

2023 HOT AIR & HOT WATER FORUMS

Hot Air Forum – March 7-8

Hot Water Forum – March 8-9

Draft Program as of 1-24-23

Tuesday, March 7 – Hot Air Forum

7:00 am–7:00 pm Registration

8:00–9:00 am Breakfast

9:00–10:30 am Welcome and Plenary Panel

10:30–11:00 am Networking Break

11:00 am–12:00 pm Concurrent Sessions

Decarbonizing Commercial and Industrial

Moderator: **TBD**

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

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

Sizing Heat Pumps in Cold Climates

Presenter: **David Lis**, Northeast Energy Efficiency Partnerships

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

Presenter: **Dan Wildenhaus**, 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: **Tim Kingston**, GTI Energy

Design Strategies for Energy Efficiency and Decarbonization

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

Future-proofing HVAC: A System Approach to Healthy, Efficient, and Resilient Buildings for a Decarbonized World

Presenter: **Maria Murphy**, Northwest Energy Efficiency Alliance

12:00–1:00 pm Networking Lunch

1:00–2:00 pm Concurrent Sessions

Commercial Boiler Solutions

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

Moderator: **Courtney Moriarta**, NYSERDA

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

Tony Bouza, U.S. Department of Energy

Vrushali Mendon, Pacific Northwest National Laboratory

William Goetzler, Guidehouse

Workforce Tools and Programs

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*)

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: **Deborah Driscoll**, Northwest Energy Efficiency Alliance

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

Presenter: **Ramanathan Dharmarajan**, GTI Energy

Variable Speed Heat Pumps (VSHP) Equipment

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

Market Transformation: Adoption and Customer Focus

Moderator: **Emma Hanson**, Consortium for Energy Efficiency; **Debbie Driscoll**, Northwest Energy Efficiency Alliance

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

Presenter: **Matt Malinowski**, CLASP

Go Big or Go Home: Transforming Under Resourced Communities with Heat Pump Technology

Presenter: **Thomas Mcateer**, CMC Energy

Achieving High Impacts in Low-Income Multifamily Housing

Presenter: **Steve Wiese**, Frontier Energy

3:15-4:15 pm

Networking Break

3:45–4:45 pm

Concurrent Sessions

Heat Pumps in Single Family Homes (Residential Case Studies)

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

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

Panel Presentation – More information to follow.

5:30–7:30 pm

Reception

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

7:30 am – 7:00 pm

Registration

8:00–9:00 am

Breakfast

9:00–10:30 am

Plenary Panel

10:30–11:00 am

Networking Break

11:00 am–12:00 pm

Concurrent Sessions

Flexibility and Demand Response: State Water Heating Perspective

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

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

Hot Water in Arizona

Presenter: **Grace Sauter**, Guidehouse

Utility Programs in the Midwest

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

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

Presenter: **Keith Dennis**, The Beneficial Electrification League

Program - Decarbonization Considerations

Moderator: **Peter Turnbull**, Turnbull Energy

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

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

"Rate" of Beneficial Electrification

Presenter: **Sabarish Vinod**, Lincus, Inc.

Residential Electrical Panels: How Many Need to be Upgraded?

Presenter: **Doug Lindsey**, EPRI

12:00–1:00 pm

Networking Lunch

1:00–2:00 pm

Concurrent Sessions

Reducing Emissions through Policy

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

California Regulatory Activity on Heating and Water Heating

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

Delivering Results through Innovation: Results from a Heat Pump Water Heater

Presenter: **Chris Badger**, VEIC

Making Lower-Emissions Water Heating Affordable and Accessible

Presenter: **Nancy Seidman**, Regulatory Assistance Project

State Utility Programs

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

Moderator: **Kim Katz; Emma Hanson**, Consortium for Energy Efficiency

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

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

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

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

Heat Pump Water Heaters: Preparing for the Tsunami

Presenter: **Paul Campbell**, ICF

Residential: Heat and Water Heating Multi-Use Heat Pumps

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

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 Baez 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)

Moderator: **Abigail Daken**, U.S. Department of Energy

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

Presenter: **John Arent**, NORESO

Air-to-Water Heat Pumps in Minnesota

Presenter: **Samantha Hill**, Center for Energy and Environment

Making Closed Loop Water Source Heat Pump Retrofits Attainable

Presenter: **Jason Strano**, Eversource

Policies: Codes, Standards, and Testing

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! The Power of Moving Together

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

JIS C-9200, Learning from the Japanese Residential Heat Pump Water Heater Standard

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

Residential – Decarbonization

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

3:45–4:45 pm

Concurrent Sessions

Global Warming Potential Refrigerants and Green House Gas Reductions

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: **Bo Shen**, Oak Ridge National Laboratory

Refrigerant-free Thermoelectric Heat Pump Water Heaters

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

Exploring Collaboration

Panel Discussion – More to follow

Workforce

Moderator: **Amber Wood**, ACEEE

Key Lessons for Workforce Development in Urban Disadvantaged Communities

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

BIPOC Focused Workforce and Contractor Training Opportunities for Heat Pumps

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

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

Presenter: **Katey Beaton**, VEIC

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

Presenter: **Sandy Laube**, Energy Solutions

Equipment – Thermal Heat Pumps

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

6:15–7:30 pm

Reception

Thursday, March 9 – Hot Water Forum

7:00 am–4:00 pm Registration

8:00–9:00 am Breakfast

9:00–10:30 am Plenary Panel

10:30–11:00 am Networking Break

11:00 am–12:00 pm Concurrent Sessions

Market Transformation: Heat Pump Water Heater Decarbonization

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

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

Presenters: **Helen Merjia**, East Bay Community Energy
Jennifer West, Stop Waste

Insightful Market Research to Guide Regional Heat Pump Water Heater Deployment

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

Piping Design

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

Applying the Benefits of the Water Demand Calculator to Your Upcoming Projects: Right-Sizing is the Second Domino

Presenter: **Elise Wall**, 2050 Partners

Water Heating Equipment: 120 Volt

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

Retrofit Ready Game Changing Technology: 120V Heat Pump Water Heaters National Field Validation and Market/Cold Climate 120V Heat Pump Water Headers Performance Modeling

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

Commercial and Public Building Innovations

Moderator: **George Chapman**, Energy Solutions

Heat Pump Water Heaters MOOving into the Farm Dairy

Presenter: **Helen Townsend**, D&R International, Ltd.

Why Tankless?

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

12:00–1:00 pm

Networking Lunch

1:00–2:00 pm

Concurrent Sessions

Program Design – Heat Pump Water Heaters

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

Enhancing Heat Pump Water Heating Programs in the Northeast

Presenter: **David Lis**, 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

Hot Water Design: Water Quality, Design, and Innovations – Part I

Panel Presentation – more to follow

Heat Pump Water Heater Ventilation Design

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

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

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/Price-Driven Load Flexibility for Heat Pump Water Heater Systems: Opportunities and Challenges

Presenter: **Yanda Zhang**, ZYD Energy

Hot Water Design: Water Quality, Design, and Innovations – Part II

Hot Water Design: Water Quality, Design, and Innovations

Panel Discussion – more to follow

Solar Water Heating Strategies

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

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

Retrofitting Multifamily Heat Pump Water Heating: A Case Study

Presenter: **Louise Sharrow**, Elevate

3:15–3:30 pm

Networking Break

3:30–4:30 pm

Concurrent Sessions

Multifamily – Hot Water Design Strategies

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: **Bouba Dieme**, Consortium for Energy Efficiency

Hot Water System Design

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.

Decarbonization and Electrification, System Design Strategies

Presenter: **Charles Simek**, New Ecology

Innovative Strategies

Moderator: **Theresa Pistochini**, 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

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** and **Nick Young**, New Buildings Institute

When DHW Electrification Goes Wrong

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

System Design Strategies

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