

# RESIDENTIAL HEATING & COOLING

*Moderator: Jeff Ihnen, Michaels Energy*

## PAPERS:

### **Data – Kindling for Fire(places): Using Data to Inform Program Design for High Efficiency Gas Fireplaces**

Erika Kociolek, Energy Trust of Oregon  
Phil Degens, Energy Trust of Oregon  
Adam Shick, Energy Trust of Oregon  
Bob Davis, Ecotope  
Linda Dethman, Research Into Action

### **Impacts of the OPA HVAC Installation Optimization Training Program on Realized Energy Efficiency of Retrofit AC Systems**

Michael Sullivan, Nexant, Inc.  
Kausar Afrat, IESO  
Phil Bosco, IESO  
Jesse Smith, Nexant, Inc.

### **To Condense, or Not to Condense? Installation Practices Leave Boiler Savings on the Table**

Laura Tabor, Navigant  
Tony Larson, National Grid  
Justin Spencer, Navigant  
Ryan Tanner, Navigant  
Dave Korn, The Cadmus Group

### **The Coil & Blade Project: Combining Field Work and Interval Data to Measure Impacts**

Kelly Parmenter, Applied Energy Group  
Joe Priyanonda, Applied Energy Group  
Donney Dorton, Oklahoma Gas & Electric

## SESSION SUMMARY:

This session features four residential HVAC papers. The first paper features establishing market baselines and impacts for gas fireplace programs; the second features disaggregation techniques for a comprehensive O&M program for split-system cooling; and the last two cover new equipment installation best practices.

Ms. Kociolek's paper discusses three studies undertaken by Energy Trust of Oregon to answer questions and inform the design of its gas fireplace program. The gas fireplace measure began as a pilot in 2007, but as of 2013 comprised about 14% of the residential gas savings. Such quick growth since 2007 warranted study of market changes to determine if changes to program requirements or incentive levels were necessary. The first study of Oregon gas fireplace vendors revealed a significant decrease in the proportion of units sold with a standing pilot light and an increase in the efficiency of units sold. As a result, minimum fireplace efficiency levels and incentives were both increased, and the program was moved upstream to work with fireplace retailers. A metering study, including effects of alternate heat sources was conducted to determine whether or not the estimated savings for the fireplace measure were actually achieved.

Mr. Sullivan's paper discusses an HVAC Installation Optimization Training Program established by Independent Electricity System Operator (IESO) and whether participation in this training on installation practices helped to ensure that newly installed retrofit air conditioners achieved their design efficiency levels. The realized energy efficiency ratios (EER) for air conditioning systems were measured before and after installation 16,000 technicians received training. The results of the study demonstrated that efficiency of newly installed air conditioners is lost during installation, and that the training course emphasizing best installation practices does not correct the problem. Other program approaches to capture lost efficiency should be investigated.

Ms. Tabor's paper discusses an evaluation conducted to quantify natural gas savings associated with high-efficiency boilers installed through the Massachusetts High-Efficiency Heating Equipment Rebate Program. Results of the evaluation indicated that high-efficiency boilers were not operating as efficiently as possible, reducing savings potential, and suggested that best installation practices and improved education of contractors should improve the operating efficiency.

Finally, Ms. Parmenter's paper addresses the challenges to determining deemed savings for residential air conditioning tune-up programs. This includes a detailed assessment of each step in the tune-up process, including coil cleaning and filter replacement. Using measures and a customer base from the Home Energy Efficiency Program (HEEP) offered by Oklahoma Gas & Electric (OG&E), a multi-phase data collection protocol was designed to measure energy savings. The study evaluated incremental savings for each element of a comprehensive tune-up to determine which elements (e.g., condenser coil cleaning) garner the most savings. Tune-up elements include condenser coil cleaning and filter replacement, and evaporator coil and fan blade cleaning..