Swimming upstream: When DSM programs can benefit from upstream incentives

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Paying incentives to manufacturers, distributors, or retailers affords energy-efficiency program administrators (PAs) benefits that downstream rebate programs just can't achieve on their own. Incentives paid "up the stream" help programs adapt to market changes faster, increase the availability of program-eligible measures, simplify the rebate process, and can reduce first costs of measures.

This report refers to both upstream and midstream programs to follow common nomenclature. However, when "upstream" is used, it broadly refers to any channel that doesn't utilize an end-user, or downstream, rebate. For more on upstream terminology see the sidebar Defining the Streams.

Defining the streams

Although there are some generally agreed-upon definitions for upstream and midstream programs, many industry professionals are still unsure of which term to use. Historically, the relationship to the customer has been the defining factor:

- Programs that pay incentives to those who sell directly to end users (distributors or retailers) are "midstream"
- Programs that pay incentives to those who do not sell directly to end users (manufacturers or distributors) are "upstream"

Arguably, rigid definitions don't matter because at a macro level, any program activities taking place up the value chain from the end user are upstream.

Lighting programs have been the epitome of upstream and midstream program success, but PAs have proved that these channels are also effective at increasing sales of high-efficiency space heating, space cooling, water heating, plug load, and appliance measures and a number of such programs exist (**Table 1**). However, questions linger around why, when, and how to shift incentives upstream for non-lighting measures. The focus of this report will be to explain the value of moving upstream, to untangle when it makes sense, and to examine the upstream incentive structure and evaluation techniques.

TABLE 1: Diversity of upstream and midstream incentives

Upstream and midstream programs aren't only used for lighting. Several program administrators pay incentives to upstream partners for a variety of end-uses, from HVAC to water heating to plug loads. While not an exhaustive list of all administrators running upstream programs, this table paints a picture of what's offered in the market.

Benefits of upstream approaches

In upstream and midstream programs, PAs pay incentives to relatively few partners (compared to tens of thousands of end users). In doing so, PAs can increase sales of high-efficiency equipment and can significantly influence the overall market when compared to their downstream counterparts. **Figure 1** highlights recent program results showing that upstream approaches are highly effective at moving residential and nonresidential HVAC and water heating equipment.

FIGURE 1: Program success in California, Massachusetts, and Connecticut

A. Program implementers in California report that upstream, nonresidential HVAC programs have increased participation by 900 percent and sold significantly more tonnage than downstream programs. This statewide program targets distributors and manufacturers of high-efficiency commercial HVAC equipment. B. In Massachusetts, upstream HVAC resulted in an 86 percent increase in equipment sales in the first year of implementation despite a start that was slower than expected. As in California, this program targets manufacturers and distributors. C. In Connecticut, upstream water heating efforts yielded a 641 percent increase in the total number of residential heat pump water heaters sold. This

program targets distributors and retailers.

Responsive market insight. Working directly with upstream and midstream partners can offer PAs more timely insight into changes to equipment manufacturing processes, stocking practices, or consumer demand. The upstream approach allows utilities to affect markets and claim energy savings quickly. Working at the supply level can help PAs quickly adjust programs when markets are transformed and ensure that efficiency budgets are spent on measures that present the greatest energy-saving opportunities. PAs can also make use of channel partners' marketing teams to communicate changes in incentives to customers.

Increased availability of preferred products. Most customers purchase what's in stock, especially when equipment fails unexpectedly and quick replacement is a priority. These customers don't have the time or patience to wait weeks for high-efficiency equipment to arrive. By ensuring that distributors stock and sell high-efficiency equipment, PAs eliminate the wait and reduce barriers to selling energy-saving equipment.

Simplified rebate process. Incentivizing manufacturers, distributors, and retailers instead of end users reduces the number of rebates issued. This streamlines the PAs' workload because they don't have to review hundreds or thousands of rebate forms. And because upstream programs use online systems to process batches of incentives, PAs don't have to issue paper checks.

Additionally, removing the end user reduces the risk of rebate errors, which add an administrative burden and create a negative customer experience. According to Energize Connecticut's report "EnergizeCT Residential Program Rollout," after it learned that a nearby state found flaws on 28 percent of its rebates and had a rejection rate of 7 percent, Connecticut began shifting its residential portfolio upstream in 2013.

Reduced measure first cost. The incremental cost of higher-efficiency measures can leave customers opting to purchase the less-expensive, less-efficient alternative. Upstream and midstream incentives may not be passed down fully, but it behooves program partners to lower upfront costs to a degree, making measures more attractive to customers. Where PAs actually require the cost to be reduced, there's no question that first cost is reduced. For more details on how upstream and midstream incentives can be structured, see the section "Anatomy of the Upstream Incentive."

Determining when upstream and midstream make sense

Upstream and midstream programs work best when PAs can leverage a smaller per-unit incentive compared to what would have been paid downstream. This approach can be particularly cost-effective for measures with small per-unit energy savings, such as some plug loads, and for measures like space cooling equipment, where a downstream incentive would have to be substantially large to influence customer buying behavior. **Table 2** outlines criteria that can help determine the applicability of upstream programs.

TABLE 2: When upstream and midstream programs can work

Several situations may favor an upstream or midstream delivery channel over downstream rebates. The following matrix outlines when to consider upstream and why. Though the scenarios are not mutually exclusive (nor collectively exhaustive), they can serve as a starting place for deeper conversations around the attributes that make a measure suited for upstream delivery channels.

PAs will want to thoroughly review a product category (for example, refrigerators, water heaters, Blu-ray/DVD players) to understand where incentives will have the greatest impact among manufacturers, distributors, and retailers. By estimating the number of companies that make, distribute, and sell equipment to the end user and by assessing the relationship between each, PAs can understand how a measure flows through the market. They can also determine if one entity has a greater influence on purchase and installation decisions. **Table 3** shows how manufacturers, distributors, and retailers would use an upstream program differently.

TABLE 3: When to target manufacturers, distributors, or retailers

Once program administrators have determined that it's appropriate to move "up the stream," certain criteria, such as sales volume, can help determine which channel may be preferred.

Anatomy of the upstream incentive

When it comes to paying incentives to manufacturers, distributors, and retailers, there are generally two approaches: Either the entire incentive is passed down to the end user or the incentive is dispersed at the discretion of the program partner. It can be used to reduce equipment first cost, pay sales incentives to staff, cut costs related to carrying and stocking equipment, or pay for the marketing of eligible measures. While there isn't a hard and fast rule, the former is often applied to residential programs and the latter (known as the discretionary incentive) is reserved for nonresidential programs. See the sidebar Implications of a Discretionary Incentive for more information on impacts this structure can have on a program.

Implications of a discretionary incentive

The discretionary incentive approach has benefits—namely, allowing individual upstream partners to determine how to spread the incentive to move the market—but it can create confusion. If a downstream rebate was in place previously, contractors would want to know what happened to it. And those receiving an incentive will need education on how they can use it and effective ways to discuss it. PAs in Massachusetts found that if contractors don't understand how the program works, a sense of mistrust can develop between the contractor and the distributor or PA.

A discretionary incentive could decrease program cost-effectiveness. Under the commonly used total resource cost test, incentives are usually neutral to the equation, equally a cost to the PA and a benefit to the customer. In California and Colorado, where distributors have flexibility in how they apply the incentive, PAs must categorize all or a portion of the associated cost as "administrative" instead of cost neutral "incentive" because the full incentive is not inherently passed along. California splits the cost

(70 percent administrative and 30 percent incentive) under the theory that just under one-third of the incentive is passed down. Stakeholders want to quantify the amount that is truly passed down in hopes of shifting a more accurate portion of the budget to the incentive category in the cost-effectiveness equation.

Massachusetts, however—another state that embraces the discretionary incentive structure—does not require the cost of incentives to fall under administrative expenses.

PAs can ensure that an incentive is passed down to the end user through explicit program mandates. In Connecticut, where residential incentives have steadily moved away from downstream, post-transaction rebates since 2013, PAs require the incentive to be a line item on the final customer invoice. Additionally, PAs mail a postcard to end users informing them their equipment was discounted via the program. To sweeten the deal for program partners, PAs compensate them for the administrative burden associated with implementing the incentive.

Overcoming the challenges in program evaluation

Program results indicate that upstream incentives facilitate stocking and increased sales of high-efficiency equipment, yet these programs face challenges—in particular, lack of consumer awareness of upstream and midstream incentives—that make it difficult to quantify the program's influence. However, PAs and evaluators are developing techniques to attribute energy savings to upstream programs that bypass surveys asking end users what level of influence an incentive had on their purchase decision.

Instead of focusing on end users, an evaluation of California's upstream nonresidential HVAC program determined attribution by assessing the program's influence on distributors. The program's objectives were designed around affecting distributor's sales and stocking practices, thus the evaluation focused on assessing the degree to which the program increased the stock of qualifying equipment and led to more sales and installation of the most efficient equipment when available. In this scenario, a distributor is a free-rider if it doesn't change its stocking and sales practices and if "naturally-occurring market demand is the only driver to account for high-efficiency equipment sales," according to the DNV GL in its HVAC Impact Evaluation Final Report: WO32 HVAC (PDF). **Figure 2** provides a summary of the evaluation methodology.

FIGURE 2: Determining attribution at the distributor level

A 2014 evaluation of California's statewide upstream commercial HVAC program used distributor self-report surveys to quantify the program's influence on participants' sales and stocking practices. The survey results were weighted based on the priority of each goal. Sales were given more weight because they were a priority versus stocking alone. Those results were then weighted again based on the distributor's contribution of energy and demand savings. Responses from distributors with greater impacts were given more weight.

New methods to determine energy savings in retailer-level plug load and appliance programs are also surfacing. The sales-weighted unit energy consumption is a new evaluation, measurement, and

verification method that's being honed by PAs on the cutting edge—Pacific Gas and Electric Co. in particular. The method establishes average energy consumption across a product category, such as freezers or DVD players, based on historical sales and efficiency standards. In theory, PAs would be able to claim savings by quantifying a reduction in a category's average energy consumption after a program has been implemented. For now, PAs will have to wait for a published evaluation to document the accuracy and applicability of the technique. A variety of papers that examine the premise are currently available:

- For Trial Programs, It's Not All About Energy Savings: A Methodology for Evaluating a Retail Plug Load Program Trial (PDF), American Council for an Energy-Efficient Economy
- What's your UEC? Baselining Sales-Weighted Unit Energy Consumption for Plug Load Products at the Retailer Level (PDF), American Council for an Energy-Efficient Economy
- Estimating Energy Savings for a Midstream Program Design Targeting Plug Load, Pacific Gas and Electric Co.

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