ETA
EFFICIENT TECHNOLOGY ACCELERATOR

2024 Annual Report

March 31, 2025

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Introduction

In 2024, Minnesota's Efficient Technology Accelerator (ETA) laid the groundwork for market transformation efforts that will accelerate the deployment of emerging, energy efficient technologies in the state. We launched initiatives for a diverse range of products, with applications spanning residential heating to commercial lighting, benefiting both natural gas and electric utility customers. Early projections of their technical potential suggest these products could significantly impact customer bills while also delivering measurable and broader societal benefits.

ETA is a groundbreaking program, distinct from and complementary to traditional Energy Conservation and Optimization (ECO) programs. ETA aims to:

- drive a strategic process to accelerate market deployment of key technologies,
- employ effective strategies to leverage market forces,
- become a hub for collaboration among stakeholders, and
- achieve cost-effective energy savings and other benefits for utilities and Minnesotans.

In our first annual report, we highlight key programmatic accomplishments in line with our program theories of market change and the barriers and opportunities identified during extensive market research conducted in the first year.

The report is organized by Market Transformation Initiative (MTI) stage. There are four basic stages in the life cycle of an ETA initiative:

- **Concept Development:** Scan and assess a broad pipeline of emerging MT opportunities and select the optimal opportunities to pursue.
- **Program Development:** Conduct detailed planning as well as market and product research to prepare an initiative for successful launch.
- **Market Deployment:** Deploy market intervention strategies in close collaboration with key market actors to accelerate the adoption of ETA technologies.
- **Long-term Monitoring and Tracking:** Monitor the market, estimate savings and periodically assess need for market re-entry.

Figure 1: Efficient Technology Accelerator Initiative Stages

At the end of 2023, three MTIs progressed from the Program Development Stage to the Market Deployment Stage. These include the Residential Air Source Heat Pumps (ASHPs), High-Performance Windows (HPW) and Luminaire-Level Lighting Controls (LLLC) initiatives. In 2024, two MTIs progressed to the Market Deployment Stage: Next Generation Rooftop Units (Next Gen RTUs) and the Codes and Standards Advancement Initiative. At the end of 2024 the Gas Heat Pump initiative was in the Program Development stage.

This report highlights key accomplishments from the past year, with a focus on the MTIs in the Market Deployment stage. In 2024, the ETA program made significant strides, expanding our networks through mapping the markets and engagement with key mid-stream market actor segments; developing and delivering training to support technology practitioners and installers; refining and improving technology value propositions; enhancing customer tools and resources; facilitating collaboration and alignment across utility programs; and forging partnerships with manufacturers and engaging nationally to increase visibility and focus on these emerging technologies. These collaborative efforts and strategic outreach have laid a strong foundation for continued success in driving market transformation results and eventual energy savings across Minnesota.

The 2024 ETA budget was $5.5 million. This amount reflects CEE's costs for administering the program and the Department of Commerce's costs for administering the contract, providing support for the program, and hiring an evaluation contractor for MN ETA.

ETA is funded through an assessment by the Department of Commerce on the state's investor-owned utilities (IOUs). The 2024 assessment per IOU is shown in Table 1. The assessment is proportional to the utility's gross operating revenue from sales, excluding revenues from CIP exempt customers.[1]

Table 1: 2024 ETA Assessment

Utility	2024
CenterPoint Energy	$1,121,321
Minnesota Energy Resources	$296,141
Minnesota Power	$281,841
Otter Tail Power Company	$116,167
Xcel Energy – Electric	$3,041,550
Xcel Energy – Gas	$602,088
Total	**$5,459,108**

[1] Minnesota Statute 216B.241 Subd. 14h.

Initiatives in Market Deployment

In 2024 the ETA program had four Market Transformation Initiatives (MTI) in the Market Deployment phase. This phase includes the greatest investment of resources to create an initial market lift and momentum to start the exponential growth curve for the product or practice identified in each MTI. The four MTIs included in the 2024 Status Report along with the date they started in Market Deployment are as follows.

- Residential Air Source Heat Pumps (Jan 2024)[2]
- High-Performance Windows (Jan 2024)
- Luminaire-Level Lighting Controls (Jan 2024)
- Next Gen Rooftop Units (April 2024)

The ETA market transformation program employs a strategic process of intervening in markets of chosen technologies to enact lasting change with the end goal of saving energy for the benefit of all Minnesotans. This process is outlined at the beginning of initiatives in three foundational documents. The Market Characterization Report, Market Transformation Plan, and Savings and Evaluation Plan can all be found on the ETA Research & Data webpage.[3] The Market Transformation Plan outlines the long-term strategy to achieve a transformed market — each year, the initiative team takes a critical path focusing on near-term activities and actions that will help us reach our end goal.

Residential Air Source Heat Pumps

ETA's residential air source heat pump (ASHP) initiative is focused on accelerating the adoption of dual fuel, centrally ducted ASHPs. This application can replace central air conditioners and displace a portion of heating from propane or natural gas furnaces.

Currently, an estimated two-thirds of single-family Minnesotan households heat their homes with gas furnaces and cool with AC and could instead meet a portion of their home heating needs and continue to cool by replacing their AC with an ASHP. This initiative has the potential to reduce Minnesota's residential heating and cooling energy use by roughly 35%. Therefore, this initiative has an end goal of making ASHPs the standard choice for home heating and cooling, rather than standard air conditioning units, by 2035.

The ASHP initiative has seven market support strategies that are outlined in the initiative's long-term Market Transformation Plan. In the following, we describe progress made within the four strategies that were our main focus in 2024.

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[2] The ASHP Collaborative is unique among ETA initiatives in that activities were funded voluntary by utilities since January 2020, so although the "official" ETA market launch was 2024, the initiative had already been active in the market for four years by that point.

[3] https://www.etamn.org/research-data

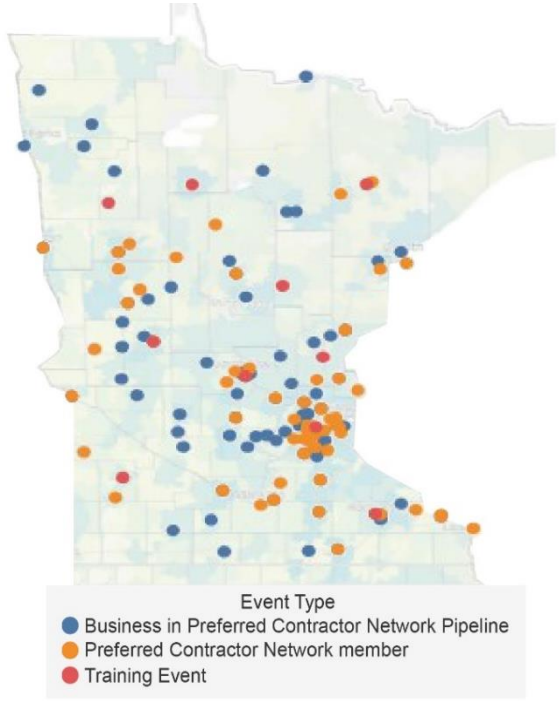
Build contractor champions

Lack of contractor experience and buy-in has been a predominant market barrier since beginning work in the ASHP market in 2020. The ASHP initiative has continued deployment of numerous activities in 2024 to support the increase of contractors that champion ASHP technology.

- **Developed and deployed 11 contractor training events** in 2024 with ~460 attendees, of which ~330 were installation contractors. The training format was in-person classroom style and covered key considerations for heat pump energy performance and maximizing customer benefits.
- **Supported distributor dealer events** by presenting and tabling at distributor dealer meetings throughout the year. The team provided support to 7 distributor hosted contractor meetings, reaching ~570 contractor participants.
- **Expanded the Preferred Contractor Network** by adding 39 new contractors bringing total membership to 63. The network is intended to allow contractors dedicated to heat pump technology to differentiate their business to customers and to promote installation quality and customer satisfaction. The network grew significantly in greater Minnesota and coverage spread to Southwest Minnesota for the first time.
- **Gained Department of Energy's "Energy Skilled" certification** on training curriculum to provide additional benefit to contractor participants and continued to offer North American Technician Excellence certification and Preferred Contractor Network eligibility. Additionally, the team continually assessed feedback from participants and enhanced training curriculum throughout the year.
- **Completed contractor survey with 93 participants** from across the state to understand contractor progress, perceptions, and needs.
- **Developed resources to support contractors** in enhancing their ASHP business, including an updated cost of heat calculator, a Controls Guide for optimizing heat pump settings, guidance on tax credits and rebates, and a monthly newsletter with high engagement (45% open rate, 13% click rate).

Figure 2: ETA ASHP Training, Spring 2024

Figure 3: ASHP contractor engagement by location



Contractor Engagement Showcase: 4Front Energy

The MN ASHP Collaborative team has provided support to contractors since the program began in 2020. Recently, 4Front Energy, a contractor that participates in the programs' preferred contractor network recently commented on the impact the ASHP Collaborative program has had on their business.

> *"At 4Front Energy we have had great success in our partnership with the MN Heat Pump Collaborative. They have done a great job of preparing a foundation for the homeowner that we are able to then go in and further educate and explain the benefits of a variety of different heat pump options. As well, the explanation of Utility/Municipal rebates and the Xcel Energy Electric Space Heating Rate given by MN ASHP Collaborative to the homeowner really has helped in our process from initial conversations to quoting to installation to closeout of project go much smoother and create a secondary trusted source for the homeowner about the investment they are making! Thank you MN ASHP Collaborative for all the help, we look forward to the continued relationship!"*
>
> - Nick Flann, HVAC Division, 4Front Energy

Develop customer tools and resources with articulated value proposition

With three years of contractor support underway and indications that contractors and the market are well poised to serve customers. A remaining barrier identified in 2024 is low customer awareness and lack of demand for the technology. The initiative increased efforts around understanding customer needs and finding ways to drive awareness through trusted market partners.

- **Conducted consumer research** to identify barriers and motivations around heat pump adoption and messaging strategies for homeowners. The research findings resulted in several key messaging takeaways that contractors, utilities, manufacturers, and other market actors can use to educate and support homeowners.[4]
- **Became a hub of collaboration among industry partners with the goal of increasing heat pump adoption** by convening industry actors (utilities, distributors, and state and local government representatives) together for three in-depth meetings that relayed timely heat pump technology updates, identified opportunities for ongoing collaboration including customer awareness building, and aligned actors across the state and broader region to increase heat pump installations.

[4] https://www.etamn.org/messaging-strategies-drive-heat-pump-adoption-minnesota

- **Delivered customer-focused presentations** upon request including Sustainable Duluth: Clean Heat Workshop with ~30 participants and Sauk River Watershed District in Cold Spring, MN with ~30 participants.
- **Developed and launched a consumer awareness toolkit** for market partners including messaging, FAQs and marketing templates. These resources are designed for contractors, utilities, and state/local governments to increase customer awareness.
- **Enhanced the program website** that serves as a central hub for heat pump technology and attracted 20k new users to the MN ASHP Collaborative website.[5]

Work with utilities, state, and other programs to align incentives

In 2024, an important pillar of the ASHP initiative was to work to build alignment across the numerous rebate sources available in the market including utility programs, tax credits, and federal rebates under development. Aligning incentives maximizes the potential for customers to stack incentives and reduce first costs, allows contractors to track program details more easily and confidently promote rebates, and motivates distributors to more readily stock qualifying product that meets all program criteria. The team did the following to enhance utility engagement and incentive alignment.

- **Engaged with utilities to support ASHP programs,** which included 77 meetings and engagements with SMMPA, Otter Tail Power, Xcel Energy, MRES, Great River Energy, CenterPoint Energy, Minnesota Power, Connexus Energy, Dairyland Power Cooperative, and Minnkota Power Cooperative. The team tracked and communicated updates on product specification trends from ENERGY STAR and the Consortium for Energy Efficiency and brought that to Minnesota utilities, as well as encouraged idea sharing and alignment on incentive program design.
- **Developed ASHP market reports twice per year** for participating utilities. The team collected, aggregated, and analyzed utility rebate data to better understand market trends and provide insight for utility programs.

Distributor engagement and rates optimization

The team also engaged with market partners upstream of contractors to optimize conditions for ASHP market growth. This included supporting optimization of more favorable electric rates for heat pump technology, which improve operational costs and increase the value of the technology.

- **The team engaged with seven distributor companies** to plan training, communicate market shifts, provide support, and promote ASHP technology. Across all seven distributor partners, the team had 52 unique meetings and calls to advance the program's goals. This is one of the core market audiences and priority engagement to support overall programmatic goals.

[5] https://www.mnashp.org/

- **Provided technical analysis supporting the adoption of Xcel Energy's Electric Space Heating Rate** in the Xcel Energy Residential Time-of-Use Rate Design (Docket No. E002/M-23-524).[6] The revised electric space heating rate will improve operational costs for ASHP customers in comparison to other fuel types thereby increasing the value proposition for ASHPs as an AC replacement.
- **Facilitated discussions and awareness of rates optimization** with utility groups through engagement discussed above.

High-Performance Windows

Windows are the least efficient element of the building envelope — as the nation moves to decarbonize its buildings, it will be imperative to improve this weak link. Windows make up only 8% of the typical home's building envelope area but account for 45% of envelope heat transfer. For this initiative, we classify high-performance windows (HPWs) as those with a U-Factor of 0.22 or less, which aligns with the ENERGY STAR Version 7.0 Northern zone prescriptive specification.

This initiative focuses on residential-style windows and focuses initially on the new construction market to increase demand signals to manufacturers, which will in turn increase production, availability, affordability, and promotion of HPWs, positioning them to be competitive in the retrofit market.

Figure 4: HPW demonstration site funded through Minneapolis 4D program, Minneapolis, MN

The HPW initiative completed its first year in Market Deployment in 2024. Activities and accomplishments are described below, organized by the market support strategies that were our priority for 2024.

Implement product demonstrations to understand challenges and benefits, increase familiarity, and clarify value propositions

As a technology with low market share, there is a lack of experience of the positive benefits of HPWs in the state. In the early stage of the program, we are funding demonstrations of high-performance windows in affordable housing and new construction to demonstrate the value of the technology and create case studies to promote it.

- **Advocated for the use of high-performance windows in a Parade of Homes Artisan Home Tour** project by Sustainable9. Through this event, we provided marketing materials for the event that promoted the benefits of HPWs and shared these on social media.
- **Funded HPWs in an affordable multifamily retrofit** in Minneapolis.

[6] https://www.edockets.state.mn.us/documents?doSearch=true&dockets=23-524

- **Supported the Department of Commerce team in developing a State Fair Eco Experience display** for HPWs by providing educational materials and facilitating a product display from Alpen windows.

Collaborate with and empower builders, manufacturers, architects, contractors and utilities toward HPW promotion, value engineering, and market opportunities

Figure 5: Minnesota State Fair, ECO Experience HPW display

The team gained a broad understanding of the MN HPW market and initiated market engagement by participating in 28 meetings and engagements across 4 manufacturers, 5 builders, 3 contractors, 1 energy rater, and 6 homeowners and 3 additional outreach and meetings with all other market actors. Through this outreach, the team identified the most likely partners and high value opportunities to pursue in 2025. In addition, the team accomplished the following.

- **Presented at numerous events** on the HPW program, building the programs' partner network. Events included EEBA builder workshop, attendance at Windows and Doors Manufacturers Association (WDMA) conference, ENERGY STAR Partner Meeting attendance and presentation, and ACEEE Summer Study attendance and poster presentation.
- **Supported the development of new HPW rebate measures** by providing guidance and supporting analysis to the Technical Reference Manual Advisory Committee. As a result, CenterPoint Energy, Minnesota Power, Otter Tail Power Company, and Minnesota Energy Resources all developed and launched new HPW rebate programs in 2024.
- **Supported utilities as they launched HPW rebate programs** through individual outreach to encourage and provide support for rebate launch, ad hoc support throughout the year, and three market advisory committees consisting of utility stakeholders to align and increase success of ECO programs.

Develop marketing materials, tools, resources, and market research to raise awareness of HPW

To enable effective communication, engagement, and outreach as described, the team built foundational communication strategies and tools.

- **Developed foundational program branding and messaging** to begin market engagement. This included foundational resources and a program website.[7] The foundational materials include an HPW benefits pamphlet (utilized at State Fair Eco Experience Booth) and an HPW Benefits document for utility programs.

[7] https://www.wisewindowhub.org/

- **Influenced increased ENERGY STAR ad spend in MN** through the development of new ECO programs. ENERGY STAR directed increased ad spend in markets with utility rebates.

National engagement and collaboration on above code programs, tax credits, tools, resources, and data

In addition to engagement within MN, the team engaged nationally to promote advancement of the HPW product category.

- **Engaged in the Partnership for Advanced Windows (PAWS)**, a national working group with the goal of promoting advancement and adoption of HPWs. The steering committee consists of two members each from CEE, PNNL, and Energetics. The team was involved in PAWS through participation in the steering committee and, leadership group, co-leading the utility working group, and participation in the communications and outreach working group.
- **Contracted Minnesota-specific market data collection to understand the baseline market share** of the HPW market and gather market intelligence to prioritize manufacturer engagement based on market share.
- **Analyzed new construction data to understand emerging trends and opportunities** in new construction. Provided insights into market share and helped the team prioritize builder outreach by gaining visibility into which builders have the highest proportion of high-performance homes.

Builder Event at EEBA

On October 10, 2024, the Wise Windows Hub, through the Partnership for Advanced Windows (PAWS), co-facilitated a "Window Match-Making Meeting" at the EEBA Summit. In this meeting, the following insights were gained from 40 builder and rater participants.

- High-performance products and more affordable high-performance product offerings are needed.
- Standard offerings should include high-performance glass packages in lower-cost, builder-grade framing systems.
- More education on installation is necessary.
- Builders also need easy access to performance information and clarity on glass packages, which can be confusing when marketed differently by different manufacturers.
- Reducing costs of HPWs is vital. Hidden costs in ordering and acquiring windows need to be addressed.
- Price transparency needs improvement.
- Just-in-time delivery is crucial to meet project deadlines. Builders need accurate lead time and delivery timeline information considering regional variabilities.

Luminaire-Level Lighting Controls

The LLLC initiative strives to advance the adoption of luminaire-level lighting control (LLLC) systems to bring lasting change in the lighting market where LLLC systems become standard practice for commercial buildings in Minnesota. LLLCs are individually programmable luminaires that contain embedded sensors and compact control components. LLLCs simplify design and installation by reducing the number of components and time required for installation, offering a cost-effective solution to energy code compliance while providing unparalleled flexibility, deep energy savings, and a superior lighting experience.

Figure 6: LLLC demonstration project installation

While lighting has long been a key opportunity for electric energy savings, widespread market adoption of efficient solid-state lighting shifts the opportunities for savings from loads to controls. Despite the fact that LLLCs have reached a level of maturity in the market, LLLCs are rarely installed in Minnesota (1% of projects), while standalone controls are typical for projects that include controls (17% of projects).

As a result, the LLLC initiative has a tremendous opportunity to influence the adoption of advanced controls, leading to significant energy savings.

The LLLC initiative uses a multi-faceted approach that equips the market with practical know-how, incorporates efforts to bolster demand and addresses the market barriers that have significantly inhibited the pace and scale of LLLC uptake throughout Minnesota. The LLLC initiative has eight long-term market support strategies that are outlined in the initiative's Market Transformation Plan that are designed to allow the team to adapt over time. In the following, we highlight the three primary strategies the team focused on in 2024 to establish a market presence and identify early adopters to build a foundation for initiative and market growth.

Build the local market and leverage national resources

Consistent collaboration with local market actors is crucial for addressing market challenges such as limited awareness and lack of technical skills. These partnerships stimulate demand and help build industry skills needed to make LLLCs more accessible and widely available.

- **Identified key market actors,** which enabled the team to deliver targeted training and foster market relationships for future outreach. We cast a wide net and engaged with 263 individuals from over 100 firms across various disciplines, including specifiers, manufacturers' representatives, contractors, and engineers.
- **Established key partners** (firms we are in regular contact with and have demonstrated intent to work with us) with 5 designers, 3 primary builders, and 3 electric contractors.

These early adopters will serve as program champions to maximize the appropriate use of LLLCs and document ways to scale and expand the market.

- **Met quarterly with major manufacturer reps** Davis & Associates (Acuity), RL Mlazgar Associates (Cooper), and Rouzer Group (RAB) who play a key role in the existing building market as they tend to touch the majority of the product entering the market and work closely with contractors.
- **Continued to engage with national and regional partners** to collaborate on best practice, program strategies, resource development and standardization across the industry. Quarterly meetings were held with NEEA, Ameren Illinois, and the DesignLight Consortium.
- **Participated in the DLC Controls Summit** that was well represented by manufacturers, lighting experts, and energy efficiency professionals from across North America and highlighted that resources and real-world examples will be key, but we need to condense them into straightforward instructions with references and simplify control programs to scale adoption.

Demonstrate LLLC technology

Demonstration projects and field studies play a vital role in highlighting the real-world benefits, such as energy and cost savings, of LLLC technology. They help develop installer experience and comfort with the technology and create case studies and educational materials that effectively showcase the value of this technology.

- **Completed two demonstration projects** that have provided valuable information in terms of sharing lessons learned and leveraging metered results to fine-tune the systems and maximize energy savings. Our first demonstration project was with BI Worldwide where LLLCs were installed in an office and warehouse space that was undergoing a lighting retrofit. The second project was with Intermediate School District 287, which consisted of split office and warehouse space that underwent a lighting retrofit project.
- **Prepared a case study to be published in early 2025**. Additional demonstration projects were identified and are in various stages of conceptual or pre-approval for 2025.

Develop Tools and Resources

Providing customers and market actors with tools, resources, and trainings will fill market gaps, generate more market awareness, and build confidence in LLLC technology.

- **Developed and released foundational resources to raise awareness and accelerate LLLC adoption** in Minnesota, including a Program Overview, Technology Overview, and guidance on using the DesignLights Consortium's Qualified Product List to identify suitable systems.
- **Published a case study** (rolled over into early 2025) on the BI Worldwide demonstration project and began working on a metered study that will present information learned from monitoring the systems.

- **Developed and delivered four contractor trainings** with a total of 27 attendees from 16 companies to increase market knowledge and experience. Trainings were hosted in conjunction with our utility partners.
- **Developed two training sessions in partnership with the Department of Labor and Industry** as part of the University of Minnesota's Annual Institute for Building Officials conference in January 2025.

Next Gen Rooftop Units

The Next Gen Rooftop Unit (RTU) initiative strives to advance the performance of next gen RTUs to meet the growing demand for energy efficient and sustainable building solutions and establish next gen RTUs as the preferred choice for commercial buildings in Minnesota. The Next Gen RTU initiative promotes dual fuel heat pump RTUs and energy recovery ventilators (ERVs).

In the state of Minnesota, there are approximately 21,000[8] buildings that rely on RTUs for space conditioning, which represents 80% of the state's commercial buildings. The average age of these units is 13 years, which means they are approaching the end of their expected 15-year lifetime and are operating below federal minimum standards for efficiency. This presents a huge opportunity for energy and emissions savings because commercial HVAC accounts for more than 60% of the energy use in Minnesota's commercial buildings. Furthermore, there have not been any significant improvements in RTU heating efficiency in the past 30 years, creating a large opportunity for market transformation.

The Next Gen RTU initiative has seven long-term market support strategies that are outlined in the initiative's Market Transformation Plan, designed to allow the team to adapt over time. Deployed in the spring of 2024, the three primary strategies the team focused on are highlighted in the following sections as they helped establish a market presence for initiative and market growth.

Collaborate with local market actors and national partners

Regular engagement with local market actors strategically supports the initiative's ability to overcome market barriers related to lack of awareness and product availability. These partnerships drive demand and create better, more widely available products.

- **Identified key market actors and nurtured relationships** to raise awareness, solicit market intelligence, and identify potential demonstration sites to identify ways we can scale and expand into this market.

Figure 7: RTU contractor training session

[8] Ibid.

- **Ongoing market engagement** consisting of 265 unique engagements across 149 organizations. Organizations include architecture firms, consumer groups, distributors, utilities, associations, local governments, manufacturers, nonprofit community organizations, installers, researchers, retailers, state agencies, and vendors.
- **Met quarterly with 6 major manufacturers** of RTUs: Aaon, Carrier, Daikin, Johnson Controls, Lennox, and Trane. From these quarterly meetings we learned about product development plans, timeline for product rollouts, and where manufacturers are seeing sales of product.
- **Met quarterly with 3 distributors** of RTUs: Auer Steel, Stevens Supply, and Trane Sales Reps. From these distributors we heard what resources were needed and what training was needed. A key takeaway from this first year was that sales teams need training to sell products, and don't yet have a strong understanding of why customers look to buy dual fuel heat pump RTUs and ERVs.
- **Collaborated with national partners** (including NEEA, Consortium of Energy Efficiency (CEE1), Cal MTA, DOE Heat Pump Accelerator program, NREL) to align specifications and standards to drive consistency in the market. As part of this effort, we took a lead role, along with NEEA, Efficiency VT and EE1, to advance a national collaborative of efficiency organizations and utilities to discuss and align efficient RTU work.

Demonstrate Next Gen RTU Technology

Demonstration projects and field studies showcase the tangible benefits, such as energy and cost savings, associated with Next Gen RTU technology. These support compelling case studies and educational resources that show the local market that this technology is viable for the Minnesota climate.

Figure 8: RTU demonstration project site visit with NREL

- **Kicked off two field studies and extended a third to monitor technology performance** during the 2024/2025 winter season. Continued recruitment of additional pilots to launch in 2025. A lesson learned from this year is that RTU installs have a six-month to a year of planning for scheduled replacement, so any recruitment requires us to follow up regularly to see if sites are going forward with next gen units.
- **Published a research paper presenting the modeling results to show estimated energy and bill savings**. This paper was used as a basis for the bill, energy, and emissions savings calculator on our website. We received very positive feedback from contractors and engineers that this is a consistent resource to provide a general estimate of energy and bill savings without an energy model.

Develop Tools and Resources

Providing customers and market actors with tools, resources, and trainings will fill market gaps, generate more market awareness and build confidence in Next Gen RTU technology.

- **Created the Next Gen RTU brand and branded materials** promoting both the program and the technologies supported by the Next Gen RTU initiative.
- **Developed foundation resources** such as technology overview sheets, sell sheets, program overview, and presentation materials.
- **Launched a Next Gen RTU website** that includes pages around demonstration projects and case studies, training and event resources, and information on incentives and financing.[9]
- **Developed comprehensive training curriculum** for contractors and other market actors to raise awareness and increase confidence in next gen RTU technologies.
- **Built an energy savings calculator** designed to help contractors and building management professionals estimate potential energy, bill, and emissions savings by upgrading their HVAC technology. Our team plans to continue to develop tools to support efficient HVAC implementation, including decision trees and literature on return on investment.

Influencing National Specifications to Benefit Minnesota

Next Gen RTUs connected early in 2024 with a new Better Buildings campaign through the Department of Energy called the Commercial Heat Pump Accelerator. This program includes a challenge in which major manufacturers are given efficiency requirements that are above and beyond what is currently in the market and are asked to create new RTUs which meet these requirements. When creating the specifications, the DOE and NREL, the program implementer, requested feedback from the Next Gen RTU team. When the specifications were finalized, NREL made it clear that the Next Gen RTU initiative directly influenced how they set the efficiency of the specifications and convinced them to set goals that could be met in the near future, because they saw programs like ETA's as proof the market was ready to adopt high-efficiency heat pump RTUs.

[9] https://www.nextgenrtus.org

Collaboration and Co-Created Savings

In addition to the market transformation goal established through the ETA program, a secondary benefit of ETA is that enhancing market conditions for selected technologies will have a positive and beneficial impact on existing utility programs and the overall performance of the ECO portfolio. Each ETA technology in active market deployment has utility ECO rebates associated with them, and through its market support efforts, ETA drives participation in these rebates and increases energy savings. In market transformation lingo, this is called co-created savings that will be claimed through the individual utilities' ECO programs and is separate from the savings that will be claimed by ETA. ETA strives to coordinate closely with utility program managers to maximize the combined efforts of the technology.

In 2024, the ETA market deployment portfolio made the following strides in bolstering the utility programs.

- **Facilitated knowledge sharing and incentive alignment across utilities.** The ETA teams, across all technologies and sectors, worked to promote knowledge sharing and alignment across utility incentives. This alignment helps product distributors better plan for purchasing and carrying inventory that qualifies for incentives, creates an easier environment for installation contractors to navigate, and allows customers to better track available incentives. In 2024, there was particular traction in continued alignment for ASHP utility rebates and a new outcropping of HPW incentives based on TRM updates.
- **Provided data-driven input and analysis to the TRM advisory committee.** The ETA team engaged with the TRM advisory committee to add a High-Performance Window measure that simplifies the energy savings calculations for utilities, extends the measure life, and helps utilities justify and potentially increase their HPW rebates.
- **Promoted utility programs.** Each initiative has mechanisms to promote utility programs to the market and customers as well as meetings and processes to allow utilities to collaborate, share information, and share lessons learned across utility ECO programs.
- **Initiatives provide ad hoc support to utilities across the state in support of healthy and effective ECO programs.** This support can include technical assistance, product specification assistance, and market and contractor training assistance.
- **Strengthened the market upstream of selected technologies to aid in transforming the market.** In addition to the long-term goal, near-term incremental market improvements and reduction of barriers also bolster utility program performance.

Benefiting all Minnesotans

It is the goal of ETA to reach and benefit all classes of customers in Minnesota. This includes balancing residential with commercial and industrial customer impact; working in rural and urban areas; ensuring equitable outcomes for low-income and disadvantaged communities to the extent possible; and enhanced employment opportunities and workforce development for efficiency businesses.

The ETA market deployment portfolio advanced the following efforts to increase equitable outcomes within ETA initiatives.

- **Collaborated with Weatherization Assistance Programs (WAP).** The ASHP and HPW initiatives have worked closely with the state's WAP program team to incorporate these technologies into WAP program offerings. This was achieved through technical assistance to define program design and assess technology cost-effectiveness. It also included training and engagement with the WAP network (state technical assistance staff, CAP agencies and CAP providers) support, training and assistance to incorporate ASHPs and HPWs into existing programs.
- **Promoted affordable and accessible products.** The ASHP and HPW initiatives take a product strategy that includes focus on entry level, affordable products that **have** beneficial energy efficiency outcomes. This can be achieved by prioritizing energy performance and decoupling high-end features and materials that might bring energy efficient products to a higher price point. For ASHPs, the initiative has a Tier 1 specification that outlines products with entry level pricing and encourages utilities to offer incentives on this product Tier. For HPW, the initiative is encouraging manufacturers to offer entry-level or builder-grade window products with high-performance glazing that would offer improved energy performance without the added bells and whistles that would drive up the price.
- **Showcased the benefits of entry-level products for income-qualified housing.** The HPW initiative is focused on demonstrating entry-level products in Minesota homes in 2024 and 2025. Through this effort, the team is working to demonstrate the product in affordable housing projects to showcase the technology and its benefits in the income-qualified housing segment.
- **Engaged community-based organizations working with underserved populations.** The ASHP initiative has been building a coalition of market partners to advance the heat pump market. As part of this coalition, the team has focused on engaging with community-based organizations (CBOs) to engage underserved populations.
- **Sought out partnerships with disadvantaged business enterprises across the state**. The LLLC initiative pursued projects in all Minnesota service territories, seeking out partnerships with disadvantaged business enterprises, such as C70 Builders, Flannery Construction, Shaw-Lundquist Construction, L&J Electric, The Retrofit Companies, ATEK Distribution, and Mel Management. In addition, the LLLC initiative has explored two projects that specifically serve underserved communities, as well as four projects that

serve rural, outstate communities in northern Minnesota, with more in both categories anticipated.

- **Supported diversity-focused industry associations,** including the Association of Women Contractors – MN, National Association of Minority Contractors – Upper Midwest, and the National Association of Women in Construction – MSP Chapter, and regularly attended and supported their events.
- **Pursued projects that serve underserved communities** including two potential field demonstrations of Next Gen RTUs. These discussions demonstrate the Next Gen RTU initiative's commitment to equal access to advanced HVAC. Next Gen RTUs is also pursuing a project for a senior living community with Integrity HVAC, a woman-owned business. Additionally, Next Gen RTUs is actively pursuing projects in northwest and northeast Minnesota to demonstrate the applicability of the technology in all areas of the state.

Initiatives in Program Development

The Program Development stage involves detailed planning and testing to prepare a concept to successfully launch as a market transformation initiative. The result of this stage is a Market Characterization Study, a fully developed Market Transformation Plan, and an Energy Savings and Evaluation Plan. At the end of 2024, two initiatives were in the Program Development stage.

Codes and Standards Advancement

Codes and standards set a minimum efficiency level, required by law, that must be met for new construction and renovation (and, in the case of standards, for any equipment replacement as well). Codes and standards advancement has been a core market transformation strategy for decades, as codes and standards enshrine in law the default market practice for a given technology and can substantially accelerate efficient technology adoption. Achieving a code or standard for a particular technology is the goal for a majority of ETA's current technology initiatives. The goal of this initiative is to increase the efficiency of codes and standards as a whole. Thus, there is great synergy between this initiative and other ETA initiatives, and a compelling value proposition for ETA to establish a leading role in energy code implementation in Minnesota. This initiative will support the adoption of higher-efficiency Minnesota energy codes and federal standards and claim savings based on the influence the initiative has on advancing these codes or standards.

The Codes and Standards Advancement initiative advanced to the market deployment stage at the beginning of 2025. Thus, most of 2024 was spent preparing the requisite materials to start work in the market, rather than deep engagement with the market, which will be the focus for 2025. The key accomplishments for 2024 included the following.

Market Transformation Plan

Developed the market transformation plan (posted on the ETA website) that outlines the long-term vision for this initiative, as well as the key barriers to overcome and market opportunities to leverage. This plan includes the program logic model and provides details on the market support strategies needed to achieve the long-term vision. This plan is the foundation for implementing this initiative.

Energy Savings and Evaluation Plan

The Energy Savings and Evaluation Plan (posted on the ETA website) outlines how energy savings are calculated for this initiative, as well as how energy savings and net benefits are claimed. This plan also provides details on the evaluation efforts, including the market progress indicators for this initiative.

Advanced to Market Deployment Stage

Both plans were completed with extensive stakeholder engagement efforts in the latter half of 2024. All of this work came together when this initiative was voted into the market deployment stage by ETA's Coordinating Committee in early 2025.

Gas Heat Pumps

The Gas Heat Pump initiative is in the product development phase where the goal is to track product readiness and stay informed on new products to recommend for eventual ETA market deployment.

In 2024, we continued to monitor the state of the market independently and through national collaboration with NEEA, CEE1, the NAGHPC, and other gas utilities such as Nicor Gas. At a high level, we are aware of and tracking commercial and residential space and water heating technology, including both water heating and combi units, as well as residential home heating and combi units. Based on engagement with the NAGHPC and others monitoring technology advancements and readiness, we do not expect to recommend a technology for eventual application until late 2025 at the earliest.

Some entities are beginning to conduct small pilots and at least two manufacturers, Robur and ANSEI, report having limited commercial units available; ANSEI is looking to participate in utility pilots and hopes to be involved with CenterPoint's NGIA pilots.

In the second half of 2024, we also began collaborating with CenterPoint Energy around potential support ETA could provide in planning and supporting pilots through the Natural Gas Innovation Act's (NGIA) programs.

Exploring New Technologies and Approaches

ETA is constantly exploring new technologies and approaches through our concept development activities. The goal of ETA's concept development stage is to develop a broad pipeline of emerging technologies to consider for future Efficient Technology Accelerator initiatives or for other future ECO programs. Not every emerging technology is suitable for a market transformation approach, so we collaborate closely with utilities and other stakeholders that work on bringing new technologies into ECO, so that ETA efforts can be leveraged and be more useful broadly to ECO, even if a particular technology would not be appropriate for ETA.

Key activities in 2024 included:

Developed an emerging technology matrix and concept development process

In 2024, we finalized an emerging technology matrix and developed a process for assessing emerging technology ideas and shepherding them through the emerging technology pipeline. This includes a four-step process of gathering ideas, assessing ideas, developing ideas, and advancing ideas. The emerging technology matrix provides the structure and tracking for this process and includes the key elements for assessing emerging technology ideas.

Emerging Technology Committee Collaboration

Collaborating with the Emerging Technology Advisory Committee was a key goal of 2024. We met with the committee four times and provided multiple ways for them to provide input and direction for ETA's emerging technology work. This included multiple surveys, both in meetings for live feedback and prior to meetings, which helped prioritize emerging technology assessments. Utilities also shared their work on emerging technologies to identify areas for collaboration.

Assessed Emerging Technology Ideas

The concept development and research teams assessed a number of emerging technology ideas in 2024 and provided an overview of this work to the committee during the 4th quarter meeting. This included deeper dives into the two technologies that the committee voted on as having the highest priority, and a technology flyover of the other emerging technology idea assessments.

Conclusion

The ETA program made significant strides in 2024 with its four Market Transformation Initiatives (MTIs) in the Market Deployment phase. Each initiative has made positive progress through education and outreach, marketing, contractor training, and collaboration with utilities, distributors, and manufacturers. These efforts are laying the foundation for long-term energy-saving solutions that will benefit all Minnesotans.

The program's strategic focus on stakeholder collaboration, market insights, and resource development has proven effective. Significant milestones include expanding contractor networks, enhancing customer tools, and fostering partnerships across sectors. These accomplishments have strengthened the initiatives' momentum and positioned it for continued success.

Looking ahead, the ETA program will build on 2024's achievements with an emphasis on the following types of activities.

- **Contractor Training and Support:** Ongoing development of contractor training programs and resources, including enhancing contractor confidence, expanding the contractor networks, and using hands-on and online training approaches.
- **Market Awareness and Customer Education:** Raise market actor and customer awareness of MTI technologies through targeted resources, media libraries, sell sheets, and websites.
- **Collaboration with Stakeholders:** Strengthen relationships with utilities, national energy efficiency organizations, contractors, and local market actors to align program goals, share resources, and drive industry growth.
- **Field Demonstrations and Market Intelligence:** Conduct field demonstration projects, collect market insights, and publish case studies to understand challenges and showcase successful applications of new technologies.
- **Codes and Standards Advancement:** Engage in codes and standards development, propose amendments, and collaborate with national bodies to support the adoption of energy efficient solutions and ensure their applicability in energy codes.

Additionally, ETA will continue collecting data that will be used to estimate the energy savings resulting from our activities. We are actively building partnerships and establishing data-sharing agreements with distributors, manufacturers, and data aggregators to help quantify the impact of our work on the statewide adoption of MTI technologies. We plan to quantify and report 2025 electric and natural gas savings, and the utility allocations of those savings, in next years' Status Report.

With ongoing collaboration and market education, the program aims to drive widespread adoption of energy efficient technologies, delivering lasting economic and environmental benefits for Minnesota.