

2013 ACEEE Hot Water Forum
“Water Heating, Distribution, and Use Efficiency”
Hyatt Regency Atlanta • Atlanta, GA • November 3-5, 2013

Sunday, November 3		
4:00 pm to 7:00 pm	Registration	Embassy Hall Lobby
5:00 pm to 7:00 pm	Hospitality	Embassy Hall Lobby

Monday, November 4		
7:30 am to 6:00 pm	Registration	Embassy Hall Lobby
7:30 am to 8:30 am	Breakfast	Embassy CD
8:15 am to 8:30 am	Welcome, Logistics & Announcements	Embassy CD
8:30 am to 10:00 am	Breakout Sessions	

Session 1A *Embassy A*

Heat Pump Water Heater Technology

Presenters: **Ken Eklund**, Washington State University Energy Program
 Dave Kresta, Northeast Energy Efficiency Partnerships
 Carlos Colon, Florida Solar Energy Center

Moderator: **John Bush**, Electric Power Research Institute

This technical session will review laboratory testing and modeling efforts on the cutting edge of heat pump water heater technology. As the product class grows and evolves, it will be essential to review existing technology for improvements, and emerging technologies which may enter or disrupt the HPWH market. This technically-focused session will discuss laboratory testing of CO₂ systems approaching the US marketplace, as well as the integration of solar and HPWH technology. Also a detailed modeling effort, which can help understand today's technology in greater detail, will be shared.

Session 1B *Embassy B*

Performance Testing of Water Heaters: How Should It Be Done? (Part 1)

Presenters: **Jim Lutz**, Lawrence Berkeley National Laboratory
 Charlie Adams, A.O. Smith
 Wayne Reedy, Carrier Corporation
 Ashley Armstrong, U.S. Department of Energy

Moderator: **Martin Thomas**, Natural Resources Canada

Over the last few years we've seen a lot of activity in the water heating industry with technology developments, the call from all sides for a more reasonable/realistic method of test, and new performance test requirements implemented by energy efficiency groups and governments to support both utility DSM and/or regulatory initiatives. With this medley of changes, what do we make of it all? Well, never fear; in this session, split into three parts (see Session 2B and 3B), we hope to be able to answer questions such as “what’s wrong with the current water heater performance tests?”, “what are others doing and what options for testing are there?”, and “where are we going with the performance testing of water heaters?” This session will provide some interesting information and stimulate a thought provoking discussion.

*Session 1C**Embassy F***Solar Electric and Solar Thermal Hot Water Systems**

Presenters: **Hillary Vadnal**, Gas Technology Institute
 Hal Slater, Slater Solar

Moderator: **Paul Glanville**, Gas Technology Institute

In this session, two speakers bring updates on the performance of two related but different technologies: solar thermal and solar electric water heating systems. In this session speakers describe findings from a broad field study of solar thermal water heating systems at sites throughout the U.S. and compare the performance of solar electric (PV + HPWH) to typical solar thermal hot water systems.

*Session 1D**Embassy E***On Premise Pathogens, Legionella and Its Buddies**

Presenters: **Larry Acker**, ACT Inc. D'MAND Systems
 Marc Edwards, Virginia Tech
 Tim Keane, Legionella Risk Management, Inc.

Moderator: **Carl Hiller**, Applied Energy Technology

This panel discussion focuses on kinds of pathogens sometimes found in potable water systems (such as legionella bacteria which causes Legionnaire's disease), where they might be found in hot and cold water systems, how they may represent health risks, and what can be done to reduce those risks. Audience participation and questions are encouraged.

10:00 am to 10:30 am**Break****Embassy Hall Lobby****10:30 am to 12:00 pm****Breakout Sessions***Session 2A**Embassy A***Heat Pump Water Heater Field Studies**

Presenters: **Carl Hiller**, Applied Energy Technology
 Bill Hosken, A.O. Smith
 Troy Trant, Rheem

Moderator: **John Bush**, Electric Power Research Institute

Heat pump water heaters have received a lot of attention in recent years, with many lab and field studies showing promising energy savings results. However, since HPWHs are sensitive to their application and installation, ongoing research into the performance of HPWHs in different applications and climates remains important in helping regulators, utilities, and consumers to understand the potential of HPWHs in their specific regions. In this session, two field studies will be discussed, one in a hot, humid climate, and one in a very cold climate. In addition, the critical "do's and don'ts" of real-world installations will be discussed.

*Session 2B**Embassy B***Performance Testing of Water Heaters: How Should It Be Done? (Part 2)**

Presenters: **Jim Lutz**, Lawrence Berkeley National Laboratory
David Villaroel, Office of Energy Efficiency, Natural Resources Canada
Earl Rightmier, AERCO International, Inc.
Frank Stanonik, Air-Conditioning, Heating, and Refrigeration Institute

Moderator: **Martin Thomas**, Natural Resources Canada

Over the last few years we've seen a lot of activity in the water heating industry with technology developments, the call from all sides for a more reasonable/realistic method of testing, and new performance test requirements implemented by energy efficiency groups and governments to support both utility DSM and/or regulatory initiatives. With this medley of changes, what do we make of it all? Well, never fear; in this session, split into three parts (see Session 1B and 3B), we hope to be able to answer questions such as "what's wrong with the current water heater performance tests?", "what are others doing and what options for testing are there?", and "where are we going with the performance testing of water heaters?" This session will provide some interesting information and stimulate a thought provoking discussion.

*Session 2C**Embassy F***The Emerging Market for Grid Interactive Electric Water Heating (Part 1)**

Presenters: **Gary Connett**, Great River Energy
Paul Steffes, Steffes Corporation
Keith Dennis, National Rural Electric Cooperative Association
Robin Roy, Natural Resources Defense Council
Steve Rosenstock, Edison Electric Institute

Moderator: **Steve Koep**, Vaughn Corporation

Grid-Interactive Water Heating (GIWH) is the descriptor identifying high-speed, two-way communication between the electric water heating appliance and the Smart Grid, electric utility, Balancing Authority, Independent System Operator (ISO) or aggregation entity. When equipped with a grid-interactive control device, a large-capacity, electric thermal storage water heater has the ability to: follow locational marginal pricing, better integrate renewable energy and provide fast regulation service. Join us to learn more about this emerging opportunity to transform the electric water heating marketplace. (See session 3C for Part 2.)

*Session 2D**Embassy E***Safety and Pipes**

Presenters: **William Rhoads**, Virginia Tech
Paul Sturman, Center for Biofilm Engineering, Montana State University

Moderator: **Gary Klein**, Affiliated International Management, LLC

While energy and water efficient buildings have the potential to help conserve the earth's resources, there are many design features that deserve more scrutiny, as the application of conservation techniques also have the potential to help these systems harbor harmful human pathogens. This session has two presentations; Green Building Premise Plumbing: The potential for Pathogens and Biofilm Growth, and Disinfection in Water Systems. Participants will learn about water age and how it can affect water quality. They will also learn how biofilms propagate in plumbing systems and what techniques are currently available for managing them.

12:00 pm to 1:30 pm

Lunch

Embassy CD

1:30 pm to 3:00 pm

Breakout Sessions

Session 3A

Embassy A

Heat Pump Water Heater Programs for Happy Customers and Realized Savings

Presenters: **Anna Morgan**, Tennessee Valley Authority
Jill Reynolds, Northwest Energy Efficiency Alliance
Shawn Enterline, Vermont Energy Investment Corporation

Moderator: **Stephanie Vasquez**, Bonneville Power Administration

In the lab and in the field, heat pump water heaters have proven their savings are real, and surveys show customers are happy with this choice. What do you need to know about this major innovation in water heating technology? Program managers and researchers have learned that proper selection, installation, and supply chain management of heat pump water heaters differs from conventional water heaters, in ways that can affect both customer satisfaction and energy savings. Join us to discuss the biggest innovation in electric water heating in decades, and the program design considerations for contractor, retail, utility-direct, and wholesale channels.

Session 3B

Embassy B

Performance Testing of Water Heaters: How Should It Be Done? (Part 3)

Presenters: **Grant Bourke**, University of Auckland
Masayuki Mae, University of Tokyo
George Wilkenfeld, George Wilkenfeld & Associates

Moderator: **Martin Thomas**, Natural Resources Canada

Over the last few years we've seen a lot of activity in the water heating industry with technology developments, the call from all sides for a more reasonable/realistic method of test, and new performance test requirements implemented by energy efficiency groups and governments to support both utility DSM and/or regulatory initiatives. With this medley of changes, what do we make of it all? Well, never fear; in this session, split into three parts (see Session 1B and 2B), we hope to be able to answer questions such as "what's wrong with the current water heater performance tests?", "what are others doing and what options for testing are there?", and "where are we going with the performance testing of water heaters?" This session will provide some interesting information and stimulate a thought provoking discussion.

Session 3C

Embassy F

The Emerging Market for Grid Interactive Electric Water Heating (Part 2)

Presenters: **Eric Rehberg**, Battelle Memorial Institute
Daniel Flohr, Sequentric Energy Systems, LLC
Peter Stymiest, New Brunswick Power
Steve Koep, Vaughn Corporation

Moderator: **Steve Koep**, Vaughn Corporation

Grid-Interactive Water Heating (GIWH) is poised to move from field test and pilot project to MW-scale implementation for electric utilities across the country. Join us to learn more about the efforts to develop a waiver or product classification for "grid-enabled" large capacity electric resistance water heaters as well as the research and product development efforts currently underway to facilitate the implementation of GIWH technology on a broad scale. (See session 2C for Part 1.)

*Session 3D**Embassy E***Hot Water Pipes in Multifamily Homes**

Presenters: **Sean Armstrong**, Redwood Energy
Jonah Schein, U.S. Environmental Protection Agency
Yanda Zhang, TRC Solutions

Moderator: **Gary Klein**, Affiliated International Management, LLC

Some multi-family homes have a water heater for each individual unit, in which case the hot water piping looks much like that found in a single family house of the same size. Some are two or three units sharing a water heater. Other multi-family homes share a water heater, either in groups that are small (think garden apartments with 4-12 units in each building) or large (think 40-200 units with a mechanical room and a central circulation system). There are many variations, but all current water heater sizing methods are based on higher flow rate fixtures that are no longer being used. This session has three presentations: one will present a spreadsheet based tool that can be used to estimate the water consumption in multifamily units; one will discuss how the WaterSense program is being used to label multifamily homes and one will discuss the changes to California's 2014 Title-24 energy code that affect multifamily homes.

3:00 pm to 3:30 pm**Break****Embassy Hall Lobby****3:30 pm to 5:00 pm****Breakout Sessions***Session 4A**Embassy A***Heat Pump Water Heaters in Thermal Storage and Grid Interactive Applications**

Presenters: **Harshal Upadhye**, Electric Power Research Institute
Sarah Widder, Pacific Northwest National Laboratory

Moderator: **John Bush**, Electric Power Research Institute

Water heaters provide an interesting proposition for utility companies and others, acting as a thermal battery of sorts in nearly every household in the United States. Services such as demand response, integration of renewable resources and power frequency regulation are provided by electric resistance water heaters in many applications today. However, as regulations change and the future status of electric resistance water heaters remains unknown, interest is turning towards heat pump water heaters to see whether they can provide these same services. In this session, presenters will talk about ongoing research in the area of "grid-interactive" heat pump water heaters. This session will include data from laboratory and simulated field studies to begin answering some of the many research questions in this area.

*Session 4B**Embassy B***Natural Gas Utility Energy Efficiency Programs**

Presenters: **George Chapman**, Consortium for Energy Efficiency
Adam Neale, Natural Gas Technologies Center
Bruce Grossman, South Jersey Gas
James York, Rinnai

Moderator: **Elizabeth Noll**, American Gas Association

Water heating represents a major use of energy in homes with the potential for significant natural gas savings. This session will first provide a state of the natural gas utility programs overview and then dive into the strategy, vision, market barriers and activities currently underway for natural gas utilities to deliver energy efficiency opportunities through their hot water programs.

*Session 4C**Embassy F***Overcoming the Barriers of Emergency Replacements for Residential Water Heating**

Presenters: **David Lis**, Northeast Energy Efficiency Partnerships
Delaina Wilhelm, Pacific Gas and Electric Company
Natalie Zandt, ICF International

Moderator: **Steve Ryan**, U.S. Environmental Protection Agency

The last thing anyone wants in the morning is a cold shower. When faced with the prospect of purchasing a new water heater, how are consumers being reached on the benefits of ENERGY STAR qualified gas and electric water heater options? What are the barriers, specifically to their reluctance in purchasing a qualified water heater? This panel will cover successful marketing and outreach strategies deployed by some of the most active water heater programs in the country.

*Session 4D**Embassy E***Issues in Optimizing Hot Water Systems**

Presenters: **Steven Buchberger**, University of Cincinnati
Craig Selover, Independent Consultant
Yanda Zhang, TRC Solutions LLC

Moderator: **Gary Klein**, Affiliated International Management, LLC

Seventy years ago the US National Bureau of Standards developed a theoretically rigorous and convenient graphical approach for estimating the 99th percentile of water use in public facilities (Hunter's curves). These curves have been incorporated into design codes for plumbing systems around the globe. Water fixtures and consumer habits have changed markedly over the years; current experience indicates that Hunter's curves often overestimate actual water demands. This can lead to over-sized plumbing systems which inflate construction costs and pose potential public health hazards, which can be both energy and water inefficient. This session has three presentations, two address right-sizing hot water piping from different perspectives. The third presents a spreadsheet based tool to assist practitioners in designing a hot water distribution plan for any building that minimizes the waste of water and time while waiting for the hot water to arrive as energy efficiently as possible.

5:00 pm to 7:00 pm**Reception****Embassy CD****7:00 pm****Informal Sessions***Informal Session**Embassy A***Urethane in the Water Heater Industry**

Moderator: **Patrick Watters**, BASF Corporation

How urethane is a major contributor to meeting new energy efficiency requirements. Current and next generation blowing agents that help meet these ever changing targets.

*Informal Session**Embassy F***Tank Corrosion Protection**

Moderator: **Doug Rourke**, Magontec GmbH

This session explains why cathodic corrosion protection of hot water storage tanks is necessary, and how sacrificial anodes work. The presentation also describes the growing use of impressed current protection technology as used in glass-lined steel as well as stainless steel tanks.

Tuesday, November 5

7:30 am to 4:00 pm	Registration	Embassy Hall Lobby
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7:30 am to 8:30 am	Breakfast	Embassy CD
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8:30 am to 10:00 am	Breakout Sessions	
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Session 5A

Embassy A

Heat Pump Water Heater International Markets and Standards

Presenters: **George Wilkenfeld**, *George Wilkenfeld & Associates*
Sara Williams, *Australian Government, Department of Resources, Energy and Tourism*
Martin Thomas, *Natural Resources Canada*

Moderator: **Stephanie Vasquez**, *Bonneville Power Administration*

As the HPWH market gradually emerges in the US and abroad, many non-technical barriers exist to broad adoption. This session will feature international presenters discussing heat pump water heater markets and programs, the learnings of which may be of great use in the US and elsewhere. It will also include a comprehensive review of the many testing standards and proposed protocols, with an eye towards harmonizing the many international standards and requirements.

Session 5B

Embassy B

Commercial Kitchens I: Hot Water Lab and Field Monitoring Projects

Presenters: **Eddie Heustis**, *PG&E Applied Technology Services*
Jason Hanleybrown, *Fast Water Heater Company*
Sal Brunetto, *Rheem*

Moderator: **Amin Delagah**, *Fisher-Nickel, Inc.*

By simulating real-world hot water use profiles in a controlled environment, PG&E's Commercial Water Heating Laboratory examined the benefits of high efficiency storage and tankless water heaters, the effect of preheating and retro-commissioning practices, and various distribution system layouts. Join us for a discussion on the key results from this first round of testing. The second presentation will cover areas proposed for a subsequent round of testing at the laboratory including hybrid heaters and demand circulation. It is hoped that the results will accelerate the proper application of existing technologies and design of distribution systems, and adoption of emerging technologies. Lastly, the energy savings and hot water delivery performance of a condensing hybrid heater that replaced a storage heater in a quick-service restaurant will be detailed.

Session 5C

Embassy F

After April 16, 2015?: Impact of Federal Policies and Regulations on Residential Water Heater Markets

Presenters: **Frank Stanonik**, *Air-Conditioning, Heating, and Refrigeration Institute*
Harvey Sachs, *American Council for an Energy-Efficient Economy*

Moderator: **Keith Dennis**, *National Rural Electric Cooperative Association*

Federal energy efficiency regulations can have a significant impact on the type of appliances that consumers can purchase in the marketplace. One such example is the April 2010 final rule for residential water heaters. The impacts of this rule, which go into effect in April 2015, are very significant. This panel will discuss the impacts of the new rule from the point of view of electric utilities and water heater manufacturers.

*Session 5D**Embassy E***Pumps & Motors: Innovative Technologies & Applications for Delivering Energy Savings in Hot Water Systems**

Presenters: **Jesse Ander**, Grundfos Pumps Corporation
Gabriel Ayala, Enovative Group, Inc.
Hugh Henderson, CDH Energy Corporation

Moderator: **Jesse Ander**, Grundfos Pumps Corporation

Pump and motor applications account for 15-20% of worldwide energy consumption. As pump and motor technologies have advanced, the potential to reduce energy consumption in those applications has increased dramatically, especially in hot water systems. This panel will discuss recent innovations in pump and motor technologies, electric savings potential in hot water applications, thermal savings potential from pump control strategies, and program design considerations.

10:00 am to 10:30 am

Break

Embassy Hall Lobby

10:30 am to 12:00 pm

Breakout Sessions

*Session 6A**Embassy A***Advanced Gas Heat Pump Water Heater Technologies**

Presenters: **Paul Glanville**, Gas Technology Institute
Mike Garrabrant, Stone Mountain Technologies
Kyle Gluesenkamp, Oak Ridge National Laboratory

Moderator: **Paul Glanville**, Gas Technology Institute

This session focuses on thermally-driven advanced heat pump water heaters (HPWH), technologies that may soon transition from the laboratory to the marketplace to provide end users with options for gas or propane-fired water heaters with efficiencies exceeding that of condensing tankless or storage products. In this session, speakers will discuss (a) the opportunity and challenges for this new class of product in the gas water heater market and (b) update attendees on two active gas-fired absorption HPWH development efforts.

*Session 6B**Embassy B***Commercial Kitchens II: Using Hard Data to Transform the Market**

Presenters: **Steve Memory**, A.O. Smith
Amin Delagah, Fisher-Nickel, Inc.
Roy Sieber, Eastern Research Group

Moderator: **Amin Delagah**, Fisher-Nickel, Inc.

This session will examine strategies to save hot water by providing knowledge to the operator. The first presentation will discuss using the iCOMM, an integrated water heater performance monitoring device which allows the operator to monitor temperatures, diagnostic parameters and hot water usage remotely without the need to add instrumentation. A technique to infer hot water usage from iCOMM enabled heaters and potential uses for this estimation technique will be discussed. A second presentation will focus on field testing in a full-service restaurant using the iCOMM device versus traditional field instrumentation. The third and fourth presentations will discuss transforming the commercial pre-rinse spray valve market in commercial kitchens by utilizing the EPA's WaterSense labeling program. The presentation will review the evolution of pre-rinse spray valve performance tests, discuss collaborative development of a new test method for spray force and introduce the new WaterSense pre-rinse spray valve specification.

*Session 6C**Embassy F***Update on ENERGY STAR® Certified Commercial Water Heaters***Presenter: Steve Ryan, U.S. Environmental Protection Agency**Moderator: Mark Michalski, Cadmus Group*

The ENERGY STAR Program continues to lead the way for water heater efficiency through specifications and outreach. This session will provide attendees with an overview of upcoming changes to the water heater specification to reflect the upcoming federal standards. In addition, an overview of available marketing and outreach tools for residential and commercial water heaters as well as other updates will be provided to attendees.

*Session 6D**Embassy E***Drain Water Heat Recovery**

*Presenters: Gerald Van Decker, RenewABILITY Energy Inc.
Dan Cautley, Energy Center of Wisconsin
David Velan, Ecodrain*

Moderator: Larry Weingarten

This session looks at drain water heat recovery from different angles. We look at the subject from a codes and incentives perspective, to see how the rules may hurt or help. From modeling we'll see possible performance versus actual. We're used to vertical orientation in these units, but horizontal systems have been developed. We'll look at those. Also, we'll look at measured results of DWHR in commercial applications.

12:00 pm to 1:00 pm**Lunch****Embassy CD****1:00 pm to 2:30 pm****Breakout Sessions***Session 7A**Embassy A***Advanced Electric Heat Pump Water Heater Technologies**

*Presenters: Himanshu Pokharna, Sheetak Inc.
Bamdad Bahar, Xergy Inc.
Hal Slater, Slater Solar
Craig Richmond, Nexus eWater*

Moderator: Paul Glanville, Gas Technology Institute

Focusing on advanced electric HPWHs, these emerging technologies look beyond the vapor compression cycle, using thermoelectric and electrochemical cycles to produce hot water, and move away from air-source HPWH designs, utilizing geothermal and grey water heat sources for hot water generation. Vendors of these advanced HPWHs describe their technologies, market challenges, and recent developments.

*Session 7B**Embassy B***Combi Systems I: Systems in the Real World**

Presenters: **David Kalensky**, Gas Technology Institute
 Ben Schoenbauer, Minnesota Center for Energy and Environment
 Sal Brunetto, Rheem

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

Both new housing construction practices and present day retrofit measures are leading to more thermally efficient building envelopes and reductions to home space heating loads. At the same time, new water heating product lines with higher firing rates are becoming the dominant thermal engine in an increasing number of homes. Instead of continuing to specify two separate thermal engines—such as a separate gas-fired furnace and water heater—researchers, homebuilders and HVAC\domestic hot water equipment manufacturers are exploring more cost-effective packaging of space and water heating in a new generation of combination systems. Experts have been conducting field tests of these combi systems under various application scenarios. In this session they will present the latest findings and expected outcomes. The discussion will include, installed efficiency, occupant comfort, paybacks, as well as safety and durability.

*Session 7C**Embassy F***Sudden Impact: ENERGY STAR® Commercial Water Heaters**

Presenters: **Steve Ryan**, U.S. Environmental Protection Agency
 Matt Schulz, A.O. Smith
 Nick Mark, CenterPoint Energy
 Amin Delagah, Fisher-Nickel, Inc.

Moderator: **Mark Michalski**, Cadmus Group

ENERGY STAR commercial water heaters is a relatively new category; however, its benefits have been immediate in the restaurant industry and could provide the same benefits to other niche markets. This panel session will cover ENERGY STAR qualified commercial water heater technology, firsthand accounts of how it is being used to benefit businesses, and other niche markets the technology is applicable for.

*Session 7D**Embassy E***How Occupants Use Hot Water**

Presenters: **Adam Neale**, Natural Gas Technologies Centre
 Marc Hoescele, Davis Energy Group
 Masayuki Mae, University of Tokyo
 Danny Parker, Florida Solar Energy Center

Moderator: **Jim Lutz**, Lawrence Berkeley National Laboratory

People use hot water. The speakers on this panel will present results of studies of how people respond to technologies (tankless water heaters, on-demand recirc systems, super-insulated bath tubs) that save energy and water. Predicting hot water use from household demographic information is also presented.

2:30 pm to 3:00 pm**Break****Embassy Hall Lobby**

3:00 pm to 4:30 pm

Breakout Sessions

Session 8A

Embassy A

Inverter Driven Hot Water: Heating Water with Multi-Purpose Residential Heat Pumps

Presenters: **Wayne Reedy**, ASHRAE
Dave Kresta, Northwest Energy Efficiency Alliance
Joe Bush, Mitsubishi Electric

Moderator: **Paul Doppel**, Mitsubishi Electric

In this session, the presenters will discuss the emergence of inverter-driven compressor systems into the water heating marketplace, but not without complications. Commercial inverter-driven, multi-split systems, or as they are better known, Variable Refrigerant Flow (VRF) systems are becoming more widely used in the US with engineers finding interesting ways to incorporate these systems. Options include heating water for domestic hot water, floor heating and even pool heating. In the residential market, ductless mini- and multi-splits are becoming more widely used — even in more northern climates because of their great heating performance at 0° F and colder. So why not use them to heat water and condition the space at the same time? The panel will show how the new ASHRAE Standard 206, "Method of Testing for Rating of Multi-Purpose Heat Pumps for Residential Space Conditioning and Water Heating" works for these very complex systems.

Session 8B

Embassy B

Combi Systems II: Ratings and Other Limitations to the Market

Presenters: **Martin Thomas**, Natural Resources Canada
Tom Butcher, Brookhaven National Laboratory

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

Both new housing construction practices and present day retrofit measures are leading to more thermally efficient building envelopes and reductions to home space heating loads. At the same time, new water heating product lines with higher firing rates are becoming the dominant thermal engine in an increasing number of homes. Instead of continuing to specify two separate thermal engines—such as a separate gas-fired furnace and water heater—researchers, homebuilders and HVAC\domestic hot water equipment manufacturers are exploring more cost-effective packaging of space and water heating in a new generation of combination systems. High efficiency combination systems appear to be a good fit in many homes, what are the hurdles to increased market penetration for these systems. Presenters will discuss the hurdles that impact combi systems, including ratings and standards, verified installed performance, and utility program development.

Session 8C

Embassy F

Keeping Water Heaters Alive and Healthy

Presenters: **Jim Bridegum**, Sierra Nevada Industries
Larry Weingarten
Larry Brand, Gas Technology Institute

Moderator: **Larry Weingarten**

In this session Jim Bridegum, who has been in the water heating industry since 1963, will share his experience, observations and suggestions for keeping tank type heaters functioning well by controlling sediment/scale and using a novel way of preventing rusting in tanks. Larry Weingarten will discuss what he's found in the field, both in terms of equipment and how it's used. He'll share ideas on how we can cut costs and problems associated with hot water.

Monitoring the Hot Water System

Presenters: **Hugh Henderson**, CDH Energy Corporation
 Gabe Cohn, University of Washington, UbiComp Lab, SNUPI Technologies
 Jim Lutz, Lawrence Berkeley National Laboratory

Moderator: **Jim Lutz**, Lawrence Berkeley National Laboratory

Understanding what's happening in the hot water distribution system between the water heater and the end user is difficult. The talks at this panel will report on innovative techniques being developed to measure hot water distribution energy losses and water leaks.

DISPLAY TABLES

Please take time to visit the displays/exhibits located in the Embassy Lobby during the forum breaks, lunches and reception.

ACT Inc. D'MAND Kontrols® Systems
Jim Bridegum
EcoDrain
Enovative Group, Inc.
Fiorentini USA
Nuvoh2o
RenewABILITY Energy Inc.
Rheem Manufacturing
Sequentric
Hal Slater
Steffis Corporation
Vaughn Thermal Corporation

Thank you for coming!

Please remember to fill out the online conference evaluation by 11/26 at
<https://www.surveymonkey.com/s/2013HWF>.

- Notes -

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