

Assumptions to the Annual Energy Outlook 2007

Table 7. 2001 Households

Census Division	Single-family Units	Multiple family Units	Mobile Home	Total Units
New England	3,491,245	1,750,832	164,920	5,406,997
Mid Atlantic	8,517,861	5,841,068	487,669	14,846,598
East North Central	12,434,352	3,823,487	833,176	17,091,015
West North Central	5,847,681	1,165,884	386,829	7,400,394
South Atlantic	14,789,885	3,994,812	1,503,227	20,287,924
East South Central	5,082,656	881,661	853,964	6,818,281
West South Central	8,714,591	2,191,011	896,583	11,802,185
Mountain	4,631,584	1,334,829	758,618	6,725,031
Pacific	10,154,346	5,509,759	921,178	16,585,283
	0	0	0	0
United States	73,664,201	26,493,343	6,806,164	106,963,708

Source: U.S. Department of Energy, Energy Information Administration, 2001 Residential Energy Consumption Survey.

Table 8. Installed Cost and Efficiency Ratings of Selected Equipment

Equipment Type	Relative Performance ¹	2004 Installed Cost (\$2004) ²	Efficiency ³	2020 Installed Cost (\$2004) ²	Efficiency ³	Approximate Hurdle Rate
Electric Heat Pump	Minimum	\$3,800	10.0	\$4,150	13.0	15%
	Best	\$7,000	18.6	\$7,000	18.8	
Natural Gas Furnace	Minimum	\$1,500	0.80	\$1,500	0.80	15%
	Best	\$2,000	0.97	\$2,000	0.97	
Room Air Conditioner	Minimum	\$387	9.8	\$387	9.8	140%
	Best	\$760	11.7	\$800	12.0	
Central Air Conditioner	Minimum	\$2,000	10.0	\$2,500	13.0	15%
	Best	\$6,000	19.5	\$6,000	20.0	
Refrigerator (23.9 cubic ft in adjusted volume)	Minimum	\$600	510	\$600	510	19%
	Best	\$650	432	\$650	400	
Electric Water Heater	Minimum	\$350	0.90	\$350	0.90	83%
	Best	\$1,800	2.4	\$1,800	2.4	
Solar Water Heater	N/A	\$2,867	2.0	\$2,200	2.0	83%

¹Minimum performance refers to the lowest efficiency equipment available. Best refers to the highest efficiency equipment available.

²Installed costs are given in 2004 dollars in the original source document.

³Efficiency measurements vary by equipment type. Electric heat pumps and central air conditioners are rated for cooling performance using the Seasonal Energy Efficiency Ratio (SEER); natural gas furnaces are based on Annual Fuel Utilization Efficiency; room air conditioners are based on Energy Efficiency Ratio (EER); refrigerators are based on kilowatt-hours per year; and water heaters are based on Energy Factor (delivered Btu divided by input Btu).

Source: Navigant Consulting, EIA Technology Forecast Updates, Reference Number 117943, September 2004.

Table 9. Capital Cost and Performance Parameters of Residential Distributed Generation Technologies

Technology Type	Year of Introduction	Average Generating Capacity (kW)	Electrical Efficiency	Combined Efficiency (Elec. + Thermal)	Installed Capital Cost (\$2003 per KW of Capacity) ¹	Service Life Years
Solar Photovoltaic						
	2005	2.0	0.16	N/A	\$8,577	30
	2010	2.5	0.18	N/A	\$6,944	30
	2015	3.0	0.20	N/A	\$5,310	30
	2020	3.0	0.22	N/A	\$4,627	30
	2030	4.0	0.25	N/A	\$3,840	30
Fuel Cell						
	2005	10	0.30	0.696	\$11,293	20
	2010	10	0.32	0.699	\$7,802	20
	2015	10	0.335	0.705	\$6,160	20
	2020	10	0.350	0.712	\$4,517	20
	2030	10	0.360	0.723	\$2,669	20

¹Installed costs are given in 2003 dollars in the original source document.

Source: Solar Technology Specifications: Solar Energy Industries Association, *Our Solar Power Future - The U.S. Photovoltaic Industry Roadmap through 2030 and Beyond* (SEIA, September 2004). Fuel cells: Discovery Insights, LLC, *"Installed Costs for Small CHP Systems - Estimates and Projections"* (April 2005).

Table 10. Minimum and Maximum Life Expectancies of Equipment

Equipment	Minimum Life	Maximum Life
Heat Pumps	7	21
Central Forced-Air Furnaces	10	25
Hydronic Space Heaters	20	30
Room Air Conditioners	8	16
Central Air Conditioners	7	21
Gas Water Heaters	4	14
Electric Water Heaters	5	22
Cooking Stoves	16	21
Clothes Dryers	11	20
Refrigerators	7	26
Freezers	11	31

Source: Lawrence Berkeley Laboratory, *Baseline Data for the Residential Sector and Development of a Residential Forecasting Database*, May 1994, and analysis of RECS 2001 data.