Market Effects Pilot

SAG Meeting – July 14, 2021

Agenda

Market Effects Pilot Discussion

Topic	Speaker
Market Effect Pilot Overview & Framework: • Definition of market effects • Pilot Objectives • Plan & Design	Matt Armstrong
Pilot Update & Market Research • Research – Market research & design refinement • Tracking and claiming results – Update on process for market effects	Matt Armstrong, Hilary Polis, and Noel Stevens
Questions & Discussion	Matt Armstrong

Pilot Overview & Update

Market Effects

2020 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 8.0.

- “A change in the structure of a market or the behavior of participants in a market that is reflective of an increase (or decrease) in the adoption of energy efficient products, services, or practices and is causally related to market interventions (e.g., programs). Examples of market effects include increased levels of awareness of energy-efficient technologies among customers and suppliers, increased availability of energy-efficient technologies through retail channels, reduced prices for energy-efficient models, build-out of energy-efficient model lines, and—the end goal— _increased market shares for energy-efficient goods, services, and design practices.”

Objectives

Market Effect Framework Pilot

1. Test framework to deliver market effects savings from resource acquisition programs
2. Explore for cost impact of delivering programs utilizing the framework
3. Leverage pilot efforts to develop Ameren staff skillsets and increase exposure to delivering programs focused on creating change in behavior and/or market structures
4. Identify and execute appropriate best practices in teaming strategy to build market effects framework (i.e. evaluation/market research, planning, program, implementation)
5. Deepen relationships with the supply chain program allies (manufacturers, distributors, retailers and installers) to aid in program delivery and data collection.
6. Evaluate market progress and measure impact including methodology for calculating and claiming market effects
7. Work with stakeholders to review plan and results and establish market effects savings

Our Team

Market Effects Pilot

Ameren ILLINOIS

Ameren ILLINOIS

Pilot Management

BRIO

Strategy & Design

leidos

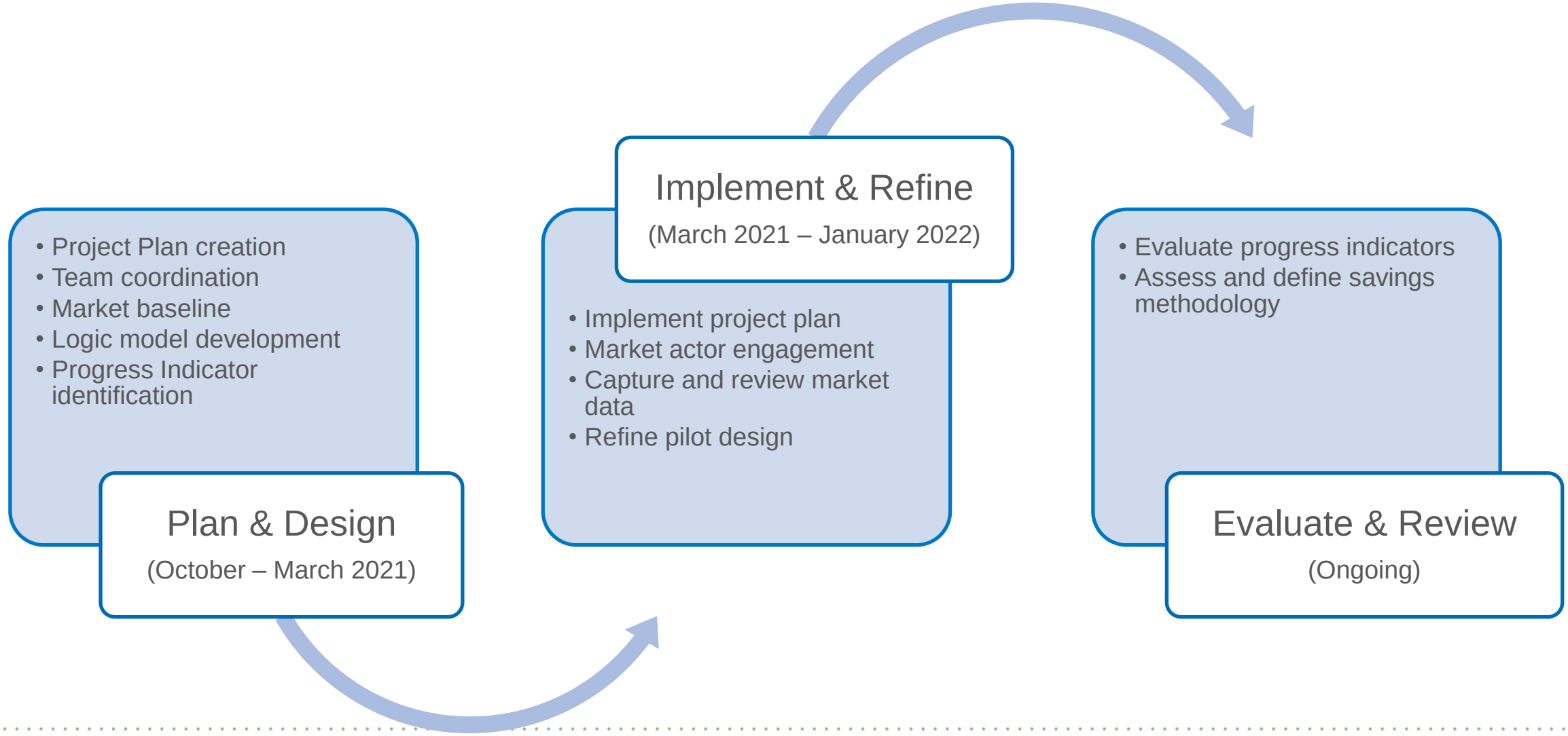
Implementation

Opinion Dynamics

Evaluation & Research

Timeline & Design

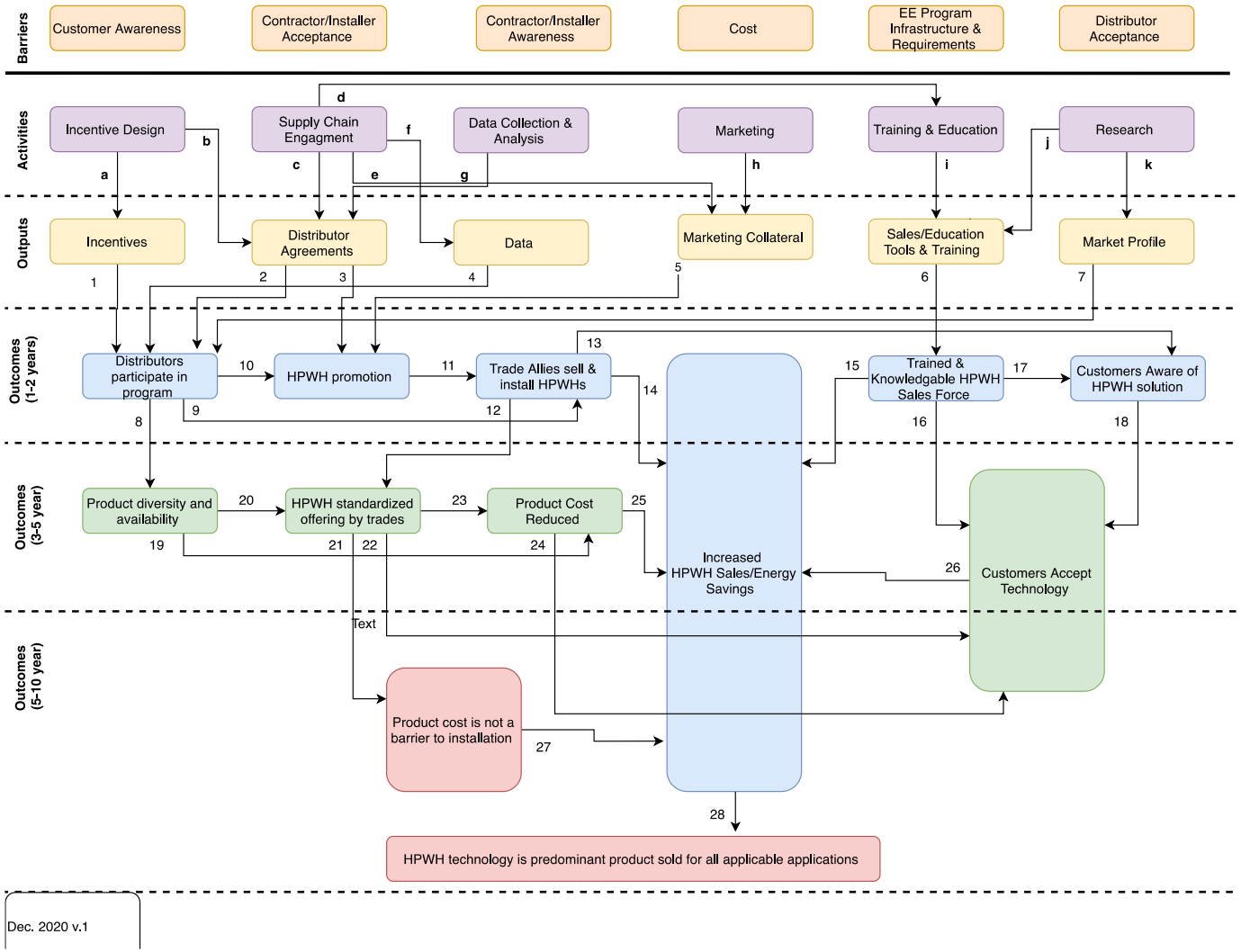
Market Effect Framework Pilot



Pilot Design

Logic model & Work Plan Development

- Documented intention
- Identified key activities and anticipated market changes
- Identified and documented data sources
- Created shared work plan identifying:
  - Key Activities
  - Roles/Responsibilities
  - Milestones
  - Communication approach & plan
  - Research activities



Research Activities & Results (ODC)

Opinion **Dynamics**

HVAC AND HPWH BASELINE AND MARKET CHARACTERIZATION

SAG Evaluation Working Group Meeting

Agenda

- Market Characterization Research Overview
- Key Research Findings
  - HPWHs
  - HVAC
- Approach to Evaluating Market Effects

Key Research Objectives and Questions

- **Overarching Objective:** Measure baseline market structure and sizing metrics and characterize market factors to support future evaluations of market effects resulting from the AIC Midstream HVAC and HPWH Initiative
- **Key Research Questions:**
  - What is the market size for HPWH and High Efficiency (HE) HVAC equipment in AIC service territory?
  - What are the HPWH and HE HVAC supply chains in AIC's service territory, from manufacturer to installer? What are the distribution channels?
  - What are the drivers and barriers to acceptance, including:
    - Distributors stocking and selling HPWH and HE HVAC products?
    - Installers selling HPWH and HE HVAC products?
    - End-customers purchasing HPWH and HE HVAC products?
  - What are the future opportunities for AIC to generate market effects through the Midstream HPWH and HVAC offerings?

Research Methods

SECONDARY DATA REVIEW

- Review of 23 reports and data sources
- Leveraged HARDI data for HVAC market sizing

SUPPLY CHAIN MAP DEVELOPMENT

- Developed a map of the HPWH and HVAC supply chains in AIC service territory

INTERVIEWS WITH MARKET ACTORS ACTIVE IN AIC SERVICE TERRITORY

- 19 installer interviews
- 9 distributor interviews
- 3 manufacturer interviews

Indicators to Support Market Characterization and Evaluation

MARKET EFFECTS CHARACTERIZATION AND QUANTIFICATION

MARKET SIZING AND STRUCTURE METRICS

- Percentage of sales by equipment type
- Number of homes in AIC service territory suitable for HE equipment
- Supply chain map

MARKET EFFECTS FACTORS

- Perceptions of high efficiency equipment
- Product recommendations
- Stocking practices
- Product availability
- Awareness
- Acceptance

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HPWH Market Characterization

Key Findings

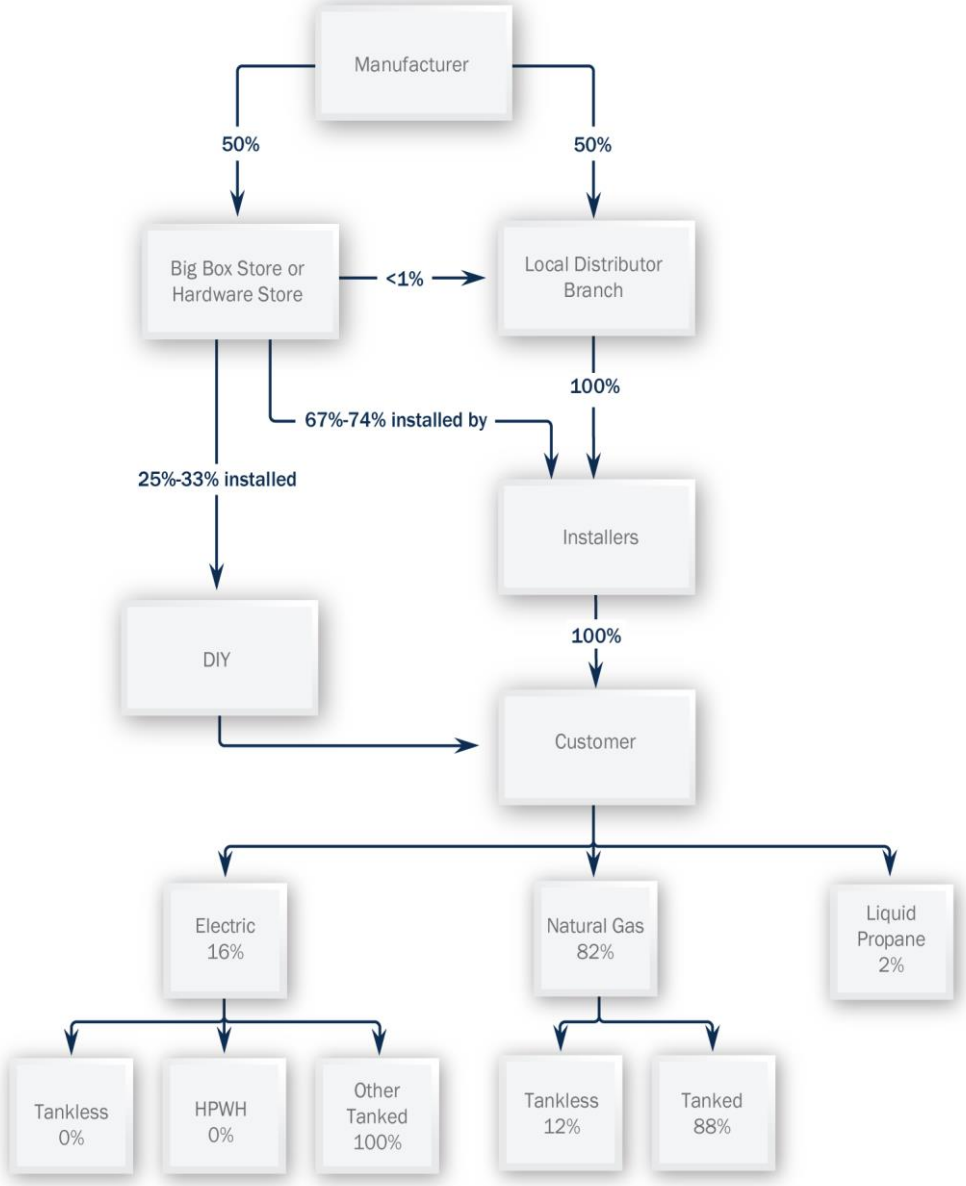
HPWH Market Size

- The HPWH market in AIC service territory is very nascent and has room to grow
  - 2.5% of US electric water heater sales in 2020 were HPWHs
  - Between 0.5% and 1% of single-family homes in AIC service territory have HPWHs
  - Approximately 184,240 water heaters will be replaced in AIC territory in 2021 and 2022
- The high prevalence of gas water heating in AIC service territory presents a barrier to adoption
  - 80% of the households in AIC service territory have gas heating
- New construction is well-suited for HPWH installations
- Market actors expect modest growth in their HPWH sales over the next five to ten years

HPWH Supply Chain Overview

- Retail stores are a key HPWH distribution channel
  - 50% of US water heaters sales are sold through retail and 50% are sold through distributors
- On average the distributors interviewed sell 89% of water heaters directly to plumbers
- All nine interviewed installers preferred to buy water heating equipment from distributors
- Interviewed installers estimated that 26% of water heaters are installed directly by end-customers, but expected that percentage to be smaller for HPWHs
  - Customers are more likely to do DIY installs when purchasing directly from a retailer

Water Heater Retrofit Market Supply Chain



Drivers of HPWH Acceptance

- Installers report Illinois end-customers are cost-conscious and may be interested in a HPWH for its potential operational savings and ten-year warranty
  - Installers report water heaters in AIC service territory need to be replaced every 7 to 10 years due to the water hardness
- Market actors agreed that a $1,000 incentive per HPWH should be adequate to generate interest in HPWHs, but a $500 incentive would not be enough (current incentive is $800)

Barriers to HPWH Acceptance

DISTRIBUTORS

- Stocking practices are largely driven by installer demand
- Distributors in AIC territory are generally stocking enough HPWHs to meet current demand, but will need to increase their stock to induce market effects

INSTALLERS

- Low awareness of HPWHs
- Do not understand the energy efficiency performance and overall value of HPWHs
- Concerned about several HPWH technical challenges
- 90% of jobs are replace on burnout with like-for-like equipment

END-CUSTOMERS

- Low awareness of HPWHs
- Five experienced installers estimated that a customer asks about an HPWH 2% of the time
- Concerned about higher upfront cost of the equipment

Key Opportunities for Generating HPWH Market Effects

Finding	Recommendation	Actions Taken and Planned
Current **nascent state of the market reflects opportunity** for AIC to claim both resource acquisition and market effects savings	Focus on encouraging distributors to increase HPWH stock	▪ Engage distributors, educating on HPWH benefits and AIC efforts to grow the market ▪ Call out need for increased stocking given anticipated uptake
The **high prevalence of gas water heating** in AIC service territory presents a barrier to adoption	Ensure incentives are high enough to encourage adoption	▪ AIC is **evaluating whether a "sweet spot" incentive** exists
Illinois **end-customers are cost-conscious** and may be interested in an HPWH for its potential **operational savings and ten-year warranty**	Consider expanding HPWH marketing efforts to include homeowners	▪ AIC has **conducted marketing efforts** via email and mailers to distributors, installers and customers. ▪ AIC continues to **explore collaborative marketing efforts** with equipment manufacturers

Key Opportunities for Generating HPWH Market Effects (cont.)

Finding	Recommendation	Actions Taken and Planned
Over **25% of end-customers buy** their water heaters **directly from retailers**	Downstream rebates for HPWH at retailers will still be an important incentive mechanism	▪ AIC offers rebates to customers purchasing at retailers via the **Retail Products Initiative**
New construction presents a market opportunity for HPWH installations	Continue to explore opportunities to work with new construction	▪ AIC developed a **solution to confirm customer eligibility** for new construction installations and has engaged home builder associations to promote the program and educate builders
Installers in AIC territory are not convinced of an HPWH's energy efficiency and overall value	**Provide training for installers** should include how an HPWH works, as well as its installation requirements, demonstrated efficiencies and performance, modes, warranty, value propositions, and available incentives	▪ AIC has **planned roundtables and morning briefs** that will address the recommended installer selling points and training needs

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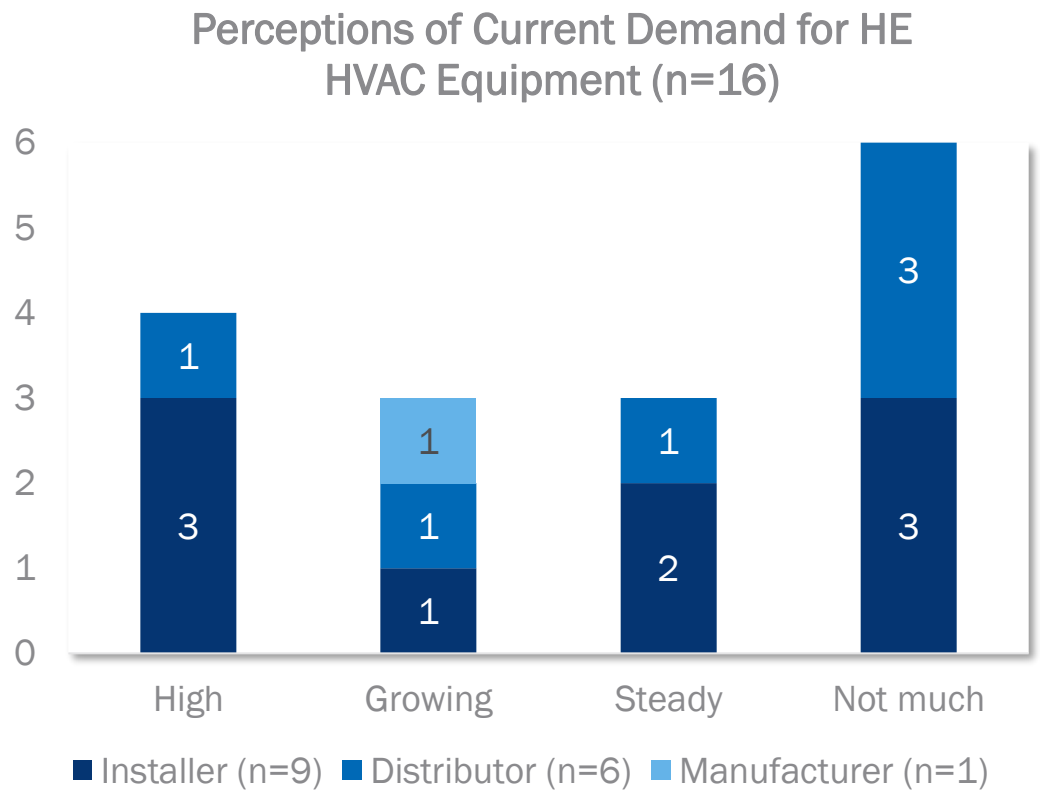
HVAC Market Characterization

Key Findings

HVAC Market Size

- The current market for HE HVAC equipment (heat pumps and SEER 16+ CACs) in AIC service territory has room to grow
  - 474,000 HVAC units were shipped to Illinois in 2020 (HARDI)
    - AIC incentivizes heat pumps and SEER 16+ CACs through the Midstream HVAC Initiative
    - 7% of the HVAC units shipped to IL in 2020 were heat pumps, 62% were CACs, 14% of the CACs were SEER 16+
- Market actors expect their sales of HE HVAC equipment to grow over the next five years
- Selling heat pump HVAC equipment to the 45% of AIC households that have natural gas for heating and cooling will likely be challenging due to the preference for like-for-like replacements



HVAC Supply Chain in AIC Service Territory

- All interviewed installers purchased their HVAC equipment exclusively from distributors, the distributors sold exclusively to installers and never to end-customers, installers sell directly to end-customers
- The lack of a trained and certified HVAC installer workforce poses a barrier to market adoption of efficient HVAC equipment
- Most distributors (5 of 6) promote their HE equipment to installers and do not promote lower efficiency equipment
- COVID-19 impacted both the supply of and demand for HE HVAC equipment, resulting in pent up end-customer demand for HE HVAC equipment in 2021

Drivers of HE HVAC Equipment Acceptance

- Installers report Illinois end-customers are cost-conscious and are interested in HE HVAC equipment for their operational savings and environmental benefits
- Installers consider both the home's characteristics and the customer's needs when deciding what equipment to recommend
- Installers see incentives (both from AIC and other sources) playing an important role in stimulating customer interest

Factors Installers Consider When Deciding What Equipment to Recommend (n=10)

Factor	Number of Installers
Home's existing fuel	6
Equipment fit in home/placement	5
Customer budget/upfront price	5
Energy efficiency of unit	5
Operating cost	4
Customer equipment preference	2
Customer comfort needs	2

Barriers to HE HVAC Equipment Acceptance

DISTRIBUTORS

- Identified few drawbacks to installers offering HE equipment
- Acknowledged systems must be sized correctly for energy savings to be realized

INSTALLERS

- Strongly believe that the Illinois climate requires supplemental back-up heating for heat pumps
- A few installers had concerns that heat pumps emit cooler air and don't last as long
- Installers did not report significant challenges installing heat pumps

END-CUSTOMERS

- Low awareness of HE HVAC Equipment
- 8 of 10 installers reported that customers are not aware of heat pumps and their heating and cooling features
- Upfront cost of HE equipment is a primary concern
- Concerns about cold weather performance

Key Opportunities for Generating HVAC Market Effects

Finding	Recommendation	Actions Taken and Planned
The **current market for heat pumps has a large margin to grow**, however demand for HE HVAC equipment also seems to be growing naturally especially for SEER 16+ CACs	The market effects team should continue to work together to **ensure that Midstream HVAC Initiative interventions are well-documented**	• AIC, Brio and Leidos have been working closely with ODC throughout pilot design and implementation, providing input on the logic model, pilot work plan, and data collection framework.
The **lack of a trained workforce poses** a barrier to market adoption of efficient HVAC equipment	Consider **supporting HVAC internships and career opportunities** aimed at educating high school students	• AIC will continue exploring opportunities within its Market Development Initiative that support internships and strategies aimed at building a diverse workforce
Installers are **unlikely to sell heat pumps to the 45% of AIC households that have natural gas** for heating and cooling	Focus on targeting the Midstream HVAC Initiative **towards customers with electric heating and cooling**	• AIC analyzed AMI data to identify and target program marketing to electric resistance heating customers
Distributors inform and educate the installers about the HE equipment who, in turn, promote products to the end-user	Focusing training efforts on **working with distributors to educate installers**	• AIC will host a morning brief webinar that includes education focused on addressing market characterization report recommendations • Roundtables will be held separately with distributors and manufacturers to allow program feedback and gathering of market intelligence

Key Opportunities for Generating HVAC Market Effects (Cont.)

Finding	Recommendation	Actions Taken and Planned
There is an **urgent need to educate installers on cold climate heat pump performance** and other misperceptions of heat pumps	Consider working with distributors to host trainings for installers on the cold weather performance of heat pump equipment	• AIC has planned engagement activities (morning briefs/roundtables) with supply chain actors
While end-customer awareness of HE HVAC equipment is growing, it still remains low	Customer marketing and outreach efforts on highlighting **the benefits of HE HVAC equipment** that are most appealing to end-customers, including **operational savings, warranties, and environmental benefits**	• Benefits can be highlighted on marketing materials and on the program website to address equipment attributes that are important to customers
Incentives are influencing the market, however installers also see room for growth in AIC's incentive offerings	Monitor market data and sales trends for HE HVAC equipment in Illinois and across the US to ensure incentive levels stay competitive	• AIC is continuing to evaluate whether a "sweet spot" incentive exists

Tracking & Claiming (ODC)

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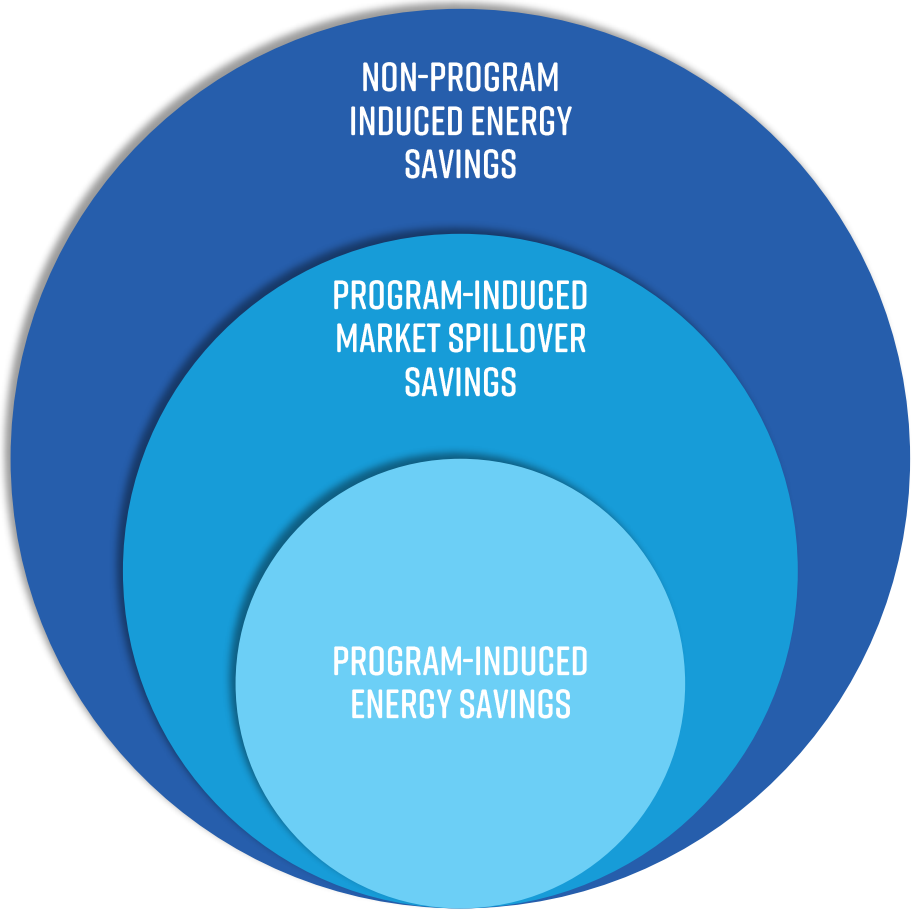
Approach to Evaluating Market Effects

Update on Methodology

- The evaluation team is currently developing the methodology for quantifying market effects from the Midstream Initiative
  - Our approach builds upon on recently completed foundational research, Brio's logic models (only HPWH completed to date), and existing industry frameworks for evaluating market effects
  - These activities have codified what AIC intends to change in the market, the baseline from which they are starting, the market indicators we'll look at and as it relates to tracking market effects, how we plan to measure progress
- Today's focus is on providing an overview of the key components of the method and outlining next steps

Theoretical Basis for Market Effects

- The underlying theory of market effects centers on the lowering of barriers to adoption that exist throughout the supply chain
- By reducing transactions costs, the Midstream Initiative can induce changes to market actor procurement practices, knowledge, recommendations, and activities
- These changes reflect market effects and the corresponding savings from this changed behavior provide measures of program-induced market spillover savings
- Identifying and measuring these changes is the focus of planned market effects evaluation efforts



Overview of the Approach

- The evaluation approach will quantify program-induced savings and look at the preponderance of evidence of program-induced market effects. This involves utilizing:
  - Primary research with manufacturers, distributors, contractors, and potentially additional market experts
  - Secondary data on equipment shipments to Illinois (e.g., HARDI and AHRI data)
- Next steps: Finalize memo outlining specific steps involved in quantifying program-induced market spillover savings, as well as primary data to be collected (expected early August)

Questions & Discussion

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