



# Q4 2025 RETAC Meeting Notes

December 4, 2025

8:30 a.m. – 12:00 p.m. (Pacific)

Microsoft Teams Webinar

## Meeting Attendees

James White, Chelan PUD  
Robert Bogataj, City of Seattle  
Kenji Spielman, Energy Trust Oregon  
Todd Greenwell, Idaho Power  
Jonathan Heller, Ecotope  
Travis Reeder, Eugene Water & Electric Board  
Ramin, Faramarzi, National Lab of the Rockies

Dr. Jason Woods, National Lab of the Rockies  
Brittney Breen, Energy Trust Oregon  
Keshmira McVey, Bonneville Power  
Ammi Amarnath, EPRI  
Ritika Kumbharkar, MN CEE  
Matt Iris, Avista

NEEA Staff: Lynne Mosley, Adam Gage, Noe Contreras, Mike Smith, Chuck Karras, Mark Rehley, Wendy Preiser, Kristen Aramthanapon, Eric Olson, Alisyn Maggiora

## Meeting Agenda

<b>Welcome and Announcements</b>	Mark Rehley	NEEA
<b>Central Commercial Heat Pump Water Heaters Round Table</b>	Keshmira McVey Adam Gage	BPA NEEA
<b>Energy Trust Oregon Emerging Technology Update and Overview</b>	Kenji Spielman	ETO
<b>National Lab of the Rockies* Overview and Current Research Projects</b>	Ramin Faramarzi Dr. Jason Woods	NLR

\*Formerly National Renewable Energy Lab (NREL)

## Resources

- Agenda and Packet Materials: [Q4 2025 RETAC Agenda Packet - Northwest Energy Efficiency Alliance \(NEEA\)](#)
- Slide Deck: [Q4 2025 RETAC Meeting Slides - Northwest Energy Efficiency Alliance \(NEEA\)](#)
- Q4 2025 Emerging Technology Newsletter: [Q4 2025 Emerging Technology Newsletter - Northwest Energy Efficiency Alliance \(NEEA\)](#)

## Central Commercial HPWH Round Table

*Partially generated by AI.*

- **Central Commercial Heat Pump Water Heaters Regional Activities:** Adam led a discussion with Kashmira and committee members including Todd, Robert, Kenji, Kevin, Lauren, and Matt, focusing on current activities, barriers, and next steps for central commercial heat pump water heaters, with updates from NEEA and Bonneville Power Administration and input from regional utilities and stakeholders.
  - **NEEA Initiative Overview:** Adam explained that NEEA is in the concept development phase for central commercial heat pump water heaters, evaluating viability and consulting with regional stakeholders. NEEA has invested in field demonstrations and developed resources such as the Advanced Water Heating Specification and a qualified products list, which are being adopted nationally by organizations like Energy Star and CEE.
  - **Bonneville Power Administration Implementation:** Kashmira described BPA's structured approach over the past decade, including opportunity assessments, specification adherence, demonstration projects, and energy savings measurement. BPA updated its implementation manual to permit central heat pump water heater systems in multifamily new construction and retrofits, opting for custom project protocols and integrating monitoring incentives.
  - **Utility and Stakeholder Feedback:** Committee members from Idaho Power, Seattle City Light, Avista, and others shared their experiences and challenges, such as cold climate performance, baseline determination for incentives, and the need for monitoring and commissioning. Robert highlighted issues with built-up systems and the importance of plumber education, while Todd and Lauren discussed market interest and demand response applications.
  - **Barriers and Future Directions:** Participants identified barriers including lack of standardized performance calculators, custom engineering challenges, code compliance, and market readiness. BPA and others are considering further pilots, enhanced monitoring, and collaboration with general contractors to expand adoption, with ongoing evaluation of program design and incentive structures.

## Energy Trust Oregon ET Update

*Partially generated by AI.*

- **Energy Trust of Oregon Technology Research and Program Updates:** Kenji presented an overview of Energy Trust of Oregon's evolving strategic priorities, recent research, and programmatic changes, with contributions from Brittney and Mark, highlighting efforts in equity, evaluation, and technology adoption, and discussing upcoming research and pilot programs.
  - **Strategic Planning and Equity Focus:** Kenji outlined Energy Trust's shift to multi-year strategic planning and increased emphasis on equity, aiming to reach historically excluded customer segments and support community resilience. The organization is tailoring innovative efforts to broaden engagement and address split incentives and trust gaps in underserved communities.
  - **Recent Evaluations and Research:** Kenji summarized recent studies including adjustable wattage lighting fixtures, residential thermostat billing analysis, greenhouse market

research, independent restaurant decision-making, and cannabis dehumidifier efficiency. These evaluations inform program design and highlight market trends, savings verification, and customer behavior insights.

- **Upcoming Research and Legislative Impacts:** Energy Trust is initiating research on the impact of Oregon's mercury ban on lighting products, with ongoing studies to assess compliance, market adaptation, and implications for program baselines. Additional research is planned for indoor agriculture lighting and school-specific exemptions, with findings expected to inform regional utilities.
- **Programmatic Innovations and Pilots:** Kenji described new and ongoing pilots, such as building performance standard support, residential heat pump advocacy, dual fuel system evaluation, prescriptive duct sealing, and expanded commercial midstream offerings. The organization is also enhancing partnerships with community-based organizations to improve program reach and effectiveness.

## National Lab of the Rockies (NLR)

*Partially generated by AI.*

- **National Renewable Energy Laboratory (National Lab of the Rockies) Overview and Research Projects:** Ramin and Jason provided a comprehensive overview of NREL's mission, facilities, modeling platforms, and current research projects, with interactive discussion from Mark, Lauren, Kenji, Adam, Noe, Ammi, and Todd, focusing on HVAC, refrigeration, and building technologies relevant to utility partners.
  - **Lab Mission and Capabilities:** Ramin explained NREL's history, recent name change, and its role in de-risking technologies for market adoption, emphasizing partnerships with utilities and industry. The lab's facilities include advanced research campuses, environmental chambers, and the Energy Systems Integration Facility, supporting applied research from TRL 4 to 7.
  - **Advanced Modeling and Stock Analysis:** NREL's modeling platforms, such as EnergyPlus, OpenStudio, Comstock, and Restock, enable large-scale impact analysis for utilities, supporting distributed energy resource planning, load forecasting, and policy development. Ramin illustrated territory-wide end-use analysis and the integration of high-performance computing for scenario modeling.
  - **Refrigeration Innovation Project:** Ramin detailed a DOE-funded project to redesign open vertical display cases in supermarkets, replacing air curtains with radiant cooling panels and integrating phase change thermal energy storage. The prototype aims to reduce energy consumption by 30%, improve load flexibility, and comply with food safety codes, with ongoing manufacturer collaboration and future field demonstration plans.
  - **Modular Cold Climate Heat Pump Development:** Jason described a modular residential heat pump system using R290 refrigerant and glycol loops to reduce installation costs, peak load, and improve comfort. The system incorporates thermal energy storage for load shifting and is progressing through prototype development with Copeland, targeting field demonstrations in 2028.
  - **Commercial Rooftop Unit Heat Pump Challenge:** Jason presented the HVAC Technology Challenge, collaborating with major manufacturers and building owners to develop cold climate rooftop unit heat pumps with improved capacity and efficiency at low temperatures. Seven units are currently installed for field validation, with results expected next summer and market launch anticipated in 2027.

- **DOE HVAC and Heat Pump Challenges:** Jason clarified the distinction between the older DOE RTU challenge focused on cooling and the current Cold Climate Heat Pump (now HVAC) Challenge, offering to connect interested participants with the appropriate contacts.
  - **Challenge Clarification:** Jason explained that the current DOE challenge is the Cold Climate Heat Pump Challenge, now referred to as the HVAC Challenge, and is distinct from the RTU challenge 10 years ago, which focused on cooling.
  - **Participant Engagement:** Jason offered to connect interested participants with the right people for more information about the current DOE HVAC Challenge.
- **Air-to-Water Heat Pump Project with Trane:** Jason described the collaborative project with Trane to develop a commercial air-to-water heat pump capable of delivering 180F water for hydronic space heating, discussing prototype status, performance targets, and field demonstration plans.
  - **Project Overview:** Jason outlined the project's goal to create a commercial air-to-water heat pump for hydronic space heating, targeting supply temperatures up to 180F to replace boilers, with Trane as the manufacturing partner.
  - **Technical Approach:** The system uses a cascade heat pump design with two refrigerant cycles and an intermediate heat exchanger, enabling high temperature lifts and maintaining a high coefficient of performance (COP) even at low ambient temperatures.
  - **Economic Analysis:** Jason presented an analysis comparing electric and gas rates across Oregon, Washington, Montana, and Idaho, noting that electrification is most economically favorable in Oregon and Washington due to higher gas and lower electric rates.
  - **Prototype and Demonstration Plans:** Trane has built an initial prototype and is testing it in the lab, with plans to continue testing for a second-generation design in 2026 and to pursue field demonstrations in the following winters.
- **DC Backbone HVAC Nano Grid Hub Project:** Ramin introduced a new project funded by the California Commission and DOE to develop a DC backbone HVAC nano grid hub system with integrated PV and energy storage, aiming to improve efficiency and resiliency, with Trane as a partner.
  - **Project Description:** Ramin described the DC backbone HVAC nano grid hub system, which powers an RTU system entirely on DC, integrates onsite PV and energy storage, and aims to enhance energy efficiency by reducing AC/DC conversion losses.
  - **Project Phases:** The project consists of three phases: fabricating a proof of concept at Trane, evaluating performance at NREL HVAC labs, and modeling the large-scale impact in California using EnergyPlus.
  - **System Integration:** Ramin confirmed that the hub includes all components within the defined control volume, all powered by a DC bus, and integrates battery, PV, and thermal energy storage.
  - **Power Source and Conversion:** In response to Noe's question, Ramin clarified that the system is energized from the grid, converted to DC, and then distributed to all RTU components via the DC bus.
- **Dedicated Outdoor Air System (DOAS) Heat Pump Development:** Jason presented the development of a heat pump-driven DOAS targeting significant energy cost reductions and load shifting, with plans for prototype fabrication and field demonstrations, and addressed questions about heat recovery and system design.
  - **System Function and Market Need:** Jason explained that DOAS units provide heating and cooling to ventilation air, which constitutes the majority of heating load in cold climates, but current market options are mainly gas-heated and lack grid interactivity.
  - **Technical Design:** The proposed system uses a vapor compression cycle to heat antifreeze solution to high temperatures, stores it in a tank, and delivers heat to the building, enabling energy-dense storage and efficient operation at low ambient temperatures.
  - **Performance Targets:** The project aims for a 50% reduction in energy costs compared to current DOAS units and provides two to six hours of load shifting via integrated thermal storage, with operation down to -30°C.

- **Heat Recovery Considerations:** In response to Mark's question, Jason clarified that the design assumes no heat recovery in the ventilation air, as is typical for many retail applications like Walmart and Target, but acknowledged that energy recovery could be used in other building types.
- **Prototype and Demonstration Plans:** Jason shared that Blue Frontier, a startup partner, will fabricate a proof-of-concept prototype next year, with testing and field demonstration opportunities targeted for 2027–2028.
- **Opportunities for Stakeholder Engagement and Collaboration:** Jason and Ramin discussed ongoing and future opportunities for stakeholders to engage with their research projects, including regular updates, feedback mechanisms, and potential partnerships with utilities and industry members.
  - **Engagement Mechanisms:** Jason suggested periodic phone calls for interested parties to stay updated and provide feedback on project impacts to the electric grid and utilities. Jason will be providing updates to research like window heat pumps when the report is available.
  - **Collaboration Structure:** Ramin explained that there are many ongoing research projects and expressed openness to more regular touchpoints, sharing project lists, and receiving feedback from utility members to align research with industry challenges.
  - **Next Steps:** Mark committed to scheduling follow-up discussions to explore collaboration opportunities and connect with the rest of the committee.
  - **Industry Involvement:** Todd expressed interest in involving commercial colleagues in DOAS-related work and learning more about NREL's research outcomes to support technology proliferation.
  -

## Follow-up tasks:

- **Dairy Heat Pump Field Studies Collaboration:** Coordinate with Avista and Idaho Power to discuss potential pilots and collaboration opportunities for central heat pump water heater demonstrations in dairy operations. (Keshmira)
- **Small Commercial Heat Pump Water Heater Testing Results Sharing:** Follow up with the project lead to determine if the test results for the small commercial heat pump water heaters (e.g., gradient window unit) can be shared with interested utilities and provide access if possible. (Jason)
- **Ongoing Engagement and Feedback Mechanism:** Schedule a follow-up meeting to discuss regular engagement and feedback opportunities between the committee and Ramin and Jason's team, including sharing the overall list of building-related research projects and exploring partnership opportunities. (Mark)
- **DOAS Collaboration Opportunity:** Connect Todd's commercial team with Ramin and Jason to explore potential involvement in DOAS-related work at NREL and share relevant experiences and interests. (Todd, Mark)