



ENERGY STAR
Residential Water Heater Program

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Program Goal



Transform the residential water heater market to energy efficient technologies and achieve national energy savings

- 13% - 17% of national residential energy consumption
- ENERGY STAR had not yet addressed water heating
- New, more efficient technologies are available or on the way



Program Vitals

DOE's newest ENERGY STAR program

- Takes effect January 1, 2009
- Technologies included
 - High-Efficiency Gas Storage
 - Heat Pump
 - Whole-Home Tankless
 - Gas Condensing
 - Solar
- Criteria address energy efficiency, performance, safety, and reliability

Program Strategy



Criteria Development Considerations

- Electric, gas and solar are categorically unique in efficiency
- Each technology's criteria were based on its own merits
- Certain technologies have exclusive criteria
- Fuel/energy choice decided by consumer
- Ensure reliability, performance and safety



Technologies

Gas Condensing



HE Gas Storage



Heat Pump
Water
Heater



Solar



Gas Tankless





Technologies

High-Efficiency Gas Storage Criteria

- Minimum Energy Factor of 0.62
- Minimum First-Hour Rating of 67 gallons-per-hour
- Minimum 6-year warranty on tank and parts
- Safety compliance with ANSI Z21.10.1/CSA 4.1
- Criteria conform to the Consortium of Energy Efficiency (CEE) tiers for gas water heaters.
- Phased Criteria Change – September 1, 2010



Technologies

High-Efficiency Gas Storage

- Cost Efficient
 - 2.5 year payback (12-year lifetime)
 - 7.3% savings = 19 therms or \$26/year
- Ideal for emergency replacement of existing gas storage
- Installation and maintenance service infrastructure exists



Technologies

Heat Pump Water Heater Criteria

- Minimum Energy Factor of 2.0
- Minimum First-Hour Rating of 50 gallons-per-hour.
- Minimum 6-year warranty on tank and parts.
- Safety compliance with UL 174 and UL 1995.

Technologies



Heat Pump Water Heaters

- Cost Efficient
 - 3-year payback (12-year lifetime)
 - 55% Savings = 2,662 kWh or \$277/year
- Ideal for emergency replacement of existing electric storage as well as new construction
- GE announced it will introduce a heat pump water heater model to meet ENERGY STAR criteria
- Installation and maintenance service infrastructure will exist for products coming into market

Technologies



Gas Tankless Water Heater Criteria

- Minimum Energy Factor of 0.82
- Minimum gallons-per-minute (gpm) of 2.5 gpm at a 77°F rise.
- Minimum 10-year warranty on the heat exchanger and 5-year warranty on parts.
- Safety compliance with ANSI Z21.10.3/CSA 4.3.



Technologies

Gas Tankless Water Heaters

- Cost efficient in appropriate applications
 - 5.5-year payback (20-year lifetime)
 - 30% Savings = 78 therms or \$108/year
- Ideal for new construction and major remodeling jobs
- Current Market: 250,000+ shipments in 2006, 2.5%+ market share
 - Service infrastructure exists and is increasing
- Consumer demand has initiated market transformation up through supply chain.

Technologies



Gas Condensing Water Heater Criteria

- Minimum Energy Factor of 0.80
- Minimum First-Hour Rating of 67 gallons-per-hour.
- Minimum 8-year warranty on tank and parts.
- Safety compliance with ANSI Z21.10.1/CSA 4.1



Technologies

Gas Condensing Water Heaters

- Cost efficient in appropriate applications
 - 4 year payback (15-year lifetime)
 - 30% Savings = 187 therms or \$102/year
- Ideal for new construction and major remodeling jobs
- Products are in the process of reaching the market. Manufacturers anticipate product releases in 2009.
- Installation and maintenance service infrastructure will exist for products coming into market.

Technologies



Solar Water Heater Criteria

- Minimum Solar Fraction of 0.50.
- OG-300 certification from the SRCC.
- Warranty
 - Minimum 10-year warranty for the solar collector
 - Minimum 6-year warranty for the storage tank
 - Minimum 2-year warranty for the controls
 - Minimum 1-year warranty for the piping and parts.

Technologies



Solar Water Heaters

- Cost efficient in appropriate applications
 - 10-year payback (20-year lifetime)
 - 50% Savings = 130 therms or \$180/year, 2,430 kWh or \$252/year
 - Cost efficiency is dependent upon climate characteristics (sunshine)
- Ideal for new construction and major remodeling jobs
- Service infrastructure is typically associated with incentive programs
- 8,500-12,000 shipments per year, regionally associated with incentive programs

Technologies



Technology	Minimum Efficiency	Savings	Payback
HE Gas Storage	0.62 EF	~7.5% or 19 thm/yr	~2.5 years
Gas Tankless	0.82 EF	~30% or 78 thm/yr	~5.5-15 years
Gas Condensing	0.8 EF	~30% or 74 thm/yr	~4-9 years
Heat Pump	2.0 EF	~55% or 2,660 kWh/yr	~3 years
Solar (electric auxiliary)	0.5 SF	~50% or 2,430 kWh/yr	~10+ years
Solar (gas auxiliary)	0.5 SF	~50% or 131 thm/yr	~13+ years



Upcoming Milestones

- Signing up Manufacturers now
- Appliance Partner Meeting
Sept 21-24, Long Beach, CA
- Program marketing materials - Winter 09
 - ENERGY STAR Web Site
 - Partner Resource Guide
 - Program Design Guide for Efficiency Program Sponsors



Questions?

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<http://www.energystar.gov/waterheaters>