

Table E4. Renewable Energy Production and Consumption by Source, Fossil Fuel Equivalency Approach (Trillion Btu)

	Production ^a				Consumption								
	Biomass			Total Renewable Energy ^e	Noncombustible (Fossil Fuel Equivalent)				Biomass				Total Renewable Energy
	Wood ^b	Bio-fuels ^c	Total ^d		Hydroelectric Power ^f	Geothermal ^g	Solar ^h	Wind ⁱ	Wood ^j	Waste ^k	Bio-fuels ^l	Total	
1950 Total	1,562	NA	1,562	2,978	1,415	NA	NA	NA	1,562	NA	NA	1,562	2,978
1955 Total	1,424	NA	1,424	2,784	1,360	NA	NA	NA	1,424	NA	NA	1,424	2,784
1960 Total	1,320	NA	1,320	2,928	1,608	(s)	NA	NA	1,320	NA	NA	1,320	2,928
1965 Total	1,335	NA	1,335	3,396	2,059	2	NA	NA	1,335	NA	NA	1,335	3,396
1970 Total	1,429	NA	1,431	4,070	2,634	6	NA	NA	1,429	2	NA	1,431	4,070
1975 Total	1,497	NA	1,499	4,687	3,155	34	NA	NA	1,497	2	NA	1,499	4,687
1980 Total	2,474	NA	2,475	5,428	2,900	53	NA	NA	2,474	2	NA	2,475	5,428
1985 Total	2,687	93	3,016	6,084	2,970	97	(s)	(s)	2,687	236	93	3,016	6,084
1990 Total	2,216	111	2,735	6,040	3,046	171	59	29	2,216	408	111	2,735	6,040
1995 Total	2,370	198	3,099	6,557	3,205	152	68	33	2,370	531	200	3,101	6,559
2000 Total	2,262	233	3,006	6,102	2,811	164	63	57	2,262	511	236	3,008	6,104
2005 Total	2,137	561	3,101	6,221	2,703	181	58	178	2,137	403	574	3,114	6,233
2006 Total	2,099	716	3,212	6,586	2,869	181	60	264	2,099	397	766	3,262	6,637
2007 Total	2,089	970	3,472	6,510	2,446	186	65	341	2,089	413	983	3,485	6,523
2008 Total	2,059	1,374	3,868	7,191	2,511	192	74	546	2,059	435	1,357	3,851	7,174
2009 Total	1,935	1,570	3,957	7,624	2,669	200	77	721	1,935	452	1,553	3,940	7,607
2010 Total	2,217	1,868	4,553	8,312	2,539	208	90	923	2,217	468	1,821	4,506	8,266
2011 Total	2,213	2,037	4,712	9,306	3,103	212	110	1,168	2,213	462	1,941	4,616	9,210
2012 Total	2,151	1,936	4,554	8,890	2,629	212	156	1,340	2,151	467	1,899	4,517	8,853
2013 Total	2,338	2,000	4,835	9,438	2,562	214	225	1,601	2,338	496	2,026	4,861	9,464
2014 Total	2,401	2,135	5,052	9,798	2,466	214	337	1,727	2,401	516	2,099	5,016	9,761
2015 Total	2,312	2,201	5,031	9,766	2,320	212	427	1,776	2,312	518	2,185	5,015	9,749
2016 Total	2,299	2,329	5,132	10,477	2,471	210	570	2,095	2,227	503	2,333	5,063	10,409
2017 Total	2,264	2,407	5,166	11,259	2,765	210	777	2,342	2,185	495	2,364	5,045	11,138
2018 Total	2,356	2,471	5,314	11,580	2,661	209	915	2,481	2,262	487	2,355	5,105	11,370
2019 Total	2,341	2,432	5,215	11,627	2,562	201	1,016	2,633	2,237	442	2,376	5,056	11,468
2020 Total	2,076	2,194	4,710	11,588	2,501	203	1,211	2,963	1,970	440	2,136	4,545	11,423
2021 January	180	191	409	987	217	17	77	266	172	38	169	379	956
February	162	152	348	865	178	16	86	236	154	34	154	342	858
March	179	194	411	1,086	188	16	125	347	167	38	194	399	1,075
April	171	187	393	1,044	171	17	143	320	162	36	186	383	1,035
May	176	206	418	1,102	206	17	162	299	168	36	207	410	1,094
June	175	201	410	1,030	207	17	160	236	164	34	200	398	1,018
July	181	209	426	991	195	17	161	192	173	36	204	413	978
August	182	195	413	1,005	180	17	156	239	172	35	200	407	999
September	175	185	395	963	151	17	144	256	164	34	186	385	952
October	172	214	422	996	152	17	121	285	164	35	214	413	988
November	173	216	424	1,031	171	17	102	316	161	35	207	403	1,010
December	183	224	445	1,108	208	19	84	352	171	38	209	418	1,081
Total	2,109	2,374	4,914	12,208	2,225	205	1,520	3,345	1,989	430	2,331	4,751	12,045
2022 January	184	214	435	1,099	213	18	102	330	175	37	193	404	1,067
February	171	190	394	1,046	188	16	116	332	159	33	177	370	1,022
March	181	212	430	1,195	215	17	154	379	169	37	207	412	1,177
April	173	198	406	1,180	177	17	174	407	164	34	195	393	1,168
May	182	214	430	1,219	206	17	195	371	170	35	208	412	1,201
June	182	214	430	1,176	229	16	203	298	168	33	213	414	1,160
July	185	218	436	1,132	217	17	203	260	175	31	206	415	1,111
August	184	211	429	1,039	186	17	189	218	174	34	213	421	1,031
September	177	193	402	981	150	17	172	241	162	32	192	387	966
October	174	217	425	1,012	127	17	155	289	163	34	216	413	1,000
November	174	219	427	1,080	158	18	114	363	164	34	209	407	1,059
December	183	211	429	1,064	180	18	96	341	169	35	205	409	1,045
Total	2,150	2,511	5,073	13,224	2,245	205	1,872	3,827	2,012	412	2,433	4,857	13,007
2023 January	^R 182	220	437	1,107	196	19	109	^R 346	174	36	210	420	^R 1,090
February	162	198	393	^R 1,070	165	16	124	^R 372	154	32	190	376	^R 1,053
March	180	222	436	1,190	178	18	165	^R 393	165	34	220	420	1,174
April	160	212	404	^R 1,151	154	17	196	^R 380	152	32	207	391	^R 1,138
May	^R 175	229	438	1,202	242	17	222	^R 283	^R 164	34	234	432	1,196
June	168	230	430	1,088	172	16	227	^R 243	156	32	232	^R 420	^R 1,078
July	172	232	437	^R 1,128	187	17	^R 242	246	162	33	223	418	1,109
August	177	230	440	^R 1,125	186	17	230	^R 252	163	33	235	431	^R 1,116
September	166	227	425	1,037	145	17	201	^R 249	153	32	224	408	1,020
October	166	231	430	^R 1,112	159	18	183	^R 322	154	33	233	420	^R 1,102
November	^R 168	229	^R 430	^R 1,072	160	18	138	^R 326	159	32	219	410	^R 1,052
December	173	248	456	1,107	170	18	125	338	162	36	235	432	1,083
Total	2,049	2,708	5,155	13,389	2,114	209	2,164	3,748	1,918	398	2,662	4,978	13,212

^a For hydroelectric power, geothermal, solar, wind, and biomass waste, production equals consumption.

^b Wood and wood-derived fuels. Through 2015, wood production equals consumption. Beginning in 2016, wood production equals consumption plus densified biomass exports.

^c Total biomass inputs to the production of fuel ethanol and biodiesel. Beginning in 2011, also includes production of renewable diesel fuel. Beginning in 2014, also includes production of other biofuels.

^d Includes biomass waste.

^e Hydroelectric power, geothermal, solar, wind, and biomass.

^f Conventional hydroelectricity net generation (converted to Btu by multiplying by the total fossil fuels heat rate factors in Table A6).

^g Geothermal electricity net generation (converted to Btu by multiplying by the total fossil fuels heat rate factors in Table A6), and geothermal heat pump and direct use energy.

^h Solar photovoltaic (PV) and solar thermal electricity net generation (converted to Btu by multiplying by the total fossil fuels heat rate factors in Table A6), and solar thermal direct use energy.

ⁱ Wind electricity net generation (converted to Btu by multiplying by the total fossil fuels heat rate factors in Table A6).

^j Wood and wood-derived fuels.

^k Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and

tire-derived fuels).

^l Fuel ethanol (minus denaturant), biodiesel, renewable diesel fuel, and other biofuels consumption; plus losses and co-products from the production of fuel ethanol and biodiesel.

^m Revised. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: • Production data are estimates. Consumption data are estimates, except for hydroelectric power in 1949–1978 and 1989 forward, and wind. • Totals may not equal sum of components due to independent rounding.

• Geographic coverage is the 50 states and the District of Columbia.

Web Page: See <http://www.eia.gov/totalenergy/data/monthly/#appendices> (Excel and CSV files) for all available annual data beginning in 1949 and monthly data beginning in 1973.

Sources: • **Biomass:** Table 10.1. • **Hydroelectric Power and Wind:** Calculated as electricity net generation (see Table 7.2a) multiplied by the total fossil fuels heat rate factors (see Table A6). • **Geothermal:** Calculated as geothermal electricity net generation (see Table 7.2a) multiplied by the total fossil fuels heat rate factors (see Table A6); plus geothermal heat pump and direct use energy in the residential, commercial, and industrial sectors (see Tables 10.2a and 10.2b). • **Solar:** Calculated as solar electricity net generation (see Table 7.2a) multiplied by the total fossil fuels heat rate factors (see Table A6); plus solar thermal direct use energy (see Table 10.5). • **Total Production:** Calculated as the sum of biomass production and noncombustible consumption. • **Total Consumption:** Calculated as the sum of biomass consumption and noncombustible consumption.