



Q3 2026 RETAC Meeting Notes

September 30, 2026

8:30 a.m. – 12:00 p.m. (Pacific)

Microsoft Teams Webinar

Meeting Attendees

Matt Iris, Avista
Keshmira Engineer, Bonneville Power
Administration (BPA)
Jon Heller, Ecotope
Kenji Spielman, Energy Trust Oregon (ETO)
Todd Greenwell, Idaho Power
Quentin Nesbitt, Idaho Power
Edward Louie, Pacific Northwest National
Laboratory (PNNL)

Lauren Kerr, Portland General Electric (PGE)
Andrew Pultorak, Puget Sound Energy
Amit Singh, Puget Sound Energy
Michelle Wildie, Puget Sound Energy
Robert Bogataj, Seattle City Light
Ammi Amarnath, Electric Power Research
Institute (EPRI)

NEEA Staff: Juan Carlos Blacker, Christopher Dymond, Adam Gage, Chuck Karras, Alisyn Maggiora, Lynne Mosley, Eric Olson, Wendy Preiser, Mark Rehley, Mike Smith, Becky Walker, Sarah Widder, John Wilson

Meeting Agenda

Welcome and Announcements	Mark Rehley	NEEA
ACEEE Summer Study Recap	Mike Smith, Sarah Widder, Juan Carlos Blacker, Eric Olson, Christopher Dymond	NEEA
Round Robin	All	
Seattle City Light	Robert Bogataj	SCL
Bonneville Power Administration	Keshmira Engineer	BPA

Resources

- Agenda and Packet Materials: [Q3 2026 RETAC Agenda Packet - Northwest Energy Efficiency Alliance \(NEEA\)](#)
- Slide Deck: [Q3 2026 RETAC Meeting Slides - Northwest Energy Efficiency Alliance \(NEEA\)](#)
- Q3 2026 Emerging Technology Newsletter: [Q3 2026 Emerging Technology Newsletter - Northwest Energy Efficiency Alliance \(NEEA\)](#)

Executive Summary

The meeting focused on key takeaways from the ACEEE Summer Study, regional utility initiatives, emerging technology opportunities, and ongoing research in electrification, flexibility, and demand management. Major themes included data center growth and flexibility, heat pump advancements, water heater demand response, commercial building efficiency, and emerging technology development.

Key Highlights

1. ACEEE Summer Study Insights

Presenters shared findings across several high-interest areas:

- **Data Centers:** Rapid growth is expected, but forecasts vary significantly. Utilities are concerned about overestimating future demand and potentially investing in infrastructure that may not be fully utilized. New approaches such as demand guarantees and minimum-use contracts are being explored.
- **Data Center Flexibility:** Emerging technologies are demonstrating the ability to temporarily reduce computing loads to support grid reliability. Discussions included battery storage options and the importance of accounting for emissions from backup generation.
- **Building Efficiency & Codes:** Growing attention is being paid to heat pumps, building performance standards, and strategies that combine efficiency, electrification, and market transformation.
- **Commercial Buildings:** AI, advanced metering analytics, building controls, digital twins, and automated commissioning are increasingly viewed as important tools for improving energy savings.
- **Load Flexibility:** Industry research continues to focus on integrating energy efficiency and load flexibility into cost-effectiveness frameworks while improving interoperability among distributed energy resources.
- **Heat Pumps:** Heat pumps remained a dominant conference topic, with significant interest in room heat pumps, dual-fuel systems, and AI-supported program delivery.

2. Water Heater Flexibility Research

Eric presented results from NEEA's laboratory and field studies:

- Water heaters demonstrated strong load-shifting capability, with fleet demand reductions of nearly 50% during curtailment events.
- However, major issues were identified with:
 - Device reporting accuracy
 - Energy-use calculations
 - Control-system conformance
 - Event-duration tracking
- Some products failed to participate consistently because they lacked onboard clocks, causing repeated interpretation of events as occurring on the same day.
- Findings suggest a need for stronger manufacturer requirements and clearer industry standards around demand-response functionality.

3. Regional Utility Program Updates

Utilities across the Northwest reported active pilots and program development efforts, including:

- Heat pump optimization programs
- Residential pay-for-performance initiatives
- Small-business electrification pilots
- Room heat pump deployment strategies
- Lighting controls integrated with HVAC systems
- Demand-management programs
- AI-assisted energy assessments

A notable development was the expected arrival of **Type 3 room heat pumps** in retail channels next year at prices below \$1,000, potentially creating a scalable solution for replacing electric resistance heat.

4. Data Center Demand Response Demonstrations

Puget Sound Energy, EPRI, NVIDIA, Emerald AI, and a data center customer completed a successful demonstration showing that computing loads can be flexed to support the electric grid.

Next steps include evaluating a larger-scale demonstration and potentially bringing Emerald AI to present findings at a future product council.

5. Bonneville Emerging Technology Portfolio

Bonneville requested feedback on its draft portfolio and described a process that moves technologies through:

1. Feasibility assessment
2. Performance evaluation
3. Pilot testing
4. Program implementation

Key areas of interest include:

- Advanced water heating
- Agricultural applications
- Industrial process electrification
- Space conditioning technologies
- Measurement and verification tools

Specific discussion topics included:

- Dairy heat recovery systems
- Central heat pump water heating
- Load-shifting water-heating technologies
- Improved product qualification criteria
- Regional coordination on technology deployment

6. Seattle City Light Updates

Seattle City Light provided updates on:

- Demand response programs
- Time-of-use rates
- Electrification efforts
- Distributed energy resources (DER)
- Commercial efficiency incentives

Notable items included:

- A 29 MW demand-response target.
- Expansion of room-heat-pump incentives.
- Ongoing electrification support through the Lab at City Light.
- A reminder that incentives for fluorescent-to-LED replacement projects will end in 2029 under upcoming funding restrictions.

7. Commercial Heat Pump Research

PNNL research found that thermostat controls can significantly affect heat-pump performance:

- Third-party thermostats may reduce inverter heat pumps to behavior similar to single-stage systems.
- OEM communicating controls can improve efficiency but may unintentionally increase demand during late-afternoon peak periods.
- Additional winter, dual-fuel, and thermostat-comparison testing is planned.

Key Strategic Themes

Across all discussions, several recurring themes emerged:

- Growing need for **electrical load flexibility** as electrification expands.
- Increasing use of **AI and advanced controls** to improve efficiency and grid responsiveness.
- Continued market momentum for **heat pumps**, especially room heat pumps and commercial applications.

- Strong interest in improving **measurement, verification, and interoperability standards**.
- Greater coordination among utilities, regulators, manufacturers, and researchers to accelerate adoption of emerging technologies.

Action Items

Action	Owner
Provide feedback on Bonneville's emerging technology portfolio	Meeting participants
Coordinate regional work on central heat pump water-heating baselines and specifications	Keshmira
Verify and report central HPWH project activity in Energy Trust territory	Kenji
Evaluate larger Emerald AI demonstration and presentation opportunity	Lauren Kerr, Mike
Arrange presentation on EPRI industrial heat-pump facility	Ammi
Share multi-head mini-split research and guidance	Christopher Dymond, Edward
Encourage junior staff participation in future ACEEE Summer Studies	Meeting participants

End of Summary

Continue for full recap below

Full Recap:

- **ACEEE Summer Study Learnings:** Mike, Sarah, Juan Carlos, Eric, and Christopher shared ACEEE Summer Study findings spanning data-center growth, heat pumps, building performance standards, AI-enabled efficiency, load flexibility, and emerging technologies.
 - **Data Center Growth:** Mike reported that data-center siting is driven by speed to compute, fiber proximity, power availability, water rights, and community acceptance. Forecasts for incremental data-center load by 2030 varied widely, with roughly 50 GW as a commonly cited estimate and projections as high as 166 GW. Utilities are concerned that approved interconnection capacity may not materialize, creating stranded-asset risk; proposed responses included minimum-demand billing or contracts requiring developers to guarantee a portion of requested demand.
 - **Data Center Flexibility:** Mike described emerging work on chip-level flexibility, including an Emerald AI demonstration that reportedly flexed approximately 96 MW of computing power. Edward asked about batteries to buffer rapid load changes and about the duration of flexibility needed by the grid. Mike connected these questions to EPRI's DC Flex initiative and cited iron-oxide batteries as a possible alternative to gas turbines, while noting that flexibility rules should account for emissions when on-site generation is used.
 - **Building Efficiency and Policy:** Sarah highlighted extensive heat-pump research, including commercial HVAC studies evaluating cost-effectiveness and retrofitability, duct-leakage research, and lab-home work. She also noted growing emphasis on pragmatic programs that combine value streams and engage different market actors. Key open areas included the relationship between building codes and building-performance standards, coverage of small commercial buildings below typical 20,000-square-foot thresholds, and how codes, utility programs, and market-transformation efforts should work together in leading and lagging policy environments.
 - **Commercial Building Programs:** Juan Carlos described strong ACEEE interest in building-performance standards, including implementation, enforcement, compliance assistance, and utility DSM program roles. He also identified contractor financial exposure in midstream and custom programs as a barrier, and discussed AI, AMI analytics, building-management-system controls, automated commissioning, fault detection, demand response, and digital twins as tools for targeting commercial-building savings.
 - **Load Flexibility Research:** Eric reported that ACEEE sessions examined combining energy-efficiency and load-flexibility benefits in a single cost-effectiveness framework, scaling flexibility through variable-speed heat pumps, dual-fuel systems, smart panels, batteries, and interoperable controls. He noted concerns about proprietary APIs and aggregator claims, along with efforts by national laboratories to develop utility procurement templates for DERMS and related providers.
 - **Heat Pump Market Developments:** Christopher reported that heat pumps dominated the conference, with ongoing work on room heat pumps, thermostat requirements, electrification versus efficiency objectives, dual-fuel systems, triple-function heat pumps, and AI-assisted bid review. The Room Heat Pump Collaborative is being supported by CalMTA, NEEA, NYSERDA, and CEE to expand small heat pumps that can displace resistance heating.

- **Water Heater Flexibility and Conformance:** Eric presented NEEA's laboratory and field research with Portland State University and SkyCentrics, showing substantial water-heater flexibility but also major reporting and control-conformance issues that affect grid planning and utility programs.
 - **Laboratory Findings:** Eric explained that present energy take is difficult to estimate consistently in both heat-pump and electric-resistance water heaters. Testing found reporting resolutions ranging from approximately 1 Wh to 75 Wh and energy-take errors from 41% to 337%, creating uncertainty for planners seeking to load or shed water-heater capacity.
 - **Field Flexibility Results:** In an uncontrolled field study of more than 100 water heaters across Oregon and Washington, fleet consumption fell 49% during curtailment events: approximately 45% for electric-resistance units and 51% for heat-pump units. Units heated water less than 3% of the time during events, participation exceeded 95%, and average shifted power was about 930 W per resistance unit and 1.1 kW per heat-pump unit; Eric cautioned that equipment and home characteristics were uncontrolled.
 - **Clock And Safeguard Issue:** Some water heaters stopped responding after reaching their programmed event limit because they lacked an internal clock and repeatedly interpreted requests as occurring on the same day. SkyCentrics mitigated the issue by sending updated date and time information daily. Eric identified onboard clocks as an important manufacturer requirement for continued event participation.
 - **Standards And Guidance:** Eric distinguished compliance—whether a unit says it can perform a requested action—from conformance—whether it performs that action as expected. Field and laboratory testing found inaccurate power values, inconsistent total-capacity reporting, insufficient separation between ordinary shed and critical-peak responses, and present-energy-take values that did not reach zero after charging. AHRI 1430 provides a starting point but does not define reporting accuracy; NEEA can use the collected data to develop manufacturer guardrails without preventing product innovation.
- **Regional Utility Program Updates:** Andrew, Amitpal, Kenji, Todd, Lauren, and Ammi described pilots and initiatives involving heat-pump optimization, room heat pumps, lighting controls, data-center flexibility, AI tools, agricultural efficiency, and industrial heat pumps.
 - **Residential And Small-Business Pilots:** Andrew reported that Puget Sound Energy is launching a residential pay-for-performance pilot in which customers receive the standard rebate and contractors receive a performance-based incentive for improved heat-pump settings. PSE is also examining multifamily and small- and medium-business electrification challenges, affordability, and a NEEA pilot connecting lighting-level controls with thermostats to achieve additional setback savings.
 - **Residential Program Development:** Amitpal reported that PSC is considering a small- and medium-business heat-pump-optimization pilot, evaluating savings from its in-home energy-assessment program launched in May, and exploring room heat-pump offerings. PSC is using BPA's implementation manual as a guide while examining product availability, customer purchase channels, and whether its online marketplace could support deployment.
 - **Room Heat Pump Availability:** Christopher stated that two Type 3 room heat-pump products are expected in retail channels next year for under \$1,000, with approximately 9,000 Btu capacity and operation down to around 10°F. He explained that Type 3 products are expected to provide a practical market option for replacing resistance heat, while

deployment experience from multifamily projects showed that scheduling and customer support require a high-touch, white-glove process.

- **Utility Efficiency Initiatives:** Kenji described work on a horticultural-lighting calculator, a broader midstream program, targeted load-management work with Northwest Natural in the McMinnville and Dallas areas, and lighting-level-control/HVAC integration. Todd reported preparation for NEEA's 2027 field study of ducted heat-pump installations, investigation of smart diesel-engine block-heater controls, exploration of HomeBoost's AI-assisted home assessment, and possible expansion of bring-your-own-thermostat flexibility for central air conditioners.
- **Diesel Block Heater Measure:** Todd explained that the Power Badger controller monitors outdoor temperature and activates diesel-engine block heaters only long enough before departure to enable a cold start, instead of operating overnight. He cited RTF-estimated savings of roughly 1,000–5,000 kWh and confirmed that Idaho Power already has a related commercial measure while considering residential applications for diesel pickup trucks and cars. Todd emphasized that the control uses manufacturer-appropriate timing rather than continuous heating.
- **Industrial And Large Loads:** Ammi reported that EPRI's industrial heat-pump test facility near Atlanta has been commissioned in partnership with Southern Company and Georgia Power and can test systems up to approximately 2 MW. The facility will prioritize equipment with U.S. market applicability, including modular systems from roughly 30 kW to 2 MW, while also supporting research on seaport, airport, and data-center electrification.
- **Data Center Demonstration:** Lauren reported that Puget Sound Energy, EPRI, NVIDIA, Emerald AI, and a data-center customer completed a successful kilowatt-scale demonstration of chip-level demand response over several days. PSE is considering a larger follow-on demonstration, but the scope and internal decision to proceed remain under development. Lauren agreed to explore whether Emerald AI could present its work at a product council.
- **Bonneville Emerging Technology Portfolio:** Keshmira outlined Bonneville's draft emerging-technology portfolio and requested regional feedback on water heating, agricultural applications, space conditioning, industrial processes, and tools that could move technologies from feasibility through pilots and utility measures.
 - **Portfolio Stage Gates:** Keshmira described a technology-innovation framework that begins with feasibility, including building-code, electrical, and resource-profile checks, followed by performance mapping and pilot testing. The objective is to validate customer-serving approaches and energy-savings potential before technologies move into program implementation; most portfolio items are currently in early stages.
 - **Dairy Heat Recovery:** Bonneville is evaluating heat-pump and CO₂-based technologies for dairy and food-processing applications. A prior Webb Dairy demonstration used a standard heat-pump water heater to recover heat from groundwater and eliminate propane use. Proposed work would recover waste heat created when milk is cooled and use it for sanitation rinsing and other domestic hot-water needs, reducing expensive propane consumption for rural farms.
 - **Commercial Water Heating Baseline:** Keshmira proposed regional collaboration to establish a market baseline for central heat-pump water heaters, potentially using a baseline around 1.2 without onboard measurement and verification. She attributed

underperformance in many installations primarily to design and installation practices rather than product defects, and suggested that a baseline measure could help the RTF and utilities support better-performing systems.

- **QPL And Flexibility Criteria:** Keshmira suggested tiering advanced water-heating specifications so that products with onboard measurement and verification or load-shifting capability receive additional recognition or credit in the qualified-products list. She also discussed reducing onboard-M&V costs through integration with UCM modules and using manufacturer configuration diagrams to improve installation consistency.
- **System Configurations:** Bonneville is evaluating central water-heating configurations including swing tanks that separate recirculation and primary hot-water loads, return-to-primary designs that reduce equipment and maintenance costs, and unpressurized storage. CO2 systems can lose coefficient of performance when return water reduces the temperature lift, which is one reason separate-load configurations were initially studied.
- **Regional Coordination:** Kenji said dairy and water-heating work could be valuable if Bonneville identifies repeatable savings without extensive site-specific intervention. Kashmira noted that Idaho has a large dairy sector and that distributors report many central water-heating products being sold across the region even though utility reporting systems show few or no projects. Kenji agreed to compare the distributor information with program staff and follow up by email.
- **Seattle City Light Programs:** Robert described Seattle City Light's demand-response, time-of-use, efficiency-incentive, electrification, webinar, and distributed-energy-resource activities, including updates to the former Lighting Design Lab.
 - **Demand Response and Rates:** Seattle City Light has a three-year target of approximately 29 MW but currently has limited demand response, with two large industrial customers participating in a day-ahead program by scheduling maintenance during response days. Residential and small-commercial time-of-use rates are opt-in, with evening peak periods and low overnight rates that Robert identified as particularly applicable to EV charging.
 - **Lab At City Light:** Robert clarified that the physical Lighting Design Lab facility ended several years ago and that the organization is now officially called the Lab at City Light. Its focus has shifted from mature lighting technology toward electrification, heat pumps, and efficiency. Robert also curates a professional webinar series, generally targeting architects, designers, contractors, large customers, schools, ports, and engineering firms; recordings are posted to YouTube about a week after each event.
 - **Commercial Incentives:** City Light offers new construction incentives based on design-stage modeling and selectable incentive packages, along with commercial retrofit, distributor-discount, custom, and strategic-energy-management programs. Eligible technologies include heat pumps, lighting, variable-frequency drives, induction cooking equipment, efficient laboratory refrigeration, and other measures for which energy savings can be demonstrated.
 - **Codes And Electrification:** Robert noted that Seattle code requires new motors of roughly 5 horsepower and above to use variable-frequency drives and requires new restaurants that retain gas cooking to include electrical infrastructure for future conversion. Seattle's building-emissions performance standards are also intended to reduce gas use over time.

- **Heat Pump Incentives:** City Light is working to implement BPA's room-heat-pump incentive and expects increased incentives for regular residential heat pumps later in the year. Robert reported that Seattle's midstream data shows mini-splits dominate installations, while conversions to central ducted systems are less common. Washington law prevents City Light from using ratepayer funds to incentivize fuel switching from gas or oil, although the City of Seattle operates a separate oil-to-heat-pump program.
- **DER Handbook:** City Light released a distributed-energy-resource handbook covering requirements for projects of different sizes, including residential systems and projects up to approximately 100 kW. Robert recommended it as the primary reference for Seattle DER projects because it documents siting, metering, and acceptance requirements.
- **Lighting Funding Change:** Robert stated that beginning in 2029, City Light will no longer be able to fund LED replacements for fluorescent lamps, so customers seeking that incentive must complete qualifying replacements before the funding restriction takes effect.
- **Commercial Heat Pump Research:** Edward shared PNNL lab-home findings showing that thermostat choice and control strategy can materially change inverter heat-pump modulation, peak demand, and timing during summer cooling, with winter and dual-fuel testing still planned.
 - **Third-Party Thermostat Effects:** In PNNL lab-home testing, an inverter heat pump paired with a 24-volt third-party thermostat behaved much like a single-stage heat pump and lost most of its modulation capability. Although its shorter runtime partly offset the effect, its energy peaks were higher than those of the single-stage comparison system.
 - **OEM Control Behavior:** With its original communicating controller, the inverter unit prioritized energy savings so strongly that indoor temperature began drifting upward in the afternoon. The system then increased compressor output around 5 p.m. to recover, producing higher energy use than the single-stage system during the 5–6 p.m. period when the grid is often stressed.
 - **Next Research Steps:** PNNL plans to continue with winter testing, dual-fuel changeover analysis, and comparisons of OEM and third-party thermostats, including how accurately controls detect outdoor temperature and switch operating modes. A report will summarize the combined cooling- and heating-season findings.