
Connecticut Energy Advisory Board

Presentation to the DPUC

Docket No. 08-07-01

DPUC Review of the
Integrated Resource Plan

August 28, 2008

2008 Comprehensive Plan for Procurement of Energy Resources

The Connecticut Energy Advisory Board
August 1, 2008

John A. Mengacci – CEAB Chair

CEAB Procurement Plan Sub-Committee

Michael Cassella – Chair

Mary Healey

Gina McCarthy

Jeff Gaudiosi

Melissa Ozols

Jim Hoffman

Agenda

Opening Remarks: *CEAB Chairman – John A. Mengacci*

- 1.** Overview of CEAB Activities in Procurement Plan Development
- 2.** EDCs' Presentation of their Jan. 1, 2008 IRP
- 3.** CEAB Process to Review and Modify the EDC Plan
- 4.** Discussion of EDC's Supplemental Analysis
- 5.** CEAB Presentation of its Aug 1, 2008 Procurement Plan
- 6.** Comparing the Findings of the EDCs' IRP and the CEAB Plan
- 7.** 2009 Procurement Plan Approach

1. Overview of CEAB Activities in Procurement Plan Development

- EDCs Presented CEAB With IRP On January 1, 2008
- CEAB Solicited Written And Oral Public Comments
- CEAB Has Established A Standing Sub-committee To Conduct Its Review Of The EDCs' IRP And Make Recommended Modifications
- CEAB And EDCs Worked Collaboratively To Secure Additional Stakeholder Input
- CEAB And EDCs Collaborated On Supplemental Analysis
- CEAB Developed Its Procurement Plan Recommendations And Report

2. Comprehensive Electricity Resource Plan

Electric Distribution Companies
January 1, 2008

(separate presentation)

Jim Shuckerow CL&P
Rich Peters UI

3. CEAB Process to Review and Modify the
EDC Plan

The Connecticut Energy Advisory Board

John A. Mengacci – CEAB Chair

Overview of CEAB Process for Review, Modification and Approval of EDCs' IRP

1. January 2008 Plan filed jointly by CL&P and UI (EDCs)
2. CEAB initial review – January/February, 2008
 - a) Public Comment/Hearing on EDC IRP
 - b) CEAB preliminary assessment of the EDC IRP
 - c) CEAB assessment and public comment indicated that further stakeholder input and analysis was necessary
3. CEAB process for modifying EDCs' Plan
 - a) CEAB and the EDCs consulted with ISO-NE and held a dozen Stakeholder Input Workshops with some 16 entities represented
 - b) Collaborative Supplemental Analysis run by the EDCs at the request of CEAB

Key Areas Identified in Initial Review and by Public Comment

1. Procurement Process
 - Scope of the Procurement Plan and implementation
2. Demand Management
 - Implementation of aggressive targets
3. Renewable Energy
 - Assess the potential for RPS compliance
4. Environmental Compliance
 - Address additional emissions considerations
5. Connecticut Generation
 - Address retirement risks of older fossil-steam units
6. Transmission
 - Integrate transmission plans and options

CEAB Objectives for 2008 Plan Review

1. Add recommendations for procurement actions
2. Address the key issues from initial review
3. Take and consider key stakeholder input
4. Establish CEAB-EDCs collaboration on analysis
5. Provide the DPUC an actionable 2008 Plan for 120 day review
6. Develop the planning process to expedite 2009 and future planning cycles

4. CEAB Requested Supplemental Analysis

The Connecticut Energy Advisory Board

John A. Mengacci – CEAB Chair

CEAB Rationale for the Supplemental Analysis

1. Evolving emissions regulations could have a large effect on the longevity of older Connecticut generation capacity.
 - Compliance investment costs could be needed on many units
 - Compliance could increase operating costs
 - Emissions of NO_x and SO₂ in New England and Connecticut would likely change significantly due to retirements or compliance
2. Analysis should assume DSM Focus objectives as base case.
 - The cost effectiveness of the DSM Focus level of programs indicated this assumption base line for supply resources planning.
3. Analysis should assume RPS Compliance as base case.
 - The CEAB sponsored Renewable Generation analysis that shows RPS levels can be achieved and should be the base line for resource planning.
4. Illustrate these changes utilizing the Current Trends Scenario and the Conventional Resource Solution Set for 2018 only.
 - Time constrained for 2008 Plan, use insights for 2009 planning cycle.

Supplemental Analysis Modeling and Results

Electric Distribution Companies
July 31, 2008

(separate presentation)

Jim Shuckerow CL&P
Rich Peters UI

CEAB Observations and Conclusions from Supplemental Analysis

1. Investing in Renewables to meet RPS targets could be cheaper system-wide than not investing and paying the ACP price.
2. Added emissions control investments appear uneconomic based on allowance savings alone and would not likely occur without more stringent regulations.
3. SCRs and Scrubbers on coal units reduce NO_x and SO₂ emissions far more than control on oil-fired steam units, and at a much lower cost per ton (both overall and during peak days).
4. The analysis indicates that the potential exists for economic retirements of roughly 1,400 MW from existing CT generation.
5. CEAB recommends that the DPUC establish the generating capacity resource procurement mechanism (Section 52 of the legislation) to prepare for future retirement-derived capacity need in Connecticut.

5. CEAB Presentation of its August 1, 2008
Procurement Plan

The Connecticut Energy Advisory Board

John A. Mengacci – CEAB Chair

Action Plan Development

1. Provide a context for plan elements relative to current programs and policy
2. Capture insight from stakeholder workshops and additional analysis
3. Develop recommendations for procurement implementation
4. Develop recommendations for further investigation and for future editions of the procurement plan
5. Propose roles for the CEAB, EDCs and other parties in implementing the recommendations

Procurement Recommendations

Procurement Actions

1. The focus of resource acquisition procurement actions should be demand-side management and renewable energy credits.
2. The Plan identifies the potential benefits of bilateral contracting as a means to stabilize and/or reduce standard service rates, and recommends that the DPUC consider combining bilateral and REC contracting.
3. No other resource acquisition procurement activities are recommended in this 2008 Procurement Plan.

Resource Planning Actions for 2009 or Later Procurement Plans

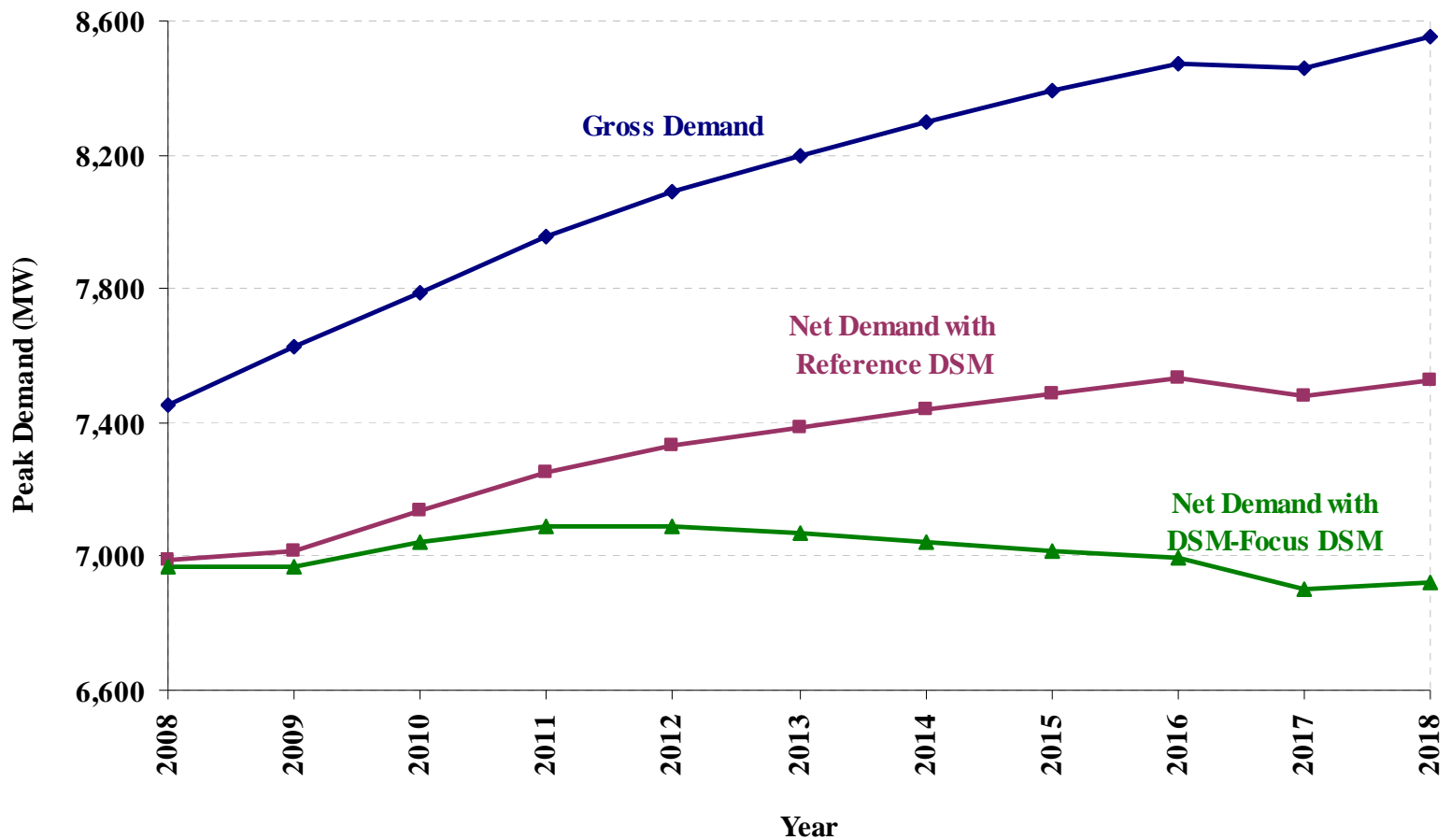
4. The DPUC should consider establishing the rules for implementation for procurement under Section 52 (b) as preparation for any future plans recommending construction of new generation.

Demand Management

Information and Direction

- Reviewed DSM analysis basis for scope, cost and practical potential of the expansion of Energy Efficiency and Price Responsive Demand.
 - Cost effectiveness process
 - Capability to ramp up programs
 - Funding Sources for DSM expansion
- ECMB asked CEAB to support its request to the DPUC to:
 - Immediately approve increased energy efficiency funding
 - Support ECMB attempts to meet high consumer demand levels for programs
- DSM Focus is a legitimate resource case based on current information.
 - Further information is pending, as ECMB is conducting a new DSM potential study for energy efficiency and demand response

Appendix G Figure 2.4: CT Peak Demand Forecast under Different DSM Scenarios



Appendix G Table 1 Illustration of Potential DSM Funding

DSM Focus Solution: 2008 IRP

ECMB, 5/1/08

Annual Budget (\$ million) - CL&P and UI

CL&P and UI		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EE	Total EE	92.3	125.4	176.4	240.1	287.1	311.6	312.4	269.4	206.3	175.6	176.3
DR	Load Response	27.9	27.6	27.6	27.7	27.7	27.7	27.8	27.8	27.9	27.9	28.0
	Res. DLC	2.9	6.4	9.6	12.0	13.2	12.2	12.2	12.3	12.4	12.5	12.5
	Total DR	30.8	33.9	37.2	39.6	40.8	39.9	39.9	40.1	40.2	40.4	40.4
Total Budget		123.1	159.4	213.7	279.7	328.0	351.5	352.3	309.5	246.5	215.9	216.8
Revenues & Funding Sources												
Funding Sources	C&LM (3 mils) EE	81.4	92.0	92.2	92.4	92.6	92.8	93.0	93.2	93.4	93.6	93.8
	FCM EE	1.8	2.1	4.4	7.2	8.9	10.7	12.4	14.2	15.9	17.7	19.5
	Class III EE	2.3	4.5	6.0	6.0	6.0	5.9	5.9	5.9	5.9	5.8	5.8
	FCM DR*	27.9	27.6	27.6	27.7	27.7	27.7	27.8	27.8	27.9	27.9	28.0
Total Estimated Revenues		113.3	126.2	130.2	133.2	135.2	137.1	139.1	141.1	143.1	145.1	147.0
Difference (Budget - Revenues)		9.9	33.2	83.5	146.5	192.7	214.4	213.2	168.5	103.4	70.9	69.7

* FCM DR partially funded by FMCCs in 2007-2009

2nd Total (check-Brattle) 123.1 159.4 213.7 279.7 328.0 351.5 352.3 309.5 246.5 215.9 216.8

Estimated Potential RGGI Revenues - C&LM Programs in CL&P and UI Service Territories (\$ million)

ECMB, 5/1/08

Market Price \$ Per Short Ton		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimated	\$2.00		14	14	14	14	14	14	14	14	14	14
Range	\$5.00		35	35	35	35	35	35	35	35	35	35

Assumptions:

Allowances 10,695,036 (short tons)

% to C&LM 66%

Total allowances sold in each year assumed to equal allowances for that compliance year (i.e., any portion of allowances delayed is offset by pre-selling of allowances from future compliance years)

Decline in allowances beginning in 2015 (2.5% per year) assumed to be offset by increase in market price for allowances

Demand Management

Qualifiers

- The DPUC had not finalized a long range funding plan.
- Revised assessments of programs will occur annually in ECMB budget approval process.
- A more detailed look at the potential will be available in the Fall of 2008.
- Levels of programs both energy efficiency and demand response is unprecedented.

Stakeholders

- Utilities, ECMB, Environment Northeast, AARP, First Light Power

Demand-Side Management Recommendations

Procurement Actions

1. The CEAB Plan supports adopting the DSM Focus demand response (DR) and energy efficiency (EE) program levels as a 3-5 year objective.
2. The DPUC should investigate whether DSM Focus objectives can be reasonably met while minimizing Ratepayer/CEEF funding.
3. DPUC should determine the appropriate ramp-up for DSM Focus, balancing the results of the Utility Cost Test and Total Resource Cost Test for cost-effectiveness with near term rate impacts.

Resource Planning Actions for 2009 or later Procurement Plans

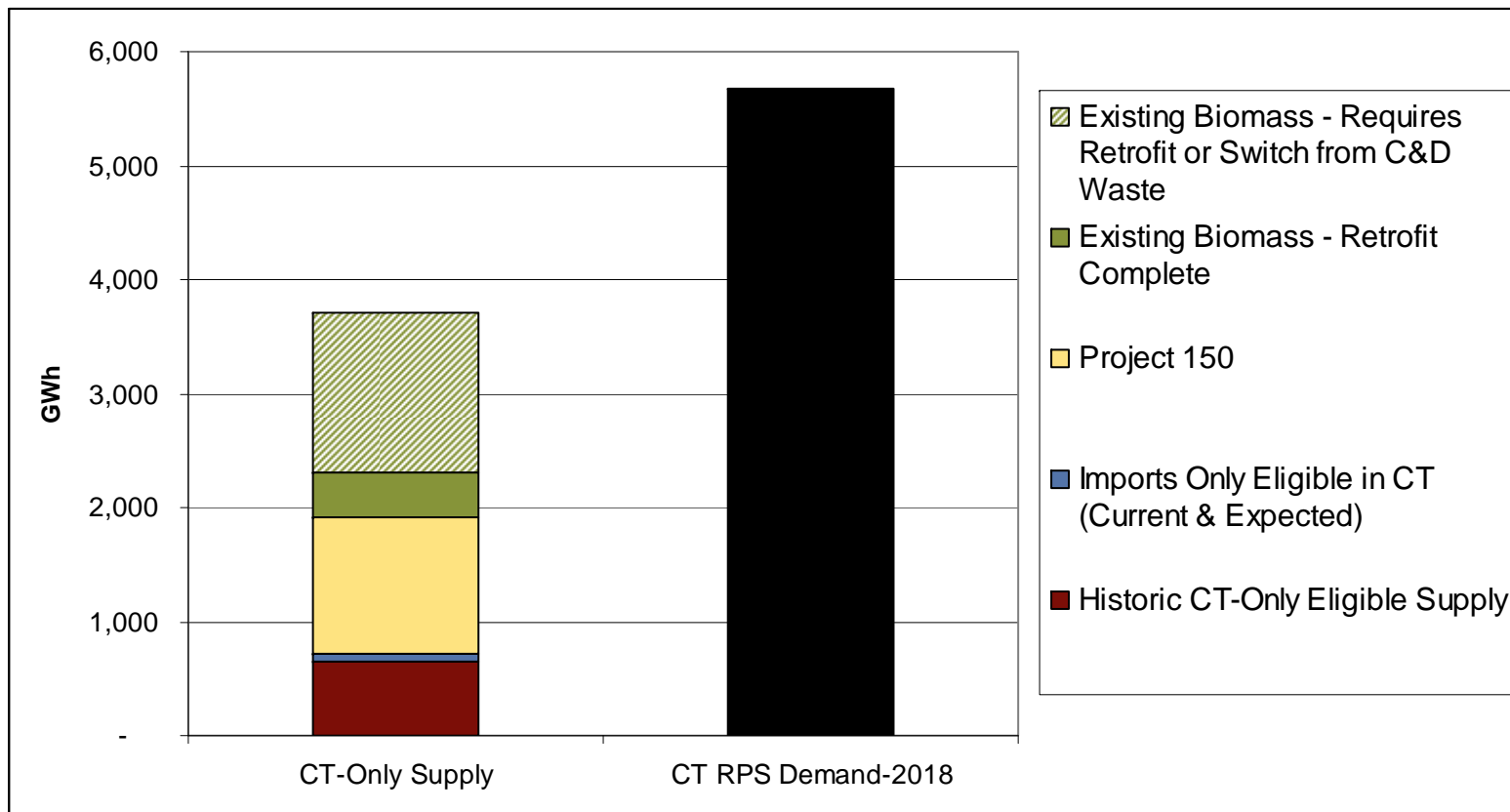
4. Upon completion of the ECMB's 2008 DSM Potential Study, future Plans should provide a review of and possibly revisions to DSM Focus objectives.

Renewable Energy

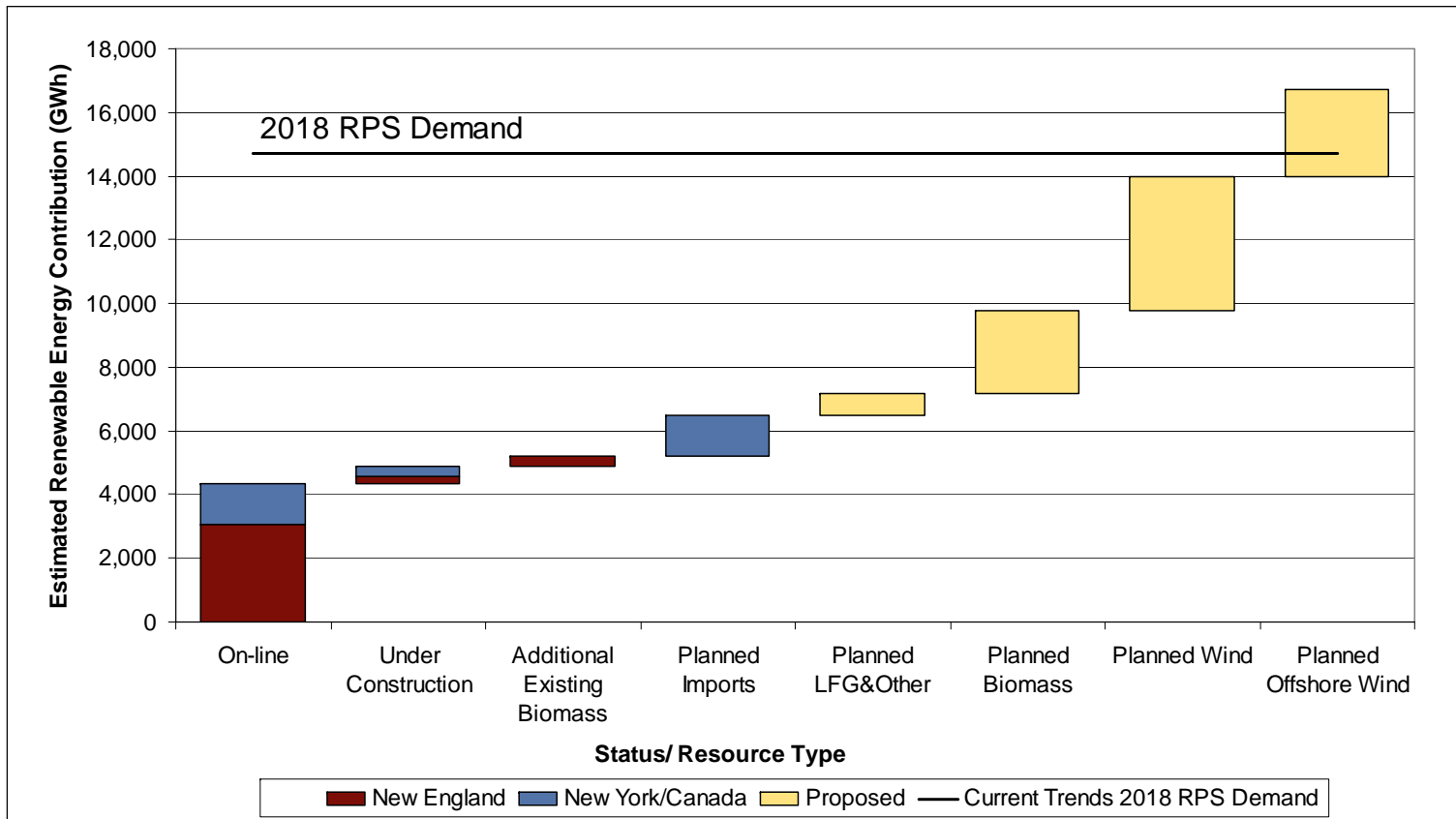
Information and Direction

- Renewable project development that includes long-term contracts should result in REC prices closer to a cost basis than to the Alternate Compliance Payment (ACP).
- Renewables should be modeled in scenarios with associated transmission projects.
- Each scenario will incorporate state by state results of supply curve analysis.
- REC pricing will be phased in to be based on primarily long-term contract prices for RECs substantially below ACP.
- **Result:** In 3 of the 4 scenarios, RPS requirements should be met with REC prices at or below ACP.

Appendix H Figure 2: Connecticut 2018 RPS Demand vs. Connecticut-Only Renewable Supply

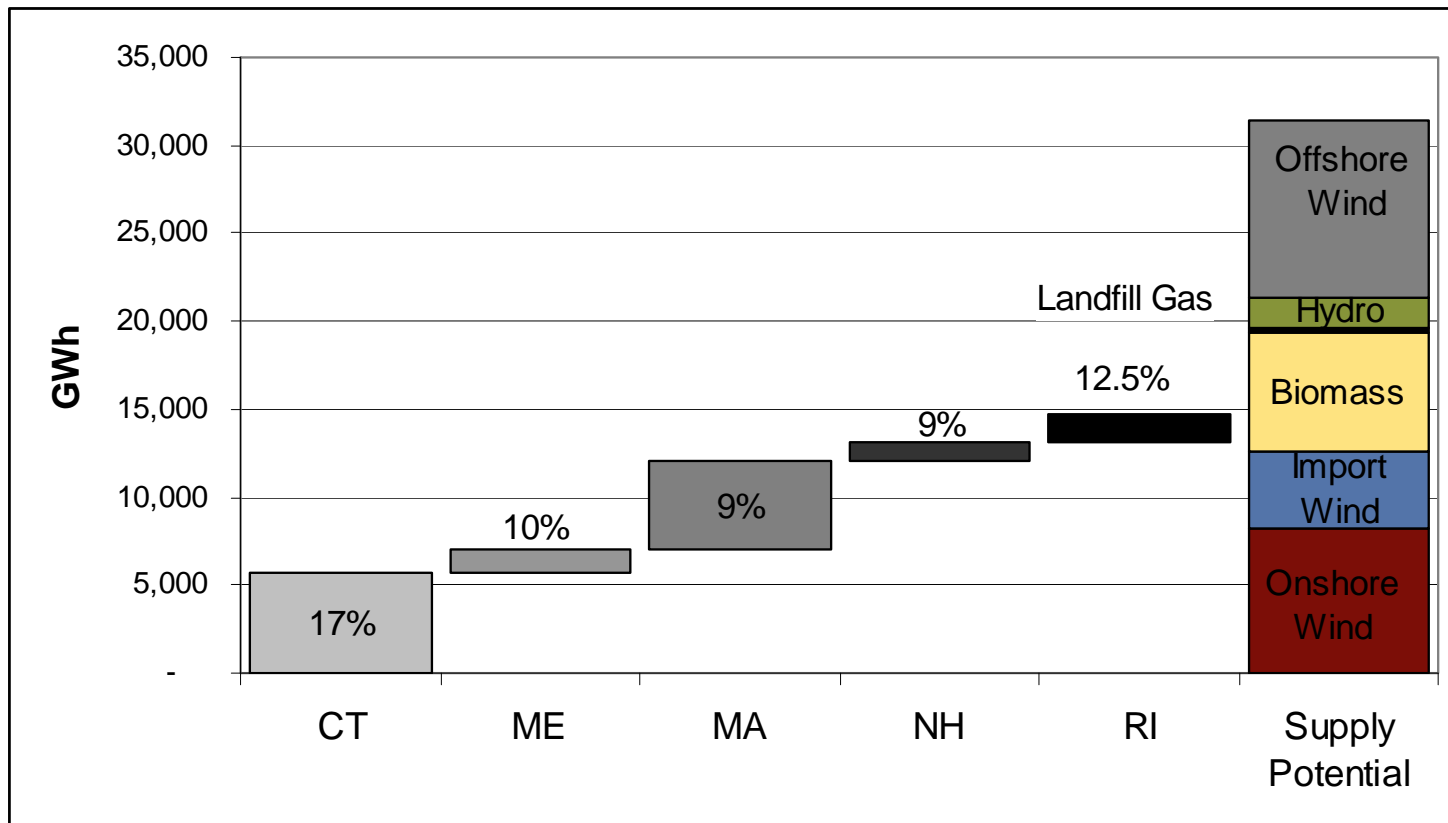


Appendix H Figure 3: New England Planned Projects vs. New England 2018 RPS Demand*



* The Massachusetts Green Communities Act signed into law on July 2, 2008 would make the 1% per year increase in Massachusetts RPS automatic and would increase the New England 2018 RPS demand to just under 17,000 gigawatt hours.

Appendix H Figure 4: New England 2018 Renewable Supply Potential verses Renewable Demand*



* The Massachusetts Green Communities Act signed into law on July 2, 2008 would make the 1% per year increase in Massachusetts RPS automatic and would increase the New England 2018 RPS demand to just under 17,000 gigawatt hours.

Renewable Energy

Qualifiers

- Long-term REC contracting is not prevailing policy in region.
- Projected renewable capacity used in the subsequent analysis will be based on resource potential, not specific projects under development.
- The Plan discusses dynamics of long-term contracting, project development and REC pricing.

Stakeholders

- Utilities, CCEF, Environment Northeast, AARP

Renewable Energy Generation Recommendations

Procurement Actions

1. A significant portion of the uncommitted standard service REC requirements for 2014 and beyond should be obtained through long-term contracts to lower the overall cost of RPS; and to assure the full development of the needed renewable resources.
2. The DPUC should direct the EDCs, along with the CCEF, to create a pilot contract solicitation to allow the DPUC to evaluate the potential contracting for bundled RECs, energy and capacity to further reduce REC costs.

Resource Planning Actions for 2009 or Later Procurement Plans

3. Additional analysis on CHP should be included in future Procurement Plans.
4. Assess the economic potential renewable resource import options for Connecticut including consideration of nearby resources, northern New England, Canadian renewable resources, transmission projects and information from the ISO-NE Economic Study.

Environmental Compliance

Information and Direction

- Initiated dialogue between DEP, utilities and Connecticut Generation owners.
- Established scenario assumptions for individual Electric Generation Unit (EGU) for each scenario.
- Currently establishing planning levels for Statewide compliance of individual pollutants, particularly NO_x and CO₂.
- Apply multiple scenarios/cases for individual EGU emission rate levels for NO_x, Sulfur, CO₂ and HG to modeling effort of utilities.
- Apply multiple scenarios/cases for statewide targets/caps of individual pollutants.
- Metrics to be produced to demonstrate plan impacts on High Electric Demand Days (HEDD) emissions to enable future working group efforts be captured in procurement planning.

Appendix J Tables 2 and 3: Proposed Emissions Limits for Boilers

Table 2: Proposed NO_x Emissions Limits for Boilers

Time Frame	Emissions Limit (lb/mmbtu)	Emissions Control Technology required
Current Standard	0.15	Not applicable
Short-term Goal (3–5 years)	0.12	SNCR and/or water injection
Long-term Goals (5–10 years)	0.08	SCR

Table 3: Proposed SO_x Emissions Limits for Boilers

Time Frame	Emissions Limit (lb/mmbtu)	Emissions Control Technology required
Current Standard	0.3	Not applicable
Long-term Goals (5–10 years)	0.15	Scrubber

Appendix J Table 4: Proposed Emissions Regulations by Scenario

	EGU NO _x Rates (lb/mmbtu)	Statewide NO _x Budget	EGU SO ₂ Rates (lb/mmbtu)	Connecticut CO ₂ Cap
Current Trends	0.12 by 2011 0.08 by 2018	2691*	0.3 by 2011 0.15 by 2018	RGGI
High Fuel	0.15 by 2013 0.12 by 2018	4466*	0.3 by 2011 0.15 by 2018	Accelerated RGGI
Climate Constrained	0.08 by 2013	<2691*	0.3 by 2011 0.15 by 2013	Accelerated RGGI
Low Stress	0.12 by 2013 0.08 by 2018	2691*	0.3 by 2011 0.15 by 2018	RGGI

Environmental Compliance

Qualifiers

- Supplemental analysis will build in DEP air quality regulation changes that are contemplated, but not yet adopted.
- Generator response to evolving regulations could vary from the generator response predicted in the collaborative analysis.

Stakeholders

- Utilities, CCEF, Environment Northeast, AARP

Emission Management Recommendations

Procurement Actions

1. Resource acquisitions should be evaluated on the basis that there will be more stringent application of NO_x, SO₂ and CO₂ (state, regional and federal) emissions regulations.

Resource Planning Actions for 2009 or Later Procurement Plans

2. More thorough estimates of the environmental retrofits and their costs should be included in Procurement Plans.
3. Procurement Plans should provide a basis for DEP to consider of the impact of DEP changes to air quality regulations.

Connecticut Generation

Information and Direction

- Initiated dialogue between DEP, utilities and Connecticut Generation owners on continued operation costs.
- Attempted to secure support of generators to provide:
 1. Generating company perspectives on continued operation of older generation.
 2. Cost estimates for emissions compliance by technology.
 3. Individual owners' sponsored best available public information to be used with specific units in economic analysis.
 4. Support in applying the correct 'potential' retrofit projects, i.e., emissions reduction technologies, for the each unit.
- NRG provided technical expertise in identifying likely environmental compliance retrofit projects.
- Generation companies via NEPGA maintain the appropriateness of FERC level revenue requirement costs as the proper GFC for determining continued operation.

Steam Oil / Gas and Coal Units In Connecticut with Questionable Continued Operation

<u>Unit Name</u>	<u>Fuel</u>	<u>Capacity (MW)</u>
Montville 5	Oil / Gas	81
Middletown 3	Oil / Gas	236
Middletown 2	Oil / Gas	117
Norwalk Harbor 1	Oil	168
Norwalk Harbor 2	Oil	162
Montville 6	Oil	407
Middletown 4	Oil	400
Bridgeport Harbor 2	Oil	130
New Haven Harbor	Oil/potential Gas	461
Bridgeport Harbor 3	Coal	372
AES Thames	Coal	<u>181</u>
<u>Total</u>		2,715

Connecticut Generation

Qualifiers

- No consensus on how to estimate economic obsolescence.
- CEAB analysis will assume utility GFC and environmental compliance project costs in determining likely retirement cases.
- Generator response to evolving regulations could vary from analytical results the collaborative with utilities will produce.

Stakeholders

- Utilities, DEP, Environment Northeast, AARP, NRG, PSEG, Competitive Power Ventures, NEPGA, First Light Power

Connecticut Generation Recommendations

Procurement Actions

1. The Plan recognizes that a significant portion of existing Connecticut oil/gas steam capacity could retire over the next ten years.
2. The 2008 Plan recommends preparation, but not the immediate solicitation of any replacement capacity within Connecticut.
3. DSM, REC, and Bilateral Contracting resource acquisitions evaluations should use an assumption that some retirements occur as a base case.

Resource Planning Actions for 2009 or Later Procurement Plans

3. The EDCs should complete the analysis of evolving emissions regulations and their impact on generation retirements into Procurement Plans.
4. The DPUC should investigate the process that should be used to consider contracting involving repowering, retrofit or long-term life extension from existing generation.

Transmission Considerations

Information and Direction

- Meetings with ISO-NE and stakeholders (plus PAC meetings) established views on:
 - Needs Assessment & Options Analysis Report
 - 2010 FCM Delisting Process Reliability Assessment
 - Additional Connecticut Areas of Concern (from Nov 07 PAC) ISO-NE
 - LFRM & Daily Second Contingency Dispatch Requirements
 - ISO-NE studies on Transmission requirements to support renewable generation build-out

Transmission Considerations

Qualifiers

- ISO-NE analysis on transmission to support Renewables not yet complete.
- Connecticut should not be a capacity zone with NEEWS.
- Phase II of the current CT Transmission project and the CT procurement dramatically reduce the need for added operating reserves capability.

Stakeholders

- Utilities, NRG, PSEG, Competitive Power Ventures, NEPGA, First Light Power, ISO-NE

Transmission Resource Needs Affect Generation and Demand Management Resource Needs

Factors Affecting Capacity Needs

- ISO-NE Resource Adequacy analysis used to set:
 - Required capacity that would be procured by ISO-NE through the Forward Capacity Market (FCM)
 - The CT Local Sourcing Requirements for FCM
- Operable Capacity
 - Local Forward Reserve Capacity
 - Reliability Must Run Designations
- Transmission Configuration Changes through new projects and upgrades

CT Actions Taken

- New long-term Contract Capacity procured through 2006/2007 DPUC procurement
- Almost 700 MW of new Peaking Capacity contracts awarded in 2008
- DSM Focus which effectively eliminates peak demand growth
- Renewable Generation contracts through Project 150

Transmission Related Recommendations

Procurement Actions

1. CEAB will be reviewing alternative solution analysis of the NEEWS project either via the reactive RFP process triggered by Siting Council filing or via alternative analysis proffered to support an exemption.

Resource Planning Actions for 2009 or Later Procurement Plans

2. Future Procurement Plans should include Non-Transmission Alternatives (NTA) and economic benefits assessments for all proposed significant transmission projects.

Additional Recommendations

1. Future Procurement Plans should incorporate some aspects of risk analysis and an optimization of resource mix.
2. Future Procurement Plans should specifically include analysis and/or information on the following supply resources:
 - o Import of Renewables and nuclear power from Canada, particular including the transmission requirements and their costs
 - o Combined Heat and Power potential – small scale and grid-connected projects
 - o Connecticut and Domestic sited additional nuclear capacity
 - o Connecticut potential for advanced / clean coal generation with or without carbon sequestration
3. Future Procurement Plans should determine the impact on electric energy requirements, and the resulting emissions, from emerging technologies such as plug-in hybrid vehicles
4. Future Procurement Plans should consider their impact on 'energy security'.

Action Plan Proposed Responsibilities

- The Plan developed recommendations regarding current procurement activities and future procurement plan development.
- The recommendations need the participation of several parties to successfully implement.
- In Section 5, the Plan outlines the proposed responsibilities of four parties necessary to implement recommendations and develop future procurement plans for submission to the DPUC:
 - Electric Distribution Utilities
 - CEAB
 - CCEF
 - ECMB

6. Comparing the Findings of the EDCs' IRP and the CEAB Plan

The Connecticut Energy Advisory Board
Overview

John A. Mengacci – CEAB Chair

Electric Distribution Companies

(separate presentation)

Jim Shuckerow CL&P

Rich Peters UI

Highlights of Similarities between 1/1/08 EDCs IRP and the 8/1/08 CEAB Procurement Plan

- DSM programs can likely eliminate peak demand growth cost effectively.
- EDCs recommend maximize the use of DSM. The CEAB Plan recommends adoptions of DSM Focus impacts as objectives.
- DSM can be effective at reducing emissions and lessen Connecticut's dependence on Natural Gas for generation.
- There is no need for the acquisition of additional capacity at this time.
- Non-fossil baseload generation capacity deserves further investigation for its emissions reduction and fuel diversity potential.
- Neither plan was able to assess the plan's impact on energy security or the potential for CHP to provide cost effective resources to the plans.

Highlights of Differences between 1/1/08 EDCs IRP and the 8/1/08 CEAB Procurement Plan

- Renewable energy costs and supply potential revised.
 - EDC IRP identified a shortfall in renewable energy generation in satisfying RPS requirements.
 - The CEAB Plan now recognizes that there is a potential regional supply of renewable energy that can be developed with RECs priced below the ACP.
- Approaches to RPS requirements differ.
 - The EDC IRP recommended that RPS requirements may need to be revisited given the likely ACPs to be paid in lieu of actual renewable energy.
 - The CEAB plan recommends that a strong REC and renewable energy and capacity contracting effort commence to secure the needed renewable energy generation capacity development.
- Approaches to existing generation retirements has been revised.
 - The EDC IRP analysis concluded that there likely would be no retirements of Connecticut generation over the 10-year planning horizon.
 - The CEAB plan and the supplemental analysis determined that 1400 MW or more could retire in conjunction with lower emissions rate level regulations.
- The CEAB Plan recommends the full integration of Transmission Project comparisons to Non-Transmission Alternatives (NTA) into the procurement planning process.

7. 2009 Procurement Plan Approach

- 2009 Plan due January 1, 2009
 - Development now underway
- EDCs and CEAB are discussing ways to conduct a collaborative approach
- To the extent DPUC has direction or preferences for 2009 Plan, EDCs and CEAB welcome input as early as possible to enable it to be reflected in 2009 Plan.