



New Frontiers in Residential Water Heating

Exploring Deeper Savings
CEE 6th Annual Industry Partners Meeting


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Thursday, October 1, 2009,
2:30 PM
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Ground Rules

- ▶ 100% Participation
- ▶ Punctuality
- ▶ Parking lot for off topic issues
- ▶ All ideas are valid and valued
- ▶ Meeting closure will outline next steps

This meeting will follow **CEE Guidelines for Program Meetings**

Today's Opportunity

- ▶ In 2010 Gas Committee efforts will continue to focus on getting efficient water heaters “on the truck”
 - Supporting member trade ally outreach
 -  COALITION FOR ENERGY STAR® WATER HEATERS
- ▶ We also need to look down the road. How can efficiency programs achieve further savings from water heating?

What are “New Frontiers”?

- ▶ Anything beyond incentives for replacing the water heater that may achieve energy savings
 - Behavior change approaches
 - Efficient plumbing system design
 - Other measures?
- ▶ Outcomes of today’s discussions will become inputs for further discussion on the Gas Committee

OUR MISSION

CEE increases the effectiveness of energy efficiency programs by enhancing communications and harmonizing approaches across programs to advance energy efficiency for the public benefit.

Criteria for CEE Initiatives

- ▶ Magnitude of savings opportunity
- ▶ Suitability for member programs
- ▶ Permanency and timing of savings
- ▶ Complexity of the marketplace
- ▶ Consistency in markets across regions
- ▶ Complexity of influencing decision makers
- ▶ National relevance vs. regionally concentrated savings
- ▶ Available resources

Behavioral Considerations and Approaches to Energy Savings

Kira Ashby, Program Manager



Efficient Plumbing System Design

Kara Rodgers, Senior Program Manager



What is the opportunity?

- ▶ The basic concept is that therms can be saved by paying more attention to how the plumbing system is laid out
- ▶ “Structured Plumbing” is one path to achieve this proposed by Gary Klein
- ▶ Other equipment may be relevant
 - Drainwater heat recovery
 - Recirculation pumps

Savings Potential – Structured Plumbing

Annual therms of Natural Gas used by*

All Residential Water Heating in the U.S.	10,800,000
A Standard efficiency gas water heater	258
A CEE Tier 1/ENERGY STAR Storage	242
A CEE Tier 2 Storage	224
A CEE Tier 3/ENERGY STAR Condensing Storage	187
A CEE Tankless/ENERGY STAR Tankless	183

Expected Savings on a per unit/per household basis

A Standard efficiency gas water heater	-
A CEE Tier 1/ENERGY STAR Storage	17
A CEE Tier 2 Storage	35
A CEE Tier 3/ENERGY STAR Condensing Storage	71
A CEE Tankless/ENERGY STAR Tankless	76
Advanced Plumbing Design	12

*2008 Buildings Energy Data Book, Table 2.1.5 and Calculated based on EF Test

Savings Potential – Drainwater Heat Recovery

- ▶ Field test in a commercial application in Vermont shows
 - Increased incoming water temperature by up to 25%
 - Up to 1500 therms saved per year in a single application

Opportunity Evaluation

- ▶ Could Voluntary Programs achieve the desired outcomes?
- ▶ What do efficiency program administrators need to demonstrate to their regulators to get this accepted?

Considerations for a Specification

- ▶ Technology neutral performance metric
- ▶ Estimation of savings on a per unit basis
- ▶ Indication and assurance of persistence or proof of compliance
 - i.e. the plumbers you train actually make use of this in the field

Programs need a decent basis of knowledge that paying an incentive for a measure will get the expected savings

GTI Project Activities for the California Energy Commission

- ▶ Integrated hot water generation and distribution system analysis tools
- ▶ Efficient water heating equipment and piping system designs and best practices guide
- ▶ Water heater standard test method/rating and building/energy code developments
- ▶ Water heating and venting equipment laboratory evaluations
- ▶ Water heater field performance monitoring and consumer behavior studies
- ▶ Advanced water heating system training for the plumbing trades and others

Parties involved in the CEC project

- ▶ Gas Technology Institute
 - Laboratory Testing
- ▶ Lawrence Berkeley National Laboratory
 - Tool creation and standards
- ▶ Davis Energy Group
 - Best Practices Guide Creation and codes
- ▶ Affiliated International Management and GreenPlumbers® USA
 - Outreach Projects

Contact

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