

Appendix C

Thermal Conversion Factors

Table C1. Approximate Heat Content of Petroleum and Coal and Heat Rates for Electricity, 1960-1999

Year	Petroleum Consumption			Anthracite Consumption			Bituminous Coal and Lignite Consumption ^a (BCTCKUS)	Electricity Net Generation		
	Liquefied Petroleum Gases (LGTCKUS)	Motor Gasoline (MGTCKUS)	Total Petroleum Products ^a (PATCKUS)	Sectors Other Electric (ACNUKUS)	Electric Utilities (ACEUKUS)	Total ^a (ACTCKUS)		Fossil-Fueled Steam-Electric Plants ^b (FFEOKUS)	Nuclear Steam-Electric Plants (NUEOKUS)	Geothermal Energy Plants (GEEOKUS)
	Million Btu per Barrel			Million Btu per Short Ton				Btu per Kilowatthour		
1960	4.011	5.253	5.55503	24.721	17.500	23.592	24.765	10,760	11,629	23,200
1961	4.011	5.253	5.55163	24.870	17.500	23.707	24.693	10,650	11,629	23,200
1962	4.011	5.253	5.54496	24.666	17.500	23.515	24.668	10,558	11,629	23,200
1963	4.011	5.253	5.53379	24.110	17.500	23.107	24.639	10,482	11,877	22,182
1964	4.011	5.253	5.52758	24.164	17.500	23.128	24.652	10,462	11,912	22,182
1965	4.011	5.253	5.53200	24.316	17.500	23.175	24.575	10,453	11,804	22,182
1966	4.011	5.253	5.53178	24.193	17.500	22.906	24.431	10,415	11,623	22,182
1967	3.838	5.253	5.51469	23.506	17.500	22.291	24.287	10,432	11,555	21,770
1968	3.818	5.253	5.50368	23.293	17.500	22.037	24.229	10,398	11,297	21,606
1969	3.805	5.253	5.49220	23.200	17.500	22.003	24.011	10,447	11,037	21,606
1970	3.779	5.253	5.50317	23.476	17.500	22.102	23.461	10,494	10,977	21,606
1971	3.772	5.253	5.50449	23.572	17.500	22.210	23.138	10,478	10,837	21,655
1972	3.760	5.253	5.50004	23.403	17.500	21.822	23.050	10,379	10,792	21,668
1973	3.746	5.253	5.51461	22.674	17.920	21.464	23.073	10,389	10,903	21,674
1974	3.730	5.253	5.50388	22.330	17.200	20.919	22.694	10,442	11,161	21,674
1975	3.715	5.253	5.49427	22.272	17.064	20.762	22.522	10,406	11,013	21,611
1976	3.711	5.253	5.50448	22.618	17.526	21.254	22.509	10,373	11,047	21,611
1977	3.677	5.253	5.51825	24.101	17.244	22.066	22.266	10,435	10,769	21,611
1978	3.669	5.253	5.51865	24.388	17.104	22.398	22.014	10,361	10,941	21,611
1979	3.680	5.253	5.49383	24.272	17.454	22.069	22.100	10,353	10,879	21,545
1980	3.674	5.253	5.47933	22.719	17.652	21.405	21.950	10,388	10,908	21,639
1981	3.643	5.253	5.44818	23.749	18.168	22.080	21.710	10,453	11,030	21,639
1982	3.615	5.253	5.41514	24.578	18.160	22.518	21.670	10,454	11,073	21,629
1983	3.614	5.253	5.40567	24.536	16.516	21.583	21.576	10,520	10,905	21,290
1984	3.599	5.253	5.39530	25.128	17.018	22.322	21.570	10,440	10,843	21,303
1985	3.603	5.253	5.38744	23.031	16.784	20.817	21.368	10,447	10,813	21,263
1986	3.640	5.253	5.41832	24.399	15.578	21.512	21.462	10,446	10,799	21,263
1987	3.659	5.253	5.40281	26.293	15.962	22.435	21.514	10,419	10,776	21,263
1988	3.652	5.253	5.41017	26.021	17.312	22.423	21.324	10,324	10,743	21,096
1989	3.683	5.253	5.40967	27.196	16.310	22.623	21.268	10,432	10,724	21,096
1990	3.625	5.253	5.41084	25.199	16.140	21.668	21.330	10,402	10,680	21,096
1991	3.614	5.253	5.38408	25.268	15.858	21.410	21.146	10,436	10,740	20,997
1992	3.624	5.253	5.37773	24.617	16.944	21.423	21.142	10,342	10,678	20,914
1993	3.606	5.253	5.37911	24.096	16.534	21.262	20.983	10,309	10,682	20,914
1994	3.635	^c 5.230	5.36097	25.037	14.680	20.828	21.011	10,316	10,676	20,914
1995	3.623	5.215	5.34138	24.696	14.572	20.808	20.845	10,312	10,658	20,914
1996	3.613	5.216	5.33638	24.638	14.360	20.652	20.857	10,340	10,623	20,960
1997	3.616	5.213	5.33598	24.497	15.022	20.878	20.861	10,357	10,623	20,960
1998	3.614	5.212	5.34900	24.497	15.022	20.878	20.861	10,346	10,623	21,017
1999	3.616	5.211	5.32807	24.497	15.022	20.878	20.861	10,346	10,623	21,017

^a This factor is not actually applied in CSEDS but is displayed here for information.

^b This factor is the average for electricity generated at U.S. fossil-fueled steam-electric plants. In CSEDS, it is applied to convert hydroelectricity, electricity generated for distribution from wood, waste, wind, photovoltaic, and solar thermal energy, and imports and exports of electricity produced at hydroelectric and conventional power

plants.

^c There is a discontinuity in this time series between 1993 and 1994; beginning in 1994, the single constant factor is replaced by a factor that is a quantity-weighted average of motor gasoline's major components.

Sources: See source listing at the end of this appendix.

Table C2. Approximate Heat Content of Natural Gas Consumed by Electric Utilities, 1960-1985, Selected Years
(Thousand Btu per Cubic Foot)

State	1960	1965	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Alabama	1.03500	1.03400	1.03100	1.03300	1.15300	1.18200	1.12600	1.12100	1.13300	1.13400	1.12500	1.10300	1.12400	1.09900
Alaska	—	1.01000	1.00500	1.00600	1.00600	1.00600	1.00600	1.00600	1.00600	1.00500	1.00600	1.00600	1.00600	1.00600
Arizona	1.03500	1.07600	1.05900	1.07100	1.07200	1.06600	1.06400	1.05700	1.05700	1.04900	1.05100	1.04200	1.05100	1.05900
Arkansas	1.03500	1.00100	1.00400	1.01100	1.01300	1.05100	1.05300	1.02600	1.02600	1.03200	1.03200	1.03500	1.03700	1.05500
California	1.03500	1.07300	1.05400	1.06300	1.06100	1.05900	1.06000	1.05500	1.05200	1.05500	1.05300	1.04800	1.05000	1.05100
Colorado	1.03500	0.91200	0.97400	0.99600	0.99200	0.98800	0.99200	0.98200	0.98100	0.97500	0.96400	0.98900	0.98800	0.98900
Connecticut	1.03500	1.02200	1.01600	1.00500	1.00800	—	—	—	—	—	—	—	1.02800	1.03100
Delaware	1.03500	1.04300	1.02000	1.07300	1.07800	1.10300	1.07000	1.04300	1.04200	1.03600	1.03300	1.03500	1.03900	1.03800
District of Columbia	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Florida	1.03500	1.03700	1.04100	1.00900	1.01400	1.01900	1.02400	1.02000	1.01500	1.01300	1.01400	1.01100	1.01100	1.01100
Georgia	1.03500	1.04000	1.03100	1.02900	1.02900	1.02600	1.02600	1.09700	1.03500	1.02700	1.02800	1.02500	1.02300	1.02400
Hawaii	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Idaho	—	—	—	1.05300	1.05900	1.05600	1.04800	1.04200	1.03700	1.08700	1.07500	1.04700	1.04500	1.04900
Illinois	1.03500	1.02900	1.02500	1.02900	1.02800	1.02800	1.02800	1.02100	1.02400	1.02300	1.02400	1.02900	1.03100	1.02700
Indiana	1.03500	0.99900	1.00600	1.00000	1.00300	1.00800	1.00100	1.00200	1.00400	1.00200	1.00200	1.00200	1.00300	1.00500
Iowa	1.03500	1.01000	1.00900	1.00800	1.01100	1.01200	1.02100	1.00900	1.00800	1.00700	1.01900	1.02700	1.03500	1.02100
Kansas	1.03500	0.99500	0.99800	0.99100	0.98200	0.98000	0.96800	0.96200	0.96000	0.96200	0.95600	0.95300	0.97500	0.96800
Kentucky	1.03500	1.02800	1.01700	1.01700	1.01800	1.02000	1.02400	1.02300	1.02400	1.02400	1.02400	1.02300	1.02400	1.02400
Louisiana	1.03500	1.04200	1.02900	1.05900	1.06100	1.05300	1.05600	1.04700	1.04100	1.04100	1.04600	1.04900	1.04800	1.04700
Maine	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Maryland	1.03500	1.02500	1.02200	0.94300	0.94600	0.99800	1.06200	1.07600	1.02300	1.01500	1.02500	1.02500	1.02500	1.02500
Massachusetts	1.03500	1.01300	1.01200	1.00200	1.00100	1.00000	1.00000	1.00100	1.00000	1.00000	1.04800	1.05400	1.06000	1.03900
Michigan	1.03500	1.01400	1.01500	0.83400	0.76700	0.69800	0.77400	0.67700	0.73700	0.65300	0.66200	0.21300	0.59200	0.46000
Minnesota	1.03500	0.99800	1.00200	0.98400	0.97200	0.97200	0.92800	0.99200	0.99400	0.99400	0.99900	1.01100	1.00100	1.00200
Mississippi	1.03500	1.02900	1.02500	1.03000	1.01600	1.02000	1.00900	1.00900	1.01700	1.01600	1.02200	1.02900	1.02700	1.03900
Missouri	1.03500	1.02000	1.00700	0.97700	0.97400	0.97300	0.97400	0.97600	0.97900	0.98600	1.02200	0.99500	0.99800	0.99200
Montana	1.03500	1.00100	1.03200	1.14900	1.19200	1.17300	1.14600	1.08400	1.04900	1.07500	1.17300	1.19700	1.17900	1.20400
Nebraska	1.03500	0.99100	1.00800	0.98200	0.97100	0.96700	0.96800	0.95400	0.95000	0.94200	0.98200	0.94900	0.94800	0.95700
Nevada	1.03500	1.06200	1.08200	1.06700	1.06800	1.06300	1.07700	1.06400	1.07100	1.07500	1.06800	1.06300	1.06000	1.06500
New Hampshire	—	—	—	1.00000	1.00000	1.00000	—	1.00000	—	1.02500	—	1.02500	1.02700	—
New Jersey	1.03500	1.04500	1.02600	1.02800	1.02900	1.02800	1.03000	1.03900	1.03400	1.03600	1.03300	1.03700	1.03600	1.04600
New Mexico	1.03500	1.10800	1.08300	1.03300	1.02900	1.02800	1.04200	1.03400	1.02900	1.02900	1.02100	0.99200	0.99600	1.01300
New York	1.03500	1.02600	1.02100	1.02500	1.02500	1.02800	1.02900	1.03000	1.03600	1.03200	1.03000	1.03100	1.03300	1.03500
North Carolina	1.03500	1.03300	1.02400	1.03100	1.03300	1.03300	1.03300	1.03000	1.03400	1.03500	1.03300	1.03300	1.03300	1.03300
North Dakota	1.03500	1.00000	1.03100	1.05400	1.05400	1.05400	1.05400	1.05400	1.05400	1.05400	1.05400	1.05400	1.05400	1.05400
Ohio	1.03500	1.03300	1.02300	0.86400	0.82500	0.69600	0.65300	0.86200	1.00400	1.01000	1.01400	1.01100	1.01400	1.01400
Oklahoma	1.03500	1.02600	1.03200	1.03800	1.04200	1.04600	1.04800	1.05000	1.04800	1.04700	1.04500	1.05100	1.04000	1.04400
Oregon	1.03500	1.07000	1.04500	1.03700	1.03500	1.04200	—	1.04600	0.99800	1.04700	0.99000	0.99000	0.99000	—
Pennsylvania	1.03500	1.03800	1.03300	1.00000	1.00000	1.00000	1.00000	1.00400	1.02000	1.01500	1.00900	1.00000	1.00000	1.00000
Rhode Island	1.03500	1.04200	1.02100	1.04200	1.04200	—	—	1.04600	1.02200	1.02200	1.02000	1.03900	1.03000	1.03400
South Carolina	1.03500	1.04200	1.02800	1.02800	1.02800	1.02800	1.04800	1.07600	1.03000	1.02300	1.02900	1.02600	1.02700	1.02900
South Dakota	1.03500	0.99700	1.00400	1.00000	0.99600	0.99000	0.92800	0.98300	0.98800	0.99300	0.94800	1.01100	1.01100	1.01000
Tennessee	1.03500	1.04600	1.02200	—	1.02900	—	—	—	1.01600	1.01600	—	1.02300	—	—
Texas	1.03500	1.03700	1.02700	1.01900	1.01800	1.02600	1.03300	1.03800	1.03700	1.03000	1.03300	1.02400	1.03000	1.03600
Utah	1.03500	0.92500	0.93800	0.94100	0.95200	0.94500	0.95100	0.96300	0.95500	0.93200	0.94000	0.94100	1.03000	1.07500
Vermont	—	—	—	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Virginia	1.03500	1.03100	1.02600	1.09800	1.09100	1.17400	1.21800	1.10100	1.10400	1.09700	1.08100	1.04600	1.04100	1.04000
Washington	—	—	—	—	—	—	1.03000	1.03000	1.03000	1.03100	1.03300	1.03300	1.03300	1.03300
West Virginia	1.03500	1.07100	1.02900	0.57500	0.68300	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Wisconsin	1.03500	1.01800	1.01900	1.01600	1.01400	1.01400	1.00500	1.01000	1.00700	1.00800	1.01200	0.99100	0.99200	1.00000
Wyoming	1.03500	0.92600	1.02300	0.84300	0.84300	0.85400	0.83700	0.84700	0.84700	0.85500	0.84700	1.03900	1.04700	1.04800
U.S. Average	1.03500	1.03765	1.02944	1.02341	1.02345	1.02841	1.03289	1.03263	1.03313	1.03258	1.03396	1.02794	1.03332	1.03706

— =Not applicable.
Sources: See source listing at the end of this appendix.

Table C3. Approximate Heat Content of Natural Gas Consumed by Electric Utilities, 1986-1999
(Thousand Btu per Cubic Foot)

State	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Alabama	1.09100	1.05400	1.03900	1.03000	1.03000	1.02200	1.02100	1.01600	1.01100	1.01600	1.02400	1.03100	1.04400	1.01100
Alaska	1.00600	1.00600	1.00600	1.00600	1.00600	1.00100	1.00000	0.99900	0.99900	1.00200	1.00100	1.00000	1.00000	1.00000
Arizona	1.04400	1.03400	1.03400	1.03500	1.03400	1.02700	1.03100	1.02700	1.02300	1.02200	1.01500	1.01400	1.01400	1.01100
Arkansas	1.05300	1.03100	1.02900	1.01900	1.01800	1.02000	1.02500	1.02900	1.02400	1.02300	1.02400	1.02900	1.02300	1.02200
California	1.04500	1.03800	1.03600	1.04000	1.03300	1.02800	1.03300	1.03000	1.02900	1.02700	1.02600	1.01900	1.01800	1.00600
Colorado	0.99400	0.98800	0.98500	0.97700	0.98800	0.99500	1.00000	1.01200	1.04200	1.00800	0.99800	0.99500	0.99400	1.03200
Connecticut	1.03600	1.03100	1.03100	1.03000	1.03300	1.03300	1.03100	1.03200	1.01700	1.01700	1.01900	1.01900	1.03000	1.02500
Delaware	1.04600	1.03600	1.07200	1.07500	1.05400	1.05200	1.03700	1.03300	1.03700	1.03200	1.03400	1.03500	0.97100	0.98300
District of Columbia	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Florida	1.00800	1.00800	1.00800	1.01000	1.01100	1.01400	1.01100	1.00900	1.01000	1.01000	1.00800	1.04400	1.05300	1.04400
Georgia	1.02400	1.02300	1.02300	1.02400	1.02400	1.02500	1.02400	1.02300	1.02500	1.02400	1.02400	1.02400	1.02800	1.03200
Hawaii	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Idaho	1.02100	1.01700	—	—	—	—	—	—	—	—	—	—	—	—
Illinois	1.02600	1.02500	1.02100	1.01700	1.02100	1.01800	1.01600	1.01600	1.02200	1.01600	1.02000	1.01600	1.01900	1.02200
Indiana	1.00600	1.00500	1.00200	1.00200	1.00200	1.00100	1.00100	1.01300	1.02300	1.02100	1.02100	1.02100	1.02500	1.02600
Iowa	1.01700	1.00700	1.00700	1.00700	1.00600	1.00400	1.00400	1.00600	1.00600	1.00500	1.00300	1.00300	1.00300	1.00400
Kansas	0.96900	0.98800	0.99300	0.97100	0.99000	0.96800	0.97000	0.97500	0.98300	0.98000	0.97300	0.97800	1.00100	1.01000
Kentucky	1.02200	1.02100	1.02300	1.02100	1.02000	1.02000	1.02000	1.02000	1.02100	1.02200	1.02200	1.02300	1.02400	1.02500
Louisiana	1.04400	1.04300	1.04500	1.04400	1.04500	1.04200	1.04300	1.04300	1.04600	1.04300	1.04300	1.03600	1.04300	1.03900
Maine	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Maryland	1.05800	1.04300	1.04200	1.04500	1.04200	1.04600	1.04500	1.04100	1.04300	1.03900	1.04100	1.04100	1.04700	1.04000
Massachusetts	1.02900	1.02600	1.02900	1.04800	1.05200	1.04100	1.03200	1.03400	1.03700	1.02600	1.03700	1.03300	1.02900	1.02600
Michigan	0.34600	0.40400	0.16100	0.10800	0.22400	0.38900	0.41400	0.37900	0.40300	0.36500	0.27400	0.31000	0.54200	0.60800
Minnesota	0.99900	0.99800	1.00300	1.00500	1.00300	1.00800	1.00800	1.00800	1.00500	1.00600	1.00300	1.00400	1.00800	1.01100
Mississippi	1.03800	1.02800	1.02600	1.02500	1.03600	1.02500	1.02900	1.02200	1.04300	1.03900	1.03800	1.03600	1.03900	1.02700
Missouri	0.98300	0.99000	0.99400	1.01600	1.01800	1.01400	1.00800	1.00800	1.00000	1.00600	1.01100	1.00600	1.01100	1.00300
Montana	1.20100	1.20500	1.20800	1.21300	1.21800	1.19400	1.20600	1.16500	1.05500	1.07300	1.07500	1.07100	1.07200	1.09100
Nebraska	0.97100	0.97700	0.95400	0.95900	0.94600	0.94200	0.95900	0.97600	0.98700	0.99800	1.00400	0.99800	0.98900	0.99500
Nevada	1.05300	1.03500	1.02700	1.02700	1.03100	1.02400	1.02500	1.02900	1.03300	1.02900	1.02900	1.02900	1.03400	1.03700
New Hampshire	—	1.02700	1.02700	1.02700	—	—	1.01800	1.01600	1.01500	1.01800	1.01800	1.01700	1.01700	1.02400
New Jersey	1.03600	1.03300	1.03300	1.03300	1.03200	1.03200	1.03400	1.03400	1.03500	1.03100	1.02000	1.03700	1.04500	1.03100
New Mexico	1.04100	1.02600	1.02600	1.03300	1.03400	1.01600	1.01700	1.01600	1.02200	1.01700	1.01200	1.01700	1.01000	1.01300
New York	1.03600	1.03000	1.03100	1.02800	1.03300	1.03100	1.03000	1.03100	1.03100	1.02600	1.02900	1.02600	1.02900	1.02400
North Carolina	1.03300	1.03300	1.03300	1.03300	1.03300	1.03200	1.03600	1.03300	1.03800	1.03300	1.03600	1.03700	1.04800	1.03100
North Dakota	1.05400	1.07200	1.06500	1.05000	1.03800	1.00400	1.03700	1.08000	1.09500	1.06600	1.05900	1.06600	—	—
Ohio	1.01800	1.00900	1.01200	1.00700	1.00800	1.00700	1.03300	1.03000	1.02900	1.02700	1.02800	1.02400	1.02700	1.02800
Oklahoma	1.04300	1.04700	1.03900	1.04300	1.04500	1.04000	1.03700	1.03900	1.03400	1.03400	1.02800	1.03200	1.03000	1.02800
Oregon	0.99000	—	—	1.03500	1.02300	1.01100	1.01100	1.01100	1.01100	1.01200	1.00900	1.01100	1.01100	1.01200
Pennsylvania	1.02500	1.03100	1.03500	1.02900	1.03200	1.03400	1.03100	1.03000	1.03100	1.03000	1.02800	1.03400	1.02900	1.03300
Rhode Island	—	1.03100	1.03200	1.03100	1.03300	1.03200	1.03100	1.05100	1.02900	1.02800	1.02800	1.02700	1.02800	—
South Carolina	1.02300	1.02700	1.03200	1.02300	1.02300	1.02500	1.02200	1.02100	1.02300	1.02400	1.02500	1.02400	1.02400	1.02800
South Dakota	1.00500	1.01300	1.02000	1.01700	1.01600	1.00600	1.01900	1.01400	0.97200	1.00200	1.01400	1.01800	1.00000	1.00600
Tennessee	—	—	1.03100	1.03200	1.03500	1.03300	1.03100	1.03500	1.03200	1.03100	1.03200	1.03100	1.03000	1.02700
Texas	1.03500	1.03500	1.03300	1.03400	1.03500	1.03000	1.02600	1.02600	1.02300	1.02300	1.02300	1.02300	1.02400	1.02100
Utah	1.08700	1.07800	1.07800	1.07800	1.00000	1.06700	1.07400	1.06300	1.04400	1.05500	1.02100	1.03200	1.04400	1.04300
Vermont	1.00000	—	—	1.00000	1.00000	0.98800	0.98800	0.99800	0.99600	1.00100	1.01500	1.01200	1.01400	1.01200
Virginia	1.05300	1.03900	1.05400	1.04100	1.04100	1.04400	1.05000	1.03800	1.03700	1.03100	1.05700	1.04800	1.04900	1.05500
Washington	1.03300	1.03300	1.03300	1.03300	1.03300	1.05000	1.05000	1.05000	1.05000	1.05000	1.05000	1.04800	1.05500	1.05500
West Virginia	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Wisconsin	1.00300	0.99200	1.00200	1.00300	1.00700	1.00800	1.00900	1.01200	1.01100	1.00900	1.01000	1.00800	1.01300	1.01000
Wyoming	1.02200	1.01900	1.02600	1.03600	1.03500	1.05100	1.03900	1.04400	1.03300	1.04300	1.04000	1.04100	1.04400	1.04400
U.S. Average	1.03311	1.03153	1.02742	1.02720	1.02658	1.02316	1.02297	1.02300	1.02337	1.01779	1.01543	1.01837	1.02136	1.01851

— =Not applicable.
Sources: See source listing at the end of this appendix.

Table C4. Approximate Heat Content of Natural Gas Consumed by Sectors Other Than Electric Utilities, 1960-1985, Selected Years
(Thousand Btu per Cubic Foot)

State	1960	1965	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Alabama	1.03500	1.03400	1.03100	1.02891	1.02782	1.02863	1.02965	1.02608	1.03349	1.03535	1.05159	1.03784	1.03286	1.03770
Alaska	1.03500	1.01000	1.00500	1.00470	1.00467	1.00475	0.99878	0.99868	1.00231	1.00369	0.99910	1.00140	1.00144	1.00600
Arizona	1.03500	1.07600	1.05900	1.04957	1.04869	1.05386	1.06502	1.04051	1.04558	1.05486	1.05490	1.04560	1.04594	1.04578
Arkansas	1.03500	1.00100	1.00400	0.99503	0.99590	1.02007	0.99920	1.01577	0.99415	0.99524	0.99681	1.02070	1.01884	1.01677
California	1.03500	1.07300	1.05400	1.05594	1.05139	1.05022	1.05157	1.04797	1.04358	1.04419	1.04714	1.04083	1.03782	1.03848
Colorado	1.03500	0.91200	0.97400	0.89576	0.90136	0.88783	0.86156	0.88005	0.99471	0.99530	1.00099	1.00637	1.00231	0.99923
Connecticut	1.03500	1.02200	1.01600	1.00500	1.00800	1.01000	1.01300	1.01170	1.02200	1.02500	1.02700	1.02900	1.02903	1.02998
Delaware	1.03500	1.04300	1.02000	1.01468	1.01779	1.02350	1.02787	1.02801	1.03285	1.03477	1.03300	1.01514	1.01746	1.02197
District of Columbia	1.03500	1.02400	1.01600	1.01200	1.01200	1.01600	1.01600	1.01600	1.00300	1.01400	1.01700	1.01000	1.01200	1.01500
Florida	1.03500	1.03700	1.04100	1.07754	1.06174	1.06668	1.06968	1.05369	1.06968	1.10649	1.08246	1.09719	1.10065	1.10911
Georgia	1.03500	1.04000	1.03100	1.02672	1.02696	1.02702	1.02794	1.03843	1.03196	1.02700	1.03001	1.02601	1.02601	1.02801
Hawaii	—	—	—	—	—	—	—	—	0.96300	0.95900	0.98900	1.02300	1.02600	1.08200
Idaho	1.03500	1.06500	1.06100	1.05500	1.05700	1.06006	1.05340	1.04715	1.05301	1.06999	1.07200	1.04700	1.04500	1.04900
Illinois	1.03500	1.02900	1.02500	1.02590	1.02492	1.02800	1.01811	1.02450	1.02196	1.01996	1.02198	1.04115	1.04005	1.04008
Indiana	1.03500	0.99900	1.00600	0.98976	0.98990	0.98995	0.98901	0.99034	0.98894	0.99290	1.01608	1.00603	1.00701	1.00801
Iowa	1.03500	1.01000	1.00900	1.00800	1.00773	1.00359	1.00153	1.00210	1.00287	1.00295	1.00788	1.01381	1.01474	1.01091
Kansas	1.03500	0.99500	0.99800	0.98159	0.98069	0.98134	0.98107	0.98175	0.99404	0.99267	1.00673	1.00627	0.99365	0.99990
Kentucky	1.03500	1.02800	1.01700	1.00799	1.01100	1.01097	1.00982	1.00984	1.00886	1.01387	1.01392	1.01998	1.02198	1.03004
Louisiana	1.03500	1.04200	1.02900	1.03153	1.03299	1.03515	1.04248	1.03433	1.03707	1.03578	1.04731	1.04014	1.04060	1.03819
Maine	—	—	1.01200	1.02400	1.02400	1.02400	1.02400	1.00000	1.02400	1.02500	1.02500	1.02600	1.03200	1.03500
Maryland	1.03500	1.02500	1.02200	1.01323	1.01411	1.01604	1.02998	1.04291	1.01990	1.01396	1.01796	1.02095	1.02601	1.03408
Massachusetts	1.03500	1.01300	1.01200	1.00402	1.00608	1.00714	1.00919	1.00947	1.01646	1.01662	1.02196	1.02077	1.02454	1.02388
Michigan	1.03500	1.01400	1.01500	1.02420	1.02345	1.01996	1.01668	1.02013	1.01961	1.02596	1.02823	1.03896	1.02283	1.02304
Minnesota	1.03500	0.99800	1.00200	1.00225	0.99914	0.99745	0.99704	0.99537	0.99709	0.99502	1.00580	1.02314	1.00302	1.00401
Mississippi	1.03500	1.02900	1.02500	1.02189	1.02438	1.02623	1.02449	1.02946	1.03421	1.02898	1.03068	1.02647	1.03091	1.02459
Missouri	1.03500	1.02000	1.00700	1.00822	1.00508	1.00419	1.00625	0.97972	1.01577	1.01581	1.01794	1.02735	1.01718	1.01714
Montana	1.03500	1.00100	1.03200	1.01927	1.01229	1.00677	0.99866	0.98687	1.00926	1.00837	1.00995	1.00662	1.00365	0.99897
Nebraska	1.03500	0.99100	1.00800	0.99650	0.99652	1.00080	1.00035	0.99737	0.98019	0.97923	0.98099	0.98241	0.98137	0.98226
Nevada	1.03500	1.06200	1.08200	1.06700	1.06480	1.03695	1.00292	0.96765	1.05209	1.07753	1.07101	1.06689	1.05871	1.06122
New Hampshire	1.03500	1.01200	1.01000	1.01024	1.01001	1.00000	1.00730	1.04014	1.02000	1.02196	1.02000	1.02099	1.02700	1.02700
New Jersey	1.03500	1.04500	1.02600	1.03111	1.03416	1.03418	1.03502	1.03549	1.03269	1.03348	1.03058	1.02912	1.02046	1.02214
New Mexico	1.03500	1.10800	1.08300	1.07555	1.06632	1.06976	1.06047	1.06537	1.04776	1.05393	1.05173	1.04148	1.06146	1.08795
New York	1.03500	1.02600	1.02100	1.01476	1.01390	1.01088	1.01186	1.01349	1.02277	1.01751	1.02128	1.02607	1.02536	1.02724
North Carolina	1.03500	1.03300	1.02400	1.01799	1.01800	1.01900	1.02080	1.02186	1.01175	1.01186	1.03300	1.03300	1.03400	1.03400
North Dakota	1.03500	1.00000	1.03100	1.00077	0.99994	0.99994	0.99997	0.99997	1.05200	1.04199	1.02598	1.04500	1.04900	1.06200
Ohio	1.03500	1.03300	1.02300	1.02403	1.02606	1.02531	1.02425	1.02592	1.01606	1.02303	1.02902	1.03403	1.03702	1.04403
Oklahoma	1.03500	1.02600	1.03200	0.99619	0.99240	1.01236	1.00408	1.00543	1.00198	1.02610	1.01036	1.03656	1.01711	1.01970
Oregon	1.03500	1.07000	1.04500	1.03900	1.03600	1.04200	1.04510	1.04477	1.04620	1.04399	1.04402	1.04100	1.03600	1.03000
Pennsylvania	1.03500	1.03800	1.03300	1.02505	1.02502	1.02101	1.02151	1.02064	1.02201	1.02203	1.02804	1.02907	1.03413	1.03409
Rhode Island	1.03500	1.04200	1.02100	1.01399	1.01208	1.01300	1.01290	1.00891	1.02094	1.02200	1.03647	1.03453	1.03000	1.03291
South Carolina	1.03500	1.04200	1.02800	1.02346	1.02287	1.02189	1.03126	1.01547	1.03312	1.02300	1.03001	1.02701	1.02600	1.02800
South Dakota	1.03500	0.99700	1.00400	1.00000	0.99910	1.00005	0.99925	0.99566	0.99811	1.00202	0.99906	1.01100	1.01100	1.01000
Tennessee	1.03500	1.04600	1.02200	1.03100	1.02900	1.03100	1.02800	1.03260	1.01600	1.01600	1.02400	1.02300	1.02400	1.03400
Texas	1.03500	1.03700	1.02700	1.02966	1.02872	1.02756	1.02542	1.02954	1.03085	1.03308	1.03139	1.03190	1.03950	1.03909
Utah	1.03500	0.92500	0.93800	0.95023	0.94792	0.95026	0.95656	0.95963	1.09212	1.07740	0.93897	1.07655	1.07511	1.07500
Vermont	—	—	1.00600	1.00930	1.00814	1.00899	1.01061	1.01151	0.98936	0.99268	0.99282	0.99157	0.99153	0.99185
Virginia	1.03500	1.03100	1.02600	1.01868	1.01872	1.02124	1.01933	1.01923	1.01471	1.02294	1.02590	1.02962	1.03589	1.03899
Washington	1.03500	1.07500	1.05500	1.04200	1.04100	1.04500	1.04761	1.04713	1.05216	1.05007	1.05302	1.04300	1.04500	1.04000
West Virginia	1.03500	1.07100	1.02900	1.03805	1.04369	1.04201	1.03140	1.02371	1.03201	1.04005	1.04705	1.03804	1.05305	1.06707
Wisconsin	1.03500	1.01800	1.01900	1.02023	1.01712	1.01502	1.01247	1.01308	1.00804	1.00902	1.01200	1.00921	1.00810	1.01004
Wyoming	1.03500	0.92600	1.02300	0.93453	0.95069	0.93775	0.91433	0.92963	1.06069	1.05932	1.00223	1.05903	1.05301	1.05100
U.S. Average	1.03500	1.03182	1.02543	1.02232	1.02149	1.02212	1.02040	1.01988	1.02375	1.02575	1.02739	1.03099	1.03023	1.03156

— =Not applicable.
Sources: See source listing at the end of this appendix.

Table C5. Approximate Heat Content of Natural Gas Consumed by Sectors Other Than Electric Utilities, 1986-1999
(Thousand Btu per Cubic Foot)

State	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Alabama	1.03571	1.03285	1.02889	1.03000	1.02898	1.02708	1.02809	1.03023	1.03026	1.02931	1.03317	1.04132	1.03858	1.03661
Alaska	1.00960	1.00942	1.00376	0.99821	0.94820	1.00209	1.00216	0.99360	1.00117	1.00630	0.98918	1.00000	0.99893	1.00000
Arizona	1.03683	1.03659	1.03400	1.04268	1.03153	1.02454	1.03100	1.02822	1.02786	1.03742	1.01024	1.02252	1.01667	1.01685
Arkansas	1.01334	1.01250	1.00673	1.00426	1.00756	1.01654	1.00681	1.01249	1.02177	1.08374	1.02629	1.01354	1.02417	1.01845
California	1.03655	1.02602	1.02879	1.03582	1.03168	1.02670	1.02746	1.03785	1.02063	1.01316	1.03328	1.01776	1.05151	1.01780
Colorado	1.00322	1.00046	1.00681	1.01222	1.00540	1.02976	1.02347	1.01098	1.00433	1.01814	1.02447	1.01231	1.01263	1.00539
Connecticut	1.02994	1.03100	1.03201	1.03414	1.03300	1.03090	1.02794	1.02697	1.03093	1.02988	1.02880	1.02811	1.02561	1.02389
Delaware	1.01639	1.00929	1.01777	1.01404	1.01536	1.02464	1.03446	1.03553	1.03544	1.03561	1.03576	1.03500	1.06179	1.06673
District of Columbia	1.01300	1.01400	1.01100	1.01000	1.00800	1.00600	1.00700	1.00700	1.01100	1.00600	1.00900	1.02100	1.02700	1.02100
Florida	1.07589	1.09473	1.07984	1.08571	1.08663	1.09834	1.10018	1.09842	1.12409	1.07028	1.10872	1.05429	1.04796	1.04140
Georgia	1.02706	1.02601	1.02501	1.02600	1.02702	1.02701	1.02500	1.02703	1.03002	1.02604	1.02299	1.02706	1.02693	1.02667
Hawaii	1.08600	1.06800	1.07800	1.08000	1.07000	1.08000	1.07300	1.06200	1.05100	1.04800	1.05700	1.03000	1.05600	1.05500
Idaho	1.02100	1.01700	1.02000	1.02700	1.02800	1.03300	1.03000	1.03800	1.03800	1.03000	1.03000	1.03100	1.03800	1.03800
Illinois	1.02097	1.01496	1.01798	1.02204	1.02201	1.01901	1.01802	1.02108	1.02097	1.02015	1.01898	1.02122	1.02219	1.02200
Indiana	1.00901	1.00901	1.01510	1.01612	1.01824	1.01429	1.01116	1.01300	1.01282	1.01186	1.01092	1.01092	1.01686	1.01789
Iowa	1.00995	1.00802	1.00700	1.01104	1.00702	1.00806	1.00400	1.00295	1.00802	1.00500	1.00604	1.00910	1.01121	1.01935
Kansas	0.98581	1.04899	0.98560	0.99325	0.99975	1.01121	0.98772	0.98770	0.99905	1.00381	0.99756	1.00290	0.99424	0.99525
Kentucky	1.03804	1.03703	1.03703	1.03903	1.04003	1.04703	1.05805	1.04804	1.06207	1.09629	1.04921	1.05026	1.03429	1.03219
Louisiana	1.03908	1.03941	1.04137	1.04281	1.04138	1.04801	1.04420	1.03590	1.03877	1.03315	1.04418	1.13446	1.07687	1.04282
Maine	1.03100	1.04000	1.02700	1.00300	1.00500	1.00600	1.01300	1.01400	1.01400	1.01600	1.01600	1.01400	1.01700	1.01800
Maryland	1.03568	1.03333	1.03168	1.03054	1.02641	1.02506	1.02684	1.02733	1.03011	1.02460	1.02845	1.03361	1.03626	1.03345
Massachusetts	1.02574	1.02965	1.03010	1.03559	1.03419	1.03863	1.03775	1.03841	1.02458	1.02600	1.02556	1.02028	1.02265	1.04854
Michigan	1.03829	1.03126	1.03962	1.05189	1.04510	1.03863	1.03742	1.03457	1.03340	1.04195	1.03617	1.04083	1.04905	1.04230
Minnesota	0.99900	0.99902	1.00707	1.00601	1.00402	1.01208	1.01105	1.01104	1.01111	1.01317	1.01822	1.01825	1.00229	1.01916
Mississippi	1.02130	1.01554	1.01533	1.03124	1.03196	1.03033	1.05226	1.02321	1.02829	1.01782	1.02642	1.03320	1.04924	1.03993
Missouri	1.01114	1.01113	1.00608	1.00796	1.01089	1.00874	1.00194	1.00393	1.00610	1.00705	1.01100	1.01011	1.01100	1.01379
Montana	0.99799	1.01769	1.02374	1.01857	1.02614	1.02802	1.02211	1.01725	1.02362	1.02971	1.02965	1.03072	1.02560	1.02369
Nebraska	0.99337	0.98513	0.98349	0.98762	0.98430	0.98538	0.97936	0.97498	0.98495	0.97959	1.00705	0.99800	1.00356	0.99916
Nevada	1.06045	1.00363	0.99619	1.03172	1.03100	1.03603	1.03432	1.03567	1.03593	1.03526	1.04028	1.02565	1.04615	1.03174
New Hampshire	1.02700	1.02900	1.02499	1.01899	1.01400	1.00700	1.00865	1.00995	1.01286	1.01011	1.01900	1.01083	1.01095	1.00857
New Jersey	1.02595	1.02448	1.02502	1.02503	1.02525	1.02508	1.02539	1.03614	1.03931	1.03425	1.03672	1.03490	1.03761	1.03945
New Mexico	1.08337	1.08057	1.07381	1.05044	1.05639	1.04239	1.04287	1.04238	0.99975	1.02052	1.03166	1.01931	0.97655	0.97276
New York	1.02743	1.03000	1.02854	1.02927	1.02895	1.02704	1.02872	1.02855	1.02734	1.02855	1.02557	1.02600	1.02778	1.02753
North Carolina	1.03300	1.03098	1.02998	1.03098	1.03198	1.03200	1.03396	1.03503	1.03599	1.03300	1.03600	1.03598	1.03950	1.03520
North Dakota	1.04300	1.04800	1.05500	1.04900	1.03200	1.04600	1.04500	1.06000	1.05800	1.05000	1.05100	1.05000	1.03800	1.04500
Ohio	1.04602	1.04504	1.04003	1.04204	1.04005	1.04416	1.03601	1.03803	1.03703	1.03809	1.03803	1.04508	1.04012	1.03712
Oklahoma	1.02282	1.03094	1.03757	1.02168	1.02002	1.01312	1.02185	1.02130	1.02581	1.01479	1.02274	1.00603	1.00692	1.02065
Oregon	1.02200	1.02800	1.02300	1.03500	1.02300	1.03074	1.03817	1.04052	1.04630	1.04423	1.04281	1.04832	1.04824	1.05590
Pennsylvania	1.03601	1.03602	1.03600	1.03705	1.03702	1.03500	1.03602	1.03709	1.03609	1.03518	1.03406	1.03501	1.03608	1.03605
Rhode Island	1.02900	1.02748	1.02697	1.02673	1.02710	1.02788	1.01792	1.02889	1.02900	1.02585	1.07392	1.02254	1.02434	1.02300
South Carolina	1.03010	1.02801	1.02689	1.02607	1.02828	1.02716	1.02707	1.02911	1.03117	1.02714	1.03004	1.03113	1.03439	1.03110
South Dakota	1.00500	1.01300	1.02000	1.01700	1.01600	1.01808	1.01499	1.01299	1.01020	1.01433	1.01400	1.01800	1.01095	1.00600
Tennessee	1.03200	1.03200	1.03100	1.03200	1.03500	1.03300	1.03100	1.03500	1.03200	1.03100	1.03200	1.03100	1.03000	1.02700
Texas	1.04266	1.04233	1.04010	1.03958	1.04194	1.03975	1.04956	1.02880	1.04261	1.04232	1.03652	1.02983	1.04858	1.03701
Utah	0.94770	1.08001	1.08101	1.08705	1.08869	1.07324	1.07823	1.08081	1.06860	1.06347	1.04255	1.04225	1.04607	1.05551
Vermont	0.98699	0.98700	0.99000	0.98591	0.98554	0.98800	0.99582	0.99800	0.99600	0.99590	1.01500	1.01200	1.01195	1.01200
Virginia	1.03992	1.04001	1.04091	1.04100	1.04204	1.04189	1.03836	1.04460	1.03809	1.03100	1.03819	1.04380	1.04245	1.03635
Washington	1.02900	1.03300	1.02592	1.03195	1.03000	1.03098	1.03244	1.03667	1.04089	1.03970	1.03663	1.04598	1.04447	1.05192
West Virginia	1.07620	1.07415	1.07705	1.07707	1.07108	1.07309	1.06510	1.06506	1.06411	1.06117	1.06108	1.06809	1.06318	1.05515
Wisconsin	1.01005	1.00813	1.00805	1.00501	1.00599	1.00699	1.00900	1.01099	1.01201	1.01105	1.01306	1.01112	1.01090	1.01208
Wyoming	1.05005	1.05704	1.05306	1.05502	1.09905	1.06001	1.05801	1.05601	1.05603	1.06303	1.06102	1.06903	1.06706	1.05101
U.S. Average	1.03018	1.03127	1.02995	1.03182	1.03076	1.03110	1.03164	1.02884	1.03022	1.03000	1.03064	1.03496	1.03680	1.02921

— =Not applicable.
Sources: See source listing at the end of this appendix.

Table C6. Approximate Heat Content of Natural Gas Total Consumption, 1960-1985, Selected Years
(Thousand Btu per Cubic Foot)

State	1960	1965	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Alabama	1.03500	1.03400	1.03100	1.02900	1.03000	1.03100	1.03250	1.02840	1.03400	1.03600	1.05200	1.03800	1.03300	1.03800
Alaska	1.03500	1.01000	1.00500	1.00500	1.00500	1.00500	1.00000	1.00000	1.00300	1.00400	1.00000	1.00200	1.00200	1.00600
Arizona	1.03500	1.07600	1.05900	1.05200	1.05200	1.05600	1.06470	1.04540	1.04900	1.05300	1.05400	1.04500	1.04700	1.05000
Arkansas	1.03500	1.00100	1.00400	0.99700	0.99700	1.02100	1.00090	1.01700	1.00100	1.00100	1.00200	1.02300	1.02100	1.01900
California	1.03500	1.07300	1.05400	1.05700	1.05300	1.05200	1.05320	1.04970	1.04600	1.04800	1.04900	1.04300	1.04200	1.04300
Colorado	1.03500	0.91200	0.97400	0.91300	0.91400	0.90000	0.87590	0.89240	0.99300	0.99400	1.00000	1.00600	1.00200	0.99900
Connecticut	1.03500	1.02200	1.01600	1.00500	1.00800	1.01000	1.01300	1.01170	1.02200	1.02500	1.02700	1.02900	1.02900	1.03000
Delaware	1.03500	1.04300	1.02000	1.02000	1.02500	1.03000	1.03090	1.03110	1.03500	1.03500	1.03300	1.01800	1.02100	1.02500
District of Columbia	1.03500	1.02400	1.01600	1.01200	1.01200	1.01600	1.01600	1.01600	1.00300	1.01400	1.01700	1.01000	1.01200	1.01500
Florida	1.03500	1.03700	1.04100	1.04300	1.04100	1.04500	1.04700	1.03730	1.04100	1.05900	1.04400	1.04800	1.04900	1.05300
Georgia	1.03500	1.04000	1.03100	1.02700	1.02700	1.02700	1.02790	1.03900	1.03200	1.02700	1.03000	1.02600	1.02600	1.02800
Hawaii	1.03500	—	0.96200	0.94700	0.91100	0.94900	0.95800	0.95000	0.96300	0.95900	0.98900	1.02300	1.02600	1.08200
Idaho	1.03500	1.06500	1.06100	1.05500	1.05700	1.06000	1.05340	1.04710	1.05300	1.07000	1.07200	1.04700	1.04500	1.04900
Illinois	1.03500	1.02900	1.02500	1.02600	1.02500	1.02800	1.01830	1.02440	1.02200	1.02000	1.02200	1.04100	1.04000	1.04000
Indiana	1.03500	0.99900	1.00600	0.99000	0.99000	0.99000	0.98910	0.99040	0.98900	0.99300	1.01600	1.00600	1.00700	1.00800
Iowa	1.03500	1.01000	1.00900	1.00800	1.00800	1.00400	1.00220	1.00230	1.00300	1.00300	1.00800	1.01400	1.01500	1.01100
Kansas	1.03500	0.99500	0.99800	0.98400	0.98100	0.98100	0.97810	0.97780	0.98700	0.98700	0.99900	0.99900	0.99200	0.99800
Kentucky	1.03500	1.02800	1.01700	1.00800	1.01100	1.01100	1.00990	1.00990	1.00900	1.01400	1.01400	1.02000	1.02200	1.03000
Louisiana	1.03500	1.04200	1.02900	1.03700	1.03800	1.03800	1.04470	1.03690	1.03800	1.03700	1.04700	1.04200	1.04200	1.04000
Maine	1.03500	—	1.01200	1.02400	1.02400	1.02400	1.02400	1.00000	1.02400	1.02500	1.02500	1.02600	1.03200	1.03500
Maryland	1.03500	1.02500	1.02200	1.01300	1.01400	1.01600	1.03010	1.04480	1.02000	1.01400	1.01800	1.02100	1.02600	1.03400
Massachusetts	1.03500	1.01300	1.01200	1.00400	1.00600	1.00700	1.00910	1.00910	1.01600	1.01600	1.02400	1.02500	1.03000	1.02700
Michigan	1.03500	1.01400	1.01500	1.01200	1.00800	1.00600	1.00550	1.00530	1.01100	1.01700	1.02200	1.02400	1.01700	1.01500
Minnesota	1.03500	0.99800	1.00200	1.00100	0.99800	0.99700	0.99670	0.99530	0.99700	0.99500	1.00500	1.02300	1.00300	1.00400
Mississippi	1.03500	1.02900	1.02500	1.02300	1.02300	1.02500	1.02120	1.02430	1.02800	1.02500	1.02800	1.02700	1.03000	1.02800
Missouri	1.03500	1.02000	1.00700	1.00600	1.00300	1.00200	1.00380	0.97950	1.01400	1.01500	1.01800	1.02700	1.01700	1.01700
Montana	1.03500	1.00100	1.03200	1.02100	1.01400	1.00900	1.00050	0.99010	1.01200	1.01100	1.01100	1.00800	1.00500	1.00100
Nebraska	1.03500	0.99100	1.00800	0.99400	0.99400	0.99800	0.99780	0.99380	0.97800	0.97800	0.98100	0.98200	0.98100	0.98200
Nevada	1.03500	1.06200	1.08200	1.06700	1.06600	1.04900	1.02790	1.01310	1.06100	1.07600	1.07000	1.06600	1.05900	1.06200
New Hampshire	1.03500	1.01200	1.01000	1.01000	1.01000	1.00000	1.00730	1.04000	1.02000	1.02200	1.02000	1.02100	1.02700	1.02700
New Jersey	1.03500	1.04500	1.02600	1.03100	1.03400	1.03400	1.03500	1.03590	1.03300	1.03400	1.03100	1.03100	1.02400	1.02600
New Mexico	1.03500	1.10800	1.08300	1.06400	1.05700	1.05700	1.05500	1.05640	1.04300	1.04700	1.04500	1.03300	1.04900	1.07400
New York	1.03500	1.02600	1.02100	1.01500	1.01400	1.01100	1.01190	1.01550	1.02500	1.02000	1.02300	1.02700	1.02700	1.02900
North Carolina	1.03500	1.03300	1.02400	1.01800	1.01800	1.01900	1.02080	1.02190	1.01200	1.01200	1.03300	1.03300	1.03400	1.03400
North Dakota	1.03500	1.00000	1.03100	1.00100	1.00000	1.00000	1.00000	1.00000	1.05200	1.04200	1.02600	1.04500	1.04900	1.06200
Ohio	1.03500	1.03300	1.02300	1.02300	1.02500	1.02400	1.02300	1.02490	1.01600	1.02300	1.02900	1.03400	1.03700	1.04400
Oklahoma	1.03500	1.02600	1.03200	1.01500	1.01400	1.02700	1.02390	1.02350	1.02300	1.03500	1.02300	1.04200	1.02500	1.02800
Oregon	1.03500	1.07000	1.04500	1.03900	1.03600	1.04200	1.04510	1.04480	1.04600	1.04400	1.04400	1.04100	1.03600	1.03000
Pennsylvania	1.03500	1.03800	1.03300	1.02500	1.02500	1.02100	1.02150	1.02060	1.02200	1.02200	1.02800	1.02900	1.03400	1.03400
Rhode Island	1.03500	1.04200	1.02100	1.01400	1.01300	1.01300	1.01290	1.01130	1.02100	1.02200	1.03600	1.03500	1.03000	1.03300
South Carolina	1.03500	1.04200	1.02800	1.02400	1.02300	1.02200	1.03200	1.01810	1.03300	1.02300	1.03000	1.02700	1.02600	1.02800
South Dakota	1.03500	0.99700	1.00400	1.00000	0.99900	1.00000	0.99920	0.99560	0.99800	1.00200	0.99900	1.01100	1.01100	1.01000
Tennessee	1.03500	1.04600	1.02200	1.03100	1.02900	1.03100	1.02800	1.03260	1.01600	1.01600	1.02400	1.02300	1.02400	1.03400
Texas	1.03500	1.03700	1.02700	1.02600	1.02500	1.02700	1.02810	1.03250	1.03300	1.03200	1.03200	1.02900	1.03600	1.03800
Utah	1.03500	0.92500	0.93800	0.95000	0.94800	0.95000	0.95620	0.95980	1.08600	1.07300	0.93900	1.07500	1.07500	1.07500
Vermont	1.03500	—	1.00600	1.00800	1.00800	1.00800	1.01050	1.01010	0.99000	0.99300	0.99300	0.99200	0.99200	0.99200
Virginia	1.03500	1.03100	1.02600	1.01900	1.01900	1.02300	1.02080	1.02140	1.01600	1.02400	1.02700	1.03000	1.03600	1.03900
Washington	1.03500	1.07500	1.05500	1.04200	1.04100	1.04500	1.04760	1.04690	1.05200	1.05000	1.05300	1.04300	1.04500	1.04000
West Virginia	1.03500	1.07100	1.02900	1.03700	1.04300	1.04200	1.03140	1.02370	1.03200	1.04000	1.04700	1.03800	1.05300	1.06700
Wisconsin	1.03500	1.01800	1.01900	1.02000	1.01700	1.01500	1.01230	1.01290	1.00800	1.00900	1.01200	1.00900	1.00800	1.01000
Wyoming	1.03500	0.92600	1.02300	0.93400	0.95000	0.93700	0.91370	0.92920	1.06000	1.05900	1.00200	1.05900	1.05300	1.05100
U.S. Average	1.03500	1.03271	1.02618	1.02249	1.02179	1.02315	1.02243	1.02208	1.02549	1.02703	1.02856	1.03046	1.03077	1.03253

— =Not applicable.

Sources: See source listing at the end of this appendix.

Table C7. Approximate Heat Content of Natural Gas Total Consumption, 1986-1999
(Thousand Btu per Cubic Foot)

State	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Alabama	1.03600	1.03300	1.02900	1.03000	1.02900	1.02700	1.02800	1.03000	1.03000	1.02900	1.03300	1.04100	1.03900	1.03500
Alaska	1.00900	1.00900	1.00400	0.99900	0.95400	1.00200	1.00200	0.99400	1.00100	1.00600	0.99000	1.00000	0.99900	1.00000
Arizona	1.03900	1.03600	1.03400	1.04000	1.03200	1.02500	1.03100	1.02800	1.02700	1.03500	1.01100	1.02100	1.01600	1.01500
Arkansas	1.01900	1.01600	1.00900	1.00600	1.00900	1.01700	1.00900	1.01400	1.02200	1.07600	1.02600	1.01500	1.02400	1.01900
California	1.03900	1.03000	1.03100	1.03700	1.03200	1.02700	1.02900	1.03600	1.02300	1.01600	1.03200	1.01800	1.04700	1.01700
Colorado	1.00300	1.00000	1.00600	1.01100	1.00500	1.02900	1.02300	1.01100	1.00500	1.01800	1.02400	1.01200	1.01200	1.00700
Connecticut	1.03000	1.03100	1.03200	1.03400	1.03300	1.03100	1.02800	1.02700	1.03000	1.02800	1.02800	1.02700	1.02600	1.02400
Delaware	1.01800	1.01500	1.02300	1.02800	1.02600	1.03400	1.03500	1.03500	1.03600	1.03400	1.03500	1.03500	1.03700	1.03700
District of Columbia	1.01300	1.01400	1.01100	1.01000	1.00800	1.00600	1.00700	1.00700	1.01100	1.00600	1.00900	1.02100	1.02700	1.02100
Florida	1.03600	1.04400	1.04200	1.04200	1.04300	1.04900	1.04900	1.05200	1.06800	1.03300	1.05000	1.04800	1.05100	1.04300
Georgia	1.02700	1.02600	1.02500	1.02600	1.02700	1.02700	1.02500	1.02700	1.03000	1.02600	1.02300	1.02700	1.02700	1.02700
Hawaii	1.08600	1.06800	1.07800	1.08000	1.07000	1.08000	1.07300	1.06200	1.05100	1.04800	1.05700	1.03000	1.05600	1.05500
Idaho	1.02100	1.01700	1.02000	1.02700	1.02800	1.03300	1.03000	1.03800	1.03800	1.03000	1.03000	1.03100	1.03800	1.03800
Illinois	1.02100	1.01500	1.01800	1.02200	1.02200	1.01900	1.01800	1.02100	1.02100	1.02000	1.01900	1.02100	1.02200	1.02200
Indiana	1.00900	1.00900	1.01500	1.01600	1.01800	1.01400	1.01100	1.01300	1.01300	1.01200	1.01100	1.01100	1.01700	1.01800
Iowa	1.01000	1.00800	1.00700	1.01100	1.00700	1.00800	1.00400	1.00300	1.00800	1.00500	1.00600	1.00900	1.01100	1.01900
Kansas	0.98500	1.04600	0.98600	0.99200	0.99900	1.00700	0.98700	0.98700	0.99800	1.00200	0.99600	1.00100	0.99500	0.99700
Kentucky	1.03800	1.03700	1.03700	1.03900	1.04000	1.04700	1.05800	1.04800	1.06200	1.09600	1.04900	1.05000	1.03400	1.03200
Louisiana	1.04000	1.04000	1.04200	1.04300	1.04200	1.04700	1.04400	1.03700	1.04000	1.03500	1.04400	1.11800	1.07000	1.04200
Maine	1.03100	1.04000	1.02700	1.00300	1.00500	1.00600	1.01300	1.01400	1.01400	1.01600	1.01600	1.01400	1.01700	1.01800
Maryland	1.03600	1.03400	1.03200	1.03200	1.02800	1.02700	1.02800	1.02800	1.03100	1.02600	1.02900	1.03400	1.03700	1.03400
Massachusetts	1.02600	1.02900	1.03000	1.03800	1.03800	1.03800	1.03700	1.03800	1.02600	1.02700	1.02600	1.02200	1.02300	1.04800
Michigan	1.02700	1.02100	1.02200	1.02900	1.02200	1.02000	1.02000	1.02100	1.02100	1.01700	1.01200	1.01600	1.02000	1.01800
Minnesota	0.99900	0.99900	1.00700	1.00600	1.00400	1.01200	1.01100	1.01100	1.01100	1.01300	1.01800	1.01800	1.02000	1.01900
Mississippi	1.02500	1.01800	1.01700	1.03000	1.03300	1.02900	1.04700	1.02300	1.03300	1.02600	1.03000	1.03000	1.04600	1.03600
Missouri	1.01100	1.01100	1.00600	1.00800	1.01100	1.00900	1.00200	1.00400	1.00600	1.00700	1.01100	1.01000	1.01100	1.01300
Montana	1.00000	1.02000	1.02500	1.02000	1.02800	1.02900	1.02300	1.01800	1.02400	1.03000	1.03000	1.03100	1.02600	1.02400
Nebraska	0.99300	0.98500	0.98300	0.98700	0.98300	0.98400	0.97900	0.97500	0.98500	0.98000	1.00700	0.99800	1.00300	0.99900
Nevada	1.05900	1.00900	1.00300	1.03000	1.03100	1.03200	1.03100	1.03400	1.03500	1.03300	1.03600	1.02700	1.04100	1.03400
New Hampshire	1.02700	1.02900	1.02500	1.01900	1.01400	1.00700	1.00900	1.01000	1.01300	1.01100	1.01900	1.01100	1.01100	1.00900
New Jersey	1.02700	1.02600	1.02600	1.02600	1.02600	1.02600	1.02600	1.03600	1.03900	1.03400	1.03600	1.03500	1.03800	1.03900
New Mexico	1.07700	1.07400	1.06800	1.04800	1.05400	1.03900	1.04000	1.03900	1.00300	1.02000	1.02900	1.01900	0.98200	0.97900
New York	1.02900	1.03000	1.02900	1.02900	1.03000	1.02800	1.02900	1.02900	1.02800	1.02800	1.02600	1.02600	1.02800	1.02700
North Carolina	1.03300	1.03100	1.03000	1.03100	1.03200	1.03200	1.03400	1.03500	1.03600	1.03300	1.03600	1.03600	1.04000	1.03500
North Dakota	1.04300	1.04800	1.05500	1.04900	1.03200	1.04600	1.04500	1.06000	1.05800	1.05000	1.05100	1.05000	1.03800	1.04500
Ohio	1.04600	1.04500	1.04000	1.04200	1.04000	1.04400	1.03600	1.03800	1.03700	1.03800	1.03800	1.04500	1.04000	1.03700
Oklahoma	1.03000	1.03600	1.03800	1.02800	1.02700	1.02100	1.02600	1.02600	1.02800	1.02000	1.02400	1.01200	1.01400	1.02300
Oregon	1.02200	1.02800	1.02300	1.03500	1.02300	1.02900	1.03500	1.03700	1.04000	1.04000	1.04000	1.04600	1.04300	1.05100
Pennsylvania	1.03600	1.03600	1.03600	1.03700	1.03700	1.03500	1.03600	1.03700	1.03600	1.03500	1.03400	1.03500	1.03600	1.03600
Rhode Island	1.02900	1.02800	1.02700	1.02700	1.02800	1.02800	1.01800	1.02900	1.02900	1.02600	1.06000	1.02400	1.02500	1.02300
South Carolina	1.03000	1.02800	1.02700	1.02600	1.02800	1.02700	1.02700	1.02900	1.03100	1.02700	1.03000	1.03100	1.03400	1.03100
South Dakota	1.00500	1.01300	1.02000	1.01700	1.01600	1.01800	1.01500	1.01300	1.01000	1.01400	1.01400	1.01800	1.01000	1.00600
Tennessee	1.03200	1.03200	1.03100	1.03200	1.03500	1.03100	1.03100	1.03500	1.03200	1.03100	1.03200	1.03100	1.03000	1.02700
Texas	1.04000	1.04000	1.03800	1.03800	1.04000	1.03700	1.04300	1.02800	1.03700	1.03700	1.03300	1.02800	1.04100	1.03200
Utah	0.94800	1.08000	1.08100	1.08700	1.08800	1.07300	1.07800	1.08000	1.06700	1.06300	1.04200	1.04200	1.04600	1.05500
Vermont	0.98700	0.98700	0.99000	0.98600	0.98700	0.98800	0.99500	0.99800	0.99600	0.99600	1.01500	1.01200	1.01200	1.01200
Virginia	1.04000	1.04000	1.04100	1.04100	1.04200	1.04200	1.03900	1.04400	1.03800	1.03100	1.03900	1.04400	1.04300	1.03800
Washington	1.02900	1.03300	1.02600	1.03200	1.03000	1.03100	1.03300	1.03700	1.04100	1.04000	1.03700	1.04600	1.04500	1.05200
West Virginia	1.07600	1.07400	1.07700	1.07700	1.07100	1.07300	1.06500	1.06500	1.06400	1.06100	1.06100	1.06800	1.06300	1.05500
Wisconsin	1.01000	1.00800	1.00800	1.00500	1.00600	1.00700	1.00900	1.01100	1.01200	1.01100	1.01300	1.01100	1.01100	1.01200
Wyoming	1.05000	1.05700	1.05300	1.05500	1.09900	1.06000	1.05800	1.05600	1.05600	1.06300	1.06100	1.06900	1.06700	1.05100
U.S. Average	1.03065	1.03131	1.02958	1.03113	1.03014	1.02994	1.03041	1.02806	1.02923	1.02819	1.02875	1.03271	1.03444	1.02768

Sources: See source listing at the end of this appendix.

Table C8. Approximate Heat Content of Bituminous Coal and Lignite Consumed by the Residential and Commercial Sector, 1960-1985, Selected Years
(Million Btu per Short Ton)

State	1960	1965	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Alabama	24.90955	24.77905	23.93285	23.51979	23.61816	23.50701	23.94624	24.01274	24.04242	24.22595	24.31358	24.15500	24.30488	24.40711
Alaska	18.90636	18.80731	18.16504	17.68304	17.73431	17.65792	17.64148	15.80000	15.80000	15.80000	15.80000	15.80000	15.80000	15.80000
Arizona	—	—	—	—	—	23.13886	23.03907	—	—	19.98524	19.99547	19.86600	19.79000	19.78800
Arkansas	23.58822	23.46464	22.66333	22.78461	—	23.25776	24.55559	—	23.89952	26.51913	22.89048	22.94800	22.81074	22.99047
California	23.01295	22.89238	22.11061	21.37302	—	21.42094	22.18359	22.38055	23.10930	23.02922	23.28646	23.09600	23.14219	23.55520
Colorado	22.95289	22.83264	22.05291	20.82582	21.41799	21.55660	19.87246	21.73459	21.46057	21.33917	21.51570	21.37000	21.55892	21.21743
Connecticut	25.06247	24.93116	24.07977	—	—	—	22.40550	24.09419	24.45394	24.29057	25.13790	25.92800	—	24.66397
Delaware	—	—	—	—	—	—	—	—	24.41454	24.28610	24.41599	24.59400	—	24.66000
District of Columbia	25.10862	24.97707	24.12411	23.24075	23.71388	—	—	24.14581	24.54122	24.30399	24.49389	24.78500	24.81371	24.88768
Florida	24.33573	24.20824	23.38153	23.49264	—	—	—	24.06838	24.28341	24.32752	22.98457	24.68400	24.75000	24.88200
Georgia	24.74225	24.61262	23.77210	23.49417	23.84904	23.59090	23.62811	24.09985	24.32123	24.31119	24.36058	24.50100	24.74515	24.88078
Hawaii	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Idaho	24.83140	24.70130	23.85776	22.66294	21.31072	21.63582	20.09020	19.14751	22.29152	21.71739	21.67035	22.12100	22.22887	22.83215
Illinois	24.04090	23.91495	23.09826	22.52306	22.45631	22.23331	22.26637	22.26385	22.06574	22.06493	22.01927	22.21700	22.27314	22.26660
Indiana	24.06302	23.93695	23.11951	22.13211	22.47946	22.89893	22.29510	22.38371	21.87750	21.95293	22.06379	22.05200	22.08600	22.25712
Iowa	21.32126	21.20956	20.48526	18.27722	18.94425	21.89519	19.92939	21.33432	20.22308	20.61051	20.52589	21.64800	20.92480	21.39008
Kansas	21.78815	21.67400	20.93384	19.74632	—	—	21.09194	20.90868	21.18218	21.18317	22.42143	21.32800	21.43826	21.14600
Kentucky	24.41023	24.28234	23.45311	23.20915	23.73730	23.44388	23.40679	23.94161	23.86491	23.96212	23.97577	24.00400	24.28360	24.34440
Louisiana	—	—	—	20.47422	—	—	—	—	21.36502	—	21.42848	—	22.77784	—
Maine	25.15186	25.02009	24.16566	23.25980	23.71388	23.36163	23.47358	24.18655	24.44110	24.39970	24.50683	24.75000	24.74849	24.88310
Maryland	25.11916	24.98756	24.13424	23.33369	23.75979	23.57470	23.80769	24.31769	24.46833	24.30977	24.51908	24.60400	24.74104	24.85439
Massachusetts	25.07336	24.94200	24.09023	23.24075	23.71388	23.33604	23.59895	23.06344	24.50975	24.73845	24.82777	25.01800	24.82431	25.07917
Michigan	24.75962	24.62990	23.78880	23.47415	23.57719	23.31103	23.06861	24.08615	24.36325	24.24302	24.38544	24.56500	24.38057	24.47177
Minnesota	21.97087	21.85576	21.10939	19.25676	23.25512	23.22381	20.59904	18.75714	20.82860	18.49710	18.04556	19.19900	18.57345	19.14210
Mississippi	23.04357	22.92284	22.14003	21.95036	—	—	23.31499	24.09419	22.99343	—	—	23.87900	24.75000	24.54115
Missouri	22.94167	22.82147	22.04212	21.40447	21.61124	21.51115	21.34634	21.24613	21.80697	21.54143	21.47124	21.66500	21.67702	22.80191
Montana	21.33557	21.22380	20.49901	20.38911	20.03721	18.94201	18.43165	18.69575	22.04235	17.67068	17.59846	20.40500	17.70690	17.8025
Nebraska	20.91322	20.80366	20.09322	18.40616	18.41033	18.07395	17.96742	18.44085	18.03826	17.70058	19.19546	20.61600	21.37525	21.52621
Nevada	25.23114	25.09895	24.24182	23.52145	22.47754	23.07994	18.67965	17.79288	22.33387	22.62540	23.09437	23.09600	21.78448	23.56200
New Hampshire	24.95798	24.82722	23.97937	—	—	—	—	—	24.45810	—	24.49270	24.75000	24.58800	—
New Jersey	24.74372	24.61409	23.77352	21.82099	—	—	—	—	24.32119	24.28610	24.88430	24.59400	24.74516	24.87099
New Mexico	22.99301	22.87255	22.09146	—	—	21.82706	19.97236	20.00716	19.78553	20.01748	20.06988	19.86600	19.79000	19.81693
New York	24.62410	24.49509	23.65859	23.38572	23.83645	23.38315	23.87414	24.01167	24.36952	24.21078	24.36286	24.66000	24.56787	24.65957
North Carolina	24.76213	24.63240	23.79120	23.49258	23.86489	23.59213	23.46900	24.09999	24.42236	24.32632	24.49270	24.74900	24.75007	24.87841
North Dakota	15.55018	15.46871	14.94046	13.75718	13.48724	13.49456	13.28937	13.45096	13.24298	13.22083	13.26253	13.15700	13.00063	13.13815
Ohio	23.84944	23.72449	22.91430	22.32524	22.92489	22.69671	22.65768	22.97712	23.21312	23.47004	23.57085	23.74600	23.80036	23.84836
Oklahoma	22.72718	22.60811	21.83605	20.67259	20.96468	21.30529	21.53110	25.72233	23.29143	21.66746	21.84151	21.31800	21.50073	23.39403
Oregon	24.60503	24.47612	23.64027	22.38275	21.53895	21.41286	20.44651	19.56036	22.72195	20.26182	19.75846	20.24000	21.75434	22.60723
Pennsylvania	24.79066	24.66078	23.81862	23.49453	23.80811	23.82432	24.03394	24.02308	24.18275	24.12648	24.48508	24.62600	24.64525	24.84190
Rhode Island	25.87949	25.74390	24.86475	—	—	—	—	—	24.41454	—	—	24.59400	24.58800	24.66000
South Carolina	24.76172	24.63199	23.79081	23.49264	23.86489	23.59214	23.62799	24.09999	24.41433	24.14642	24.49270	24.75000	24.67873	24.88200
South Dakota	19.41154	19.30984	18.65041	16.85997	19.54143	19.15533	22.22392	17.79288	18.42630	18.29957	18.03164	19.83900	23.33603	19.36902
Tennessee	24.71529	24.58580	23.74620	23.48538	23.85462	23.52067	23.32331	23.37282	23.97514	24.15563	24.00493	24.58200	24.27867	24.38903
Texas	14.95177	14.87344	14.36552	13.10400	—	13.20200	—	—	15.20049	19.31609	17.79300	23.10500	—	22.51056
Utah	25.89198	25.75633	24.87676	23.74007	22.41031	23.08304	22.96192	23.36462	23.17910	23.13998	23.27931	23.09600	23.14200	23.56200
Vermont	25.14754	25.01579	24.16151	24.28203	—	—	—	—	—	24.32752	25.16538	24.59400	24.74251	24.88200
Virginia	24.78594	24.65608	23.81408	23.47257	23.85106	23.58575	23.56409	24.04433	24.43211	24.36232	24.58812	24.84300	24.79707	24.87725
Washington	22.90924	22.78922	22.01097	19.96772	19.34891	22.16433	21.80682	21.65332	22.77100	22.97649	23.03893	22.74400	22.78786	23.45190
West Virginia	24.99691	24.86595	24.01679	23.70919	24.02458	23.88573	24.18947	24.14787	24.05881	24.18392	24.71583	24.89700	24.81981	24.93027
Wisconsin	21.91550	21.80068	21.05619	18.97225	23.53615	23.47004	20.61526	20.48444	24.29637	23.34779	23.42252	23.24900	24.16838	24.62943
Wyoming	20.62538	20.51732	19.81665	18.57163	18.61369	18.37162	18.05772	17.84923	17.80856	17.90710	17.58366	17.46800	17.91289	17.26200
U.S. Average	24.05400	23.92800	23.11100	22.25800	22.81900	22.59400	22.07800	21.88400	22.48800	22.01000	22.22600	22.43800	22.40600	22.56800

— =Not applicable.
Sources: See source listing at the end of this appendix.

Thermal Conversion Factor Source Documentation

Approximate Heat Content of Petroleum and Natural Gas Plant Liquids

Asphalt. EIA adopted the thermal conversion factor of 6.636 million British thermal units (Btu) per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Aviation Gasoline. EIA adopted the Bureau of Mines thermal conversion factor of 5.048 million Btu per barrel for “Gasoline, Aviation” as published by the Texas Eastern Transmission Corporation in Appendix V of *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

Butane. EIA adopted the Bureau of Mines thermal conversion factor of 4.326 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

Butane-Propane Mixture. EIA adopted the Bureau of Mines calculation of 4.130 million Btu per barrel based on an assumed mixture of 60 percent butane and 40 percent propane. See **Butane** and **Propane**.

Crude Oil (Including Lease Condensate) Used Directly. EIA adopted the thermal conversion factor of 5.800 million Btu per barrel as reported in a Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Value of Various Fuels, Adopted January 3, 1950.”

Distillate Fuel Oil. EIA adopted the thermal conversion factor of 5.825 million Btu per barrel as reported in a Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Value of Various Fuels, Adopted January 3, 1950.”

Ethane. EIA adopted the Bureau of Mines thermal conversion factor of 3.082 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

Ethane-Propane Mixture. EIA calculated 3.308 million Btu per barrel on the basis of an assumed mixture of 70 percent ethane and 30 percent propane. See **Ethane** and **Propane**.

Isobutane. EIA adopted the Bureau of Mines thermal conversion factor of 3.974 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

Jet Fuel, Kerosene Type. EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel for “Jet Fuel, Commercial” as published by the Texas Eastern Transmission Corporation in Appendix V of *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

Jet Fuel, Naphtha Type. EIA adopted the Bureau of Mines thermal conversion factor of 5.355 million Btu per barrel for “Jet Fuel, Military” as published by the Texas Eastern Transmission Corporation in Appendix V of *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

Kerosene. EIA adopted the thermal conversion factor of 5.670 million Btu per barrel as reported in a Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.”

Liquefied Petroleum Gases. (LGTCCKUS) • 1960 through 1966: U.S. Department of the Interior, Bureau of Mines, *Mineral Industry Surveys*, “Crude Petroleum and Petroleum Products, 1956,” Table 4 footnote, constant value of 4.011 million Btu per barrel. • 1967 forward: Calculated annually

by EIA as a weighted average by multiplying the quantity consumed of each of the component products by each product's conversion factor, listed in this appendix, and dividing the sum of those heat contents by the sum of the quantities consumed. The component products are ethane (including ethylene), propane (including propylene), normal butane (including butylene), butane-propane mixtures, ethane-propane mixtures, and isobutane. Quantities consumed are from: 1967 through 1980: EIA, *Energy Data Reports*, "Petroleum Statement, Annual," Table 1. 1981 forward: EIA, *Petroleum Supply Annual*, Table 2.

Lubricants. EIA adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Miscellaneous Products. EIA adopted the thermal conversion factor of 5.796 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Motor Gasoline. (MGTCCKUS) • 1960 through 1993: EIA adopted the Bureau of Mines thermal conversion factor of 5.253 million Btu per barrel for "Gasoline, Motor Fuel" as published by the Texas Eastern Transmission Corporation in Appendix V of *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics. • 1994 forward: EIA calculated national annual quantity-weighted average conversion factors for conventional, reformulated, and oxygenated motor gasolines (shown in appendix Table C1). The factor for conventional motor gasoline is 5.253 million Btu per barrel, as used for previous years. The factors for reformulated and oxygenated gasolines, both currently 5.150 million Btu per barrel, are based on data published in the Environmental Protection Agency, Office of Mobile Sources, National Vehicle and Fuel Emissions Laboratory report EPA 420-F-95-003, *Fuel Economy Impact Analysis of Reformulated Gasoline*.

Natural Gasoline. EIA adopted the thermal conversion factor of 4.620 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Pentanes Plus. EIA assumed the thermal conversion factor to be 4.620 million Btu per barrel, equal to that for natural gasoline. See **Natural Gasoline**.

Petrochemical Feedstocks, Naphtha Less Than 401 °F. EIA assumed the thermal conversion factor to be 5.248 million Btu per barrel, equal to that for special naphthas. See **Special Naphthas**.

Petrochemical Feedstock, Other Oils Equal to or Greater Than 401 °F. EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel, equal to that for distillate fuel oil. See **Distillate Fuel Oil**.

Petrochemical Feedstock, Still Gas. Assumed by EIA to be 6.000 million Btu per barrel, equal to the thermal conversion factor for still gas. See **Still Gas**.

Petroleum Coke. EIA adopted the thermal conversion factor of 6.024 million Btu per barrel as reported in Btu per short ton in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Value of Various Fuels, Adopted January 3, 1950." The Bureau of Mines calculated this factor by dividing 30,120,000 Btu per short ton, as given in the referenced Bureau of Mines internal memorandum, by 5.0 barrels per short ton, as given in the Bureau of Mines Form 6-1300-M and successor EIA forms.

Petroleum Products, Total Consumption. Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed, weighted by the quantity of each petroleum product consumed.

Plant Condensate. EIA estimated 5.418 million Btu per barrel from data provided by McClanahan Consultants, Inc., Houston, Texas.

Propane. EIA adopted the thermal conversion factor of 3.836 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

Residual Fuel Oil. EIA adopted the thermal conversion factor of 6.287 million Btu per barrel as reported in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

Road Oil. EIA adopted the Bureau of Mines thermal conversion factor of 6.636 million Btu per barrel, equal to that of asphalt and first published by the Bureau of Mines in the *Petroleum Statement, Annual, 1970*. See **Asphalt**.

Special Naphthas. EIA adopted the Bureau of Mines thermal conversion factor of 5.248 million Btu per barrel, equal to that of total gasoline (aviation and motor) and first published in the *Petroleum Statement, Annual, 1970*.

Still Gas. EIA adopted the Bureau of Mines estimated thermal conversion factor of 6.000 million Btu per barrel and first published in the *Petroleum Statement, Annual, 1970*.

Unfinished Oil. EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel, equal to that for distillate fuel oil and first published in the *Annual Report to Congress, Volume 3, 1977*. See **Distillate Fuel Oil**.

Unfractionated Stream. EIA assumed the thermal conversion factor to be 5.418 million Btu per barrel, equal to that for plant condensate and first published in the EIA, *Annual Report to Congress, Volume 2, 1981*. See **Plant Condensate**.

Waxes. EIA adopted the thermal conversion factor of 5.537 million Btu per barrel as estimated by the Bureau of Mines and first published in the EIA, *Petroleum Statement, Annual, 1956*.

Approximate Heat Content of Natural Gas

Natural Gas, Total Consumption. (NGTCKZZ) • 1960 through 1962: EIA adopted the thermal conversion factor of 1,035 Btu per cubic foot as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*. • 1963 through 1979: EIA adopted the thermal conversion factors calculated annually by the American Gas Association (AGA) and published in *Gas Facts*, an AGA annual. • 1980 forward: EIA, *Historical Natural Gas Annual 1930 Through 1999*, Table 16. This report is available only via the Internet at <http://www.eia.doe.gov>. In the box titled “Search EIA by Google” type “Historical Natural Gas Annual 1930” and click the “Go” button. Select the report from the list.

Natural Gas, Consumption by Electric Utilities. (NGEUKZZ) • 1960 through 1971: Assumed by EIA to be equal to the thermal conversion factor for the consumption of natural gas by all users. See **Natural Gas, Total Consumption**. • 1972 through 1982: Calculated annually by EIA by dividing the total heat content of natural gas received at steam

electric plants 25 megawatts or greater by the total quantity received at those electric plants. The heat contents and quantities received are from the Federal Energy Regulatory Commission (FERC) Form 423, “Monthly Report of Cost and Quality of Fuels for Electric Plants.” • 1983 forward: The average heat content of natural gas received at steam electric plants 50 megawatts capacity or larger from FERC Form 423 and published from 1993 forward in Btu per cubic foot in the EIA, *Cost and Quality of Fuels for Electric Utility Plants*, Table 14. This report is available only via the Internet at <http://www.eia.doe.gov>. In the box titled “Search EIA by Google” type “Cost and Quality of Fuels for Electric” and click on the “Go” button. Select the report from the list.

Natural Gas, Consumption by Sectors Other Than Electric Utilities. (NGNUKZZ) • 1960 through 1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of natural gas. See **Natural Gas, Total Consumption**. • 1973 forward: Calculated annually by EIA by dividing the heat content of all natural gas consumed less the heat content of natural gas consumed at electric utilities by the quantity of all natural gas consumed less the quantity of electric utility consumption. Data are from FERC Form 423, Forms EIA-176 and EIA-759, and predecessor forms.

Approximate Heat Content of Coal and Coal Coke

Anthracite, Total Consumption. Calculated annually by EIA by dividing the sum of the heat content of anthracite consumed by electric utilities and by all other sectors combined by the total quantity of anthracite consumed.

Anthracite, Consumption by Electric Utilities. (ACEUKUS) • 1960 through 1972: EIA assumed that all anthracite consumed at electric utilities was recovered from culm banks and river dredging and was estimated to have an average heat content of 17.500 million Btu per short ton. • 1973 forward: Calculated annually by EIA by dividing the heat content of anthracite received at electric utilities by the quantity of anthracite received at electric utilities, as reported on FERC Form 423 and predecessor forms.

Anthracite, Consumption by Sectors Other Than Electric Utilities. (ACNUKUS) Calculated annually by EIA by dividing the heat content of

anthracite produced less the heat content of the anthracite consumed at electric utilities, net exports, and shipments to U.S. Armed Forces overseas by the quantity of anthracite consumed by all sectors other than electric utilities less the quantity of anthracite stock changes, losses, and “unaccounted for.”

Bituminous Coal and Lignite, Total Consumption. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumed by electric utilities, coal coke plants, other industrial plants, the residential and commercial sector, and the transportation sector by the sum of their respective tonnages.

Bituminous Coal and Lignite, Consumption by Coke Plants. Estimated by EIA to be 26.800 million Btu per short ton on the basis of an input-output analysis of coal carbonization.

Bituminous Coal and Lignite, Consumption by Electric Utilities. (BCEUKZZ) • 1960 through 1972: EIA adopted the average thermal conversion factor of the Bureau of Mines, which used the National Coal Association (NCA) average thermal conversion factor for electric utilities calculated from the Federal Power Commission’s (FPC) Form 1 and published in *Steam Electric Plant Factors*, an NCA annual report. • 1973 through 1982: The average heat content of coal received at steam electric plants 25 megawatts or greater from FERC Form 423 and published in Btu per pound in EIA, *Cost and Quality of Fuels for Electric Utility Plants*, “Destination and Origin of Coal ‘Delivered to’ (1973–1979) ‘Receipts to’ (1980) ‘Received at’ (1981–1982) Steam-Electric Plants 25–MW or Greater.” • 1983 forward: The average heat content of coal received at steam electric plants having 50 megawatts capacity or larger from FERC Form 423 and published in Btu per pound in EIA, *Cost and Quality of Fuels for Electric Utility Plants*. This report is available only via the Internet at <http://www.eia.doe.gov>. In the box titled “Search EIA by Google” type “Cost and Quality of Fuels for Electric” and click on the “Go” button. Select the report from the list.

Notes: • The State conversion factors for 1960 through 1972 were derived from actual consumption data, while the conversion factors for 1973 to the present were based on receipts of coal. The factors for 1960 through 1972 may also have included some quantities of anthracite. These breaks in the series create some data discrepancies. • Alaska and Hawaii were excluded from the NCA report, FPC Form 423 and FERC Form 423. However,

Alaska reported consumption of bituminous coal and lignite at electric utilities for all years. An FPC heat rate for coal at electric utilities in Alaska was used for 1960 through 1978 as published by EIA in *Federal Energy Data System (FEDS) Technical Documentation*, June 1978, Table 21. The 1972 conversion factor (the last year for which a conversion factor was reported for Alaska) was used for 1972 through 1978. According to industry sources, new mines were opened in 1978 and a more representative factor was used for 1979 and following years. • In instances where a State had no receipts for a particular year but did report consumption, it was assumed that the coal received in one year was consumed during the following year and the Btu value of the previous year’s receipts was used.

Bituminous Coal and Lignite, Consumption by Other Industrial Users. (BCKCKZZ) • 1960 through 1973: Estimated by EIA by adjusting the 1974 average heat value of bituminous coal and lignite consumed by industrial users other than coke plants by the ratios of 1960 through 1973 national averages for the other industrial users to its 1974 average. • 1974 forward: Calculated by EIA by assuming that the bituminous coal and lignite consumed by industrial users other than coke plants in each State contained heating values equal to those of bituminous coal and lignite received at electric utilities in each State from identified coal-producing districts as reported on FERC Form 423. The average Btu content of coal delivered from each coal-producing district was applied to deliveries to other industrial users in each State and the sum total of the heat content was divided by total tonnages, yielding a weighted average. The coal distribution data by coal-producing district are reported on Form EIA-6 and predecessor Bureau of Mines Form 6-1419-Q.

Bituminous Coal and Lignite, Consumption by Residential and Commercial Users. (BCHCKZZ) • 1960 through 1973: Estimated by EIA by adjusting the 1974 average heat value of bituminous coal and lignite consumed in the residential and commercial sector by the ratios of 1960 through 1973 national averages for the sector to its 1974 average. • 1974 forward: Calculated by EIA by assuming that the bituminous coal and lignite consumed in the residential and commercial sector in each State contained heating values equal to those of bituminous coal and lignite received at electric utilities in each State from identified coal-producing districts as reported on FERC Form 423. The average Btu content of coal delivered from each coal-producing district was applied to deliveries to the residential and commercial sector in each State and the sum total of the heat content was divided by total tonnages, yielding a weighted average. The coal

distribution data by coal-producing district are reported on Form EIA-6 and predecessor Bureau of Mines Form 6-1419-Q.

Bituminous Coal and Lignite, Consumption by Transportation Users. Assumed by EIA to be equal to the Btu conversion factor for bituminous coal and lignite consumption by other industrial users. See **Bituminous Coal and Lignite, Consumption by Other Industrial Users.**

Coal Coke, Imports and Exports. EIA adopted the Bureau of Mines estimate of 24.800 million Btu per short ton.

Approximate Heat Content of Renewable Energy Sources

Ethanol, Consumption by the Transportation Sector. Fuel ethanol, which is derived from agricultural feedstocks (primarily corn) and blended into motor gasoline, is shown separately in *SEDR* to display the use of renewable energy in the transportation sector. Its gross heat content, calculated by EIA, is 3.539 million Btu per barrel.

Wood, Consumption by the Residential and Commercial Sectors. Estimated by EIA to be 20 million Btu per cord of wood. This rough average factor takes into account a number of variables, such as moisture content and species of wood, as explained in the EIA, *Household Energy Consumption and Expenditures 1993*, page 314.

Approximate Heat Rates for Electricity

Fossil-Fueled Steam-Electric Plant Generation. (FFEOKUS) There is no generally accepted practice for measuring the thermal conversion rates for power plants that generate electricity from hydroelectric, biomass fuels, wind, photovoltaic, or solar thermal energy sources. Therefore, EIA uses data from Form EIA-767 to calculate a rate factor that is equal to the prevailing annual average heat rate factor for fossil-fueled steam-electric power plants in the United States. By using that factor, it is possible to evaluate fossil fuel requirements for replacing those sources during periods of interruption, such as droughts. The heat content of a kilowatthour of electricity produced, regardless of the generation process, is 3,412 Btu per kilowatthour. • 1960 through 1988: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published by EIA in *Electric Plant Cost and Power Production Expenses 1991*, Table 9. • 1989 forward: Calculated annually by EIA on the basis of data from Form EIA-767 “Steam-Electric Plant Operation and Design Report.”

Geothermal Energy Plant Generation. (GEEOKUS) • 1960 through 1981: Calculated by EIA by weighting the annual average heat rates of operating geothermal units by the installed nameplate capacities as reported on FPC Form 12. • 1982 forward: Estimated annually by EIA based on an informal survey of relevant plants.

Nuclear Steam-Electric Plant Generation. (NUEOKUS) • 1960 through 1991: Calculated annually by EIA by dividing the total heat content consumed in nuclear generating units by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation data are reported on FERC Form 1, Form EIA-412, and predecessor forms. The factors for 1982 through 1991 are published in the following EIA reports—1982: *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants 1982*, page 215; 1983 through 1991: *Electric Plant Cost and Power Production Expenses 1991*, Table 13. • 1992 forward: Calculated annually by EIA by dividing the total heat content of the steam leaving nuclear generating units to generate electricity by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation data are reported in the Nuclear Regulatory Commission, *Licensed Operating Reactors—Status Summary Report*.