



2013-2015 Electric and Gas Energy Efficiency Plans: EEAC Consultant Review

EEAC Consultants
November 13, 2012





Recommendation

- **The Consultant Team recommends that the EEAC approve the November 2nd final Statewide Three-Year Plan.**
- **The Team expects that the PAs' Individual Plans will be fully consistent with the Statewide Plan.**
- The Team has not reviewed all of the Individual Plans in detail





Statewide Plan is Consistent with the Council-Approved Term Sheets

Comparison: Final Plan (Nov. 2) vs. Term Sheets

	Term Sheet Provision	Three-Year Plan Provision
Electric PA Total Annual Energy Savings Goals (MWh)	3,702,844	3,705,368
Gas PA Total Annual Energy Savings Goals (Therms)	72,000,000	72,011,183
Benefits (\$, million) - Electric and Gas Combined	\$8,770	\$8,922
Benefits (\$, million) - Electric	\$7,500	\$7,638
Benefits (\$, million) - Gas	\$1,270	\$1,284
Budget (\$, million) - Electric and Gas Combined	\$2,020	\$2,018.80
Budget (\$, million) - Electric	\$1,495	\$1,495.70
Budget (\$, million) - Gas	\$525	\$523.10
Cost per Annual kWh Saved - Electric	\$0.4037	\$0.4037
Cost per Annual Therm Saved - Gas	\$7.292	\$7.264



Statewide Plan (Nov. 2) is an Improvement from Sept. 19 Plan

ELECTRIC	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	2.50%	2.55%	2.60%	2.48%	2.51%	2.56%
National Grid	2.53%	2.59%	2.64%	2.51%	2.55%	2.60%
NSTAR	2.51%	2.57%	2.61%	2.50%	2.55%	2.60%
WMECo	2.58%	2.70%	2.82%	2.51%	2.56%	2.61%
CLC	2.08%	1.92%	1.92%	2.09%	1.92%	1.90%
Unitil	1.68%	1.72%	1.74%	1.66%	1.70%	1.73%

ELECTRIC	November 2nd Plan				Sept 19th Plan			
	2013	2014	2015	2013-2015	2013	2014	2015	2013-2015
Sales (MWh)	47,763,309	48,460,704	48,960,921	145,184,934	47,763,309	48,460,704	48,960,921	145,184,934
Annual Savings (MWh)	1,194,556	1,236,268	1,274,544	3,705,368	1,184,139	1,218,520	1,255,545	3,658,204
Savings as % Of Sales	2.50%	2.55%	2.60%	2.55%	2.48%	2.51%	2.56%	2.52%
Budgets	\$481,315,926	\$495,657,181	\$518,725,224	\$1,495,698,331	\$487,706,107	\$498,690,801	\$522,129,849	\$1,508,526,757
Cost per Annual kWh Saved	\$0.403	\$0.401	\$0.407	\$0.404	\$0.412	\$0.409	\$0.416	\$0.412
Lifetime Savings (MWh)	13,144,743	13,264,331	13,862,596	40,271,670	13,117,227	13,137,492	13,769,129	40,023,848
Cost per Lifetime kWh Saved	\$0.037	\$0.037	\$0.037	\$0.037	\$0.037	\$0.038	\$0.038	\$0.038



Statewide Plan (Nov. 2) is an Improvement from Sept. 19 Plan

GAS	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	1.05%	1.13%	1.15%	1.01%	1.10%	1.12%
National Grid	1.07%	1.18%	1.19%	1.03%	1.16%	1.17%
NSTAR	1.07%	1.13%	1.19%	1.05%	1.10%	1.18%
CMA	1.10%	1.11%	1.12%	1.02%	1.05%	1.09%
NEG	0.83%	0.84%	0.85%	0.79%	0.80%	0.80%
Berkshire	0.70%	0.76%	0.81%	0.65%	0.69%	0.74%
Unitil	0.69%	0.77%	0.86%	0.66%	0.71%	0.76%

GAS	November 2nd Plan				Sept 19th Plan			
	2013	2014	2015	2013-2015	2013	2014	2015	2013-2015
Sales (Therms)	2,151,166,829	2,150,793,782	2,163,251,593	6,465,212,204	2,151,166,829	2,150,793,782	2,163,251,593	6,465,212,204
Total Annual Savings (Therms)	22,661,039	24,401,130	24,949,014	72,011,183	21,745,121	23,666,821	24,282,828	69,694,770
Savings as % of Sales	1.05%	1.13%	1.15%	1.11%	1.01%	1.10%	1.12%	1.08%
Budgets	\$168,429,800	\$174,563,392	\$180,092,607	\$523,085,799	\$171,035,761	\$178,728,275	\$183,859,012	\$533,623,048
Cost per Annual Therm Saved	\$7.43	\$7.15	\$7.22	\$7.26	\$7.87	\$7.55	\$7.57	\$7.66
Total Lifetime Therms	303,974,380	313,021,522	321,318,178	938,314,079	290,897,430	303,674,766	312,923,617	907,495,813
Cost per Lifetime Therm Saved	\$0.554	\$0.558	\$0.560	\$0.557	\$0.588	\$0.589	\$0.588	\$0.588



Responsiveness of the Plan to Council Priorities: Residential Programs

- The Efficiency Neighborhoods+ initiative and Home Energy Services (HES) enhancements **maximize savings and benefits** from the hard to reach, hard to serve market.
- Enhancements in market-rate multifamily **improves integration** of programs across fuels and sectors.
- Market Lift in Lighting and Upstream HVAC strategies **improve the cost efficiency** of program delivery.
- The MTAC review and recommendation of new technologies for program inclusion advances **best practice integration**.



Responsiveness of the Plan to Council Priorities: C & I Programs

- New segmentation strategies for municipalities, healthcare, commercial real estate, and grocery lead to **deeper savings and solutions to tenant-landlord barriers.**
- Upstream initiatives in HVAC and refrigeration capture new savings and improve the effectiveness which leads to **improvements in cost-efficiency**
- *Requiring* PAs TA vendors to address gas and electric end-uses improves **integration of electric and gas programs** and addresses desire for **deeper retrofit applications.**
- Community mobilization initiative seeks to leverage the power of communities to engage more customers and **maximize savings with hard-to-reach and hard-to-serve customers.**





Responsiveness of the Plan to Council Priorities: Action Plans

- The PAs responded to the Council's request for Action Plans by providing high-level Action Plans for 12 items
- At this point, plans are strategic not tactical
- Each plan should be operationalized to include milestones, deadlines for action, clear indication of accountability, and tracking mechanisms for progress.
- Still a need for additional detail on action plans in areas not included in original 12
 - Residential examples
 - Behavior based initiative does not have an action plan
 - HES deeper savings measure inclusion unspecified



Responsiveness of the Plan to Council Priorities: Statewide Database

- Defining and implementing better data management, analytics, and access is a priority.
- The Council and the PAs will continue to collaborate on data management solutions to improve the access, accuracy, and efficacy of energy efficiency program data.
- PAs Plan provides budget allocation (\$500k) in each year to fund work on statewide database





Responsiveness of the Plan to Council Priorities: CECP

- Statewide Plan is on the path to satisfy the Green Communities Act (GCA) mandate to capture all available cost-effective energy efficiency
- Also supports the achievement of the greenhouse gas emissions reductions called for in the Clean Energy and Climate Plan (CECP) per GWSA
- Goal: Reduce greenhouse gas emissions from 1990 levels by 25% by 2020 and 80% by 2050
- Energy efficiency plans account for 7.1% of these reductions
- Potential revisions in Plan numbers on GHG emissions possible



Program & Technical Issues: Continuing Review & Coordination

- Small list of items still outstanding or continuing
- Detail is not in Plan and will only be fully explained as new initiatives are implemented
 - Residential
 - Products - Re-examine measure mix
 - Assumptions for LED and CFL
 - Accelerate implementation of HES enhancements
 - Behavior program development and expansion
 - C&I
 - Increase depth of savings in small/medium market
 - Segmentation strategies for Commercial Real Estate
 - Accelerated implementation



Stakeholder Process Improvements

- Establish external stakeholder input process
- From the Plan - “the C&IMC will take a lead to review best current structures as previously described, as well as best practices in other states, with the intent of creating a common process and guidelines to ensure consistent and effective responses from the PAs as a collective [to stakeholders]. The details of this concept will be developed during Q4 2012 with expected implementation in Q1 2013.”
- Council seeks PA commitment on follow through with this important task

Non-Energy Impacts

- Continued study needed for the manner in which EM&V results are applied in Residential NEIs
- Study did not distinguish systematically between early replacement and replace-on-failure retrofit situations
- Benefits (NEIs) attribution between two scenarios is significantly different
- NEIs can represent up to 40% of total benefits for residential programs
- Ultimately resolve issue through further EM&V research into the frequency of ROF vs ER
- Observation now: Some numerical variations in NEI levels & NEIs as a percent of total benefits across the PAs



Energy Savings Goals: Savings as % of Energy Sales

ELECTRIC	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	2.50%	2.55%	2.60%	2.48%	2.51%	2.56%
National Grid	2.53%	2.59%	2.64%	2.51%	2.55%	2.60%
NSTAR	2.51%	2.57%	2.61%	2.50%	2.55%	2.60%
WMECo	2.58%	2.70%	2.82%	2.51%	2.56%	2.61%
CLC	2.08%	1.92%	1.92%	2.09%	1.92%	1.90%
Unitil	1.68%	1.72%	1.74%	1.66%	1.70%	1.73%

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NSTAR	1.07%	1.13%	1.19%	1.05%	1.10%	1.18%
CMA	1.10%	1.11%	1.12%	1.02%	1.05%	1.09%
NEG	0.83%	0.84%	0.85%	0.79%	0.80%	0.80%
Berkshire	0.70%	0.76%	0.81%	0.65%	0.69%	0.74%
Unitil	0.69%	0.77%	0.86%	0.66%	0.71%	0.76%



Electric Savings Goals: Savings as % of Energy Sales

ELECTRIC	2013	2014	2015
Statewide	2.50%	2.55%	2.60%
Residential (total)	2.12%	2.34%	2.44%
Low-Income (total)	1.33%	1.23%	1.13%
Commercial & Industrial (total)	2.78%	2.75%	2.80%
National Grid	2.53%	2.59%	2.64%
Residential (total)	2.19%	2.47%	2.59%
Low-Income (total)	1.20%	1.05%	0.93%
Commercial & Industrial (total)	2.87%	2.80%	2.84%
NSTAR	2.51%	2.57%	2.61%
Residential (total)	1.95%	2.12%	2.19%
Low-Income (total)	2.65%	2.54%	2.43%
Commercial & Industrial (total)	2.72%	2.74%	2.77%
CLC	2.08%	1.92%	1.92%
Residential (total)	1.55%	1.57%	1.61%
Low-Income (total)	2.40%	2.69%	3.01%
Commercial & Industrial (total)	2.69%	2.27%	2.21%
Unitil	1.68%	1.72%	1.74%
Residential (total)	0.84%	0.88%	0.87%
Low-Income (total)	0.37%	0.38%	0.39%
Commercial & Industrial (total)	2.36%	2.41%	2.45%
WMECo	2.58%	2.70%	2.82%
Residential (total)	3.24%	3.43%	3.60%
Low-Income (total)	0.72%	0.69%	0.66%
Commercial & Industrial (total)	2.75%	2.86%	3.00%



Program Costs Per Lifetime kWh or Therm Saved

ELECTRIC	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	\$0.0366	\$0.0374	\$0.0374	\$0.0372	\$0.0380	\$0.0379
National Grid	\$0.0360	\$0.0365	\$0.0364	\$0.0368	\$0.0374	\$0.0374
NSTAR	\$0.0324	\$0.0339	\$0.0337	\$0.0328	\$0.0343	\$0.0340
WMECo	\$0.0505	\$0.0503	\$0.0522	\$0.0508	\$0.0506	\$0.0519
CLC	\$0.0725	\$0.0684	\$0.0725	\$0.0726	\$0.0685	\$0.0724
Unitil	\$0.0528	\$0.0526	\$0.0531	\$0.0520	\$0.0516	\$0.0513

GAS	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	\$0.554	\$0.558	\$0.560	\$0.59	\$0.59	\$0.59
National Grid	\$0.603	\$0.607	\$0.610	\$0.68	\$0.68	\$0.67
NSTAR	\$0.524	\$0.530	\$0.529	\$0.50	\$0.50	\$0.50
CMA	\$0.486	\$0.489	\$0.503	\$0.48	\$0.49	\$0.50
NEG	\$0.561	\$0.613	\$0.609	\$0.54	\$0.60	\$0.60
Berkshire	\$0.464	\$0.434	\$0.415	\$0.51	\$0.49	\$0.48
Unitil	\$0.466	\$0.435	\$0.426	\$0.50	\$0.51	\$0.51



Program Costs Per Lifetime kWh Saved

ELECTRIC	2013	2014	2015
Statewide	\$ 0.0366	\$ 0.0374	\$ 0.0374
Residential (total)	\$ 0.0810	\$ 0.0834	\$ 0.0861
Low-Income (total)	\$ 0.2046	\$ 0.2113	\$ 0.2239
Commercial & Industrial (total)	\$ 0.0249	\$ 0.0252	\$ 0.0250
National Grid	\$ 0.0360	\$ 0.0365	\$ 0.0364
Residential (total)	\$ 0.0765	\$ 0.0785	\$ 0.0808
Low-Income (total)	\$ 0.2184	\$ 0.2216	\$ 0.2300
Commercial & Industrial (total)	\$ 0.0234	\$ 0.0239	\$ 0.0240
NSTAR	\$ 0.0324	\$ 0.0339	\$ 0.0337
Residential (total)	\$ 0.0857	\$ 0.0878	\$ 0.0898
Low-Income (total)	\$ 0.2099	\$ 0.2258	\$ 0.2444
Commercial & Industrial (total)	\$ 0.0228	\$ 0.0236	\$ 0.0231
CLC	\$ 0.0725	\$ 0.0684	\$ 0.0725
Residential (total)	\$ 0.0964	\$ 0.0970	\$ 0.1003
Low-Income (total)	\$ 0.2954	\$ 0.2591	\$ 0.2689
Commercial & Industrial (total)	\$ 0.0510	\$ 0.0389	\$ 0.0397
Unitil	\$ 0.0528	\$ 0.0526	\$ 0.0531
Residential (total)	\$ 0.1596	\$ 0.1492	\$ 0.1600
Low-Income (total)	\$ 0.2120	\$ 0.2140	\$ 0.2150
Commercial & Industrial (total)	\$ 0.0353	\$ 0.0354	\$ 0.0355
WMECo	\$ 0.0505	\$ 0.0503	\$ 0.0522
Residential (total)	\$ 0.0732	\$ 0.0779	\$ 0.0836
Low-Income (total)	\$ 0.1232	\$ 0.1292	\$ 0.1405
Commercial & Industrial (total)	\$ 0.0402	\$ 0.0392	\$ 0.0402



Program Costs Per \$ of Benefits

ELECTRIC	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	\$ 0.204	\$ 0.190	\$ 0.194	\$ 0.261	\$ 0.244	\$ 0.246
National Grid	\$ 0.187	\$ 0.174	\$ 0.178	\$ 0.315	\$ 0.293	\$ 0.301
NSTAR	\$ 0.212	\$ 0.197	\$ 0.203	\$ 0.211	\$ 0.196	\$ 0.200
WMECo	\$ 0.239	\$ 0.235	\$ 0.238	\$ 0.234	\$ 0.229	\$ 0.202
CLC	\$ 0.237	\$ 0.203	\$ 0.206	\$ 0.233	\$ 0.202	\$ 0.206
Unitil	\$ 0.242	\$ 0.229	\$ 0.225	\$ 0.268	\$ 0.258	\$ 0.254

GAS	November 2nd Plan			Sept 19th Plan		
	2013	2014	2015	2013	2014	2015
Statewide	\$ 0.404	\$ 0.407	\$ 0.410	\$ 0.435	\$ 0.437	\$ 0.435
National Grid	\$ 0.427	\$ 0.429	\$ 0.427	\$ 0.473	\$ 0.473	\$ 0.466
NSTAR	\$ 0.403	\$ 0.409	\$ 0.410	\$ 0.390	\$ 0.393	\$ 0.394
CMA	\$ 0.354	\$ 0.357	\$ 0.376	\$ 0.396	\$ 0.399	\$ 0.406
NEG	\$ 0.404	\$ 0.428	\$ 0.426	\$ 0.397	\$ 0.425	\$ 0.426
Berkshire	\$ 0.362	\$ 0.348	\$ 0.339	\$ 0.380	\$ 0.373	\$ 0.370
Unitil	\$ 0.418	\$ 0.388	\$ 0.377	\$ 0.395	\$ 0.412	\$ 0.393



Program Costs Per \$ of Benefits

ELECTRIC	2013	2014	2015
Statewide	\$ 0.204	\$ 0.190	\$ 0.194
Residential (total)	\$ 0.243	\$ 0.237	\$ 0.240
Low-Income (total)	\$ 0.452	\$ 0.449	\$ 0.462
Commercial & Industrial (total)	\$ 0.170	\$ 0.154	\$ 0.159
National Grid	\$ 0.187	\$ 0.174	\$ 0.178
Residential (total)	\$ 0.255	\$ 0.243	\$ 0.254
Low-Income (total)	\$ 0.486	\$ 0.466	\$ 0.475
Commercial & Industrial (total)	\$ 0.142	\$ 0.132	\$ 0.135
NSTAR	\$ 0.212	\$ 0.197	\$ 0.203
Residential (total)	\$ 0.249	\$ 0.245	\$ 0.240
Low-Income (total)	\$ 0.521	\$ 0.511	\$ 0.535
Commercial & Industrial (total)	\$ 0.182	\$ 0.165	\$ 0.172
CLC	\$ 0.237	\$ 0.203	\$ 0.206
Residential (total)	\$ 0.197	\$ 0.193	\$ 0.194
Low-Income (total)	\$ 0.259	\$ 0.298	\$ 0.291
Commercial & Industrial (total)	\$ 0.288	\$ 0.197	\$ 0.202
Unitil	\$ 0.242	\$ 0.229	\$ 0.225
Residential (total)	\$ 0.401	\$ 0.363	\$ 0.372
Low-Income (total)	\$ 0.557	\$ 0.547	\$ 0.533
Commercial & Industrial (total)	\$ 0.183	\$ 0.174	\$ 0.170
WMECo	\$ 0.239	\$ 0.235	\$ 0.238
Residential (total)	\$ 0.211	\$ 0.217	\$ 0.225
Low-Income (total)	\$ 0.320	\$ 0.324	\$ 0.356
Commercial & Industrial (total)	\$ 0.244	\$ 0.234	\$ 0.232



Bill Impacts – Electric

Summary of Electric Bill Impacts Across PAs, Representative Rate Classes

Average Monthly Bill Impacts Over Time

2013 Bill Impact Compared to 2012, and Bill Impacts Over the Three-Year Plan (2013-2015 vs. 2012)

	Present Rates		Proposed Rates			
	2012		2013 vs. 2012		2013-2015 vs. 2012	
	Average Monthly kWh	Total Monthly Revenue (\$)	Total Monthly Difference (\$)	Total Monthly Difference (%)	Total Monthly Difference (\$)	Total Monthly Difference (%)
Residential:						
Residential R-1	500 - 586	\$70.26 to \$102.29	-\$1.04 to \$1.63	-1.0% to 2.3%	\$0.30 to \$2.92	0.3% to 3.1%
Low Income:						
Residential R-2:	483 - 500	\$50.73 to \$75.57	-\$0.70 to \$0.62	-1.1% to 1.2%	-\$0.37 to \$0.26	-0.6% to 0.3%
Small Business:						
Commercial G-1	300 - 2,396	\$67.44 to \$374.85	\$0.04 to \$17.10	0.1% to 4.6%	\$0.90 to \$4.26	0.2% to 2.0%
Commercial G-2	11,800 - 141,375	\$1,352 to \$18,176	\$5.29 to \$1,009	0.1% to 5.6%	\$31 to \$127	0.3% to 2.4%
Commercial G-3	400,000 - 949,000	\$44,339 to \$132,888	\$137 to \$4,828	0.1% to 5.9%	\$255 to \$3,310	0.3% to 2.6%



Bill Impacts – Gas

**Summary of Gas Bill Impacts Across PAs, Representative Residential Rate Classes
Average Monthly Bill Impacts Over Time
2013 Bill Impact Compared to 2012, and Bill Impacts Over the Three-Year Plan (2013-2015 vs. 2012)**

	Present Rates		Proposed Rates			
	2012		2012-2013		2012-2015	
	Average Monthly Therms	Total Monthly Revenue (\$)	Total Monthly Difference (\$)	Total Monthly Difference (%)	Total Monthly Difference (\$)	Total Monthly Difference (%)
Residential R-1 (Non-heating)	13 - 25	\$28.19 to \$47.84	-\$0.14 to \$1.50	-0.4% to 4.5%	-\$0.08 to \$1.21	-0.2% to 3.6%
Residential R-2 (Low income non-heating)	13 - 30	\$22.82 to \$41.88	-\$0.11 to \$1.50	-0.4% to 4.6%	-\$0.6 to \$1.53	-0.2% to 4.0%
Residential R-3 (heating)	75 - 133	\$99.87 to \$185.00	\$3.22 to \$7.16	0.5% to 5.3%	\$0.50 to \$8.82	0.3% to 5.5%
Residential R-4 (Low income heating)	75 - 130	\$82.78 to \$145.98	\$1.30 to \$5.36	0.4% to 4.4%	\$0.34 to \$6.59	0.3% to 5.5%



Evaluation, Monitoring, and Verification (EM&V)

- The current EM&V process is working reasonably well, and most technical issues were resolved prior to the filing of the Three-year Plan
- Consultant Team strongly recommended that the EM&V budget not be cut dramatically (Statewide Plan EM&V budget is somewhat lower than other leading states)
- Need for an increased long-term strategic planning effort in EM&V
- Reorganizing the six research areas by which EM&V efforts are currently structured, coinciding with the process of rebidding some of the EM&V contracts in these research areas