

Table A18. Energy-related carbon dioxide emissions by sector and source
(million metric tons, unless otherwise noted)

Sector and source	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Residential								
Petroleum	72	69	60	55	51	48	45	-1.6%
Natural gas	255	226	242	239	235	229	223	0.0%
Electricity ¹	824	760	751	770	785	800	814	0.2%
Total residential	1,150	1,056	1,054	1,064	1,071	1,077	1,082	0.1%
Commercial								
Petroleum	47	45	49	48	48	48	48	0.2%
Natural gas	171	157	172	174	178	185	194	0.7%
Coal	6	4	4	4	4	4	4	0.0%
Electricity ¹	769	732	728	760	781	801	823	0.4%
Total commercial	992	939	952	987	1,011	1,038	1,069	0.5%
Industrial²								
Petroleum	347	350	395	402	405	404	406	0.5%
Natural gas ³	432	449	512	540	556	567	578	0.9%
Coal	148	139	152	152	147	140	139	0.0%
Electricity ¹	574	543	628	658	654	638	625	0.5%
Total industrial	1,501	1,480	1,688	1,752	1,761	1,750	1,748	0.6%
Transportation								
Petroleum ⁴	1,812	1,771	1,734	1,669	1,618	1,603	1,600	-0.4%
Natural gas ⁵	39	41	44	48	58	70	91	2.9%
Electricity ¹	4	4	5	6	7	8	9	3.1%
Total transportation	1,854	1,815	1,782	1,723	1,683	1,681	1,700	-0.2%
Electric power⁶								
Petroleum	27	19	13	14	14	14	14	-1.0%
Natural gas	409	494	478	514	545	578	608	0.7%
Coal	1,723	1,514	1,609	1,654	1,656	1,643	1,637	0.3%
Other ⁷	12	12	12	12	12	12	12	0.0%
Total electric power	2,171	2,039	2,112	2,194	2,227	2,247	2,271	0.4%
Total by fuel								
Petroleum ⁴	2,304	2,254	2,252	2,188	2,136	2,117	2,113	-0.2%
Natural gas	1,306	1,366	1,447	1,516	1,572	1,629	1,694	0.8%
Coal	1,876	1,657	1,766	1,810	1,807	1,788	1,780	0.3%
Other ⁷	12	12	12	12	12	12	12	0.0%
Total	5,498	5,290	5,476	5,526	5,527	5,546	5,599	0.2%
Carbon dioxide emissions								
(tons per person)	17.6	16.8	16.4	15.9	15.4	15.0	14.7	-0.5%

¹Emissions from the electric power sector are distributed to the end-use sectors.

²Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

³Includes lease and plant fuel.

⁴This includes carbon dioxide from international bunker fuels, both civilian and military, which are excluded from the accounting of carbon dioxide emissions under the United Nations convention. From 1990 through 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.

⁵Includes pipeline fuel natural gas and natural gas used as fuel in motor vehicles, trains, and ships.

⁶Includes electricity-only and combined heat and power plants that have a regulatory status.

⁷Includes emissions from geothermal power and nonbiogenic emissions from municipal waste.

Note: By convention, the direct emissions from biogenic energy sources are excluded from energy-related carbon dioxide emissions. The release of carbon from these sources 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. If, however, increased use of biomass energy results in a decline in terrestrial carbon stocks, a net positive release of carbon may occur. See "Energy-Related Carbon Dioxide Emissions by End Use" for the emissions from biogenic energy sources as an indication of the potential net release of carbon dioxide in the absence of offsetting sequestration. Totals may not equal sum of components due to independent rounding. Data for 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 emissions and emission factors: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0384(2013/09) (Washington, DC, September 2013). 2011 emissions: EIA, *Monthly Energy Review*, DOE/EIA-0035(2011/10) (Washington, DC, October 2011). 2012 emissions and emission factors: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/08) (Washington, DC, August 2012). Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.