

2023 HOT AIR & HOT WATER FORUMS

Hot Air Forum – March 7-8

Hot Water Forum – March 8-9

Program as of 3-9-23

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: **Amber Wood**, American Council for an Energy Efficient Economy

Welcome: **Karen Meyers**, Vice President, Government Affairs, Rheem Manufacturing

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 Deck*

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

1A. 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

1B. 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

1C. Design Strategies for Energy Efficiency and Decarbonization

Shutters West I-II

Moderator: **Isaac Smith**, 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

2A. 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

2B. 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

2C. Workforce Tools and Programs

Shutters West I-II

Moderator: **Dan Wildenhaus**, 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

Presenters: **Justin Margolies**, Slipstream

Pauravi Shah, ComEd

2:15–3:15 pm

Concurrent Sessions

3A. 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 Akber 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

3B. 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

3C. 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 Deck

3:45–4:45 pm

Concurrent Sessions

4A. 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.

4B. 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

4C. 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 Gallery

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

7:00 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*

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

Welcome: **Karen Meyers**, Vice President, Government Affairs, Rheem Manufacturing

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 Policy Advisor and IRA Management Expert

U.S. Department of Energy

Andrew McAllister, Commissioner, California Energy Commission

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

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

5A. 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

Ray Troy, Rheem

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

5B. Utility Programs in the Midwest *Shutters East I-II*

Moderator: **Joe Ricchiuto**, Midwest Energy Efficiency Alliance

Heat Pump Adoption - Regional Collaboration

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

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

Presenters: **Kevin Gries**, Slipstream

Pauravi Shah, ComEd

5C. 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: **Kieren McCord**, Pacific Northwest Energy Laboratory

Weatherization and Electrification Together

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

5D. 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

6A. Reducing Emissions through Policy

Great Room I-III

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

Emission Standards to Reduce Appliance Pollution

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

6B. 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

6C. 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, U.S. EPA ENERGY STAR

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

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

6D. 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 Three Function Air-to-Water Heat Pumps for Retrofits

Presenter: **James Haile**, Frontier Energy

2:15–3:15 pm

Concurrent Sessions

7A. 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

7B. 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**, NORESO

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

7C. 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

JIS C-9220, Learning from the Japanese Household Use Heat Pump Water Heater Standard (家庭用ヒートポンプ給湯機)

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

7D. 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 Deck

3:45–4:45 pm

Concurrent Sessions

8A. Low Global Warming Potential Refrigerants & 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

8B. 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

8C. 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

Steven Brotton, Great Northwest Installations

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

Presenter: **Sandy Laube**, Energy Solutions

8D. 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: **Joseph Rendall**, Oak Ridge National Laboratory

5:00–6:00 pm

Shameless Commerce

Great Room IV-VIII

6:15–7:30 pm

Reception

The Gallery

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*

Welcome & Introduction: **Amber Wood**, American Council for an Energy Efficient Economy

Welcome: **Joshua Greene**, Corporate Vice President – Government, Regulatory, and Industry Affairs, A.O. Smith Corporation

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
Nick Dirr, Senior Director Programs, Association for Energy Affordability

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

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

9A. 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

9B. 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, Inc.

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

Presenter: **Elise Wall**, 2050 Partners

9C. 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 Headers: 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

9D. 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

10A. 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

10B. Innovative Hot Water Research

Shutters East I-II

Moderator: **Tim Bartrand**, ESPRI

Presenters: TBA

10C. 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

10D. 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

11A. Flexibility and Demand Response: Heat Pump Water Heater Controls and Costs

Great Room I-III

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

Emission Reduction Potential of Controlled Water Heaters in the United States

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

Price- and Load-Responsive CTA-2045 Controls for HPWHs

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

11B. Hot Water Design: Water Quality, Design, and Innovations

Shutters East I-II

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

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

Presenter: **Tim Bartrand**, ESPRI

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

Presenter: **Katherine Alfredo**, ESPRI

Innovation in Codes and Standards

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

11C. 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

11D. 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 Deck

3:30–4:30 pm

Concurrent Sessions

12A. Multifamily – Hot Water Design Strategies

Great Room I-III

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

Upcoming Codes & Guidelines for Central Heat Pump Water Heater Systems

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

Sizing Challenges Based on Climate for Packaged Multifamily Systems

Presenter: **Brent Kovash**, Steffes, LLC

Commercial and Industry Heat Pump Water Heater System Design

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

12B. 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

Presenters: **Charles Simek**, New Ecology

John Beaumont, New Ecology

12C. Innovative Strategies

Shutters West I-II

Moderator: **Dave Vernon**, University of California, Davis

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

12D. Multifamily – Design and Installation Heat Pump Water Heaters

Brickstones

Moderator: **Amin Delagh**, TRC Companies

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

Demonstrating Successful Heat Pump Water Heater Load Shift in Multifamily Buildings

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

When DHW Electrification Goes Wrong

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

Multifamily Design Charrette for 1 to 1 Installs

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