To: D.C. Department of Energy and Environment, D.C. Sustainable Energy Utility, Mitsubishi Electric
From: Meister Consultants Group, A Cadmus Company (MCG)
Date: April 4th, 2018
Re: Summary of D.C. Workshop, City Industry Building Electrification Initiative

SECTION 1 OVERVIEW AND KEY FINDINGS

On Tuesday, March 27, 2018, representatives from the D.C.'s Department of Energy and Environment (DOEE), D.C. Sustainable Energy Utility (DCSEU), and Mitsubishi Electric convened in Washington, D.C. to collaboratively discuss key program design components for an incentive to implement the Carbon Neutral Cities Alliance (CNCA)-funded City Industry Building Electrification Initiative in Washington, D.C.

Key meeting goals and outcomes included:

- Share knowledge regarding the state of the D.C. heat pump market, including market sizing estimates, state of contractor and distributor networks, and key market barriers
- Discuss key elements of an incentive program design to drive customer demand and strengthen the D.C. area supply chain
- Identify opportunities for collaboration and resource sharing between manufacturers, DOEE, and DCSEU

Key conclusions for designing an incentive program targeting the D.C. market include:

- Partners will collaboratively design an incentive program for DCSEU to review for implementation in Fall 2018. MCG will work with DOEE to create recommendations for program design that reflects input from DCSEU, Mitsubishi, and contractors/distributors operating the market. DCSEU will review the program design and make all final decisions on program implementation, taking into account requirements for their performance-based energy efficiency contract. DCSEU will target a Fall 2018 implementation date for the program.
- Program design should target the distributor or the contractor as the incentive recipient. Workshop participants discussed the implementation considerations for delivering the incentive at each of the four points in the supply chain (manufacturer, distributor, contractor, and homeowner) and agreed that program design should focus on delivering the incentive to either the distributor or the contractor. These two options were favored due to their ability to simultaneously develop the contractor network and improve customer awareness.
- Contractor development and training is a high-priority goal for the program. Participants identified the development and training of ASHP contractors that can serve the D.C. market as a high-priority goal for program design. This is a priority because (i) there is a need to increase the number of contractors based in Washington DC and (ii) there is need to ensure high-quality heat pump installations.

- Contractors should be engaged during program design. DOEE and partners should engage contractors throughout program design to (i) gather information on the D.C. market, (ii) develop relationships with contractors, and (iii) ensure that program will be attractive to contractors. This may include conducting contractor "listening sessions" that target different contractor segments (e.g. participating DCSEU contractors and non-participating DCSEU contractors). For targeting non-participating contractors, workshop participants recommended using existing forums/meetings (e.g. the monthly Air Conditioner Contractors of America meeting) or working through distributor networks.

Participants identified the following next steps and organizations responsible for furthering program design:

Follow-up task and description	Lead	Support
Workshop summary. Summarize workshop and distribute workshop notes to all participants	MCG	DOEE
Develop workplan. Develop timeline for program design activity and detail deliverables to be completed.	MCG	DOEE
Contractor listening session(s). Plan listening session(s) with contractors, which will potentially include two different groups: participating contractors (who are currently active in the ASHP market) and non-participating contractors. Non-participating contractors could be reached through distributor networks or regular contractor meetings (e.g. Air Conditioner Contractors of America meeting)	DOEE	DCSEU and MCG
Report/presentation on program design. Draft report and incorporate edits from workshop participants to create final document.	MCG	All
Core team communication. Develop core team with representatives from each organization and schedule regular conference calls during program design.	DOEE	MCG and All
Mitsubishi Spring Campaign. Mitsubishi to run and report on Spring Campaign results.	Mitsubishi	N/A
Collaborate on contractor development. DCSEU and Mitsubishi will further discuss opportunities to collaborate on contractor development.	DCSEU	Mitsubishi (and MCG as needed)
DCSEU Fall Campaign. If DCSEU decides to move forward with program, the organization will target a Fall 2018 program implementation in campaign. The campaign will likely occur in collaboration with Mitsubishi and DOEE.	DCSEU	Mitsubishi/DOEE

SECTION 2 SUMMARY OF WORKSHOP DISCUSSION

2.1 Program Expectation Setting

Representatives from key workshop participants discussed their expectations for the workshop and the role that they can play in program design and potential implementation.

Stakeholder Group	Role, Goals, Capabilities and Constraints
DOEE	◉ Organization role is to design and recommend policy and regulatory tools that help achieve ambitious decarbonization goal of 100% reductions by 2050. DOEE, with the help of MCG, will lead the effort to develop this ASHP program. ◉ DCSEU is a performance contractor that DOEE relies on for program expertise; DOEE can recommend a program, but implementation will *entirely* depend on DCSEU internal decision-making ◉ Program must be open to all manufacturers ◉ Interest in collaborating to build effective program
DCSEU	◉ Organization has a performance-based contract for electricity and natural gas reductions that drives decision-making ◉ Any program design must be vetted through internal processes and be compared with alternative energy-saving investments ◉ Excited about heat pumps and view technology as a potential growth area ◉ Seeking additional information that can inform a launch of a FY19 (begins October 2018) program targeting heat pumps ◉ No goal for fuel-switching and cannot orient the program toward fuel-switching ◉ Program must be open to all vendors ◉ Program must work with local D.C. contractors ◉ Hope to rationally evaluate the customer value proposition, and the effort required by DCSEU to train contractors and implement marketing/outreach
Mitsubishi	◉ Representing the industry at this workshop, but have no expectation that program will benefit only Mitsubishi ◉ Working toward market transformation, which will require action from all actors across the value chain (manufacturers, distributors, contractors, and customers) to change the way they think and operate ◉ Specific goals for workshop are to understand how Mitsubishi can support program, and what Mitsubishi's role will be in implementation ◉ Goals to grow D.C. contractor base, raise installation quality, and raise customer awareness ◉ Concerned about how/if initiative can tap into the emergency replacement market and addressing regulatory policies that hinder market development

2.2 D.C. Market and Program Context

Notes included in this section are intended to supplement the slides presented by MCG, DOEE, and Mitsubishi.

Topic Area	Discussion
D.C. market barriers. Key market barriers identified by Mitsubishi and other participants	◉ Very few contractors currently based in D.C. due to cost of operating business and living in the city ◉ Difficult to get D.C. HVAC masters license in D.C.; licenses for surrounding areas (Maryland and Virginia) are not recognized in D.C. ◉ Sub-metering not allowed in D.C., which creates a split incentive between landlord and rental ◉ High rental percentage which, when combined with sub-metering challenges, makes it challenging to impossible to retrofit homes with EE or heat pump technologies ◉ No distributors (that participants are aware of) are located in D.C. due to high cost of space ◉ Low-quality data on D.C. market; (already captured in the second bullet)
D.C. market opportunity. Growth opportunities according to Mitsubishi	◉ Single family and multi-family homes/buildings ◉ High rates of new construction and conversation from B/C class buildings to A class buildings
ASHP value proposition for non-homeowner stakeholders.	Small commercial ◉ Quiet heating and cooling created limited disruption for operations ◉ Equipment does not use very much space and (ductless) requires no ductwork, which can save time and money ◉ Cost savings for operations through improved zoning (e.g. turn off areas during the night) ◉ Low upfront cost and easy to maintain ◉ Ideal for common area loads Contractors ◉ Quick installation (if doing ductless), which means contractor can do multiple installations in one day
DCSEU contractor network.	◉ Contractor must complete forms to become certified contractor in DCSEU programming ◉ Currently have around 20 certified contractors, but would like to have more operating in the area and installing ASHP specifically
Mitsubishi contractor network.	◉ Mitsubishi has ~50 Diamond Dealers operating in the D.C. area and sees regular ASHP installations from 5-7 of these contractors ◉ Has no contractors based in D.C. itself and is very interested in developing more D.C. based contractors; recently hired Frederick Fortune to focus on D.C. market specifically ◉ Three training centers that operate semi-locally in the D.C. area

	◉ Diamond Dealer training is an intensive process, which uses several KPIs to evaluate contractors ◉ Benefits of being a Diamond Dealer include longer technology warranty and co-marketing benefits
Mitsubishi D.C. marketing campaign. See Mitsubishi presentation for additional details	◉ DC market 9th in country in terms of response rate to marketing campaigns ◉ Spring 2017 campaign produced high number of leads during a short period ◉ Fall 2017 was not as strong as the Spring campaign – generated fewer leads during a longer campaign ◉ 70% of leads were from non-branded keywords, which means that more were coming based on searching for the technology rather than the manufacturer ◉ Planning a Spring 2018 $50,000 campaign that will build upon previous campaign; Mitsubishi will share campaign results
Incentive program best practices. See Mitsubishi presentation for additional details	◉ Differentiate single/multi-zone. Incentives that use single-zone systems to benchmark efficiency often inadvertently create a disincentive for multi-zone systems. ◉ Bonus for electric heat. Some programs offer a bonus if replacing electric resistance heating systems. (DCSEU/MCG should review justification for this and evaluate if this makes sense in their market context). ◉ Inclusion of all distributors. For distributor programs, incentives that are open to all distributors (i.e. those that do not choose distributors) fosters a competitive atmosphere that increases program participation. ◉ Offer financing support. For example, MassSave's Heat Loan offers 0% financing for seven years, and may have a greater impact on market adoption than the incentive program.

2.3 Program Design

This section summarized discussion and conclusions related to program design elements.

Topic Area	Discussion
Program goals	• Contractor development. All parties interested in developing number of contractors operating in D.C. market and improving contractor training • Customer awareness. All parties interested in increasing awareness of heat pumps among D.C. residents and business-owners • Energy savings. DCSEU needs to validate program through energy savings

Sector. Program could target both the residential and light commercial sectors, which will have different associated considerations/needs.	• Residential
	  ○ 1-4 family homes
	  ○ Multi-family (larger buildings that may have high rental rates)
	• Light commercial (e.g. restaurants, stores, etc.)
	• DCSEU noted that there is internal management complexity for targeting multiple sectors simultaneously.

Segment. Program design should consider the following segments, which will have different considerations/needs.	• Replacement vs. Displacement. Replacement of existing heating system versus displacement of heating load; replacement may be a more difficult to target in initial program • Owner-occupied versus rented buildings. If rented buildings are targeted, then split incentive would need to be addressed • Emergency replacement versus planned replacement. May be difficult to tap emergency replacement market, so consider methods to encourage planned replacement
Incentive recipient. Consensus among participants that program design should target either distributors or contractors as the incentive recipient. For additional information on incentive program design options, see Appendix C: Summary of Available Incentive Design	Current DCSEU Program • Rebate delivered directly to homeowner (can also be processed through contractor) • Low uptake (~100 rebates over past few years) • *Pros:* Increases awareness of DCSEU brand, customer gets rebate directly • *Cons:* Low yield (~$400/MWh reduction compared to ~$37/MWh for lighting) and low participation Manufacturer – *Implementation Considerations* • Effective at lowering price of product into the market • Furthest from the contractor and customer, so would not be as effective in contractor development and customer awareness • Difficult to track sales after distributor • Industry players already motivated to develop market Distributor – *Implementation Considerations* • Distributors have existing relationships with contractor networks that could be leveraged for contractor development

	◉ Would have to design program to track sales to D.C. customer (e.g. could follow Efficiency Vermont program where customer address must be presented at sale from distributor to contractor) ◉ Outreach to distributors would have to be on a branch-by-branch basis to sell them on program and target branches with highest percentage of D.C. sales (no distributors located in D.C.) ◉ Outreach would have to highlight long-term market transformation because only small portion of distributor sales to D.C. market ◉ Would have to give distributor sales performance incentive fund (SPIF) of $25-$100/unit to handle paperwork, etc. ◉ Considerations for passing savings to contractor and then homeowner – contractors may not initially pass entire savings down to homeowner, but over the long-term, price competition would likely decrease install price ◉ Unlikely that a distributor would market the program Contractors – *Implementation Considerations* ◉ Could be an effective entry-point for increased contractor development and training ◉ Must be easy to process, otherwise participation will be low ◉ Contractors may not initially pass entire savings down to homeowner, but over the long-term, price competition would likely decrease install price Homeowner – *Implementation Considerations* ◉ Need rationale for seeing better results than existing program
Recipient/Incentive Requirements. Homeowner location and contractor training were identified as priority requirements.	◉ Homeowner location. Homeowner must be a D.C. resident (or potentially a D.C. business) and DCSEU must receive address ◉ Contractor training. Contractors will need to go through some form of training (various examples from other states include four-hour training, e-training, and two-day training) ◉ Contractor location? Concern that DCSEU funds may not be able to be delivered to contractors working outside of D.C.; DOEE willing to advocate for changes to current rule to enable greater contractor participation, if needed ◉ Savings to customer? This is not necessarily a priority for DCSEU, but should be considered and evaluated further
Education and Outreach. Participants discussed a need for three different types of marketing: consumer outreach, contractor outreach, and general PR/program branding.	*Outreach Categories* ◉ Consumer outreach. Education and outreach to build consumer awareness ◉ Contractor outreach. Develop relationships with contractors and increase program awareness; this was identified as a high-priority channel by some; could be achieved by working through distributor channels and existing relationships ◉ PR and overall branding. Communicate ambition and social benefits of program publicly to increase program profile *DCSEU Current Activity/Priorities*

	◉ Recently launched a blog and have accompanying social media ◉ Interested in expanding contractor outreach (ensuring that businesses are educated, providing marketing benefits, easing permitting) ◉ Partner with EPA EnergyStar programs ◉ Open to joint messaging with other players *Mitsubishi Current Activity/Priorities* ◉ Ran Spring/Fall 2017 campaigns and will run Spring 2018 campaign (results will be shared) ◉ Interested in joint messaging and collaboration ◉ Can help enable contractor access through distributor relationships ◉ See more information in "Mitsubishi Marketing Campaign" section of 2.2 *DOEE Potential Activities* ◉ Currently increasing awareness of ASHPs at policy level ◉ Willing to support midstream education and outreach as needed/helpful ◉ Consider end-user education and outreach, but cannot commit to a campaign during this fiscal year *Potential Additional Activities* ◉ Leverage distributor network to engage contractors ◉ Connect with Washington Air Conditioning Contractors of America (ACCA) chapter to target best contractors ◉ Leverage DCSEU brand and history in marketplace ◉ Press releases/additional PR activity to increase campaign profile
Technology Requirements. Program design should consider the following issues when developing technology requirements and incentive amount.	*Possible Additions/Considerations* ◉ Controls. Add specifications and incentive for complementary controls technology ◉ Multi-zone adders. Multi-zone systems could be viewed/evaluated independently and receive a separate incentive because multi-zone systems are often penalized in incentive programs because they are not as efficient as wall-mounted units. ◉ Electric heat adders. Some programs have adders for systems that replace electric heating systems. ◉ Ducted versus ductless. Program could treat these installations differently ◉ ccASHP standard. Different standards/incentives could be developed for technologies recognized by NEEP as ccASHPs. ◉ D.C. climate. Align technology efficiency with D.C. climate needs/data (e.g. number of heating hours) by using DC's climate projection data *Constraints* ◉ Technical Reference Manual (TRM) standards. DCSEU gets energy savings figures from independent TRM standards on a per-unit basis, must work within the boundaries
Incentive amount. See additional incentive considerations under the	◉ Balance volume goals with budget availability

"Technology Requirements" section in 2.3 and the "Incentive Best Practices" in 2.2	◉ Consider including financing in program design: identify financing partners, review case studies (e.g. MassSave), and estimate cost of buying down loans ◉ Consider modeling impact of implementing a PACE program on the adoption rate of ASHP as part of TA budget
Quality control. *(Note that workshop did not discuss occupant training requirements specifically, but these should likely be included in program)*	*DCSEU Current Requirements* ◉ Third-party organization does quality control and processing of applications ◉ Don't have resources to do field inspections (though have expertise) ◉ Only accept rebate applications from pre-qualified contractors *Considerations for Program* ◉ Use a system design tool (e.g. to avoid oversizing); Mitsubishi's training could cover use of this tool ◉ Create a commissioning checklist for installations ◉ Include a continuing education requirement (e.g. ongoing training programs) ◉ Balance quality control goals with a system that is not too onerous for the contractor and thus will not be utilized

APPENDIX A: WORKSHOP AGENDA

City-Industry Building Electrification Initiative| Washington D.C. Workshop
(formerly the "Thermal Decarbonization Initiative")

D.C. Sustainable Energy Utility
Tuesday, March 27, 2018 | 9:00 am – 5 pm
80 M Street SE #310
Washington, DC, 20003

Meeting Goals & Outcomes

- Share knowledge and resources regarding the D.C. heat pump market
- Collaboratively design a program to drive customer demand, including incentive design, education and outreach, and other supporting activities
- Identify opportunities for collaboration and resource sharing between manufacturers, DOEE, and DCSEU
- Discuss industry development needs and barriers to explore opportunities for supply chain development
- Foster new connections, gain valuable perspectives from attendees, and have fun!

Participants

Participants includes representatives from:

- Department of Energy and Environment (DOEE)
- D.C. Sustainable Energy Utility (DCSEU)
- Mitsubishi Electric
- Meister Consultants Group, A Cadmus Company (MCG)

Detailed Agenda

9:00 am to 9:30 am	**Breakfast and Networking** Participants arrive for the event, enjoy breakfast, and network.
9:30 am to 9:45 am	**Welcome & Vision** DCSEU Edward Yim, DOEE Eric Dubin, Mitsubishi
9:45 am to 10:10 am	**Introductions and Run of Day** Neil Veilleux, MCG Introduction from all participants: • What is your name, organization, and specific role at the organization? • How do you envision contributing to this discussion/what capabilities can you bring to the table?

- What questions or concerns (if any) do you have related to working together to encourage building electrification?

10:10 am to 10:35 am — **DC Market Context and Initiative Background**

- City-Industry Building Electrification Initiative and Introduction of Phase One Research Findings, Jamie Daudon (15 min)
- Washington D.C. Plan of Action, Edward Yim (10 min)

10:40 am to 11:10 am — **Workshop Expectation Setting**
DCSEU
Edward Yim, DOEE
Eric Dubin, Mitsubishi

11:10 am to 12:15 pm — **Presentations & Discussion**

- State of the Market, Joe Tompkins (10 min)
- Mitsubishi Marketing, Leah Montgomery (10 min)
- Incentive Overview and Best Practices, Rick Nortz (15 min)
- Technology Development, Rick Nortz (10 min)

12:15 pm to 1:00 pm — **Lunch:**
Chipotle 1247 First St SE, Washington, DC 20003
RASA 1247 First St SE, Washington, DC 20003
Chopt Creative Salad Co 1257 First St SE, Washington, DC 20003
CAVA 52 M St SE, Washington, DC 20003
Shake Shack 1500 S Capitol St SE, Washington, DC 20003
Roti Modern Mediterranean 1251 First St SE, Washington, DC 20003
SUBWAY 1100 New Jersey Ave SE, Washington, DC 20003

1:00 pm to 3:00 pm — **Program Design Collaboration**
MCG Facilitation
All discussion

3:00 pm to 3:10 pm — **BREAK**
All take 10-minute break.

3:10 pm to 4:00 pm — **Program Design Collaboration (cont.)**
MCG Facilitation
All discussion

4:00 pm to 4:10 pm — **BREAK**
All take 10-minute break.

4:10 pm to 4:35 pm — **Review and Next Steps**
Neil Veilleux, MCG

4:35 pm to 5:00 pm — **Debrief and Close**
Neil Veilleux, MCG
Edward Yim, DOEE

APPENDIX B: WORKSHOP PARTICIPANTS

Organization	Name and Title	Contact Information
DCSEU	Solome Girma, Director, Program Management Office	sgirma@dcseu.com
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Meister Consultants Group, A Cadmus Company	Neil Veilleux, Principal (lead facilitator)	neil.veilleux@mc-group.com
	Jamie Daudon, Research Analyst (facilitation support)	james.daudon@mc-group.com

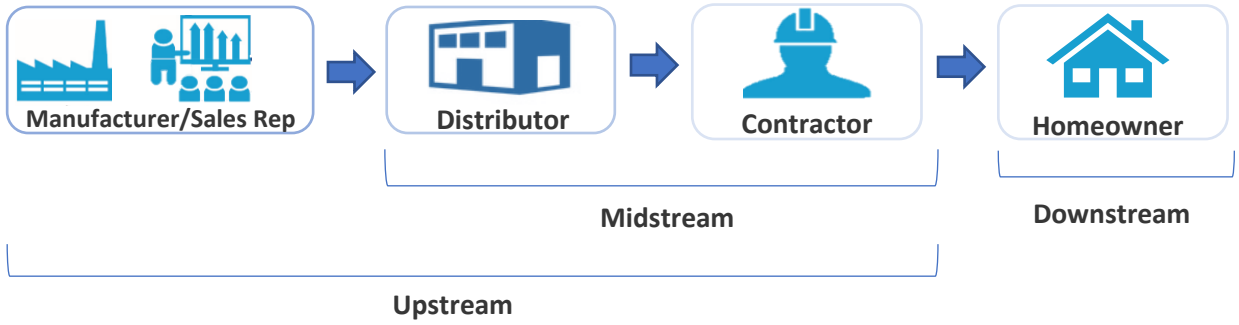
APPENDIX C: SUMMARY OF AVAILABLE INCENTIVE PROGRAMS

Heat pump incentives can be targeted at four primary points of the technology's supply chain: the manufacturer, the distributor, the contractor, and the homeowner. The terms "upstream," "midstream," and "downstream," are applied to incentives targeted at different points in the supply chain. While there is some inconsistency in how these terms are used, this document will define the terms in the following ways:

- Downstream incentives are targeted at the homeowner
- Midstream incentives are targeted at points between the homeowner and the manufacturer (in the case of heat pumps, this includes the distributor and the contractor)
- Upstream incentives are targeted at any point upstream of the homeowner (in the case of heat pumps, this includes the contractor, distributor, and manufacturer)

This document describes incentive programs that are targeted at each of the four points in the supply chain and outlines the strengths and challenges of each option. It also summarizes the current homeowner incentive offered by the D.C. Sustainable Energy Utility (DCSEU).

INCENTIVE OPTIONS



Manufacturer Program:

Efficiency program delivers incentive directly to the manufacturer, which passes savings to distributor in the form or reduced technology prices, enhanced support for technology, or increased availability of products. This incentive structure is most effective at reducing the upfront cost of technologies when they are in an early stage of market penetration.

Strengths	Challenges
• Smallest number of market actors to influence large portion of the market • Low transaction and administrative costs due to small number of players • Highest incentive leverage – rebate dollars increase in value to the consumer as they move through the supply chain[1]	• Furthest away from contractor and homeowner, so likely will not increase product awareness and visibility to end-user • Monitoring and verification needed to ensure that rebate is passed through the supply chain to the consumer • Most effective when delivered over largest area (i.e. D.C. market rebates will not have large impact on manufacturing costs)

Note: no case study found for related technologies during initial research

Distributor Program

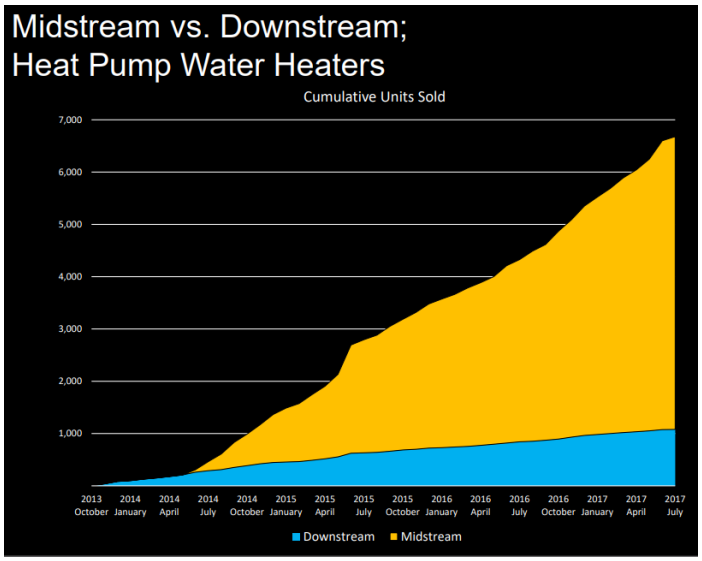
Efficiency program delivers incentive to the wholesale distributors for technology sold to contractors. Many programs (though not all) require that the distributor pass the entire discount value to the contractor and then homeowner. This incentive structure is most effective at increasing product availability and driving marketing and outreach through contractor channels.

Strengths	Challenges
• Broad market engagement with few program participants – a small number of distributors account for a high percentage of sales in a market/region • Contractors/homeowners receive rebate upfront through reduced price of technology, reducing complexity and barriers • Distributors have an impact on inventory, contractor product selection and training,	• Difficult to track sale of product to location of ultimate delivery (i.e. difficult to isolate to the Washington, D.C. city-limits) • Can be more difficult to track, monitor and improve installation quality because incentive further from contractor network • Most effective when delivered throughout a distributor's business area (i.e. on a larger scale) because this will have largest impact on

[1] For example, a light bulb may be marked up by 40% above its manufacturing cost when it is sold to the consumer. A $1.00 rebate to the consumer reduces the consumer cost by $1.00. However, it the same $1.00 rebate is applied prior to the markup (i.e. at the manufacturer level), the cost to the consumer will be reduced by $1.40 ($1.00 +40% at different stages of the supply chain). See https://www.sciencedirect.com/science/article/pii/S0301421514002705 pg. 60 for more information.

which can be leveraged via the incentive design to influence the market • Distributors already have administrative staff to manage incentive paperwork, filing, etc. • High incentive leverage – the price of the product increases as it moves downstream and gets burdened with transaction costs, meaning that incentives higher in the supply chain have higher leverage. Studies show that $1 in incentives to the distributor would require $2.50 of incentive at the retail level to result in an equivalent consumer price[2]	distributor profits; distributor may not value the program if it's only offered in D.C. • Incentive may not be entirely passed down to consumer – distributor and contractor may take some of incentive; this can be managed for during program design, but may require monitoring and verification

Case Study:
VEIC implemented a $400 midstream rebate in the Efficiency Vermont program in addition to an existing downstream rebate for heat pump water heaters (HPWHs). Following the rebate, they saw a 750% increase[3] in total sales of HPWHs (see figure below). Efficiency Maine and Energize CT have also implemented mid-stream programs and have seen participation increases ranging from 234% to 1,000%. Additional information on the benefits of mid-stream programs can be found here.



[2] "Moving to the Middle – How to Navigate the Ins and Outs of C&I Midstream Programs." Association of Energy Services Professionals. Retrieved: https://aesp.site-ym.com/page/MidstreamPrograms
[3] "Gain Steam, Go Midstream! Distributor focused Residential HVAC and Water Heater Incentives." EnergyStar. Retrieved: https://www.energystar.gov/sites/default/files/asset/document/2017_ESPPM_Gain%20Steam%2C%20Go%20Midstream%21%20FINAL.pdf

Contractor Program:

Efficiency program delivers incentive to contractor after contractor completes a qualified installation. Depending on the rebate design, the contractor may be required to pass savings on to the homeowner, but also may be allowed to determine pricing independently (keeping a portion of the incentive, and passing a portion to the homeowner). This structure is most effective at mobilizing sales through the contractor network and increasing homeowner awareness of technology.

Strengths	Challenges
• Motivates contractor to sell product and may translate to greater contractor awareness of incentive opportunity, increasing homeowner technology awareness • May motivate contractors to offer the product who currently do not offer the product • Enables easier monitoring of installation location (i.e. program can target the D.C. city limits specifically or can target certain customer-types) • May include quality control components in program design (e.g. certified installers, and post-installation inspections) • Homeowner can receive incentive upfront as a pass-through, reducing complexity and out of pocket expenses	• Can be more difficult to administer and have high overhead costs due to larger number of contractors compared to distributors • More burdensome for contractors to process the incentive paperwork, and smaller contractors may not have administrative staff

Case Study:

NYSERDA offers a $500 incentive to contractors per ASHP installed in residential single- or multi-family homes. Incentives are available on a first-come, first-served basis until the $10.95 million program limit is reached, and are capped at $500,000 per participating installer. Installers must complete an application and training program to become eligible for the incentive, and are not required to pass the incentive to the customer (but may do so if they choose). Through the program, NYSERDA also helps contractors offer more ASHP products and solutions, and promotes participating installers on NYSERDA's website.

Homeowner Program:

Efficiency program delivers incentive directly to homeowner, primarily in the form of a mail-in or online rebate following technology purchase. This incentive structure is most effective at addressing lack of information about technologies and perceived risks associated with energy efficiency investments.

Strengths	Challenges
• Enables incentive to be more targeted to specific groups and locations (e.g. the D.C. area, homeowners with certain existing fuel types, or early-retirement of existing heating system) • Increases homeowner awareness of the value of energy efficiency products by engaging them directly • Can include quality control components in program design (e.g. certified installers, easier inspections)	• Can be difficult to administer and have high overhead costs • Largest number of actors to influence • Lower program participation rates than alternatives • Large marketing and outreach effort needed to support program design • No multiplier effect – receive a direct cost reduction for dollars spent

Case Study:
MassSave offers incentives for heat pump technologies ranging from $100-$300 per unit for ductless and $250-500 for centrally ducted. Contractors must be certified installers for the system to be eligible for a rebate, and rebate can be received either online or via mail. The total number of rebates exceeded 9,000 in 2016.[4]

EXISTING DCSEU REBATES

DCSEU's existing downstream program offers incentives for heat pump technologies directly to the homeowner through an online rebate. To receive the rebate, the homeowner must have their system installed by a contractor listed on DCSEU's qualified contractor page. The rebate amounts offered by DCSEU through this program are summarized below:[5]

Ductless Mini-Split Heat Pumps - Tier 1	≥ 18 SEER, ≥ 12.5 EER, ≥ 8.5 HSPF	$300
Ductless Mini-Split Heat Pumps - Tier 2	≥ 20 SEER, ≥ 13 EER, ≥ 9.5 HSPF	$500
Air Source Heat Pumps - Tier 1	≥ 16 SEER, ≥ 13 EER, ≥ 9 HSPF	$300
Air Source Heat Pumps - Tier 2	≥ 18 SEER, ≥ 13 EER, ≥ 9.5 HSPF	$500

SOURCES

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