

**Table A6. Approximate Heat Rates for Electricity, and Heat Content of Electricity, Selected Years, 1949-2011**  
(Btu per Kilowatthour)

Year	Approximate Heat Rates <sup>1</sup> for Electricity Net Generation					Nuclear <sup>8</sup>	Noncombustible Renewable Energy <sup>7,9</sup>	Heat Content <sup>10</sup> of Electricity <sup>11</sup>
	Fossil Fuels <sup>2</sup>				Total Fossil Fuels <sup>6,7</sup>			
	Coal <sup>3</sup>	Petroleum <sup>4</sup>	Natural Gas <sup>5</sup>					
1949	NA	NA	NA	15,033	--	15,033	3,412	
1950	NA	NA	NA	14,030	--	14,030	3,412	
1955	NA	NA	NA	11,699	--	11,699	3,412	
1960	NA	NA	NA	10,760	11,629	10,760	3,412	
1965	NA	NA	NA	10,453	11,804	10,453	3,412	
1970	NA	NA	NA	10,494	10,977	10,494	3,412	
1975	NA	NA	NA	10,406	11,013	10,406	3,412	
1976	NA	NA	NA	10,373	11,047	10,373	3,412	
1977	NA	NA	NA	10,435	10,769	10,435	3,412	
1978	NA	NA	NA	10,361	10,941	10,361	3,412	
1979	NA	NA	NA	10,353	10,879	10,353	3,412	
1980	NA	NA	NA	10,388	10,908	10,388	3,412	
1981	NA	NA	NA	10,453	11,030	10,453	3,412	
1982	NA	NA	NA	10,454	11,073	10,454	3,412	
1983	NA	NA	NA	10,520	10,905	10,520	3,412	
1984	NA	NA	NA	10,440	10,843	10,440	3,412	
1985	NA	NA	NA	10,447	10,622	10,447	3,412	
1986	NA	NA	NA	10,446	10,579	10,446	3,412	
1987	NA	NA	NA	10,419	10,442	10,419	3,412	
1988	NA	NA	NA	10,324	10,602	10,324	3,412	
1989	NA	NA	NA	10,432	10,583	10,432	3,412	
1990	NA	NA	NA	10,402	10,582	10,402	3,412	
1991	NA	NA	NA	10,436	10,484	10,436	3,412	
1992	NA	NA	NA	10,342	10,471	10,342	3,412	
1993	NA	NA	NA	10,309	10,504	10,309	3,412	
1994	NA	NA	NA	10,316	10,452	10,316	3,412	
1995	NA	NA	NA	10,312	10,507	10,312	3,412	
1996	NA	NA	NA	10,340	10,503	10,340	3,412	
1997	NA	NA	NA	10,213	10,494	10,213	3,412	
1998	NA	NA	NA	10,197	10,491	10,197	3,412	
1999	NA	NA	NA	10,226	10,450	10,226	3,412	
2000	NA	NA	NA	10,201	10,429	10,201	3,412	
2001	10,378	10,742	10,051	10,333	10,443	10,333	3,412	
2002	10,314	10,641	9,533	10,173	10,442	10,173	3,412	
2003	10,297	10,610	9,207	10,241	10,421	10,241	3,412	
2004	10,331	10,571	8,647	10,022	10,427	10,022	3,412	
2005	10,373	10,631	8,551	9,999	10,436	9,999	3,412	
2006	10,351	10,809	8,471	9,919	10,436	9,919	3,412	
2007	10,375	10,794	8,403	9,884	10,485	9,884	3,412	
2008	10,378	11,015	8,305	9,854	10,453	9,854	3,412	
2009	10,414	10,923	8,160	9,760	10,460	9,760	3,412	
2010	10,415	10,984	8,185	<sup>R</sup> 9,756	<sup>R</sup> 10,452	<sup>R</sup> 9,756	3,412	
2011	<sup>E</sup> 10,415	<sup>E</sup> 10,984	<sup>E</sup> 8,185	<sup>E</sup> 9,756	<sup>E</sup> 10,452	<sup>E</sup> 9,756	3,412	

<sup>1</sup> The values in columns 1-6 of this table are for net heat rates. See "Heat Rate" in Glossary.  
<sup>2</sup> Through 2000, heat rates are for fossil-fueled steam-electric plants at electric utilities. Beginning in 2001, heat rates are for all fossil-fueled plants at electric utilities and electricity-only independent power producers.  
<sup>3</sup> Includes anthracite, bituminous coal, subbituminous coal, lignite, and, beginning in 2002, waste coal and coal synfuel.  
<sup>4</sup> Includes distillate fuel oil, residual fuel oil, jet fuel, kerosene, petroleum coke, and waste oil.  
<sup>5</sup> Includes natural gas and supplemental gaseous fuels.  
<sup>6</sup> Includes coal, petroleum, natural gas, and, beginning in 2001, other gases (blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels).  
<sup>7</sup> The fossil-fuels heat rate is used as the thermal conversion factor for electricity net generation from noncombustible renewable energy (hydro, geothermal, solar thermal, photovoltaic, and wind) to approximate the quantity of fossil fuels replaced by these sources. Through 2000, also used as the thermal

conversion factor for wood and waste electricity net generation at electric utilities; beginning in 2001, Btu data for wood and waste at electric utilities are available from surveys.  
<sup>8</sup> Used as the thermal conversion factor for nuclear electricity net generation.  
<sup>9</sup> Technology-based geothermal heat rates are no longer used in Btu calculations in this report. For technology-based geothermal heat rates for 1960-2010, see the *Annual Energy Review 2010*, Table A6.  
<sup>10</sup> See "Heat Content" in Glossary.  
<sup>11</sup> The value of 3,412 Btu per kilowatthour is a constant. It is used as the thermal conversion factor for electricity retail sales, and electricity imports and exports.  
R=Revised. E=Estimate. NA=Not available. -- =Not applicable.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#appendices> for updated annual conversion factors. • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all annual data beginning in 1949.  
Sources: See "Thermal Conversion Factor Source Documentation," which follows this table.