



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

# INCORPORATING ENERGY EFFICIENCY INTO NEW ENGLAND'S REGIONAL SYSTEM PLAN

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Director - Regional EM&V Forum

Northeast Energy Efficiency Partnerships, Inc.

*Energy Efficiency as a Resource - ACEEE Conference  
September 26, 2011*

# OVERVIEW



## 1. The Regional EM&V Forum

- Overview
- Interest in EE Forecasting and System Planning

## 2. Context: EE Goals, IRP in New England

## 3. Incorporating EE into Regional System Plans

- Current approaches (NYISO, ISO-NE, PJM)
- Key developments in New England
- Data Needs, and opportunities to coordinate with the Regional EM&V Forum

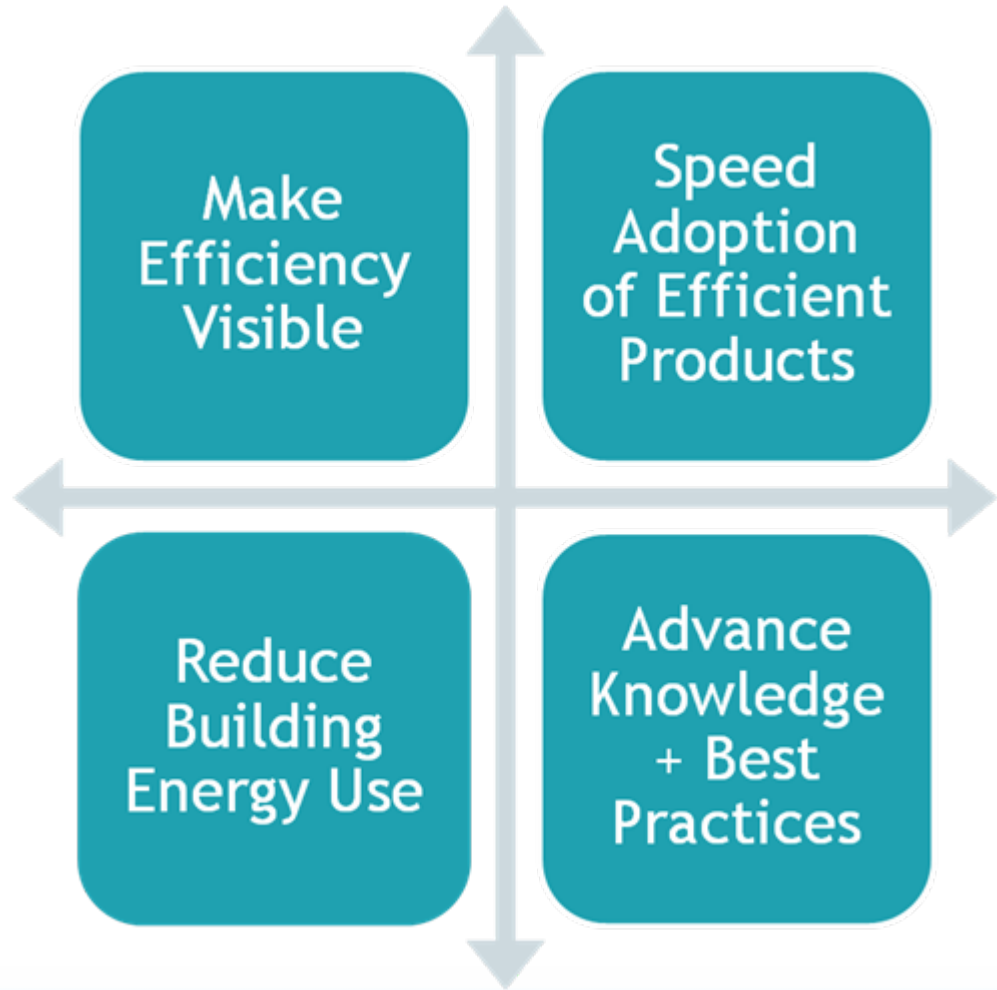
# Accelerating energy efficiency since 1996



## NEEP 2011 STRATEGIES

**MISSION**  
Accelerate energy efficiency in homes, buildings & industry in the Northeast - Mid-Atlantic region.

**GOAL**  
Keep the Northeast region a national leader in accelerating energy efficiency.



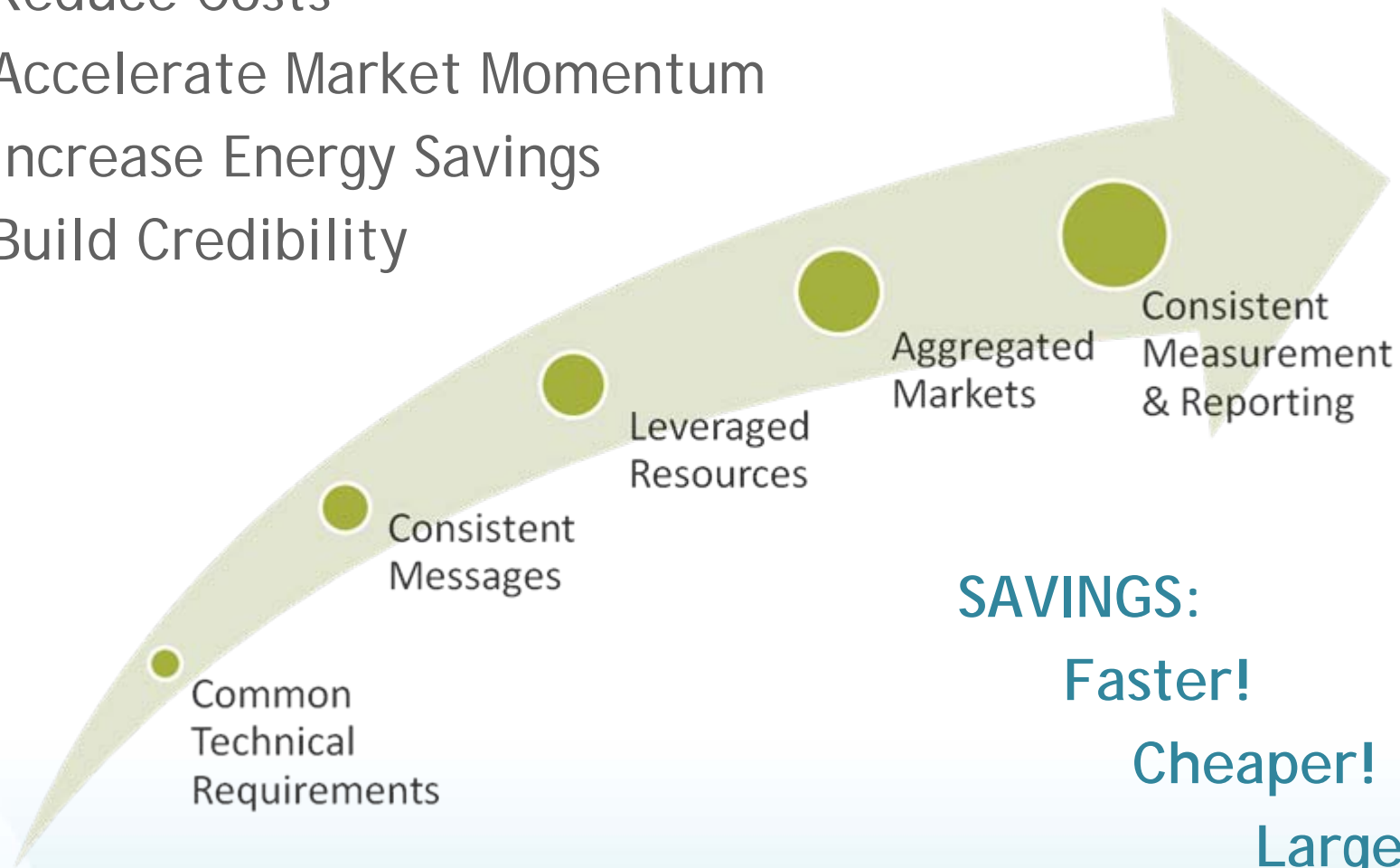
**APPROACH:** *Collaboration, Education, Advocacy*

# MAKING EFFICIENCY HAPPEN



## REGIONAL STRATEGIES

- ✓ Reduce Costs
- ✓ Accelerate Market Momentum
- ✓ Increase Energy Savings
- ✓ Build Credibility



**SAVINGS:**

**Faster!**

**Cheaper!**

**Larger!**

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# REGIONAL EM&V FORUM

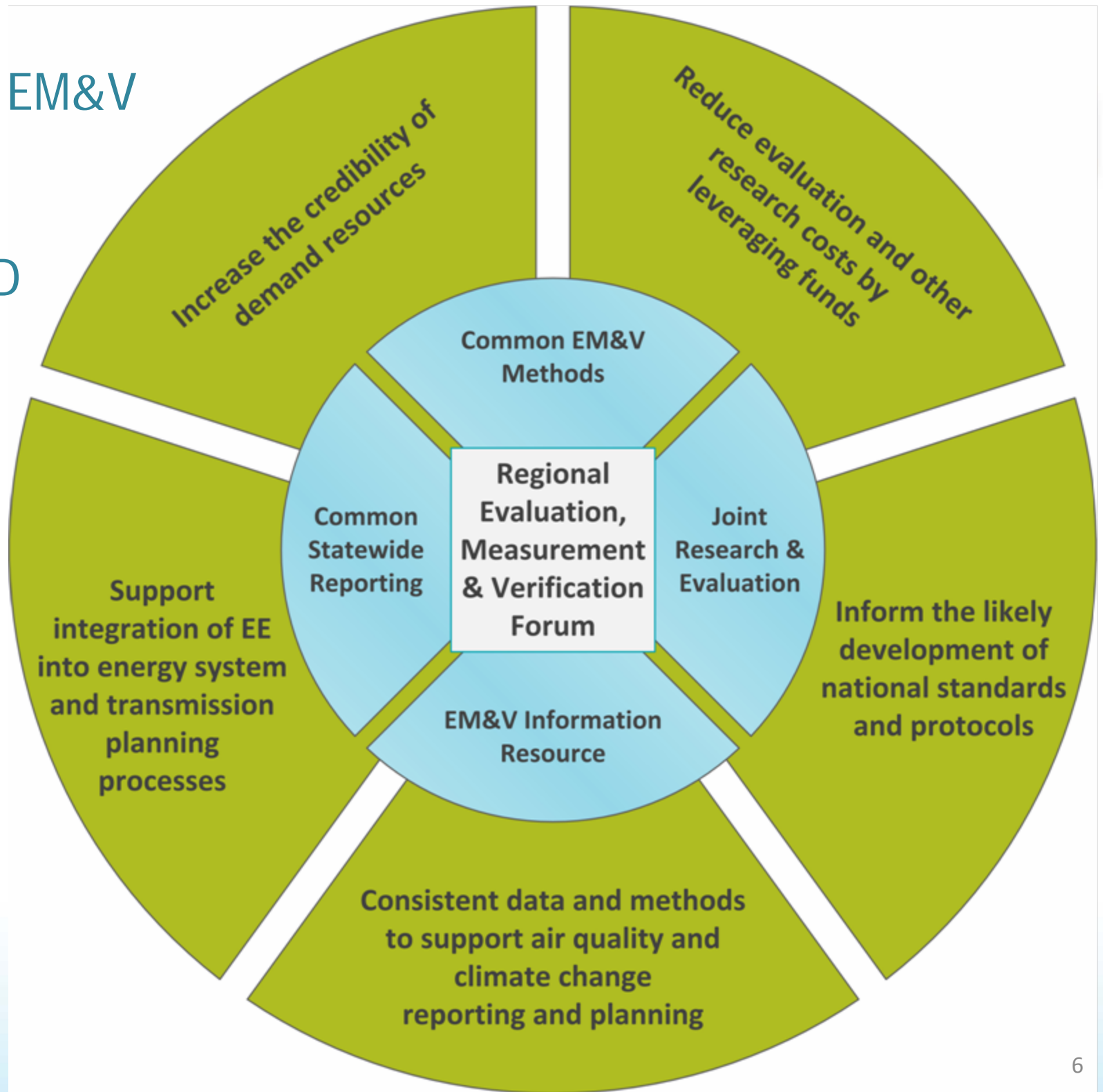


## What is the Forum?

- **New England M&V (2006-07)** - NEEP facilitated state coordination into ISO-New England development of Forward Capacity Market M&V standards/manual for demand resources
- **Resolutions passed in 2008** by New England Conference of Public Utility Commissioners (NECPUC) and Mid-Atlantic Conference of Regulatory Utility Commissioners (MACRUC) in support of establishing and funding a regional EM&V forum
- **Seed funding** (3-year plan and setting up operations) provided by: US DOE, US EPA, NYSERDA, Energy Foundation, CSG
- **Steering Committee** convened in July 2008, Project Committees formed fall 2008, Forum projects launched 2009

# REGIONAL EM&V FORUM

## GOALS AND PURPOSE:



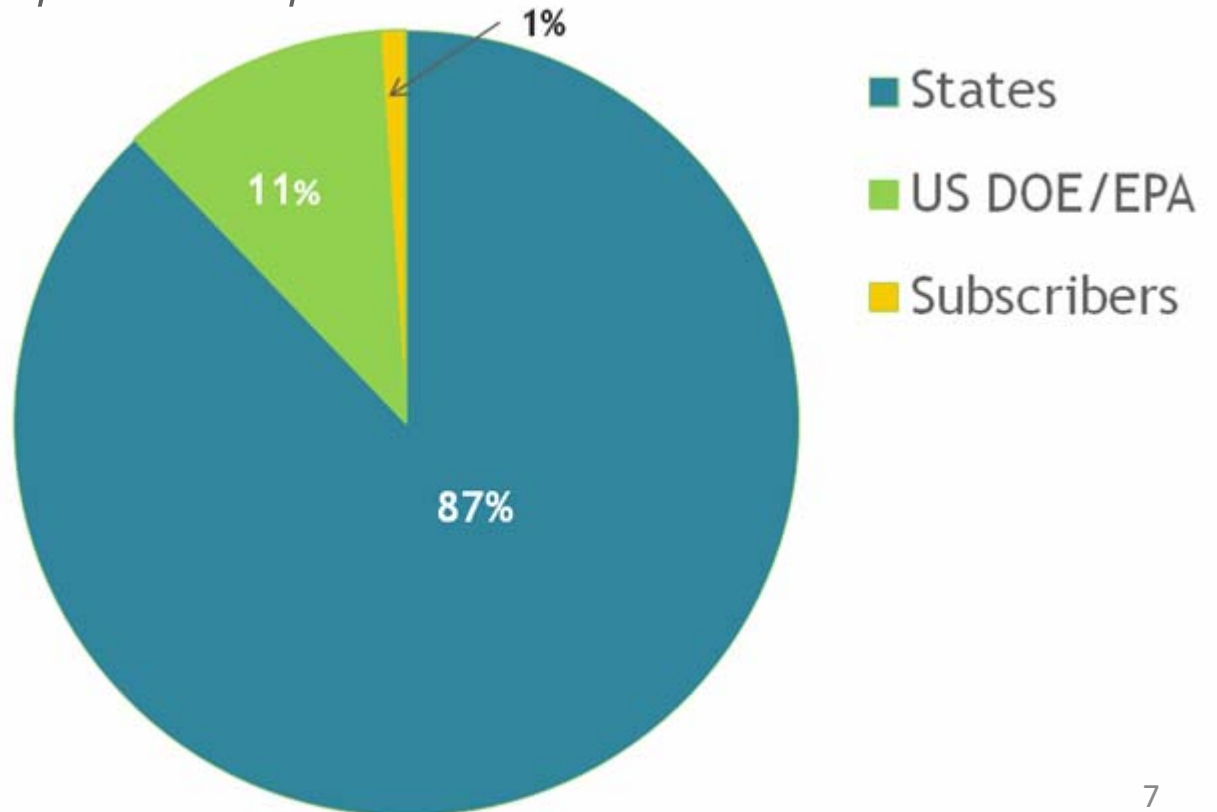
# REGIONAL EM&V FORUM



## Who's Involved?

- ❑ Ten Jurisdictions: New England, New York, Maryland, Delaware, District of Columbia
- ❑ Steering Committee: PUC commissioners and air regulator reps
- ❑ Project Committees: PUC staff and air regulatory staff, SEOs, program administrators, US DOE, US EPA

## Funding Sources:





# REGIONAL EM&V FORUM STRUCTURE AND ROLES



**NEEP Board of Directors**

- Provide overall strategic guidance for NEEP Projects
- Approve Annual Forum Project Agenda, Budget and Revenue Plan
- Oversee NEEP Operations and Fiscal Management

**Steering Committee**

- Develop Forum plans and budgets
- Support Forum funding
- Endorse for state adoption protocols and materials developed through Forum
- Provide clear, accountable governance structure
- Encourage transparency (e.g., access to info)
- Adopt provisions to protect confidential or market sensitive information/data

**Project Committees**

- Inform development of Forum project agenda & budgets
- Review and comment on draft project materials
- Develop recommendations to the Steering Committee regarding adoption of Forum products

**Project Subcommittees**

Work with NEEP staff to develop and review draft project materials: scopes of work, RFPs, contractor bid review and selection, and draft reports/deliverables

<b>Protocol Development</b>	<b>Research &amp; Evaluation</b>	<b>Education &amp; Info Access</b>
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**NEEP Forum Staff**

- Convene and facilitates committees
- Provide technical and administrative support, and project management
- Facilitate revenue generation to support Forum activities
- Retain contractors selected with Project Committees input to undertake projects
- Coordinate Forum activities with state, regional, and national EM&V efforts
- Disseminate Forum results and products to target audiences
- Conduct outreach/education to support understanding/use of Forum products
- Serve as legal fiduciary and fiscal agent/manager for Forum projects
- Maintain Forum website and EMV Library

**3<sup>rd</sup> Party Contractors**

- Conduct research to inform and develop common EM&V protocols/guidelines
- Conduct coordinated or joint R&E studies

**FORUM USERS**

# REGIONAL EM&V FORUM LEADERSHIP



**Steering Committee Co-chairs:**  
Rich Sedano, RAP and NEEP Board Member  
Paul Roberti, RI PUC

## Project Committee Co-Chairs

### Protocol Development

Lisa Shea  
(NSTAR Electric & Gas)  
Helen Eisenfeld and  
Mary Cahill  
(NY Power Authority)

### Research & Evaluation

Dave Jacobson  
(National Grid)  
Tom Belair  
(Public Service NH)

### Education & Info Access

Crissy Godfrey  
(MD Public Service  
Commission)  
Pam Stonier  
(VT Public Service  
Board)

# FORUM PROJECTS (to date, in progress, of interest)

## Protocol Development



- ❑ Forum Glossary of EM&V Terms (2011 V2)
- ❑ Regional EM&V Methods Guidelines (2010)
- ❑ Mid-Atlantic TRM (MD, DE, DC) (2010/2011 update)
- ❑ Net Savings Scoping Paper (2010-11); Net Savings Common Definitions and Policy Research (Q1 2012)
- ❑ Common Statewide EE Reporting Guidelines (2010) - with Phase 2 Implementation in 2011-12
- ❑ Impact of EE on Codes & Standards Workshop (2010); with possible guidelines for estimating savings (2012)
- ❑ *Develop Guidelines for Incorporating EE into System Planning - on-going interest in topic...*

## FORUM PROJECTS (TO DATE, IN PROGRESS)

### Research & Evaluation / Education & Info Access



### RESEARCH & EVALUATION PROJECTS

- Loadshape Research - Unitary HVAC, Comm. Lighting, Phase 3 starting this fall (2009-2012) \*
- Commercial Lighting Measure Persistence (2010-11) \*
- Incremental Cost Study (2011)
- Emerging Technologies Savings Assumptions (2011-12) \*

### EDUCATION & INFORMATION ACCESS

- Regional EE Database (REED): Launch in Q1 2012*
- EM&V Resource Library
- Forum Annual Public Meetings - 2009, 2010, 2011 meeting on *October 12 in Albany, New York - includes ISO/RTO Panel to discuss EE in system planning*

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# The New England Landscape



- All states except Vermont deregulated in late 1990s
- With deregulation, **IRP no longer except in VT and CT** - as such, New England is not Northwest (no regional IRP in place, no Tom Eckman ☹ ), nor WECC
- States have **variety of energy efficiency goals, legislative mandates, different EE planning cycles**
- But ...with significant ramp up of efficiency investment in region, strong desire/push from New England PUC regulators **for ISO New England to integrate efficiency more comprehensively into its system planning process**

# EFFICIENCY POLICIES ACROSS NEW ENGLAND

## *A VARIETY OF GOALS*



State	Policy Type	Delivery	Energy Savings Goals
<a href="#"><u>Connecticut</u></a>	All Cost Effective EE- <i>Funding Limited by IRP</i>	Utilities	<i>Annual savings targets not currently in place</i>
<a href="#"><u>Maine</u></a>	All Cost Effective EE- <i>Funding Limited by Legislature</i>	Efficiency Maine Trust	1.4% of electricity sales annually and 130 BBTU gas savings by 2013
<a href="#"><u>Massachusetts</u></a>	All Cost Effective EE	Utilities	2.4% of electricity and 1.15% of natural gas sales annually by 2012
<a href="#"><u>New Hampshire</u></a>	<i>Funding Limited by Cap on SBC</i>	Utilities	<i>In process</i>
<a href="#"><u>Rhode Island</u></a>	All Cost Effective EE	Utilities	Estimated 2.5% of electric & 1.0% of natural gas sales by 2014
<a href="#"><u>Vermont</u></a>	All Cost Effective EE	Energy Efficiency Utility	2.2% of sales annually

# EFFICIENCY POLICIES: NEW YORK AND THE MID-ATLANTIC

## *A VARIETY OF GOALS*



State	Policy Type	Delivery	Energy Savings Goals
<a href="#">Delaware</a>	Energy Efficiency Resource Standard- <i>Not Yet Implemented</i>	Sustainable Energy Utility	15% of electricity use by 2015
District of Columbia	<i>Efficiency Funding Only</i>	Sustainable Energy Utility	<i>No mandated savings goals</i>
<a href="#">Maryland</a>	Energy Efficiency Resource Standard	Electric Utilities	15% of per capita electricity use by 2015
<a href="#">New Jersey</a>	<i>Efficiency Funding Only</i>	Office of Clean Energy + Utilities	20% of energy use by 2020
<a href="#">New York</a>	Energy Efficiency Portfolio Standard	NYSERDA + Utilities	15% percent reduction in electric and natural gas use by 2015
<a href="#">Pennsylvania</a>	Energy Efficiency Resource Standard	Utilities	3% reduction in annual electric use by 2013



# REGIONAL RAMP UP IN EFFICIENCY SPENDING

*INVESTMENT IN EFFICIENCY HAS GROWN SIGNIFICANTLY*



## Federal Recovery Act Funding

2009 to 2011: \$2.33 billion  
\$610 million - New England  
\$712 million - New York  
\$1.01 billion - Mid-Atlantic  
(NJ, MD, DE, DC, PA)

## Ratepayer Funding

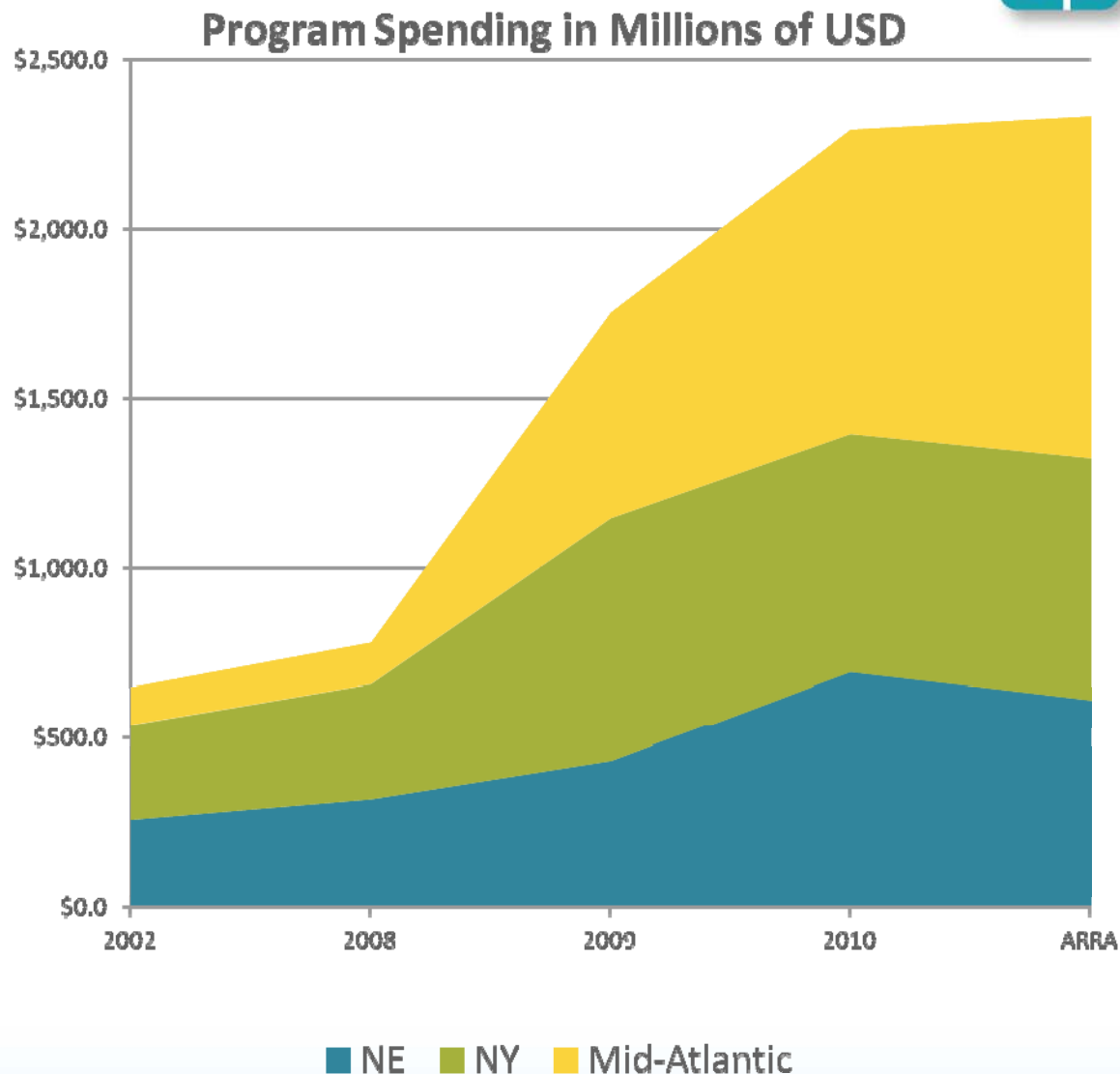
2009 - \$1.57 billion  
2010 - \$1.84 billion

## Capacity Market Commitments

PJM 2009- TBD  
ISO NE 2006-2015 ~\$250 million

## RGGI Revenue

2008-2010 Auction Proceeds  
\$729.2 million  
65.3% for Energy Efficiency



\* Figures include spending on electric and natural gas efficiency programs, Regional Greenhouse Gas Initiative (RGGI) auction revenues, and ISO-New England Forward Capacity Market (FCM) revenues. ARRA funds are listed separately.

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# ISO/RTO Current Approaches to Incorporating EE into their System Plans



## Overview

- 1) **NYISO** - developed approach in 2010 using production cost model based on historical data and statewide 15 X 15 EEPS goal
- 2) **ISO New England** - to date, system plan reflects EE resources that are cleared in the Forward Capacity Market (i.e., 2011 plan reflects investments through 2014, and savings from 2014 investments to 2018)
- 3) **PJM** - same approach as ISO New England: Only EE resources that clear capacity market (Reliability Pricing Model) are reflected in forecast



# NY ISO Approach

## Production Cost Model Adopted in 2010

- Basic approach to forecasting for Planning System  
Reliability: NYISO prepares an econometric forecast, a separate EE forecast , where system forecast is net of EE impacts
- Used data from PA scorecards filed with NY DPS
- Developed production cost approach:
  - Estimated cost / MWh and compared to budgeted cost/MWh previously provided to NYISO by NY DPS
  - Data served as basis for producing a probabilistic, cost-based approach:

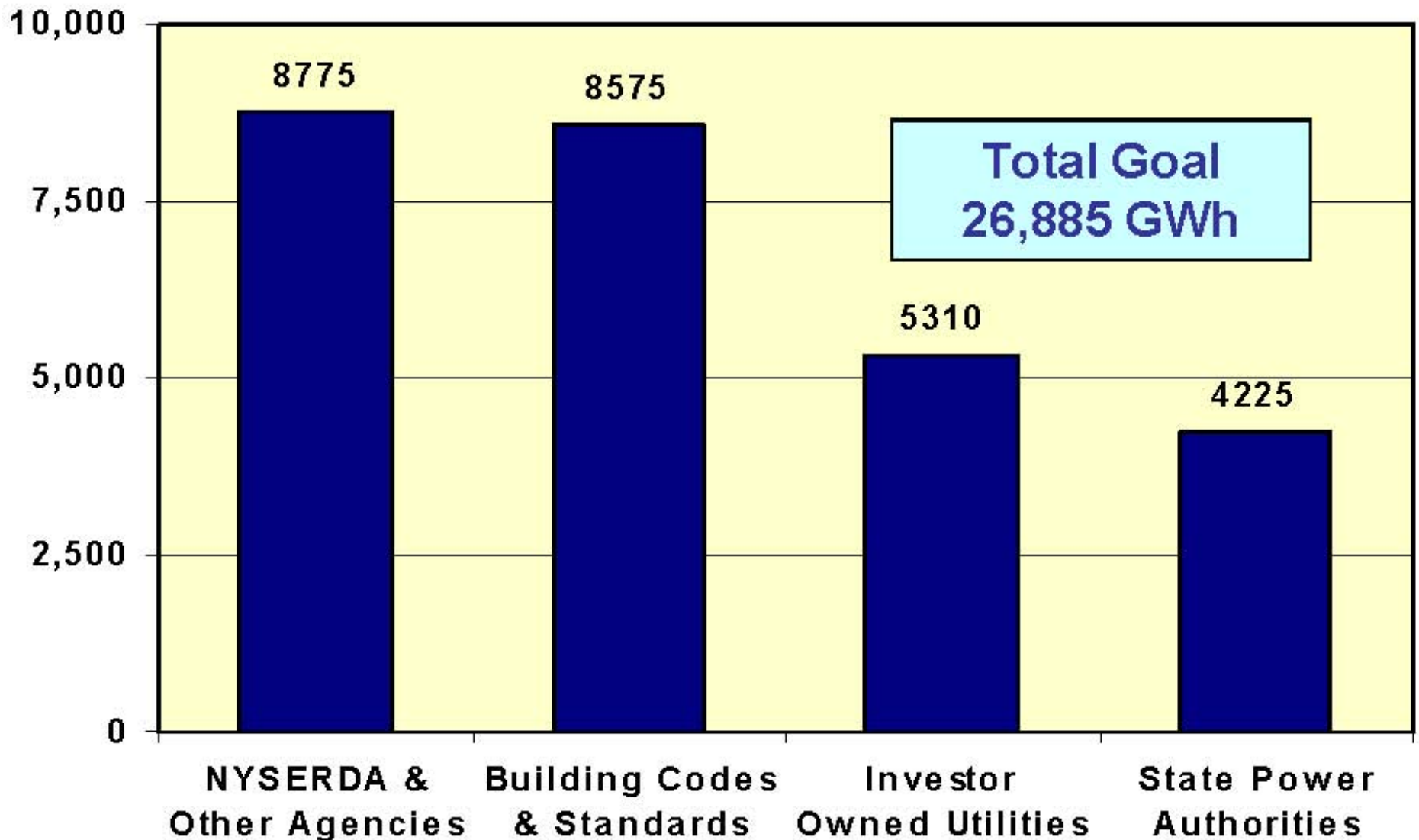
$$\text{GWh\_Yr} = \text{Budget\_\$M\_yr} * \text{fraction\_spent} / \text{\$_per\_MWh} * \\ (1 \text{ GWh} / 1000 \text{ MWh}) * (\text{Net\_to\_Gross ratio})$$

$$\text{MW\_Yr} = \text{GWh\_Yr} / 8.76 / \text{Load\_Factor}$$

# NY EEPS GOALS - 15% Reduction in Energy Use by 2015



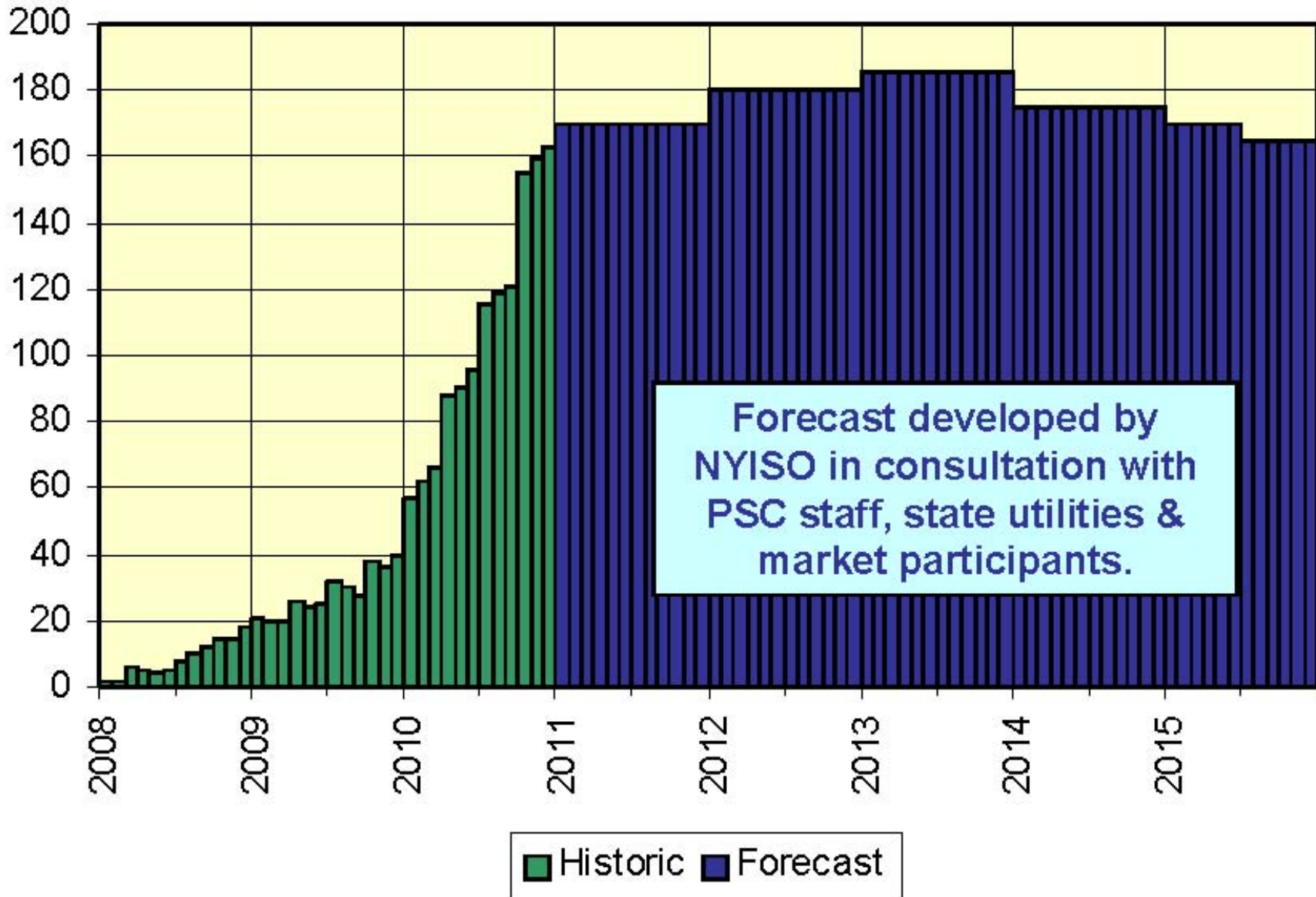
## NY Energy Efficiency Goals - GWh



# NY ISO EE Forecast 2010



## Actual & Forecast Energy Efficiency Trends: New EE Impacts Added Each Month (GWh)

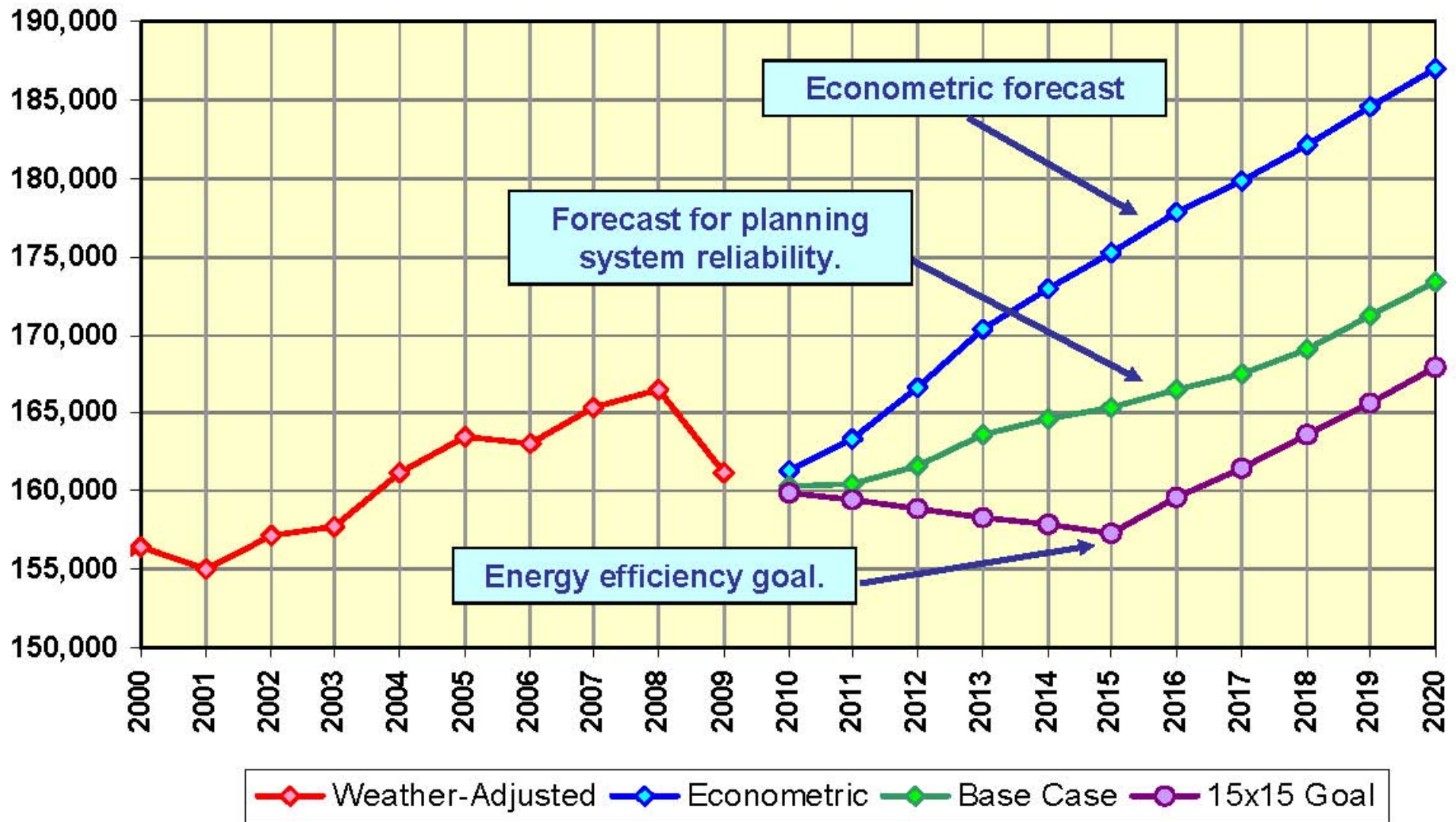


# NY ISO 2010 Forecast



## 2010 Reliability Needs Assessment Energy Forecasts - GWh

With and Without Projected Energy Efficiency Impacts





# ISO New England

## Approaches Being Considered

- **Current approach:** EE resources that cleared in FCM
- 2010-11: New England Conference of Public Utilities Commissioners (NECPUC) **strong push for ISO-NE to forecast EE beyond FCM period (2014)** - need longer term forecast for EE given significant ramp up of EE in region
- **Key stakeholders** involved in effort:
  - NECPUC staff
  - NESCOE (New England States Committee on Electricity)
  - Program Administrators
  - ISO-NE staff, ISO Planning Advisory Committee (PAC)





# ISO New England

## Approaches Being Considered, cont.

- **Production Cost Model (ISO-NE)** - builds on NY approach, but with request for more detailed assumptions on projected programs, savings, costs
- **Alternative approach (NECPUC/NESCOE)**: use rolling average of EE resources cleared in the 3 FCM auctions prior to the forecast year
- **Other?** What about data from state/regional achievable potential studies?

# ISO New England

## Approaches Being Considered, cont.



### NECPUC/NESCOE concerns with using Production Cost Model:

- EE planning cycle for most NE states is no more than 3 yrs
- Production cost values would be based on *current* set of EE programs
- Developing production cost curve would require considerable data gathering with subjective predictions about future programs and budgets = exercise in false precision

### NECPUC/NESCOE advantages to alternative approach:

- PAs already predict future savings for 3 yrs to bid into FCA
- Increases objectivity, decreases debate about future unknowns
- Less burdensome in terms of data collection

# NECPUC/NESCOE Proposed Approach

## Rolling 3-Year Average of FCAs - Illustration



FCA	Mo/Yr	CCP	Mo/Yr	RSP	PlanningHorizon	FCA Results Used in:	3-yr rolling avg used in:
2	Dec – 08					(first 4 yrs	(last 6 yrs
3	Oct – 09					Of plan)	Of plan)
4	Aug – 10						
5	June – 11	2	Jun – 11	12	2013 – 2022	2013 – 2016	2017 – 2022
6	Apr – 12	3	Jun – 12	13	2014 – 2023	2014 – 2017	2018 – 2023
7	Feb – 13	4	Jun – 13	14	2015 – 2024	2015 – 2018	2019 – 2024
8	Feb – 14	5	Jun – 14	15	2016 – 2025	2016 – 2019	2020 – 2025
9	Feb – 15	6	Jun – 15	16	2017 – 2026	2017 – 2020	2021 – 2026
10	Feb – 16	7	Jun – 16	17	2018 – 2027	2018 – 2021	2022-2027

In 2013, PA will deliver its commitment (that was bid 3 years prior in FCA #4), and bids into FCA #7. ISO planning in 2013 for RSP 2014 will have values for summers 2015-18 based on FCA #7, and can use 3-year rolling average of what cleared in the most recent 3 FCAs to forecast for 2016-2024 period.

# ISO/RTO Forecasting and Data Needs

## Coordinating with Regional EM&V Forum



- Forum Annual Public Meeting - Oct. 12, 2011 in Albany NY

1:30pm Incorporating EE into Regional System Planning - Part 2:  
*Where are we a year later with efforts to more comprehensively integrate EE into system planning, and how can these efforts interface with Forum products and air quality planning?*

Moderator: Paul Roberti, Commissioner - RI PUC, and Steering Committee co-chair

Arthur Maniaci - New York ISO

Eric Winkler - ISO New England

John Reynolds - PJM Interconnection

John Moskal, EPA Region 1

- Forum Regional Energy Efficiency Database (REED) project

# REGIONAL EM&V FORUM

## Regional Energy Efficiency Database (REED)



- REED design and development underway for:
  - a state EE data collection tool (consistent with *Common Statewide EE Reporting Guidelines* table templates); and
  - a regional energy efficiency database with **interactive web-based graphical reports** that will be publically available to all interested stakeholders/users
- **Project subcommittee members** include state entities designated to populate data collection tool (e.g., SEOs, PUCs, program administrators) and air quality reps, ISO/RTO staff
- **Launch in January 2012**, states to report EE program impacts for 2011 program year

## REGIONAL EM&V FORUM

### Regional Energy Efficiency Database (REED) cont.



- REED outputs/reports:
  - ✓ Annual incremental energy savings
  - ✓ Lifetime energy savings
  - ✓ Peak demand savings (summer/winter)
  - ✓ Expenditures, cost of saved energy
  - ✓ Avoided emissions
  - ✓ Job impacts
  - ✓ *Other (Version 2): Forecasted EE Data?*
- **Interactive Reports** – view data graphically by selected state(s) or region(s), compare and/or aggregate data



# REED DATABASE PROCESS



# REED LOGIN PAGE



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Current Reporting Period: **12/31/2011** ; after completing and uploading all forms you can submit the report to NEEP.

Jurisdiction/State

Rhode Island

Reporting Period

12/31/2011

Show only forms not yet uploaded

Include overwritten forms

Form Name	Form Description	Download Blank Form	Upload Completed Form	Date Uploaded
Table1.0	<input checked="" type="checkbox"/> Description of Reported Energy Efficiency Savings			<a href="#">8/28/2011</a>
Table1.1	<input type="checkbox"/> Incremental Annual Energy Savings			
Table1.2	<input type="checkbox"/> Energy Efficiency Program Lifetime Energy Savings			
Table1.3.1	<input checked="" type="checkbox"/> Summer Peak Annual Demand Savings			<a href="#">9/14/2011</a>
Table1.3.2	<input type="checkbox"/> Winter Peak Annual Demand Savings			
Table2.1	<input type="checkbox"/> Efficiency Program Funding Sources			
Table2.2	<input type="checkbox"/> Electric and Gas Energy Efficiency Program Expenditures			
Table2.3	<input type="checkbox"/> Cost of Saved Energy			
Table3	<input type="checkbox"/> Avoided Emissions			
Table4	<input type="checkbox"/> Job Impacts from Energy Efficiency Investments			

Status

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D9

ENERGY EFFICIENCY PROGRAM SAVINGS  
Residential Non-Low Income Customer  
by Program (Enter Program name below)

Back

E38

Report Incomplete: Please enter values in all fields with red backgrounds

Table 1.3.1: Summer Peak Annual Demand Savings

Jurisdiction/State	Program Year	Adjusted Gross Demand Savings		Net Demand Savings	
		Generation Level (MW)	Meter Level (MW)	Generation Level (MW)	Meter Level (MW)
<b>Summer Peak Demand Savings by Sector and Program</b>					
<b>ENERGY EFFICIENCY PROGRAM SAVINGS</b>					
<a href="#">Residential Non-Low Income Customer Sector</a>		-	2,000,000	-	-
<a href="#">Residential Low Income Customer Sector</a>		-	-	-	-
<a href="#">Commercial &amp; Industrial Customer Sector</a>		-	-	-	-
<b>TOTAL ENERGY EFFICIENCY PROGRAM SAVINGS</b>		-	2,000,000	-	-
<a href="#">TOTAL DEMAND RESPONSE PROGRAM SAVINGS</a>		-	-	-	-
<b>TOTAL SUMMER PEAK DEMAND SAVINGS</b>		-	2,000,000	-	-

Summer Annual Demand Savings - coincident with:

Utility Peak Demand  ISO/RTO System Peak  Other

Provide description of peak coincidence hours (e.g., average hours, maximum hours during peak):

Required fields

Notifications

Data value validation

# VIEW REPORTS

SAMPLE REPORT

COMPARISON OF COST OF SAVED ENERGY



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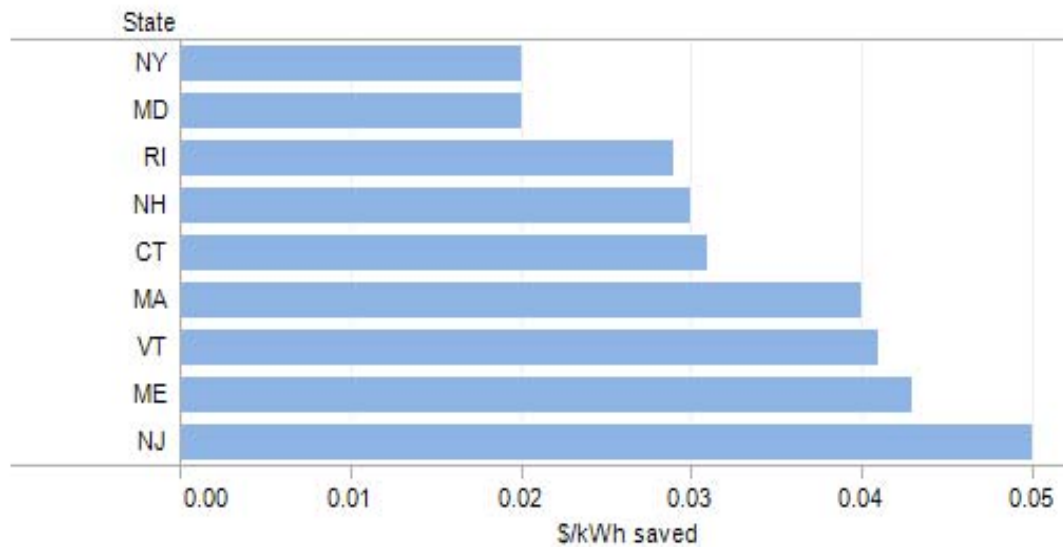
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### Cost of Saved Energy



## Next Steps / My Questions...

### Coordinating with and across ISO/RTOs



## Develop common approach/method for how system operators integrate EE into their regional plans

- How important is it to use similar “methods,” or is approach fundamentally unique to each region?
- Are there common elements that cut across different approaches worth building some consistency and documenting into guidelines? e.g., level of certainty, definition of net vs gross, estimating C&S impacts, other?
- Is national guidance needed to document best practice (NW, WECC, CA, Northeast etc...), including addressing bottom up with top down forecasting approaches?
- What about methods for incorporating EE into distribution utility system planning?

## Next Steps (and Questions...) cont. Coordinating with and across ISO/RTOs



### Data Needs to Support EE and System Planning:

- For New England (and PJM) can REED help support ISO/RTO forecasting needs (ISO-NE 2011 RSP cites Forum's Common EE Reporting Templates)?
- Incorporate ISO/RTO forecasted data into REED (future REED module)? Make forecasted EE data readily available to range of policymakers (e.g., SEOs, air regulators, NGOs, others)
- Coordinate with EIA data (Form 861), other EE forecasts (IPM)



For more information:

<http://neep.org/emv-forum>

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