2013 Q4 Year-End Results: Consultant Review & Trend Analysis

EEAC Consultants
February 25, 2014 (rev. draft)
Outline of Presentation

• Summary of Consultant Findings Based on Analysis
• Overall Results, Statewide and by PA, and Implications
  – Electric
  – Gas
  – Oil
• 2013 Program Performance is Analyzed in Two Ways:
  – Preliminary results compared to the Plan goals
  – Energy savings as a % of retail energy sales (consistent indicator across PAs)
• C&I Findings
• Residential/Low Income Findings

Note: Some PAs plan to make corrections to 2011 and 2012 data in the DPU proceedings on the Annual Reports. We did not make any such corrections here.
Summary of Consultant Findings

• Some programs and PAs have performed well in some areas… however, not all programs and PAs have performed well in all areas
• Residential and Low Income sectors exceeded the statewide goals – very good performance
• C&I sector fell far short of goal (79% of electric annual goal and 77% of gas annual goal) for the third straight year, which is a critical concern
• Exceeding the Residential and Low Income goals is not going to make up for underperformance on electric C&I
• Large variations in performance across the PAs indicate that higher and more consistent performance statewide is possible if all PAs implement the best practices
• Better data will result in better performance
Critical Problems Remain

• Missing the C&I electric and gas savings goals significantly for three years in a row
• Some individual PA goals are lower than the statewide goals
• Not achieving better and more consistent PA performance overall (much variability, some lagging in performance across the PAs)
  – Not using the best practices of some PAs to achieve best performance consistently across all PAs in all programs
• The PAs not having or providing adequate data to analyze the EE programs in greater depth (measure- and project-level data) and for the consultants to assess where improvements are possible
• Need for continued emphasis on and increased achievement of deeper savings – the high benefit/cost ratios and customer concerns continue to indicate that the programs are not capturing all cost-effective potential
Statewide Results – 2013 Q4 Year-End Electric

2013 Q4 Year-End Preliminary Actuals as a Percent of Plan Goal

- Residential
- Low-Income
- Commercial & Industrial
- Total

<table>
<thead>
<tr>
<th>Category</th>
<th>Residential</th>
<th>Low-Income</th>
<th>Commercial &amp; Industrial</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Participants</td>
<td>126%</td>
<td>140%</td>
<td>126%</td>
<td></td>
</tr>
<tr>
<td>Sum of Total Spend</td>
<td>113%</td>
<td>93%</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>Sum of Capacity (kW)</td>
<td>91%</td>
<td>87%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>Sum of Energy (annual MWh)</td>
<td>113%</td>
<td>115%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>Sum of Energy (Lifetime MWh)</td>
<td>113%</td>
<td>115%</td>
<td>89%</td>
<td></td>
</tr>
</tbody>
</table>

- Residential: 146%
- Low-Income: 113%
- Commercial & Industrial: 91%
- Total: 135%
2013 Annual Savings by Sector: Missed Annual Savings in C&I

Over or Under Achievement of Annual Savings Goal: 2013 Electric

Percentages are Over or Under Achievement as % of Annual Savings Goal

- Residential: 13% (44,096 MWh)
- Low-Income: 15% (4,237 MWh)
- C&I: 21% (174,548 MWh)
- Statewide: 11% (126,215 MWh)
Trends: Some Sector Improvements But Still Missed Savings in C&I

Over or Under Achievement of Annual Savings Goals: 2011-2013 Electric

Percentages are Over or Under Achievement as a % of the Annual Savings Goal

- Residential
- Low Income
- C&I
- Statewide

Plan

- 2011: Over 5,272 MWh, 2%
- 2012: Under -10,029 MWh, 33%
- 2013: Over 4,237 MWh, 15%

- 2011: Over 17% of Annual Savings Goal
- 2012: Over 13% of Annual Savings Goal
- 2013: Over 11% of Annual Savings Goal

Goal Completion

- 2011: Over 112,573 MWh
- 2012: Over 147,356 MWh
- 2013: Over 174,548 MWh

- 2011: Over 117,330 MWh
- 2012: Over 130,048 MWh
- 2013: Over 126,215 MWh
2013 Expenditures vs Budget; Continued Trend in the C&I Sector

Over or Under Expenditure of Plan Budget: 2011-2013 Electric

Percentages are Over or Under Expenditures as a % of the Plan Budget

<table>
<thead>
<tr>
<th>Year</th>
<th>Residential</th>
<th>Low Income</th>
<th>C&amp;I</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>34%</td>
<td>12%</td>
<td>22%</td>
<td>46%</td>
</tr>
<tr>
<td>2012</td>
<td>34%</td>
<td>1%</td>
<td>14%</td>
<td>34%</td>
</tr>
<tr>
<td>2013</td>
<td>26%</td>
<td>7%</td>
<td>22%</td>
<td>11%</td>
</tr>
</tbody>
</table>
Spending Only a Portion of the Underinvestment Would Achieve Goals

- Plan Savings: 1,195
- Plan Budget: $482M
- Actual Savings: 1,069
- Actual Expenditures: $39M

Diagram: Bar chart showing savings and expenditures.
Summary: Electric Findings

- The C&I sector fell far short of its electric goal (79% of annual savings goal) for the third straight year; a critical problem considering the large C&I contribution to goals.
- Exceeding the Res. and Low Income goals is very good, but it is not going to make up for shortfalls in electric C&I.
- Underinvestment of the 2013 C&I budget (only 74% of budget spent) contributed to the shortfall in C&I savings goals – a continued trend (but with a more accurate budget in 2013).
- About 92% of the C&I savings shortfall was in the C&I Retrofit initiative – a huge program with a total 2013 budget of $143 million (30% of the total EE budget).
- The PAs and consultants cannot effectively determine the best practices across PAs and identify solutions without detailed and comparable measure- and project-level data.
## 2013 Electric Annual Savings as a % of Retail Sales

<table>
<thead>
<tr>
<th>Company</th>
<th>2013 Annual Savings as a Percent of 2013 Retail Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statewide</td>
<td>2.24%</td>
</tr>
<tr>
<td>NGrid</td>
<td>2.14%</td>
</tr>
<tr>
<td>NSTAR</td>
<td>2.43%</td>
</tr>
<tr>
<td>WMECO</td>
<td>2.36%</td>
</tr>
<tr>
<td>CLC</td>
<td>1.39%</td>
</tr>
<tr>
<td>Unitil</td>
<td>1.72%</td>
</tr>
</tbody>
</table>

% values at the bottom of the columns show savings as % of individual PA goal.

Statewide Electric Goal: Energy Savings Equivalent to 2.50% of Retail Sales
# 2013 Savings as % of Sales: Variations Across PAs

<table>
<thead>
<tr>
<th>Row Labels</th>
<th>National Grid</th>
<th>NU (NSTAR)</th>
<th>NU (WMECo)</th>
<th>UNITIL</th>
<th>CLC</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>2.53%</td>
<td>2.51%</td>
<td>2.60%</td>
<td>1.68%</td>
<td>2.08%</td>
<td>2.50%</td>
</tr>
<tr>
<td>Residential</td>
<td>2.19%</td>
<td>1.96%</td>
<td>2.58%</td>
<td>0.85%</td>
<td>1.55%</td>
<td>2.09%</td>
</tr>
<tr>
<td>Low-Income</td>
<td>1.20%</td>
<td>2.52%</td>
<td>1.48%</td>
<td>0.37%</td>
<td>2.41%</td>
<td>1.51%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td>2.87%</td>
<td>2.72%</td>
<td>2.75%</td>
<td>2.36%</td>
<td>2.69%</td>
<td>2.78%</td>
</tr>
<tr>
<td><strong>Q4</strong></td>
<td>2.14%</td>
<td><strong>2.43%</strong></td>
<td>2.36%</td>
<td><strong>1.72%</strong></td>
<td>1.39%</td>
<td><strong>2.24%</strong></td>
</tr>
<tr>
<td>Residential</td>
<td>2.65%</td>
<td>2.31%</td>
<td>1.97%</td>
<td>1.29%</td>
<td>1.12%</td>
<td>2.37%</td>
</tr>
<tr>
<td>Low-Income</td>
<td>1.20%</td>
<td>3.49%</td>
<td>0.81%</td>
<td>0.42%</td>
<td>6.33%</td>
<td>1.74%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td><strong>1.89%</strong></td>
<td><strong>2.44%</strong></td>
<td><strong>2.79%</strong></td>
<td>2.22%</td>
<td>1.40%</td>
<td>2.20%</td>
</tr>
<tr>
<td><strong>% of Goal</strong></td>
<td>84%</td>
<td>97%</td>
<td>91%</td>
<td>103%</td>
<td>67%</td>
<td>89%</td>
</tr>
<tr>
<td>Residential</td>
<td>121%</td>
<td>118%</td>
<td>76%</td>
<td>151%</td>
<td>72%</td>
<td>113%</td>
</tr>
<tr>
<td>Low-Income</td>
<td>100%</td>
<td>138%</td>
<td>54%</td>
<td>115%</td>
<td>262%</td>
<td>115%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td>66%</td>
<td>90%</td>
<td>101%</td>
<td>94%</td>
<td>52%</td>
<td>79%</td>
</tr>
</tbody>
</table>
Achievement of Electric C&I Annual Savings Goals by PA

Over or Under Achievement of C&I Annual Savings Goals: 2011-2013 Electric by PA

Percentages are Over or Under Achievement as a % of the Annual Savings Goal
Underinvestment of Electric C&I Budgets by Individual PA

Over or Under Expenditure of C&I Plan Budget: 2011-2013 Electric by PA

Percentages are Over or Under Expenditures as a % of the Plan Budget

<table>
<thead>
<tr>
<th>Year</th>
<th>PLAN</th>
<th>NGRID</th>
<th>NSTAR</th>
<th>WMESCO</th>
<th>CLC</th>
<th>Unitil</th>
<th>Statewide C&amp;I</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>(53)</td>
<td>49%</td>
<td>22%</td>
<td>(5)</td>
<td>54%</td>
<td>15%</td>
<td>(3)</td>
</tr>
<tr>
<td>2012</td>
<td>(43)</td>
<td>37%</td>
<td>11%</td>
<td>(2)</td>
<td>21%</td>
<td>33%</td>
<td>(0)</td>
</tr>
<tr>
<td>2013</td>
<td>(27)</td>
<td>25%</td>
<td>(4)</td>
<td>(7)</td>
<td>13%</td>
<td>54%</td>
<td>(0)</td>
</tr>
</tbody>
</table>

Statewide C&I:
- 2011: (117) 46%
- 2012: (54) 37%
- 2013: (101) 34%

$0, $20, $40, $60, $80, $100, $120, $140, $200
Individual PA Performance – 2013 Electric Savings

- There are very wide variations in electric performance across the PAs, in actual savings as a % of goal, and in savings as a % of retail sales
- High C&I savings are achievable; WMECo achieved 2.79% of C&I retail sales and NSTAR achieved 2.44%
- NGrid achieved 66% of its C&I electric annual goal and C&I savings of 1.89% of retail sales; NGrid accounted for 72% of the C&I savings shortfall
- Large variations in performance across the PAs indicate that higher and more consistent C&I performance is possible if all PAs implement the best practices
- Again, it is not possible to determine the specific problems and solutions without measure- and project-level data
2013 Q4 Year-End Preliminary Actuals as a Percent of Plan Goal

- **Sum of Participants**: 103%, 150%, 210%
- **Sum of Total Spend**: 103%, 101%, 90%
- **Sum of Annual Therms**: 128%, 164%, 77%
- **Sum of Lifetime Therms**: 125%, 160%, 74%

Categories: Residential, Low-Income, Commercial & Industrial, Total
2013 Gas Annual Savings vs Plan; Trends Over 2011-2013

Over or Under Achievement of Annual Savings Goals: 2011-2013 Gas

- **Residential**
- **Low Income**
- **C&I**
- **Statewide**

<table>
<thead>
<tr>
<th>Year</th>
<th>Residential</th>
<th>Low Income</th>
<th>C&amp;I</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1,011</td>
<td>18%</td>
<td>36%</td>
<td>0%</td>
</tr>
<tr>
<td>2012</td>
<td>81%</td>
<td>3%</td>
<td>17%</td>
<td>14%</td>
</tr>
<tr>
<td>2013</td>
<td>28%</td>
<td>64%</td>
<td>6%</td>
<td>(2509)</td>
</tr>
</tbody>
</table>

- Percentages are Over or Under Achievement as a % of the Annual Savings Goal

- Over or Under Achievement of Annual Savings Goals: 2011-2013 Gas

- **Residential**
- **Low Income**
- **C&I**
- **Statewide**
Gas Expenditures vs. Budget

Over or Under Expenditure of Plan Budget: 2011-2013 Gas

Percentages are Over or Under Expenditures as a % of the Plan Budget

- Residential
- Low Income
- C&I
- Statewide

2011:
- Residential: $7,033 (10%)
- Low Income: $(4,052) (15%)
- C&I: $(5,614) (22%)
- Statewide: $(5,000) (10%)

2012:
- Residential: $5,480 (9%)
- Low Income: $(9,213) (9%)
- C&I: $(9,067) (26%)
- Statewide: $(16,675) (39%)

2013:
- Residential: $(3,445) (3%)
- Low Income: $(2,603) (3%)
- C&I: $(19,452) (10%)
- Statewide: $(19,452) (39%)
Achievement of Gas Annual Savings Goals by PA

Over or Under Achievement of Annual Savings Goals by PA: 2013 Gas

Percentage are Over or Under Achievement as a % of the Annual Savings Goal.
### 2013 Gas Annual Savings as a % of Retail Sales

#### Gas: 2013 Annual Savings as a Percent of 2013 Retail Sales

<table>
<thead>
<tr>
<th></th>
<th>Statewide</th>
<th>NGrid</th>
<th>NU</th>
<th>CMA</th>
<th>NEG</th>
<th>Berkshire</th>
<th>Unitil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Savings</td>
<td>106%</td>
<td>111%</td>
<td>110%</td>
<td>88%</td>
<td>70%</td>
<td>115%</td>
<td>73%</td>
</tr>
<tr>
<td>Goal: Annual Energy Savings Equivalent to 1.07% of Retail Sales</td>
<td>1.07%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% values at the bottom of the columns show savings as % of individual PA goal.
# 2013 Savings as % of Sales: Variations Across Gas PAs

<table>
<thead>
<tr>
<th>Row Labels</th>
<th>National Grid</th>
<th>NU</th>
<th>CMA</th>
<th>BERKSHIRE</th>
<th>UNITIL</th>
<th>NEG</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>1.07%</td>
<td>1.07%</td>
<td>1.21%</td>
<td>0.70%</td>
<td>0.69%</td>
<td>0.83%</td>
<td>1.07%</td>
</tr>
<tr>
<td>Residential</td>
<td>1.07%</td>
<td>0.93%</td>
<td>0.85%</td>
<td>0.89%</td>
<td>0.39%</td>
<td>0.73%</td>
<td>0.98%</td>
</tr>
<tr>
<td>Low-Income</td>
<td>2.01%</td>
<td>1.29%</td>
<td>0.76%</td>
<td>1.00%</td>
<td>0.71%</td>
<td>0.33%</td>
<td>1.28%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td>1.00%</td>
<td>1.15%</td>
<td>2.12%</td>
<td>0.56%</td>
<td>0.84%</td>
<td>1.46%</td>
<td>1.14%</td>
</tr>
<tr>
<td><strong>Q4</strong></td>
<td>1.18%</td>
<td>1.18%</td>
<td>1.06%</td>
<td>0.81%</td>
<td>0.50%</td>
<td>0.58%</td>
<td>1.13%</td>
</tr>
<tr>
<td>Residential</td>
<td>1.57%</td>
<td>1.19%</td>
<td>0.61%</td>
<td>0.94%</td>
<td>0.71%</td>
<td>0.38%</td>
<td>1.26%</td>
</tr>
<tr>
<td>Low-Income</td>
<td>3.78%</td>
<td>1.68%</td>
<td>1.07%</td>
<td>1.51%</td>
<td>0.82%</td>
<td>0.36%</td>
<td>2.09%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td>0.57%</td>
<td>1.13%</td>
<td>2.05%</td>
<td>0.65%</td>
<td>0.35%</td>
<td>1.23%</td>
<td>0.88%</td>
</tr>
<tr>
<td><strong>% of Goal</strong></td>
<td>111%</td>
<td>110%</td>
<td>88%</td>
<td>115%</td>
<td>73%</td>
<td>70%</td>
<td>106%</td>
</tr>
<tr>
<td>Residential</td>
<td>147%</td>
<td>128%</td>
<td>71%</td>
<td>105%</td>
<td>183%</td>
<td>53%</td>
<td>128%</td>
</tr>
<tr>
<td>Low-Income</td>
<td>188%</td>
<td>130%</td>
<td>141%</td>
<td>152%</td>
<td>115%</td>
<td>108%</td>
<td>164%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td>57%</td>
<td>98%</td>
<td>96%</td>
<td>117%</td>
<td>41%</td>
<td>84%</td>
<td>77%</td>
</tr>
</tbody>
</table>
Summary: Gas Findings

- Residential and Low Income sectors exceeded the statewide gas goals – with improved gas performance over the last three years.
- NGrid and NU led the way at 111% and 110% of goal, with annual savings at 1.18% of gas retail energy sales.
- However, the C&I sector fell far short of its gas goal (77% of annual savings) for the third straight year.
- Continued underinvestment of the gas C&I budgets.
- Wide variations in performance across the PAs.
- And wide variations within a PA (e.g., NGrid achieved gas savings of 1.18% of sales overall, but 0.57% in C&I).
- Better data will result in better performance.
2013 Statewide Results – Oil

Over or Under Achievement of Annual Savings Goal: 2013 Oil

- **Residential**: 331,052 MMBTU
  - **Achievement**: 33% of goal
- **Low Income**: 74,981 MMBTU
  - **Achievement**: 36% of goal
- **C&I**: (70,688) MMBTU
  - **Achievement**: (45%) of goal
- **Statewide**: 503,040 MMBTU
  - **Achievement**: 50% of goal

Percentages are Over or Under Achievement as a % of the Annual Savings Goal.
2013 Oil Savings by PA

Over or Under Achievement of Annual Savings Goals by PA in the Residential & Low Income Sectors: 2013 Oil

Percentages are Over or Under Achievement as a % of the Annual Savings Goal

<table>
<thead>
<tr>
<th>Sector</th>
<th>Residential</th>
<th>Low Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGrid</td>
<td>44%</td>
<td>38%</td>
</tr>
<tr>
<td>NSTAR</td>
<td>25%</td>
<td>67%</td>
</tr>
<tr>
<td>WMECO</td>
<td>96%</td>
<td>4%</td>
</tr>
<tr>
<td>CLC</td>
<td>32%</td>
<td>8%</td>
</tr>
<tr>
<td>Unitil</td>
<td>186%</td>
<td>52%</td>
</tr>
<tr>
<td>Statewide</td>
<td>33%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Over or Under Achievement of C&I Annual Oil Savings Goal, MMBTU

(20,000)
Summary: Oil Findings

• More detailed look at oil (compared to the usual quarterly reports) in response to requests from the Council
• Programs achieved 150% of the oil annual savings goal, a very positive result
• Most oil savings are in the Residential and Low Income sectors
• Almost all PAs exceeded their Residential and Low Income oil savings goals
• High performance in 2013 suggests and supports continued ramp up of oil savings goals
• Also very wide variations in oil savings performance across the PAs, which could be informed with better data
Improving Statewide C&I Performance Requires Better Data

• Huge variation in C&I electric and gas performance
• Why? What did the PA that achieved 117% of the gas C&I goal do differently from the PA that achieved 41%?
• Requires detailed, comparable data on the projects and measures that each PA did
• Statewide database envisioned to provide these data but PAs have raised concerns about statewide database and deeper data on measures and projects
• How can we get these data and start using the data?
• This issue is of fundamental importance to improve the statewide performance of the C&I programs
Concerted Efforts Needed to Reduce the C&I “Hockey Stick”

Cumulative Electric Savings -- 2013 vs 2012
Residential and Low Income Highlights

• Excellent statewide results
  – Statewide savings results exceeded goals for both sectors and for both the Res Whole House and Consumer Products Programs, achieving as much as 164% of goal
  – Total spend ranged from 93% (LI electric) to 113% (Res electric)
• Variations in goal achievement between PAs persist
• Half of the PAs expect to achieve below the Threshold level for the residential deeper savings performance metric
  – Most PAs expect to achieve the Exemplary level for the other residential and two low income performance incentive metrics
• Need for continued focus on data collection and analysis, and on best practice information exchange
Residential Electric Savings and Participants by Initiative

Energy Savings:
- New Construction
- Multi-Family Retrofit
- HES
- Behavior/Feedback
- Cooling & Heating Equip
- Lighting
- Consumer Products

Annual savings (MWh)
Lifetime savings (MWh)
Participants
Additional Slides for Reference
Achievement of 2013 C&I Retrofit Annual Savings Goals by PA

Over or Under Achievement of C&I Annual Savings Goal for C&I Large Retrofit by PA: 2013 Electric

- PLAN: 19% (3,971 MWh)
- NSTAR: 19% (7,466 MWh)
- WMECO: 86% (158 MWh)
- Unitil: 4% (159,839 MWh)

Percentages are Over or Under Achievement as % of Annual Savings Goal

- NGrid
- NSTAR
- WMECO
- CLC
- Unitil
- Statewide
Achievement of 2013 C&I Direct Install Savings Goals by PA

Over or Under Achievement of C&I Annual Savings Goal for Small Business Direct Install by PA: 2013 Electric

- PLAN:
  - Over Achievement: 4% (1,411 MWh)
  - Under Achievement: 7% (3,571 MWh)

- WMECO:
  - Over Achievement: 50% (13,902 MWh)

- NSTAR:
  - Under Achievement: 13% (233 MWh)

- Unitil:
  - Under Achievement: 16% (19,770 MWh)

Percentages are Over or Under Achievement as % of Annual Savings Goal

NGrid  NSTAR  WMECO  CLC  Unitil  Statewide
Achievement of 2013 C&I New Construction Savings Goals by PA

Over or Under Achievement of C&I Annual Savings Goal for C&I New Construction by PA: 2013 Electric

Percentages are Over or Under Achievement as % of Annual Savings Goal.
Q4 Residential Overview

Annual savings

Electric: 1,275,755 MMBtu (49%)
Gas: 1,317,306 MMBtu (51%)

Lifetime savings

Electric: 8,694,079 MMBtu
Gas: 14,590,642 MMBTU (63%)
Res YTD as Percentage to Goal
Annual Savings

- Statewide Berkshire
- CLC
- CMA
- Liberty
- National Grid
- NSTAR
- Unitil
- WMECo

Legend:
- Res Electric
- LI Electric
- Res Gas
- LI Gas