

Thinking Twice About Transmission -- and its alternatives

BPA – Energizing the Northwest

September 28, 2004

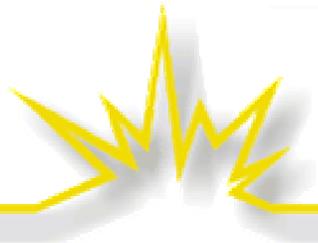
Richard Cowart

The Regulatory Assistance Project

*50 State Street, Suite 3
Montpelier, Vermont USA 05602
Tel: 802.223.8199
Fax: 802.223.8172*

*177 Water St.
Gardiner, Maine USA 04345
Tel: 207.582.1135
Fax: 207.582.1176*

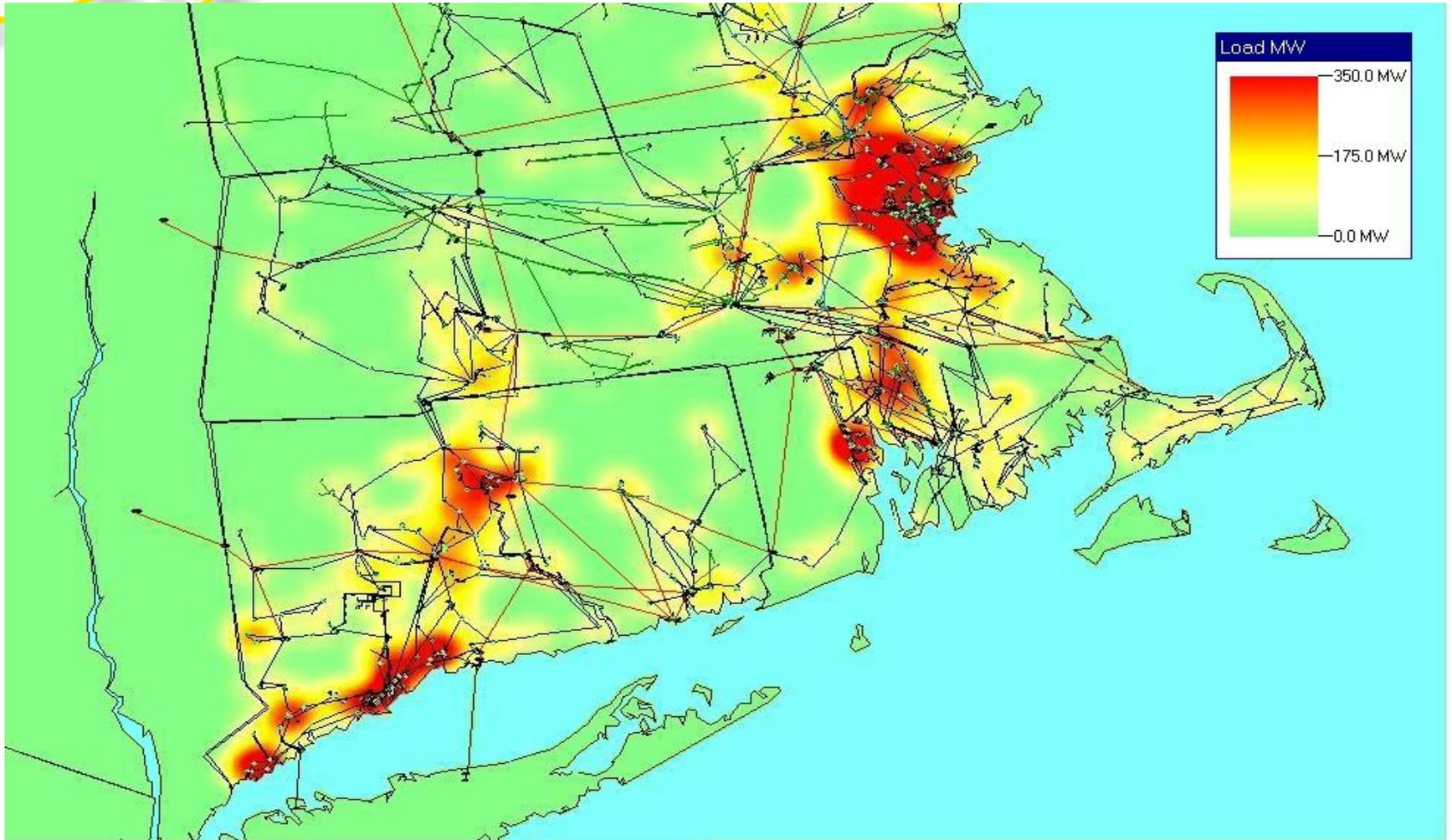
Website:
<http://www.raonline.org>



How much transmission do we need?

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- **Consumers don't purchase *transmission***
 - **Transmission is a service with substitutes**
 - ❖ **Load center resources of all kinds: G,DG,DR,EE**
 - **Transmission bottlenecks: reduced options, thinner markets (market breadth as an issue)**
 - ***Demand-side bottlenecks*: reduced options, thinner markets (depth as an option)**
 - **Challenge: how much geographic breadth is needed, and how much market depth?**
 - **Real issue: What kind of *electric power system* do we want?**

The geography of congestion



Load Densities - Southern New England

New England Demand Response Initiative (NEDRI)

- **Point #1: The potential pool of load center (non-wires) resources is quite large**
- **NEDRI 2002-2003 -- Regional, in-depth look at customer-based resources**
- **Sponsors: ISO-NE, NE PUCs and Env. agencies, US EPA, DOE, FERC**
- **38 consensus recommendations**
- **Broad view of Demand Response resources: Short-term price-responsive load, short-term reliability LM, longer term EE, DG/CHP**
- **LBL review: With these policies, customer-based resources could meet 80% of the region's expected load growth to 2015.**

What if the NEDRI Recommendations were implemented actively?

One post-NEDRI estimate:

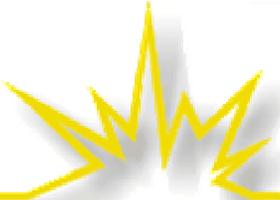
| | Mid-Term (2007) | Long-Term (2015) |
|---|--------------------|---------------------|
| ISO-NE Peak Demand Forecast (MW) | 26,258 | 29,768 |
| Energy Efficiency Total | 500 | 2,450 |
| <i>Building Codes</i> | 0 | 700 |
| <i>Appliance Standards</i> | 500 | 1,750 |
| <i>Enhanced SBC Funding</i> | ? | ? |
| Short-Term DR Total | 220-440 | 440-1,100 |
| <i>Emergency Programs</i> | 200-400 | 400-900 |
| <i>Market Programs</i> | 20-40 | 40-200 |
| Load as Contingency Reserve | 10-25 | 60-300 |
| Dynamic Pricing | 50-200 | 200-750 |

- ❖ Thus: Energy efficiency could offset 30-50% of incremental load growth
 - ❖ And: DR and Pricing could provide an additional ~300 – 1800 MW of resources –
- Source: Lawrence Berkeley National Lab estimates (C. Goldman and G. Barbose), based on 2003 NEDRI Report after adoption, thus not reviewed or endorsed by NEDRI participants.*



Point #2: Transmission affects resource choices at both ends of the wire

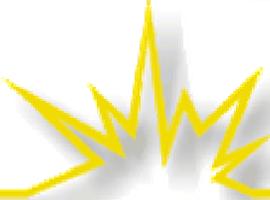
- **But “It’s Only 10%” ?**
- **The Transmission Policy Barbell:**
 - ❖ **Competitive effects on different generators (remote vs. closer to load)**
 - ❖ **Effects on the market value of load-side resources**
- **“Tasty Treats for Transmission?”**
- **Dynamic effects - signals to investors**
- **Dynamic effects - logrolling on the wires**



Transmission Planning: Efficient Reliability Rule

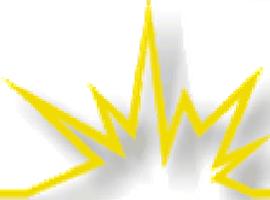
- **Before “socializing” the costs of a proposed reliability-enhancing investment through uplift or tariff, decision-makers (RTOs, PMAs, PUCs and FERC) should require a showing:**
 - (a) that the relevant market is open to demand-side as well as supply resources;**
 - (b) that the proposed investment is the lowest cost, reasonably-available measure to correct a remaining market failure; and**
 - (c) that benefits will be widespread, and thus appropriate for broad-based funding.**

New England Transmission Expansion Process



- **Up to \$1.4 billion in new transmission projects**
- **No least-cost review of transmission and alternatives**
- **Compromise: SW Connecticut RFP**
 - ❖ **BUT: Only as a stop-gap, small % demand-side**
 - ❖ **Transmission is regional, non-T is charged to Connecticut**
- **VELCO – Vermont law requires a least-cost review**
 - ❖ **Non-transmission options may be cheaper**
 - ❖ **But: RTO will pay for 95% of transmission option, Vermont must pay for 100% if alternatives are chosen**
 - ❖ **Also: Enough lead time for non-transmission options?**
- **Result: Transmission wins even if it costs more**

Open Season for Transmission and Alternatives



- NTGS: "Enabling customers to reduce load on the transmission system (through load mgt, efficiency, and DG) ...could do much to address transmission's bottlenecks today and delay the need for new transmission facilities."
- How to test the preferred alternative in transmission planning?
- One answer: Put it out to bid
- Essential component: Winning bid has the same security of payment as the transmission proposal would have.

Balanced Grid Management

5 steps needed

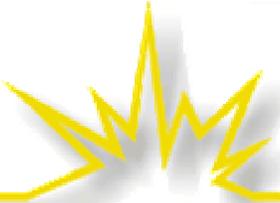
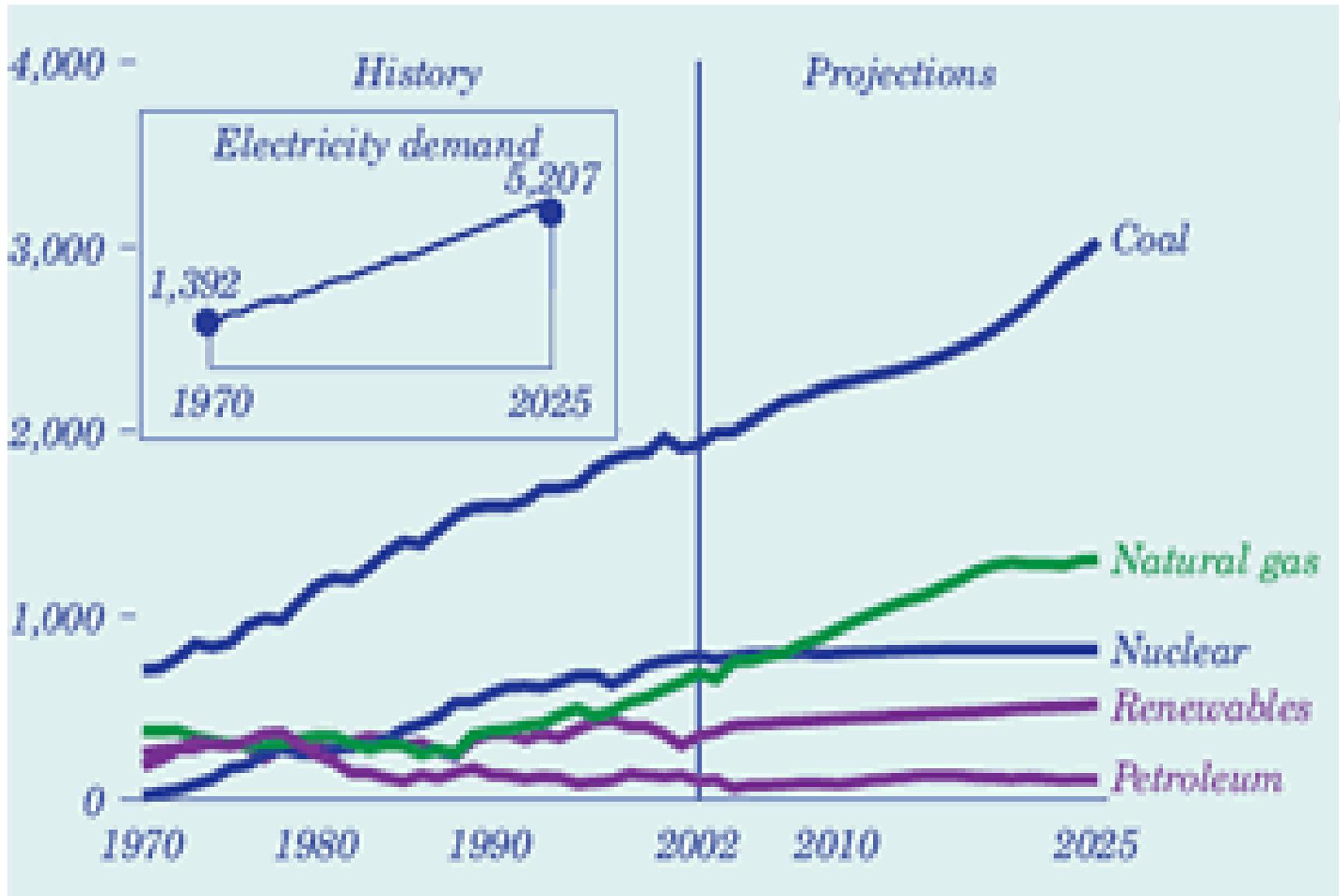
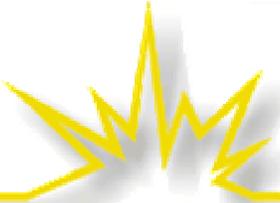
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- 1. Fix the underlying power markets
 - 2. Set cost-based transmission rates
 - 3. Broad-based transmission planning process really examines alternatives
 - 4. Efficient Reliability Test for costs proposed to be rolled-in or socialized
 - 5. “Open Season” to test planning outcomes in the market

Figure 4. Electricity generation by fuel, 1970-2025 (billion kilowatthours)





For more information

New England Demand Response Initiative

web link at www.raonline.org

Posted: Framing Papers and Memos on Demand Response; DR Strategy memos and proposals; “Thinking Twice About Transmission”

“Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets”

(R Cowart, NARUC June 2001)

