

# Illinois Energy Efficiency Stakeholder Advisory Group

2020 SAG Portfolio Planning Process  
Proposed Energy Efficiency Ideas Template

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**Energy Efficiency Idea Questions**

Please check the boxes below to identify 1) the type of idea; 2) which Illinois utility or utilities will be impacted by the idea; and 3) which EE sector the idea impacts.

Check	Type of Energy Efficiency Idea
<input checked="" type="checkbox"/>	New Measure or New Program Idea
<input checked="" type="checkbox"/>	Proposed Program Approach
<input type="checkbox"/>	Innovative Idea

Check	Illinois Utility Impacted by Energy Efficiency Idea
<input type="checkbox"/>	Ameren Illinois
<input type="checkbox"/>	ComEd
<input type="checkbox"/>	Nicor Gas

<input type="checkbox"/>	Peoples Gas & North Shore Gas
<input checked="" type="checkbox"/>	All Illinois Utilities

Check	Energy Efficiency Sector Targeted by Energy Efficiency Idea
<input checked="" type="checkbox"/>	Residential Customers – Single Family (non-income qualified/income eligible)
<input checked="" type="checkbox"/>	Residential Customers – Multifamily (non-income qualified/income eligible)
<input checked="" type="checkbox"/>	Residential Customers – Single Family Income Qualified/Income Eligible
<input checked="" type="checkbox"/>	Residential Customers – Multifamily Income Qualified/Income Eligible
<input checked="" type="checkbox"/>	Small Business Customers (commercial & industrial sector)
<input checked="" type="checkbox"/>	Medium/Large Business Customers (commercial & industrial sector)
<input checked="" type="checkbox"/>	Other (research & development, emerging technologies, market transformation)

## Upstream/Midstream Program Additions

### Basic Concept

Expand upstream/midstream offerings to additional products beyond lighting (and planned food service equipment). This can be considered as separate initiatives for each product, although could be housed under a single “program” or programs if appropriate. The intent is to: 1) increase savings and program participation/adoption of efficiency measures; 2) improve administrative efficiency and costs; 3) help with achievement of statutory goals. An ancillary goal is to transform markets for relatively new and currently low penetration products by achieving: greater adoption and customer acceptance; greater stocking and availability of product; greater contractor familiarity, comfort with, and capability to install and service product; bring down costs as economies of scale kick in and penetration increases; and ultimately potentially codified in codes and/or standards.

We propose expansion of upstream/midstream<sup>1</sup> offerings wherever it is appropriate and likely to lead to improvements in the three items listed above. Experience (some of which is discussed below) has shown that substantial increases in customer participation and product penetration—at times even by an order of magnitude—have been rapidly achieved when moving promotion from downstream to upstream. While most efficiency products could be offered through upstream approaches, there are some key characteristics that make this approach particularly appropriate for certain types of products.

- Market-driven investments (e.g., new construction, replace on burnout) as opposed to retrofit opportunities where the product is an add-on (e.g., controls or shell measures) or early retirement

<sup>1</sup> While distinctions between upstream and midstream approaches are sometimes made, for the remainder of this document the term “upstream” is used to include both approaches. How far up the supply chain a program targets should be specific to the functioning of that supply chain and determination of what points of intervention will be most effective.

- Products where a significant range of efficiency is available in the market
- Products where purchases are often time sensitive
- Products where customers tend to make product selection based on lowest first cost and/or contractor/vendor recommendations
- Products that have relatively low current market share<sup>2</sup>
- Products that are stand-alone widgets, as opposed to integrally tied to systems or other more integrated approaches to efficiency<sup>3</sup>

The concept is to engage primarily upstream from the ultimate end user of the product. This can be at the retail vendor/contractor, distributor, or manufacturer level. Often optimally designed programs may have aspects of engagement with all three. There are a number of potential advantages to this approach vs. focusing marketing, incentives and technical assistance on the downstream end user:

- Downstream approaches rely on very effective marketing and saturation of messages to build overall program awareness and rely on customers thinking of the programs at the opportune time when they are making an investment. This is particularly challenging when promoting products that are often installed with little planning, and are time sensitive (e.g., replacing a failed water heater).
- By focusing marketing, outreach, and implementation activity upstream, PAs have many less actors to engage with and influence. The further upstream one goes the greater the reduction in actors (e.g., a few at the manufacturer level, handful to low single digits at distributor level).
- Once participating actors are involved, they require less handholding and assistance, and can drive the product sales for the PAs. They know best how to sell their products, and this knowledge and ability is leveraged.
- Upstream actors are already engaged in the stocking and purchasing decisions at the right time automatically, eliminating the difficulties of PA efforts influencing consumers at exactly the right time.
- Each step in the supply chain typically will involve a mark up on price. Upstream rebates carry more “bang for the buck” because they address the incremental cost at a wholesale level, and this is then magnified down to the ultimate retail price impact because mark ups are generally percentage adders to costs.
- Reduced administrative costs and burden result from engaging with a small number of actors. Payments can be monthly to a few participants, and much of the data tracking is performed by the upstream actors.
- Fully engaging in the upstream supply chain may offer co-branding, marketing and other cost sharing opportunities with manufacturers or large distributors.

## Suggested Products

Below is a list of some potential products that we believe would be worthwhile to consider upstream approaches for. We believe they all have relatively low market share at this point, and would benefit greatly in terms of market transformation (as well as capturing immediate resource savings) in jump starting the market for these products.

- **Food Service Equipment** – Already in process. Time sensitive, and split incentives because lots of leased equipment that is primarily influenced by the what the lessees offer.
- **Heat Pump Water Heaters** – Relatively unknown by homeowners, typically time sensitive emergency replacements.

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<sup>2</sup> See section on “market lift” approaches for possible exceptions to this.

<sup>3</sup> While these may be the simplest for consumers to understand and purchase, Efficiency Vermont has had significant success with some system component products as well, such as for refrigeration systems.

- **Ductless Mini-Split Heat Pumps** – There is a significant range of efficiency levels available, and some customers are now choosing DMSAC for cooling and might be able to be upsold to a cold climate DMSHP. Will spur future cost reductions and product options.
- **Efficient Circulator Pumps** – Customers are unaware of circulator options and simply get whatever the contractor chooses to install. Eliminating first cost and ensuring stocking are key to ensuring contractors routinely install these.
- **LED Fixture with integrated controls** – Because integration of controls adds cost to fixtures, encouraging upselling to these fixtures may be effective through upstream approaches. We think this could be an effective complement to our proposed broader initiative on networked lighting controls. For more information on LED controls see the separate program template on networked controls.
- **Efficient Refrigerated Vending Machines** – We are not sure of the market share of these or status of Federal standard, and it already have high penetration. However, the vending market in general is a good one to target upstream because most of these products are leased and product decisions driven a very small number of lessees with split incentives.
- **Efficient Reach-in and Stand-alone Display-Case Refrigerators** – Food stores and restaurants tend to operate on very slim margins, are highly driven by first costs, and these product purchases may be time sensitive. In addition, many of these are owned, tightly controlled, and provided by upstream actors and tied to specific product manufacturers (e.g., you can't put Pepsi in a Coke-provided reach-in). Because of the split incentive, upstream can be a way to work with the beverage manufacturers and distributors to incent them to provide high efficiency equipment to stores.<sup>4</sup>

The above products are ones that we have initially thought of as prime opportunities we encourage the utilities to consider. However, we are not suggesting we would not be open to proposals for other products which we may not have thought about. In addition, there may be some “emerging” technologies that possibly could benefit from upstream initiatives, but may not be quite “ready” and might benefit first from an R&D and/or pilot effort. Two that come to mind to us are heat pump boilers and combination chiller/heat pumps. Also, perhaps something related to furthering the adoption of newer, low-GHG-potential refrigerants.

## Design and Implementation Suggestions

A key aspect of successful upstream programs is that there is not one “cookie-cutter” design that is universally applicable. Because the idea is to intervene by working with the product supply chain actors, one must fully understand who those actors are, what role they play, how the product supply chain functions, what current barriers to greater adoption are, and the most important and influential decision points within it. For example, some product sales are driven heavily by the manufacturers, directly through manufacturer reps. Other's rely on a small number of distributors at a lower level than manufacturers, but still selling wholesale product to contractors or retail vendors. For example, ESource estimates that 90% of all commercial HVAC equipment is sold through distributors.<sup>5</sup> Often distributors may be tied to a particular manufacturer, but sometimes are independent. In some cases manufacturers may have heightened influence and control over distributors, and perform or engage in marketing and training functions for them. Some products ultimate retail sale may be by large retail Companies like DIY big box stores, while others are generally only sold through independent contractors.

It is critical to engage with and listen to the supply chain actors, and involve them in the design of the program to ensure it meets their needs and works within their normal business procedures. For example, understand what barriers they see to participation and data collection and provision and create mutually beneficial solutions. Encourage their participation by promise to move more product and potentially increase their gross profit margin in efficient equipment while not asking them to fundamentally change their business

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<sup>4</sup> Note there is a Federal efficiency standard for refrigerated vending machines, however, DOE issued a new rule in 2016 to modify it which we do not believe has been acted on, nor do we know whether there is a range of efficiency still available in the market.

<sup>5</sup> We believe Lenox products are the major exception to this rule.

model. As an example, Efficiency Vermont completely redesigned some upstream offerings based specifically on the needs and recommendations of a key refrigeration and HVAC distributor.

Stocking practices and timing of delivery may also be distinct to specific products. A key aspect to success is ensuring that the efficient products are as readily available (stocked or rapidly delivered) as the less efficient alternatives, or more so. For example, it may often be the case that a contractor can get a homeowner an emergency replacement standard electric resistance water heater installed that day, but a heat pump water heater would be a special order and result in an unacceptable delay. Often, one of the highest values of upstream programs may simply be to ensure distributors maintain rapidly available stock of the efficient product. Some programs have provided incentives specific to cover inventory carrying costs. Businesses are much more motivated to move existing inventory than deal with new orders while limited storage capacity is held for products not selling; and contractors are reticent to have to wait for a special order and possibly lose the sale.

Often the strategy is to cover the incremental wholesale cost of the efficient product. Because this cost will be marked up—often multiple times—before it reaches the end user, the program can leverage those mark ups and effectively drive a greater end user cost reduction than an equivalent downstream rebate would. Some PAs have mandated that upstream actors pass all incentive value on to the end user. Others have left this up to the individual market actors to decide how to be most effective at selling the most product, balancing retail cost reductions with other uses of some of the funds that may be more effective. For example, paying bonuses to sales reps for increasing product sales, covering inventory carrying costs, paying for marketing, etc. We recommend avoiding a hard rule that all savings must be proven to be passed onto the customer, or alternatively, providing separate upstream “participant” incentives that compensate them for increased administration burden, inventory costs, etc. First, it makes sense for program dollars to go wherever they can have the most impact, which often may not be passing 100% of the incentive on. This is because a key aspect of upstream programs is to influence how the supply chain functions, and rely on those actors to do the selling and create the customer demand. Often customers may be unaware they are even participating in a program. Therefore, ensuring supply chain actors are highly motivated to move the product, and relying on them to know best how to sell their products, will be key. It is fairly typical for upstream programs to provide a contribution to supply-chain administrative costs. Because PAs will rely on those actors to track and provide data, offsetting this burden with some payment may be necessary.

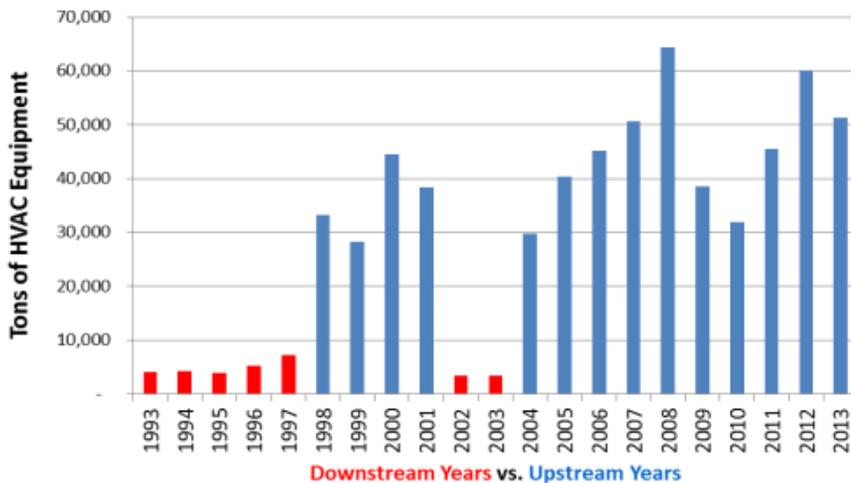
If some “incentive” funds do go to supporting functions that are not simply defraying measure costs, there can be some challenges regarding cost-effectiveness assessment. This is because any defraying of measure costs is simply a transfer payment and does not impact a TRC cost-effectiveness test. However, if the incentives are going to actual new activities or costs, they should be treated as costs within a TRC test. Different jurisdictions have dealt with this different ways. For example, CT requires 100% pass thru of the incentives to the customer, and tracks customers and sends each a postcard informing them that they received an incentive. MA does allow for some of the incentive funds to be used by the upstream actor(s) for other functions, but simply does not try to police or quantify this, and continues to treat the entire contribution as an incentive. CA also allows discretionary uses of the funds, but is required to recognize that not all funds are a true transfer payments, and attempts to account for the fraction that is not. We do not believe this should be a barrier to pursuing upstream programs in IL, and the Policy Manual can address this issue as appropriate, if necessary.

Many programs have promoted products when they already enjoy a reasonable market share of new sales. This is particularly true of HVAC programs. Some examples of programs are provided below. A significant concern with this approach is that the PA may end up paying for a huge amount of freeridership because it will incent all sales from participating market actors. For this reason, we initially propose targeting measures that generally have low penetration, such as heat pump water heaters. There is anecdotal information that some HVAC programs that are “tracking” large savings and showing a dramatic increase in participation compared to downstream efforts (e.g., see CA and CT HVAC program graphics below) may not in fact be creating a significant increase in true savings attributable to the program. For example, CT moved its

downstream HVAC efforts to upstream, and showed a dramatic uptick in participation. However, anecdotal evidence from D&R International, which tracks and sells statewide HVAC sales data, found no significant increase in the market share of the efficient products in CT during the same period.

Below is a graphic, which was originally presented to the SAG by Phil Mosenthal in 2014 when the OAG encouraged pursuit of upstream approaches<sup>6</sup> It shows an example of how dramatic an increase can occur—in this case by an order of magnitude—when shifting from downstream to upstream. However, it is not known to what extent some of this increase was simply that the program was now tracking a larger portion of the natural market share as participating.

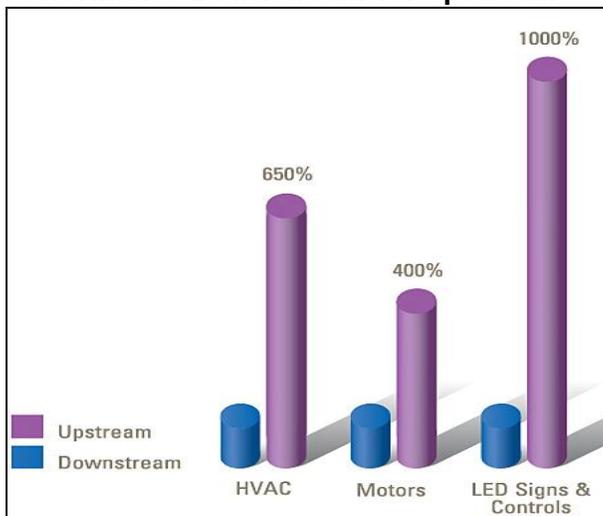
Figure 2 | PG&E Commercial HVAC Program Results: 1993-2013



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

The following shows other CA historic participation comparisons for additional measures, also presented to the SAG in 2014.

**California Average Annual Energy Efficiency Program Performance Downstream vs. Upstream**



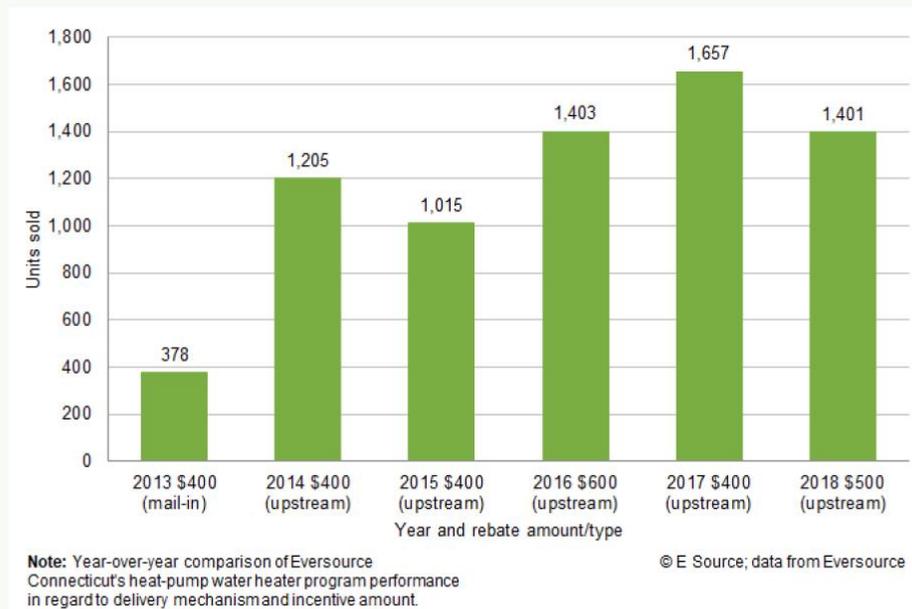
Source: Daniel Cornejo, Energy Solutions

<sup>6</sup> Link to presentation on ILSAG site: [Upstream Approaches to Commercial and Industrial lighting Programs... and Other Potential Markets](#)

Efficiency Vermont began promotion of HPWHs upstream in 2014. While the national penetration of HPWHs is only 1-1.5% currently, it is 60% in VT now—a direct result of this promotion. The figure below provides a New England example of Eversource in CT achievements with heat pump water heaters. Given the relatively new emergence of HPWHs commercially available in the market in 2014, this is likely an example where true new adoptions happened and likely not a large share of freeridership. While not quite an order of magnitude improvement, the large and relatively immediate increase is an example of how much more effective upstream approaches can be.

**Figure 3: Eversource’s midstream and upstream HPWH activity, 2013 to 2018**

Eversource’s HPWH program had a notable lift in program participation when it moved from a downstream approach to an upstream approach.



See the [CT HVAC and Water Heater Process and Impact Evaluation](#) and [CT Heat Pump Water Heater Impact Evaluation](#) (PDF) for more information.

While we initially recommend focusing on newly emerging technologies with low natural market share, we also encourage PAs to consider creative ways to take advantage of the positive attributes of upstream programs while effectively accounting for freeridership and ideally, not having large incentive funds going to support the freeridership. One concept that has been tried is “market lift.” The idea is to establish a “baseline” of market share for each upstream actor (e.g., distributors), and then only provide the incentive for sales above that baseline. There have been challenges making this successful. Upstream actors often are uncomfortable sharing sales data with PAs. Further, they may see less benefit in participation because they won’t see any financial benefit for much of the year, and risk that they may not actually earn much. Because upstream programs require at a minimum data sharing of sales of the efficient units during the participation period, one possible approach is to begin the program paying for 100% of sales in the first year of participation, and then each subsequent year set a baseline for each participant based on the sales in the prior year (e.g., after year one, only pay on units above 80% of last year’s volume). This approach would avoid distributors or contractors needing to provide any additional data. It would also ensure maximum benefits to participants in year one to get good participation and embrace the program. We encourage PAs to consider this approach, or others that might address this concern, perhaps experimenting with one or more pilots. We believe this may be an appropriate approach for products such as furnaces, boilers, gas water heaters, RTUs, and traditional air source heat pumps and central AC.

Below is a graphic developed by ESource that summarizes some of the concepts discussed above in terms of what products might be appropriate and what key supply chain actors might be the primary focus.

Upstream and midstream programs can work when...		Why?
	Downstream incentives must be substantially high to facilitate a sale	Some measures like HVAC equipment or luxury plug loads require a big incentive to affect purchasing behavior. Shifting incentives to upstream partners allows program administrators to reduce the per-unit incentive and leverage a collective sales incentive.
	Eligible equipment has small per-unit energy savings	Energy savings from some measures, like DVD players, don't warrant a downstream rebate. But in aggregate, these energy savings can be substantial. Pacific Gas and Electric Co. is piloting a midstream initiative that includes Blu-ray/DVD players because of the potential combined savings.
	A channel partner is necessary to promote the stocking, marketing, and sale of high-efficiency equipment	Upstream and midstream programs are particularly effective when the individual receiving an incentive plays a critical role in ensuring its sale.
	The measure is "off the shelf"	Upstream and midstream programs are most effective in one-to-one replacement scenarios, where measures don't need additional pieces (like controls) to generate energy savings.
	Close relationships with manufacturers are present or can be established	Manufacturers can provide special pricing, targeted marketing and promotion, or additional incentives that can be piggybacked on program administrator incentives. No matter who receives a program-related incentive (retailer, distributor, or manufacturer), opportunities to provide manufacturer discounts should be explored.

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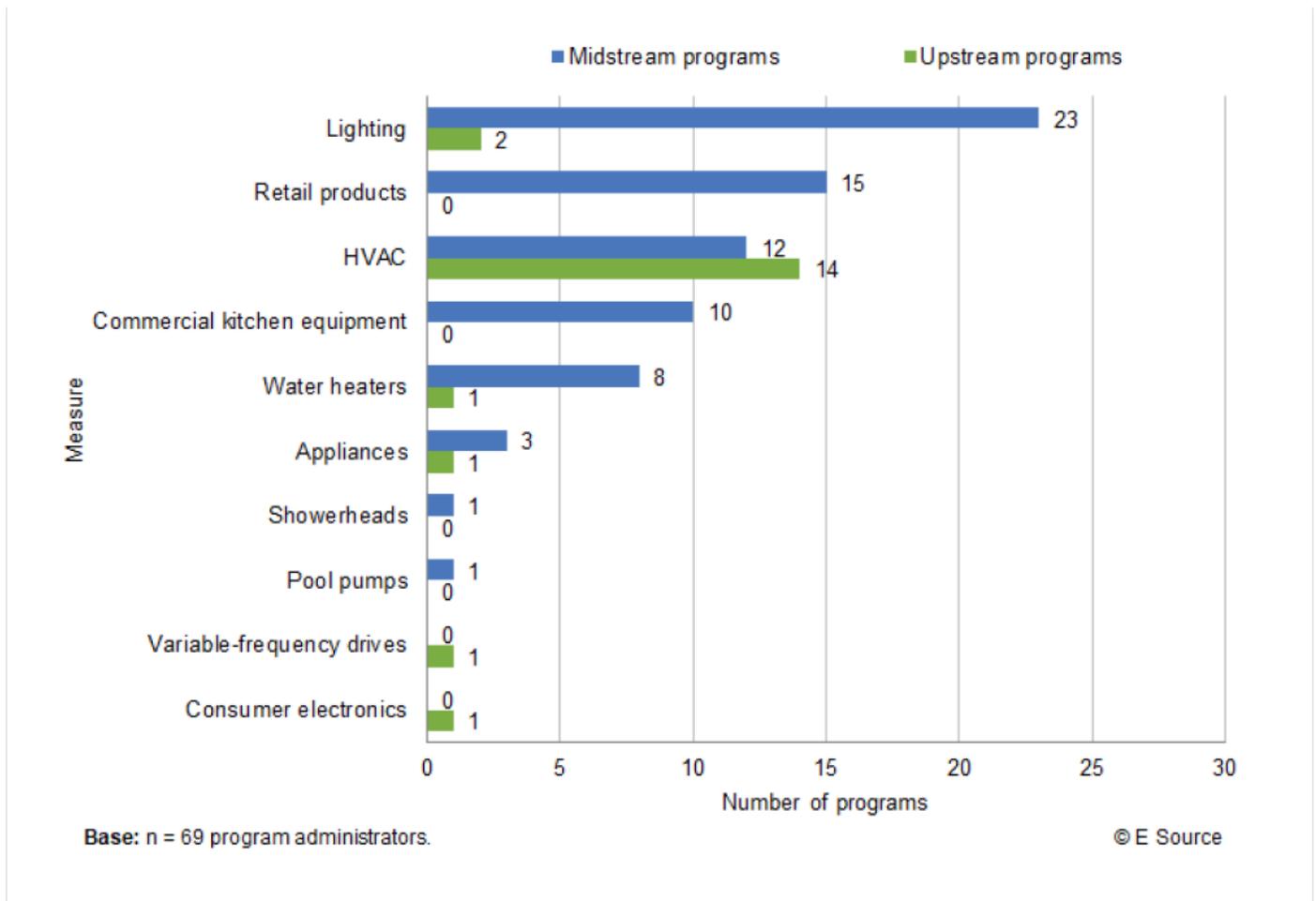
Which channel works	Why?	Characteristics of measures
 Manufacturers	When there are fewer manufacturers of a measure than retailers selling it, incentives have the biggest aggregate impact when paid to manufacturers.	The measure likely has small per-unit energy savings, but high sales volume to warrant an incentive. Measures passed through this channel shouldn't overly rely on end-user sales and promotion efforts done by retailers, but should leverage manufacturer labeling to differentiate products.
 Distributors	Distributors have close relationships with installation contractors and niche markets to which they sell directly.	The measure requires a licensed installation contractor, or it's for a niche market, such as commercial kitchens or agricultural operations. Distributors must upsell and promote so that contractors purchase higher-tier efficiency.
 Retailers	Program administrators can make use of midstream actors' marketing and promotion efforts to differentiate similar products.	When a measure falls under numerous brands, retailers benefit because an incentive can be applied across an entire category of products. The measure likely has small per-unit energy savings, but has adequate sales volume that makes creating an incentive cost-effective.

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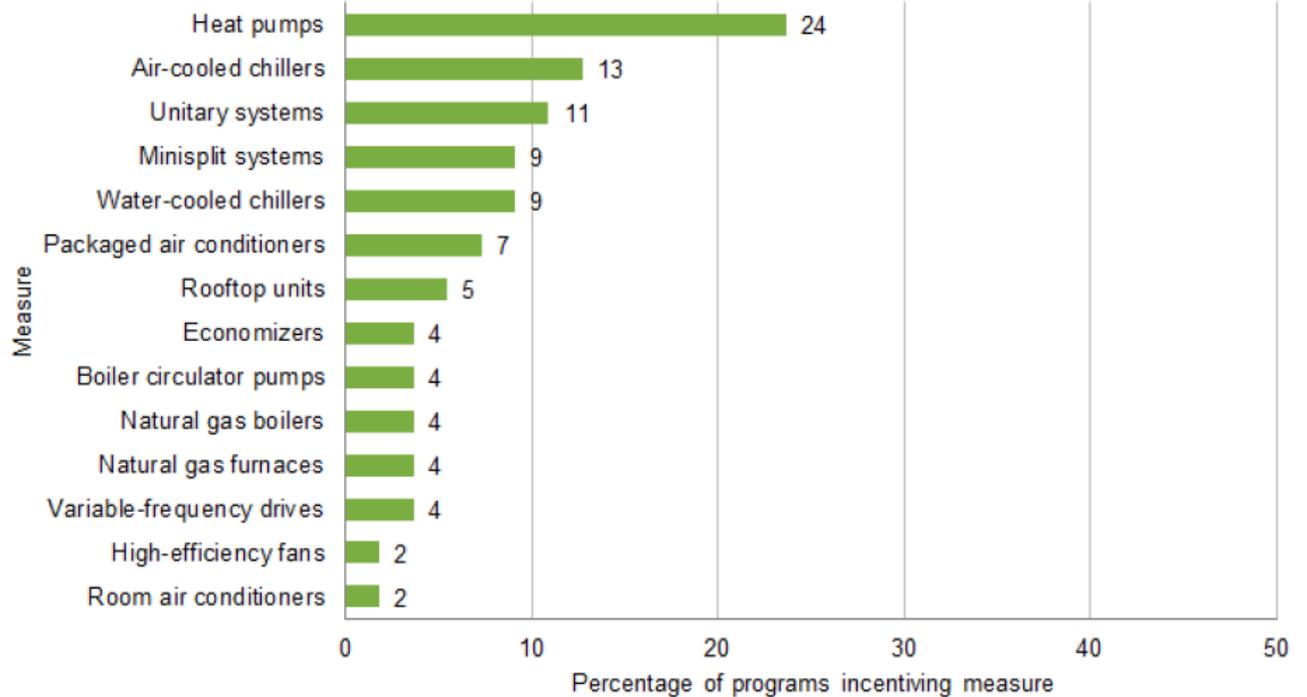
<https://www.esource.com/429191azeh/sending-your-dsm-measures-upstream>

## Experience Elsewhere

We have not done a comprehensive review of upstream programs outside of IL. We are aware that leaders in this area have tended to be the New England states and CA, some examples of their performance are shown above. Efficiency Vermont has had particular success recently with heat pump water heaters (as mentioned above, current penetration of 60% vs. national average 1-1.5%) and efficient circulator motors, and some refrigeration system components like evaporator fans and efficient condenser units, which will be presented to the SAG by Efficiency Vermont following submittal of this template. These technologies have very low natural market share, but EVT achieved significant improvements in sales in a relatively short time. Below, we show the number of programs nationally identified by ESource as of 2014, as well as an estimate of the share of programs by measure type that use an upstream approach.



<https://www.esource.com/429191azeh/sending-your-dsm-measures-upstream>



**Base:** n = 26. **Note:** This is not a comprehensive list of incentivized measures; rather, it's 14 popular measures.

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p. 4, <https://www.esource.com/429191azeh/sending-your-dsm-measures-upstream>

Another source of general information about upstream programs is SWEEP

[http://www.swenergy.org/data/sites/1/media/documents/publications/documents/Upstream\\_Utility\\_Incentive\\_Programs\\_05-2014.pdf](http://www.swenergy.org/data/sites/1/media/documents/publications/documents/Upstream_Utility_Incentive_Programs_05-2014.pdf)