11. Environment

Figure 11.1 Carbon Dioxide Emissions From Energy Consumption by Source

(Million Metric Tons of Carbon Dioxide)

Total [a], 1973–2020

Total [a], Monthly

By Major Source, 1973–2020
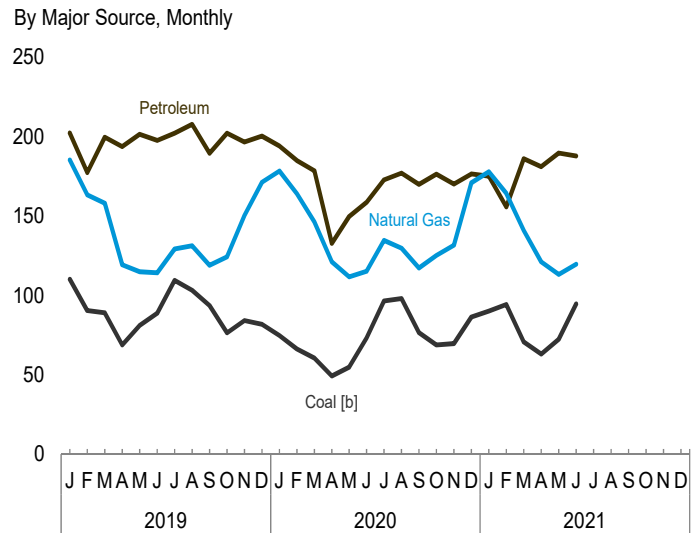

By Major Source, Monthly

Total [a], January–June

By Major Source, June 2021
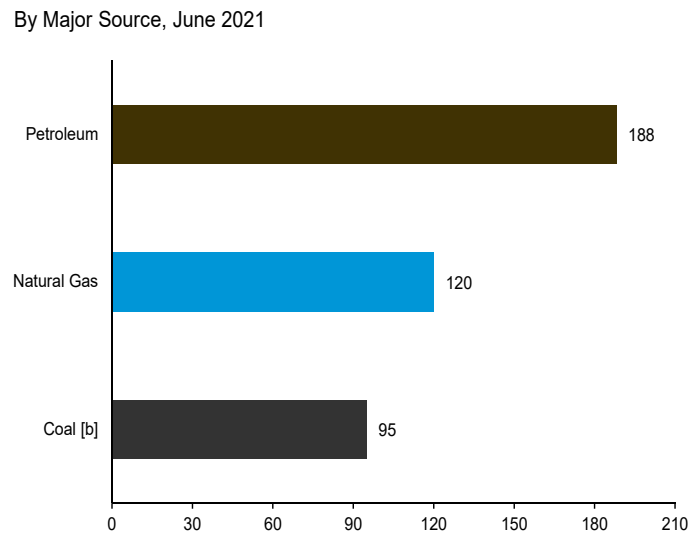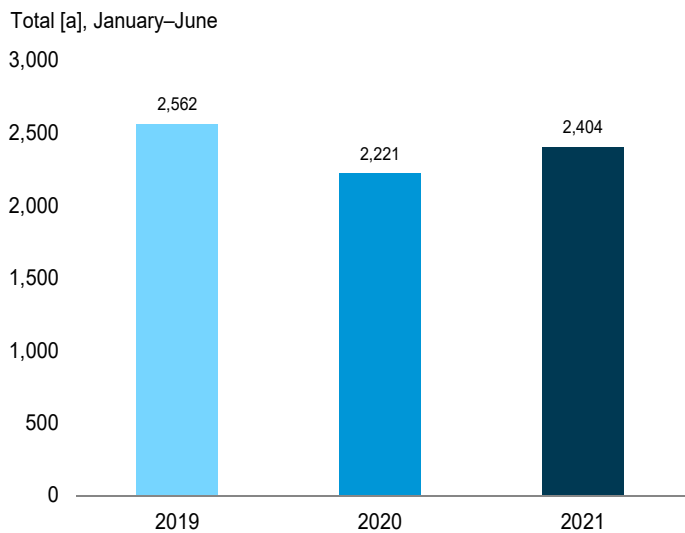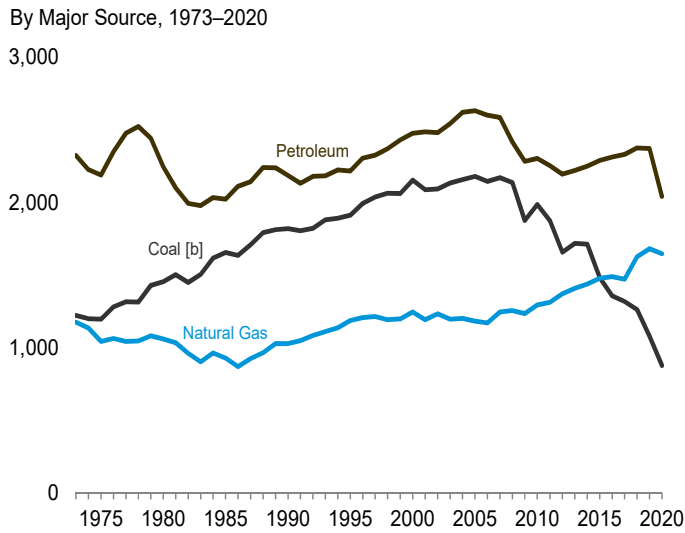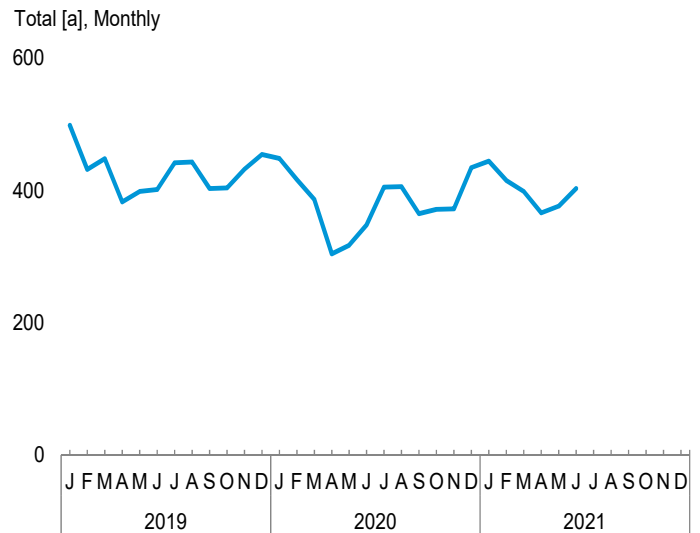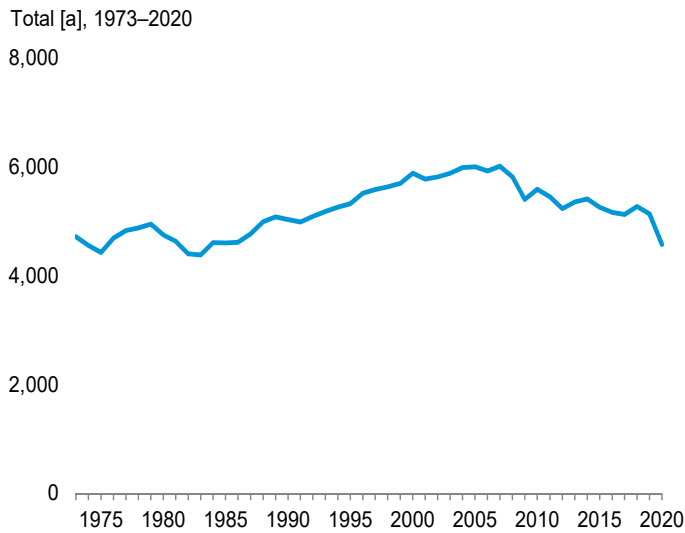
[a] Excludes emissions from biomass energy consumption.
[b] Includes coal coke net imports.

Web Page: http://www.eia.gov/totalenergy/data/monthly/#environment.
Source: Table 11.1.

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Table 11.1 Carbon Dioxide Emissions From Energy Consumption by Source
(Million Metric Tons of Carbon Dioxide[a])

	Coal[b]	Natural Gas[c]	Petroleum Aviation Gasoline	Distillate Fuel Oil[d]	HGL[e]	Jet Fuel	Kerosene	Lubricants	Motor Gasoline[f]	Petroleum Coke	Residual Fuel Oil	Other[g]	Total	Total[h,i]
1973 Total	R 1,221	R 1,175	6	R 485	80	R 154	R 33	13	911	55	R 486	R 102	R 2,325	R 4,721
1975 Total	R 1,195	R 1,043	5	R 447	73	146	24	11	911	52	R 424	R 97	R 2,190	4,428
1980 Total	R 1,454	R 1,058	4	R 451	78	156	24	13	R 901	50	R 433	R 134	R 2,244	R 4,756
1985 Total	R 1,655	927	3	R 450	82	178	17	12	R 933	56	R 207	R 86	2,024	R 4,605
1990 Total	R 1,820	R 1,026	3	R 475	75	223	6	13	988	72	R 212	R 119	R 2,185	R 5,038
1995 Total	R 1,912	R 1,185	3	R 504	90	222	8	13	1,042	R 77	R 147	R 111	R 2,216	5,324
2000 Total	R 2,155	1,246	3	R 592	106	R 259	10	14	R 1,141	85	R 157	R 111	R 2,477	5,889
2005 Total	R 2,180	R 1,182	2	R 653	92	R 251	R 11	12	R 1,205	110	R 159	R 140	R 2,633	R 6,007
2006 Total	R 2,146	R 1,170	2	R 658	86	R 244	8	11	R 1,217	106	R 119	R 151	R 2,602	R 5,929
2007 Total	R 2,171	R 1,245	2	R 657	90	R 242	5	12	R 1,209	99	R 125	R 147	R 2,587	R 6,016
2008 Total	R 2,139	1,255	2	R 619	89	R 231	2	11	R 1,134	94	R 107	R 130	R 2,418	R 5,823
2009 Total	R 1,875	R 1,233	2	R 563	86	R 208	3	10	R 1,127	87	R 88	R 111	R 2,283	R 5,404
2010 Total	1,986	1,292	2	R 591	R 84	R 214	3	11	R 1,107	81	R 92	R 119	R 2,304	R 5,594
2011 Total	R 1,876	R 1,312	2	R 600	79	R 213	2	10	R 1,074	78	R 79	R 118	R 2,255	R 5,455
2012 Total	R 1,658	1,372	2	R 577	R 75	R 210	1	9	R 1,066	78	R 64	R 114	R 2,195	R 5,236
2013 Total	1,718	1,408	2	R 581	85	R 214	1	10	R 1,077	77	R 55	R 120	R 2,221	R 5,359
2014 Total	R 1,713	R 1,438	2	R 614	86	R 220	1	10	R 1,085	77	R 44	R 112	R 2,251	R 5,414
2015 Total	R 1,482	R 1,479	1	R 606	R 86	R 231	1	11	R 1,114	77	R 45	R 116	R 2,290	5,262
2016 Total	R 1,355	R 1,490	1	R 583	83	R 242	1	11	R 1,134	77	R 56	R 124	R 2,313	5,169
2017 Total	R 1,318	R 1,471	1	R 591	R 85	R 251	1	10	R 1,131	71	R 59	R 130	R 2,331	R 5,131
2018 Total	R 1,263	R 1,626	2	R 626	98	R 255	1	10	R 1,131	73	R 55	R 127	R 2,377	R 5,277
2019 January	110	R 185	(s)	R 56	13	R 21	(s)	1	91	6	5	11	202	499
February	90	R 163	(s)	R 50	11	18	(s)	1	R 84	2	4	7	177	432
March	89	R 158	(s)	R 54	10	R 22	(s)	1	95	6	3	10	R 200	448
April	69	R 119	(s)	R 51	R 7	R 22	(s)	1	R 94	4	3	R 12	R 194	383
May	81	115	(s)	R 53	7	R 23	(s)	1	98	6	3	12	R 202	R 399
June	89	R 114	(s)	49	7	22	(s)	1	97	7	5	10	R 198	R 402
July	R 110	R 129	(s)	R 50	7	23	(s)	1	R 98	8	5	10	202	442
August	103	R 131	(s)	R 52	7	23	(s)	1	102	6	5	12	R 208	443
September	94	119	(s)	R 49	7	21	(s)	1	92	5	R 4	11	R 190	403
October	76	R 124	(s)	54	9	22	(s)	1	96	4	5	R 12	202	404
November	84	R 150	(s)	R 53	10	21	(s)	1	R 91	6	3	11	R 197	432
December	82	R 171	(s)	50	11	23	(s)	1	R 92	7	4	R 12	200	455
Total	R 1,078	R 1,681	2	R 621	105	R 261	1	9	R 1,128	67	R 47	R 131	R 2,372	R 5,141
2020 January	75	R 178	(s)	R 52	R 11	21	(s)	1	R 90	5	R 3	11	194	448
February	66	R 164	(s)	R 49	9	19	(s)	1	87	5	R 3	12	R 185	R 416
March	60	R 146	(s)	R 51	10	R 18	(s)	R 1	R 80	5	R 1	R 13	R 179	R 386
April	49	R 121	(s)	R 44	7	8	(s)	1	59	3	R 1	10	133	R 304
May	55	112	(s)	R 44	7	R 8	(s)	1	74	4	1	11	150	R 317
June	73	R 115	(s)	43	6	R 10	(s)	1	R 82	4	3	R 10	159	348
July	R 97	135	(s)	R 46	7	12	(s)	1	R 87	5	5	R 10	R 173	R 405
August	98	130	(s)	R 47	7	13	(s)	1	88	7	R 4	10	177	406
September	77	R 117	(s)	47	R 8	11	(s)	1	R 85	R 6	5	8	R 170	R 365
October	69	R 125	(s)	R 52	9	13	(s)	1	86	4	4	8	176	371
November	70	132	(s)	48	10	14	(s)	1	R 79	6	3	9	170	372
December	86	171	(s)	R 50	13	R 15	(s)	1	R 80	5	3	10	R 177	435
Total	R 875	R 1,647	1	R 572	R 104	R 161	1	8	R 977	58	R 36	R 123	R 2,042	R 4,575
2021 January	90	178	(s)	R 52	13	14	(s)	1	R 79	5	4	8	175	444
February	94	R 164	(s)	R 47	10	R 13	(s)	1	R 72	3	R 3	7	156	R 416
March	71	141	(s)	R 53	10	R 15	(s)	1	R 88	4	4	11	186	399
April	63	121	(s)	50	8	R 16	(s)	1	R 88	4	2	12	181	366
May	72	R 113	(s)	R 51	8	R 17	(s)	1	R 94	6	4	10	190	376
June	95	120	(s)	50	8	18	(s)	1	92	6	5	9	188	403
6-Month Total	485	838	1	302	57	92	1	4	513	28	22	57	1,076	2,404
2020 6-Month Total	379	837	1	283	50	84	1	4	472	26	12	67	999	2,221
2019 6-Month Total	528	855	1	313	54	127	1	5	557	31	21	63	1,173	2,562

a Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
b Includes coal coke net imports.
c Natural gas, excluding supplemental gaseous fuels.
d Distillate fuel oil, excluding biodiesel.
e Hydrocarbon gas liquids.
f Finished motor gasoline, excluding fuel ethanol.
g Aviation gasoline blending components, crude oil, motor gasoline blending components, petrochemical feedstocks, special naphthas, still gas, unfinished oils, waxes, and miscellaneous petroleum products.
h Includes electric power sector use of geothermal energy and non-biomass waste. See Table 11.6.
i Excludes emissions from biomass energy consumption. See Table 11.7.

R=Revised. (s)=Less than 0.5 million metric tons.
Notes: • Data are estimates for carbon dioxide emissions from energy consumption, plus the relatively small amount of emissions from the non-combustion use of fossil fuels. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • Data exclude emissions from biomass energy consumption. See Table 11.7 and Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
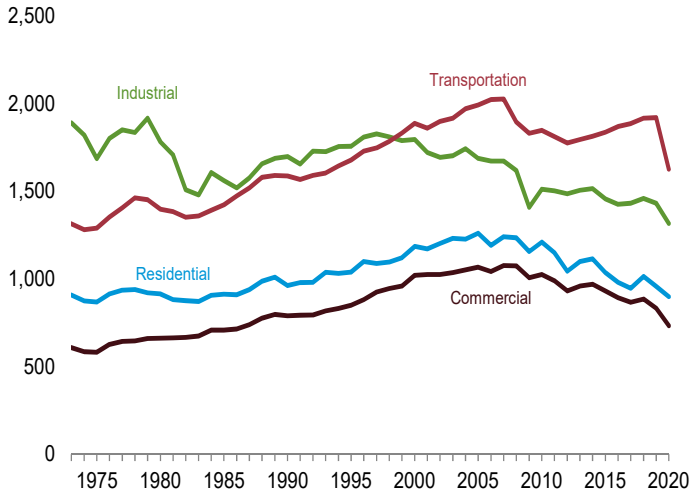Sources: See end of section.

Historical revisions are due to revised CO2 factors. See "Section 11 Methodology and Sources," Step 4, at end of section.
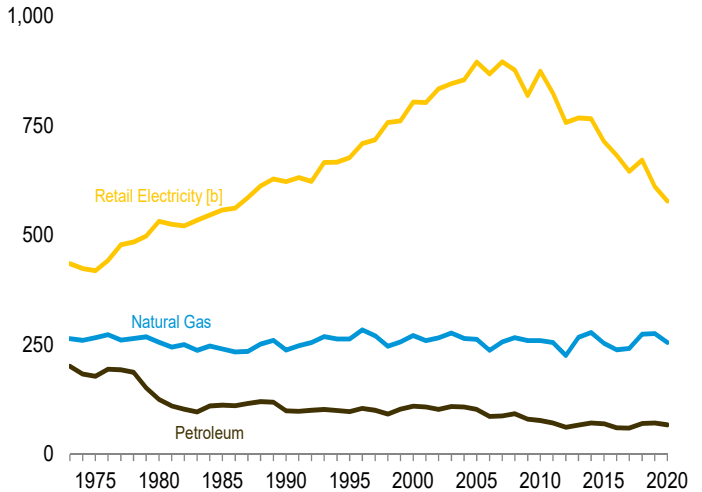
Figure 11.2 Carbon Dioxide Emissions From Energy Consumption by Sector
(Million Metric Tons of Carbon Dioxide)

Total [a] by End-Use Sector [b], 1973–2020

Residential Sector by Major Source, 1973–2020

Commercial Sector by Major Source, 1973–2020
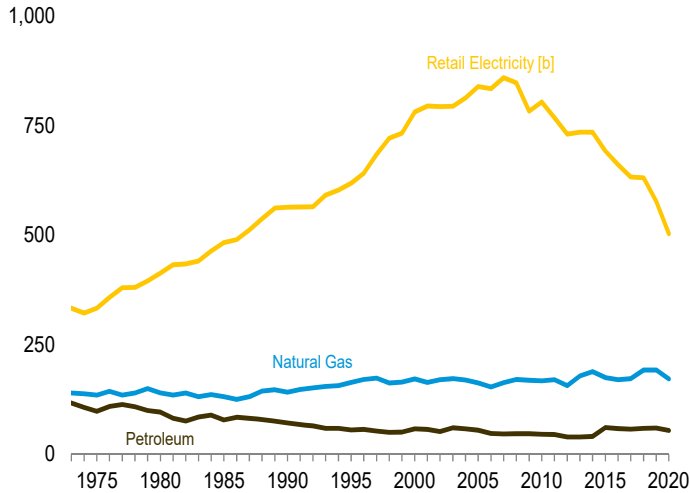
Industrial Sector by Major Source, 1973–2020
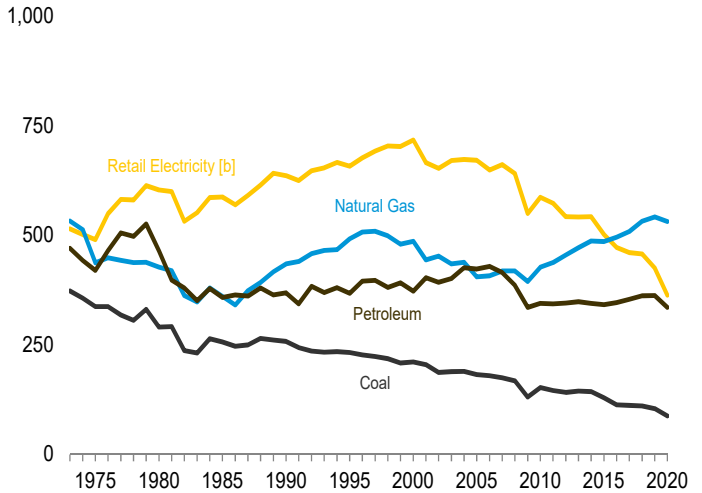
Transportation Sector by Major Source, 1973–2020
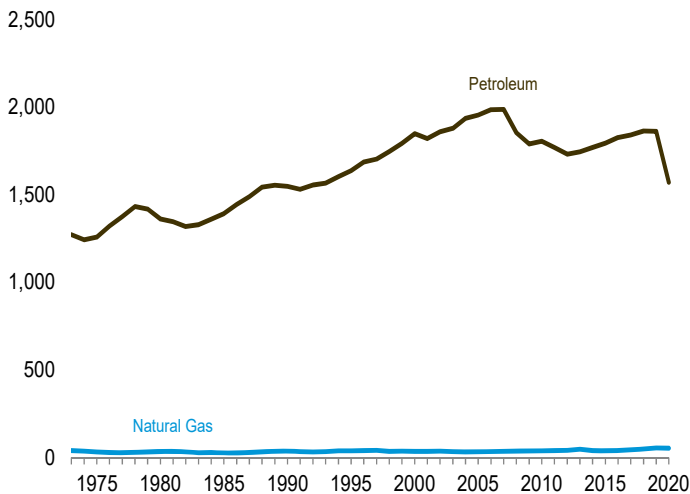
Electric Power Sector by Major Source, 1973–2020
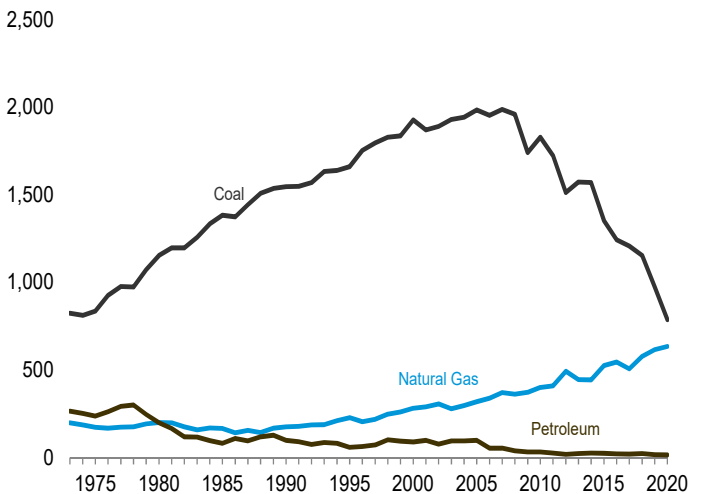
[a] Excludes emissions from biomass energy consumption.
[b] Emissions from energy consumption in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales.
Web Page: http://www.eia.gov/totalenergy/data/monthly/#environment.
Sources: Tables 11.2–11.6.

Table 11.2 Carbon Dioxide Emissions From Energy Consumption: Residential Sector
(Million Metric Tons of Carbon Dioxide[a])

	Coal	Natural Gas[b]	Petroleum				Retail Electricity[e]	Total[f]
			Distillate Fuel Oil[c]	HGL[d]	Kerosene	Total		
1973 Total	9	264	R 148	36	R 17	R 201	435	R 908
1975 Total	6	266	R 134	32	12	R 178	419	R 869
1980 Total	3	256	R 97	20	8	R 125	R 531	R 915
1985 Total	4	R 240	R 81	20	R 12	R 112	R 557	R 913
1990 Total	3	238	72	22	5	R 99	R 622	R 962
1995 Total	2	263	R 67	25	5	R 97	R 677	1,039
2000 Total	1	271	R 68	35	7	R 109	R 804	1,185
2005 Total	1	262	R 64	32	6	R 102	R 895	R 1,260
2006 Total	1	237	R 53	28	5	R 86	R 868	1,191
2007 Total	1	R 256	R 54	R 30	3	R 87	R 896	R 1,240
2008 Total	NA	266	R 56	35	2	R 92	877	R 1,234
2009 Total	NA	259	43	R 34	2	R 80	R 818	1,157
2010 Total	NA	259	R 42	33	2	77	874	1,210
2011 Total	NA	255	R 39	31	1	71	823	1,149
2012 Total	NA	225	R 36	25	1	61	757	1,043
2013 Total	NA	R 266	36	29	1	66	R 767	1,100
2014 Total	NA	278	R 40	31	1	71	766	1,115
2015 Total	NA	253	R 41	28	1	R 70	714	1,037
2016 Total	NA	R 238	32	27	1	60	683	R 981
2017 Total	NA	R 241	32	27	1	R 60	645	R 946
2018 Total	NA	R 274	R 38	32	1	70	671	R 1,015
2019 January	NA	R 52	5	6	(s)	11	61	124
February	NA	R 44	4	5	(s)	9	50	R 103
March	NA	38	4	4	(s)	8	47	93
April	NA	18	2	3	(s)	5	34	57
May	NA	12	2	2	(s)	4	41	56
June	NA	7	2	1	(s)	3	51	61
July	NA	6	2	1	(s)	3	70	79
August	NA	6	2	1	(s)	3	67	76
September	NA	6	1	1	(s)	3	57	65
October	NA	13	2	2	(s)	4	42	R 59
November	NA	32	4	4	(s)	8	44	85
December	NA	41	5	5	(s)	10	49	100
Total	NA	R 275	R 35	R 35	1	71	611	958
2020 January	NA	45	4	5	(s)	R 10	48	102
February	NA	40	3	R 5	(s)	8	42	90
March	NA	29	3	4	(s)	7	37	73
April	NA	21	3	3	(s)	6	33	59
May	NA	13	3	2	(s)	5	37	55
June	NA	7	2	1	(s)	3	52	63
July	NA	6	1	1	(s)	2	75	83
August	NA	6	1	1	(s)	2	71	80
September	NA	7	2	1	(s)	3	52	62
October	NA	13	2	2	(s)	R 5	R 41	59
November	NA	24	3	3	(s)	6	39	69
December	NA	44	R 4	5	(s)	R 9	54	106
Total	NA	R 255	R 32	R 34	1	R 67	578	R 899
2021 January	NA	48	3	R 6	(s)	R 9	56	113
February	NA	47	3	5	(s)	9	56	112
March	NA	31	3	4	(s)	R 7	41	79
April	NA	19	2	3	(s)	5	34	57
May	NA	12	2	2	(s)	3	39	54
June	NA	7	1	1	(s)	2	58	68
6-Month Total	NA	164	14	20	(s)	35	284	483
2020 6-Month Total	NA	155	19	19	1	39	249	443
2019 6-Month Total	NA	171	19	21	(s)	40	284	495

a Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
b Natural gas, excluding supplemental gaseous fuels.
c Distillate fuel oil, excluding biodiesel.
d Hydrocarbon gas liquids.
e Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 7.6 and 11.6.
f Excludes emissions from biomass energy consumption. See Table 11.7.
R=Revised. NA=Not available. (s)=Less than 0.5 million metric tons.

Notes: • Data are estimates for carbon dioxide emissions from energy consumption. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • Data exclude emissions from biomass energy consumption. See Table 11.7 and Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
Sources: See end of section.

Historical revisions are due to revised CO2 factors. See
"Section 11 Methodology and Sources," Step 4, at end of section.

Table 11.3 Carbon Dioxide Emissions From Energy Consumption: Commercial Sector
(Million Metric Tons of Carbon Dioxide[a])

	Coal	Natural Gas[b]	Petroleum Distillate Fuel Oil[c]	Petroleum HGL[d]	Petroleum Kerosene	Petroleum Motor Gasoline[e]	Petroleum Coke	Petroleum Residual Fuel Oil	Petroleum Total	Retail Electricity[f]	Total[g]
1973 Total	15	R 140	R 48	9	5	6	NA	R 50	R 118	334	R 607
1975 Total	14	136	43	8	4	6	NA	R 37	R 98	R 334	R 582
1980 Total	11	141	38	6	3	8	NA	R 42	R 97	R 414	662
1985 Total	13	132	R 47	6	2	7	NA	R 17	79	R 484	R 708
1990 Total	12	142	R 40	6	1	8	0	R 17	R 72	R 564	R 790
1995 Total	11	164	35	7	2	1	(s)	11	56	R 619	R 850
2000 Total	9	R 172	R 37	9	2	3	(s)	7	58	R 781	R 1,021
2005 Total	9	163	33	8	2	3	(s)	9	55	R 840	R 1,067
2006 Total	6	154	R 30	8	1	3	(s)	6	R 48	R 834	R 1,042
2007 Total	7	164	28	8	1	4	(s)	6	46	R 860	R 1,077
2008 Total	8	171	R 29	10	(s)	3	(s)	R 5	47	R 848	R 1,074
2009 Total	7	169	29	9	(s)	3	(s)	R 5	47	784	1,007
2010 Total	7	168	29	9	(s)	3	(s)	5	46	804	1,025
2011 Total	6	171	29	9	(s)	3	(s)	4	45	768	990
2012 Total	4	157	26	9	(s)	3	(s)	2	40	731	932
2013 Total	4	179	25	10	(s)	3	(s)	2	R 40	736	958
2014 Total	4	R 189	26	10	(s)	4	(s)	1	41	736	970
2015 Total	3	R 175	R 27	9	(s)	25	(s)	(s)	61	692	932
2016 Total	2	171	24	9	(s)	25	(s)	(s)	59	R 661	R 893
2017 Total	2	R 173	24	10	(s)	24	(s)	(s)	58	633	R 866
2018 Total	2	193	24	11	(s)	24	(s)	(s)	59	R 631	R 885
2019 January	(s)	R 30	R 4	2	(s)	2	(s)	(s)	7	51	89
February	(s)	26	3	1	(s)	2	(s)	(s)	6	44	76
March	(s)	23	3	1	(s)	2	(s)	(s)	6	45	74
April	(s)	14	2	1	(s)	2	(s)	(s)	5	38	57
May	(s)	10	1	1	(s)	2	0	(s)	4	45	60
June	(s)	8	1	1	(s)	2	0	(s)	4	49	61
July	(s)	8	1	1	(s)	2	0	(s)	4	60	72
August	(s)	8	2	1	(s)	2	0	(s)	4	59	71
September	(s)	8	1	1	(s)	2	0	(s)	3	53	64
October	(s)	12	1	1	(s)	2	0	(s)	4	45	R 61
November	(s)	21	3	1	(s)	2	0	(s)	6	44	72
December	(s)	25	3	1	(s)	2	(s)	(s)	7	44	76
Total	**2**	**193**	**24**	**11**	**(s)**	**24**	**(s)**	**(s)**	**60**	**R 577**	**R 832**
2020 January	(s)	27	3	1	(s)	2	(s)	(s)	6	42	75
February	(s)	24	2	1	(s)	2	(s)	(s)	R 6	38	68
March	(s)	R 18	2	1	(s)	2	0	(s)	5	37	61
April	(s)	13	2	1	(s)	1	0	(s)	4	30	R 48
May	(s)	9	2	1	(s)	2	0	(s)	R 5	33	47
June	(s)	7	1	1	(s)	2	0	(s)	4	43	54
July	(s)	7	1	1	(s)	2	0	(s)	3	56	67
August	(s)	7	1	1	(s)	2	0	(s)	3	55	65
September	(s)	8	1	1	(s)	2	0	(s)	4	45	57
October	(s)	11	R 2	1	(s)	2	0	(s)	4	42	58
November	(s)	16	2	1	(s)	2	0	(s)	5	38	59
December	(s)	25	2	1	(s)	2	0	(s)	R 6	43	74
Total	**1**	**173**	**R 22**	**11**	**(s)**	**21**	**(s)**	**(s)**	**R 55**	**504**	**R 733**
2021 January	(s)	27	2	R 2.	(s)	2	0	(s)	5	43	75
February	(s)	27	2	1	(s)	2	(s)	(s)	5	44	76
March	(s)	19	2	1	(s)	2	(s)	(s)	5	37	61
April	(s)	R 13	1	1	(s)	2	0	(s)	4	35	53
May	(s)	10	1	1	(s)	2	0	(s)	4	40	54
June	(s)	8	1	1	(s)	2	0	(s)	3	52	63
6-Month Total	**1**	**104**	**10**	**6**	**(s)**	**11**	**(s)**	**(s)**	**27**	**250**	**383**
2020 6-Month Total	**1**	**99**	**13**	**6**	**(s)**	**10**	**(s)**	**(s)**	**30**	**223**	**352**
2019 6-Month Total	**1**	**111**	**13**	**6**	**(s)**	**12**	**(s)**	**(s)**	**32**	**273**	**416**

[a] Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
[b] Natural gas, excluding supplemental gaseous fuels.
[c] Distillate fuel oil, excluding biodiesel.
[d] Hydrocarbon gas liquids.
[e] Finished motor gasoline, excluding fuel ethanol.
[f] Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 7.6 and 11.6.
[g] Excludes emissions from biomass energy consumption. See Table 11.7.
R=Revised. NA=Not available. (s)=Less than 0.5 million metric tons.

Notes: • Data are estimates for carbon dioxide emissions from energy consumption. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • Data exclude emissions from biomass energy consumption. See Table 11.7 and Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
Sources: See end of section.

Historical revisions are due to revised CO2 factors. See "Section 11 Methodology and Sources," Step 4, at end of section.

Table 11.4 Carbon Dioxide Emissions From Energy Consumption: Industrial Sector

(Million Metric Tons of Carbon Dioxide[a])

	Coal	Coal Coke Net Imports	Natural Gas[b]	Petroleum Distillate Fuel Oil[c]	Petroleum HGL[d]	Petroleum Kerosene	Petroleum Lubricants	Petroleum Motor Gasoline[e]	Petroleum Coke	Petroleum Residual Fuel Oil	Petroleum Other[f]	Petroleum Total	Retail Electricity[g]	Total[h]
1973 Total	R 373	-1	533	R 107	31	11	7	18	54	R 139	R 102	R 471	515	R 1,891
1975 Total	R 338	2	R 437	R 98	30	9	6	16	52	R 113	R 97	R 420	490	1,686
1980 Total	R 291	-4	R 427	R 97	52	13	7	11	50	R 101	R 134	465	R 604	R 1,782
1985 Total	R 257	-2	361	R 82	54	3	6	R 16	55	R 56	R 86	358	R 587	R 1,561
1990 Total	258	1	R 435	R 85	45	1	7	13	69	R 31	R 119	R 369	R 636	R 1,699
1995 Total	R 232	7	492	R 83	57	1	7	14	69	R 25	R 111	368	R 658	R 1,757
2000 Total	211	7	486	R 89	61	1	7	11	75	R 18	R 111	373	R 717	R 1,795
2005 Total	182	5	R 405	R 94	49	3	6	25	86	R 21	R 140	R 423	R 671	R 1,687
2006 Total	180	7	R 407	R 93	R 48	2	6	26	85	R 18	R 151	R 430	R 649	R 1,673
2007 Total	175	3	419	R 93	50	1	6	21	83	R 14	R 147	R 415	R 661	R 1,672
2008 Total	168	5	419	R 99	41	(s)	6	17	79	15	R 130	R 386	R 641	R 1,619
2009 Total	131	-3	395	R 79	41	(s)	5	16	73	10	R 111	335	550	R 1,408
2010 Total	152	-1	R 428	R 85	42	1	5	17	67	9	R 119	345	587	R 1,511
2011 Total	146	1	438	R 91	38	(s)	5	17	64	10	R 118	343	574	R 1,502
2012 Total	R 142	(s)	455	R 94	42	(s)	4	17	69	5	R 114	345	543	R 1,485
2013 Total	R 145	-2	472	R 94	46	(s)	5	17	64	4	R 120	349	542	R 1,505
2014 Total	R 144	-2	R 487	R 101	45	(s)	5	14	65	3	R 112	345	543	R 1,516
2015 Total	129	-2	R 486	R 87	R 48	(s)	5	17	66	R 2	R 116	342	502	R 1,457
2016 Total	113	-2	R 496	R 86	46	(s)	5	17	65	4	R 124	347	472	R 1,426
2017 Total	112	-3	R 509	R 89	48	(s)	5	R 17	61	4	R 130	R 354	461	R 1,432
2018 Total	R 111	-3	R 532	R 93	R 54	(s)	5	18	62	3	R 127	R 362	457	R 1,459
2019 January	9	(s)	50	10	5	(s)	(s)	1	5	(s)	11	R 34	38	130
February	9	(s)	45	R 9	4	(s)	(s)	1	1	(s)	7	R 24	33	110
March	9	(s)	48	9	4	(s)	(s)	1	5	(s)	10	R 30	34	120
April	8	(s)	R 43	8	4	(s)	(s)	1	4	(s)	R 12	29	30	111
May	9	(s)	44	8	4	(s)	(s)	2	5	(s)	12	R 32	34	118
June	9	(s)	R 41	6	5	(s)	(s)	R 1	7	(s)	10	30	36	116
July	R 9	(s)	43	6	5	(s)	(s)	2	7	(s)	10	30	42	122
August	R 9	(s)	44	R 6	5	(s)	(s)	2	6	(s)	12	R 31	41	124
September	8	(s)	42	7	5	(s)	(s)	1	4	(s)	11	29	37	117
October	9	(s)	45	9	5	(s)	(s)	1	4	(s)	R 12	32	33	118
November	8	(s)	47	7	5	(s)	(s)	1	6	(s)	11	31	34	121
December	9	(s)	50	5	5	(s)	(s)	1	6	(s)	R 12	30	32	121
Total	R 105	-2	R 542	R 89	58	(s)	4	18	60	3	R 131	R 363	R 425	R 1,432
2020 January	8	(s)	50	10	4	(s)	(s)	1	4	(s)	11	R 32	30	R 120
February	8	(s)	R 46	10	3	(s)	(s)	1	4	(s)	12	R 32	28	R 114
March	8	(s)	R 46	9	5	(s)	(s)	1	4	(s)	R 13	R 33	28	R 115
April	7	(s)	42	4	3	(s)	(s)	1	3	(s)	10	R 21	23	93
May	6	(s)	41	R 3	4	(s)	(s)	1	R 4	(s)	11	24	25	R 96
June	7	(s)	40	4	R 5	(s)	(s)	1	3	(s)	R 10	R 23	30	99
July	6	(s)	42	5	5	(s)	(s)	1	4	(s)	R 10	R 26	36	R 111
August	7	(s)	43	R 6	5	(s)	(s)	1	6	(s)	10	29	37	R 116
September	7	(s)	42	7	R 6	(s)	(s)	1	5	(s)	8	R 28	31	R 108
October	R 8	(s)	45	9	6	(s)	(s)	1	4	(s)	8	R 28	31	112
November	8	(s)	R 45	8	6	(s)	(s)	1	5	(s)	9	30	R 29	112
December	8	(s)	50	8	R 6	(s)	(s)	1	4	(s)	10	30	32	119
Total	R 88	-1	R 532	R 83	59	(s)	4	15	50	2	R 123	R 335	363	R 1,317
2021 January	8	(s)	50	R 11	6	(s)	(s)	1	4	(s)	8	30	32	R 121
February	8	(s)	42	8	3	(s)	(s)	1	2	(s)	7	22	32	104
March	8	(s)	45	10	5	(s)	(s)	1	4	(s)	11	32	27	R 113
April	9	(s)	44	9	5	(s)	(s)	1	4	(s)	12	31	28	112
May	8	(s)	43	8	6	(s)	(s)	1	5	(s)	10	31	32	114
June	9	-1	42	8	6	(s)	(s)	1	6	(s)	9	30	37	118
6-Month Total	51	-2	266	53	30	(s)	2	8	25	1	57	177	190	681
2020 6-Month Total	45	-1	265	40	24	(s)	2	7	22	1	67	164	164	637
2019 6-Month Total	53	-1	272	50	27	(s)	2	9	27	1	63	178	205	707

a Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
b Natural gas, excluding supplemental gaseous fuels.
c Distillate fuel oil, excluding biodiesel.
d Hydrocarbon gas liquids.
e Finished motor gasoline, excluding fuel ethanol.
f Aviation gasoline blending components, crude oil, motor gasoline blending components, petrochemical feedstocks, special naphthas, still gas, unfinished oils, waxes, and miscellaneous petroleum products.
g Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 7.6 and 11.6.
h Excludes emissions from biomass energy consumption. See Table 11.7.

R=Revised. (s)=Less than 0.5 million metric tons and greater than -0.5 million metric tons.
Notes: • Data are estimates for carbon dioxide emissions from energy consumption, plus the relatively small amount of emissions from the non-combustion use of fossil fuels. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • Data exclude emissions from biomass energy consumption. See Table 11.7 and Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
Sources: See end of section.

Historical revisions are due to revised CO2 factors. See "Section 11 Methodology and Sources," Step 4, at end of section.

Table 11.5 Carbon Dioxide Emissions From Energy Consumption: Transportation Sector
(Million Metric Tons of Carbon Dioxide[a])

	Coal	Natural Gas[b]	Petroleum								Retail Electricity[f]	Total[g]
			Aviation Gasoline	Distillate Fuel Oil[c]	HGL[d]	Jet Fuel	Lubri-cants	Motor Gasoline[e]	Residual Fuel Oil	Total		
1973 Total	(s)	39	6	R 164	3	152	6	R 887	R 55	R 1,272	2	R 1,314
1975 Total	(s)	32	5	R 157	3	R 144	6	889	R 53	R 1,257	2	R 1,291
1980 Total	(h)	34	4	R 207	1	155	6	R 882	R 105	R 1,361	2	R 1,397
1985 Total	(h)	28	3	R 234	2	178	6	R 910	R 59	R 1,393	3	R 1,423
1990 Total	(h)	36	3	R 271	1	223	7	967	R 76	1,548	3	R 1,587
1995 Total	(h)	38	3	R 310	1	222	6	1,026	R 68	1,637	3	1,679
2000 Total	(h)	36	3	R 386	1	R 259	7	R 1,128	R 67	R 1,848	4	R 1,888
2005 Total	(h)	33	2	R 453	2	R 251	6	R 1,177	R 63	R 1,954	5	R 1,992
2006 Total	(h)	33	2	R 476	2	R 244	5	R 1,188	R 68	R 1,985	5	R 2,023
2007 Total	(h)	35	2	R 476	1	R 242	6	R 1,184	R 75	R 1,986	5	R 2,026
2008 Total	(h)	37	2	R 430	3	R 231	5	R 1,114	R 70	R 1,854	5	R 1,896
2009 Total	(h)	38	2	R 406	2	R 208	5	1,107	R 59	R 1,789	5	R 1,832
2010 Total	(h)	38	2	R 429	(s)	R 214	6	R 1,086	R 67	R 1,804	5	R 1,847
2011 Total	(h)	39	2	R 436	(s)	R 213	R 5	R 1,054	R 58	R 1,769	4	R 1,813
2012 Total	(h)	41	2	R 417	(s)	R 210	5	R 1,047	R 50	R 1,730	4	R 1,776
2013 Total	(h)	47	2	R 421	(s)	R 214	5	R 1,057	R 44	R 1,744	4	R 1,795
2014 Total	(h)	40	2	R 441	(s)	R 220	6	R 1,067	R 34	R 1,769	4	R 1,814
2015 Total	(h)	R 39	1	R 447	(s)	R 231	6	R 1,073	R 35	R 1,794	4	R 1,837
2016 Total	(h)	40	1	R 437	(s)	R 242	6	R 1,092	R 47	R 1,826	4	R 1,869
2017 Total	(h)	42	1	R 442	(s)	R 251	5	R 1,090	R 50	R 1,841	4	R 1,886
2018 Total	(h)	51	2	R 466	(s)	R 255	5	R 1,090	R 45	R 1,863	4	R 1,918
2019 January	(h)	6	(s)	R 37	(s)	R 21	(s)	R 87	4	149	(s)	155
February	(h)	5	(s)	34	(s)	18	(s)	R 81	3	137	(s)	143
March	(h)	5	(s)	38	(s)	R 22	(s)	R 91	3	155	(s)	160
April	(h)	4	(s)	R 39	(s)	R 22	1	R 90	2	154	(s)	158
May	(h)	4	(s)	41	(s)	R 23	(s)	R 94	2	160	(s)	164
June	(h)	4	(s)	40	(s)	22	(s)	R 93	4	160	(s)	164
July	(h)	4	(s)	R 42	(s)	23	(s)	R 94	4	164	(s)	169
August	(h)	4	(s)	R 42	(s)	23	(s)	R 98	4	168	(s)	172
September	(h)	4	(s)	39	(s)	21	(s)	R 88	4	153	(s)	157
October	(h)	4	(s)	R 42	(s)	22	(s)	R 92	4	160	(s)	165
November	(h)	5	(s)	R 38	(s)	21	(s)	R 88	R 2	150	(s)	155
December	(h)	6	(s)	R 37	(s)	23	(s)	89	R 3	152	(s)	158
Total	(h)	55	2	R 468	(s)	R 261	5	R 1,086	R 40	1,862	3	1,920
2020 January	(h)	6	(s)	34	(s)	21	(s)	R 86	3	R 145	(s)	R 151
February	(h)	5	(s)	R 33	(s)	19	(s)	84	2	R 139	(s)	R 144
March	(h)	5	(s)	36	(s)	R 18	(s)	77	1	133	(s)	138
April	(h)	4	(s)	34	(s)	8	(s)	57	1	R 100	(s)	R 104
May	(h)	4	(s)	35	(s)	R 8	(s)	R 71	1	R 115	(s)	R 119
June	(h)	4	(s)	36	(s)	R 10	(s)	79	R 2	128	(s)	132
July	(h)	4	(s)	38	(s)	12	(s)	84	4	139	(s)	144
August	(h)	4	(s)	R 39	(s)	13	(s)	85	4	141	(s)	145
September	(h)	4	(s)	R 37	(s)	11	(s)	82	4	R 134	(s)	R 138
October	(h)	4	(s)	R 39	(s)	13	(s)	83	R 3	138	(s)	142
November	(h)	4	(s)	35	(s)	14	(s)	R 76	R 2	R 128	(s)	133
December	(h)	6	(s)	35	(s)	R 15	(s)	77	2	130	(s)	136
Total	(h)	54	1	R 432	(s)	R 161	4	R 941	R 30	R 1,570	3	R 1,627
2021 January	(h)	6	(s)	35	(s)	14	(s)	R 76	3	R 129	(s)	R 135
February	(h)	5	(s)	32	(s)	R 13	(s)	R 69	3	R 117	(s)	123
March	(h)	5	(s)	R 38	(s)	15	(s)	85	4	R 141	(s)	R 146
April	(h)	4	(s)	38	(s)	R 16	(s)	85	2	R 140	(s)	145
May	(h)	4	(s)	39	(s)	R 17	(s)	R 90	3	R 150	(s)	154
June	(h)	4	(s)	39	(s)	18	(s)	89	4	150	(s)	155
6-Month Total	(h)	27	1	222	(s)	92	2	494	18	829	1	858
2020 6-Month Total	(h)	27	1	209	(s)	84	2	455	10	760	1	788
2019 6-Month Total	(h)	28	1	230	(s)	127	2	537	18	915	2	944

[a] Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
[b] Natural gas, excluding supplemental gaseous fuels.
[c] Distillate fuel oil, excluding biodiesel.
[d] Hydrocarbon gas liquids.
[e] Finished motor gasoline, excluding fuel ethanol.
[f] Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 7.6 and 11.6.
[g] Excludes emissions from biomass energy consumption. See Table 11.7.
[h] Beginning in 1978, the small amounts of coal consumed for transportation are reported as industrial sector consumption.

R=Revised. (s)=Less than 0.5 million metric tons.
Notes: • Data are estimates for carbon dioxide emissions from energy consumption, plus the relatively small amount of emissions from the non-combustion use of fossil fuels. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • Data exclude emissions from biomass energy consumption. See Table 11.7 and Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
Sources: See end of section.

Historical revisions are due to revised CO2 factors. See "Section 11 Methodology and Sources," Step 4, at end of section.

Table 11.6 Carbon Dioxide Emissions From Energy Consumption: Electric Power Sector
(Million Metric Tons of Carbon Dioxide[a])

	Coal	Natural Gas[b]	Petroleum — Distillate Fuel Oil[c]	Petroleum — Petroleum Coke	Petroleum — Residual Fuel Oil	Petroleum — Total	Geo-thermal	Non-Biomass Waste[d]	Total[e]
1973 Total	R 823	199	20	2	R 242	R 264	NA	NA	1,286
1975 Total	R 836	172	17	(s)	R 221	R 237	NA	NA	R 1,245
1980 Total	R 1,153	200	12	1	R 185	R 198	NA	NA	R 1,551
1985 Total	R 1,383	166	6	1	R 75	R 82	NA	NA	R 1,631
1990 Total	R 1,547	R 175	7	3	R 87	R 98	(s)	6	R 1,826
1995 Total	R 1,660	228	8	8	R 43	R 59	(s)	10	R 1,957
2000 Total	R 1,926	281	13	10	R 65	R 89	(s)	10	R 2,306
2005 Total	R 1,983	319	R 9	24	R 66	R 98	(s)	11	R 2,411
2006 Total	R 1,953	338	5	21	R 27	R 53	(s)	12	R 2,356
2007 Total	R 1,986	R 371	R 7	17	R 30	R 53	(s)	11	R 2,422
2008 Total	R 1,958	362	5	15	R 18	R 38	(s)	12	R 2,371
2009 Total	R 1,740	373	5	13	14	R 32	(s)	11	R 2,157
2010 Total	1,828	R 400	6	14	12	R 31	(s)	11	2,270
2011 Total	1,723	409	5	14	7	26	(s)	11	2,170
2012 Total	R 1,512	493	4	9	6	R 18	(s)	11	R 2,035
2013 Total	1,571	444	4	13	6	R 22	(s)	11	R 2,049
2014 Total	R 1,568	R 443	6	12	7	R 25	(s)	11	R 2,048
2015 Total	R 1,351	R 525	5	11	7	24	(s)	11	R 1,912
2016 Total	R 1,242	R 545	4	12	R 5	R 21	(s)	11	R 1,820
2017 Total	R 1,207	R 506	4	10	5	19	(s)	11	1,743
2018 Total	R 1,153	R 577	6	10	6	22	(s)	11	1,764
2019 January	101	46	R 1	1	R (s)	2	(s)	1	150
February	R 82	43	(s)	1	(s)	1	(s)	1	126
March	80	R 44	(s)	1	(s)	1	(s)	1	126
April	60	40	(s)	(s)	(s)	1	(s)	1	103
May	72	46	(s)	1	(s)	2	(s)	1	R 120
June	80	54	(s)	1	(s)	1	(s)	1	136
July	101	R 68	(s)	1	(s)	2	(s)	1	172
August	95	70	(s)	1	(s)	2	(s)	1	167
September	85	59	(s)	1	(s)	1	(s)	1	147
October	68	51	(s)	(s)	(s)	1	(s)	1	121
November	76	45	(s)	(s)	(s)	1	(s)	1	123
December	73	50	(s)	1	(s)	1	(s)	1	125
Total	R 974	R 616	4	8	R 4	16	(s)	11	R 1,617
2020 January	66	51	(s)	1	(s)	1	(s)	1	120
February	58	48	(s)	1	(s)	1	(s)	1	108
March	52	48	(s)	1	(s)	1	(s)	1	102
April	43	42	(s)	1	(s)	1	(s)	1	86
May	48	R 45	(s)	1	(s)	1	(s)	1	96
June	66	57	(s)	1	(s)	2	(s)	1	126
July	90	75	(s)	1	(s)	2	(s)	1	R 167
August	91	70	(s)	1	(s)	2	(s)	1	164
September	70	57	(s)	(s)	(s)	1	(s)	1	R 128
October	61	52	(s)	(s)	(s)	1	(s)	1	115
November	62	42	(s)	1	(s)	1	(s)	1	106
December	79	48	(s)	1	(s)	1	(s)	1	129
Total	R 787	R 633	3	8	4	16	(s)	11	R 1,447
2021 January	82	47	(s)	1	(s)	1	(s)	1	132
February	87	43	1	1	(s)	2	(s)	1	133
March	62	41	(s)	1	(s)	1	(s)	1	105
April	54	41	(s)	(s)	(s)	1	(s)	1	97
May	64	45	(s)	1	(s)	1	(s)	1	111
June	87	59	(s)	1	(s)	1	(s)	1	148
6-Month Total	436	275	2	4	2	8	(s)	5	725
2020 6-Month Total	334	291	2	4	2	8	(s)	5	638
2019 6-Month Total	475	273	2	4	2	8	(s)	5	763

[a] Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
[b] Natural gas, excluding supplemental gaseous fuels.
[c] Distillate fuel oil, excluding biodiesel.
[d] Municipal solid waste from non-biogenic sources, and tire-derived fuels. Through 1994, also includes blast furnace gas, and other manufactured and waste gases derived from fossil fuels.
[e] Excludes emissions from biomass energy consumption. See Table 11.7.
R=Revised. NA=Not available. (s)=Less than 0.5 million metric tons.
Notes: • Data are estimates for carbon dioxide emissions from energy consumption. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • Data exclude emissions from biomass energy consumption. See Table 11.7 and Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
Sources: See end of section.

Historical revisions are due to revised CO2 factors. See "Section 11 Methodology and Sources," Step 4, at end of section.

Table 11.7 Carbon Dioxide Emissions From Biomass Energy Consumption
(Million Metric Tons of Carbon Dioxide[a])

	By Source					By Sector					
	Wood[b]	Biomass Waste[c]	Fuel Ethanol[d]	Bio-diesel	Total	Resi-dential	Com-mercial[e]	Indus-trial[f]	Trans-portation	Electric Power[g]	Total
1973 Total	143	(s)	NA	NA	143	33	1	109	NA	(s)	143
1975 Total	140	(s)	NA	NA	141	40	1	100	NA	(s)	141
1980 Total	232	(s)	NA	NA	232	80	2	150	NA	(s)	232
1985 Total	252	14	3	NA	270	95	2	168	3	1	270
1990 Total	208	24	4	NA	237	54	8	147	4	23	237
1995 Total	222	30	8	NA	260	49	9	166	8	28	260
2000 Total	212	27	9	NA	248	39	9	161	9	29	248
2005 Total	200	37	23	1	261	40	10	150	23	37	261
2006 Total	197	36	31	2	266	36	9	151	33	38	266
2007 Total	196	37	39	3	276	39	9	146	41	39	276
2008 Total	193	39	55	3	290	44	10	139	57	40	290
2009 Total	182	41	62	3	288	47	10	125	64	41	288
2010 Total	208	42	73	2	325	51	10	149	74	42	325
2011 Total	208	42	73	8	331	49	11	151	80	40	331
2012 Total	202	42	73	8	325	41	10	153	80	42	325
2013 Total	219	45	75	13	353	54	11	158	87	43	353
2014 Total	225	47	76	13	361	54	12	158	88	49	361
2015 Total	217	47	79	14	357	48	13	157	90	48	357
2016 Total	209	46	81	20	355	42	14	155	98	47	355
2017 Total	205	45	82	19	351	40	14	152	98	47	351
2018 Total	212	44	82	18	356	49	14	151	97	46	356
2019 January	18	4	6	1	30	4	1	13	7	4	30
February	17	3	6	1	27	4	1	12	7	3	27
March	18	3	7	1	29	4	1	13	8	3	29
April	17	3	7	1	28	4	1	12	8	3	28
May	17	3	7	2	30	4	1	12	9	3	30
June	17	3	7	1	29	4	1	12	8	3	29
July	18	3	7	2	30	4	1	13	8	4	30
August	18	3	7	2	30	4	1	13	8	4	30
September	17	3	7	1	28	4	1	12	8	3	28
October	17	3	7	1	29	4	1	12	8	3	29
November	17	3	7	1	29	4	1	12	8	3	29
December	18	4	7	1	30	4	1	13	8	4	30
Total	210	40	83	17	350	51	13	147	97	41	350
2020 January	17	4	7	1	29	4	1	13	8	4	29
February	16	3	6	1	27	3	1	12	7	3	27
March	17	3	R 5	1	27	4	1	12	7	3	27
April	16	3	4	1	R 25	4	1	12	5	3	R 25
May	17	3	6	1	27	4	1	12	7	3	27
June	16	3	6	1	R 27	4	1	11	R 8	3	R 27
July	16	3	6	2	28	4	1	12	8	3	28
August	16	3	6	2	28	4	1	12	8	4	28
September	16	3	6	2	27	4	1	12	8	3	27
October	16	3	6	2	27	4	1	12	7	3	27
November	16	3	6	1	27	4	1	12	7	3	27
December	17	3	6	2	29	4	1	13	8	3	29
Total	197	39	72	18	R 326	43	13	144	R 87	39	R 326
2021 January	17	3	6	1	27	4	1	13	6	3	27
February	15	3	5	1	25	3	1	11	6	3	25
March	17	3	7	1	28	4	1	12	8	3	28
April	16	3	6	1	27	4	1	12	7	3	27
May	17	3	7	1	29	4	1	13	8	3	29
June	16	3	7	1	28	4	1	12	8	3	28
6-Month Total	98	19	38	8	162	21	6	72	44	19	162
2020 6-Month Total	98	20	34	8	161	21	6	72	41	20	161
2019 6-Month Total	104	20	41	8	173	25	7	73	48	20	173

[a] Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.
[b] Wood and wood-derived fuels.
[c] Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass.
[d] Fuel ethanol minus denaturant.
[e] Commercial sector, including commercial combined-heat-and-power (CHP) and commercial electricity-only plants.
[f] Industrial sector, including industrial combined-heat-and-power (CHP) and industrial electricity-only plants.
[g] The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

R=Revised. NA=Not available. (s)=Less than 0.5 million metric tons.
Notes: • Carbon dioxide emissions from biomass energy consumption are excluded from the energy-related carbon dioxide emissions reported in Tables 11.1–11.6. See Note 2, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section. • Data are estimates. See "Section 11 Methodology and Sources" at end of section. • See "Carbon Dioxide" in Glossary. • See Note 1, "Emissions of Carbon Dioxide and Other Greenhouse Gases," at end of section. • 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/#environment (Excel and CSV files) for all available annual and monthly data beginning in 1973.
Sources: See end of section.

Environment

Note 1. Emissions of Carbon Dioxide and Other Greenhouse Gases. Greenhouse gases are those gases—such as water vapor, carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride—that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.

The vast majority of U.S. CO_2 emissions come from fossil fuel combustion, with smaller amounts from the non-combustion use of fossil fuels, as well as from electricity generation using geothermal energy and non-biomass waste. Other sources of CO_2 emissions include industrial processes, such as cement and limestone production. Data in the U.S. Energy Information Administration's (EIA) *Monthly Energy Review* (MER) Tables 11.1–11.6 are estimates for U.S. CO_2 emissions from energy consumption, plus the non-combustion use of fossil fuels (excluded are estimates for CO_2 emissions from biomass energy consumption, which appear in MER Table 11.7).

For annual U.S. estimates of CO_2 emissions from all sources, as well as emissions for other greenhouse gases, see the U.S. Environmental Protection Agency's *Inventory of U.S. Greenhouse Gas Emissions and Sinks* reports at https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

Note 2. Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion. Carbon dioxide (CO_2) emissions from the combustion of biomass to produce energy are excluded from the energy-related CO_2 emissions reported in MER Tables 11.1–11.6, but appear in MER Table 11.7. According to current international convention (see the Intergovernmental Panel on Climate Change's "2006 IPCC Guidelines for National Greenhouse Gas Inventories"), carbon released through biomass combustion is excluded from reported energy-related emissions. The release of carbon from biomass combustion is assumed to be balanced by the uptake of carbon when the feedstock is grown, resulting in zero net emissions over some period of time. (This is not to say that biomass energy is carbon-neutral. Energy inputs are required in order to grow, fertilize, and harvest the feedstock and to produce and process the biomass into fuels.)

However, analysts have debated whether increased use of biomass energy may result in a decline in terrestrial carbon stocks, leading to a net positive release of carbon rather than the zero net release assumed by its exclusion from reported energy-related emissions. For example, the clearing of forests for biofuel crops could result in an initial release of carbon that is not fully recaptured in subsequent use of the land for agriculture.

To reflect the potential net emissions, the international convention for greenhouse gas inventories is to report biomass emissions in the category "agriculture, forestry, and other land use," usually based on estimates of net changes in carbon stocks over time.

This indirect accounting of CO_2 emissions from biomass can potentially lead to confusion in accounting for and understanding the flow of CO_2 emissions within energy and non-energy systems. In recognition of this issue, reporting of CO_2 emissions from biomass combustion alongside other energy-related CO_2 emissions offers an alternative accounting treatment. It is important, however, to avoid misinterpreting emissions from fossil energy and biomass energy sources as necessarily additive. Instead, the combined total of direct CO_2 emissions from biomass and energy-related CO_2 emissions implicitly assumes that none of the carbon emitted was previously or subsequently reabsorbed in terrestrial sinks or that other emissions sources offset any such sequestration.

Section 11 Methodology and Sources

To estimate carbon dioxide emissions from energy consumption for the *Monthly Energy Review* (MER), Tables 11.1–11.7, the U.S. Energy Information Administration (EIA) uses the following methodology and sources:

Step 1. Determine Fuel Consumption
Coal—Coal sectoral (residential, commercial, coke plants, other industrial, transportation, electric power) consumption data in thousand short tons are from MER Table 6.2. Coal sectoral consumption data are converted to trillion Btu by multiplying by the coal heat content factors in MER Table A5.

Coal Coke Net Imports—Coal coke net imports data in trillion Btu are derived from coal coke imports and exports data in MER Tables 1.4a and 1.4b.

Natural Gas (excluding supplemental gaseous fuels)—Natural gas sectoral consumption data in trillion Btu are from MER Tables 2.2–2.6.

Petroleum—Total and sectoral consumption (product supplied) data in thousand barrels per day for asphalt and road oil, aviation gasoline, distillate fuel oil, hydrocarbon gas liquids (HGL), jet fuel, kerosene, lubricants, motor gasoline, petroleum coke, and residual fuel oil are from MER Tables 3.5 and 3.7a–3.7c. For the component products of HGL (ethane/ethylene, propane/propylene, normal butane/butylene, isobutane/isobutylene, and natural gasoline) and "other petroleum" (aviation gasoline blending components, crude oil, motor gasoline blending components, naphthas for petrochemical feedstock use, other oils for petrochemical feedstock use, special naphthas, still gas, unfinished oils, waxes, and miscellaneous petroleum products), consumption (product supplied) data in thousand barrels per day are from EIA's *Petroleum Supply Annual* (PSA), *Petroleum Supply Monthly* (PSM), and earlier publications (see sources for MER Table 3.5). Petroleum consumption data by product are converted to trillion Btu by multiplying by the petroleum heat content factors in MER Tables A1 and A3.

Biomass—Sectoral consumption data in trillion Btu for wood, biomass waste, fuel ethanol (minus denaturant), and biodiesel are from MER Tables 10.2a–10.2c.

Step 2. Remove Biofuels From Petroleum
Distillate Fuel Oil—Beginning in 2009, the distillate fuel oil data (for total and transportation sector) in Step 1 include biodiesel and other renewable diesel fuel, which are non-fossil renewable fuels.

2009–2011: To remove the biodiesel portion from distillate fuel oil, data for biodiesel consumption (calculated using data from EIA, EIA-22M, "Monthly Biodiesel Production Survey") and biomass-based diesel fuel data (from EIA-810, "Monthly Refinery Report," EIA-812, "Monthly Product Pipeline Report," and EIA-815, "Monthly Bulk Terminal and Blender Report") are converted to trillion Btu by multiplying by the biodiesel heat content factor in MER Table A1, and then subtracted from the distillate fuel oil consumption values. To remove the other renewable diesel fuel portion from distillate fuel oil, data for refinery and blender net inputs (from EIA-810, "Monthly Refinery Report," and EIA-815, "Monthly Bulk Terminal and Blender Report") are converted to trillion Btu by multiplying by the other renewable diesel fuel heat content factor in MER Table A1, and then subtracted from the distillate fuel oil consumption values.

2012–2020: To remove the biodiesel portion from distillate fuel oil, data for biodiesel consumption (from MER Table 10.4) is subtracted from the distillate fuel oil consumption values. To remove the other renewable diesel fuel portion from distillate fuel oil, data for refinery and blender net inputs (from EIA-810, "Monthly Refinery Report," and EIA-815, "Monthly Bulk Terminal and Blender Report") are converted to trillion Btu by multiplying by the other renewable diesel fuel heat content factor in MER Table A1, and then subtracted from the distillate fuel oil consumption values.

2021 forward: To remove the biodiesel and other renewable diesel fuel portions from distillate fuel oil, data for refinery and blender net inputs (from EIA-810, "Monthly Refinery Report," and EIA-815, "Monthly Bulk Terminal and Blender Report") are converted to trillion Btu by multiplying by the biodiesel and other renewable diesel fuel heat content factors in MER Table A1, and then subtracted from the distillate fuel oil consumption values.

Motor Gasoline—Beginning in 1993, the motor gasoline data (for total, commercial sector, industrial sector, and transportation sector) in Step 1 include fuel ethanol, a non-fossil renewable fuel. To remove the fuel ethanol portion from motor gasoline, data in trillion Btu for fuel ethanol consumption (from MER Tables 10.2a, 10.2b, and 10.3) are subtracted from the motor gasoline consumption values. (Note that about 2% of fuel ethanol is fossil-based petroleum denaturant, to make the fuel ethanol undrinkable. For 1993–2008, petroleum denaturant is double counted in the PSA product supplied statistics, in both the original product category—e.g., natural gasoline—and also in the finished motor gasoline category; for this time period for MER Section 11, petroleum denaturant is removed along with the fuel ethanol from motor gasoline, but left in the original product. Beginning in 2009, petroleum denaturant is counted only in the PSA/PSM product supplied statistics for motor gasoline; for this time period for MER Section 11, petroleum denaturant is left in motor gasoline.)

Step 3. Remove Carbon Sequestered by Non-Combustion Use

The following fuels have industrial non-combustion uses as chemical feedstocks and other products: coal, natural gas, asphalt and road oil, distillate fuel oil, hydrocarbon gas liquids (ethane/ethylene, propane/propylene, normal butane/butylene, isobutane/isobutylene, and natural gasoline), lubricants (which have industrial and transportation non-combustion uses), naphthas, other oils, petroleum coke, residual fuel oil, special naphthas, still gas, waxes, and miscellaneous petroleum products. See Tables 1.11a and 1.11b for estimates of fossil fuel non-combustion uses.

In the non-combustion use of these fuels, some of the carbon is stored (sequestered) in the final product, and EIA subtracts this from the fuel consumption values in Steps 1 and 2. EIA calculates the amount of carbon sequestered as the product of the non-combustion use of fossil fuels shown in MER Table 1.11b and the following carbon sequestration factors. The factors range from 0.00 to 1.00. A factor of 0.00 indicates that the fuel does not sequester any carbon (all is emitted), while a factor of 1.00 indicates that the fuel sequesters all of the carbon (none is emitted). EIA uses the following carbon sequestration factors: coal—0.75; natural gas used to produce hydrogen—0.00; natural gas used for other manufacturing—0.44; asphalt and road oil—1.00; distillate fuel oil—0.50; hydrocarbon gas liquids—0.80; lubricants—0.50; naphthas used for petrochemical feedstock—0.75; other oils used for petrochemical feedstock—0.50; petroleum coke used for aluminum production—0.00; petroleum coke used for other manufacturing—0.50; residual fuel oil—0.50; special naphthas—0.00; still gas—0.80; waxes—1.00; and miscellaneous petroleum products—1.00.

Step 4. Determine Carbon Dioxide Emissions From Energy Consumption

EIA calculates carbon dioxide (CO_2) emissions data in million metric tons as the product of the consumption values in trillion Btu from Steps 1 and 2 (minus the carbon sequestered by non-combustion use in Step 3) and the annual CO_2 emissions factors at https://www.eia.gov/environment/emissions/xls/CO2_coeffs_detailed.xls.

Except for plant condensate and unfractionated stream (which are EIA estimates), the CO_2 emissions factors for fossil fuels are from the U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, Tables A-32, A-38, and A-232. EIA converts metric tons of carbon to metric tons of CO_2 using the approximate molar mass (44/12)—see https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

Coal—EIA calculates coal CO_2 emissions for each sector (residential, commercial, coke plants, other industrial, transportation, electric power). Total coal emissions are the sum of the sectoral coal emissions.

Coal Coke Net Imports—EIA calculates coal coke net imports CO_2 emissions for the industrial sector.

Natural Gas—EIA calculates natural gas CO_2 emissions for each sector (residential, commercial, industrial, transportation, electric power). Total natural gas emissions are the sum of the sectoral natural gas emissions.

Petroleum—EIA calculates CO_2 emissions for each petroleum product and sector. Total petroleum emissions are the sum of the product emissions. Total HGL emissions are the sum of the emissions for the component products (ethane/ethylene, propane/propylene, normal butane/butylene, isobutane/isobutylene, and natural gasoline). EIA estimates residential, commercial, and transportation sector HGL emissions as the product of the HGL consumption values in trillion Btu from MER Tables 3.8a and 3.8c and the propane emissions factor. EIA estimates industrial sector HGL emissions as total HGL emissions minus emissions by the other sectors.

Geothermal and Non-Biomass Waste—EIA estimates annual CO_2 emissions data for geothermal and non-biomass waste on Form EIA-923, "Power Plant Operations Report" (and predecessor forms). EIA estimates monthly data by dividing the annual data by the number of days in the year and then multiplying by the number of days in the month. Annual estimates for the current year are set equal to those of the previous year.

Biomass—EIA calculates wood, biomass waste, and biofuel CO_2 emissions for each sector. Total emissions for each biomass fuel are the sum of the sectoral emissions. EIA uses the following CO_2 emissions factors, in million metric tons CO_2 per quadrillion Btu: wood—93.80; biomass waste—90.70; fuel ethanol—68.44; and biodiesel—73.84. For 1973–1988, EIA estimates the biomass portion of waste in MER Tables 10.2a–10.2c as 67%; for 1989–2000, the annual biomass portion of waste ranges from 67% in 1989 to 58% in 2000, based on the biogenic shares of total municipal solid waste shown in EIA's "Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy," Table 1 at https://www.eia.gov/totalenergy/data/monthly/pdf/historical/msw.pdf.

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