

## 2023 HOT AIR & HOT WATER FORUMS

Hot Air Forum – March 7-8

Hot Water Forum – March 8-9

### *Program as of 2-13-23*

#### **Tuesday, March 7 – Hot Air Forum**

**7:00 am–7:00 pm**                      **Registration**    *South Foyer*

**8:00–9:00 am**                      **Breakfast**    *Great Room IV-VIII*

**9:00–10:30 am**                      **Welcome and Plenary Session**    *Great Room IV-VIII*

Welcome & Introduction: **Steve Nadel**, American Council for an Energy Efficient Economy

Moderator: **Christopher Dymond**, Northwest Energy Efficiency Alliance

*When Decarbonizing the Air Side...Five Years from Now, Where Will We Be and Where Should We Be?*

Presenter: **Kandice Cohen**, Director, Electrification of Heat, Trane Technologies

**10:30–11:00 am**                      **Networking Break**    *West Foyer*

**11:00 am–12:00 pm**                      **Concurrent Sessions**

**Decarbonizing Commercial and Industrial**    *Great Room I-III*

Moderator: **George Chapman**, Energy Solutions

*The Guidebook for Decarbonizing Healthcare Buildings*

Presenter: **Austin Barolin**, Mazzetti

*High Temperature Heat Pumps and Implications for Commercial and Industrial Applications*

Presenter: **Kashif Nawaz**, Oak Ridge National Laboratory

*Hot and Humid: Efficient Dehumidification for a Warming Environment*

Presenter: **Kevin Bostaph**, Mazzetti

**Cold Climate Heat Pumps**    *Shutters East I-II*

Moderator: **Emma Hanson**, Consortium for Energy Efficiency

*Load Shifting with Cold-Climate Ductless Heat Pumps*

Presenter: **Samuel Rosenberg**, Pacific Northwest National Laboratory

*Reducing Greenhouse Gas Emissions and Improving Energy Resilience with Integrated Energy Systems*

Presenter: **Alejandro Guada**, GTI Energy

*The Northeast Energy Efficiency Partnership's Cold Climate Air Source Heat Pump Resources are More Relevant than Ever!*

Presenters: **Dan Wildenhaus**, Center for Energy and Environment

**David Lis**, Northeast Energy Efficiency Partnerships

## Design Strategies for Energy Efficiency and Decarbonization

Shutters West I-II

Moderator: **Ben Schoenbauer**, Center for Energy and Environment

*Duct Loss Implications of Variable Capacity Heat Pumps*

Presenter: **Curtis Harrington**, University of California-Davis

*Strategies for Increased Heat Pump Savings*

Presenter: **Christopher Dymond**, Northwest Energy Efficiency Alliance

*A System Approach to Healthy, Efficient, and Resilient Buildings for a Decarbonized World*

Presenter: **Jordan Pratt**, Energy 350

12:00–1:00 pm

Networking Lunch

Great Room IV-VIII

1:00–2:00 pm

Concurrent Sessions

## Commercial Boiler Solutions

Great Room I-III

Moderator: **George Chapman**, Energy Solutions

*Dual-fuel (Gas-Electric) Commercial Steam Boiler with Demand Response, Decarbonization and Green House Gas Emission Reductions*

Presenter: **Ramanathan Dharmarajan**, GTI Energy

*Space Heating Electrification Strategies for Large Commercial Buildings*

Presenters: **Mark Butrico**, Guidehouse

**Ryan Murphy**, Guidehouse

*Heat Pumps are Not Boilers*

Presenter: **Shawn Oram**, Ecotope

## U.S. Department of Energy's Residential Cold Climate Heat Pump Technology Challenge: The Next Frontier in Residential Heating Decarbonization

Shutters East I-II

Moderator: **Bing Liu**, Pacific Northwest National Laboratory

Panelists: **Tony Bouza**, U.S. Department of Energy

**Vrushali Mendon**, Pacific Northwest National Laboratory

**William Goetzler**, Guidehouse

## Workforce Tools and Programs

Shutters West I-II

Moderator: **Ben Schoenbauer**, Center for Energy and Environment

*Farewell HVAC Manifold, Technicians of the Future Go Wireless*

Presenter: **Christian Valoria**, Pacific Northwest National Laboratory

*Training Material for Residential Heat Pump Conversions*

Presenter: **Jamie Kono**, Pacific Northwest National Laboratory

*Empowering HVAC Distributors and Contractors: Lessons Learned from an Air-Source Heat Pump Training and Education Pilot*

Presenter: **Justin Margolies**, Slipstream

**2:15–3:15 pm**

**Concurrent Sessions**

**Solutions for Roof-Top Units (RTUs) (*small/medium commercial*)**

*Great Room I-III*

Moderator: **Curtis Harrington**, University of California, Davis

*Commercial Heat Pump Rooftop Units: Current Decarbonization Opportunities and Future Technology Needs*

Presenters: **Ali Kazmi**, Guidehouse  
**Carolyn Barrera**, Guidehouse

*Furnace Efficiency Beyond Annual Fuel Utilization Efficiency (AFUE): How the Whole Box Matters and How to Change the Market*

Presenter: **Jason Jones**, Northwest Energy Efficiency Alliance

*Advanced Fuel-Fired Heat Pumps with Improved Occupant Comfort, Decarbonization, Green House Gas Reductions*

Presenter: **Hardik Shah**, GTI Energy

**Variable Speed Heat Pumps (VSHP) Equipment**

*Shutters East I-II*

Moderator: **Christopher Dymond**, Northwest Energy Efficiency Alliance

*Rating Representativeness Project - Developing Lab and Field Data for a Better Heat Pump Rating*

Presenter: **Jennifer McWilliams**, DNV

*Lab Testing a Mid-Tier Variable Speed Heat Pump*

Presenter: **Micah Sweeney**, EPRI

*Finding the “Goldilocks” Heat Pump and the Key Performance Metrics That Define It*

Presenter: **Isaac Smith**, Center for Energy and Environment

*Variable Speed Heat Pumps for Central Air Conditioning Replacement in Illinois*

Presenter: **Ranal Tudawe**, Center for Energy and Environment

**Market Transformation: Adoption and Customer Focus**

*Shutters West I-II*

Moderator: **Debbie Driscoll**, Northwest Energy Efficiency Alliance

*Replacing Central ACs with Heat Pumps – the Fastest Route to Widespread Heat Pump Adoption*

Presenter: **Matt Malinowski**, CLASP

*Who’s a Good Fit for Electrification? Data-Driven Customer Analysis*

Presenter: **Meghan O’Connor**, Eversource

*Achieving High Impacts in Low-Income Multifamily Housing*

Presenter: **Steve Wiese**, Frontier Energy  
**Austin Pooley**, CenterPoint Energy

**3:15-3:45 pm**

**Networking Break**

*West Foyer*

**3:45–4:45 pm**

**Concurrent Sessions**

**Heat Pumps in Single Family Homes (Residential Case Studies)**

*Great Room I-III*

Moderator: **Courtney Moriarta**, NYSERDA

*Evaluating the Use of Integrated Controls to Maximize the Effectiveness of Ductless Heat Pumps in Existing Homes*

Presenter: **Karen Fenaughty**, UCF/FSEC

*Data-driven Insights into Air Source Heat Pump Installation Costs*

Presenter: **Dylan Sarkisian**, Energy Solutions

*Efficiency Impact of Low Refrigerant Levels in Variable Capacity Heat Pumps*

Presenter: **Abram Conant**, Proctor Engineering Group, Ltd.

**Equipment Sizing**

*Shutters East I-II*

Moderator: **David Lis**, Northeast Energy Efficiency Partnership

Size Up or Size Down? National Analysis of Heat Pump Sizing Factors and Impacts

Presenter: **Prateek Munankarmi**, National Renewable Energy Laboratory

Goldilocks Method: A Heat Pump Decision Tool Helps Choose a System that's Just Right

Presenter: **Alekzander Parsons**, Pacific Northwest National Laboratory

What Matters Most in Determining Heat Pump Application Types?

Presenter: **Dan Wildenhaus**, Center for Energy and Environment

**Landscape of Current Collaborations & What's Needed**

*Shutters West I-II*

In this interactive session, attendees will join us in identifying where collaboration is happening and where it is needed to accelerate adoption of decarbonization for residential HVAC and light commercial roof-top units (RTUs)

Discussion Moderators: **Abigail Daken**, U.S. Environmental Protection Agency

**Debbie Driscoll**, Northwest Energy Efficiency Alliance

**5:30–7:00 pm**

**Reception**

*The Patio*

## Wednesday, March 8 – Hot Air & Hot Water Forum Combo Day

**7:30 am – 7:00 pm**                      **Registration**                                      *South Foyer*

**8:00–9:00 am**                      **Breakfast**                                      *Great Room IV-VIII*

**9:00–10:30 am**                      **Plenary Session**                                      *Great Room IV-VIII*

Moderator: **George Chapman**, Energy Solutions

*A Vision of the Policy Future – Policies, Funding, and Approaches for Energy and Emissions from a Federal and State Perspective*

Presenters: **Ashley Armstrong**, Senior Advisor, U.S. Department of Energy  
**Andrew McAllister**, Commissioner, California Energy Commission

**10:30–11:00 am**                      **Networking Break**                                      *West Foyer*

**11:00 am–12:00 pm**                      **Concurrent Sessions**

**Flexibility and Demand Response: State Water Heating Perspective**                                      *Great Room I-III*

Moderator: **Geoff Wickes**, Northwest Energy Efficiency Alliance

*EcoPort™ is LIVE! A Standard for Grid Connected Hot Water Heaters*

Presenter: **Don Dulchinos**, OpenADR Alliance

*Findings and Updates from WatterSaver, PG&E's Electric Water Heater Daily Load Shifting Program*

Presenter: **Nick Dirr**, Association for Energy Affordability

*Hot Water in Hot Arizona*

Presenter: **Grace Sauter**, Guidehouse

**Utility Programs in the Midwest**                                      *Shutters East I-II*

Moderator: **Molly Graham**, Midwest Energy Efficiency Alliance

*Heat Pump Adoption - Regional Collaboration*

Presenter: **Emily McPherson**, Center for Energy and Environment

*Regional Barriers & Opportunities*

Presenter: **Molly Graham**, Midwest Energy Efficiency Alliance

*Residential Space Heating Electrification: Laying the Groundwork for a New Generation of Programs*

Presenters: **Kevin Gries**, Slipstream  
**Pauravi Shah**, ComEd

**Energy Equity & Environmental Justice in Decarbonization**                                      *Shutters West I-II*

Moderator: **Amber Wood**, ACEEE

*U.S. Department of Energy's Field Validation Partnership Network and Strategy*

Presenter: **Frederica Brown**, Pacific Northwest Energy Laboratory

*Weatherization and Electrification Together*

Presenters: **Keith Dennis**, The Beneficial Electrification League  
**Long Lam**, Brattle Group

**Program - Decarbonization Considerations**

*Brickstones*

Moderator: **Peter Turnbull**, Turnbull Energy

*Modeling the World: Where Does Building Decarbonization Make the Most Sense?*

Presenter: **Ian Hammon-Hogan**, BIRA Energy

*Residential Electrical Panels: How Many Need to be Upgraded?*

Presenter: **Doug Lindsey**, EPRI

**12:00–1:00 pm**

**Networking Lunch**

*Great Room IV-VIII*

**1:00–2:00 pm**

**Concurrent Sessions**

**Reducing Emissions through Policy**

*Great Room I-III*

Moderator: **Jim Lutz**, Hot Water Research

*California Regulatory Activity on Heating and Water Heating*

Presenter: **Leah Louis-Prescott**, RMI (formerly Rocky Mountain Institute)

*Delivering Results through Innovation: Results from a Heat Pump Water Heater Loaner Pilot*

Presenter: **Chris Badger**, VEIC

*Making Lower-Emissions Water Heating Affordable and Accessible*

Presenters: **Damali Harding**, Regulatory Assistance Project  
**Emily Levin**, NESCAUM

**State Utility Programs**

*Shutters East I-II*

Moderator: **Jerine Ahmed**, Southern California Edison

*How a Channel Strategy Can Meet Decarbonization Goals*

Presenter: **Erin Engelkemeyer**, Eversource

*Navigating the 3 Cs of Hybrid Heating: Cost, Carbon, and Comfort*

Presenter: **Morgan Hood**, Vermont Gas Systems

*Don't Cool the Heat Pump Momentum*

Presenter: **Courtney Dale**, Cadeo

**Legislation and Funding Implications**

*Shutters West I-II*

Moderator: **Emma Hanson**, Consortium for Energy Efficiency

*Tax Rebates and Grants: What the IRA Means for Consumers' Wallets*

Presenter: **Kim Katz**, Consortium for Energy Efficiency

*Heat Pump Water Heaters: Preparing for the Tsunami*

Presenters: **Paul Campbell**, ICF  
**Nate Jutras**, ESTAR

*Balancing Efficiency vs Market Adoption: The Risk of Setting the Bar too Low*

Presenter: **Christopher Dymond**, Northwest Energy Efficiency Alliance

## Residential: Heat and Water Heating Multi-Use Heat Pumps

Brickstones

Moderator: **Harvey Sachs**, ACEEE

*Smart Integrated Near Zero GWP Space Heat and Hot Water*

Presenter: **Abram Conant**, Proctor Engineering Group, Ltd.

*Initial Winter Results from a 4-ton Combi Heat Pump and Heat Pump Water Heater in the PNNL Lab Homes*

Presenter: **Edward Louie**, Pacific Northwest National Laboratory

*Three Loads, One Heat Pump: Examining Air-to-Water Heat Pumps for Retrofits in an Unoccupied Laboratory Home*

Presenter: **James Haile**, Frontier Energy

2:15–3:15 pm

Concurrent Sessions

## High Efficiency Gas Water Heating

Great Room I-III

Moderator: **Aaron Winer**, Northwest Energy Efficiency Alliance

*Commercializing a Cost-Effective Residential Retrofit Gas Heat Pump Water Heater*

Presenter: **Magnus Ekblad**, HeatAmp

*Gas Absorption Heat Pump for Commercial Applications*

Presenter: **Alejandro Guada**, GTI Energy

*Direct and Indirect Fired Tankless Condensing Water Heater Demonstration*

Presenter: **Abinesh Ravi**, GTI Energy

## Air-to-Water Heat Pumps (AWHP) and Water-Source Heat Pumps (WSHP)

Shutters East I-II

Moderator: **Abigail Daken**, U.S. Environmental Protection Agency

*Advancing Air-to-Water Heat Pumps in California's Energy Code*

Presenter: **John Arent**, NORESCO

*Air-to-Water Heat Pumps in Minnesota*

Presenter: **Ranal Tudawe**, Center for Energy and Environment

*Making Closed Loop Water Source Heat Pump Retrofits Attainable*

Presenter: **Jason Strano**, Eversource

## Policies: Codes, Standards, and Testing

Shutters West I-II

Moderator: **Harvey Sachs**, ACEEE

*Leader or Laggard: How Do U.S. Efficiency Standards for Domestic Water and Space Heating Equipment Stack Up?*

Presenter: **Matt Malinowski**, CLASP

*Just do it! What Happens When Everyone has to Change Technology Together*

Presenter: **Duane Jonlin**, City of Seattle

*Learning from the Japanese Household Use Heat Pump Water Heater Standards*

Presenter: **Jim Lutz**, Hot Water Research

## Decarbonizing Residential Water Heating

Brickstones

Moderator: **Kim Katz**, Consortium for Energy Efficiency

ENERGY STAR® Home Upgrade: A DIY Roadmap to Electrifying/Decarbonizing

Presenter: **Dan Lawlor**, U.S. EPA ENERGY STAR

ENERGY STAR® Home Upgrade: Water Heating

Presenter: **Paul Campbell**, ICF

Electrical Upgrade Challenges for Building Electrification Goals

Presenter: **William Goetzler**, Guidehouse

3:15–3:45 pm

Networking Break

West Foyer

3:45–4:45 pm

Concurrent Sessions

## Global Warming Potential Refrigerants and Green House Gas Reductions

Great Room I-III

Moderator: **Kyle Gluesenkamp**, Oak Ridge National Laboratory

*Propane as Refrigerant for Heat Pump Water Heaters*

Presenter: **Kashif Nawaz**, Oak Ridge National Laboratory

*Two-stage Hydronic Heat Pump Using Propane*

Presenter: **Zhenning Li**, Oak Ridge National Laboratory

*Refrigerant-free Thermoelectric Heat Pump Water Heaters*

Presenter: **Kyle Gluesenkamp**, Oak Ridge National Laboratory

## Landscape of Current Collaborations and What's Needed – Part II

Shutters East I-II

In this interactive session, attendees will join us in creating an action plan to address gaps in collaboration and accelerate progress in residential HVAC and light commercial roof-top units (RTFs).

Discussion Moderators: **Abigail Daken**, U.S. Environmental Protection Agency

**Debbie Driscoll**, Northwest Energy Efficiency Alliance

## Workforce

Shutters West I-II

Moderator: **Amber Wood**, ACEEE

*Key Lessons for Workforce Development in Urban Disadvantaged Communities*

Presenter: **Ebony Mayhorn**, Pacific Northwest National Laboratory

*Retooling Workforce Development and Career Pathways to Achieve Green House Gas Reductions*

Presenter: **Katey Beaton**, VEIC

*BIPOC Focused Workforce and Contractor Training Opportunities for Heat Pumps and Heat Pump Water Heaters*

Presenter: **Joseph Wachunas**, New Buildings Institute

*Heat Pump Water Heaters: You Need to Feel It to Believe It*

Presenter: **Sandy Laube**, Energy Solutions



## Equipment – Thermal Heat Pumps

Brickstones

Moderator: **Aaron Winer**, Northwest Energy Efficiency Alliance

*Pairing Managed Thermal Storage with a Heat Pump Combi*

Presenter: **Evan Green**, Harvest Thermal

*Laboratory Evaluation of a Packaged Thermal Heat Pump and Electrical Air Conditioning Unit for Space Conditioning and Hot Water*

Presenter: **Navin Kumar**, GTI Energy

*Control Scheme for Load Shifting with PCM Integrated Heat Pump Water Heaters*

Presenter: **Jian Sun**, Oak Ridge National Laboratory

5:00–6:00 pm

Shameless Commerce

Great Room IV-VIII

6:15–7:30 pm

Reception

The Patio

## Thursday, March 9 – Hot Water Forum

7:00 am–4:00 pm

Registration

South Foyer

8:00–9:00 am

Breakfast

Great Room IV-VIII

9:00–10:30 am

Plenary Panel

Great Room IV-VIII

Moderator: **Christoph Lohr**, The International Association of Plumbing & Mechanical Officials

*Workforce & Equity – The Crossover of Workforce and Equity Within States and Utilities Within Programs and Policies*

Panelists: **Jill Marver**, Program Manager, Principal, Pacific Gas & Electric Company

**Jenna Tatum**, Executive Director, Building Electrification Institute

10:30–11:00 am

Networking Break

West Foyer

11:00 am–12:00 pm

Concurrent Sessions

## Market Transformation: Heat Pump Water Heater Decarbonization

Great Room I-III

Moderator: **Emily Rosenbloom**, Northwest Energy Efficiency Alliance

*Insightful Market Research to Guide Regional Heat Pump Water Heater Deployment*

Presenter: **Josh Butzbaugh**, Pacific Northwest National Laboratory

*Heat Pump Water Heaters Failure to Launch and How We Change That*

Presenter: **Joseph Wachunas**, New Buildings Institute

*Developing the Market for Heat Pump Water Heaters in the Bay Area through a Regional Incentive*

Presenter: **Helen Mejia**, East Bay Community Energy

## Piping Design

Shutters East I-II

Moderator: **Amin Delagah**, TRC Companies

*Laboratory Testing of a Full-Scale Domestic Hot Water Distribution System for a Three-Story Multifamily Building*

Presenter: **Mehdi Zeyghami**, Pacific Gas and Electric

*Why Your Shower Feels Wimpy and What You Can Do About it*

Presenter: **Gary Klein**, Gary Klein and Associates

*Diving Deep into the Water Demand Calculator - Will You See the Benefits on Your Next Project?*

Presenter: **Elise Wall**, 2050 Partners

## 120 Volt Heat Pump Water Heaters: A Game Changing Technology Gets to Market

Shutters West I-II

Moderator: **Jim Lutz**, Hot Water Research

*2023: A Heat Pump Water Heater Odyssey*

Presenter: **Colleen Collins**, Cadeo Group

*Plug-in Heat Pump Water Heaters: An Early Look at 120-Volt Products in the Lab*

Presenter: **Ben Larson** Larson Energy Research

*Plug-in Heat Pump Water Heaters: National Field Validation Efforts and Market*

Presenter: **Amruta Khanolkar**, New Buildings Institute

## Commercial and Public Building Innovations

Brickstones

Moderator: **George Chapman**, Energy Solutions

*Heat Pump Water Heaters MOOving into the Dairy Farm*

Presenters: **Keshmira McVey**, Bonneville Power Administration

**Helen Townsend**, D&R International

*Why Tankless?*

Presenter: **Perry Bobrow**, Intellihot Inc.

12:00–1:00 pm

Networking Lunch

Great Room IV-VIII

1:00–2:00 pm

Concurrent Sessions

## Program Design – Heat Pump Water Heaters

Great Room I-III

Moderator: **Kim Katz**, Consortium for Energy Efficiency

*Enhancing Heat Pump Water Heating Programs in the Northeast*

Presenter: **Deepti Dutt**, Northeast Energy Efficiency Partnerships

*Residential Heat Pump Water Heater Program Design: Meeting the Needs of Customer, Contractors, and Utilities*

Presenter: **Jordan Losiak**, ComEd

*Southeast Heat Pump Water Heater Implementation Project*

Presenter: **Chris Granda**, Energy Solutions

## Innovative Hot Water Research from Workshop Experts

Shutters East I-II

Moderator: **Tim Bartrand**, ESPRI

Presenters: TBA

## Causes of (and Solutions to) Poor Heat Pump Water Heater Performance in Small Enclosures

Shutters West I-II

Moderator: **Michael Waite**, ACEEE

*The Amazing Shrinking Room*

Presenter: **Ben Larson**, Larson Energy Research

*Unitary Heat Pump Water Heater Ventilation Testing to Support New Title 24 Requirements*

Presenter: **Garth Torvestad**, 2050 Partners

*Overcrowding Unitary Heat Pump Water Heaters: Lessons Learned in Installation from the Field*

Presenter: **Meghan Duff**, Association for Energy Affordability

## Commercial and Industrial Hot Water

Brickstones

Moderator: **George Chapman**, Energy Solutions

*Steam to Hot Water Conversions and Their Impact on Decarbonization*

Presenter: **Jason Strano**, Eversource

*Distributed Carbon Capture Technology for Fuel-fired Water and Space Heating in Residential and Commercial Buildings*

Presenter: **Abbas Ahsan**, GTI Energy

*Industrial Heat Pumps Potential and Market Transformation*

Presenter: **Andrew Hoffmeister**, ACEEE

2:15–3:15 pm

Concurrent Sessions

## Flexibility and Demand Response: Heat Pump Water Heater Controls and Costs

Great Room I-III

Moderator: **Geoff Wickes**, Northwest Energy Efficiency Alliance

*Carbon Reduction Potential through Optimal Control of Grid Interactive Heat Pump Water Heaters Across the United States*

Presenter: **Imran Sheikh**, Western Washington University

*Renewables & Load Flexibility*

Presenter: **Peter Grant**, Lawrence Berkeley National Laboratory

*Retrofitting Central Heat Pump Heater Systems to Achieve Load Flexibility*

Presenter: **Yanda Zhang**, ZYD Energy

**Emily Higbee**, Redwood Energy

## Hot Water Design: Water Quality, Design, and Innovations

Shutters East I-II

Moderator: **Gary Klein**, Gary Klein and Associates

*Priority Research and Innovation in Hot Water Systems: Innovations and Ideas*

Presenter: **Tim Bartrand**, The Environmental Science, Policy and Research Institute

*Priority Research and Innovation in Hot Water Systems: Hot Water System Areas of Intersecting*

Presenter: **Katherine Alfredo**, The Environmental Science, Policy and Research Institute

*Innovation in Codes and Standards*

Presenter: **Christoph Lohr**, The International Association of Plumbing & Mechanical Officials

## Solar Water Heating Strategies

Shutters West I-II

Moderator: **Amber Wood**, ACEEE

*Energy Security and Efficient Electrification*

Presenter: **Adam Chrisman**, SunEarth

*The Role of Heat Pump Water Heaters with Off-Grid Hybrid Solar*

Presenter: **Carlos Colon**, Florida Solar Energy Center (FSEC)

*Experimental Results for Combined Solar Thermal and Heat Pump Systems*

Presenter: **Joshua Plaisted**, Flagstaff Research

## Multifamily – Equitable and Affordable Water Heating

Brickstones

Moderator: **Navin Kumar**, GTI

*Equitable and Efficient Solutions to Electrify Domestic Water Heating*

Presenter: **Rebecca Rothman**, VEIC

*Cost Reduction of Heat Pump Water Heaters for Multifamily Units*

Presenter: **Joseph Rendall**, Oak Ridge National Laboratory

3:15–3:30 pm

Networking Break

West Foyer

3:30–4:30 pm

Concurrent Sessions

## Multifamily – Hot Water Design Strategies

Great Room I-III

Moderator: **Gary Klein**, Gary Klein Associates

*Best Practices for Design, Installation, and Commissioning of Central Domestic Electric Heat Pump Hot Water Systems in New Multifamily Buildings*

Presenter: **Carmen Cejudo**, Pacific Northwest National Laboratory

*Electrification Options for Multifamily Water Heating in Cold Climates*

Presenter: **Kyle Gluesenkamp**, Oak Ridge National Laboratory

*Commercial and Industry Heat Pump Water Heater System Design*

Presenter: **Walker Larsen**, Consortium for Energy Efficiency

## Hot Water System Design

Shutters East I-II

Moderator: **Mike Waite**, ACEEE

*Overcoming Barriers: A Heat Pump Water Heater Decision Tool*

Presenter: **Alekzander Parsons**, Pacific Northwest National Laboratory

*System Design Strategies, Water Heating Technologies*

Presenter: **Perry Bobrow**, Intellihot Inc.

*Methods for Rightsizing of Replacement Heat Pump Domestic Hot Water Systems*

Presenter: **Charles Simek**, New Ecology

**John Beaumont**, New Ecology

## Innovative Strategies

Shutters West I-II

Moderator: **Theresa Pistochni**, University of California, Davis

*Lab Testing a Supervisory Economic Model Predictive Control on a Single-Tank Heat Pump Water Heater /Cloud-based Supervisory Economic Model Predictive Control for Cost and Emission Optimization of Heat Pump Water Heaters*

Presenter: **Caton Mande**, UC Davis Western Cooling Efficiency Center

*Three-function Heat Pumps: Jack of All Trades, but Master of None?*

Presenter: **Stephen Chally**, Frontier Energy

## Multifamily – Design and Installation Heat Pump Water Heaters

Brickstones

Moderator: **Amin Delagh**, TRC Companies

*Demonstrating Successful Heat Pump Water Heater Load Shift in Multifamily Buildings*

Presenter: **Scott Spielman**, Ecotope Inc.

*Centralized Heat Pump Water Heater Systems in Multifamily Buildings: Insights from the Supply Chain*

Presenters: **Mischa Egolf**, New Buildings Institute

**Nick Young**, Association for Energy Affordability

*When DHW Electrification Goes Wrong*

Presenter: **Nicole Ceci**, Steven Winter Associates

*System Design Strategies*

Presenter: **Ben Larson**, Larson Energy Research