

The End of Prescriptive Rebate Forms? Massachusetts Moves Upstream

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ABSTRACT

For nearly two decades, energy efficiency programs have used prescriptive rebate application forms as a primary vehicle to obtain savings in the C&I Sector. It seems simple: the customer purchases more efficient equipment, completes an application form, and receives a rebate after-the-fact. Yet time and time again, evaluation after evaluation, program after program, customers and trade allies complain about the forms. The forms are complex, the process is time-consuming, and rebates not timely. Nevertheless, the industry has soldiered on, continuing to direct customers to use this cumbersome method to help them purchase more energy efficient equipment. The questions had to be asked, “Is there a better way? Can this customer-unfriendly method achieve aggressive savings goals within both new and mature programs?” In September 2011, Massachusetts began working with a new and exciting alternative to prescriptive rebate forms for C&I customers. Frequently called “upstream” or “mid-stream”, this new program delivery model abandons the prescriptive application form and shifts the burden of paperwork away from the C&I customer. In fact, the C&I customer completes no paperwork. They don’t wait for a rebate. They simply purchase the more efficient equipment at an already discounted price. Most importantly, the new method has achieved participation levels of customers and trade allies never before seen with the traditional prescriptive approach. Beginning with lighting in 2012, HVAC in 2013, water heating and commercial kitchens in 2014, this paper will describe this new upstream approach, the evaluation results to date, lessons-learned, and plans for the future.

Introduction to Upstream

In today’s energy efficiency program environment, utilities are being pushed to achieve increasingly higher energy savings goals. Although end-users are getting more educated about energy efficiency, the rate at which they are adopting energy efficient technology and submitting rebates is not keeping pace with state-wide energy savings goals.

The standard approach for prescriptive measure incentives relies on end-users submitting rebate forms to the utility. Because the point of influence in the market is at the end of the supply chain (i.e., at the end-user versus at the manufacturer or point of sale location), this approach is typically referred to as a “downstream” approach. In the typical downstream approach, the customer purchases high efficiency equipment, completes an application form, and receives a rebate weeks or months after the equipment installation is completed. The utilities spend significant effort and resources convincing end-users to purchase high efficiency equipment and submit the rebate forms. There are many challenges with this approach, including:

- Limited understanding among end-users regarding energy efficiency costs and benefits
- Complex rebate forms that users may require assistance completing, from either a contractor or program staff
- Lengthy terms of conditions included on the rebate form

- Higher initial cost (particularly before incentives) of the more efficient equipment

Customers have provided feedback to the Massachusetts utilities stating that they often do not bother to submit the rebate forms due to the effort it takes to fill them in or the fact that the forms get buried deep in a project folder, only to be found after the job is over and the next one has begun. When rebate forms are not submitted, the utility cannot claim savings. Even worse, an end user may choose standard efficiency equipment to avoid the perceived hassle of the utility forms. When this happens, everybody loses. The opportunity to choose high efficiency equipment is lost, along with the attendant economic benefits to the customer and the system and environmental benefits to the utility and society at large. As an example of these lost benefits, an analysis of rebate applications for residential heating and cooling measures in Connecticut during 2013 revealed that up to 40% of the applications received were incomplete, claimed ineligible equipment or had other errors.

Another challenge utilities face in the downstream approach is the lack of influence on manufacturers and distributors to promote higher efficiency equipment over standard offerings. The manufacturers will base their forecasts off of what the market is buying, and distributors stock what the manufacturers have available in their pipeline. If the bulk of the market is selecting standard efficiency equipment, this is what will be available in local distributors' inventories. Although manufacturers and distributors have a high degree of influence on what is offered and sold to the market, utilities have not typically spent enough time engaging these upstream market actors, opting instead to direct more of their efforts to the end-user. Furthermore, the prescriptive rebate form approach has not created a strong enough business proposition to manufacturers and distributors to substantially change their stocking and sales practices. The downstream rebate approach does not remove transformative barriers to drive the market to build and install higher efficiency equipment. A new approach is needed to remove more of these barriers and to provide manufacturers and distributors with a stronger business proposition to manufacture, stock, and sell the high efficiency equipment to end customers.

Recognizing these challenges, the Massachusetts utilities, working together under the Mass Save initiative, sought a new approach that would overcome the challenges of the traditional Commercial & Industrial (C&I) downstream prescriptive approach and create a much stronger business proposition for manufacturers and distributors. (Mass Save® is an initiative sponsored by Massachusetts' gas and electric utilities and energy efficiency service providers, including Columbia Gas of Massachusetts, the Berkshire Gas Company, Cape Light Compact, National Grid, Liberty Utilities, NSTAR, Unitil, and Western Massachusetts Electric Company. These entities, also known as Program Administrators, work together to design, launch and implement energy efficiency programs in Massachusetts). In 2008, Vermont employed a new approach that replaced the traditional downstream prescriptive approach. Vermont opted for an "upstream" incentive delivery approach for some types of commercial and industrial lighting equipment. The term "upstream" is a reference to the act of moving utility incentive dollars and/or resources "up" the sales channel, away from the end user, to another market actor such as a distributor or manufacturer who has a high level of influence over purchasing decisions. While this change was successful and generated tremendous results for Efficiency Vermont, it had never been tried at the scale and complexity that would be required to serve the larger Massachusetts market, which is approximately ten times the size of Vermont market and with five Program Administrators. The Massachusetts utilities took the Vermont approach as a starting point and refined it for the scale and complexity of the Massachusetts market.

The Upstream approach (Figure 1) removes the reliance on the end-user to submit paper or web-based rebates. Utilities work directly with manufacturers and their distributors to buy down the incremental cost of high efficiency equipment at the point of sale. It should be noted that “upstream” program designs have long been a component of residential programs, but have not been traditionally applied to commercial and industrial programs. In the approach adopted by Massachusetts, utilities engage with the manufacturers to support and promote the upstream approach to their distributors and end-customers. Utilities channel incentive dollars to the distributors to reduce the cost of the product at the point of sale and distributors in turn collect installation information about the end-user site, such as business name and site contact. Providing incentive dollars directly to the distributor makes it possible for the distributor to price high efficiency equipment more competitively against standard efficiency equipment. This approach allows the utility to leverage the manufacturer and distributor sales and marketing resources to influence thousands of customers and contractors, cost-effectively accelerating the introduction of high efficiency equipment to the market place. Note that while some small business customers and contractors purchase products from retail and home-improvement stores, it is a small piece of the market and presently not included in the C&I upstream program. This is primarily due to barriers associated in collecting end-user address and contact data needed for installation verification.

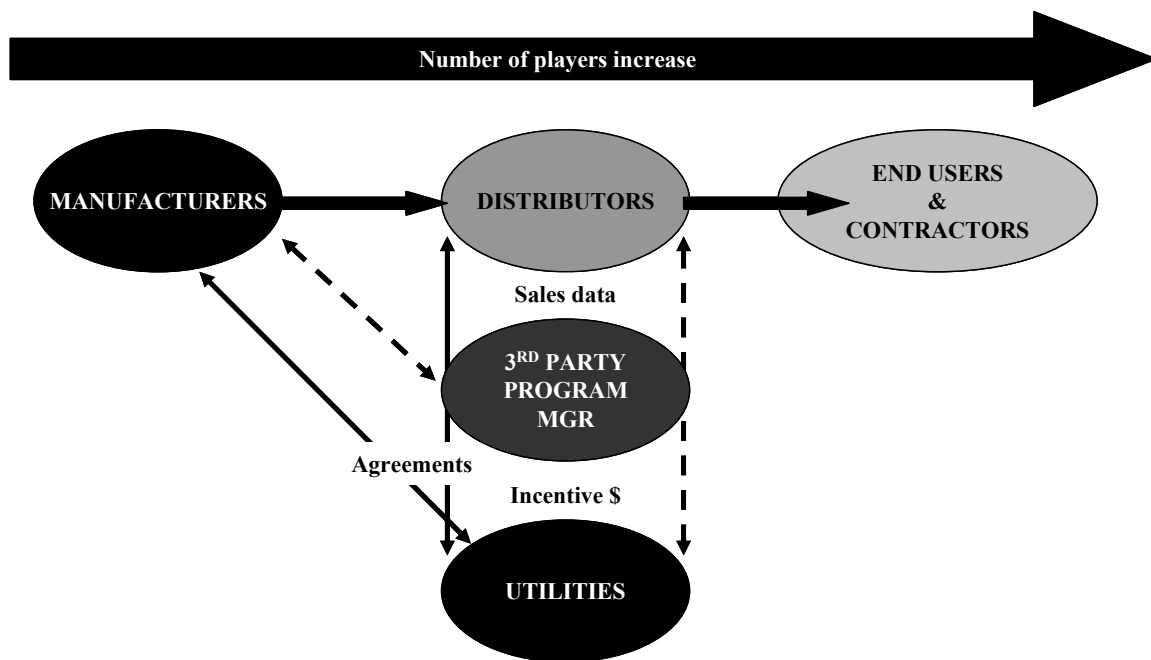


Figure 1. The upstream approach.

The upstream approach is most effectively deployed across an entire state rather than an individual utility territory. The additional scale and geographic area of an entire state reduces limitations and potential confusion for distributors regarding customer eligibility based on utility service area. Because any eligible equipment that is purchased within Massachusetts is eligible, distributors do not have to monitor customer addresses and limit participation to customers of a particular utility. To simplify statewide implementation, the five Massachusetts utilities joined together to procure a Third-Party Program Manager to manage data collection and outreach to

the distributor partners. The Program Manager receives and processes point-of-sale data from the distributors on a monthly basis. Each utility receives processed sales data for their customers along with invoices for incentive reimbursement. Once the utilities review and accept the data, they log the monthly savings and process incentive payments to the distribution partners.

The Upstream approach has many benefits. As described in the table below, the upstream approach can be a win-win proposition for all stakeholders involved.

Table 1. Summary of stakeholder benefits

Stakeholder	Benefits
Manufacturer	<ul style="list-style-type: none"> • Opportunity to balance product mix • Accelerate technology adoption in end-market
Distributor	<ul style="list-style-type: none"> • Increased profits and market share • Sales and marketing tool
Contractor	<ul style="list-style-type: none"> • Lower first cost • No rebate completion required • Sales and marketing tool to sell jobs
End-users	<ul style="list-style-type: none"> • No rebate processing (time and money) • Lower first cost • Energy and lifetime cost savings
Utility	<ul style="list-style-type: none"> • Eliminate loss of savings associated with forms • Opportunity to reach larger customer base

The upstream approach is not without challenges. The approach changes the rules of traditional program delivery and calculating energy savings. There are significant barriers within long-running energy efficiency programs against the change that it brings. Among the greatest of these barriers is the loss of the customer/end-user contact and the ability for the utility to collect site-specific data for identifying other energy efficiency measures. Customers do not receive an incentive check from the utility; in some cases, the customers may not be aware that they received a benefit from a utility-backed incentive program. Another challenge for the utility is that site-specific hours of operation that may have traditionally been captured with a prescriptive form, or a pre-inspection of the install site, are replaced with broad application and end-use assumptions. Moving away from hard data to a model of inferred data does have a slightly negative impact on the total energy savings that can be claimed per item when using this upstream approach, due to the need to develop conservative assumptions so as to not overestimate savings. There is also program conflict created between vendor-based programs (i.e. small business) and the upstream approach. Internally managing the potential for double-counting savings between the vendor-based programs and upstream can be an exercise in problem solving, something which can be overcome. Finally, in some cases, providing incentives dollars to upstream market players removes some of the transparency of how much of the incentive is passed along the supply chain to the end-user. Program Administrators (PAs) have to be comfortable with some of these uncertainties before undertaking an upstream initiative.

Despite these challenges, the upstream approach has proven to be highly effective at delivering much greater savings to Massachusetts utilities in comparison with traditional downstream prescriptive approaches.

Program Results

Massachusetts began the upstream approach with lighting in 2011 and expanded the approach to HVAC in 2013. While similar in overall structure, the different markets have required some modifications for managing the individual programs. The upstream approach allows the utilities to impact the market behavior and capture energy savings at a very fast rate. Across the 5 regulated PAs in Massachusetts, the C&I upstream lighting program provided an average of 15% of the total C&I energy savings for 2012 and 2013. The upstream program has been a key contributor to the Massachusetts C&I electric portfolio as the PAs had to ramp up savings year-over-year (shown in the chart below) to meet increasing goals.

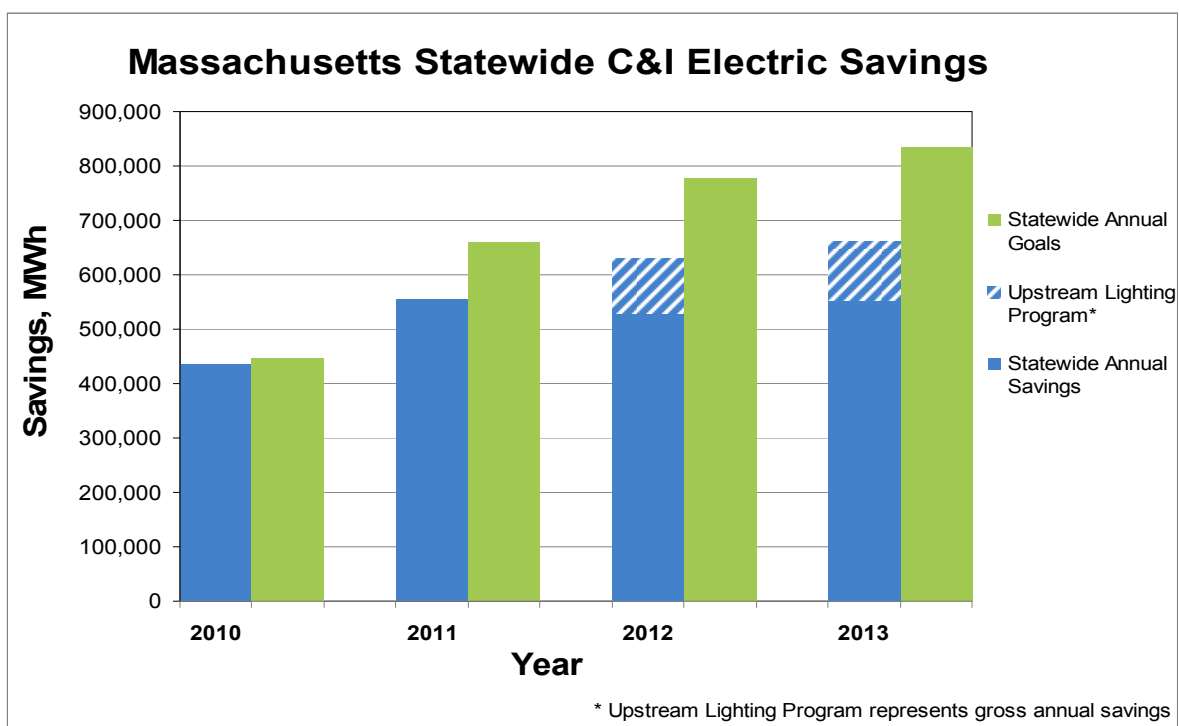


Figure 2. Impact of upstream program savings on the Massachusetts C&I Portfolio.

Lighting

The Upstream Lighting program is targeted specifically at replacement lamps, including reduced wattage linear fluorescent lamps (LFL) and LED replacement lamps. To date, lighting fixtures are not eligible and remain a downstream prescriptive item. This decision was made because lamps tend to be a “one-for-one” at the time of replacement purchases. These purchases lend themselves to the benefits of the upstream approach, while avoiding the potential drawbacks from loss of touch point, or the potential to “cherry pick” savings while ignoring deeper savings

opportunities. As of February 2014, there are 36 manufacturers and 89 distributors who have signed up and are now participating in the program.

In 2012, the Massachusetts utilities paid out \$18.3 million in incentives for 102 million kWh of gross annual savings, for an average cost of 18 cents per gross annual kWh. The program moved 2.1 million lamps through the upstream approach (about 1.3 million LFL and 800,000 LED). In 2013, the utilities paid out \$16.7 million in incentives for 110 million kWh of gross annual savings (15 cents per gross kWh). This reflected a combined total of 1.8 million lamps in 2013 (about 1.1 million LFL and 700,000 LED).

Both process and impact evaluations have been completed on the upstream lighting program. The process evaluation concluded that the program is well-designed and well-managed, citing high program satisfaction levels from end users and trade allies, lack of barriers to participation, high program net-to-gross ratios, and the lack of significant complaints from program implementers. The evaluators had only three recommendations for program improvement:

1. Provide a higher level of marketing of the program, especially to end-users.
2. Encourage participating trade allies to do more to educate their customers about the source and size of the buy-down discounts.
3. Provide more consumer education about the use of LED lamps with dimmer switches.

The impact evaluation addressed both realization rates (i.e., the extent to which forecasted and claimed savings reflect the reality of product installation and use) and net-to-gross (NTG) ratios (i.e., the extent to which product uptake would have occurred absent utility incentives.) Realization rates were determined through a series of on-site visits and equipment metering. The evaluation determined an 89% realization rate for Linear Fluorescent Lamps and 102% for LED lamps.

In terms of program attribution, self-reported data from customers, distributors, and contractors was used to calculate the overall values. The evaluation determined a NTG ratio of 82% for LED savings and 74% for LFL savings.

The evaluation results also determined that many more low efficiency lamps are being replaced by LEDs than the program's original baseline forecast estimated. While this trend is not expected to prevail long term as more sockets in the state are converted to higher efficiency equipment, it appears to be the case at present. As a negative factor, the evaluation found several instances of uninstalled or stockpiled LED and LFL lamps. Similar to the first trend, this is not expected to continue long term as it is fair to assume that many, if not most, of these will eventually be installed to replace low efficiency equipment. A third factor related to HVAC also shows positive results. In sum, by installing high efficient lamps that produce less heat, electric cooling loads are marginally decreased during the cooling season, while electric heating loads are marginally increased during the heating season. As a note, in Massachusetts, PAs make similar, subsequent adjustments to their cost effectiveness calculations to account for the negative fossil fuel heating impact of installing high efficiency lamps at locations utilizing oil and gas for heating.

For illustrative purposes, a comparison of evaluated upstream and downstream lighting is presented in Figure 2 below. Higher realization rates have the effect of decreasing the cost per kWh, while lower realization rates have an augmenting effect.

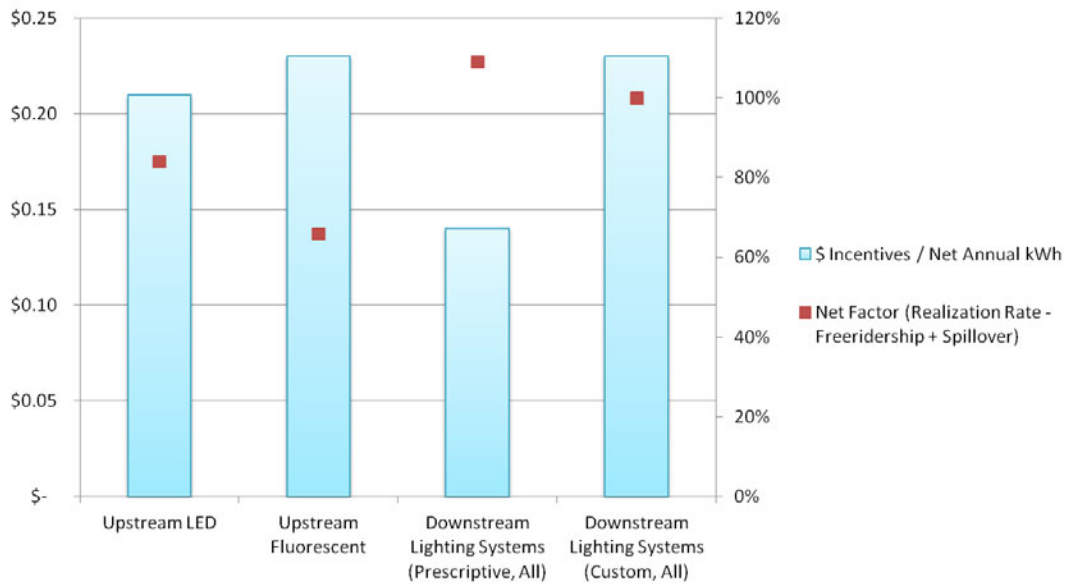


Figure 3. Measure cost & net factor comparison.

HVAC

The HVAC program was launched in April of 2013 with an initial focus on air-cooled air conditioning and heat pumps, water-source heat pumps, ground-source heat pumps, and some peripheral energy saving items such as demand control ventilation and electrically commutated motors.

The Upstream HVAC program was not launched with ideal timing, because participating distributors had already placed their equipment orders for the 2013 cooling season. This fact, coupled with the market moving off the previous prescriptive paper rebate form (known as “Cool Choice”), resulted in a slower start to the effort than anticipated. After a slow start, 10 manufacturers and 15 distributors have signed up as of February 2014, representing nearly all manufacturers and distributors selling in the Massachusetts market.

While the HVAC market fits the upstream model of targeting the replacement-on-failure segment, there are significant differences from the lighting market. The typical HVAC sale is more expensive and complex than a replacement lamp project. Utility incentives cover only a small fraction of the overall project cost. There is a high focus on first cost for HVAC equipment, wherein the lowest bid wins the job, regardless of lifetime energy savings and overall comfort benefits.

Most of the distributors in the market have been hesitant to stock both standard and high-efficiency equipment because stocking both greatly increases their inventory carrying costs. The availability of high efficiency equipment is one of the key barriers in HVAC market transformation. It has been stated by many of the manufacturers and distributors in the program that roughly 80% of the sales activity in the market is in the replacement-on-failure segment. If

the end customer needs a replacement HVAC unit immediately, distributors are not going to pass up the sale and end-customers cannot wait for 4 to 6 weeks for high efficiency equipment to be delivered to their site. To address the equipment availability issue, Massachusetts' utilities are considering many program enhancements (e.g. higher incentive levels or a stocking incentive) to change this market dynamic and provide a value proposition for distributors to stock and promote high efficiency equipment.

In 2013, the utilities paid out \$400,000 in incentives for just over 1 million kWh of gross annual savings (40 cents per gross annual kWh). The program moved a combined total of 960 pieces of HVAC equipment in 2013. This activity reflected a high number of water-source heat-pumps as a result of several large, multi-family construction projects that rely on this technology were occurring in the Boston area. This unit volume was an 86% increase over 2012 participation in the Cool Choice prescriptive.

The Massachusetts utilities are projecting a strong year for the program in 2014, in terms of both volume and gross annual energy savings. Program outreach and engagement has been accelerated and the program partners are positioned to utilize this upstream approach throughout the next cooling season in order to increase their sales.

An impact and process evaluation will occur on the HVAC program later in 2014.

Lessons Learned

The Upstream approach is not a silver bullet or a “one size fits all” solution for utilities to employ in every market. It is simply an additional program delivery approach, alongside traditional downstream programs, to accelerate market transformation for certain technologies. To facilitate extending the upstream approach to additional markets and technologies, the Massachusetts utilities developed a set of basic criteria for when the upstream approach may be preferred over a downstream approach:

- Equipment should be suited for replacement-on-failure or new construction scenarios, which typically means one-for-one replacement of standard efficiency equipment with a high efficiency version.
- Purchasing decisions are primarily driven by equipment first cost, rather than features, aesthetics, etc.
- Equipment should be an “off the shelf” item that is typically stocked at a distributor.
- Product should not rely on periphery items (e.g. ballast change outs, controls) for energy savings
- Market actor who receives incentive has a high degree of influence on a sale
- Manufacturer and distribution support is required to promote the sale of high-efficiency equipment.

Equipment that does not meet the criteria above should be reviewed very closely before being added to an upstream program. It is very important that the equipment lend itself to this approach and that the sales channel for the equipment is clear so that the appropriate market actors can be identified and enlisted into the program. For example, a technology may have a significant energy savings potential and may fit the replacement-on-failure scenario, but if key market actors, such as manufacturers and distributors, are not aligned to support the upstream model, this approach will not be successful.

Manufacturer participation is a critical requirement for upstream program success. In addition to providing advantageous pricing to their distributors to accelerate the sale of their high efficiency equipment, manufactures can also help direct their distributors to focus efforts on how to communicate and market the upstream program. Manufacturers can also influence equipment sales by providing their own incentives (to the end-users) and by running a targeted marketing campaign for a specific segment or application.

Distributors have a high degree of influence on equipment sales and play a critical role in the success of the program. Distributors that embrace the program guidelines, effectively sell higher efficiency equipment, and have some strategic sales skills will do very well. Mass Save lighting program data shows that the five, best-performing distributors in the lighting program (14% of the total participants) provide over 96% of the program energy savings. Those distributors who treat the program as a burden, perceived as more work for them, will lag behind their more aggressive and proactive competitors.

A challenge inherent to the upstream program as a state-wide effort is the need to gain alignment across all of the participating utilities. Agreement must be reached on several fronts, including the methodology used to set incentive levels, how to manage the data and incentive processing, and allocating program budgets. A state-wide upstream program will require strong program management and teamwork to create a successful outcome. This should not be under scoped. Some key items that are required for state-wide program planning and implementation include:

- Collecting state-wide sales and incremental cost data from manufacturers
- Establishing a baseline of standard versus high-efficiency equipment sales
- Developing an energy savings and budget forecasting approach for the program duration
- Developing relationships and signing agreements with manufacturers to promote the program
- Outreach to distributors, gaining their agreement to enroll in the program
- Developing a competitive bid, if needed, for a third party service provider (for data collection and/or program support efforts)
- Creating marketing collateral and a web page to help with outreach efforts
- Planning and executing a program launch – rollout calendar, webinar training, in-person events, informational emails, etc.
- Developing a process for program updates to ensure consistent communication.
- Creating a Quality Assurance and Quality Control process to maintain program integrity
- Setting up quarterly meetings with manufacturers and distributors to ensure program engagement and developing strategies to enhance program performance

Massachusetts Program Administrators (PAs) have developed close relationships with the leading HVAC and lighting manufacturers and their distributors. A key component of this strategy is to execute Memorandums of Understanding (MOUs), which are high-level agreements between the utilities and manufacturers to join forces to support and promote the upstream program. This enables the PAs to collect sales volume and incremental cost data, both of which are critical data to properly design a program. PAs can also develop savings and budget estimates using market penetration data.

A third party service provider can add value to program by streamlining the data collection, incentive processing and overall program support functions. This is especially valuable if there is more than one PA involved in the program. It can also help with ongoing outreach to the different market actors and ensure consistent participation from distribution and manufacturers. Massachusetts PAs have leveraged this model and selected third party providers based on a competitive bidding model.

Special attention should be paid to planning a program's launch. Massachusetts PAs have used a variety of tools such as webinars, in-person meets, websites and emails to target different market actors. It is prudent to give sufficient notice to the marketplace about an upcoming program launch so that program partners are able to do staff training, IT system upgrades/changes, inventory management, and other items needed for program participation.

A robust Quality Assurance and Quality Control (QA/QC) process is needed to encourage the proper behavior among participants. This process involves validation of sales data provided by the distribution and site inspections to verify installations. Massachusetts PAs have found that the QA/QC useful in maintaining program integrity and addressing problems in the marketplace.

Future Plans

Even though the Massachusetts utilities have enjoyed significant success with the Upstream Lighting and HVAC programs, they are considering new program improvements. Enhancement opportunities include adding new product types to the existing programs, tuning incentive levels to meet market conditions, improving distributor outreach and communication, and strengthening relationships with the manufacturers engaged in the program.

The Massachusetts utilities are also considering other equipment categories to help meet annual saving goals for both electric and natural gas. For example, the utilities are reviewing space heating and water heating equipment as a potential addition in late 2014. The equipment types under review include hot water heaters, boilers, furnaces, and circulator pumps.

There is also opportunity within an upstream approach to leverage individual state efforts to create regional programs. This effort is focused on alignment between manufacturers and larger distributors who can support multi-state marketing outreach. By leveraging scale, more contractors and consumers may become aware of the program(s) and this should create an end-user "pull" in the marketplace.

Conclusion

The upstream approach has the potential to change market behavior at an accelerated rate. Although the upstream approach cannot replace all traditional incentive delivery methods, it is an additional tool for utilities to use to complement existing downstream programs.

In the end, the upstream approach can be a win-win proposition for all stakeholders involved. End-users get high efficiency products at a reduced cost without having to complete a rebate application. For utilities or PAs, this approach enables them to cost-effectively reach a broader customer base, including those customers who have not participated in the past. Channel partners, such as manufacturers and distributors, can leverage this approach to increase profits by up-selling premium products, while strengthening their relationships and brand presence with end customers.

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