

## **Efficiency 2.9: The Policies and Framework Behind Massachusetts' #1 Energy Efficiency Ranking**

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### **ABSTRACT**

Massachusetts has among the most aggressive efficiency goals in the nation, reaching for an average of 2.94% of retail electric sales and 1.24% of retail gas sales during the 2016-2018 period. What does it take to create an efficiency regime that sustainably achieves among the highest energy reductions in the nation? First, Massachusetts legislation specifies that energy reduction goals be set to attain “all cost effective energy efficiency.” This paper will explore the fundamental structures, policy framework, funding, and stakeholder processes that address that objective and put Massachusetts at the top of the ACEEE Scorecard rankings. And while Massachusetts’ high-achieving programs are driven by aggressive goals, retail sales reductions of this magnitude cannot be realized without a matrix of underlying support. Therefore, we will also discuss how the Energy Efficiency Advisory Council oversees energy efficiency planning, implementation, and evaluation in the state. Included will be a description of the relationship between the various parties and their roles in fulfilling the ambitious achievement set forth in the enabling legislation. We will weave together how program cost effectiveness screening and robust evaluation feedback loops provide the confidence needed to set unprecedented targets. We also identify the need to develop sophisticated business expertise and a strategic planning forum within the program administrator framework in order to evolve standard program designs to meet such aggressive targets. Last, we will describe challenges met along the way—particularly in the areas of policy, regulation, and administration.

### **Overview of Energy Efficiency in Massachusetts**

#### **Legislation and Policy Framework**

The Massachusetts Green Communities Act (GCA), officially titled, "Chapter 169 of the Acts of 2008: An Act Relative to Green Communities," passed in 2008, largely set the framework for energy efficiency planning and delivery in the state. The landmark legislation requires that the energy distribution companies and municipal aggregators in Massachusetts (referred to as Program Administrators or PAs) jointly prepare electric and gas energy efficiency plans every three years. The first plan developed under the GCA set savings goals for the years 2010-2012. Importantly, the plans must “provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply.” Unlike many states that set arbitrary budget constraints on investments in energy efficiency, legislation in Massachusetts prioritizes all cost-effective energy savings in goal-setting efforts, undertaken by the PAs in collaboration with an Energy Efficiency Advisory Council (EEAC), chaired by the Department of Energy Resources (DOER). Although the Department of Public

Utilities (DPU) has the authority to consider bill impacts in approving the Three-Year Plan and the targets for reduction, it has never chosen to limit goals put forward for this reason.

Another key aspect of the law is that at least ten percent of the electric budget and twenty percent of the natural gas budget is earmarked for low income households, ensuring this population receives adequate program funding.<sup>1</sup> High goals motivate the PAs to find all savings opportunities in all sectors since going after low hanging fruit is not enough to meet the targets. In connection with these energy efficiency plans, the GCA established the EEAC to work with and advise the PAs on all aspects of efficiency planning and program execution.

In addition to the GCA, two other acts signed into law in 2008 have supported the continued evolution of efficiency programs in Massachusetts. The Global Warming Solutions Act (GWSA) mandates the reduction of greenhouse gas emissions in the Commonwealth, establishing a near-term emissions limit for 2020 and a long-term limit for 2050. The Clean Energy and Climate Plan for 2020 that was required by this legislation includes the statewide energy efficiency programs as its largest single emissions reduction policy.

The Green Jobs Act provides a funding source for research and development, and the cultivation of the green technology industry, facilitating economic development and job growth in the clean energy sector. This law established the Massachusetts Clean Energy Center, an agency dedicated to accelerating the success of clean energy technologies, companies and projects in the Commonwealth.

## **Political Context**

Since 2015, Massachusetts has had a Republican Governor and administration working with a Democratic controlled state legislature and Attorney General (AG). Energy efficiency policy, and broader policy aimed at climate change mitigation, spearheaded by the Executive Office of Energy and Environmental Affairs (EEA), has strong bipartisan support. Massachusetts' energy efficiency leadership continues to be driven by a number of economic and political factors, including concerns over high energy costs, vulnerability to supply constraints and price volatility in the energy markets, significant cost-saving options created by energy efficiency investments, concern about climate change impacts, and opportunities to develop a robust clean energy economy. The energy efficiency industry in Massachusetts has become an important source of job and economic growth in the state. The most recent jobs report by the Massachusetts Clean Energy Center indicated that in 2014, 65,182 jobs were attributable to energy efficiency efforts in the state.<sup>2</sup> Therefore, the benefits of energy efficiency extend beyond just the energy savings.

The Department of Energy Resources (DOER,) a department of the EEA, develops and implements policies and programs aimed at ensuring the adequacy, security, diversity, and cost-effectiveness of Massachusetts's energy supply. DOER's ongoing leadership has provided a driving force to develop and advance energy efficiency efforts in the Commonwealth including all steps of the goal-setting process. DOER chairs the EEAC and also takes an active role in pursuing energy efficiency innovations. Outside of the EEAC, DOER drives participation in the statewide energy efficiency programs by providing support to municipalities through the "Green

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<sup>1</sup> Low income customers are those earning less than 60 percent of State Median Income.

<sup>2</sup> <http://ma-eeac.org/wordpress/wp-content/uploads/MA-Clean-Energy-Center-Year-2014-MA-Clean-Energy-Industry-Report.pdf>

Communities Program,” and ensures that state facilities are actively pursuing energy efficiency through the “Leading by Example program.”

### **Key Structures, the EEAC, and its Roles and Responsibilities**

The Massachusetts EEAC was created in 2008 by the Green Communities Act (GCA) to guide the development of comprehensive, integrated, statewide energy efficiency plans and monitor their implementation. Its primary role is to support the PAs to achieve and fulfill the efficiency requirements, goals, and obligations of the Act. Fifteen voting members represent a variety of energy efficiency stakeholders that are specified in the enabling legislation. The Department of Public Utilities (DPU) appoints Council members to five-year terms. The small business representative, who also serves a five-year term, is chosen by his or her peers. Twelve non-voting members include the PAs from the investor-owned electric and gas utilities and energy efficiency service providers and other stakeholder groups. The EEAC is chaired by the Commissioner of the Massachusetts Department of Energy Resources (DOER).

The EEAC is also authorized to retain expert consultants to assist the EEAC in its mission. Since 2009, Optimal Energy, Inc., along with several key partner consultants (referred to as the Consultant Team) have supported the Council with strategic planning; program review, evaluation, measurement and verification oversight; and other support for the purpose of reviewing, assessing and making recommendations related to the energy efficiency plans administered by the PAs.

To discuss and vote on important decisions, the full EEAC meets monthly. An Executive Committee of the Council, including the DOER and the Attorney General, meets monthly to perform specific tasks and functions at the direction of the full Council, providing an additional level of scrutiny and consideration for Council priorities. Agendas are set by the Executive Committee, with the PAs, Consultant Team, and other stakeholders often presenting program updates, analysis and potential program refinements to the Council at each meeting.

Whereas the EEAC is responsible for guiding the PAs in carrying out the requirements of the GCA and for making a recommendation to the DPU on the substance of three-year plans, the PAs are responsible for delivering the programs and taking the actions that result in measurable, verifiable energy savings that meet the DPU approved three-year goals. To facilitate coordination between the state’s four electric and six gas PAs, the utilities engage in biweekly sector-specific management committee meetings. Members of the EEAC Consultant Team participate in some portions of these meetings.

Figure 1 below identifies the key players in the 2016-2018 EEAC planning process. Many other interested stakeholders also provide input to the Council process in support of the requirements of the GCA and other efficiency policies and programs in the state.<sup>3</sup>

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<sup>3</sup> Examples of interested stakeholders include housing organizations, health care organizations, contractors, environmental advocates, municipalities, social justice advocates, and large corporations, among others.

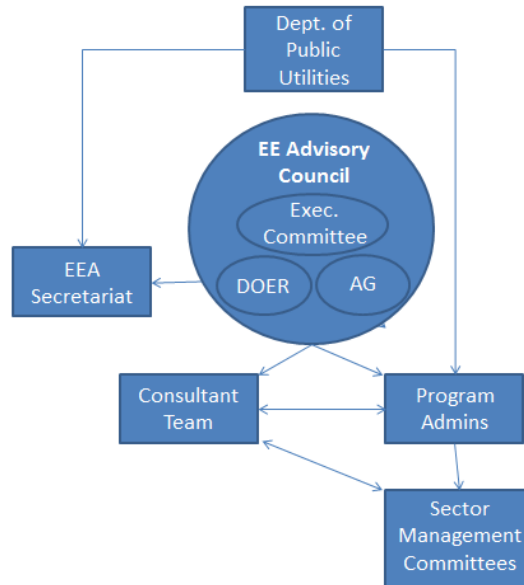


Figure 1. Key Organizations Involved in the Massachusetts Goal-Setting Process

## EM&V Feedback Loop

Evaluation, measurement, and verification (EM&V) is also a critical part of energy efficiency efforts in Massachusetts, providing objective and fact-driven results that help to ensure the reliability of savings claims, improve existing programs and support the development of new ones, and lay a solid foundation for the development of three-year plans.

The current EM&V framework was established by a 2009 Council resolution that was negotiated among the parties, unanimously approved by the Council, and included in a three-year plan that was submitted to the DPU and approved. Under the terms of that framework, EM&V is a collaborative effort among the PAs, the Council, and the Consultant Team, with the Consultant Team overseeing every phase of the EM&V process. The process includes evaluation planning, contractor procurement, study implementation, reporting and outreach, and application of study results. While the Consultant Team must work closely and collaboratively with the PAs, the resolution specifies that if consensus cannot be reached between the PAs and the Council Consultant, decision-making authority (subject to a system of appeals with the DPU) rests with the Consultant Team as the Council's agent. Thus far, there has never been a case of an EM&V issue that could not be resolved collaboratively. All parties place a strong emphasis on effective collaboration.

The overall scope of the EM&V program budget increased roughly four-fold from 2009-2014, before stabilizing in 2015. Significant efforts were made in 2013-2014 to systematize the EM&V planning, reporting, and outreach process in order to strengthen the feedback loop and enhance the ultimate usefulness of study results. The year 2015 saw the completion and filing of an overall Strategic Evaluation Plan (SEP) for the 2016-2018 period, and the completion of approximately 50 studies. In addition to impact accounting, EM&V supports program design and policymaking. To support all of these functions, EM&V efforts in Massachusetts balance the use of impact evaluations with other types of studies such as process evaluation, market assessment or data-mining studies.

Consistent with the focus on supporting program design and policymaking, there is a strong emphasis on maintaining an effective feedback loop between EM&V results and decision-making. Mechanisms for maintaining and advancing the feedback loop include the following:

- The Evaluation Management Committee (EMC), a statewide committee made up of PAs and members of EEAC Consultant Team that coordinates the EM&V program at a global level
- Overlapping membership between the EMC and the statewide program management committees
- A three-step planning process for individual studies intended to allow stakeholders to provide input on which EM&V results will be valuable to them before a study is initiated
- Multidisciplinary teams of evaluators and implementers within the PAs and Consultant Team working collaboratively on specific issues

The feedback loop created as part of the EM&V process has helped to improve programs and reduce costs. For example, in a rapidly changing lighting market, EM&V has helped to determine which kinds of lighting measures to promote, when, and for how long; which channels to target; where the programs are still having an effect and where it is time to move on; and how to balance promotion of CFLs with promotion of LEDs.

## **Funding Sources**

As regulated entities, the PAs must receive approval from the DPU for their efficiency program spending and related issues of cost recovery. The electric energy efficiency programs are funded by a variety of sources, the largest of which are a historical System Benefit Charge (SBC) and an Energy Efficiency Reconciliation Factor (EERF) created by the Green Communities Act. The legislatively mandated SBC of 2.5 mills (0.25 cents) per kilowatt-hour is paid by all electric consumers, except those served by a municipal lighting plant. The EERF is used to recover additional program costs from electric customers in proportion to the costs of programs directed at their sector (i.e., residential, commercial & industrial); with low-income programs receiving subsidies from other sectors. The EERF is a unique DPU adjustment tool that allows PAs to adequately recover the costs to achieve all cost-effective energy savings.

As show in Figure 2 below, in 2014, the SBC and EERF accounted for 91% of efficiency program funding. Other sources of funding include Regional Greenhouse Gas Initiative (RGGI) auction proceeds and Forward Capacity Market (FCM) payments from ISO-New England, as well as carryover from sources from previous years. The share of the electric program costs from RGGI and FCM payments, while modest, is growing over time as those markets become more mature. The natural gas efficiency programs are funded exclusively by an Energy Efficiency Surcharge (EES) on gas customers' bills.

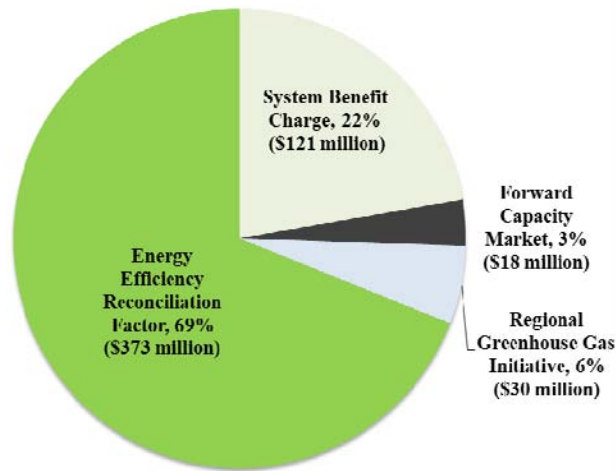


Figure 2. 2014 Funding Mix: Electric Energy Efficiency Program

## Performance Incentives

In addition to funding program costs, a portion of the three-year efficiency plan budget is dedicated to PA Performance Incentives for meeting or exceeding goals put forward in the Plan. Performance is assessed at the portfolio level based on cumulative three-year results. The incentive mechanism is composed of a savings component and a value component, both of which focus on program benefits. The savings mechanism is based on total benefits, while the value mechanism is based on net benefits. The sum of these two components makes up the total incentive. Common payout rates for each component are set by dividing the incentive pool by the dollar amount of the benefits for each component. The incentive pool is further allocated for each PA as well as by sector and program based on the contribution of benefits to the portfolio. Therefore, the PAs that contribute the most towards the savings goals are able to earn more of the incentive pool while getting savings from the sectors and programs at levels outlined in the Plan. For 2016-2018, the performance incentive pool was set at \$100 million for electric and \$18 million for gas. PAs can begin earning performance incentives if they achieve 75 percent of the benefits put forward in the Plan (referred to as the threshold level). At the design level, PAs receive 100 percent of the allocated PI for achieving the full benefits included in the Plan. PAs can also earn additional incentives at an exemplary level up to 125 percent of the design level incentive.

Performance incentives are an important tool for encouraging PAs in Massachusetts to invest in energy efficiency and strive for continuous improvement. By achieving targets established in the three-year planning process, performance incentives allow the PAs to receive a return on their investment, as they would on supply-side investments.

## 2016-2018 Goal Setting Process, Methodology, and Timeline

Every three years, on or before April 30, the PAs are required by the Green Communities Act (GCA) to prepare a Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan (referred to as the Three-Year Plan, or just the Plan) that includes program designs and strategies as well as savings targets and associated budgets. The 2016-2018 planning process began in

December of 2014, informed by a proposed engagement plan.<sup>4</sup> At the December 2014 EEAC meeting, the Council held Councilor input sessions, proposed topics for discussion at future workshops, and proposed a schedule of information delivery leading up to the submission of the PAs' initial draft of the Plan on April 30, 2015. Following several months of review and the release of an interim draft of the Plan, the PAs submitted a final version to the DPU on October 30, 2016. In January 2016, the 2016-2018 Plan was officially approved by the DPU with unprecedented savings targets set at 2.94% of annual retail electric sales and 1.24% of annual retail gas sales. These goals are the result of an intensive collaborative process between the PAs, EEAC, DOER, Consultant Team, and many interested stakeholders in the public, private, and nonprofit sectors.

Several key analytical and review steps, described in more detail in the following sections, helped to inform the Council goal-setting process. First, the Consultant Team completed an assessment of potential and trend analyses to identify energy savings and cost patterns that have occurred in Massachusetts over the past several years as well as a starting place for potential savings in 2016-2018. The Team also identified specific programs, measures, and customer classes that could provide additional sources of energy savings over the next three years. Planning efforts then moved to a collaborative stakeholder process by holding public comment sessions and sector specific workshops to recommend potential improvements to the Plan and discuss important issues impacting the programs. The PAs and Consultant Team also worked together to review and analyze the "key drivers" of savings goals and costs, including those responsible for the differences between savings and costs in the first draft of the PAs' Plan and the Consultant Team's recommendations.

Throughout these steps, the Consultant Team and PAs kept the EEAC informed through memos, presentations, and briefings. These materials as well as draft plans, data, and other documents were made available on the Council's website ([www.ma-eeac.org](http://www.ma-eeac.org)). The website served as an invaluable tool to share information not only with the Council, but also with all interested parties and stakeholders. EEAC feedback also helped to guide the stakeholder process and set priorities at each stage. The Council was able to guide 2016-2018 planning through a process of:

- **Preview**—using the assessment of potential, goals framework, briefing documents, and input sessions;
- **Review**—direct response memorandum to the PAs draft Plan and the Key Drivers analysis;
- **Recommend**—through the July resolution; and finally,
- **Endorse**—through the October resolution.

The 2016-2018 planning process timeline has been summarized in Figure 3 below.

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<sup>4</sup> <http://ma-eeac.org/wordpress/wp-content/uploads/MA-EEAC-Engagement-Plan-for-2016-18-Three-Year-Plan-Development-prepared-by-Raab-Associates.pdf>

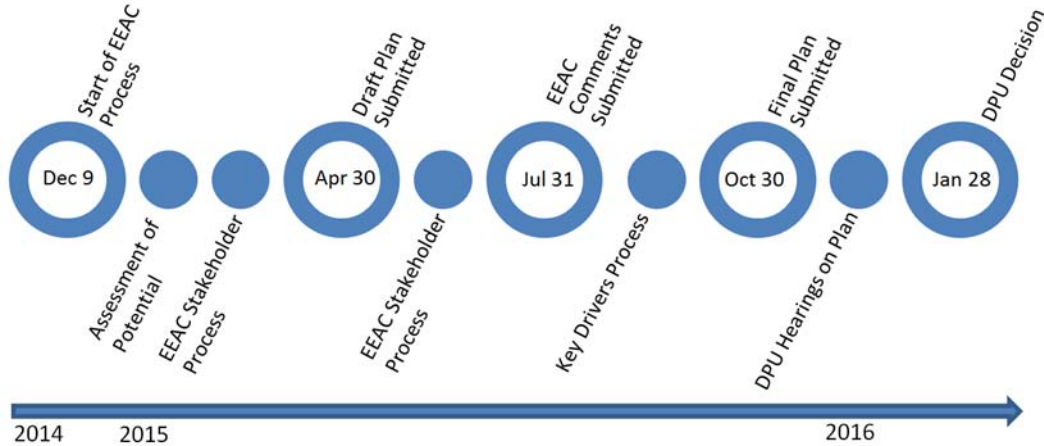


Figure 3. Timeline of 2016-2018 EEAC Planning Process

### Assessment of Potential

The first step in any energy savings goal-setting process is to estimate the level of savings that is achievable in the given timeframe. In the absence of a statewide measure-level potential study, the Consultant Team reviewed data from a large number of individual sources to arrive at a starting place for potential savings in Massachusetts for 2016-2018. These sources included:

- Historical PA performance data
- Recently completed evaluation, measurement, and verification (EM&V) studies for Massachusetts programs and markets
- Potential studies for Delaware, Maine, New York, Pennsylvania, and Vermont
- Potential studies for the small Massachusetts PAs (i.e., Unitil electric and Unitil, Berkshire, and Liberty gas)

Developing an estimate of the potential achievable savings resulted from an overall assessment of the totality of the information. The Consultant Team drew several conclusions from its analysis to help inform its initial estimate of potential:

- The Massachusetts PAs have continued to increase their annual savings rates since the passage of the GCA, and their 2014 statewide results exceed the preliminary estimates for 2015.
- A range of studies that consider various components of the Massachusetts efficiency market and customer behavior provide little to no evidence that efficiency potential is waning or that further improvements in addressing particular market sectors or service territories are not feasible.
- Potential studies from the region indicate remaining achievable potential in excess of likely achievement over the next three-year planning period, particularly when study conservatisms are considered.
- Studies conducted for one small electric and three small gas utilities in Massachusetts demonstrate savings potential consistent with the continuation or growth of current savings rates, again, when conservatisms are considered.



- Costs to achieve electric and gas savings have been relatively constant for the past five years even as savings achievement has doubled.

Taking all of the evidence together, the Consultant Team estimated that the achievable and sustainable potential over the course of the next Three-Year Plan to be approximately 3.0% annually for electric savings and 1.5% annually for natural gas savings.<sup>5</sup> In comparison, savings achieved in 2014 were 2.7% and 1.3% for electric and gas, respectively. Although the assessment did not include a direct accounting of the economic cost-effectiveness of these savings, it accounted for the both the likely cost-effectiveness and other constraints on this potential.

**Trend analysis.** As a key starting point for the assessment of potential, the Consultant Team reviewed the historic savings trends for both electric and gas PAs over the previous two Three-Year Plan periods. These data are shown in Figures 4 and 5, below. Next, the Team added a linear regression of the statewide annual savings from 2010 through 2014 to extrapolate potential statewide savings in 2015, acknowledging that the goals for 2015 were already set. The Team’s hypothesis was that this savings level—3.0% electric and 1.5% for gas—represented a reasonable preliminary estimate of continued potential in 2016 and beyond. Fourth Quarter preliminary results suggest the PAs saved 3.01% of statewide electric sales and 1.21% of gas sales in 2015, which were more closely aligned with the Consultant Team’s estimate than the savings that had been planned by the PA’s.<sup>6</sup>

The Team also considered savings achievement relative to goals, where the overall trend indicated the PAs had increasing success in meeting and exceeding the goals, which the Consultant Team believed was both commendable and was supportive of the PAs’ ability to achieve increasing goals over time.

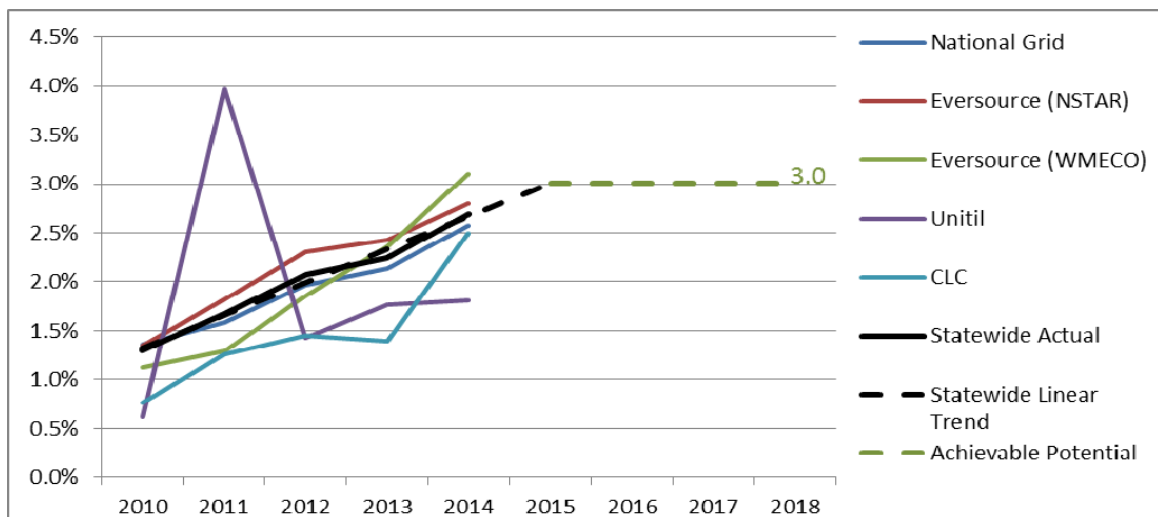


Figure 4. Historic Statewide Electric Savings Depth and Future Potential

<sup>5</sup> Percent savings are calculated at net savings divided by projected retail sales.

<sup>6</sup> <http://ma-eeac.org/wordpress/wp-content/uploads/Quarterly-Report-of-the-PAs-2015-Q4-Final.pdf>

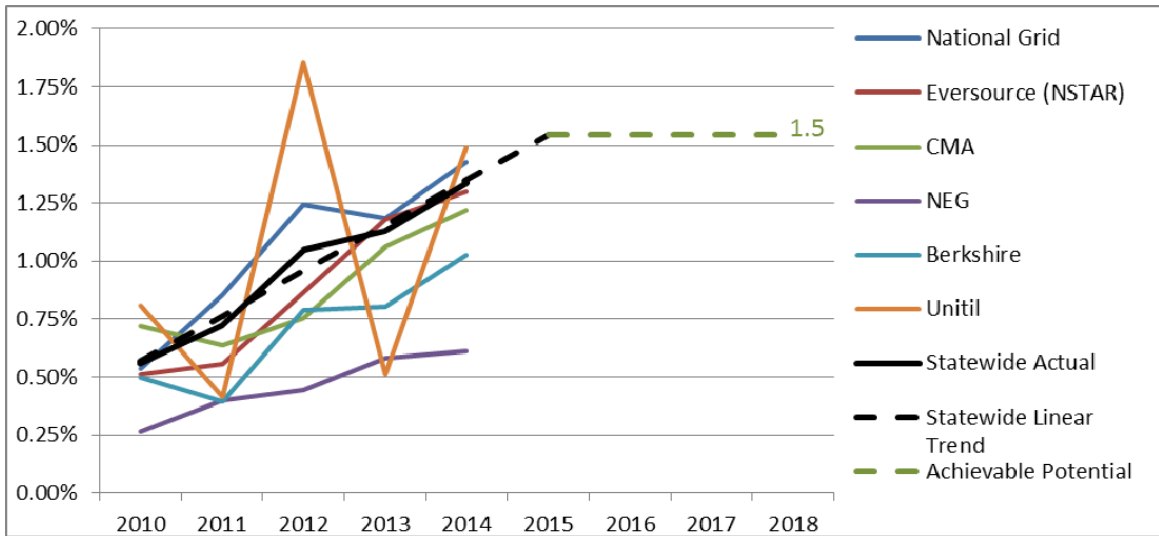


Figure 5. Historic Statewide Gas Savings Depth and Future Potential

The Consultant Team’s review of the additional resources listed in the previous section provided support for the savings levels projected in the trend analysis as reasonable estimates of achievable potential in Massachusetts from 2016-2018.

**Considerations for assessing potential.** While efficiency goal-setting is often informed by comprehensive statewide potential studies, potential assessment is as much an art as a science given that it requires assumptions and predictions about the future that cannot truly be known. This is especially the case in states like Massachusetts, which are sophisticated in their market segmentation and program delivery.

Where programs have begun attaining high reductions, past performance is no longer the best indicator for the limits of the future. As the Massachusetts PAs have matured in their approaches to markets and more extensive data has supported efforts to better understand customer patterns, the ability to segment markets burgeoned. In 2000, National Grid largely offered prescriptive incentives to C&I customers for several categories of measures under the program umbrella, “Design2000.” While prescriptive programs still exist, they do not dominate the portfolio as they once did.

At one time it was enough to know that end uses in most C&I facilities included lighting, motors, HVAC, and compressed air, among others. What has become more important over time is how customers use the technology associated with the end uses and how they make their decisions to purchase equipment. Segment specific implementers, for instance in grocery stores and healthcare, help to better reach customers by specializing in narrow markets. As implementers become better able to penetrate markets, estimators of potential must work to better understand markets in a way that more clearly exposes the remaining opportunities.

Although the assessment of potential provided a starting point for the 2016-2018 goal-setting process in Massachusetts, many other factors, including the sources of the potential needed to be examined more closely in order to best inform the Plan.

## Goals Framework

Once the Consultant Team had identified an estimate of achievable potential for the next three years in Massachusetts, the Team completed an analysis to identify available pools of savings that would enable the PAs to meet higher savings targets. In many cases, the PAs were already realizing some savings from these pools, but the Consultant Team's goals framework tried to quantify how much additional potential there would be from 2016 to 2018.

The 2014 program year, as the most recent year with reported actual savings achieved, was used as the baseline for comparison purposes. In the analysis, the Team considered changes in codes and standards, the availability and maturity of new technologies, costs of the current programs and measures, and how those costs will change over the next three year plan.

This analysis helped to identify where the savings could come from both in terms of sectors and programs to reach achievable potential levels.

## Stakeholder Process

Following the Consultant Team's analysis of the achievable potential and pools of savings in Massachusetts over the next three years, goal-setting efforts moved to a collaborative stakeholder process involving extensive feedback and discussion as well as data and information sharing. A series of workshops and briefings informed the Council about important issues related to goal-setting while Council meetings dedicated to public comment allowed for stakeholders to weigh in on the proposed Plan. Through the "key drivers" process, the Consultant Team worked with the PAs and others to review important assumptions that could have a large impact on portfolio costs and savings.

**Workshops/briefings.** Prior to the release of the first draft of the PAs' 2016-2018 Plan, the EEAC held 12 meetings and input sessions dedicated to plan elements and program ideas. These included seven workshops on specific topics related to the plan, four EEAC meetings, and a dedicated public comment meeting. Before each planning workshop, participating Councilors received briefing documents that provided the background information needed to vet and prioritize the issues and ideas outlined by the Council in its planning process input sessions.

Following the release of the first draft of the Plan on April 30<sup>th</sup>, the Council held an additional 12 meetings where plan elements and program ideas were discussed. These included nine EEAC meetings, two more workshops, and another dedicated public comment meeting. In total, the Council held 25 meetings and input sessions (including the December 2014 meeting) where the Plan was discussed.

The result of these discussion forums was that all stakeholders were able to make their priorities known. The EEAC formally commented on the draft Plan in July and included 75 recommendations covering all aspects of program design. Because the process was collaborative, the recommendations were positively received by the Program Administrators and a real effort was made to include them in the Plan. Once again, the political support for high goals drove the PAs and others to consider all possible program ideas to help achieve this level of savings.

In the final version of the Plan, the PAs provided detailed discussions of the issues included from the input process. Because the PAs addressed the recommendations made by the Council in July, the EEAC's final resolution on the Plan was able to focus on the few remaining high level priorities that would be used as benchmarks through the entire plan duration.

**Key drivers.** The energy savings and costs put forward in the PAs' April 30<sup>th</sup> draft 2016-2018 Plan suggested that there were clear differences in some of the planning assumptions made by PA's compared with the Consultant Team. The PAs' 2016-2018 goals and associated savings were generally lower than those proposed by the Consultants while the costs to achieve the savings were higher. Over a period of several months, the Consultant Team collaborated with the PAs to identify and explore the main assumptions that account for differences in the proposed goals and budgets put forward by the PAs and those recommended by the Consultants. This process was referred as the "key drivers analysis." The first step in the process was to select the end uses, programs, and customer classes that accounted for the largest differences and had a significant impact on the portfolio. The key drivers that were ultimately considered were:

- Residential Lighting
- Residential Behavior Programs
- Home Energy Services (Gas)
- Combined Heat and Power
- Commercial Lighting
- Streetlighting
- Mid size and Small Business Customers

The key drivers process provided an opportunity for finer review of savings goals and, importantly, the cost to achieve the goals. It included review of historical performance on a series of important inputs such as sector performance, projected portfolio mix, savings attribution, Net-to-Gross ratios and results from EM&V studies. In addition to these higher level considerations, penetration and market assumptions for specific end uses were reviewed in detail. The Consultants and PAs used on-site data that included segment and market-specific data to establish estimates on current penetration and available future opportunities. In many cases, the Consultants and PAs had differing opinions on technology and market maturation exemplified by assumptions for lighting, heat pumps, CHP projects, and other program components.

In each case, the EEAC Consultant Team worked directly with the PAs to review the assumptions used to build the plan. Where future assumptions differed, the PAs and Consultant Team held meetings to exchange data that supported the often competing visions of the future. As a result of discussion and information exchange, in many cases, the Consultant Team and PAs made adjustments to their assumptions, which narrowed the gap in costs and savings between the Plan and Consultants' recommendations.

For example, the Consultant Team and PAs' residential lighting assumptions originally resulted in a difference of approximately 280,000 MWh of savings for the 2016-2018 time period. Based on additional information provided by the PAs and the Consultants' own research, the Consultant Team revised its assumed LED unit share from 70%, 85%, and 100% in 2016-2018 respectively to 65%, 78%, and 90%. The Consultants also applied previously omitted values for in service rates (which adjust for whether purchased bulbs are actually installed) and readjusted its allocations for units between various lamp types to more appropriately match our larger overall unit assumptions. The Consultants requested and received from the PAs an update on YTD (through end of June) lighting unit activity. Adjustments made by the Consultant Team narrowed the difference between the PAs' planned numbers and the Consultants' goal projection to approximately 194,000 MWh. In addition to adjustments made by the Consultant Team, the

PAs made adjustments to their planning assumptions that were ultimately reflected in the September 30 draft of the plan and the final version filed with the DPU in October.

A complication on the C&I side is that a large amount of the savings comes from a small number of very large projects, especially in the category of CHP. Projecting a future stream of large projects is hard and risky for the implementers. In the end, the historical trend was used to average out a large project contribution to the plan. Using this approach, variability in CHP project timing is smoothed out by taking a three-year look.

The key drivers process was integral to moving planning efforts forward. Rather than getting bogged down by analyzing every assumption, the process focused on the assumptions that could truly contribute to significant changes in the portfolio goals. In many cases, the PAs and Consultant Team were able to find common ground, while in other instances, disagreements remained about particular assumptions and inputs. Regardless of whether agreement was achieved, the collaborative effort between the PAs and Consultant Team allowed for transparency in the planning process and a better understanding by both parties of the potential challenges, opportunities, and uncertainties that may present themselves from 2016 to 2018.

Following the key drivers process, goal-setting efforts largely moved from an analytical exercise to a negotiation between DOER, the Attorney General (with DOER and the AG acting on behalf of the Council), and representatives of the PAs. The Consultant Team continued to provide support and additional analysis throughout this process as needed. On October 26, 2015, the Council passed a resolution to support the revised goals and budgets put forward by the PAs.

**Results.** On October 30, 2015, the PAs filed a revised, final version of their 2016-2018 Plan with the DPU. As a direct result of the collaborative stakeholder process, the PAs' final electric savings goal moved from 2.50% of annual retail sales in the April 30 draft to 2.94% in the October 30 filed Plan. Electric costs were reduced from \$0.52 per annual first year kWh to \$0.45 per kWh. On the gas side, the goal moved from 1.08% to 1.24% savings and the cost to achieve moved from \$8.30 to \$7.76 per annual first year therm. These changes from the start of the process to the approval of the Plan, resulted in Massachusetts increasing its savings by 608 GWh, 116 MW of annual peak load, and 11 million therms while reducing the costs to achieve.

Table 1. 2016-2018 Plan Initial and Final Savings and Costs

	April 30 <sup>th</sup> draft Plan	October 30 filed Plan
Electric		
Savings (% of Sales)	2.50%	2.94%
Cost to achieve (\$/kWh)	\$0.52	\$0.45
Gas		
Savings (% of Sales)	1.08%	1.24%
Cost to achieve (\$/therm)	\$8.30	\$7.76

## Challenges

The 2016-2018 goal-setting process ultimately resulted in unprecedented savings and widespread support; however, there were several challenges along the way. First, although Massachusetts is a relatively small state, there are 10 investor owned utilities and one municipal aggregator serving customers, all of which must work together toward one statewide plan.

Adding to the complexity is the overlap of gas and electric companies. In some cases, one company provides both gas and electric services and in other cases one company provides electric and another gas in the same service territory. Several PAs are also multi-state entities that must synthesize programs in MA as well as maintain consistency in EE programs in multiple regulatory jurisdictions. Providing integrated services in all MA cities and towns with distinct differences in populations and demographics means that each PA submitting a plan must not only provide a statewide contribution to the overall plan but also satisfy the needs of their investors and the local populace.

The key drivers process helped to address the challenge of setting goals with multiple PAs. Although the assessment of potential, trend analysis and goals framework efforts largely looked at energy savings in aggregate in Massachusetts, the key drivers process allowed for the Consultant Team to more closely analyze PA-specific data and work with individual PAs to evaluate planning assumptions. The Consultant Team was also able to act as a liaison between the PAs and the Council to bring forward relevant differences between PAs that needed to be considered and addressed. Additionally, PA participation in sector-specific management committee meetings allowed for internal coordination on focused issues.

A second area that was particularly challenging in the planning process was the uncertainty in the potential savings from lighting. Historically, lighting has been a large contributor to the portfolio, accounting for over 60 percent of savings. However, changes in the lighting marketplace have never been more uncertain. LEDs are in the midst of a rapid proliferation in all sectors and new bulbs, features, fixtures and controls are hitting the market everyday. The EISA standards projected to transform the market when fully implemented in 2020 have instead provided an impetus to manufacturers to get ahead of the change and they are in the midst of introducing hundreds of bulb and fixture combinations. The result is that no one can predict with accuracy what savings may be attributable to program efforts in a given year when projecting four years into the future. To best address the results of this changing standard in the short-term, the PAs and Consultant Team agreed to deemed or estimated Net-to-Gross ratios that decline from 2016-2018.

Although the Plan reflects the best estimate of achievable lighting savings over the next three years, the PAs, Consultant Team, and EEAC will continue to monitor new information and market conditions related to lighting as the Plan is being implemented. Even if lighting savings decline between 2016 and 2018, it is possible that other market changes will provide additional opportunities from other technologies. The risk of the uncertainty with lighting is also mitigated by Mid-Term Modifications (MTMs). MTMs are intended to “provide Program Administrators with the flexibility to respond to changing circumstance, while ensuring that they implement their plans in a manner consistent with the Department-approved plan.”<sup>7</sup> PAs can submit an MTM to the Council or Department for approval of certain modifications to the Plan such as adding or eliminating a program, a significant increase to a program budget or decrease to program benefits.

## **Conclusion**

The 2016-2018 target setting process required Massachusetts to chart an energy efficiency path in uncharted waters. The Green Communities Act and other legislation provided the foundation for making energy efficiency a priority in the state. By creating the EEAC, the

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<sup>7</sup> D.P.U. 08-50-A at 63-64

GCA developed a forum for collaboration and discussion amongst the many stakeholders interested in and impacted by energy efficiency efforts in Massachusetts. Although the EEAC planning process was not without challenges, it effectively allowed for consideration of multiple perspectives, sources of information, and priorities. Extensive analysis of historical data coupled with consideration of evolving trends and key stakeholder input provided for an optimistic, but realistic look towards the future. The Commonwealth's intensive planning process and the commitment of the state government for continued leadership in energy efficiency resulted in a 2016-2018 Plan that continues to strive for the highest energy reduction goals in the country.<sup>8</sup> As the EEAC shifts its focus to implementation of the next Three-Year Plan, it will continue to monitor planning assumptions, program results, and market trends to support the PAs to achieve the goals set forth through the Council process.

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<sup>8</sup> Energy reduction goals as a percent of forecasted retail sales.