Hot Air and Hot Water Forums

Hot Air Forum, March 24–25 | Hot Water Forum, March 25–26
Renaissance Phoenix Downtown Hotel. Phoenix, Arizona.

Monday, March 23 | Pre-Forum Events

5:00 pm	**First-Timers' Orientation**	**Meeting Level Foyer**

Whether you're joining us for the first time or returning for another year, we'd love to see you at our informal orientation!

If you're a first-timer, come learn how to make the most of your Forum experience. If you're a return attendee, come to refresh your knowledge and connect with fellow participants.

6:00 pm	**Dine-Around Networking Activity**

We are excited to introduce a new opportunity to connect with fellow attendees. We've made five reservations at restaurants within walking distance of the Renaissance Phoenix Downtown Hotel, each led by an ACEEE staff member. The sign-up sheet is available in conference mobile app.

Tuesday, March 24 | Hot Air Forum

7:00 am–7:00 pm **Registration** **Meeting Level Foyer**

7:30–8:15 am **Breakfast** **Pueblo**

8:20–8:50 am **Welcome and Introductions** **Grand Ballroom**

Join us for a warm welcome and a helpful overview of the program, so you know what to expect and can make the most of your time at the Forums.

ACEEE Welcome: Matt Malinowski, American Council for an Energy-Efficient Economy

Rheem Welcome: Joe Boros, Rheem

9:00–10:30 am **Concurrent Sessions**

1A. New Approaches to Tackling Heat Pump Barriers — Salon 1-2

High up-front costs are a barrier to heat pump adoption, and they loom even higher in the case of panel upgrades and ground-source (geothermal) heat pumps. Learn how power efficient design (PED) and geothermal leasing can eliminate these costs and help scale efficient heating.

Moderator: Matt Malinowski, American Council for an Energy-Efficient Economy

How Geothermal Leasing Helps Utilities Build Resilient Energy Grids Cost-Effectively & Future-Proof Energy Infrastructure
Brian Ferrarese, Dandelion Energy

Practical Applications of Power Efficient Design to Accelerate Building Electrification
William Harvey, Dunsky Energy + Climate Advisors

Efficiency Arizona - Rebates for Heat Pump Affordability
Joe Vollmar, Efficiency Arizona

1B. Reporting from the Field: Residential Dual-Fuel Heating Part I — Salon 3-4

This session brings together the latest real-world findings on innovative hybrid space-heating strategies for residential applications, with a special focus on economic performance. Explore the results from field demonstrations and studies that evaluate advanced dual-fuel systems, air-to-water heat pump installations, and the integration of low-carbon liquid fuels. Attendees will discover how modern heat pumps paired with gas furnaces, backup boilers, or renewable fuels can deliver significant energy, emissions, and cost savings while enhancing homeowner comfort. Join us for a comprehensive analysis of technology options, design considerations, and lessons learned to pave the way for affordable, efficient, and sustainable home heating solutions.

Moderator: Jason LaFleur, GTI Energy

Evaluating Advanced Dual-Fuel Heating Systems: Field Demonstration Results from Residential Applications
Ram Dharmarajan, GTI Energy

My Buddy the Backup Boiler: Dual Fuel and All-Electric Air-to-Water Heat Pump Installations in Wisconsin
Danice Ball, Slipstream

Renewable Liquid Fuels as a Low-Cost Option for Heating
Thomas Butcher, NORA

1C. Advancing Heat Pump Technology: New Horizons in Cold-Climate Applications - Part I — Salon 5-6

This session focuses on boosting heat pump performance in cold climates while minimizing reliance on supplemental heat. It includes a field demonstration of an affordable thermoelectric cascaded heat pump for residential space heating, emphasizing practical deployment and cost accessibility. It also highlights advances in tandem vapor-injection compressor technology to improve capacity and efficiency at low ambient temperatures.

Moderator: Bo Shen, Oak Ridge National Laboratory

Leveraging Cold-Climate Capabilities and Minimizing Supplemental Heat
Christopher Dymond, Northwest Energy Efficiency Alliance

Field Demonstration of an Affordable Thermoelectric Heat Pump for Residential Space Heating
Sreenidhi Krishnamoorthy, Electric Power Research Institute

Advancing Cold-Climate Heat Pump Performance through Tandem Vapor-Injection Compressor Technology
Yifeng Hu, Oak Ridge National Laboratory

1D. New Insights into Rooftop Unit Performance and Efficiency Opportunities — Salon 7-8

Efficient packaged rooftop unit (RTU) products present significant energy savings over the conventional RTU equipment combining an air conditioner and gas furnace, which are ubiquitous in the commercial sector. This session will present market transformation efforts in the Northwest and nationally from concept to analysis of commercial RTU HVAC efficiency measures' energy-savings potential across different climate zones and building types, to field demonstrations. Join us to discuss how stakeholders can drive significant advancements in RTU efficiency and achieve substantial energy and cost savings nationwide.

Moderator: Bjorn Jensen, Consortium for Energy Efficiency, Inc.

Advancing Efficient Rooftop Units in the Northwest: From Concept to Market Adoption
Rebecca Hovey, Energy 350

Minnesota Efficient RTU Field Study Results
Tobias Barth, Minnesota Center for Energy and Environment

Efficient RTU Modeling Energy Savings: National Modeling Research Results
Marcus Dimeo, Resource Innovations

RTU Performance Metrics Are Leaving Savings on the Table
Jason Jones, Northwest Energy Efficiency Alliance

10:30–11:00 am Networking Break — Meeting Level Foyer

11:00 am – 12:30 pm | Concurrent Sessions

2A. Data-Driven Strategies for Sizing and Installing High-Efficiency HVAC Systems — Salon 1-2

This session will examine how data-driven methods are improving the sizing and installation of high-efficiency HVAC systems to deliver better performance and efficiency outcomes. The session covers emerging research and field applications, including updated approaches to variable-speed heat pump sizing, the use of advanced diagnostics such as 3D scanning, Manual J, and metering, and the importance of validating workforce knowledge for fuel switching and dual fuel projects. Together, the presentations highlight how better data and tools are supporting scalable deployment of advanced technology heat pumps.

Moderator: Ashley Armstrong, Daikin

Optimizing Variable-Speed Heat Pump Sizing: Rethinking Standards for Performance and Efficiency
Hannah Hargrove, EPRI

I Can See Clearly Now, Using 3-D Scanning, Manual J, and Metering to Redesign Heat Pump Installations
Jake Jaskwhich, Ridgeline Energy Analytics

First Things First: Validating Assessor Knowledge for ccASHP Fuel Switching Projects
Amanda Hatherly, Building Performance Institute

2B. Reporting from the Field: Residential Dual-Fuel Heating Part II — Salon 3-4

This session will explore emerging tools, metrics, and market opportunities for improving the performance and adoption of dual fuel/hybrid heat pump systems. Presenters will discuss modeling results examining the potential for residential heat pumps to replace central air conditioning systems in the Northeast, including associated benefits, barriers, and pathways for accelerating adoption. In addition, presenters will introduce modeling and analysis evaluating Dual Fuel Utilization Efficiency (DFUE), a metric designed to evaluate the performance of dual-fuel heat pump systems under varying conditions. The session will also highlight the use of emulator controls for dual-fuel heat pumps, enabling testing and evaluation of control strategies across different operating conditions.

Moderator: Vivian Cox, CLASP

Are New Metrics for Dual Fuel Heat Pumps Picking Winners and Losers?
Meghan Sylvia, Frontier Energy

Developing an Emulator Control Platform for Dual Fuel HVAC Systems
Navin Kumar, Oak Ridge National Laboratory

One-Way to Two-Way ACs in the Northeast
Danice Ball, Slipstream
David Smedick, NEEP

2C. Advancing Heat Pump Technology: New Horizons in Cold-Climate Applications - Part II — Salon 5-6

This session will explore the implications of heating load calculations for installing heat pumps with existing duct systems as well as how dual-fuel control schemes can be optimized for operating costs or greenhouse gas emissions. This session will also describe a novel application of water-source heat pumps plus waste heat recovery in commercial boiler systems.

Moderator: Joanna Mauer, Appliance Standards Awareness Project

Cold-Climate ASHP Sizing – Estimating Loads and Matching Duct Capacity
Justin Margolies, Slipstream

Residential Dual-Fuel Forced Air Heating – Exploratory Impacts Analysis of Sizing and Controls
Ben Larson, Larson Energy Research

How to Achieve Over 105% Thermal Efficiency by Combining WSHP Technology with Gas-Fired Boilers
Simon Mandeville, Enervex

2D. Connected Commissioning: From Rooftops to Residences — Salon 7-8

Energy savings only come when heat pumps perform as rated—and that starts with proper setup. “Connected commissioning” uses app-based software to walk technicians through startup, ensuring every unit runs at peak efficiency. Hear case studies from commercial and residential projects showing how this technology can elevate a novice installer to journeyman-level performance.

Moderator: Rick Olson-Huddle, Resource Innovations/CalMTA

Presenters:

- Rick Olson-Huddle, Resource Innovations/CalMTA
- Christopher Dymond, Northwest Energy Efficiency Alliance
- Jeff Stewart, Trane Techonologies
- Rick Kloeppner, Trane Techonologies

12:30–1:30 pm — Networking Lunch — Pueblo

1:30–3:00 pm — Concurrent Sessions

3A. Fitting the Space: Advances and Challenges in Room and Micro Heat Pump Deployment — Salon 1-2

This panel will examine how portable, window, and micro heat pump technologies are evolving to better fit real-world buildings and climates, and where key gaps remain. Speakers will share findings on window form-factor mismatches, cold- and moderate-climate performance, and emerging options for apartments, hotels, and other space-constrained buildings. The discussion will highlight implications for product development, field performance, and utility program design.

Moderator: Max Reichlin, Clean Power Research

Addressing Window Barriers to Room Heat Pumps
Alex Wurzel, CalMTA

Insights on Micro Heat Pumps Performance Metrics Via Laboratory Tests
Aniruddh Roy, Energy Solutions

Installed Performance of New Form Factor Heat Pumps in Cold-Climate Multifamily Buildings
Ben Schoenbauer, Center for Energy and Environment

3B. Peak Performance: Flexing Loads and Pumping Up Comfort in an Electrified Future — Salon 3-4

Load flexibility is quickly becoming the new energy efficiency as utilities seek means of better predicting, controlling, and matching the flow of energy through their transmission and distribution networks. As heat pump adoption rates expand and provide high-performance heating and cooling resources for end-customers, they also can become valuable utility resources for load flexibility. This session assesses the opportunities and dynamics of demand response and load flexibility enabled from heat pumps.

Moderator: Matt Christie, TRC Companies

Residential HVAC Demand Flexibility Opportunities in Cold Climates
Rabi Vandergon, Center for Energy and Environment

Comparing Available Demand Response Strategies for Residential Variable-Speed and Single-Speed Heat Pumps
Ashley Armstrong, Daikin

Unlocking Efficiency and DR Potential of Residential Dual Fuel Systems: Lessons from a Northwest Pilot
Barend Dronkers, Energy 350

3C. Affordability through Innovation in Financing and Program Design — Salon 5-6

Moderator: Jenny Frank, SUNY College of Environmental Science & Forestry

Pulling the Levers to Reduce Residential Heat Pump Costs
Matt Malinowski, American Council for an Energy-Efficient Economy

Aligning Grid and Customer Benefits of Ground-Source Heat Pumps in Cold Climates
Iain Kerr, Dunsky Energy + Climate Advisors

Harnessing Grid Value and Operational Savings to Drive Heat Pump Access and System Affordability
Matt Flaherty, Clean Energy Works

3D. Refrigerant Landscape Overview: State of the Alternatives, Low-GWP Market Readiness, and Rollbacks? — Salon 7-8

Refrigerants are the key to making all heat pumps work. The landscape of current choices and new alternatives is constantly evolving. Come learn about next-generation alternatives, how they are coming to market in new appliances, and recent regulatory action by the EPA.

Moderator: Ben Larson, Larson Energy Research

Hot Water, Cool Air, Cleaner Future: Demystifying Next-Generation Refrigerants for HVAC and Water Heating
William Goetzler, Guidehouse

Aligning Markets and Mandates: Low-GWP Readiness in Heat Pump Technologies
Ellen Steiner, Opinion Dynamics

Rolling Back the Low-GWP Refrigerants Tide
Rachel Murray, DNV Energy Insights USA, Inc

3:00–3:30 pm **Networking Break** — **Meeting Level Foyer**

3:30–5:00 pm Concurrent Workshops & Breakout Session

Workshops (4A, 4B, 4C, 4E) are open to Hot Air and Hot Water Participants.

4A. Midstream in Motion: A Supply-Chain Problem-Solving Workshop — Salon 1-2

This interactive workshop brings implementers, OEMs, and distributors together to solve the toughest challenges in midstream program delivery. Through facilitated small-group discussions—not panels—participants will help develop practical, real-world solutions they can apply immediately. Attendees leave with clear actions, shared priorities, and new supply-chain connections to strengthen and scale their programs.

Moderator: Paul Campbell, ICF International, Inc.

Facilitators: Matt Baker, Daikin
Donald Becker, ICF
Kevin Clark, Bradford White
Kevin DeMaster, LG Electronics
Andrew Erdos, Ferguson
Lacy Estes-Hill, Rheem
Roch Naleway, A.O. Smith

4B. The Ideal Controller: Functionalities Needed for Efficient System Operation — Salon 3-4

This session will introduce the challenges of current heat pump thermostat specifications and then use a workshop to build alignment and support for a common controller/thermostat that enhances energy efficiency. The ideal controller (thermostat) may, for example, include benefits such as dynamic dual fuel crossover, interoperability with other thermostats or HVAC equipment, demand response, and limit the use of auxiliary heat when heat pumps can operate more cost-effectively.

Moderator: Suzi Asmus, Northwest Energy Efficiency Alliance

Presenter: Christopher Dymond, Northwest Energy Efficiency Alliance

4C. Shifting Landscapes—Regulatory Uncertainty Across Jurisdictions — Salon 5-6

In this session, attendees will review the status of federal and state regulations and discuss potential industry responses, including how changes in regulations may impact the availability of incentives.

Moderator: Chris Granda, Energy Solutions

From Policy to Payback: The Evolving Landscape of Federal Energy Tax Credits and Incentives
Josh Irving, NORESCO

Landscape of Water Heating Standards
Josh Greene, AO Smith
Ned Bent, GENERAL America

4D. Commercial Building Electrification—New Approaches to Load and Flex — Salon 7-8

Commercial buildings are in the middle of a transition, with a drive toward electrification, flexibility, and managing peak loads. In this session we will examine different aspects of this transition—from supportive building codes and success metrics to effective program implementation, and low-cost technology solutions enabling grid-responsive load management. We'll connect practical lessons from current deployments with long-term planning for the years ahead.

Moderator: Elizabeth Traynor, American Council for an Energy-Efficient Economy

Code Switch: Energizing Efficient Buildings for a Renewable Future
Fangxing Liu, Energy and Environmental Economics

Electrifying Small Businesses in Sacramento
Nic Dunfee, TRC

Open, Grid-Interactive Commercial Loads for Affordable Peak Demand Management
Daniel Colwell, SkyCentrics

4E. Workforce Training is Local: Place-based Strategies Increase HP Adoption through Disadvantaged Community Partnership — Pueblo

Come collaborate with colleagues and industry peers to apply and develop place-based strategies for workforce engagement and development which can lower barriers to heat pump adoption. We will review three program case studies of developing funded, effective local cross-sector partnerships that unlock decarb leadership, access, and uptake in disadvantaged and frontline communities. Emerald Cities Collaborative has supported and trained over 3,000 diverse small contractors across the U.S. to help their customers transition to healthy, comfortable, cost and energy efficient buildings. Addressing workforce at the community level is critical to full realization of market and workforce potential. Disadvantaged and frontline communities are critical to effective partnership.

Moderator: Monica Guevara, Emerald Cities Collaborative

Leveraging Workforce Partnerships and Contractor Engagement to Increase Impact of Heat Pump and Energy Efficiency Work
Monica Guevara, Emerald Cities Collaborative

Partnering with Local Government, DBEs, Technical Advisors, and Community on a Heat Pump Direct Install Model that Incorporates On-the-Job Training
Ttriss Williams Renard, Emerald Cities Collaborative

Approaches to Working with Community Benefits Organizations to Connect Residents to the No-Cost Energy Efficiency Home Upgrades Through the Equitable Decarbonization (EBD) Statewide Direct Install Program
Shanette Anderson, Emerald Cities Collaborative

5:00–6:00 pm — Fireside Chat: Manufacturer Perspectives on Efficiency Opportunities in HVAC and Water Heating — Grand Ballroom

Jennifer Layke, ACEEE's new executive director, will host four industry experts to discuss challenges facing the HVAC and water-heating industries, new opportunities for energy efficiency, and how manufacturers and efficiency advocates can continue working together. This high-level session is open to both Hot Air and Hot Water registrants.

Moderator: Jennifer Layke, American Council for an Energy-Efficient Economy

Panelists: Ashley Armstrong, Daikin
Joe Boros, Rheem
Josh Greene, A.O. Smith
Jim Vershaw, Trane Technologies

6:00–7:00 pm — Reception

Wednesday, March 25 | Hot Air & Hot Water Forum (Combo Day)

7:30 am – 7:00 pm	**Registration**	**Meeting Level Foyer**
8:00–9:00 am	**Breakfast**	**Pueblo**
9:00–10:30 am	**Plenary Panel: Load Growth, Affordability and Impacts of Space and Water Heating**	**Grand Ballroom**

As new loads connect to the electric grid, we are seeing increased strain and rising bills. Natural gas prices are also rising. Speakers from around the country will discuss the unique benefits of space- and water-heating efficiency on peak load and affordability, and successful applications in their regions.

Welcome: Jennifer Layke, American Council for an Energy-Efficient Economy
Josh Greene, A.O. Smith

Moderator: Matt Malinowski, American Council for an Energy-Efficient Economy

Panelists: Blaise Caudill, Arizona Executive Office of the Governor, Office of Resiliency
Jeff Harris, Northwest Energy Efficiency Alliance
Tilak Subrahmanian, Eversource

10:30–11:00 am	**Networking Break**	**Meeting Level Foyer**
11:00 am – 12:30 pm	**Concurrent Sessions**	

5A. Low-Income Multifamily: Practical Heat Pump Water Heater Retrofits for Cold Climates and Combined Space and Water Heating Loads — **Salon 1-2**

This session explores real-world strategies to electrify low-income multifamily housing in cold climates using heat pump water heaters, including combined space- and water-heating applications. Speakers will share practical retrofit lessons, a cold-climate case study, and integrated HPWH design approaches that balance cost, comfort, and decarbonization goals.

Moderator: Vidhisha Moopnar, New Buildings Institute

Practical Decarb Approaches for Electrifying Low-Income Housing
Emily Nesting, Ecotope

Affordable Multifamily Electrification: A Case Study of Heat Pump Retrofit in Cold-Climate Multifamily
Pierre Delforge, Harvest Thermal

Heat Pump Water Heaters for Combined Space and Water Heating in Multifamily Buildings
Jeff Maguire, National Lab of the Rockies (NLR)

5B. Market Drivers and Shifts: Getting HPWHs into Houses — **Salon 3-4**

Moderator: Roch Naleway, A.O. Smith Corporation

Michigan's Residential Buildings: A Policy Roadmap to Decarbonization
Grace Michienzi, Institute for Energy Innovation/Michigan Energy Innovation Business Council

Bay Area CCA Coalition: Regional Collaboration for Water Heater Market Transformation
Jennifer Green, MCE

The Water Heater Market Shift Led by Home Builders
Susan Harris, New Buildings Institute

5C. Post Install Performance – Results for both Residential Heat Pump Water Heaters and Commercial Building Whole Building Design — Salon 5-6

The three presentations demonstrate how real world survey data and measured performance—spanning commercial modeled versus metered savings and residential Heat Pump Water Heater installations—are essential for understanding true post installation outcomes. Together, they show that customer feedback, installer insights, and performance monitoring help identify gaps, improve installation practices, strengthen customer education, and support long term market transformation for energy efficient technologies and practices.

Moderator: Emily Rosenbloom, Northwest Energy Efficiency Alliance

When Energy Models Meet Reality: Closing the Gap Through Post-Installation Evaluation
Vivek Komarina, DNV

Insights from HPWH Market Transformation Progress in the Northwest: Supporting Installers and Educating Customers
Melissa Meek, NMR Group

Heat Pump Water Heater Performance and Extended Warranties
Joseph Wachunas, New Buildings Institute

5D. Hydronic Heat Pumps: Bye-Bye Boiler or Boiler as Backup? — Salon 7-8

This session explores three key design aspects of air-to-water heat pumps and heat pump water heaters. The first presentation examines the use of both technologies in a complete retrofit of a historic building. The second details the design and performance attributes of a centralized heat pump water heater, including Legionella control considerations. The third focuses on air-to-water heat pumps and the supply water temperatures required to heat existing homes.

Moderator: David Korn, Ridgeline Analytics

Design for Off with Air-to-Water Heat Pumps
Scott Spielman, Ecotope Inc.

Measured Field Performance of a CO_2 Air to Water Heat Pump Water Heater in a Commercial Building
Sarath Kannan, GTI Energy

Hot Enough for You? What Water Temperature Does Baseboard Really Need to Heat Your Home?
Chris Zimbelman, Ridgeline Energy Analytics

12:30–1:30 pm — Networking Lunch — Pueblo

1:30–3:00 pm — Concurrent Sessions

6A. Design and Financial Strategies for Affordability — Salon 1-2

Moderator: Steve Nadel, American Council for an Energy-Efficient Economy

Financing Programs Are Energy Solutions – How Can Affordable Financing Accelerate Program Success and Reduce Barriers to Entry for Homeowners?
Aaron Edge, Slipstream

Scalable Affordable Financeable Electrification Part 2
Nicole Ceci, Steven Winter Associates

Advancing HPWH Deployment in Affordable Housing: Central HPWHs and Manufactured Home Retrofits
Vidhisha Moopnar, New Buildings Institute

6B. Winning Strategies to Engage Homeowners, Building Owners, and Installers — Salon 3-4

This session explores innovative strategies for accelerating residential and commercial adoption of high efficiency heating and hot water technologies—spanning supply chain coordination, customer engagement, installer training, and systemic improvements. Presenters will discuss how unified messaging and cross stakeholder collaboration can boost installation rates, how emerging engagement models reshape the customer journey beyond traditional audits, and how reducing the "complexity tax" can expand access to energy saving programs. Join us to hear practical approaches and stories of success across markets.

Moderator: Susan Grant Harris, New Buildings Institute

From Supply Chain Gaps to Gains: A Unified Approach to Heat Pump Adoption
Lauren Eagan, Evergreen Energy Partners
Lindsey Dorman, Carrier Corporation

Beyond the Audit: Emerging Customer Engagement Models in Heating and Hot Water Efficiency
Josh Irving, NORESCO

Removing The Complexity Tax to Reduce Cost
Dan Limbago, Groundswell

6C. Refrigerants: From Lifecycle Management to the Next Generation — Salon 5-6

Join us as we explore the full refrigerant journey—from learnings on residential reclaim to the next-generation refrigerants being explored for commercial water heating, we'll be taking a look at the technologies shaping tomorrow's heat pump sector. Speakers will examine the current landscape of effective refrigerant stewardship and how we can support our contractors, clarify the role and reliability of reclaimed refrigerants, and highlight next-generation refrigerant solutions for commercial heat pump water heaters. Together, these perspectives illuminate how the industry can accelerate decarbonization while ensuring performance, affordability, and long-term sustainability.

Moderator: Kyle Bergeron, A.O. Smith Corporation

Lifecycle Refrigerant Management: A Climate & Affordability Imperative for the Heat Pump Market
Rose Wall, VEIC

Clearing the Air on Reclaimed Refrigerants
Dennis Nasuta, OTS R&D

Next-Generation Refrigerants for Commercial Heat Pump Water Heaters
Bo Shen, Oak Ridge National Laboratory

6D. Combination HVAC/DHW Systems — Salon 7-8

This session explores how ground source and integrated heat pump technologies can help utilities manage peak demand, support electrification, and improve grid resilience without relying on curtailment. Presenters will share utility-relevant insights on geothermal heating and cooling as a scalable peak-reduction resource, emerging commercial heat pump water heating applications, and the opportunities and limitations of integrated heat recovery systems for joint space conditioning and water heating. Attendees will leave with practical perspectives on where these technologies can deliver reliable demand reductions, renewable thermal benefits, and cost-effective efficiency program value.

Moderator: Ryan Hamilton, Consortium for Energy Efficiency, Inc.

Building Grid and Climate Resiliency with Ground Source Renewable Heating and Cooling
Willem Lange, WaterFurnace International

Seeing Double: Cooling with Commercial Split Heat Pump Water Heaters
David Korn, Ridgeline Energy Analytics

Integrated Heat Pumps for Heat Recovery from Space Conditioning and Water Heating
Micah Sweeney, EPRI

3:00–3:30 pm **Networking Break** — **Meeting Level Foyer**

3:30–5:00 pm **Concurrent Sessions**

7A. Eliminating Barriers to Residential Electrification Retrofits — Salon 1-2

Moving heat pumps from niche to mainstream is hard work on many fronts. The harder parts are creating the essential infrastructure. We'll focus on the "invisible" barriers, and what is required to remove or mitigate them. This includes diverse customer motivations, contractor engagement, technician training, costs, streamlining installations, and utility incentives and regulation.

Moderator: Harvey Sachs, American Council for an Energy-Efficient Economy

Customer Journeys and Journeymen: Electrical Work for Heat Pumps and the Project Timeline
Jen Loomis, Opinion Dynamics

How To Avoid Upsizing Electrical Panels While Installing Heat Pumps
Diane Bailey, City of Palo Alto Utilities

Installing for Impact: Electrifying Older and Hard-to-Reach Homes Safely and Effectively
Jim Plantico, Community Energy Project

7B. Rate Design Strategies for Affordable Electrification — Salon 3-4

Hear from experts in energy economics, regional energy efficiency program design, and public-sector utility operations as they discuss practical approaches for improving affordability and strengthening consumer confidence in electrification. These combined insights will show how thoughtful rate design and program structures can accelerate the adoption of heat pumps while supporting customers' needs for predictable costs and reliable comfort.

Moderator: Jennifer Kane, Trane Technologies

Deploying Heat Pump Rates for Cold Climates
Erin Cosgrove, Northeast Energy Efficiency Partnerships

Heating Homes and Cooling Costs: Rate Design to Support Decarbonization and Customer Affordability
Hannah Platter, Energy and Environmental Economics (E3)

Building Consumer Confidence to Go Electric with Monthly Electrification Bill Credits
Timothy Minezaki, San Francisco Public Utilities Commission

7C. Credentials, Licensing Pathways, and Contractor Business Models that Work — Salon 5-6

In this session we'll examine three clean technology career pathways and how to make them more accessible and impactful. We'll hear about Oregon's specialty water heater license and how this could help increase the workforce for heat pump water heater installers in other states. We'll also hear about best practices in HVAC commissioning as a key part of contractor training to ensure better system performance and happier customers. Finally, we'll learn about best practices in refrigerant training from a key program present in over 20 states. Together, these presentations will discuss how to improve training and licensing for important, energy-efficient HVAC and water-heating technologies.

Moderator: Joe Wachunas, New Buildings Institute

Expanding Business Opportunities for Heat Pump Water Heaters through Specialty Licensure Pathways
Emily Rosenbloom, Northwest Energy Efficiency Alliance

Stay Tuned: Contractor Business Models that Enable Commissioning
Alison Shereda, Pacific Northwest National Laboratory

HVAC Career Advancement: Certifications for the Clean Energy Economy (BPI, EPA 608, and NORA Bronze)
Robert O'Brien, National Oilheat Research Alliance (NORA)

7D. Thermal Energy Storage — Salon 7-8

This session describes the development and demonstration phase of a novel heat pump plus storage HVAC system, demonstrating the real-world potential of thermal storage integrated into HVAC products. The three presentations describe the design and simulation process, development of optimized load shifting and defrost controls, and field demonstrations showing real-world prototype performance. The field demonstration showed up to 38% on-peak cooling electricity reduction in summer, and up to 52% on-peak cooling electricity reduction in winter.

Moderator: Peter Grant, Lawrence Berkeley National Laboratory

Field Demonstration of a Thermal Energy Storage-Heat Pump for Building Space-Heating Load Shifting
Kyle Gluesenkamp, Oak Ridge National Laboratory

Coupled Thermal Energy Storage-Heat Pump for Building Load Shifting: Prototype Validation and National Assessment
Zhenning Li, Oak Ridge National Laboratory

Optimizing HVAC Defrost with Thermal Energy Storage for Better Comfort and Grid Load Management
Navin Kumar, Oak Ridge National Laboratory

5:00–7:00 pm	Shameless Commerce & Reception	Grand Ballroom

This "Shameless Commerce" event, in which participants pitch new products and services, is one of our most popular forum activities. In a rapid-fire format, each participant will have the opportunity to present a three-minute infomercial to the audience. Each pitch will be followed by brief audience Q&A. This year, Shameless Commerce will be hosted alongside our evening reception.

Thursday, March 26 | Hot Water Forum

7:00 am – 4:00 pm	Registration	Meeting Level Foyer

8:00–9:00 am	Breakfast	Pueblo

9:00–10:30 am	Concurrent Sessions	

8A. Measured Performance of Consumer HPWHs — Salon 2

A data-rich look at real heat pump water heater performance, both in the lab and in the field. Data sets include AMI analysis, home meter data, HPWH energy metering, and actual performance efficiency. Field data spans from coast to coast; the Northwest to Maine.

Moderator: Adam Gage, Northwest Energy Efficiency Alliance

Looking High and Looking Low, Combining AMI Analysis and Meter Data for New Insights in HPWH Evaluation
Steve Morris, Demand Side Analytics

Comparison of HPWHs Ducted to the Outdoors and Unducted HPWH in Small Space
Ryan Allen, Frontier Energy Inc.

Real Performance: Measured Energy Use of 60 Heat Pump Water Heaters and 200 ERWHs
Ben Larson, Larson Energy Research

8B. Accelerating Heat Pump Water Heater Adoption in Multifamily Housing — Salon 3-4

This session explores strategies to accelerate heat pump water heater adoption in multifamily housing through field experience and market innovation. Speakers will address interactions between heat pump water heaters installed in apartments and building HVAC systems; an innovation prize designed to spur manufacturers to deliver turnkey, low-cost split system heat pump water heaters; and measured performance of a central heat pump water system in a multifamily residential building using continuous monitoring and a live dashboard.

Moderator: Adam Darlington, A.O. Smith Corporation

HPWHs in Apartments: HVAC Interactions
Robb Aldrich, Steven Winter Associates

The Heat Is On for the Hot Water Innovation Prize: Affordable Multifamily Water Heating Products for All
Suzanne Foster Porter, Kannah Consulting
Emily Rosenbloom, Northwest Energy Efficiency Alliance

Advancing Metrics and Operational Insights for Centralized Heat Pump Water Heating in Multifamily Affordable Housing
Yiyang Dong, EPRI

8C. The Evolution of Distribution: Part I - Pumps — Salon 5-6

Hot water recirculation is entering a new era driven by electronically commutated motors, variable frequency drives, and smarter control strategies. These innovations are enabling more efficient, responsive systems that reduce both energy use and water waste. Together, they set the stage for a more sustainable, performance-optimized future in hot water distribution.

Moderator: Becky Henderson, Grundfos Pumps Corporation

Controlling the Flow or How Circulator Pump Controls Can Save Energy and Reduce Heat Losses
Srushti Koli, TRC Companies

Comparative Evaluation of Hot Water Recirculation Pump Demand Controllers
Jason LaFleur, GTI Energy

To Swing or Not To Swing: Optimizing Recirculation in Central Heat Pump Water Heating Systems for Greater Efficiency and Market Adoption
Andrew Brooks, Association for Energy Affordability

8D. Taking Load Shifting to the Next Level — Advanced Load Up, Conformance, and Scaling from Pilots to Programs — Salon 7-8

Running a successful water heater load-shifting program can be challenging, between recruiting customers, optimizing across key variables, and ensuring consistent responses from signals. In this session, several load flex experts break down lessons learned from the lab all the way to the program level. Join us to learn about removing friction and maximizing cost savings from demand response implementation.

Moderator: Noah Gabriel, New Buildings Institute

Domestic Hot Water and Grid Flexibility: A Field Study of Real-Time Price Optimization at Three Affordable Housing Multifamily Sites in California
Greg Pfotenhauer, Artemisia Energy

Customer Acquisition and Connectivity Lessons from Southern California Edison's SmartShift Rewards Program
Emily Kehmeier, Energy Solutions

Laboratory Testing of Residential Electric Water Heaters for Conformance with Demand Flexibility Communications Protocols
Helen Davis, Energy Solutions
Daniela Urigwe, Energy Solutions

10:30–11:00 am **Networking Break** — **Meeting Level Foyer**

11:00 am – 12:30 pm | Concurrent Sessions

9A. 120 is Plenty: Getting the most out of Plug-In HPWHs — Salon 2

Plug-in (120V) HPWHs can deliver heat pump efficiency while avoiding the need for expensive electrical upgrades to run a dedicated 240V circuit. This session first reports insights on the economics, challenges, and opportunities for the technology from program-wide installations in multifamily and single-family homes, then on results from installations in small businesses. Finally, we discuss the development of a high-capacity 120V HPWH that can outperform many traditional hybrid 240V units.

Moderator: Jon Koliner, Town Good

"Max-Tech" 120 V Water Heater: Development of a Higher Delivery Capacity Water Heater
Kyle Gluesenkamp, Oak Ridge National Laboratory

Plugging into Transformation: Unlocking Small Business Adoption of 120V Heat Pump Water Heaters
Evan Gutierrez, TRC

Real Life 120V Heat Pump Water Heater Installation in Single-Family & Multifamily Retrofit Applications
Roch Naleway, AO Smith

9B. CHPWHs Part I: The Future of Commercial Heat Pump Water Heaters: Water Use, System Metrics, and Design Guides — Salon 3-4

Moderator: Ben Schoenbauer, Center for Energy and Environment

Multifamily Hot Water Draw Profiles – the When and How Much?
Jeff Staller, West Monroe

Progress Update on ASHRAE Guideline 47 for Central Commercial Heat Pump Water Heaters in New Multifamily Buildings
Cristalle Mauleon, Lincus Inc

Unlocking the Future of Commercial Heat Pump Water Heaters: A Unified Approach to Performance Metrics
Ryan Hamilton, Consortium for Energy Efficiency

9C. It's All About the Volume! — Salon 5-6

Do you know anyone who wonders why new buildings have essentially the same difficulties in delivering hot water efficiently that older buildings do? Perhaps the reason is due to the principles and methods we use to design our buildings and the premise plumbing that goes into them? This session will explore the benefits of reducing the volume of (hot) water in the building's water distribution system by up to 90 percent. Implementing these concepts will ensure efficient hot water delivery, and increase health and safety, while reducing first and operating costs.

Moderator: Gary Klein, Gary Klein Associates

A New Perspective on Managing OPPPS
Christoph Lohr, IAPMO

The Benefits of Tiny Pipes
Larry Weingarten

Highlights from a Research Project in Minnesota on Right-Sizing Distribution Pipes and Water Heating Systems to Save Energy and Reduce Building Costs
Steffi Becking, West Monroe

9D. Optimized Controls for Consumer HPWHs — Salon 7-8

Millions of homes across the country have thermal batteries disguised as water heaters. How and when those batteries get recharged can have a big effect on a home's hot water availability and energy costs, as well as implications for the grid. Come hear about control strategies that unlock untapped HPWH benefits.

Moderator: Sam Larson, Larson Energy Research

Maximizing Hot Water Output for Small-Volume Heat Pump Water Heaters
Janelle Domantay, Colorado School of Mines

Stop Overpaying 4x! Predictive Controls to Minimize Heat Pump Water Heater Use of Resistance Elements
Peter Grant, Lawrence Berkeley National Laboratory

Quantifying the Impacts of Shifting Residential Electric Water Heating Loads
Tim Larsen, Demand Side Analytics

12:30–1:30 pm	Networking Lunch	Pueblo

1:30–3:00 pm	Concurrent Sessions

10A. Laboratory, Field, and Modeling Results for Gas Absorption and Electric Heat Pump Water Heaters — Salon 2

This session presents new laboratory, field, and modeling results that evaluate the performance, efficiency, and hydrogen readiness of gas absorption and thermal heat pump technologies for commercial and multifamily water heating. Findings highlight real-world energy savings, system design considerations, and comparative performance against electric heat pumps across multiple climate zones, supporting broader decarbonization and fuel flexibility strategies.

Moderator: Ramy Abdelhady, GTI Energy

Heat Pump Performance in California: A Comparison Laboratory Study for Fuel-Fired Water Heating Applications
Madeline Talebi, ICF

Field Results of Gas Absorption Heat Pumps (GAHPs) In Domestic Hot Water (DHW) Systems
Cristalle Mauleon, Lincus

GAHP Commercial Water Heating Field Performance and Comparison with Electric Heat Pumps
Hardik Shah, GTI Energy

Commercial Building Modeling Results for Gas Heat Pumps
Noe Contreras, Northwest Energy Efficiency Alliance

10B. Central Heat Pump Water Heaters Part II: Field Performance of Central Heat Pump Water Heaters for Multi-Family

Salon 3-4

As multifamily buildings electrify, central heat pump water heaters (CHPWHs) are critical to decarbonizing domestic hot water. Yet a persistent gap remains between design expectations and installed performance, as outcomes are shaped by system design, controls, site conditions, and ongoing maintenance practices. This session begins with tools and best practices for standardized sizing, maintaining peak performance, and low-cost monitoring to support consistent CHPWH performance at scale. It then presents broader field findings across multiple configurations before examining detailed operational data from a five-building multifamily site, illustrating how design decisions and operating conditions shape efficiency and reliability in practice.

Moderator: Skye Gruen, American Council for an Energy-Efficient Economy

Field Insights: Evaluating Central HPWH System Performance
Maya Gantley, West Monroe

On-site Performance of Central Heat Pump Water Heater Systems in a Small Multifamily Complex
Catherine Chappell, TRC

Using NEEA Standard Protocol to Scale M&V for CHPWH Market Transformation
Scott Spielman, Ecotope Inc.

10C. Food Service: HP Performance Testing in the Laboratory to Support Sizing and Optimizing COP in Cafes, Fast Food and Sit-Down Restaurants

Salon 5-6

This session will provide background, including motivation, lab setup, and test methodology, on utilizing PG&E's Applied Technology Services Laboratory to investigate sizing and performance of HPWHs in commercial foodservice. The speakers will provide Phase I test results of a bank of 3 integrated HPWHs paired with a lab setup that mimics the hot water distribution and use in cafes, fast food and sit-down restaurants. This testing investigated the effects on energy consumption and hot water delivery performance from the mechanical room's ambient temperature, the water heaters' setpoint temperature and operating mode, and the number of water heaters used for each simulated facility and including effects of various distribution system design components by varying the recirculation flow rate and loop heat loss rate and the use of a digital master mixing valve.

Moderator: Amin Delagah, TRC Companies

Heat Pump Water Heaters for Commercial Foodservice: Lessons Learned from the Lab
Mehdi Zeyghami, PG&E
Michael Slater, PG&E

Heat Pump Water Heaters for Commercial Foodservice: Integrated HPWH System Results and Findings
Matt Stevens, TRC

10D. Emerging Paradigm or Just a Phase? Phase Change Materials for Hot Water — Salon 7-8

Expanding the thermal capacity of water with the use of phase change materials (PCM) can provide opportunities for unique benefits. Here we explore innovative applications for PCM in water heating systems. We start with the potential of PCMs to reduce space constraints in 120V HPWHs, Then look at the use PCMs to reduce circulation losses in retrofit central DHW systems, and finally move beyond merely heating water to explore how PCMs could help in systems that also provide space heating/cooling and solar electricity.

Moderator: Jim Lutz, Hot Water Research

Getting 50 Gallons out of 40 Gallons: Phase Change Material Heat Exchangers to Eliminate Up-Sizing of 120V Heat Pump Water Heaters
Erin Blackley, Colorado School of Mines

Reimagining Multifamily Central DHW Designs with Distributed PCM Storage
Emma Casavant, VEIC - Vermont Energy Investment Corporation

Integrating TES PCM for Simultaneous, On-Demand Hot Water and Space Heating/Cooling with Solar PVT
Ari Katz, GTI Energy

3:00–3:30 pm **Networking Break** — **Meeting Level Foyer**

3:30–5:00 pm **Concurrent Sessions**

11A. Dual Fuel Systems — Salon 2

Dual fuel systems typically pair natural gas combustion with an electrically-driven vapor compression system and are emerging as a pragmatic way to achieve comfort, reliability, affordability, and grid flexibility that appeals to consumers, utilities, and manufacturers. This session explores solutions for space- and water-heating, spanning hydronic products available for a few years, a just-launched 120V dual fuel water heater product, and simulation-based insights into performance and control strategies that are possible in the near future.

Moderator: Kyle Gluesenkamp, Oak Ridge National Laboratory

Advancing Hybrid Water Heating Systems for Space and Domestic Applications
Ross Brawner, Lochinvar

Dual-Fuel 120V Heat Pump Water Heaters as a Swiss Army Knife
Jason Lafleur, GTI Energy

Grid-Responsive Dual-Fuel Heat Pump Water Heater for Operating Cost Reduction
Zhenning Li, Oak Ridge National Laboratory

11B. Central Heat Pump Water Heaters Part III: Balancing Standardization and design Innovation to Advance the Commercial HPWH Market — Salon 3-4

Moderator: Scott Spielman, Ecotope Inc.

Presenters:

Andy McNamara, Carbon Zero Buildings
Adam Gage, Northwest Energy Efficiency Alliance

11C. Food Service: HP Field Demonstration and Sizing

Salon 5-6

Join this session to gather insights on advancing foodservice water heater decarbonization. We'll explore a retrofit demonstration of a HPWH assist configuration, review field performance data from a handful of commercial HPWH installations, and learn from efforts engaging with health department officials to right-size foodservice water-heating systems.

Moderator: Maya Gantley, West Monroe

Field Demonstration: HPWH Assist Retrofit in Foodservices
Daniel Hacking, TRC

H.O.T.T.O.G.O: Heat Pump Water Heaters in Quick-Service Restaurants (and other commercial applications)
Noah Gabriel, New Buildings Institute

Adding Heat Pump Water Heaters to Health Department Sizing Guidelines with "Right Sizing" Approach
Amin Delagah, TRC

11D. Workshop---Meeting Customers Where They Are: Retail and DIY

Salon 7-8

When a water heater breaks, we have a narrow window to influence the purchasing decision before the customer makes the easiest purchase that guarantees a hot shower tomorrow. This workshop will focus on strategies for reaching customers purchasing HPWHs at retail, including DIY-ers, individual plumbers or handypeople, and small contractors. How do we educate people about their options, market to them at that decision point, and make sure that their installer doesn't talk them out of the purchase? Breakout groups will discuss strategies that have or haven't worked to transform markets and programs.

Moderator: Kim Rose, C+C

Energize CT Highlight
Julia Trusty, Avangrid

CEE Highlight
Evelyn Lane, CEE

PNW Highlights
Jill Reynolds, C+C