

# Residential Low-Flow Showerheads - As of 02/29/12

## Technology Description

This measure is for the replacement of a standard, 2.5 gallon per minute showerhead with a low-flow, 1.75 gallon per minute showerhead. Energy savings is achieved by lowering the flow of hot water used for showering, and by doing so reducing domestic water heater energy use.

Both handheld and fixed showerheads are included under this measure.

## Methodology and Assumptions

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

Assumptions used in the original calculations include:

- Average shower length = 8.2 minutes<sup>1</sup>
- Inlet water temperature of 57.8°F<sup>2</sup>
- Exit water temperature of 105°F<sup>2</sup>
- Average people per household = 2.55 people<sup>2</sup>
- Existing gas water heater EF = 0.60<sup>3</sup>

## Calculations

$$\begin{aligned} \text{Gallons}_{\text{Base}} &= \text{GPM}_{\text{Base}} * \text{Minutes/Shower} * \text{Showers/Day} * 365 \\ \text{Gallons}_{\text{Proposed}} &= \text{GPM}_{\text{Proposed}} * \text{Minutes/Shower} * \text{Showers/Day} * 365 \\ \text{Therm Savings} &= (\text{Gal}_{\text{Base}} - \text{Gal}_{\text{Proposed}}) * 8.33 * 1 \text{ Btu/lb}^\circ\text{F} * \Delta T * / \text{EF} / 100,000 \end{aligned}$$

## Estimated Natural Gas Savings

An annual gross savings of 35.0 therms of natural gas per measure is calculated.

A net to gross factor of 93%<sup>4</sup> is used, resulting in a net natural gas savings of 32.6 therms per year.

## Measure Life

The measure life of residential DI low-flow showerheads is 7 years<sup>5</sup>

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<sup>1</sup> Navigant Consulting, Memo: *PY2 Default Savings Review for the All Electric Efficiency Upgrade Program*, January 2010.

<sup>2</sup> Ohio Electric Utilities, *Technical Reference Manual (TRM) for Ohio Senate Bill 221 "Energy Efficiency and Conservation Program" and 09-512-GE-UNC*, October 2009.

<sup>3</sup> Energy Efficiency Standards: Heating Products,  
[http://ees.ead.lbl.gov/projects/current\\_projects/heating\\_products](http://ees.ead.lbl.gov/projects/current_projects/heating_products)

<sup>4</sup> Navigant, *Energy Efficiency / Demand Response Plan: Plan Year 2, Evaluations Report: Summary Report*, Prepared for Commonwealth Edison Company, December 2010.

<sup>5</sup> *Minnesota Gas Energy Efficiency Potential Report*

### **Initial One-Time cost**

The average incremental cost for low-flow showerheads is \$21.75 per each.<sup>6</sup>

### **Requirements for Application**

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

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<sup>6</sup> Franklin Energy Services, past DI program cost data