Residential Low Flow Faucet Aerators

Technology Description

This measure is for the replacement of a standard, 2.2 gallon per minute faucet aerator with a low-flow, 1.5 gallon per minute aerator in a residential kitchen or bathroom. Energy savings is achieved by lowering the flow of hot water used for hand washing and other activities, and by doing so reducing domestic water heater energy use.

Methodology and Assumptions

Energy savings for this measure is achieved by reducing hot water use. The savings was calculated using the following assumptions:

- Average daily hot water requirement of aerators = 3 minutes[1]
- Inlet water temperature = 57.8°F[2]
- Exit water temperature = 105°F (kitchen and bath)
- Existing gas water heater EF = 0.60[3]
- Average people per household = 2.55 people[4]

A comparison against the savings claimed for this measure under similar programs shows that the claimed savings is typical.[5]

Calculations

$Gallons_{Base} = GPM_{Base} * Minutes/Day * 365 * People/household$
$Gallons_{Proposed} = GPM_{Proposed} * Minutes/Day * 365 * People/household$
$Therm\ Savings = (Gal_{Base} - Gal_{Proposed}) * 8.33 * 1\ Btu/lb°F * \Delta T * / EF / 100,000$

Estimated Natural Gas Savings

An annual gross savings of 10.1 therms of natural gas per measure is calculated.

A net to gross factor of 94%[6] is assumed, resulting in a net natural gas savings of 9.5 therms per year.

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[1] PA Consulting Group, *Focus on Energy Evaluation, Residential Programs: CY09 Deemed Savings Review*, March 2010.
[2] Ohio Electric Utilities, *Technical Reference Manual (TRM) for Ohio Senate Bill 221"Energy Efficiency and Conservation Program" and 09-512-GE-UNC*, October 2009.
[3] LBL, Energy Efficiency Standards: Heating Products, http://ees.ead.lbl.gov/projects/current_projects/heating_products
[4] Focus on Energy Residential Deemed Savings Review, February 2009.
[5] The We-Energies DI program in Wisconsin claims 10 gross therms per aerator. The Focus on Energy program claims 11.1 therms per kitchen aerator and 6.3 therms per bathroom aerator. (2012)
[6] Navigant, *Energy Efficiency / Demand Response Plan: Plan Year 2, Evaluations Report:Summary Report*, Prepared for Commonwealth Edison Company, December 2010.

Measure Life

The measure life of residential low-flow aerators is 5 years[7]

Initial One-Time Cost

The average incremental cost for the low flow aerators is $5.25 per aerator.[8]

Requirements for Application

- This measure is only for homes with natural gas domestic water heaters
- The existing aerator must be rated at 1.75 gallons per minute or greater
- The direct-installed aerator must be rated at 1.5 GPM or lower

[7] Navigant, *Minnesota Gas Energy Efficiency Potential*, March 2009. http://www.state.mn.us/mn/externalDocs/Commerce/Minnesota_Gas_Energy_Efficiency_Potential_Study_082109014726_MinnesotaGasPotentialFinalReport.pdf

[8] Franklin Energy Services, past DI program cost data