

### ADMINISTRATIVE UPDATES

**The Future Focus team implemented various process improvements in Q4 2024 including:**

- Updated the Future Focus landing pages including design and content development as well as overall website design.
  - Information available is now standardized across projects.
  - Ideas in review under the Emerging Technology Accelerator are now also listed on the website.
- Created onboarding and offboarding checklists to streamline procurement of new projects.

### IDEA SUBMISSIONS IN REVIEW

**The following ideas continue to be in review:**

- Phase Change Thermal Storage for Refrigeration: Refrigeration Thermal Energy Storage is a type of thermal storage that uses a phase change material to store and release energy for cold storage or industrial processes. This allows cooling equipment to be turned off or down during peak periods, reducing peak demand and energy usage during these high-cost times.
- Static Thermal Mass for Grocery Stores: Conduct research through a market assessment and potential study as well as a field demonstration. Aim to understand their potential to shift energy use from summer and winter peaks to off-summer and winter peaks. This technology will focus on grocery store applications.
- Thermal Storage Integrated into Heat Pump HVAC (residential and combined): These systems integrate an ultra-high efficiency electric heat pump with thermal energy storage to make a smart thermal battery system that offers opportunities for load shifting, allowing greater flexibility in operation to maximize value to both the customer and the utility. Controls allow the system to be charged at times when electricity is cheapest and cleanest while delivering heating, cooling, and hot water when needed.
- Combination Space and Water Heater: Evaluates packaged electric air to water heat pump solution for residential space heating/cooling and domestic hot water. Aimed at hydronic retrofit market in residential sector; but may also be a fit for new construction.
- Research Barriers to Net Positive Schools in Wisconsin: This idea seeks to identify existing barriers to the development of net positive schools. Net positive schools seek to minimize the cost of ownership by maximizing efficiency and energy generation.
- Wastewater Treatment - Strategic Energy Management (SEM): This idea proposes applying strategic energy management (SEM) approaches, system models and operator training to wastewater plants and water systems.

### 120V HEAT PUMP WATER HEATER STUDY

**The 120V Heat Pump Water Heater (HPWH) Study was completed in Q4 2024** and consisted of research through a field study on 120V HPWHs. This research project assessed 120V HPWH retrofits in 11 residential single-family homes across Wisconsin, in addition to 16 sites across the Midwest with co-funding from other utilities. The project consisted of identifying project sites, installing 120V HPWHs and modeling each project site's energy savings to evaluate their overall performance.

Project launch: March 2023  
Project completion: December 2024

A final project report is available on the [website](#). Key takeaways from the research include:

- 120V HPWHs easily replace natural gas units when space is not constrained, and an outlet is present.
- 120V HPWH and gas units are at around operational cost parity, with slight average monthly savings after HPWH installation.
- Hot water runouts occur more often at higher levels of consumption and at lower groundwater temperatures. With a 120V unit, when water runs out, it runs out for longer.
- Units performed efficiently even in the cold groundwater and air temperatures of the Midwest but consumed more energy in winter months. COP was positively correlated with indoor temperature.
- Survey results indicated an increased awareness among participants about personal hot water consumption patterns.
- Participants were satisfied with their 120V HPWH units heating and cooling and ability to provide domestic hot water.

### AIR-TO-WATER HEAT PUMP STUDY

**The Air-to-water Heat Pump (AWHP) study consists of research via a field study on air-to-water heat pumps (AWHP).** This research project will assess 3 AWHP retrofits in residential single family and multifamily buildings throughout Wisconsin and 1 residential new construction.

Project launch: January 2025  
Project completion: July 2026

Key projects activities in Q4 include:

- The multifamily site located in Ellsworth was fully installed.
- The first single family retrofit site located in Boscobel was fully installed.
- A second single family retrofit site located in Beaver Dam continues to be in progress with an anticipated installation completion date in January 2025.
- The third single family site, intended to be new construction, continues to be in recruitment.

### FOCUS FORCE MILWAUKEE

This pilot aims to educate and train individuals from disadvantaged communities in Milwaukee for careers in the energy efficiency industry. The program seeks to develop more career opportunities for disadvantaged communities while providing employers and trade allies with the highly skilled employees they need. The pilot plans to develop a roadmap that is transferable and scalable with other neighborhood centers, rural community groups and other technical training providers.

Project launch: October 2023  
Project completion: December 2026

Key projects activities in Q4 include:

- BPI Training:
  - 14 people completed BSP; Six people completed BAT.
- Job Placement:
  - Four people have confirmed job placement.
- Soft Skill Training:
  - 14 people have completed the soft skill modules.
- Employer Engagement:
  - 23 employers have been communicated to regarding their participation in this program.
  - Six have signed employer agreements
  - Two have provided jobs (anticipating 10-12 jobs available based on employer).

### HOME ENERGY UPGRADE PILOT

This community focused pilot will provide whole home retrofits at no- or low-cost to customers to two communities in Wisconsin. Black River Falls is the first community for pilot implementation. The pilot will target residential customers in selected communities facing high energy burden to offer comprehensive energy efficiency, weatherization, and safety upgrades in single- and multi-family homes. The pilot will build partnerships with advocates, community-based organizations (CBOs), and local contractors to serve utility customers.

Project launch: June 2024  
Project completion: August 2026

Key projects activities in Q4 include:

- Kicking-off the pilot with the municipal utilities and other key stakeholders.
- Pilot marketing collateral and a landing page were created for the pilot.
- Identifying partnering CBOs and Trade Allies to support delivery of the pilot.
- The first project assessments began in late Q4.

### LIFE SCIENCES MIDSTREAM PILOT

This pilot incentivizes the purchase of energy efficient, ultra-low temperature freezers and lab grade refrigerators used by biotech and pharma businesses, hospitals and medical centers and academic research facilities in Wisconsin. Standard larger capacity ultra-low temperature (ULT) freezer models and lab grade refrigerators consume nearly as much energy as the average U.S. household, whereas an ENERGY STAR® unit can cut this usage by more than 50%. The pilot is targeting the sale of 500 units.

Project launch: April 2023  
Project completion: December 2025

Key activities in Q4 include:

- 54 ultra-low temperature freezers and refrigerators were sold, bringing the yearly total to 119 units.
- Attended an in-person biotech industry event to promote the program.
- Hosted and participated in 2 informational webinars for manufacturer and distributor partners.

### EMPOWERING FAITH COMMUNITIES

This program is intended to increase participation from places of worship and reach new customers by establishing a relationship with their congregation. The pilot was selected through Pitch Day and launched in Q4 2024. The pilot will explore the energy savings potential and financial resources needed for places of worship and the Community-based Organizations (CBOs) they partner with to complete energy efficiency improvement projects. In addition, the pilot will aim to increase residential program participation of the religious organization's membership by providing trackable coupon codes for the online marketplace.

Project launch: October 2024  
Project timeline: December 2026

Key projects activities in Q4 include:

- In Q4, the vendor submitted key program planning documents, drafted a webpage for potential customers, and created program informational sheets.
- The team began outreach to Trade Allies. Some responses have been received from those willing to participate in the program. Outreach to potential customers will begin early in Q1 2025.

### COMMUNITY IMPACT PILOT

The Focus on Energy Community Impact Pilot (the Program) targets Community-Based Organizations (CBOs), utilities and small businesses who service and impact their respective communities. The Program's intent is to provide high-impact, community small businesses with the means to deploy energy efficient measures, increase their ROI, and better serve community members. A secondary intent is to demonstrate the success of partnerships between Focus on Energy, CBOs, utilities, and small businesses.

Project launch: January 2023  
Project completion: December 2025

Key projects activities in Q4 include:

- In September, the pilot launched in Black River Falls, allowing it to run in parallel with the Home Energy Upgrades pilot.
- To-date, the pilot has provided over \$1M in energy-efficiency upgrades to 47 customers.
- The pilot is being extended through the end of 2025 and will target an additional five communities

### INTEGRATED CONTROLS PILOT

This demonstration researches the potential for achieving deeper energy savings in networked lighting control (NLC) retrofits by using occupancy signals from the lighting system to enhance HVAC control strategies executed through the building's existing building automation system (BAS). At the conclusion of the pilot, a summary report, energy saving calculations, and a workpaper will be created to potentially inform future program opportunities.

Project launch: July 2022  
Project completion: December 2025

Key projects activities in Q4 include:

- In Q4, the team worked with the building manager of one project site to troubleshoot why the savings were lower than expected. A solution was provided, and further monitoring will occur in Q1 to determine if it was successful.
- Post-integration data collection will continue until mid-2025 at which point the team will analyze and summarize the results. The pilot will conclude at the end of 2025

### DISADVANTAGED BUSINESS ENTERPRISES RESEARCH PROJECT

**This project will determine the current landscape of Disadvantaged Business Enterprises (DBEs) participation in Focus on Energy and energy programs across the state.** Through researching nonparticipant DBE companies in energy adjacent industries, including conducting stakeholder interviews and feedback groups, this project will identify barriers to participation and tools the Portfolio can deploy to improve the DBE experience. This project will also aim to identify appropriate KPIs for this market segment based on the outcome of research findings.

Project launch: January 2025.  
Project completion: December 2025.

Key project activities in Q4 include:

- A contract and SOW were finalized at the end of 2024 with the project expected to launch in Q1 2025.

## EMERGING TECHNOLOGY UPDATES

This Emerging Technology initiative seeks to identify emerging technologies new to Wisconsin that could benefit utility customers. It includes the Emerging Technology Accelerator, which looks at new technologies for residential and commercial businesses, and the Industrial Technology Accelerator, which focuses on understanding technologies most beneficial to industrial operations. Technologies identified undergo an initial screening, and if they meet the opportunity threshold, they advance to comprehensive review.

Emerging Technologies currently in review include:

- Refrigerated thermal energy materials with advanced controls (Phase-change materials (PCMs)):
  - A type of thermal material that can be used to store and release energy in buildings, cold storage, or industrial processes. A FETA researcher has developed a draft work plan, whose proposal focuses on commercial refrigeration in the food sales and food storage sector.
- Integrated storage source heat pumps:
  - Combines a heat pump with a thermal energy storage system that offers opportunities for load shifting and energy efficiency. A FETA researcher has developed a draft work plan, whose proposal focuses on a market evaluation of the technology and field demonstration of its efficacy and performance.
- Dual-fuel commercial rooftop units (RTUs):
  - A hybrid commercial RTU that employs a heat pump for cooling and for the first stage of heating. A fossil-fuel fired system is used as the second stage of heating. A FETA researcher has developed a draft scope of work, whose initial phase focuses on a market assessment of the technology in Wisconsin, which includes a secondary literature review, market potential analysis and identification of barriers to adoption.
- Alternate form factor heat pumps:
  - An investigation into the wide array of emerging heat pump technologies and products such as portable units, window units, all-in-one heat pumps, packaged terminal heat pumps (PTHPs), and other configurations of single- and multi-family heat pumps. Two FETA researchers are working concurrently to develop a work plan.
- Cloud-Based Residential HVAC Monitoring Systems:
  - Cloud-based Residential HVAC Monitoring Systems feature full two-way communication between the system and thermostat gathering information from devices and connected sensors that enable continuous commissioning, remote management, energy efficiency, real-time monitoring, air quality improvements, fault detection and diagnostics. A FETA researcher has developed a draft scope of work.

## ENVIRONMENTAL AND ECONOMIC RESEARCH AND DEVELOPMENT PROGRAM

The Environmental and Economic Research and Development (EERD) program seeks to support energy efficiency and renewable energy research that allows Wisconsin to further its efforts towards reducing energy waste, costs, and environmental impacts.

There is one EERD project currently in progress.

### Emerging/ Transitional Priorities Research:

- The primary objective of the research is to provide a comprehensive, sequential roadmap addressing various Quad IV directives in all four of the research categories. The research will result in a package of high-leverage interventions and a tactical implementation plan that can best achieve high-level goals for the EERD program and Focus on Energy broadly.
  - Project launch: January 2025.
  - Project completion: December 2025.
- Key project activities in Q4 include:
  - A contract and SOW were finalized at the end of 2024 with the project expected to launch in Q1 2025.

Focus on Energy will issue a Request for Concepts (RFC) for Pitch Day 2025. Pitch Day is an opportunity for industry partners and stakeholders to showcase innovative pilot program ideas to a panel of judges in an interactive way. Focus on Energy will seek well-designed, proven, and implementation-ready pilot programs addressing a list of pre-determined concept categories.

An announcement with brief details on the Request for Concepts for Pitch Day 2025 will be released in Q1 2025.



## MARKET ANALYTICS

The Future Focus team conducted Market Scans on two topics in Q4.

**1) HVAC Smart Tools:** Smart Tools and associated software are established tools of the trades and are commercially available. Based on the current understanding of the market, Smart Tools and diagnostic software are not widely adopted, especially by entry level HVAC technicians. This research will help Focus understand how Smart Tools can be leveraged to expand the capacity of the HVAC workforce and mitigate challenges arising from the federally mandated refrigerant transition. Increased capacity among installing and service contractors supports more rapid adoption of efficient HVAC and new refrigeration technologies. Smart Tools can help Focus fully realize energy efficiency savings from improved quality of installations and maintenance efforts and support the growth of the HVAC and refrigeration workforce even as flammable A2L refrigerants require new skills and more rigorous work practices.

This market scan made the following recommendations for Focus:

- Investigate the current utilization of Smart Tools in the field and barriers to adoption.
- Reduce cost of Smart Tools by offering incentives or discounts.
- Work with HVAC manufacturers to support industry training.
- Provide a quality control incentive and implement a quality assurance process for Trade Allies using HVAC Smart Tools.
- Leverage the DOE Smart Tools for Efficient HVAC Performance (STEP) Campaign.
- Provide HVAC Smart Tools Training through the Focus Force Milwaukee Pilot.

**2) Capturing Electric Savings with Heat Pumps in MF Buildings:** This market scan examined the potential for capturing electric savings in Wisconsin multifamily buildings by replacing electric resistance heating with cold-climate air-source heat pumps (ccASHPs). Considering the impact negative electric savings are having on the portfolio, capturing electric savings where able is of high importance for Focus. Installing ccASHPs in multifamily properties with electric resistance heating also addresses equity concerns since a high proportion of the low-income community lives in multifamily properties. Though potentially expensive to implement, this approach has the potential to impact a new and underserved customer segment while providing needed electric savings to Focus on Energy.

This market scan made the following recommendations for Focus:

- Partner with the Wisconsin Weatherization Assistance Program to identify suitable multifamily buildings and leverage their weatherization efforts.
- Explore a pilot program using utility bill analysis software (e.g., Recurve) to identify buildings with electric resistance heating based on usage patterns.
- Consider bundling heat pump installations with electric water heater upgrades, as 88.9% of electrically heated multifamily units also use electric water heating.