

Energy Consumption Overview

Residential Water Heating

Commercial Water Heating

Appendices

Market Characterization

Technologies

Economics

Energy Savings

Market Potential

Market Characterization

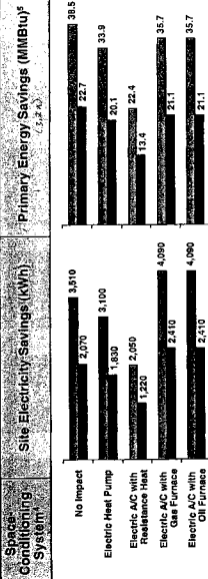
Technologies

Economics

Energy Savings

Market Potential

Typical Unit¹ Energy Impacts² Add-On HPWH Displacing³ NAECA Resistance Water Heater



¹ A "unit" is defined as a single household.

² Negative value indicates increase in energy consumption. Impacts of tank stand-by losses on space-conditioning loads are neglected. See Appendix D for calculations.

³ Not necessarily the product replaced. The product displaced is the product that would have been installed absent a joint industry/DOE program.

⁴ Assumed space-conditioning efficiencies: 10-SEER/7.4-HSPF electric Heat Pump; 10-SEER electric A/C; 80% AFUE Oil Furnace; 80% AFUE Gas Furnace. If the HPWH uses space-conditioned air as the heat source, it will impact space-conditioning loads. Hence, overall energy use will be dependent on the space-conditioning system. See Appendix D for calculations.

⁵ Based on national average, combined generation, transmission, and distribution efficiency of 10,949 Btu/kWh. Distribution losses for natural gas are neglected.

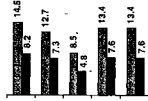
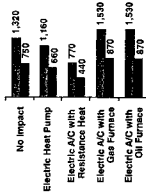
⁶ See Appendix A for discussion of water draws.

Typical Unit¹ Energy Impacts² Point-of-Use WH Displacing³ NAECA Resistance Water Heater

Space-Conditioning System⁴

Site Electricity Savings (kWh)

Primary Energy Savings (MMBtu)⁵



■ Med. Water Draws ■ High Water Draws⁶

¹ A "unit" is defined as a single household.

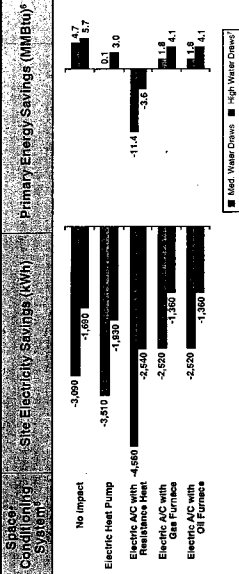
² Negative value indicates increase in energy consumption. Impacts of tank stand-by losses on space-conditioning loads are neglected. See Appendix D for calculations.

³ Not necessarily the product replaced. The product displaced is the product that would have been installed absent a joint industry/DOE program. Assumed space-conditioning efficiencies: 10-SEER/7.4-HSPF electric Heat Pump; 10-SEER electric A/C; 80% AFUE Oil Furnace; 80% AFUE Gas Furnace. If the HPWH uses space-conditioned air as the heat source, it will impact space-conditioning loads. Hence, overall energy use will be dependent on the space-conditioning system. See Appendix D for calculations.

⁴ Based on national average, combined generation, transmission, and distribution efficiency of 10,949 Btu/kWh. Distribution losses for natural gas are neglected.

⁵ See Appendix A for discussion of water draws.

Typical Unit¹ Energy Impacts² Add-On HPWH Displacing³ NAECA Gas Water Heater⁴



¹ A "unit" is defined as a single household.

² Negative value indicates increase in energy consumption. Impacts of tank stand-by losses on space-conditioning loads are neglected. See Appendix D for calculations.

³ Not necessarily the product replaced. The product displaced is the product that would have been installed absent a joint industry/DOE program.

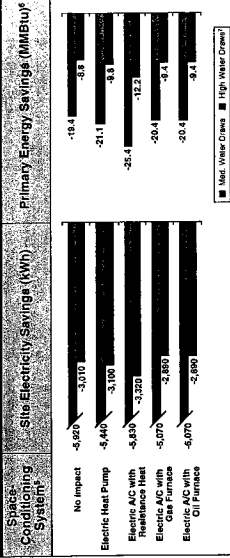
⁴ Space-conditioning impacts of gas-fired water heaters (i.e., increased infiltration associated with free convection through exhaust flues) are neglected.

⁵ Assumed space-conditioning efficiencies: 10-SEER/7.4-HSPF electric Heat Pump; 10-SEER electric AC; 80% AFUE electric AC; 80% AFUE Oil Furnace; 80% AFUE Gas Furnace. If the HPWH uses space-conditioned air as the heat source, it will impact space-conditioning loads. Hence, overall energy use will be dependent on the space-conditioning system. See Appendix D for calculations.

⁶ Based on national average, combined generation, transmission, and distribution efficiency of 10,949 Btu/kWh. Distribution losses for natural gas are neglected. See Appendix E.

⁷ See Appendix A for discussion of water draws.

Typical Unit¹ Energy Impacts² Point-of-Use WH Displacing³ NAECA Gas Water Heater⁴



¹ A "unit" is defined as a single household.

² Negative value indicates increase in energy consumption. Impacts of tank stand-by losses on space-conditioning loads are neglected. See Appendix D for calculations.

³ Not necessarily the product replaced. The product displaced is the product that would have been installed absent a Joint Industry/DOE program.

⁴ Space-conditioning impacts of gas-fired water heaters (i.e., increased infiltration associated with fire convection through exhaust flues) are neglected.

⁵ Assumed space-conditioning efficiencies: 10-SEER/7.4-HSPF electric Heat Pump; 10-SEER electric A/C; 80% AFUE Oil Furnace; 80% AFUE Gas Furnace. If the HPWH uses space-conditioned air as the heat source, it will impact space-conditioning loads. Hence, overall energy use will be dependent on the space-conditioning system. See Appendix D for calculations.

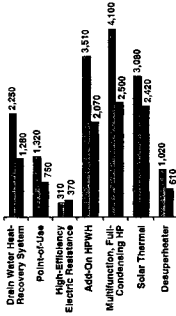
⁶ Based on national average, combined generation, transmission, and distribution efficiency of 10,948 Btu/kWh. Distribution losses for natural gas are neglected. See Appendix E.

⁷ See Appendix A for discussion of water draws.

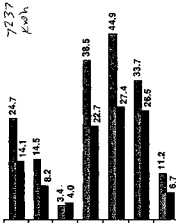
Typical Unit¹ Energy Savings With No Space Conditioning Impacts² Water Heating Technology Displacing³ NAECA Resistance Water Heater

Water Heating System

Site Electricity Savings (kWh)



Primary Energy Savings (MMBtu)



■ Med. Water Draws ■ High Water Draws⁴

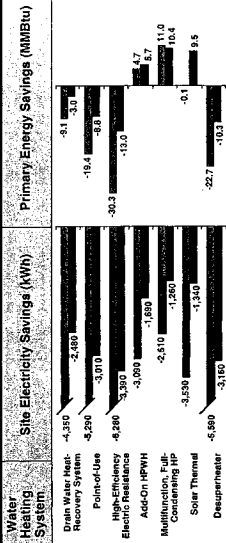
¹ A "unit" is defined as a single household.

² Negative value indicates increase in energy consumption. Impacts of tank stand-by losses on space-conditioning loads are neglected. See Appendix D for calculations.

³ Not necessarily the product replaced. The product displaced is the product that would have been installed absent a joint industry/DOE program.

⁴ See Appendix A for discussion of water draws.

**Typical Unit¹ Energy Savings With No Space Conditioning Impacts²
Water Heating Technology Displacing³ NAECA Resistance Water Heater**



1 A "unit" is defined as a single household.
 2 Negative value indicates increase in energy consumption. Impacts of tank stand-by losses on space-conditioning loads are neglected. See Appendix D for calculations.
 3 Not necessarily the product replaced. The product displaced is the product that would have been installed absent a joint Industry/DOE program.
 4 See Appendix A for discussion of water draws.

Energy Consumption Overview

Residential Water Heating

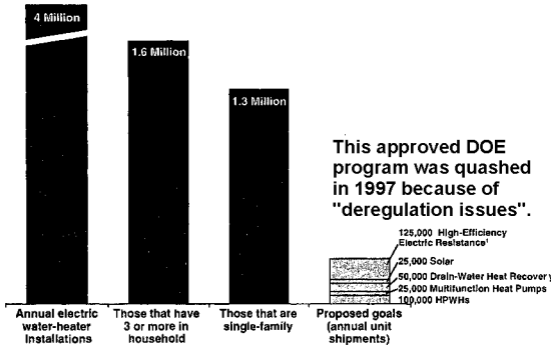
Market Characterization
Technologies
Economics
Energy Savings
Market Potential

Commercial Water Heating

Market Characterization
Technologies
Economics
Energy Savings
Market Potential

Appendices

Proposed program goals are based on realistic market penetrations.



¹Includes standard-efficiency resistance with time-of-day controls, in applications where they can be shown to achieve at least 8-10% primary energy savings.