2024 Annual Report for Puget Sound Energy

INTRODUCTION

The Northwest Energy Efficiency Alliance (NEEA or "the alliance") is a nonprofit organization working in collaboration with Puget Sound Energy (PSE) and more than 140 other Northwest utilities and partners to increase the adoption of energy-efficient technologies and practices in the Northwest. With funding from Puget Sound Energy and NEEA's other partners, the alliance leverages the market power of the region to identify and vet emerging technologies and then creates the market conditions necessary for them to take hold.

NEEA achieves Market Transformation through five primary strategies that it has honed over almost 30 years: Emerging Technology, Portfolio Execution, Market Intelligence, Codes and Standards, and Convene and Collaborate. Individually, each workstream has broad value to the region. Together, they deliver permanent market change leading to energy savings for Puget Sound Energy and measurable benefits for Northwest consumers, including efficient products that perform well and save energy, helping make homes and businesses that are more affordable to power. Key accomplishments in 2024 from each workstream are summarized below. For additional information about the alliance programs and activities, NEEA's 2024 Operations Plan is available upon request.

EMERGING TECHNOLOGY (ELECTRIC + NATURAL GAS)

The alliance identifies emerging energy efficiency opportunities and works with manufacturers and the market to test and validate product performance, bringing forward new products that meet the unique needs of Northwest consumers, including Puget Sound Energy customers. These efforts ensure the continued availability of energy-efficient products and practices to Northwest customers and measures for future utility energy efficiency programs. NEEA's emerging technology activities are coordinated with the region through its Regional Emerging Technology Advisory Committee (RETAC), of which Puget Sound Energy is a member. Key activities in 2024 included:

1. **Micro Heat Pumps:** A small heat pump designed to condition a single room, this product can be installed in a window, like a window air conditioner, or be portable to move easily from room to room. Micro heat pumps can be plugged into a standard 15A 120-volt AC outlet, making them a convenient option for homeowners or renters. In 2024, the alliance provided data and information to ENERGY STAR® to track how these products perform for customers, to help inform further innovation in this market.
2. **Power Drive Systems (PDS):** PDS combine an electric motor and variable speed controls to provide feedback to the equipment. This project builds off NEEA's work developing the Power Index (PI) metric with the National Electrical Manufacturers Association (NEMA), which describes the percent of power savings expected from a complete PDS. In 2024, NEEA researched how the PI can be used to calculate savings when retrofitting an adjustable speed

drive to a motor-driven system, establishing minimum PI values, and understanding power quality requirements for PDS. Additionally, the research provided a high-level market characterization and initial technical potential estimate for the region.

3. **Residential Laundry Field Study:** In 2024, NEEA selected a statistically representative sample of Northwest households, of which approximately one third were in Washington state, to study their laundry use patterns and equipment energy use. The study collected data on water use, load size, textile mix, and the clothes washer and dryer cycles selected to better understand how efficiently clothes washers remove water from the load, and clothes dryers perform. These insights will identify energy savings opportunities and inform voluntary specifications and standards to ensure that consumers have options for products that both perform well and save energy.
4. **Secondary Windows:** Secondary windows are comprised of one or more panes of material such as glass, polymer or acrylic, which are mounted in a frame that is attached either to the interior or exterior of existing windows without replacing the primary glass or frame. In 2024, the alliance began participating in a multi-year project, primarily funded by the California Energy Commission, and led by GTI Energy, seeking to advance high-performance window technologies by addressing technical challenges, demonstrating increased energy performance, reducing installation costs, and accelerating uptake in the retrofit market. NEEA's participation supports product improvements that will reduce costs and provide updated information on the technology's energy-savings benefits for Northwest customers.
5. **Ultra-High Definition (UHD) Televisions:** These products are 4K UHD televisions with various forms of advanced display technologies. In 2024, NEEA convened stakeholders and led an effort to develop a more accurate and comprehensive test procedure for modern televisions. Now adopted nationally and providing influence internationally, this improved test procedure raises the standard for the entire product category while giving the market confidence to introduce the next wave of technology advancements for consumers in the Northwest and beyond.
6. **Monitor and Commercial Display Testing**: These products are high-definition and ultra-high-definition monitors and commercial displays with various advanced display technologies, very similar in design and construction to TVs. NEEA is working to: 1) improve the current industry standard for monitors and commercial displays leveraging an adapted version of the NEEA-developed TV test procedure, which better represents real-world energy use; 2) Provide data and insights on improved product performance to generate buy-in that supports the adoption of the test procedure by ENERGY STAR and other industry stakeholders, including major manufacturers and energy efficiency advocates; and 3) have the new test procedure inform an update to the federal energy test standard.
7. **Heat Pump Rating Representativeness:** NEEA collaborated with several partners, including Northeast Energy Efficiency Partnerships, Air-Conditioning, Heating, and Refrigeration Institute, BC Hydro, Natural Resources Canada, New York State Energy Research and Development Authority, Southern California Edison, Xcel Energy and federal agencies, to conduct a unique project to evaluate the accuracy of the test procedure for heat pumps. The study observed heat pump performance in a controlled field installation and compared those observations with corresponding laboratory test results. The results of this study were used to inform both federal test procedure development and future Canadian standard (CSA C700) load-based tests for

heat pumps. In 2024, NEEA determined how well the test procedure and standard represented field performance, identified which lab data is essential for accurate ratings, and determined critical performance indicators that could effectively be used to differentiate efficient equipment in a Qualified Products List in advance of wide availability of modified test procedures. These efforts help to ensure that Northwest consumers have options for high-performing heat pump technologies available to purchase.

8. **Commercial Heat Pumps Dryers:** In 2024, commercial heat pump dryers, which use electric heat pump technology instead of, or in addition to, electric resistance elements, became commercially available in the market. NEEA is now conducting research to: 1) quantify the energy use of heat pump dryers compared to similar capacity electric resistance and gas commercial dryers; 2) develop a regional estimate of energy saving potential looking at three Northwest locations across Oregon, Montana and Washington state and comparing them to a U.S. national average calculation; and 3) understand the cycle time differences between conventional and commercial heat pump dryers by testing a variety of textiles; and 4) quantify potential impacts in capital costs, operational and labor costs in using heat pump dryers vs. conventional commercial dryers. These findings will support and inform future ENERGY STAR and federal test procedure developments or rulemakings to ensure that consumers have a greater choice of products that perform well and save energy.

9. **Residential Dual-Fuel Field Study:** This study involves a forced air gas furnace or hydronic furnace combined with an air source heat pump with integrated controls. In 2024, NEEA launched a field study to investigate the efficiency and performance of residential dual-fuel systems to both deliver energy savings and support reliability and grid flexibility. The study paired a highly efficient gas furnace with an electric heat pump, using a smart controller to increase fuel flexibility and dynamically control the system.

10. **Advanced Commercial Water Heating:** In 2024, NEEA studied the potential for energy and cost savings from thermally driven heat pumps as replacements for boilers, natural gas-fired storage tanks and tankless systems across various representative applications in the Northwest. Though initially focused solely on natural gas, this research has expanded to include dual-fuel commercial water heating solutions.

EFFECTIVE PORTFOLIO EXECUTION

In 2024, NEEA staff managed a portfolio of electric and natural gas Market Transformation programs in six cross-sector Product Groups: Building Envelope, Consumer Products, HVAC, Lighting, Motor-Driven Systems and Water Heating.

BUILDING ENVELOPE PRODUCT GROUP

This Product Group includes the supply chain that manufactures, distributes, and sells the physical separator between the interior and exterior of a building, which includes walls, fenestration, roofs, and the end consumers who purchase them. In 2024, High-Performance Windows was the sole program in this Product Group.

High-Performance Windows – This program aimed to accelerate the adoption of windows that reach 0.22 U-Factor (or lower). In 2024, NEEA staff completed its Volume Builder Project, which encouraged home builders to install high-performance windows instead of double-pane, code minimum compliant

windows. This effort included 100 homes in Washington state. The program also continued to explore the possibility of data acquisition with major Northwest window suppliers, with limited success.

Due to cost-effectiveness and data challenges, NEEA moved the High-Performance Windows program out of its Market Transformation portfolio at the end of the year. Staff will continue to maintain some key market relationships and monitor the market and policy landscape for opportunities to re-enter the market at a future time.

CONSUMER PRODUCTS PRODUCT GROUP

This Product Group comprises the entire supply chain, including manufacturers, distributors, physical and online retailers, contractors, and installers, which deliver consumer goods and services in high volume as well as end customers who purchase them. In 2024, Retail Product Portfolio was the sole program in this Product Group.

Retail Product Portfolio (RPP) – This program brings together utilities and national retailers to increase the availability of energy-efficient products to American consumers, including Puget Sound Energy customers. More than 300 retail locations throughout the Northwest participate in the program, including 85 in Puget Sound Energy's service territory. Participating retail locations receive incentives to preferentially stock and sell energy-efficient products, which in turn influences corporate buying decisions and sends a signal to manufacturers about the demand for these products. In 2024, the program provided midstream incentives on more than 55,680 qualified products sold through more than 117 retailers in Washington state.

Retailers who participate in the program provide the alliance with full-category sales data, which NEEA analyzes to identify promising energy efficiency opportunities and influence the stringency of voluntary specifications. In 2024, NEEA provided comments to ENERGY STAR on several product categories, including recommending an alternate test procedure for refrigerators, which would more accurately measure energy savings. The program also added televisions to the portfolio.

To increase interest in the program among national retailers, NEEA conducts outreach to potential new program sponsors. In 2024, four new utility sponsors joined the ESRPP program, bringing the share of U.S. households represented by program sponsors to more than 31%. Achieving greater scale helps NEEA to amplify the voice of the region, thereby creating more opportunities for consumers in the Northwest and beyond to purchase efficient products that meet their needs.

HVAC PRODUCT GROUP

This Product Group is comprised of the supply chain that manufactures, distributes, specifies, designs, and installs commercial and residential HVAC products. In 2024, there were three programs in the HVAC Product Group: Advanced Heat Pumps, High-Performance HVAC, and Efficient Rooftop Units

Advanced Heat Pumps – This program aims to improve heat pump efficiency by driving the adoption of product features, capabilities and ratings in all residential variable speed heat pumps installed the Northwest, including Puget Sound Energy's service territory. In 2024, NEEA focused on:

- **Connected Commissioning**: NEEA worked to increase national alignment on advanced heat pumps strategy by convening program and thought leader participants representing three major climate regions, including the Northwest. NEEA began a new collaboration of technical experts, two national laboratories and manufacturers to build consensus on a new heat pump connected

commissioning specification. This effort will identify feasible solutions across systems and build manufacturer support for verifying proper system set up and commissioning upon install that will deliver greater heat pump energy efficiency.

- **Low Load Efficiency**: NEEA conducted lab testing and a product teardown to help identify the source of low load efficiency and impacts to product costs. Low load efficiency offers energy and cost savings potential, particularly in moderate climates like the west side of the Cascades, where the majority of a heat pump system's run time is spent running in partial load.
- **Heat Pump Test Procedure**: NEEA collaborated with the Consortium for Energy Efficiency (CEE) and federal agencies, providing technical expertise and market data, to inform priority improvement(s) in updates to test procedures, efficiency tiers, and/or ENERGY STAR requirements. As a result, the revised tax credit has been simplified for easier program integration and allows for more accurate system pairing to regional climate zone needs.

High-Performance HVAC – This program aims to increase the adoption of very high efficiency dedicated outside air systems (DOAS) across the Northwest, including Puget Sound Energy's service territory. These systems separate the heating and cooling from the ventilation, resulting in more comfortable buildings that are more affordable to heat and cool. Despite rising popularity of variable refrigerant flow (VRF) systems, adoption of high efficiency energy/heat recovery ventilators (E/HRVs) has been limited due to relatively high price and lack of awareness of the system design and value proposition. Further, high efficiency E/HRV availability remains a barrier as most major manufacturers do not yet have products of this caliber available. To address these market barriers, in 2024 NEEA focused on:

- Educating and motivating manufacturer's representatives and distributors to promote the system approach by participating in joint promotional efforts, including four in Washington state (three specifically in the Puget Sound area), developing educational content and toolkits, and producing a video and podcast series featuring, among other things, the key differences between very high efficiency DOAS and Washington State Energy Code (WSEC).
- Raising supply chain and end-user awareness of the system approach and its significant cost savings and non-energy benefits. In 2024, NEEA collaborated on 15 events with partners, key industry and/or professional/ trade organizations, including 11 in Washington state (eight specifically in the Puget Sound area).
- Increasing availability of qualifying E/HRVs. Year to date, manufacturers (including two who are entirely new to the list) have added 33 new models to NEEA's Compliant Products List.

Efficient Rooftop Units (RTU) – Commonly found in commercial applications, gas-fired packaged rooftop units, or RTUs, are particularly prevalent in low rise commercial buildings, and condition approximately 35% of gas-heated commercial floor area in the Northwest. NEEA's Efficient RTU program aims to increase the efficiency of RTUs installed in the Northwest, including in Puget Sound Energy's service territory, to deliver efficiency and cost savings for natural gas customers. In 2024, NEEA focused on:

- Encouraging manufacturers to develop and promote efficient RTUs for the light commercial market (new equipment or new price points). In 2024, one light commercial manufacturer designed and worked to bring an energy recovery ventilator (ERV) product to market for use in their light commercial RTUs and production started on initial products. Also, NEEA continues to vet and support development of additional product lines as replacements within the RTU market

to expand qualified choices to customers and drive down costs of efficient options for the RTU market.

- Creating product awareness of and providing support to increase the sales of efficient RTUs in the Northwest, including in Puget Sound Energy service territory. In 2024, NEEA continued to recruit manufacturer and distributor representatives to partner with the program and provide efficient RTU sales data to enable the alliance to track market progress. The program has received some initial data and is working to formalize these relationships.
- Working with alliance funders to increase utility programs that reference NEEA's Efficient RTU Specification. In 2024, NEEA met with Northwest utilities, including Puget Sound Energy, to discuss measures related to efficient RTUs and participated in discussions with the Regional Technical Forum to develop an RTU measure for the region, allowing utilities like Puget Sound Energy to offer prescriptive incentives.
- Updating the specification to better align with a fuel-neutral approach for how RTU selections are made, with heating type provided as an option after choosing product line and feature sets. Focusing on RTU cabinet design and shell measures will create more demand in the market for the program's prescriptive measures (R12 insulation, low-leakage dampers, and heating/energy recovery).

LIGHTING PRODUCT GROUP

This Product Group works to increase promotion of energy-efficient lighting by engaging manufacturers, distributors, specifiers, designers, and installers, and by educating decision makers. In 2024, the Luminaire Level Lighting Controls program was the sole program in this Product Group.

Luminaire Level Lighting Controls (LLLC) – This program seeks to remove market barriers so that installing LLLC systems become standard practice for commercial buildings across the Northwest, including the Puget Sound Energy service territory. In 2024, the LLLC program focused on:

- **Increasing decision-maker understanding of the LLLC value proposition for their businesses:** The program promoted success stories in earned media and through events at professional associations throughout the Northwest. Two marketing case studies, including one in Washington state, were created, as well as three Industry Voices interviews, which feature industry experts discussing the value of LLLC.
- **Strengthening focus and promotion of LLLC by key manufacturer sales channels:** NEEA collaborated with nine manufacturers to help motivate their sales professionals to champion LLLC to their customers. The program team partnered with sixteen local manufacturer representatives based in the greater Puget Sound area to demonstrate LLLC capabilities and promote its value. The resulting six events held in the Puget Sound area reached a wide range of lighting engineers, designers, and installers.
- **Influencing leading specifiers to include LLLC in their ongoing business practices:** NEEA highlights the success of lighting specifiers, including designers, engineers, and installers, to bring visibility as a competitive option that can be used to service their clients. As part of this peer-to-peer strategy, the LLLC program collaborated with eight lighting specifiers, three of which are based in the greater Puget Sound area, on media content, professional association events and educational activities.

- **Increasing visibility and demand for LLLC through strategic national engagements**: NEEA worked with the Illuminating Engineering Society (IES) to revise recommended lighting practices to include LLLC. The program continues to collaborate with DesignLights Consortium on technical requirements and a qualified products list for LLLC. Additionally, NEEA engages with national partners, including Center for Energy & Environment in Minnesota, Ameren Illinois, and Commonwealth Edison, to create greater support amongst manufactures and greater visibility within the market to bring more options to Puget Sound Energy customers.

MOTOR-DRIVEN SYSTEMS PRODUCT GROUP

This Product Group includes the supply chain that manufactures, distributes, specifies, designs, and installs a variety of motor-driven systems such as pumps, fans, compressed air systems and high-performance motors, as well as the decision-makers who influence the purchase of these products. In 2024, there were two programs in the motor-driven product group: Extended Motor Products – Pumps and Efficient Fans.

Extended Motor Products (XMP) – Pumps – The XMP Pumps program works to transform the pumps and circulators market toward high efficiency systems. Clean water pumps are abundant in commercial and industrial building environments. Recent technological advancements provide the Northwest with a unique opportunity to transform the pumps and circulators market, resulting in up to a 60% improvement in energy efficiency from pumps and circulators installed in the region. In the Northwest, sales of efficient pumps are trending upward, showcasing clear progress among innovators and early adopters. However, market barriers remain, including lack of awareness of and confidence in these emerging products by key market actors. In 2024, NEEA's XMP Pumps program focused on addressing these barriers by:

- Motivating participating manufacturers' representative firms to preferentially stock and increase sales of smart pumps and smart circulators. As a result, smart pumps and smart circulators reached 24% and 26% regional market share respectively in 2024, exceeding NEEA's goal.
- Raising awareness of energy-efficient pumps, the Energy Ratings (ER) label, and the specific benefits of Smart Pumps through outreach and education to pump buyers and specifiers in the Northwest, including those in Puget Sound Energy service territory. In 2024, participating firms and the NEEA field team led or took part in 211 educational events, including 50 in Washington state, focused on pump efficiency.
- Leveraging and expanding relationships with pump manufacturers, distributors, and industry associations to accelerate Smart Pump and variable load pump market adoption. NEEA worked with nine pump manufacturers' representative firms across the Northwest to promote sales of smart pumps and smart circulators. These relationships allow NEEA to support manufacturer decision-making involved with inventory, customer training, product pricing and promotions. In addition, manufacturer representatives are providing NEEA with sales data critical to measuring NEEA's Market Transformation efforts.

In 2024, the U.S. Department of Energy (DOE) passed into law the first federal standard for circulators. NEEA provided comment letters and anonymized sales data to inform the federal standard setting process. When the standard becomes effective, it will ensure that circulator pumps, which are commonly used in heating, ventilation, HVAC, and in plumbing systems, meet minimum efficiency

levels without impacting performance, saving money and energy for customers across the country, including those in Puget Sound Energy service territory.

Efficient Fans – This program focuses on non-embedded, or stand-alone, motor-driven fan systems that are not packaged by the manufacturer as part of any equipment with additional operating functions, and may include a fan, motor, and drive. While fans are a proven technology, energy efficiency is only one of several considerations for engineers and specifiers when selecting fan products. NEEA is working to address barriers to significantly improve the efficiency of fan systems installed in the Northwest, including in Puget Sound Energy service territory. The program is focused on working with manufacturers and their representatives who sell fans with a Fan Energy Index (FEI) rating certified by the Air Movement and Control Association (AMCA).

In 2024, NEEA tested manufacturer motivation to promote efficient models in their customer-facing fan selection software. NEEA staff also conducted field and lab verification of fan systems to understand more about the performance of fan systems compared to the FEI design point and to inform future program strategies and interventions. Finally, in collaboration with external partners, NEEA is developing a market baseline and savings forecast for the program, critical to measuring market transformation.

WATER HEATING PRODUCT GROUP

This Product Group includes natural gas and electric water heaters and the supply chain that manufactures, distributes (wholesale and retail), specifies, designs, and installs commercial and residential water heaters and the end consumers who purchase these products. In 2024, there were three programs in the Water Heating Product Group, Heat Pump Water Heaters, Efficient Gas Water Heaters, and Advanced Commercial Water Heating.

Heat Pump Water Heaters (HPWH) – Since 2011, NEEA has worked to transform the water heating market by working to overcome key barriers to the adoption of HPWHs for emergency and planned replacements in single-family homes. The region's success overcoming these barriers demonstrates the feasibility for broad national adoption of the technology and market readiness for a federal standard. In October 2022, NEEA participated in a joint recommendation to U.S. DOE, along with manufacturers, energy efficiency and consumer organizations, proposing efficiency levels for consideration in the rulemaking process. NEEA participated in this effort to ensure the needs of all consumers in the Northwest were met, including those in cold climates, homes with challenging installation locations and across all income levels. The final rule, published in May 2024, indicated a shift for most electric storage water heaters to heat pump technology by 2029. The rule cited the joint recommendation as evidence that manufacturers can meet the proposed standards and that consumers will benefit, as shown by their analysis. To prepare the market for the federal standard, in 2024 NEEA focused on:

- Increasing installer experience and confidence installing HPWHs in retrofit and emergency installations: NEEA launched the Key Installer program, which included three participants located in Puget Sound Energy territory, which focused on growing the retrofit market by supporting installation companies to adopt HPWHs as a core component of their business. This included 14 trainings in Washington state for 350 attendees and 170 documented continued education units on behalf of the attendees. One training, which included 37 attendees, was hosted in collaboration with Puget Sound Energy, Snohomish PUD and Seattle City Light. Participants in the Key Installer program receive in-depth trainings, funds to offset financial risk

from call-backs, funds to stock HPWHs for emergency replacements, and access to a fully paid-for installation to use as training for their teams.

- Continuing efforts to reduce market acceptance barriers to the new standard by developing and distributing regional or market resources:
    - In June, NEEA held a webinar for regional stakeholders to explain the new federal water heating standard. The webinar provided a comprehensive overview of the new efficiency standards for water heaters. NEEA also produced and distributed information sheets about the final rule for distributors and installers.
    - Throughout 2024, NEEA engaged with seven water heater distributors, four of whom have branches in Washington state (13 total), on a bi-monthly basis. During these planned calls, NEEA shared insights with the distributors about regional utility programs, code updates, regional training opportunities and the availability of informational resources to share with their counter and sales staff.
- Improving product suitability for challenging installations and customer acceptance by launching the first-ever Hot Water Innovation Prize. The goal of the Prize is to encourage the development of innovative split system HPWHs and bring this technology to market. The prize focuses on creating affordable, easy-to-install HPWH split systems with an indoor tank and a separately housed compressor-evaporator that operates in an outdoor climate which would be ideal options for challenging installation scenarios, including low-rise multi-family dwellings.

Efficient Gas Water Heaters (EGWH) – This program worked to develop the market for efficient gas water heating products and bring a gas heat pump water heater to market. In 2024, NEEA paused program activity in response to policy developments in Washington state. In 2025, NEEA will be reprioritizing its natural gas portfolio, shifting away from residential gas heat pumps and focusing toward dual-fuel and fuel-neutral technologies based on input from the NEEA Natural Gas Advisory Committee and Board of Directors, which include representatives from Puget Sound Energy. By advancing both electric and natural gas efficiency, NEEA is helping to maximize the pathways to a more resilient and reliable energy system and to increase customer options for efficient water heating products that perform well and save energy.

Advanced Commercial Water Heating: This program focuses on accelerating technical advancements and the market availability of advanced commercial water heating systems, including commercial gas heat pumps, in the commercial and multifamily sectors. In 2024, NEEA conducted product testing, product validation and market research to learn more about gas heat pump technology, other advanced efficient system configurations, and market conditions. NEEA staff also developed market intervention strategies to remove identified barriers and validated the natural gas savings potential of these systems. In addition, NEEA supported WSEC interpretations providing clarity on how dual-fuel and gas heat pumps fit into WSEC requirements.

INFRASTRUCTURE PROGRAMS

In addition to its Market Transformation programs, the alliance develops and implements enabling infrastructure programs that build market capability, awareness and demand for energy-efficient products, services, and practices. NEEA's infrastructure programs in 2024 were: BetterBricks, Integrated Design Labs, and Strategic Energy Management.

BetterBricks – The BetterBricks platform is designed to address barriers in the commercial buildings market by providing market actors—including owners, property managers, facilities staff, architects, engineers, and contractors—with the education and resources needed to improve the efficiency of their buildings. Leveraging its market partnerships, BetterBricks regularly seeks opportunities to secure and execute engagement opportunities for current and future programs. In 2024, BetterBricks participated in the following Puget Sound area events:

- High-performance HVAC in-person lunch-and-learn with McKinstry in Seattle, Wash.
- AIA Seattle Honor Awards sponsorship
- Smart pumps, efficient HVAC and LLLC lunch-and-learn in partnership with the International Facility Management Association (IFMA) Seattle
- BetterBricks in-person and virtual booth at the Seattle Smart Buildings Exchange
- AIA Seattle Honor Awards sponsorship
- BetterBricks overview lunch-and-learn presentation with IFMA Seattle
- Smart pumps and efficient HVAC webinar in partnership with Building Owners and Managers Association (BOMA) King County

In addition, BetterBricks continued to be a trusted, go-to source of information for target audiences, developing and distributing 20 pieces of original content supporting whole-building efficiency and/or integrated design. New content relevant to commercial building audiences in Puget Sound Energy's service territory include:

- Four BetterBricks-hosted webinars covering: 1) opportunities for connected lighting and cybersecurity, 2) the value of strategically sequencing building upgrades, 3) commercial building financing strategies, and 4) the present and future of commercial building energy codes.
- Three new videos, including one breaking down the key differences between Washington State Energy Code and very high efficiency DOAS.
- Five new case studies, including a LLLC case study located in Everett, Wash.
- 12 new articles, fact sheets and technical guides.

Integrated Design Labs (IDLs) – The IDLs work to transform the design, construction, and operation of commercial, institutional, and residential buildings to advance energy-efficient, high-performance, and healthy buildings in the Northwest. The University of Washington (UW) IDL in Seattle provides regional design teams access to the best building-performance knowledge available, while offering project-by-project support, education, and training on designing, constructing, and operating the healthiest, most productive, and energy-efficient buildings. As critical partners in consulting on and advocating for alliance programs, the alliance provides annual base funding to support each IDL. The UW IDL regularly connects Puget Sound Energy's commercial building efficiency programs with design professionals to build understanding and knowledge about Puget Sound Energy efficiency programs and opportunities for participation. Additionally, to effectively support the market in engaging with Puget Sound Energy, the UW IDL connects projects that are in early design phases with Puget Sound Energy incentive programs and delivers those project leads and other energy efficiency opportunities to Puget Sound Energy, as they arise.

Strategic Energy Management (SEM) – SEM was a specially funded program from 2020-2024 that developed, maintained, and delivered a holistic set of tools to support funders, including Puget Sound Energy, in delivering strategic energy management to their customers. These tools included the SEMHub.com website and its contents, a learning management system platform, support of the Northwest SEM Collaborative, and an annual regional SEM Fall Workshop. In 2024, the SEM program ended, and NEEA transitioned these assets to market partners. Going forward, program assets will continue via the North American SEM Collaborative, Lawrence Berkeley National Laboratory, and BetterBricks.com.

CODES AND STANDARDS

In 2024, NEEA continued to support the development and successful implementation of building energy codes, appliance and equipment standards, and test procedures to materially improve efficiency outcomes and ensure that the needs of Northwest customers, including those in Puget Sound Energy service territory, are considered in code development and the federal standards rulemaking process.

Codes – NEEA's codes program provides ongoing training and technical assistance to help prepare the market for current and upcoming commercial and residential WSEC. In 2024, the alliance delivered 16 in-person and 19 online trainings about the requirements in the recently adopted 2021 WSEC, serving more than 3,400 attendees. The program also offered 12 on-demand trainings and videos, about meeting certain provisions within the Washington state residential energy code, which were viewed more than 2,100 times throughout the year. An additional 19 on-demand trainings and videos, offered through the alliance's BetterBuiltNW website, related to residential new construction best practices and techniques for building homes that are more comfortable and affordable to power / operate and exceed code, were viewed a total of 2,880 times. The alliance launched the 2021 WSEC edition of its commercial code compliance tool in March 2024 when the 2021 WSEC went into effect. This tool helps builders and engineers verify their building design's compliance with code. Additionally, the program continued to support offering technical assistance for the Total System Performance Ratio (TSPR) analysis tool used to calculate the TSPR for Washington state's performance-based energy code compliance path for HVAC systems.

Standards – In 2024, NEEA staff collaborated with partners to submit 12 comment letters in strategic response to U.S. DOE Requests for Information (RFI) and Notices of Proposed Rulemaking (NOPR). NEEA's comments included regional sales data, lab testing results, field validation data and other technical data to support data-driven recommendations for enhanced test procedures and improved efficiency levels that ensure Northwest needs are considered.

MARKET INTELLIGENCE

NEEA's Market Intelligence strategy is delivered by the Analytics, Research and Evaluation Division, which is composed of three distinct functions: Market Research and Evaluation; Data, Planning and Analytics; and Energy-use Studies.

Market Research and Evaluation – This function provides actionable insights for alliance Market Transformation programs throughout their lifecycles and conducts formal evaluations of programs in market development. These research and evaluation efforts provide market intelligence and data and analytical services for the benefit of Puget Sound Energy customers. In 2024, the alliance launched or completed nearly 40 market research or evaluation studies to support both electric and natural gas

opportunities for energy efficiency in the residential, commercial and industrial sectors. Highlighted examples include findings from a commercial building decision-maker study indicating that low commercial occupancy rates are driving commercial property owners to put more resources into attracting and retaining tenants, potentially through marketing or placards within buildings highlighting energy efficiency upgrades. In an ongoing study of connected consumer products in residential homes, eight out of 10 consumers across the Northwest would be open to providing data through connected appliances to their utility to learn more about how they might save energy.

Stock Assessments – In 2024, NEEA published the final report and data for the 2022 Residential Building Stock Assessment, a comprehensive study of single-family and multi-family building characteristics and energy use in the region. In parallel, NEEA staff launched the 2025 Commercial Building Stock Assessment to collect, analyze, and publish building characteristic and energy usage data for commercial buildings and multifamily buildings in the Northwest. NEEA also began designing a new regional study that will collect characteristics on motor-driven systems named the Motor-System Stock Assessment. Puget Sound Energy staff participate in workgroups for each of these studies' decision-making processes. The results of these stock assessments inform NEEA's portfolio development and are shared with utilities and regional stakeholders to inform long-term power and resource planning, such as the Northwest Power and Conservation Council's five-year Power Plan as well as utility conservation potential assessments and integrated resource plans.

SPECIAL PROJECTS

NEEA's special projects are funded separately from the core business plan. These projects align with the alliance's strategic goals, while also delivering a primary benefit other than energy efficiency and/or needs that are not shared across the region. In 2024, there were two special projects: End Use Load Flexibility and Northwest End Use Load Research.

End Use Load Flexibility (EULF) – This project aims to improve the connectivity, and controllability of end-use devices leveraging NEEA's existing market relationships, product development expertise, research and analytics capabilities and role as a regional convenor. With this project, NEEA is catalyzing innovation and Market Transformation towards a more flexible and reliable energy system. The near-term goal is to expedite the integration of features that enable end-use load flexibility and gain insight into related opportunities. Although the initial focus will be on residential end-use technologies, future activities may extend to commercial, non-residential end-use applications.

In 2024, NEEA convened a steering committee, chaired by a Puget Sound Energy representative, to share information and best practices aligning collective end-use load flexibility priorities. This facilitated connection will enable the region to move the market forward faster and more cost-effectively than any one organization can do alone. NEEA led monthly meetings with the Steering Committee throughout the year to determine vision and goals, inform field study priorities and design (including support for the Line Voltage Thermostat field study in Puget Sound Energy territory, leveraging Puget Sound Energy existing multifamily retrofit program and DERMs platform), and to grow the collective understanding of the national landscape for load flexibility programs and the attributes that drive successful results.

Northwest End Use Load Research (EULR) – The project continued collecting data for its Home Energy Metering Study (HEMS) and Commercial Energy Metering Study (CEMS) on select residential and commercial electric end uses. The end uses metered for the study include ductless heat pumps, ducted heat pumps, heat pump water heaters, central air conditioning, forced-air furnaces, and

baseboard heaters. One-minute-interval data is being collected by circuit for each participating residential and commercial building. As the largest end use load research project in the Northwest since the 1980s, this work will greatly support regional planning and program design. Puget Sound Energy is a contributing funder and collaborator as a part of the workgroup to direct the research, with its staff participating in technical advisory and oversight roles. In 2024, the study monitored and collected energy use data in one-minute and fifteen-minute intervals in 403 homes and 70 commercial buildings around the region. Data collection is continuing through the summer of 2025.

ACTIVITIES TO CONVENE AND COLLABORATE WITH THE REGION

Efficiency Exchange (EFX) – EFX is the region's largest energy efficiency conference, bringing together stakeholders from across the Northwest and beyond. In May 2024, EFX was held in Spokane, Wash., with 462 in-person and 60 virtual attendees. The conference covered a range of topics from innovative solutions to improve income-qualified energy programs, to strategies for unlocking the benefits of dual-fuel heat pumps, to new approaches for rural program delivery. More information about the conference, including details about Efficiency Exchange 2025, which is being held May 20-21, 2025, in Portland, Ore., can be found on neea.org.

ALLIANCE SUPPORT OF ADDITIONAL PUGET SOUND ENERGY POLICY GOALS

Puget Sound Energy's participation in the alliance supports the achievement of its CEIP goals. In 2024, alliance activities contributed to several CETA Category Indicator Metric Baseline Data (2020) Energy Benefits, including:

Non-energy Benefits – *Increase in quality and quantity of energy jobs*

The alliance provides energy efficiency training and education to a broad range of industry professionals to help them differentiate themselves from competitors and build the skills necessary to promote, install, and maintain energy-efficient products, including in the Puget Sound Area. Trade allies, building owners and other supply chain actors receive timely and informative information via NEEA's online platforms, BetterBricks and BetterBuiltNW. NEEA also partners with organizations in Washington state to provide technical assistance and training on the current and upcoming residential and commercial energy codes. Finally, NEEA supports a broad network of regional energy efficiency implementers, including some businesses that are based in the Puget Sound area, to support program implementation, research, and data-collection efforts.

Non-energy Benefits – *Improved home comfort*

Many of the products and practices that NEEA advances through its Market Transformation programs directly increase home comfort by improving indoor air quality, enhancing space heating, and cooling year-round, and contributing to a tighter building envelope.

Cost Reduction – *Improved energy affordability*

Energy efficiency reduces energy waste and can help improve energy affordability for Puget Sound Energy customers. NEEA's portfolio of Market Transformation programs includes electric, natural gas and dual-fuel cost-effective technologies, which both perform well and save energy compared to other products in the market. Where high costs present a barrier to the adoption of an energy-efficiency product, NEEA works with the supply chain to implement strategies to bring prices down over time.

NEEA also scans the market to identify and develop emerging technologies that could be more affordable than what is currently available on the market or address an unmet market need. For example, micro heat pumps are a DIY technology opportunity that could be a more efficient and affordable option for existing multifamily and single-family households.

Resilience – *Reduction in peak demand through demand response programs*

When timed right, energy efficiency programs can reduce demand on the energy system at times of peak load when the grid is most vulnerable. NEEA works with manufacturers to incorporate demand response capabilities into efficient products to support both energy efficiency and load management. In 2024, NEEA launched a two-year special project to explore market transformation opportunities to enhance the region's capacity to flexibly manage electric loads through connected end-use devices. Flexible end-use load resources can contribute to filling an expanding capacity gap by helping to shift/ shimmy/ reduce system peaks by allowing for more flexibility in load control. Puget Sound Energy is a participating funder of this effort, alongside nine other Northwest utilities and energy efficiency organizations.

Public Health – *Improved air quality and community health*

NEEA's work to advance emerging technologies and support building code adoption and compliance in Washington directly contributes to healthier buildings. New homes and buildings built to code maintain more stable indoor temperatures and are more affordable to cool, which helps prevent heat-related illnesses during the summer months. This is particularly important for vulnerable elderly populations and those with pre-existing health conditions. NEEA is also working to advance efficient technologies, like high-performance HVAC systems with heat recovery ventilation (HRV) and micro heat pumps that contribute to healthier existing buildings. HRV systems continuously replace stale indoor air with fresh outdoor air, reducing the concentration of indoor air pollutants and preventing the growth of mold and mildew, which is particularly beneficial for individuals with respiratory conditions or allergies. Micro heat pumps offer an alternative cooling option for multi-family buildings.

REGIONAL COORDINATION

Alliance programs are coordinated through regional workgroups and committees, whose membership includes representatives from Puget Sound Energy. NEEA staff is grateful for the time and energy Puget Sound Energy staff dedicates to participating in these forums and on NEEA's Board of Directors, with members including:

Board of Directors: Gilbert Archuleta

Regional Portfolio Advisory Committee: Jeff Tripp

Commercial & Industrial Coordinating Committee: Andrew Pultorak

Residential Coordinating Committee: William Dixon

Regional Emerging Technology Advisory Committee: Michelle Wildie

Natural Gas Advisory Committee: Michelle Wildie

Cost Effectiveness Advisory Committee: Kasey Curtis

Northwest End Use Load Research Steering Committee: Mark Lenssen

Northwest End Use Load Research Workgroup: Nick Gemperle, Michelle Wildie

Residential Building Stock Assessment Workgroup: Jesse Durst

Commercial Building Stock Assessment Workgroup: Kasey Curtis

Natural Gas Dual Fuel Product Workgroup: Michelle Wildie, Jesse Durst

Natural Gas Dual Fuel Measurement Workgroup: Michelle Wildie, Jesse Durst

Specially Funded Project Committees:

- **Whole Buildings**: Brian Zoeller
- **End Use Load Flexibility**: Tom Smith
- **Strategic Energy Management**: Courtney Shaw