northeast

Presentation to
**FERC Northeastern Energy Infrastructure
Conference**

By

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Objectives/Agenda

- Jeff Wright provided a review of state of Northeast energy infrastructure
- Identify areas of concern
- Identify infrastructure objectives
- Identify constraints
- Identify strategies to meet objectives

- ... in 20 minutes

CURRENT STATUS

- We are living on the fruits of boom in capacity investment of the late 1990s and early 2000s
- The era of irrational exuberance has given way to era of irrational austerity
- Investments occurring now have old-fashioned PPAs and utility credit behind them
- Energy exists in a *hybrid of market and regulation* as FERC's restructuring proceeds in fits and starts
- But...

CURRENT STATUS



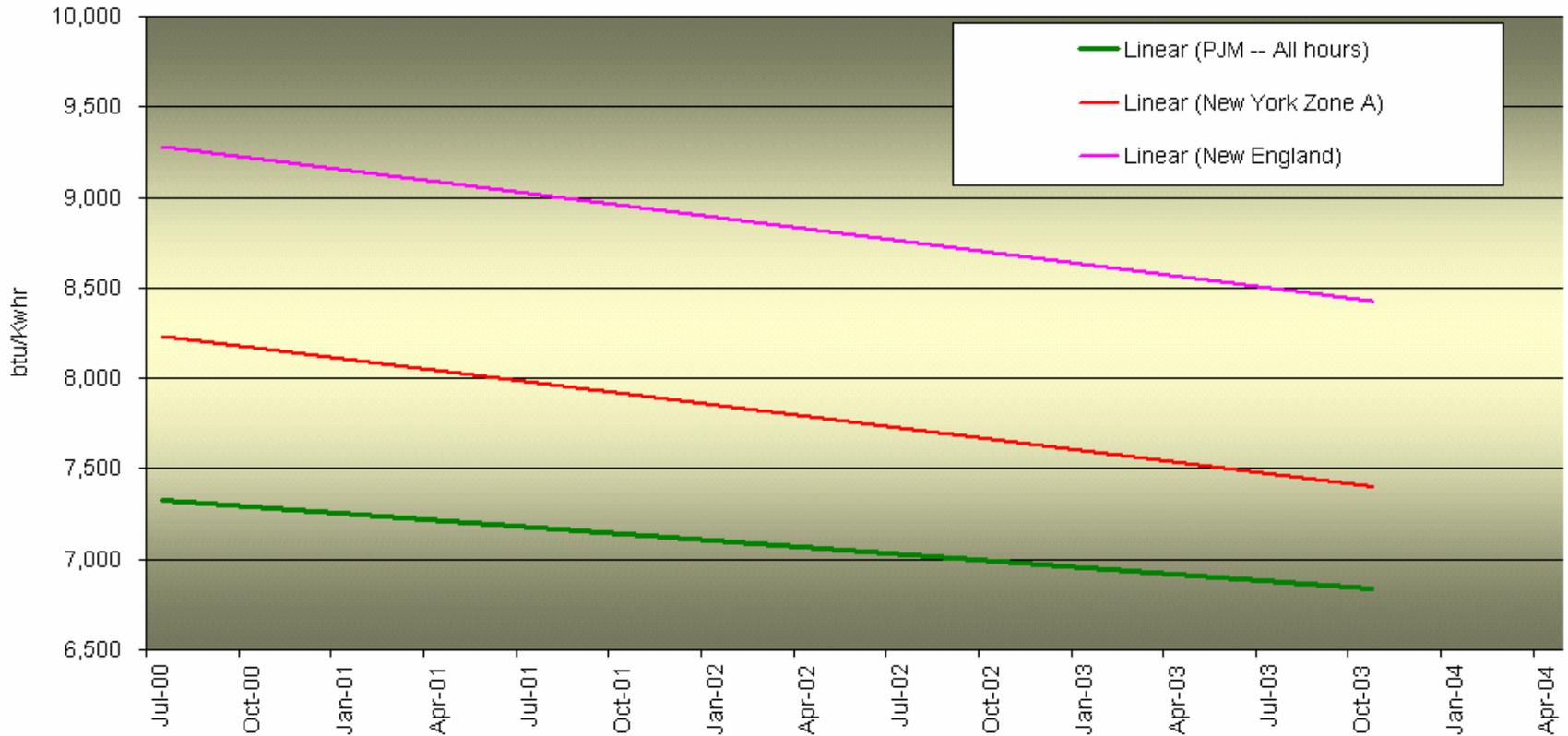
- We have gained three new competent organizations that run a very different regional power system than in the past
 - Their Regional Transmission Expansion Plans (RTEPs) are a substantial new asset for the region

The New Power Regime

- What we have accomplished in power (by accident and by design) can be seen as a major enhancement in the efficiency of creating electricity...
- Seen in terms of implied heat rates...

Increased Efficiency

Implied Heat Rates: Representative Northeastern Prices, 7x24
(Using Appropriate Gas Prices)



Natural Gas

- But increased demand for gas means pipelines barely able to meet peak needs
 - Northeast historically consumed between 6 and 7 Bcf/d in the summer and between 9 and 11 Bcf/d in the winter.
 - Long-haul capacity from Gulf designed to be more than adequate to serve peak winter loads.
 - New era: with augmented demand from power plants, peak winter loads during cold snaps testing between 13 and 14 Bcf/d,
 - Thus, Northeast has sporadic gas-flow congestion problems during “cold events.”
- Eastern Canadian Shelf did not live up to early promise
 - Will it remain at only 500 mmcf/d, or grow to 2-3 bcf/d?

LNG

- Meanwhile....
 - Increase in US gas prices has motivated LNG investment for the first time since 1980s
 - Is LNG investment interest here to stay, this time? Yes.
 - Does the Northeast need LNG? Yes.
 - Will the Northeast get an LNG terminal?

LNG

- Pure permitting play... best guess
 - US Northeast may lose 1 terminal (Everett)
 - One small new terminal may be developed in RI
 - Maine and Mass will not permit a terminal
 - New Brunswick and/or Nova Scotia more likely home for 1BCF/d facility
 - If so, interesting transportation issues

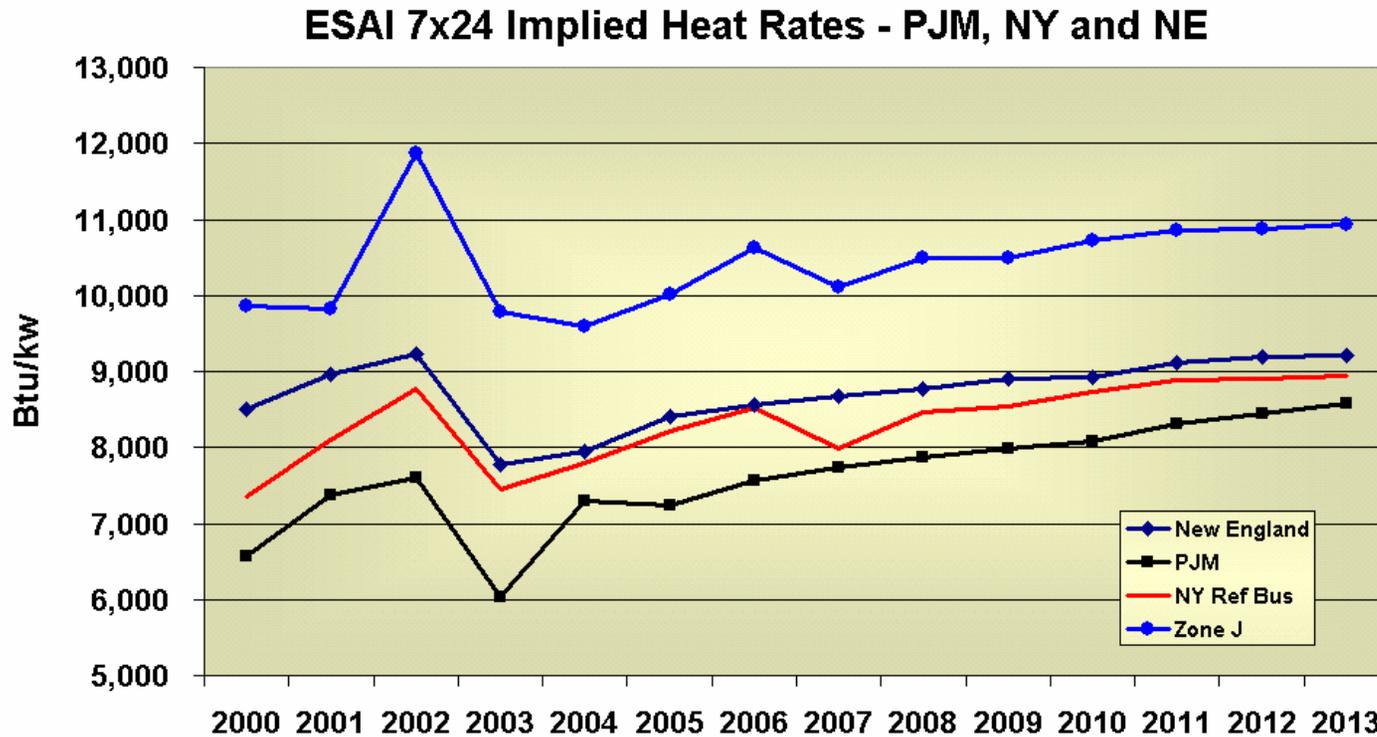
Current State of Power Markets

- Power:
 - three different regional US markets, somewhat different market designs.
 - In NE and PJM, adequate capacity for few more years
 - In NY, the need to initiate development is being handled by LSE PPAs
 - In Canada, diminished ability to be firm exporter to US, and need to be occasional importer

OUTLOOK

LOSING EFFICIENCY

Because new power plants are not being built, load growth and plant closures will produce a rising “implied heat rate”



Areas of Concern: SW Ct – Long Island

- Both SW Ct and LI are tight. Major assets
 - Cross Sound Cable
 - Should it be energized? Yes.
 - NU/UI's AC transmission project
 - Can it get built? Yes. 2007...
 - LIPA potential cable connection to PJM
 - Provides fuel diversity for overall LI-CT market
- Ultimately, transmission is the main solution to problems of this (and other?) load pockets

Areas of Concern: New York City

- Area of concern on account of its size
 - ConEd RFP -- award to 500MW CCGT
 - Main concern is “Mystic style” development delays
 - NYPA RFP – another 500MW in NYC
 - If another CCGT award, too much gas dependence?
 - Pressure to close Indian Point
 - Potential further links to PJM via dedicated AC cables to NJ generators or DC cables to PJM system
- Generation, transmission or both? Solutions are “on the table” and can be developed within 2-3 years

Areas of Concern: NEMA

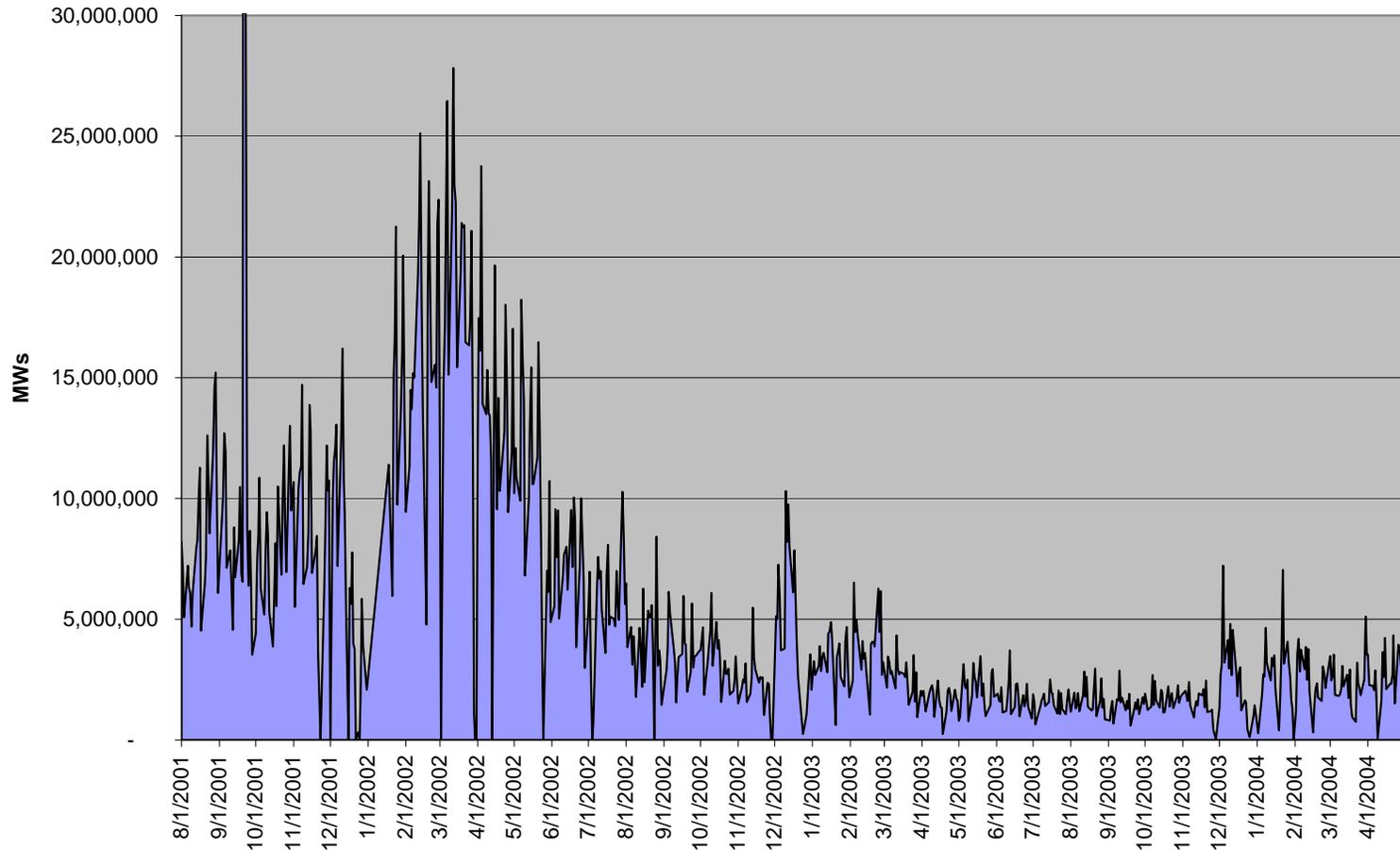
- NEMA (Northeast Mass) is well-supplied for now, but has issues
 - Desire to close Salem coal plant and other old oil facilities
 - NStar's South Boston AC expansion increases transfer capacity by 1000MW... but will it come in on time?
 - Mystic facility is bankrupt and on the market
 - Maintenance a concern
 - LNG deliverability a concern
 - May need another 500 – 1000MW by 2010?
 - Who will issue PPA to get this done?

Areas of Concern: Liquidity

- All US Power forward markets are illiquid compared to a few years ago... but
- Northeast forward markets are by far the most robust
- Traders operating under multiple severe constraints that will take years to ease
- Long-term positions are very difficult to hedge/exit, creating a sclerotic forward market
 - Action is almost entirely in the physical markets...

Areas of Concern: Liquidity

Total Daily Volume of Power Trading on ICE (all transactions)



Strategic Question

- Aligning objectives with capabilities
 - Objectives: Is next ten years *era of more gasification* or *era of existing resource optimization*?
 - If gas, where will it come from?
 - If not gas, what does it take to optimize existing resources?
 - Capabilities: capital markets saying “no” to merchant investments in either generation or transmission
 - All investment for next few years will therefore be in response to policy-driven signals
 - What will federal and state regulators promote?

Objectives and Incentives

- **Objective:**
 - \$3/MMBTU gas, \$30/MWh energy, reasonable capacity
- **Expected incentives, in addition to high prices:**
 - PPAs to generation and transmission developers in areas of concern
 - Broad FERC interpretation of what RTOs and LSEs can ratebase in terms of transmission
 - But watch out for unintended consequences in load pockets
 - More structure (aka, regulation) to electric capacity payments
 - With that, continued mitigation on extreme energy market prices

Constraints

- **Continuing constraints**
 - State and local permitting will remain difficult, costly, and complex
 - Some coal, oil, and nuclear (?) plants in parts of North East will be closed
 - Capacity will become and remain “tight” compared with reserve requirements
- **Crisis management**
 - RMR and other mechanisms to keep capacity in place in the absence of an overall, effective capacity market
 - Refine/improve natgas winter outage drills

Obstacles to Investment

- Absence of market entities willing/able to make long-term contractual commitments
 - Williams, Dynegy, et al were willing to be long capacity; no one has stepped in to take their place
 - Private equity investors buying either PPA/QF assets or merchant capacity at 40 cents on dollar
 - They are not building anything
- Surviving utilities frozen by ratings agencies
 - “Action spread:” publicly traded companies “cannot buy” distressed assets... private equity firms can

Potential Strategies

- Natural Gas/LNG
- Generation
- Transmission

Natural Gas

- Don't expect much long-haul capacity to be built in this environment
- Promote locational looping projects that link Dominion, Iroquois, TETCO, Transco, Tennessee, Maritimes, etc.
 - Most recent looping project to connect the Boston city-gate to Dracut at MN&E failed... Loss of major marketers leaves fewer entities willing/able to make long-term PL capacity commitments
- *Strategy:*
 - *allow utilities more flexibility to make long-term contracts*
 - *Develop more storage capacity*

LNG Implications

- US E&P migration overseas accelerates
 - LNG pricing seriously complicates domestic natgas pricing
 - Large percentage of gas flowing through HH will be LNG with attendant market power issues
- Promote/accelerate development of a northeastern LNG terminal of at least 1BCF/d
 - Mass and Maine proposals are likely to be Nimbied to death...Can we encourage NB or NS development?
- *Strategies:*
 - *State regulators need to become accustomed to thinking about LNG as a baseload resource.*
 - *gas utility resource planning process mandated by states needs to be revisited.... An RTO and RTEP of natural gas?*

Gas – Generation Strategy

- Strategy: until gas supply availability is resolved, defer encouraging development of additional CCGTs in favor of optimization of existing assets?
 - Should ICAP and RTEPs be “strategic” in nature?
 - What good is an ICAP payment to a plant without fuel?

Generation Strategy

- Admit there is a generation adequacy problem
 - Takes 2-3 years to build major power generation facility
 - “Capacity markets” have yet to prove themselves as constructs people will invest in/lend on...
 - PJM model: Capacity market signals motivate developers/investors
 - NY Model: Capacity demand curve motivates developers/investors
 - **NE Model:** LICAP motivates developers/investors in spite of socialized transmission undermining of locational capacity value
 - All 3 models (except possibly NY’s) are unproven in the “post-exuberance” era
- *Strategy:*
 - *empower utilities, RTOs or authorities to start/continue to issue long-term commitments to developers until market confidence is restored*

Transmission Strategy

- Develop Transmission “Beyond reliability”...
 - “Backyard” • “Neighborhood” • “Long Distance”
 - We need “elective” projects *if the goal of next ten years is to optimize existing resources*
 - “Backyard” transmission investment is proceeding: Development of major PTFs optimizes generation resources in southern NE
 - “Neighborhood projects” have been developed but have not been selected or sufficiently encouraged; NY LSE’s choice of transmission links to PJM...
 - “Long distance” projects: only one left in NE?
 - Strategy:
 - *empower utilities/authorities/ISOs to make commitments to develop neighborhood projects*

Conclusions

We live in a hybrid of regulation and market

A “well-regulated” market is not an oxymoron:

“Commodity exchanges are often cited as examples of a perfect market and perfect competition, These are markets in which transactions are highly regulated

...

It suggests, I think correctly, that for anything approaching perfect competition to exist, an intricate system of rules and regulations would *normally* be needed.”

R.H. Coase, *The Market, The Firm and the Law*



RH
Coase