

## When Achievement Exceeds Potential: High Savings in Massachusetts and Rhode Island

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Presented at the 2015 ACEEE  
*National Conference on Energy Efficiency as a Resource*  
September 22, 2015

## Presentation Goals

- ▶ Provide an overview of the EE programs
- ▶ Describe the regulatory environment for energy efficiency in MA and RI
- ▶ Highlight the great results achieved by MA and RI
- ▶ Discuss some reasons for high savings

## Who are Optimal Energy?

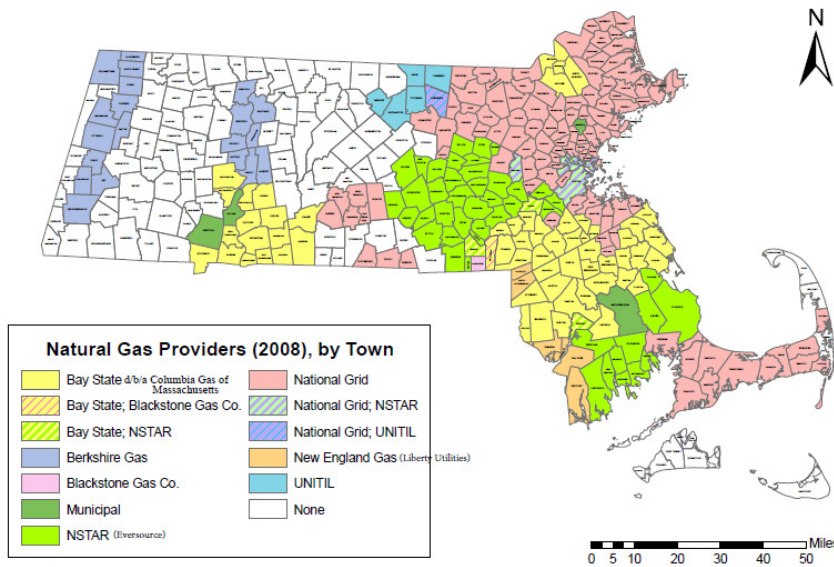
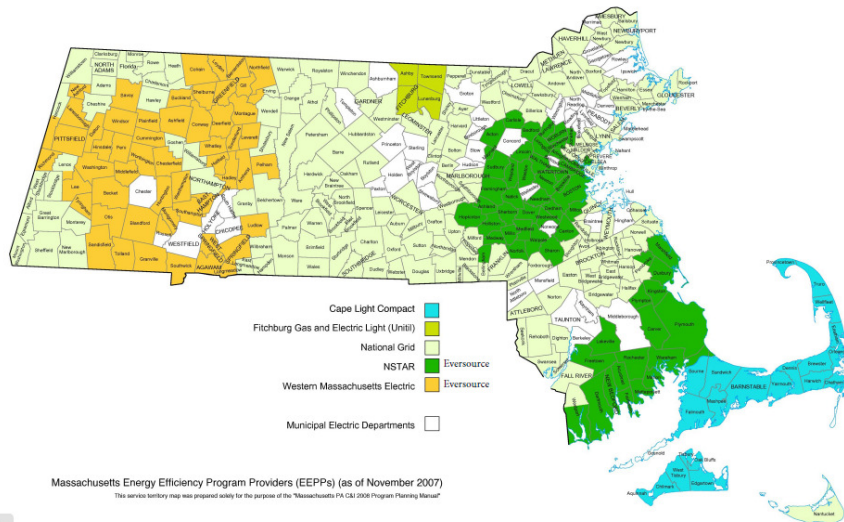
Founded in 1996, Currently 12 employees  
Offices in Hinesburg, VT and Providence, RI  
Expertise in:

- ▶ Program Design
- ▶ Potential Studies for Energy Efficiency and Renewable Energy
- ▶ Technical Reference Manual (TRM) Development
- ▶ Strategic Guidance and Policy Support
- ▶ Technical Support and EM&V Services
- ▶ Expert Testimony



# Mass. Energy Efficiency Program Administrators

- ▶ Electric: National Grid, Eversource, Unitil, Cape Light Compact
- ▶ Gas: National Grid, Eversource, Columbia, Unitil, Berkshire, Liberty

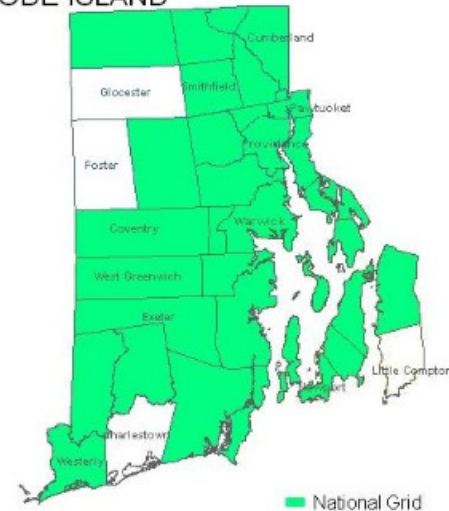


# RI Energy Efficiency Program Administrator

- ▶ Electric: National Grid
- ▶ Gas: National Grid



RHODE ISLAND



## Program Cost Effectiveness and Funding

- ▶ Total Resource Cost is used for cost effectiveness
- ▶ Benefit Cost Ratio must be  $>1$  for projects, not measures
- ▶ Cost recovery
  - Total Budget + LBR = EERF + SBC + FCM + RGGI + Other Funds + Carryover Funds
- ▶ Incentives for meeting and exceeding goals

## Program Cost Effectiveness and Funding

- ▶ No limits on spending
- ▶ MA EE spending is about 6.7% of electric sales
- ▶ RI EE spending is about 7.5% of electric sales

|               | 2015 Budgets   |                | 2015 Program Charge |              |
|---------------|----------------|----------------|---------------------|--------------|
|               | Electric       | Gas            | Electric, per kWh   | Gas, per Dth |
| Massachusetts | \$ 703,907,130 | \$ 180,092,607 | \$ 0.01085          |              |
| Rhode Island  | \$ 86,741,232  | \$ 24,416,348  | \$ 0.00966          | \$ 0.681     |

# Program Structure

## ▶ C&I

- Upstream
- New Construction
- Retrofit
- Small Business

## ▶ Low Income

## ▶ Multifamily

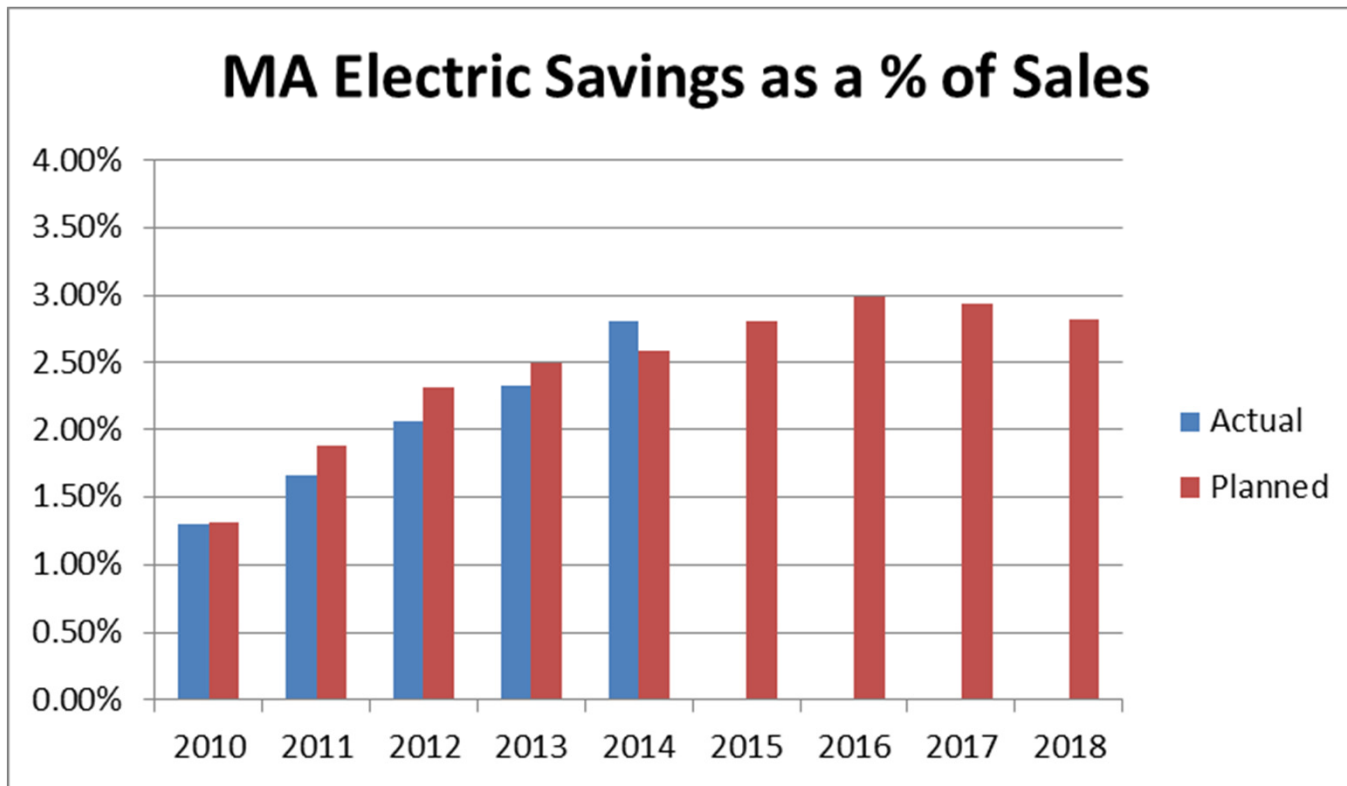
## ▶ Residential

- Upstream
- New Construction
- Retrofit
- HVAC, Appliances, Lighting
- Behavior



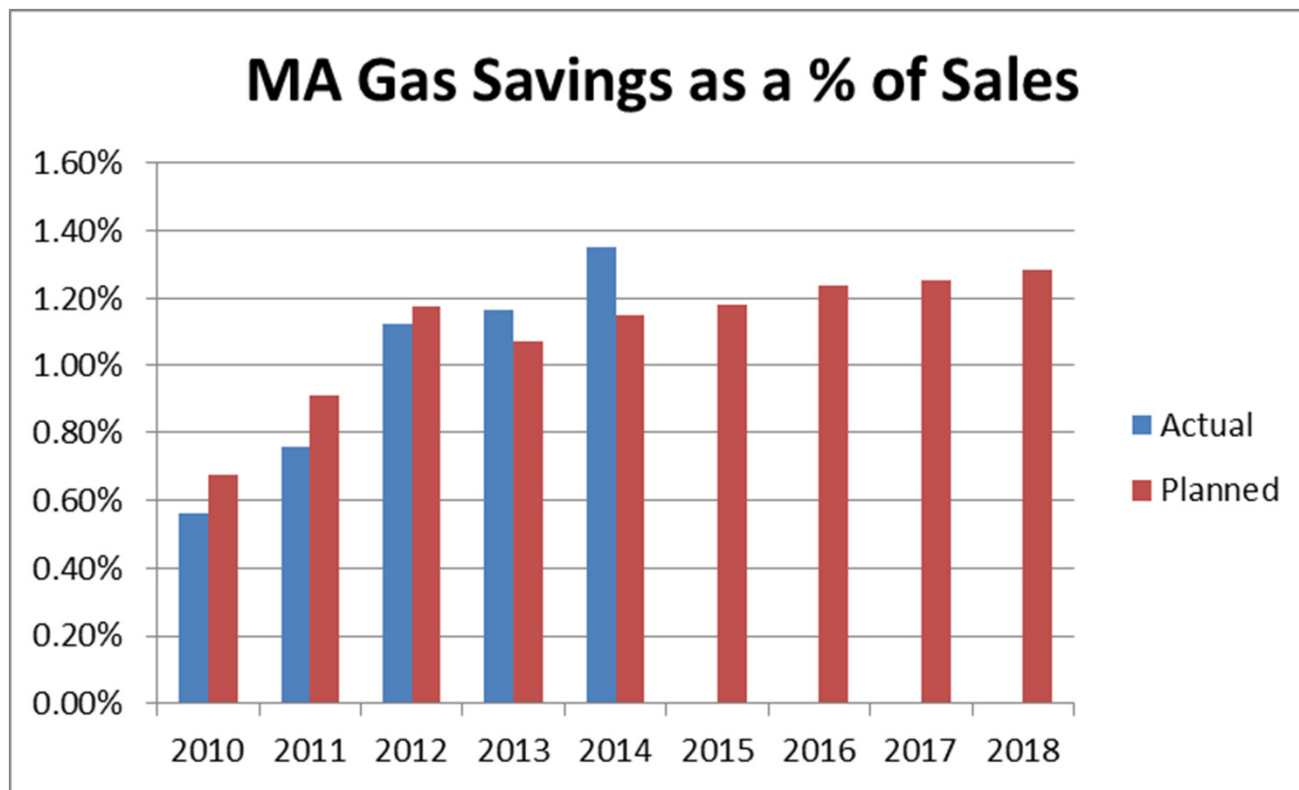
# Massachusetts 2014 Electric Achievement

- ▶ Massachusetts exceeded their electric goals in 2014
- ▶ Electric savings were 2.80% of projected 2013 sales



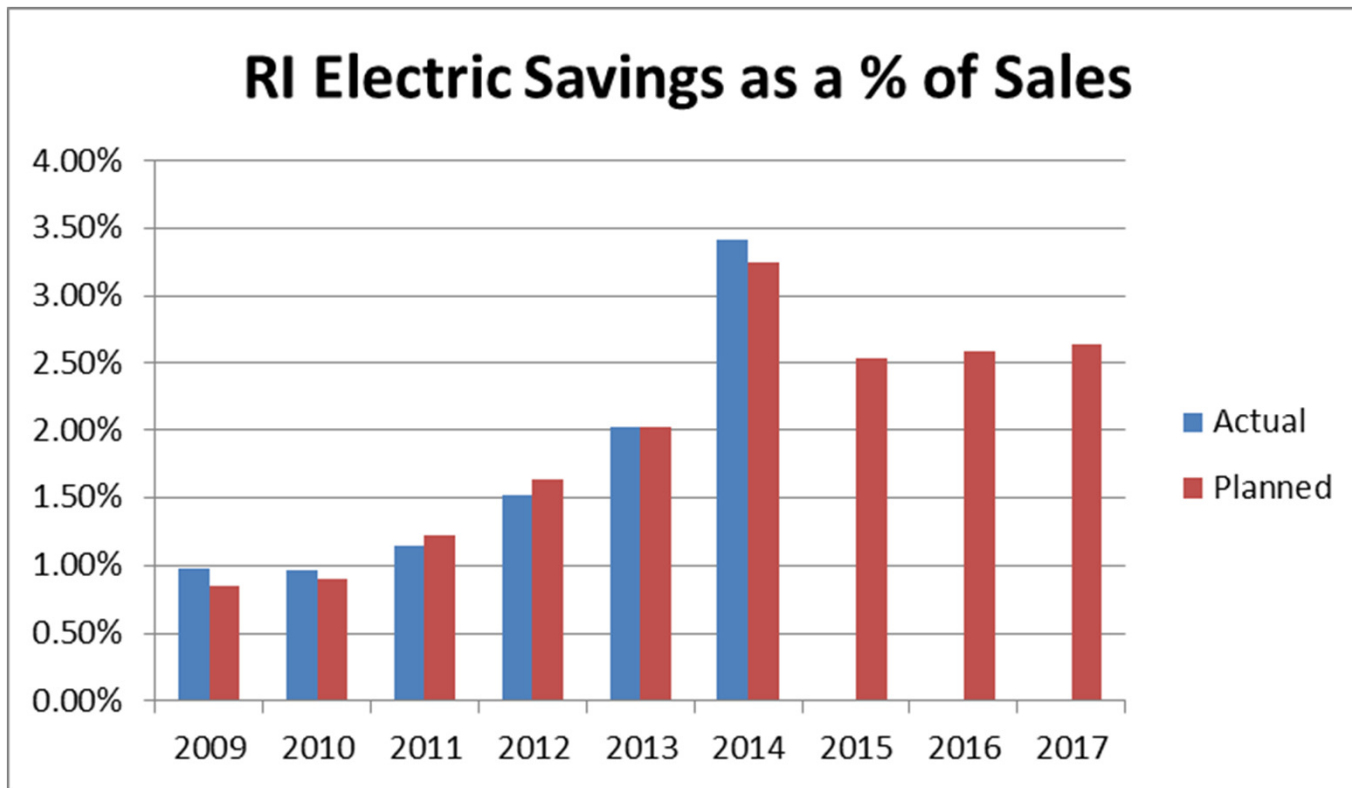
# Massachusetts 2014 Gas Achievement

- ▶ Massachusetts exceeded their gas goals in 2014
- ▶ Gas Savings were 1.35% of projected 2013 sales



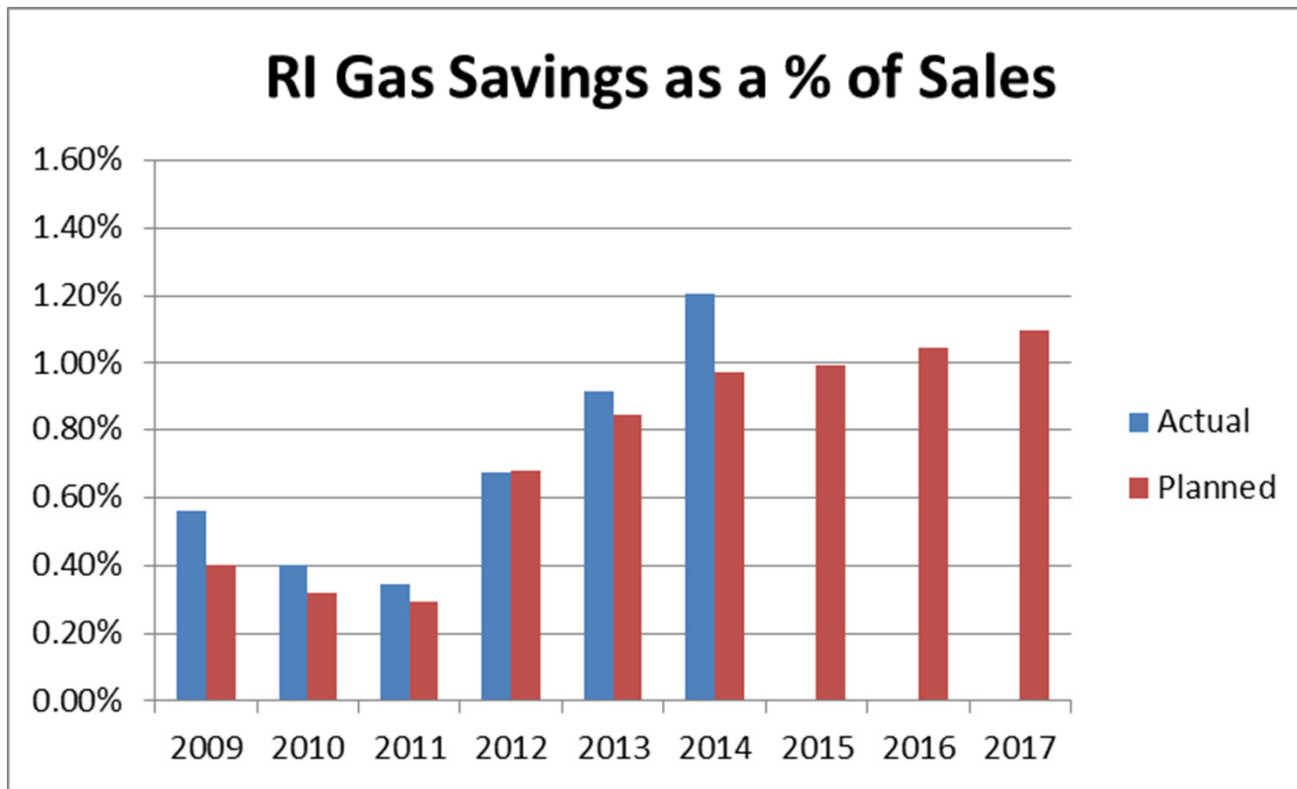
# Rhode Island 2014 Electric Achievement

- ▶ Rhode Island exceeded their electric goals in 2014
- ▶ Electric savings were 3.42% of projected 2012 sales



# Rhode Island 2014 Gas Achievement

- ▶ Rhode Island exceeded their gas goals in 2014
- ▶ Gas savings were 1.20% of projected 2012 sales



## Potential Study Predictions

- ▶ Aggressive electric potential studies applicable to the northeast (2002 - 2009) predicted achievable potential averaged about 22% over ten years, or 2.2% per year
- ▶ Adding CHP as an electric energy efficiency measure bumps potential by 0.7% annually
- ▶ Gas potential studies (2003 and 2009) predicted achievable potential of 1.7% per year
- ▶ Source: <http://ma-eeac.org/wordpress/wp-content/uploads/ElectricPlanFinalOct09.pdf> Appendix A

## 2014 Electric Performance Details

| Massachusetts | 2014 Program Year - Electric | Savings MWh |            | Implementation Expenses | Costs \$/MWh |          |
|---------------|------------------------------|-------------|------------|-------------------------|--------------|----------|
|               |                              | Annual      | Lifetime   |                         | Annual       | Lifetime |
|               | Residential                  | 520,010     | 3,790,658  | \$ 331,158,264          | \$ 637       | \$ 87    |
|               | Low Income                   | 45,872      | 454,269    | \$ 60,015,113           | \$ 1,308     | \$ 132   |
|               | Commerical and Industrial    | 773,144     | 9,310,037  | \$ 375,076,539          | \$ 485       | \$ 40    |
|               | Total                        | 1,339,026   | 13,554,964 | \$ 766,249,915          | \$ 572       | \$ 57    |

| Rhode Island | 2014 Program Year - Electric | Savings MWh |           | Implementation Expenses | Costs \$/MWh |          |
|--------------|------------------------------|-------------|-----------|-------------------------|--------------|----------|
|              |                              | Annual      | Lifetime  |                         | Annual       | Lifetime |
|              | Residential                  | 91,497      | 606,245   | \$ 24,888,500           | \$ 272       | \$ 41    |
|              | Low Income                   | 8,186       | 92,069    | \$ 9,549,900            | \$ 1,167     | \$ 104   |
|              | Commerical and Industrial    | 168,785     | 2,579,773 | \$ 44,624,200           | \$ 264       | \$ 17    |
|              | Total                        | 268,468     | 3,278,087 | \$ 79,062,600           | \$ 294       | \$ 24    |

## 2014 Gas Performance Details

| Massachusetts | 2014 Program Year - Gas   | Savings Therms |             | Implementation Expenses | Costs \$/Therm |          |
|---------------|---------------------------|----------------|-------------|-------------------------|----------------|----------|
|               |                           | Annual         | Lifetime    |                         | Annual         | Lifetime |
|               | Residential               | 15,691,501     | 176,279,050 | \$ 98,897,476           | \$ 6.30        | \$ 0.56  |
|               | Low Income                | 2,628,673      | 51,936,434  | \$ 38,284,014           | \$ 14.56       | \$ 0.74  |
|               | Commerical and Industrial | 10,323,023     | 154,642,232 | \$ 33,914,584           | \$ 3.29        | \$ 0.22  |
|               | Total                     | 28,643,197     | 382,857,716 | \$ 171,096,074          | \$ 5.97        | \$ 0.45  |

| Rhode Island | 2014 Program Year - Gas   | Savings Therms |            | Implementation Expenses | Costs \$/Therm |          |
|--------------|---------------------------|----------------|------------|-------------------------|----------------|----------|
|              |                           | Annual         | Lifetime   |                         | Annual         | Lifetime |
|              | Residential               | 1,837,740      | 25,900,850 | \$ 9,829,100            | \$ 5.35        | \$ 0.38  |
|              | Low Income                | 295,710        | 5,203,610  | \$ 4,246,800            | \$ 14.36       | \$ 0.82  |
|              | Commerical and Industrial | 1,956,840      | 28,789,350 | \$ 5,586,800            | \$ 2.86        | \$ 0.19  |
|              | Total                     | 4,090,290      | 59,893,810 | 19,662,700              | \$ 4.81        | \$ 0.33  |

# Energy Efficiency Least Cost Procurement

- ▶ MA and RI both have legislation mandating *All Cost Effective* efficiency
- ▶ MA Green Communities Act, 2008: “the department shall ensure that they are delivered in a cost effective manner capturing **all available efficiency opportunities**, minimizing administrative costs to the fullest extent practicable, and utilizing competitive procurement processes to the fullest extent practicable.” MA Gen L ch.25 § 19



# Energy Efficiency Least Cost Procurement

- ▶ RI, 2008: “The commission shall issue an order approving **all energy efficiency** measures that are cost-effective and lower-cost than acquisition of additional supply.” Rhode Island Statute § 39-1-27.7
- ▶ There are 7 states with All Cost Effective mandates:

| State         | ACEEE Rank |
|---------------|------------|
| California    | 2          |
| Connecticut   | 6          |
| Maine         | 16         |
| Massachusetts | 1          |
| Rhode Island  | 3          |
| Vermont       | 3          |
| Washington    | 8          |

## Mass. and Rhode Is. Program Oversight

- ▶ MA and RI both have Advisory Councils to oversee the energy efficiency programs
  - MA Energy Efficiency Advisory Council (EEAC)
  - RI Energy Efficiency Resource Management Council (EERMC)
- ▶ Councils are made up of Appointed Representatives who represent stakeholders (low income, industry, commercial real estate, environment, etc.)
- ▶ MA DOER and RI OER are very involved
- ▶ Optimal is a consultant to both Councils and works closely with both Energy Offices

Questions?

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## MA Electric Program Plan

|  | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>Total<br/>2013-2015</b> |
|--|-------------|-------------|-------------|----------------------------|
| Statewide Council Savings Target as % of Retail Energy Sales | 2.5%        | 2.55%       | 2.6%        | 2.55%                      |
| PA Proposed Savings Goals as % of Retail Energy Sales        | 2.5%        | 2.55%       | 2.6%        | 2.55%                      |
| Council Target Annual Energy Savings in GWh                  | 1,194       | 1,235       | 1,273       | 3,702                      |
| PA Proposed Annual Energy Savings in GWh                     | 1,195       | 1,236       | 1,275       | 3,706                      |
| Performance Incentive at Design (\$ million)                 | \$25.8      | \$26.7      | \$27.5      | \$80.0                     |
| Threshold to Begin Earning Incentives                        | 75%         | 75%         | 80%         | 75%-80%                    |
| Performance Incentive Cap                                    | 125%        | 125%        | 125%        | 125%                       |
| Program Budget (\$ million) per Term Sheet                   | \$479.10    | \$499.37    | \$516.53    | \$1,495.0                  |
| PA Proposed Program Budget (\$ million)                      | \$481.32    | \$495.66    | \$518.72    | \$1495.70                  |
| Cost Per Annual kWh Saved per Term Sheet                     | \$0.401     | \$0.404     | \$0.406     | \$0.4037                   |
| PA Proposed Cost Per Annual kWh Saved                        | \$0.403     | \$0.401     | \$0.407     | \$0.4036                   |
| PA Proposed Cost Per Lifetime kWh                            | \$0.0366    | \$0.0374    | \$0.0374    | \$0.0371                   |

## MA Gas Program Plan

|  | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>Total<br/>2013-2015</b> |
|--|-------------|-------------|-------------|----------------------------|
| Statewide Council Savings Target as % of Retail Energy Sales         | 1.10%       | 1.12%       | 1.15%       | 1.12%                      |
| PA Proposed Savings Goals as % of Retail Energy Sales per Term Sheet | 1.07%       | 1.13%       | 1.14%       | 1.11%                      |
| Annual Energy Savings Goals (therms) per Term Sheet                  | 23,000,000  | 24,250,000  | 24,750,000  | 72,000,000                 |
| PA Proposed Annual Energy Savings (therms)                           | 22,661,039  | 24,401,130  | 24,949,014  | 72,011,183                 |
| Performance Incentive at Design (\$ million)                         | \$5.1       | \$5.4       | \$5.5       | \$16.0                     |
| Threshold to Begin Earning Incentives                                | 75%         | 75%         | 80%         | 75%-80%                    |
| Performance Incentive Cap  | 125%        | 125%        | 125%        | 125%                       |
| Program Budgets (\$ million) per Term Sheet                          | \$169       | \$175       | \$181       | \$525                      |
| PA Proposed Program Budgets (\$ million)                             | \$168       | \$175       | \$180       | \$523                      |
| Cost Per Annual Therm Saved per Term Sheet                           | \$7.348     | \$7.216     | \$7.313     | \$7.292                    |
| PA Proposed Cost Per Annual Therm Saved                              | \$7.433     | \$7.154     | \$7.218     | \$7.264                    |
| PA Proposed Cost Per Lifetime Therm                                  | \$0.554     | \$0.558     | \$0.560     | \$0.557                    |

# RI Program Summary

| Electric Programs        | 2009<br>(Actual) | 2010<br>(Actual) | 2011<br>(Actual)       | 2012<br>(Actual) | 2013<br>(Actual) | 2014<br>(Planned)                  |
|--------------------------|------------------|------------------|------------------------|------------------|------------------|------------------------------------|
| Annual MWh Savings       | 81,543           | 81,275           | 96,009                 | 119,666          | 159,035          | 255,314                            |
| Lifetime MWh Savings     | 899,331          | 929,242          | 1,076,778              | 1,288,325        | 1,612,371        | 3,305,615                          |
| Total Benefits (\$000)   | \$123,045        | \$128,864        | \$151,542              | \$140,104        | \$192,418        | \$367,360                          |
| Total Spending* (\$000)  | \$29,536         | \$29,712         | \$39,308               | \$50,719         | \$72,875         | \$87,070                           |
| TRC Benefit Cost Ratio** | 3.02             | 3.73             | 3.35                   | 2.24             | 2.24             | 3.15                               |
| EE Program Charge/kWh    | \$0.0032         | \$0.0032         | \$0.00526              | \$0.00589        | \$0.00862        | \$0.00896                          |
| \$ per lifetime kwh***   | \$0.027          | \$0.027          | \$0.031                | \$0.036          | \$0.039          | \$0.025                            |
| Participants             | 106,525          | 153,611          | 254,747                | 201,351          | 470,245          | 513,134                            |
| Natural Gas Programs     | 2009<br>(Actual) | 2010<br>(Actual) | 2011<br>(Actual)       | 2012<br>(Actual) | 2013<br>(Actual) | 2014<br>(Planned)                  |
| Annual MMBtu Savings     | 195,200          | 140,097          | 119,613                | 229,811          | 311,585          | 329,963                            |
| Lifetime MMBtu Savings   | 2,553,828        | 2,155,112        | 1,623,922              | 3,300,583        | 4,377,672        | 4,052,374                          |
| Total Benefits (\$000)   | \$26,071         | \$26,309         | \$18,196               | \$36,237         | \$44,747         | \$49,021                           |
| Total Spending* (\$000)  | \$6,552          | \$5,496          | \$4,868                | \$13,310         | \$19,501         | \$23,492                           |
| TRC Benefit Cost Ratio** | 2.83             | 2.31             | 2.21                   | 1.68             | 1.78             | 1.70                               |
| EE Program Charge/Dth    | \$0.150          | \$0.150          | \$0.150<br>****\$0.411 | \$0.384          | \$0.414          | \$0.600<br>(Resi)<br>\$0.492 (C&I) |
| \$ per lifetime MMBtu*** | \$2.44           | \$2.33           | \$2.73                 | \$3.72           | \$4.21           | \$5.45                             |
| Participants             | 8,339            | 5,670            | 3,080                  | 11,681           | 135,646          | 191,435                            |

\*Total Spending includes implementation, evaluation, commitments, EERM/C, and shareholder incentive

\*\*TRC Benefit/Cost Ratio = Benefits/(Implementation Expenses + Customer Contribution + Evaluation Cost + Shareholder Incentives).

\*\*\*Implementation costs/Lifetime savings

\*\*\*\* December 2011 PUC voted to increase gas EE Program charge to \$0.411/Dth.

Actual values are from filed Annual Reports. 2014 Value from 2014 Annual Plan.