



Synapse
Energy Economics, Inc.

Demand Response and Reliability

MADRI Meeting in Trenton, NJ
September 6, 2012

Doug Hurley

Energy System modeling, analysis, expert testimony, and stakeholder representation for...

- Consumer Advocates and Public Interest Groups in more than 25 states
 - More than 20 PUCs and Attorneys General
 - Over 40 Environmental Groups and Foundations
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- NEPOOL, PJM, and MISO Representation for Consumer and Environmental Advocates, Energy Efficiency, and Renewable Generation

Demand Response and Air Emissions

Modeling Demand Response and Air Emissions in New England

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Prepared for:
U.S. Environmental Protection Agency

August, 2003

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Executive Summary very clearly states:

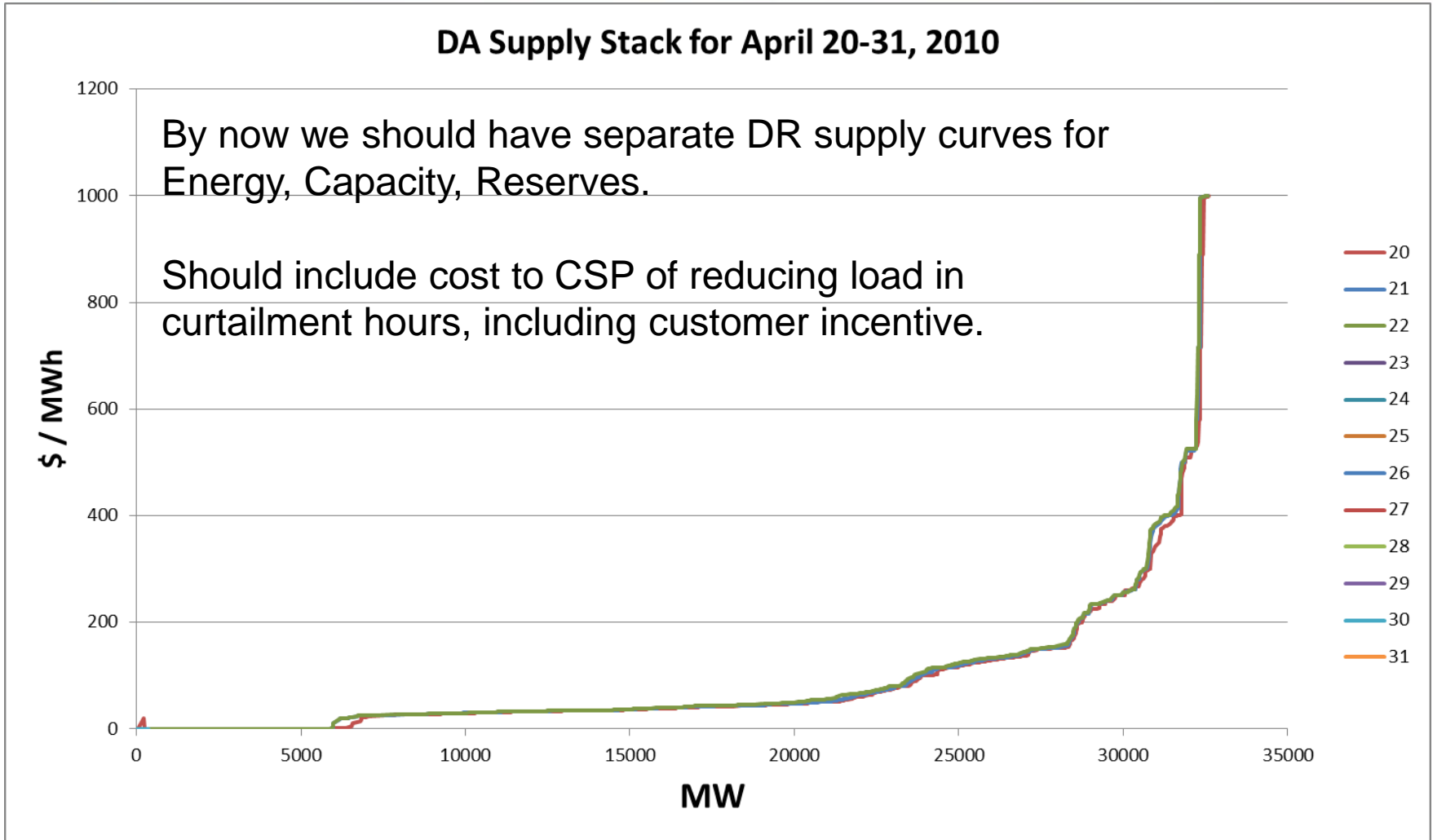
- “This finding is specific to New England and should not be extrapolated to other control areas.”
- “based upon clearly identified assumptions about how the ISO ... meets reserve requirements.”
- In specific locations, can still contribute to non-attainment

- Important to define the term “DR” in any discussion
 - Here, I speak primarily of dispatchable demand response (DR) in a market or program
 - Individual large entities responding to anticipated prices or costs is probably similar
 - I’m excluding all real-time retail pricing
- Backup generation (BUG) and demand response (DR) different from operator perspective:
 - Timing (Prep time, ramp time, recovery time)
 - Quantity (consistent or variable, and recovery load)
 - Consistency (response on numerous consecutive days)
- Location is important
 - Large remote loads vs distributed smaller loads

- Also need to define “reliability”
 - Ability to dispatch a reliable system at best price
 - Sufficient reserves to recover from contingencies
 - Sufficient resources to meet peak loads
- 8,700+ hours, markets seem to work fine
- Economic efficiency from markets that procure supply (incl. DR) Day Ahead
- In a few hours, operators take reliability actions. Who should pay for these?
- A mature DR portfolio can be a better resource for grid operators. Faster, at more specific locations, and probably cheaper.
- More supply from smaller, localized sources would allow markets to function in more hours

PLEASE publish a DR Supply Curve

DA Supply Stack for April 20-31, 2010

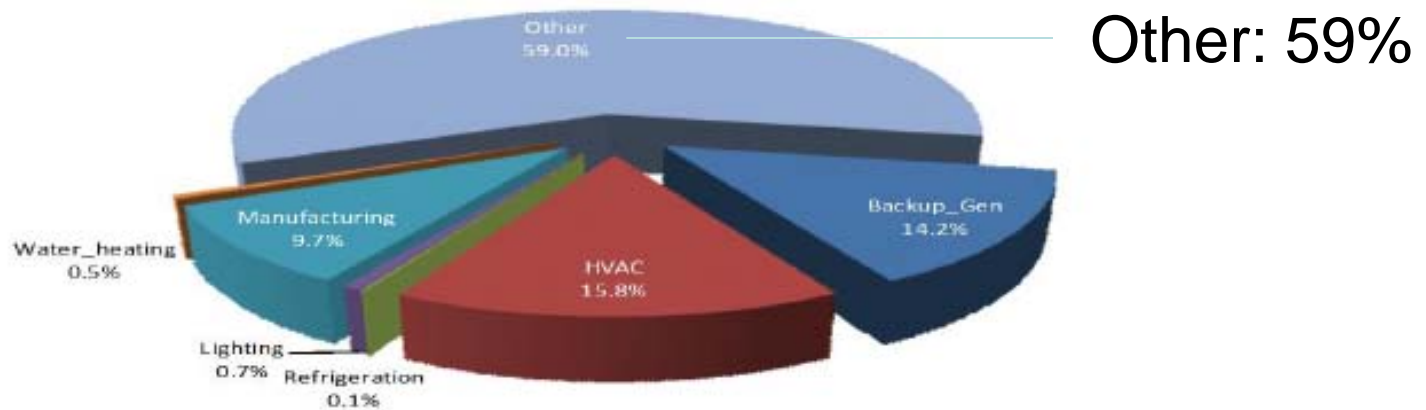


Need data on source of DR



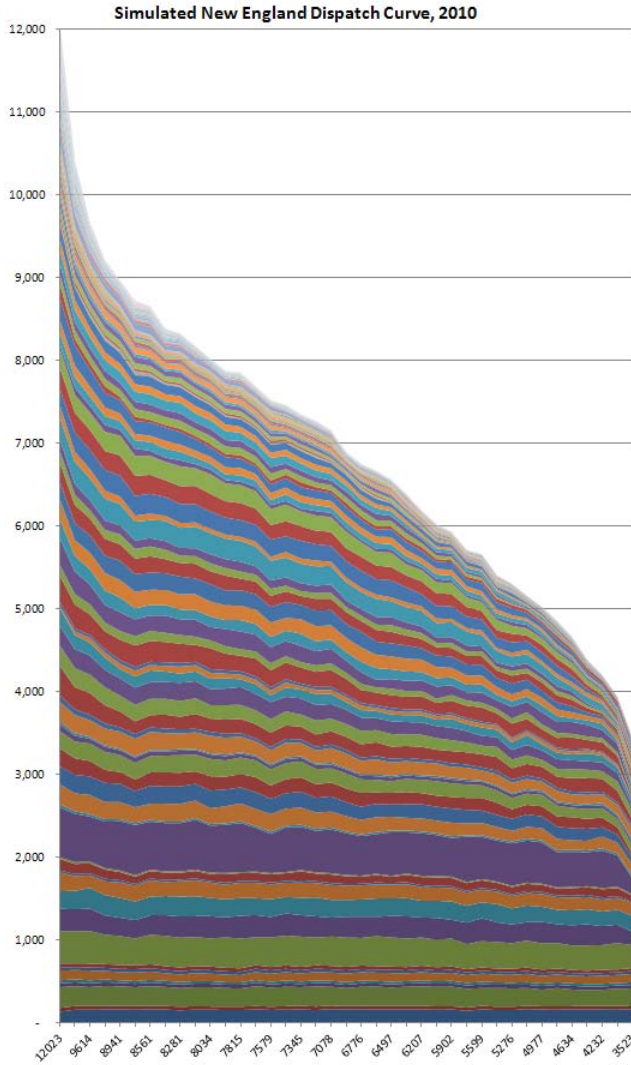
Sources and Business Segments for Emergency DR Activity 12/13

Sources

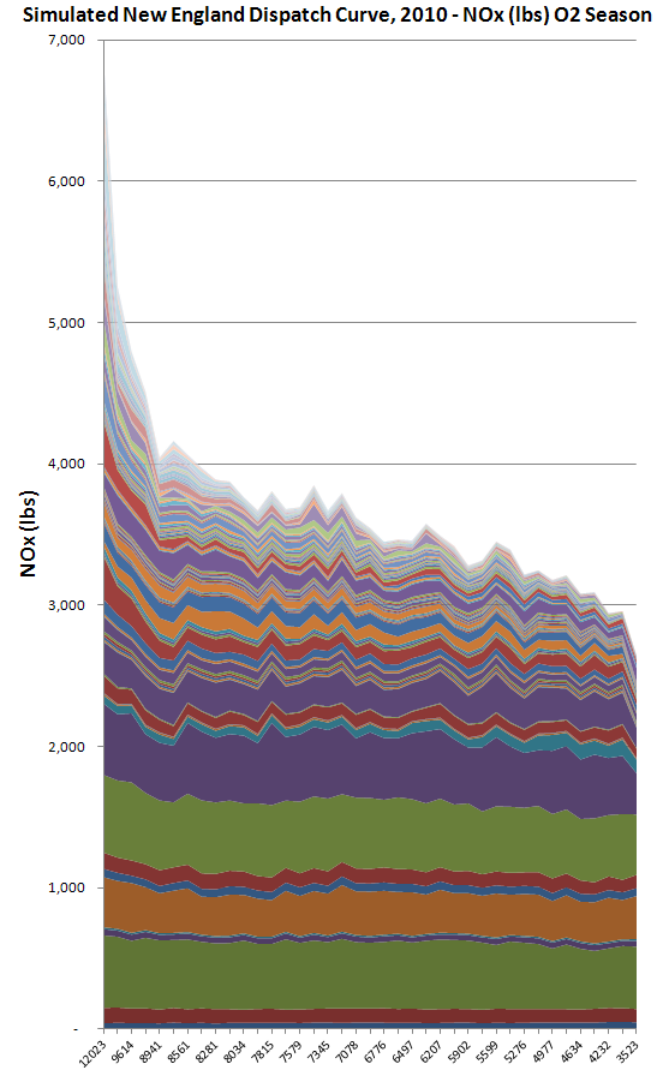


Source: PJM Load Response Activity Report dated 10 August 2012.

Effects of Peak Load Reductions Simulated Dispatch Curve (Generation / Emissions)



- Potter 3
- Montville 6
- Stony Brook 4
- Stony Brook 2
- Newington 1
- Devon 13
- Stony Brook 1
- South Boston Combustion Turbines A
- Devon 14
- Bellingham 1
- Montville 5
- Milford Power, LP 1
- P L Bartow 4A
- P L Bartow 4A
- Pittsfield Generating 3
- William F Wyman 3
- Stony Brook 3
- William F Wyman 1
- Dighton 1
- West Springfield 3
- New Haven Harbor NHB1
- Wallingford Energy CT03
- Middletown 2
- Ocean State Power 1
- Norwalk Harbor Station 2
- Ocean State Power II 4
- Manchester Street 9
- Wallingford Energy CT05
- Wallingford Energy CT04
- Wallingford Energy CT02
- Lake Road Generating Company LRG3
- Lake Road Generating Company LRG2
- Maine Independence Station 1
- Kendall Square 4
- ANP Bellingham Energy Company, LLC 2
- Westbrook Energy Center 2
- Milford Power Company LLC CT02
- Rhode Island State Energy Partners RISEP1
- ANP Blackstone Energy Company, LLC 2
- Milford Power Company LLC CT01
- NAEA Newington Energy LLC 1
- ANP Blackstone Energy Company, LLC 1
- J C McNeil 1
- Rumford Power 1
- Mystic 93
- Salem Harbor 2
- Androscoggin Energy CT03
- Granite Ridge Energy 1
- Granite Ridge Energy 2
- Androscoggin Energy CT02
- Pratt & Whitney, East Hartford 1
- Androscoggin Energy CT01
- Brayton Point 1
- Bridgeport Harbor Station BHB3
- Algonquin Power Windsor Locks, LLC GT1
- MIT Central Utility Plant 1
- Brayton Point 2
- Bucksport Clean Energy GEN4
- Cleary Road 8
- Capitol District Energy Center GT
- Pawtucket Power Associates, LP 1
- Cleary Road 9
- Bridgeport Harbor Station BHB2
- Devon 11
- Pittsfield Generating 1
- Pittsfield Generating 2
- Brayton Point 4
- Devon 12
- South Boston Combustion Turbines B
- Lowell Cogeneration Company 1
- Waters River 2
- P L Bartow 4A
- Alfred L Pierce Generating Station AP-1
- William F Wyman 2
- Middletown 4
- William F Wyman 4
- Salem Harbor 4
- Middletown 3
- General Electric Aircraft 5
- Ocean State Power II 3
- Norwalk Harbor Station 1
- Ocean State Power 2
- Manchester Street 10
- Arvah B Hopkins 2A
- Dartmouth Power 1
- Wallingford Energy CT01
- West Springfield CTG2
- West Springfield CTG1
- Lake Road Generating Company LRG1
- Maine Independence Station 2
- Mystic 7
- Bridgeport Energy BE1
- Canal Station 2
- Westbrook Energy Center 1
- ANP Bellingham Energy Company, LLC 1
- Bridgeport Energy BE2
- Berkshire Power 1
- NAEA Newington Energy LLC 2
- Fore River Station 11
- Fore River Station 12
- Salem Harbor 3
- Mystic 81
- Canal Station 1
- Mystic 94
- Salem Harbor 1
- Millennium Power Partners 1
- Mystic 82
- Brayton Point 3
- Mount Tom 1
- Tiverton Power 1
- Merrimack 2
- Schiller 6
- Merrimack 1
- Schiller 5
- Schiller 4



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