

Tankless Water Heaters (Time of Sale, Retrofit – Early Replacement)

Official Measure Code (Measure Number: **X-X-X-X** (Program name, End Use))

Description

This measure covers the installation of a natural gas-fired tankless or instantaneous water heater. Tankless water heaters essentially function like normal water heaters without the storage tank. When there is demand for hot water, the gas burner fires and heats water as it passes through the heater to the demand source. Because the water heater must heat water at the rate of flow through the device, tankless water heaters are not well suited to serve sources of significant demand. Tankless water heaters achieve savings by eliminating the standby losses that occur in stand-alone or tank-type water heaters.

Definition of Efficient Equipment

The efficient case is a tankless natural gas-fired water heater exceeding the efficiency requirements as mandated by the International Energy Conservation Code (IECC) 2006, Table 504.2.

Definition of Baseline Equipment

The baseline condition is a gas-fired tank-type water heater meeting the efficiency requirements as mandated by the International Energy Conservation Code (IECC) 2006, Table 504.2.

Deemed Calculation for this Measure

Annual kWh Savings = 0
Summer Coincident Peak kW Savings = 0
Annual MMBtu Savings = $\frac{W}{8760} \times 8.33 \times (T_{out} - T_{in}) \times [(1/\eta_{base}) - (1/\eta_{ee})] \times (STBY_{base} \times 8760) / 1,000,000$

Deemed Lifetime of Efficient Equipment

20 years⁷⁰⁷

Deemed Measure Cost⁷⁰⁸

Full Installed Cost: \$871.74

Incremental Material Cost: \$433.72

Deemed O&M Cost Adjustments

\$9.60⁷⁰⁹

Coincidence Factor

n/a

⁷⁰⁷ CenterPoint Energy – Triennial CIP/DSM Plan 2010-2012 Report

⁷⁰⁸ 2008 Database for Energy-Efficiency Resources (DEER), Version 2008.2.05, "Cost Values and Summary Documentation", California Public Utilities Commission, December 16, 2008

⁷⁰⁹ CenterPoint Energy – Triennial CIP/DSM Plan 2010-2012 Report

REFERENCE SECTION

Calculation of Savings

Energy Savings

There are no expected energy savings associated with this measure

Summer Coincident Peak Demand Savings

There is no expected peak demand reduction associated with this measure.

Fossil Fuel Impact Descriptions and Calculation

$$\Delta \text{MMBtu} = W \times 8.33 \times (T_{\text{out}} - T_{\text{in}}) \times [(1/\eta_{\text{base}}) - (1/\eta_{\text{ee}})] \times (\text{STBY}_{\text{base}} \times 8760) / 1,000,000$$

Where:

- W = Annual water use for equipment (in gallons)
 = If actual water usage is unknown, assume 21,900⁷¹⁰
- 8.33 = weight in lbs of 1 gallon of water, or the Btus required to raise 1 gallon of water 1 °F
- T_{out} = water heater set point (°F) (demand temperature)
 = If unknown, assume 130 °F⁷¹¹
- T_{in} = water inlet temperature (°F)
 = If unknown, assume 50 °F⁷¹²
- η_{base} = rated efficiency of baseline water heater expressed as Energy Factor (EF) or Thermal Efficiency (E_t); see table below for values.

water heater, electric

Equipment Type	Size Category (Input)	Subcategory	Performance Required ⁷¹³ (η _{base} and STBY _{base})
Storage water heaters, Gas	≤ 75,000 Btu/h	≥ 20 gal	EF = 0.67 - 0.0019V
	> 75,000 Btu/h and ≤ 155,000 Btu/h	< 4,000 Btu/h/gal	E _t = 80%, STBY _{base} = (Q / 800 + 110/V)
	> 155,000 Btu/h	< 4,000 Btu/h/gal	E _t = 80%, STBY _{base} = (Q / 800 + 110/V)

- V = rated tank volume in gallons
 = Actual installed
- Q = nameplate input rate in Btu/hr
 = Actual installed
- η_{ee} = rated efficiency of efficient water heater expressed as Energy Factor (EF) or Thermal Efficiency (E_t)
 = Actual installed
- 1,000,000 = conversion factor (Btu/MMBtu)
- STBY_{base} = standby losses/hr of baseline water heater (Btu/hr); see table above for values.

Water Impact Descriptions and Calculation

n/a

Deemed O&M Cost Adjustment Calculation

n/a

⁷¹⁰ 60 gallons a day for 365 days per year

⁷¹¹ NAHB Research Center, (2002). *Performance Comparison of Residential Hot Water Systems*. Prepared for: National Renewable Energy Laboratory, Golden, Colorado.

⁷¹² NAHB Research Center, (2002). *Performance Comparison of Residential Hot Water Systems*. Prepared for: National Renewable Energy Laboratory, Golden, Colorado.

⁷¹³ International Energy Conservation Code (IECC 2006) 2006, Table 504.2, Minimum Performance of Water-Heating Equipment.

Version Date & Revision History

Draft:	Portfolio #
Effective date:	Date TRM will become effective
End date:	Date TRM will cease to be effective (or TBD)