Efficiency, Heating Values (Gross and Net), and Cost Comparisons for Various Fuel Types

TYPE OF FUEL	Wood				Softwood (kiln dried)	Hardwood (kiln dried)	Wood pellets	Natural gas	Electricity	Firewood (seasoned)	Switchgrass	Bituminous coal	Shelled corn	Fuel oil		Propane
	Green (50% MC)[a]	Semidried (30% MC)[a]	Air-dried (20% MC)[a]	Ovendried (0% MC)	(13% MC)[a]	(8% MC)[a]	(premium)[b]			(20% MC)[a]	(ovendried)		(15% MC)	#2	#6	
GROSS HEATING VALUE	8,600,000 Btu/ton	12,040,000 Btu/ton	13,760,000 Btu/ton	17,200,000 Btu/ton	15,824,000 (Btu/ton)	15,996,000 (Btu/ton)	16,400,000 (Btu/ton)	1,025,000 (Btu/1000 ft³)	3,412 (Btu/kWh)	20,000,000 (Btu/cord)	15,500,000 (Btu/ton)	30,600,000 (Btu/ton)	392,000 (Btu/bu)	138,800 (Btu/gal)	150,000 (Btu/gal)	91,300 (Btu/gal)
EFFICIENCY	67%	74%	77%	80%	78%	79%	83%	80%	98%	77%	80%	85%	80%	83%	83%	79%
NET HEATING VALUE	5,740,000 Btu/ton	8,950,000 Btu/ton	10,560,000 Btu/ton	13,800,000 Btu/ton	12,300,000 Btu/ton	12,600,000 Btu/ton	13,600,000 Btu/ton	820,000 Btu/1000 ft³	3,340 Btu/kWh	15,300,000 Btu/cord	12,400,000 Btu/ton	26,000,000 Btu/ton	314,000 Btu/bu	115,000 Btu/gal	124,000 Btu/gal	71,900 Btu/gal
$/million Btu	*$/ton*	*$/ton*	*$/ton*	*$/ton*	*$/ton*	*$/ton*	*$/ton*	*$/1000 ft³*	*$/kWh*	*$/cord*	*$/ton*	*$/ton*	*$/bu*	*$/gal*	*$/gal*	*$/gal*
1.0	5.74	8.95	10.56	13.77	12.30	12.62	13.61	0.82	0.003	15.35	12.40	26.01	0.31	0.11	0.12	0.07
1.5	8.61	13.43	15.84	20.66	18.45	18.94	20.42	1.23	0.005	23.02	18.60	39.02	0.47	0.17	0.19	0.11
2.0	11.48	17.91	21.12	27.55	24.60	25.25	27.22	1.64	0.007	30.70	24.80	52.02	0.63	0.23	0.25	0.14
2.5	14.35	22.38	26.40	34.44	30.75	31.56	34.03	2.05	0.008	38.37	31.00	65.03	0.78	0.29	0.31	0.18
3.0	17.22	26.86	31.68	41.32	36.90	37.87	40.84	2.46	0.010	46.05	37.20	78.03	0.94	0.34	0.37	0.22
3.5	20.08	31.33	36.96	48.21	43.05	44.18	47.64	2.87	0.012	53.72	43.40	91.04	1.10	0.40	0.43	0.25
4.0	22.95	35.81	42.24	55.10	49.20	50.50	54.45	3.28	0.013	61.39	49.60	104	1.25	0.46	0.50	0.29
4.5	25.82	40.29	47.52	61.98	55.35	56.81	61.25	3.69	0.015	69.07	55.80	117	1.41	0.52	0.56	0.32
5.0	28.69	44.76	52.80	68.87	61.50	63.12	68.06	4.10	0.017	76.74	62.00	130	1.57	0.57	0.62	0.36
5.5	31.56	49.24	58.08	75.76	67.65	69.43	74.87	4.51	0.018	84.42	68.20	143	1.72	0.63	0.68	0.40
6.0	34.43	53.72	63.36	82.64	73.80	75.74	81.67	4.92	0.020	92.09	74.40	156	1.88	0.69	0.74	0.43
6.5	37.30	58.19	68.64	89.53	79.94	82.06	88.48	5.33	0.022	99.77	80.60	169	2.04	0.74	0.80	0.47
7.0	40.17	62.67	73.92	96.42	86.09	88.37	95.28	5.74	0.023	107	86.80	182	2.20	0.80	0.87	0.50
7.5	43.04	67.15	79.20	103	92	95	102	6.15	0.025	115	93.00	195	2.35	0.86	0.93	0.54
8.0	45.91	71.62	84.48	110	98	101	109	6.56	0.027	123	99.20	208	2.51	0.92	0.99	0.57
8.5	48.78	76.10	89.76	117	105	107	116	6.97	0.028	130	105	221	2.67	0.97	1.05	0.61
9.0	51.65	80.57	95.04	124	111	114	123	7.38	0.030	138	112	234	2.82	1.03	1.11	0.65
9.5	54.52	85.05	100	131	117	120	129	7.79	0.032	146	118	247	2.98	1.09	1.18	0.68
10.0	57.39	89.53	106	138	123	126	136	8.20	0.033	153	124	260	3.14	1.15	1.24	0.72
11.0	63.12	98.48	116	152	135	139	150	9.02	0.037	169	136	286	3.45	1.26	1.36	0.79
12.0	68.86	107	127	165	148	151	163	9.84	0.040	184	149	312	3.76	1.37	1.49	0.86
13.0	74.60	116	137	179	160	164	177	10.66	0.043	200	161	338	4.08	1.49	1.61	0.93
14.0	80.34	125	148	193	172	177	191	11.48	0.047	215	174	364	4.39	1.60	1.73	1.01
15.0	86.08	134	158	207	184	189	204	12.30	0.050	230	186	390	4.70	1.72	1.86	1.08
16.0	91.82	143	169	220	197	202	218	13.12	0.054	246	198	416	5.02	1.83	1.98	1.15
17.0	97.55	152	180	234	209	215	231	13.94	0.057	261	211	442	5.33	1.95	2.10	1.22
18.0	103	161	190	248	221	227	245	14.76	0.060	276	223	468	5.64	2.06	2.23	1.29
19.0	109	170	201	262	234	240	259	15.58	0.064	292	236	494	5.96	2.18	2.35	1.37
20.0	115	179	211	275	246	252	272	16.40	0.067	307	248	520	6.27	2.29	2.48	1.44
30.0	172	269	317	413	369	379	408	24.60	0.100	460	372	780	9.41	3.44	3.71	2.16
40.0	230	358	422	551	492	505	544	32.80	0.134	614	496	1040	12.54	4.58	4.95	2.87
50.0	287	448	528	689	615	631	681	41.00	0.167	767	620	1301	15.68	5.73	6.19	3.59
60.0	344	537	634	826	738	757	817	49.20	0.201	921	744	1561	18.82	6.87	7.43	4.31

[a]Wet basis.

[b]Presently, wood pellets come in two forms—standard and premium. There is no difference in the energy content per pound between the two. The major difference is the amount of ash. To be classified as premium, pellets must have an ash content less than 1%.

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