



# Upstream Utility Incentive Programs: *Experience and Lessons Learned*

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## INTRODUCTION

Upstream incentive programs, which work through manufacturers and distributors, have the potential to dramatically increase the market penetration of efficient technologies, at a significantly reduced unit cost, compared to downstream incentive programs which directly engage the consumer. This implies both enhanced program cost-effectiveness as well as much greater energy savings. Upstream programs can also be synergistic with traditional energy efficiency programs, and can be used effectively to leverage other resource acquisition activities.

Many utilities and other energy efficiency program administrators that have not yet begun upstream incentive programs are considering doing so, and it is likely that the approach will gain considerable momentum over the next few years. This paper reviews the experience of investor-owned electric utilities with upstream incentive programs across the U.S. and provides some conclusions and program design recommendations.

## THE LIMITATIONS OF DOWNSTREAM INCENTIVE PROGRAMS

In traditional utility energy efficiency programs, customers typically purchase qualifying efficient equipment and then apply for a rebate, which is paid directly to them with a check from the program sponsor. There is an application form for the customer to fill out, and an approval and quality control process for the program administrator to complete. The incentive is typically paid after the measure is installed. For some types of installations, a post-installation inspection is required for verification before an incentive is paid. This program approach is known as downstream incentives.

Historically, demand-side management (DSM) programs have had low participation rates and therefore low market penetration for efficient equipment. HVAC contractors, for example, have not promoted the most efficient equipment to their customers because these efficient units have higher first costs (albeit with lower operating costs), are not typically stocked by distributors, and require a special order often involving significant delivery delays. Significant market barriers exist for

installations planned in advance, such as for new construction or remodels. But barriers are even tougher on another front: as much as 65 percent of the HVAC market is for emergency replacement of equipment at failure (Cornejo 2013). The replacement must be done in a hurry, typically using whatever product a contractor has available, and energy efficiency is often not considered in the purchase decision.

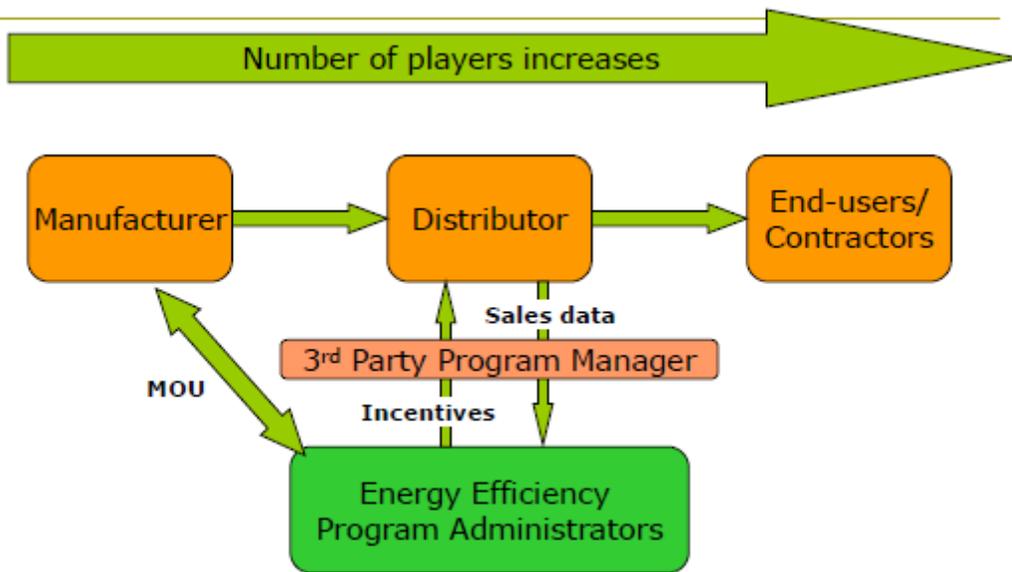
Even after a decade or more of DSM program operations, many commercial and industrial businesses are unaware of available programs and incentives, or may be reluctant to participate for various reasons. This leads to the result that utility-sponsored downstream DSM programs are missing significant portions of the markets they seek to influence. For example, only about 10% of businesses have participated in any of Xcel Energy's downstream business incentive programs in Colorado over the past five years, in spite of comprehensive rebates and considerable marketing efforts (Geller 2014).

## UPSTREAM AND MIDSTREAM MARKET APPROACH

Upstream programs work through manufacturers and distributors and operate differently than downstream programs, which engage end-use customers directly. Rather than deploying a post-installation rebate process, upstream programs offer wholesale price buy-downs to distributors or manufacturers. The process is simpler at all levels. Customers are not required to complete any paperwork, although they may be required to provide information to verify purchase and installation. Rather than sending out many individual rebate checks, program administrators send out fewer monthly payments to manufacturers or distributors who have filed electronic batch reports, or who have entered sales information into a web-based database that aggregates sales activity. Incentives can be smaller since the incremental cost for energy-efficiency products is much less at the manufacturer or distributor level, compared to the retail level. In some cases, program administrators also work directly with manufacturers to commercialize and/or increase the availability of energy-efficient products in a region or utility service territory (see Figure 1).

It should be noted that the terminology around this market approach is not completely consistent. When programs work directly with manufacturers, they are unambiguously upstream. When programs work with distributors, suppliers, or retailers, they are sometimes called midstream programs and sometimes called upstream programs. For the purposes of this paper, upstream refers to programs that work directly with distributors and/or manufacturers, as represented in Figure 1.

Figure 1 | DSM Upstream Value Chain



Source: Graphic reprinted from Sondhi 2013b.

### Retailer-based Programs

Residential lighting programs have successfully deployed upstream strategies for over a decade. Many utilities offer instant rebates through retailers to consumers interested in buying compact fluorescent lamps (CFLs), light emitting diodes (LEDs) and other efficient light bulbs. Some utilities work directly with manufacturers to buy down the cost of manufacturing energy-efficient lighting products. There is a long and successful history of retail lighting programs, which are continuously transforming the consumer lighting market (EPA 2011). These programs have demonstrated their effectiveness, and are part of most electric utilities' DSM portfolios. Although retail lighting programs have been affected by the onset of federal lamp efficiency standards, they continue to evolve by de-emphasizing or phasing out certain products such as standard spiral CFLs and promoting newer, more efficient products such as LED lamps (EPA 2011; Nowak et al. 2013).<sup>1</sup>

Efficient electronic products such as ENERGY STAR televisions, personal computers and monitors are another group of products that have been successfully promoted in the retail market. Utilities in California as well as the Northwest Energy Efficiency Alliance (NEEA) began to provide retailers with incentives for selling ENERGY STAR televisions (in some case with minimum efficiency requirements above the ENERGY STAR threshold) in 2008-09. These programs contributed to a dramatic improvement in television efficiency, with the on-mode power consumption of new televisions falling approximately 50 percent between 2007 and 2011 (Kopf et al. 2012).

<sup>1</sup> Consumer lighting standards were specified in the Energy Independence and Security Act of 2007 (EISA).

This market transformation has diminished energy savings potential in the consumer electronics market, but there are still opportunities for retailer-based strategies for a number of electronic products including highly efficient personal computers, monitors and televisions and advanced power strips (CEE 2013; NEEP 2013). As of 2013, NEEA, Pacific Gas & Electric (PG&E) and a few other utilities provided upstream support for efficient televisions, including retailer incentives and training, and enhanced marketing and informational materials for consumers. In addition, utilities in Massachusetts and Rhode Island along with Efficiency Vermont provided incentives to retailers for sale of ENERGY STAR computers, monitors and advanced power strips (CEE 2013).

### **Commercial & Industrial Upstream Programs**

Upstream incentive programs for commercial and industrial (C&I) equipment began around 1998, when PG&E started working with distributors to stock and promote energy-efficient HVAC systems and motors. Over the last several years, utilities have also tested and proven upstream approaches to promote energy-efficient lighting and computers in the C&I market. But while several utilities and regional energy efficiency organizations have explored and refined C&I upstream incentive strategies, most utilities still use downstream designs that have not achieved significant market penetration.

Program experience has demonstrated that working with equipment distributors and/or manufacturers is an effective upstream program approach in the C&I market. Distributors are responsible for stocking decisions, influence manufacturers' production decisions, and train contractors (Cornejo 2013; Humes 2013). They know what it takes to get contractors to participate.

### **Benefits of an Upstream Market Approach**

Compared to downstream programs, upstream programs achieve deeper market penetration and reduced administrative costs for measures such as energy-efficient lighting, HVAC equipment, motors, pumps and computers. Working with distributors provides economy of scale and the ability to have a large impact on the marketplace working with a relatively limited number of entities. Broader participation and greater cost-effectiveness make upstream programs a valuable asset in utilities' DSM portfolios, and upstream programs can complement traditional downstream programs. For example, a contractor overseeing a comprehensive commercial retrofit project may install an efficient HVAC system that has been bought down as part of an upstream program, in addition to installing other efficient measures that qualify for post-installation rebates.<sup>2</sup>

Program administrators, designers and evaluators have identified key advantages to partnering with a few market players to ultimately benefit customers. When compared to traditional downstream programs, upstream programs:

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<sup>2</sup> In the programs researched for this brief, double dipping was not permitted; either a piece of equipment was eligible for a downstream rebate, or its price was discounted to the distributor, but not both.

- Reduce upfront cost barriers to customers; i.e., customers get discounts at point of sale instead of waiting for a rebate payment;
- Reduce program administration and transaction costs associated with rebate fulfillment;
- Reduce incentive payments as well as mark-ups at distributor and contractor levels;
- Encourage stocking of efficient products by distributors;
- Use rebate budgets more effectively;
- Are more cost-effective;
- Capture previously lost efficiency opportunities with persistent savings;
- Leverage key actors in the marketplace, namely manufacturers and distributors; and
- Align with existing commercial sales and marketing processes.

### Equipment Types Best Suited for Upstream Programs

Traditional energy efficiency programs have had some success and maintain an advantage for custom, complex and/or labor-driven energy efficiency projects. Upstream programs complement traditional efficiency programs by making efficient equipment readily available, providing resources for distributors to stock and upsell these products. Upstream programs have been used successfully by the following program administrators for a wide range of equipment types.

#### Consumer markets:

- Lighting (retailers) – implemented by most program administrators
- Electronics and appliances (retailers) – NEEA, PG&E, SoCal Edison, SMUD, MassSave, Efficiency VT, and others
- Ductless heat pumps (manufacturers, utilities and contractors) – NEEA

#### Commercial & Industrial markets:

- Lighting (distributors) – PG&E, MassSave, Efficiency Vermont, ComEd
- HVAC (distributors) – PG&E, Centerpoint Energy, MassSave
- Computers (manufacturers, utilities, distributors, retailers, ENERGY STAR) – NEEA
- Water-cooled chillers (distributors) – PG&E
- Water heaters (distributors) – PG&E
- Variable refrigerant flow systems (distributors) – PG&E
- Circulating pumps (distributors) – Efficiency Vermont
- Food service equipment (distributors) – PG&E

## EXAMPLES OF UPSTREAM PROGRAMS FOR COMMERCIAL AND INDUSTRIAL MARKETS

### **Pacific Gas & Electric (PG&E) – Distributor Channel Engagement Program**

Since 1998, PG&E has deployed upstream market strategies to promote greater adoption of energy-efficient HVAC equipment by C&I customers. PG&E found that the upstream program model is successful because a relatively small number of manufacturers and distributors influence the majority of sales within the C&I market (Cornejo and Barnacle 2013). Before 1998, energy-efficient HVAC equipment was not being stocked or promoted by distributors, because efficient models had a 20 percent price premium compared to standard equipment (Cornejo and Barnacle 2013). Because efficient units were not being stocked, a customer who wanted to buy one had to wait 4-6 weeks for delivery. The combination of higher price and long delivery times created serious market barriers to greater adoption of efficient equipment.

The first PG&E pilot paid equipment rebates directly to distributors with the assumption that the price reductions would pass through from distributor to contractor to customer. This approach allowed participating distributors to sell premium efficient HVAC equipment for close to the same price as standard equipment, or at a small price premium.<sup>3</sup> PG&E and its program implementer focused on recruiting and training distributors, as well as ongoing outreach and communication to distributors participating in the program.

Figure 2 shows the tons of cooling capacity of high efficiency unitary packaged HVAC equipment for which PG&E provided incentives during 1993-2013. It shows a dramatic increase in market penetration in years when an upstream program design was employed (1998-2001 and 2004-2013) compared to years when a downstream approach was employed (1993-1997 and 2002-2003). In general, customer and distributor rebates were the same during this nearly 20-year period, but participation was much higher in upstream years – the program was capturing much higher market penetration for HVAC equipment with an upstream approach. While precise data are not available, it is estimated that energy-efficient packaged HVAC equipment achieved a 20-40 percent market share (i.e., fraction of all equipment sold) when upstream incentives were implemented (Hanna 2014). This is much higher than the market share that was achieved with downstream incentives.

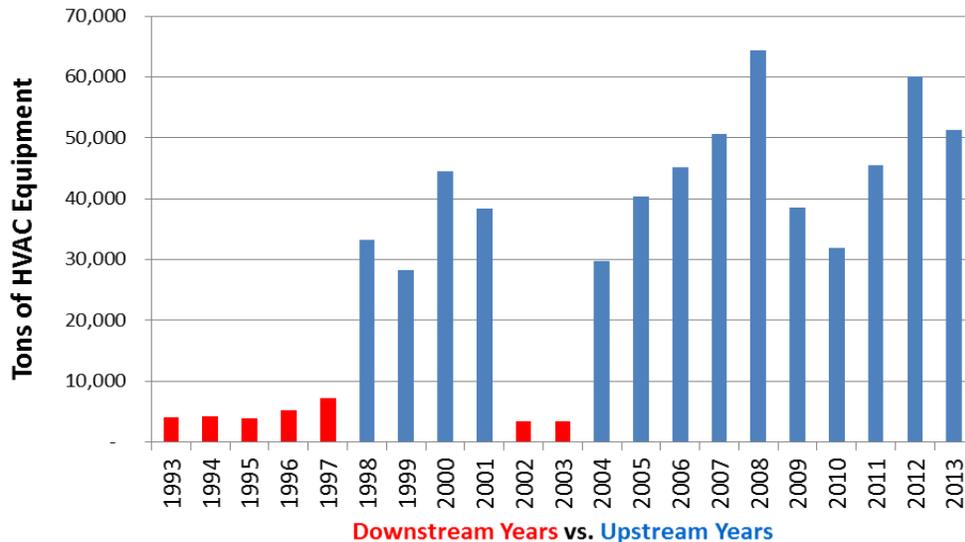
Despite the impressive results from 1998-2001, the California Public Utilities Commission (CPUC) mandated that PG&E go back to a downstream program in 2002 because they perceived that the utility was losing its customer touch points (Hanna 2014). When the CPUC reviewed the poor results from the 2002-03 program years, they reversed the policy, once again enabling PG&E to employ an upstream program model. The market penetration increased dramatically in 2004 and

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<sup>3</sup> The program originally included energy-efficient motors, but more recent efficiency standards have made rebates for efficient motors nearly obsolete.

continued to rise through 2008. The drop-off in the sale of energy-efficient HVAC equipment in 2009-10 was due to the economic recession those years.

Figure 2 | PG&E Commercial HVAC Program Results: 1993-2013



Source: Graphic provided by Jim Hanna, *Energy Solutions* (Hanna 2014).

The results from PG&E's HVAC program indicate up to a 900% increase in market impact when the approach shifted from downstream to upstream incentives. In addition, the success with upstream incentives for HVAC equipment led PG&E and other utilities in the state to expand the program (now known as the *Distributor Channel Engagement Program*) and introduce additional technologies such as variable refrigerant flow systems, water-cooled chillers, ductless mini-split systems, energy-efficient water heaters and food service equipment. Similar increases in market penetration were observed when the utilities shifted to upstream distributor-based incentives for these products (Hanna 2014).<sup>4</sup>

One of the non-energy benefits from upstream programs is high satisfaction throughout the value chain, including among customers, contractors, distributors and the utility (Cornejo 2013). Key factors include eliminating rebate applications for customers, faster payment of rebates, streamlined applications for distributors, and the opportunity to add emerging efficient technologies to the program.

<sup>4</sup> In California, the success of upstream incentives for high efficiency commercial HVAC equipment has led to a decision recently to move to upstream incentives for high efficiency residential HVAC equipment (Hanna 2014).

Almost 25,000 C&I customers purchased efficient equipment through the PG&E *Distributor Channel Engagement Program* during 2010-12. The program saved an estimated 78.7 GWh per year from efficient equipment sold and installed during this three-year period (Nowak et al. 2013). The estimated average cost of saved energy was \$0.029 per kWh saved and the program had a benefit-cost ratio of 1.6 under the Total Resource Cost (TRC) test (Nowak et al. 2013). A process evaluation of PG&E's upstream program also found that reporting requirements took only two minutes per transaction, much less than the time required in downstream incentive programs. Last but not least, the American Council for an Energy-Efficient Economy (ACEEE) recently designated the *Distributor Channel Engagement Program* an Exemplary Program in the category of Market Transformation (Nowak et al. 2013).

### **MassSave – Bright Opportunities**

MassSave is a coalition of eight electric and gas utilities in Massachusetts that works to create unified or harmonized state-wide energy efficiency programs across utility service territories.

In September 2011, MassSave launched its C&I upstream lighting program, *Bright Opportunities*, to promote increased adoption of reduced wattage T-5 and T-8 linear fluorescent lamps. Various LED products were added two months later. In 2012, Rhode Island joined the program. As of 2012, the first full year of program operations, 16 manufacturers and more than 50 lighting distributors were channeling more than \$15 million in incentives to distributors that sold more than two million qualifying lamps to end-use customers that year (Sondhi 2013a).

The upstream lighting program contributed 90 GWh per year of savings in Massachusetts in 2012, compared to 771 GWh per year of savings from the downstream C&I retrofit program and 183 GWh per year of savings from the C&I new construction program (Sondhi 2013b). Thus, in its first full year of operation, the upstream lighting program accounted for nearly nine percent of the total savings in the C&I portfolio.

A full impact evaluation of the *Bright Opportunities* program has not yet been completed, but a preliminary evaluation confirmed a high level of installation of efficient lighting equipment that was incentivized through upstream incentives to lighting distributors (Kwiatkowski, Talarico and Blake 2013). Retail and manufacturing were the end-use sectors with most program participants. According to distributors, the program was making LED bulbs accessible to new types of customers. The preliminary evaluation concluded that the upstream program is successfully delivering energy savings.

A process evaluation of the *Bright Opportunities* program found that all of the distributors participating in the program, and 89 percent of the contractors who worked with those distributors, reported being satisfied with the program as a whole (Dyson 2013). Satisfaction was also very high for the incentive payment process (88 percent of distributors); but somewhat lower for the program's reporting requirements (77 percent of distributors and 74 percent of contractors

answered that reporting requirements were “reasonable”); and still lower for the program’s marketing efforts (60 percent of distributors and 53 percent of contractors).

The process evaluation found that many customers do understand where the lamp discounts were coming from, even though the end-use customers do not receive an incentive or rebate directly (Dyson 2013). Only 34% to 62% of end-use customers recalled that their lighting suppliers mentioned the program discounts (responses to open-ended and direct questions, respectively). Very few end-use customers knew the dollar value or percentage of the discounts. These results led evaluators to recommend that the program do more education and marketing to end users, who ultimately drive purchases, even in an upstream incentive program (Dyson 2013).

Based on the success of the lighting program, MassSave launched an upstream incentives program for commercial HVAC equipment in the second half of 2013 and is planning other upstream incentive programs for future years (MassSave 2014).

### **Northwest Energy Efficiency Alliance – 80 PLUS**

In the Pacific Northwest (Washington, Oregon, Montana and Idaho) the Northwest Energy Efficiency Alliance (NEEA) has had great success with upstream incentives for efficient power supplies for personal computers and servers. This program, known as *80 PLUS*, offers financial incentives to manufacturers of desktop computers, servers and data center applications for every unit containing a certified *80 PLUS* power supply sold within participating utilities’ service territories.<sup>5</sup> Personal computers with *80 PLUS* power supplies consume 15-25% less electricity than those with inefficient power supplies.

The market share for personal computers with *80 PLUS* power supplies increased from zero in 2005 to at least 11 percent in 2008 (based on ENERGY STAR market share) and then to an estimated 70 percent of commercial desktop computers in 2012 (NEEA 2014). As of 2013, more than 200 power supply manufacturers have certified *80 PLUS* power supplies, while increased competition among power supply manufacturers has reduced incremental costs (NEEA 2014). The NEEA program also had a strong influence on the U.S. EPA’s decision to incorporate *80 PLUS* power supplies into the ENERGY STAR 4.0 personal computer specification adopted in 2007.

### **Efficiency Vermont - SMARTLIGHT**

Efficiency Vermont implemented a successful upstream commercial lighting rebate program known as *SMARTLIGHT* in 2009. The program provides distributor incentives that are aimed at eliminating

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<sup>5</sup> NEEA pioneered this program which was also adopted by other utilities across the country. The 80 PLUS® performance specification requires power supplies in computers and servers to be 80% or greater energy efficient at 10, 20, 50 and 100% of rated load with a true power factor of 0.9 or greater. This makes an 80 PLUS certified power supply substantially more efficient than typical power supplies.

any incremental first cost to the customer. At the same time, the program educates customers about the benefits of efficient lighting products. The program focused initially on reduced wattage, high performance T8 and halogen infrared (IR) lamps with the addition of LED lamps starting in 2012. Program savings grew from less than two GWh per year in 2009-2010 to more than 10 GWh per year in 2012-13.

The contribution of the upstream lighting program to Efficiency Vermont's total C&I energy savings increased from three percent of the total savings in 2009 to approximately 19 percent by 2013 (Brown 2014). Furthermore, LED lamps provided 55 percent of total C&I lighting energy savings in 2013, offsetting the loss of savings from fluorescent light fixtures which have been largely transformed to T8 and T5 lamps (Mellinger 2013).

Efficiency Vermont launched an upstream incentive program for circulating pumps in 2013. The program delivered significant benefits in its first few months, greatly increasing the number of efficient pumps purchased compared to the number purchased with downstream incentives. Approximately 800 efficient pumps were sold in the first three months of the upstream program, compared to just 50 per year under the previous downstream rebate program (Brown 2014). The upstream approach also enables Efficiency Vermont to process fewer rebates and account managers can better focus their efforts. Compared to the downstream program, the upstream program produced 45 percent labor savings, a 26 percent reduction in rebate cost per kWh saved, and a 28 percent reduction in overall program cost per kWh saved (Brown 2014).

### **Northeast Energy Efficiency Partnerships (NEEP) – Residential HVAC Pilot Program**

One effort to launch an upstream residential HVAC program highlights some of the challenges and complexities of collaborating with the entire supply chain to transform a market. In 2004, NEEP began to develop an upstream residential HVAC program in the northeast U.S. The toughest challenge was securing the support of program administrators (utilities and others) for what was at the time a loosely defined concept. The NEEP team used research from successful retail lighting buy-down programs to promote the concept (Schmidt et al. 2008). However, to the best of our knowledge, all of the residential program administrators in the region are still employing only downstream rebates to stimulate adoption of high efficiency residential HVAC equipment. Upstream incentives for high efficiency commercial HVAC equipment have been launched in Vermont, New York, Massachusetts and Rhode Island, and this may eventually lead to upstream incentives for residential products.

## PROGRAM DESIGN AND EVALUATION CONSIDERATIONS FOR USTREAM PROGRAMS

### Rebate Processing

One of the success factors for upstream incentive programs is an online paperless rebate application. The benefits include automation of the application processing, faster incentive payment, reduced errors, and program reporting for both the participants and the administrators. In order to facilitate this, the system should include and maintain an embedded utility database of customer information (to determine customer eligibility) and an equipment database (to determine equipment eligibility). The online system must also be able to electronically submit the processed application to the utility's back end data system for payment, tracking and reporting.

### Incentive Allocation Impact on Cost-Effectiveness

Utilities that have launched upstream incentive programs handle incentive allocation in a variety of ways. MassSave, for example, requires that the incentives be passed through to the distributors' customers. In California, PG&E provides flexibility to distributors as to how much of the incentive is passed through and how much is retained by the distributor.

The way incentives are distributed makes a difference in DSM cost-effectiveness tests. In a traditional downstream program, the incentive is counted as a cost to the utility but also a benefit to customers. Thus, the incentive has no net impact on the benefit-cost ratio under the TRC test.

In upstream programs, if incentives are required to be passed through to customers, it is reasonable to assume that customers receive them and thus the incentives are counted as a benefit to customers. However, if incentives are paid to distributors with no pass-through requirement, it is uncertain to what degree the incentives will be passed on to customers. It is likely that some or most of the incentive will be passed on due to competitive pressures among distributors, as well as to facilitate purchase of more efficient products by customers. If the incentive is not passed on, the more efficient product will have a significant cost premium and will probably not be purchased. It is reasonable to assume that some or most of the incentive is passed through even if it is not required. Even if no incentive pass-through is assumed, an upstream incentive program such the PG&E commercial HVAC program will still have a benefit-cost ratio greater than 1.0 under the TRC test (Hanna 2014).

### Should Incentives Pass Through Be Required?

Requiring that 100 percent of incentives be passed through from distributors to customers clarifies the TRC test calculation and ensures that the incentives benefit customers. But the requirement can penalize distributors and not recognize their critical role in building program success. In an upstream program, distributors influence stocking, sales and even the level of manufacturing of energy-efficiency products. In addition, reporting requirements fall on distributors in a way that

downstream programs have not in the past. Distributors have additional administrative costs and thus it is not unreasonable to allow them to keep a portion of the incentive. In addition, a 100 percent pass-through requirement runs counter to allowing the market to determine appropriate resource (i.e., incentive) allocation for achieving the goal of selling more efficient products.

In theory, utilities should not care whether distributors keep a portion of the incentive if it helps to sell more energy-efficient products. For example, distributors may find it very helpful to use a portion of the incentives to provide commissions (“spiffs”) to their sales staff, provide contractor training, or co-fund advertising (Hanna 2014). We recommend flexibility in the way program incentives are allocated, rather than requiring 100 percent pass-through. However, if a utility does require that all incentives be passed through to customers, it would be reasonable to provide an additional payment to distributors to offset their administrative and marketing costs.

### **Evaluation, Measurement and Verification (EM&V) for Upstream Programs**

Upstream programs present some unique but not unsurmountable challenges with respect to EM&V. Downstream programs have relatively complete tracking data, higher program awareness among end-use participants, higher participation rates in follow-up evaluation-related surveys, and confirmation of installation locations. Upstream programs may have more limited tracking data, fairly low rates of participation in follow-up evaluation surveys, no customer application forms to refer to, and more tenuous linkages between incentives provided to distributors upon evidence of equipment sale and product installation in customers’ facilities (Kwiatkowski, Telarico and Blake 2013).

Nonetheless, it is possible to verify installations, study operating conditions in a sample of installations, and estimate the resulting energy savings. This is facilitated by requiring distributors to provide customer installation addresses as part of rebate applications, standard practice for a number of programs, including PG&E’s *Distributor Channel Engagement Program*.

Beyond methodological challenges, there are even more basic questions around the appropriate strategies and assumptions used in evaluating upstream programs. One such assumption is that free riders must be counted and savings must be calculated as net of free riders.<sup>6</sup> In the case of an upstream program, program administrators work directly with manufacturers and distributors, who often sell to contractors, who may or may not educate the end-use customers about the incentives used for the purchase of efficient equipment. In some cases, customers may not be aware of the utility program or the fact that they obtained a lower price due to incentives provided to the distributor. Thus, the concept of a free rider in upstream programs is not applicable in the same way as for traditional programs.

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<sup>6</sup> Free riders are defined as customers who would have purchased a measure whether or not an incentive was available, but who accepted the incentive anyway.

These issues necessitate different approaches for measuring upstream program success. For example, free-ridership should be estimated through interviews with (and appropriate questions asked of) distributors rather than customers. This has been done in the PG&E upstream commercial HVAC program, leading to an estimated net-to-gross ratio of about 0.85 (Hanna 2014). Another potential solution is to evaluate upstream programs in the framework of gross energy savings, where free-ridership and spillover rates are not considered.

## RECOMMENDATIONS FROM UPSTREAM PROGRAM ADMINISTRATORS

The following recommendations have been gleaned and paraphrased from published reports and recent presentations by utility DSM program administrators with upstream program experience.

### *From PG&E:*

Include all measures targeting a specific market segment, even those that are not individually cost-effective. This creates a market foundation, in addition to committing to the program approach for the long-term, that market players will find attractive. Simplify program design, streamline incentive applications, offer tiered incentives, and apply a market-based approach.

An online data management system is essential to the success of upstream programs. Use web-based databases with easy-to-complete drop-down menu choices, coupled with batch application uploads and automated issue flagging and filtering. These solutions are particularly effective at capturing administrative savings in time spent in verification activities. As program volumes increase, it will be important for program administrators to make the administrative process as quick and easy as possible. (Cornejo 2013)

### *From MassSave:*

Develop constant interaction with industry players to ensure “top of mind” attention. Employ push (channel) and pull (customer awareness) strategies. Design flexibility to incorporate price changes and adjust incentive levels. Develop a robust QA/QC plan that enables verification of sales data and follows up with a sample of site inspections. Cultivate a preferred provider concept to help market transformation (Kwiatkowski, Telarico and Blake 2013).

### *From NEEA:*

The Northwest Commercial Lighting Retrofit Market Characterization study offered several recommendations for transforming the northwest lighting market, including region-wide development of upstream incentive relationships with distributors, manufacturer sales representatives, and manufacturers. One of the advantages of a regional approach is the ability to engage manufacturers and distributors that often have a regional or even national, rather than local, footprint (Heschong Mahone 2014).

***From NEEP:***

Have regionally consistent program requirements, direct incentives upstream to the distributors, and keep program operations simple by accepting applications online.

It is important for program administrators to enter for the long term, since it takes a while to ramp up and programs need to make it a worthwhile investment for distributors. Conduct a program for at least three years because it can take that long for the supply chain to effectively integrate program offerings into their business operations.

Relationships in the market are essential. In engaging market players, it is important to understand their needs and perceived barriers to sales and installation of high efficiency HVAC equipment, and to work collaboratively with them to overcome these barriers (Linn, Patenaude and Stasack 2010).

***From Efficiency Vermont:***

Construct a careful program design and robust quality assurance plan to limit program abuse. Develop a comprehensive distributor outreach program, set rebate levels that eliminate the entire incremental cost to the customer, support marketing to drive participation from below with end-use customers, and engage with manufacturers and their reps to drive the program from above (Brown 2014).

## CONCLUSION AND SWEEP RECOMMENDATIONS

Upstream incentive programs have the potential to dramatically increase the market penetration of efficient technologies, at a significantly reduced unit cost compared to downstream incentive programs. This implies both enhanced program cost-effectiveness as well as much greater energy savings. Upstream programs can also be synergistic with traditional energy efficiency programs, and can be used effectively to leverage other acquisition activities. Many utilities and other energy efficiency program administrators that have not yet begun upstream incentive programs are considering doing so, and it is likely that the approach will gain considerable momentum over the next few years.

The strategies used in successful upstream programs have been tested and refined over the past decade, and program administrators now have considerable experience upon which to base goals, budgets and program design elements. Experience with this program approach has provided a number of lessons that can contribute to the success of future upstream incentive programs. Based on our review of this experience, SWEEP provides the following recommendations:

- **Partner with distributors and manufacturers** in program design and operation. Communicate early and often.
- **Direct incentives to distributors who will pass them through**, in part or in full, to contractors and ultimately to customers.

- **Go statewide or regional** where feasible, since many distributors are statewide or regional and program consistency will help with market transformation.
- **Offset all or most of the distributors' incremental cost** for more efficient technologies.
- **Allow distributors flexibility in what portion of incentives is passed through** to customers and what portion is retained for marketing, sales promotions, training and/or administrative costs.
- **Provide a separate incentive payment to distributors** if a program requires that 100 percent of incentives be passed through to customers.
- **Keep program operations as simple as possible** by using electronic web-based reporting.
- **Implement a robust product quality assurance and tracking system.**
- **Require distributors to provide customer installation addresses** as part of rebate applications.
- **Provide training and support throughout the value chain.** Include training for distributors and their sales staff as well as contractors to enhance the understanding, promotion and ultimately the sale of energy-efficient equipment.
- **Educate customers** regarding the energy efficiency options being promoted. Build customer demand (market pull) as well as distributor and contractor promotion (market push) in order to maximize program impact.
- **Commit to the upstream program approach for at least three years** to grow distributor and contractor acceptance and provide stability for this new market paradigm.

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## ABOUT SWEEP

The Southwest Energy Efficiency Project is a public interest organization dedicated to advancing energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. For more information, visit [www.swenergy.org](http://www.swenergy.org).

SWEEP's Utility Program actively promotes the expansion and improvement of utility energy efficiency programs throughout the Southwest region.

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