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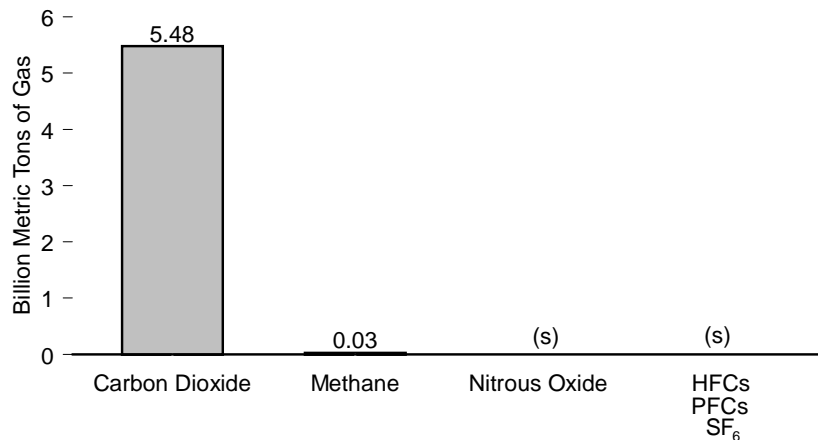
Environmental Indicators



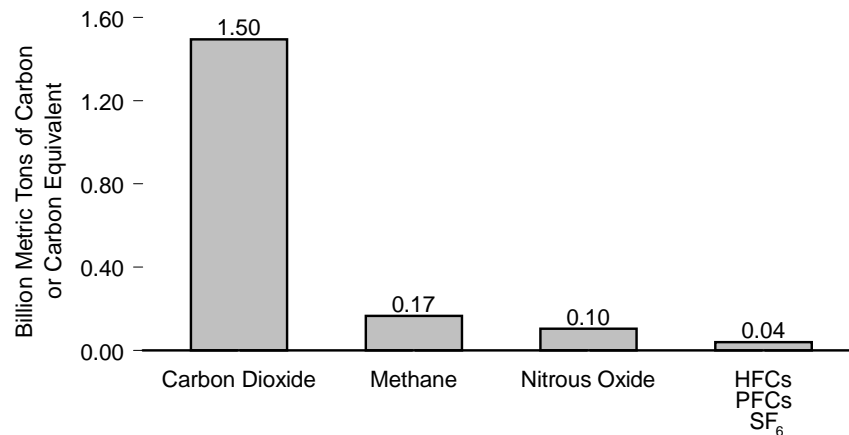
“Harpers Ferry, Junction of the Rivers Shenandoah and Potomac.” Engraving by W. Goodacre and James Archer, published in *The History and Topography of the United States of North America*, by John Howard Hinton, 1852. From the collection of the National Park Service, Harpers Ferry National Historical Park, Accession #1297.

Figure 12.1 Estimated Emissions of Greenhouse Gases

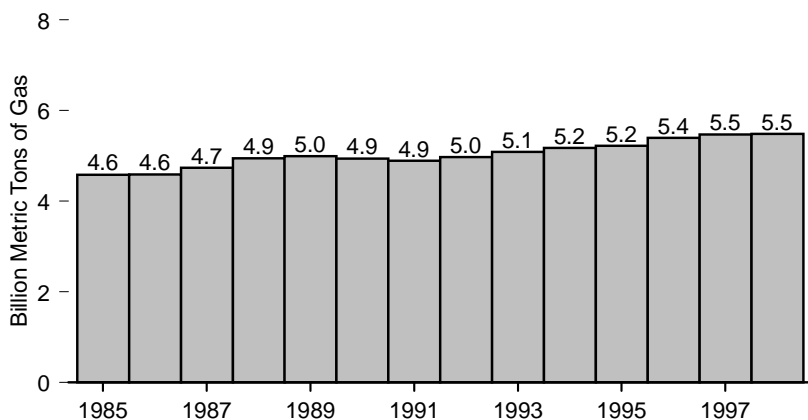
Emissions by Type of Gas, 1998



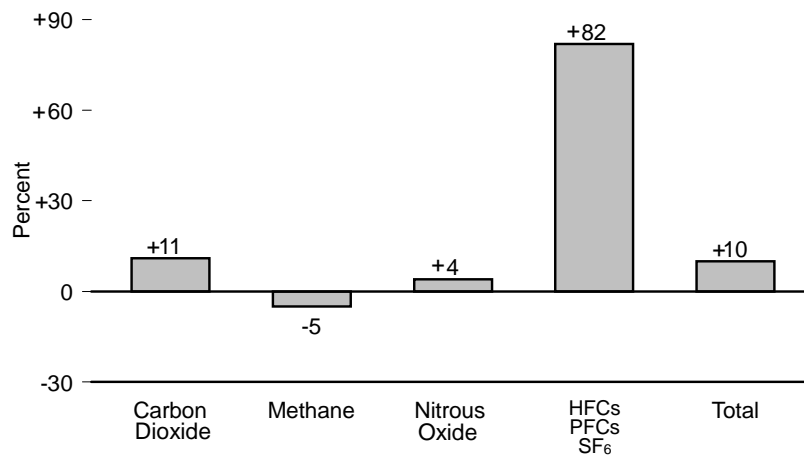
Emissions, Based on Global Warming Potential, by Type of Gas, 1998



Carbon Dioxide Emissions, 1985-1998



Change 1990-1998 in Emissions Based on Global Warming Potential



(s)=Less than 0.005 billion metric tons of gas.

Notes: • HFCs=hydrofluorocarbons; PFCs=perfluorocarbons; and SF₆=sulfur hexafluoride. • Because vertical scales differ, graphs should not be compared.

Source: Table 12.1.

Table 12.1 Estimated Emissions of Greenhouse Gases, 1985-1998

Year	Greenhouse Gases (million metric tons of gas)				Greenhouse Gases, Based on Global Warming Potential ¹ (million metric tons of carbon or equivalent)				
	Carbon Dioxide	Methane	Nitrous Oxide	HFCs PFCs SF ₆	Carbon Dioxide	Methane	Nitrous Oxide	HFCs PFCs SF ₆	Total
1985	R4,584.2	R29.3	R1.1	(s)	1,250	168	96	20	1,533
1986	R4,585.6	R28.7	R1.1	(s)	1,251	165	93	21	1,530
1987	R4,735.0	R29.3	R1.1	(s)	1,291	168	93	22	1,575
1988	R4,949.4	R29.6	R1.1	(s)	1,350	170	91	26	1,636
1989	R4,996.6	R29.8	R1.1	(s)	1,363	171	96	26	1,656
1990	R4,939.0	30.2	R1.2	(s)	1,347	173	99	22	1,641
1991	R4,886.0	R30.5	R1.2	(s)	1,333	174	101	22	1,629
1992	R4,972.9	R30.6	R1.2	(s)	1,356	175	103	23	1,657
1993	R5,090.1	R29.9	R1.2	(s)	1,389	171	103	24	1,686
1994	R5,169.7	R30.0	R1.3	(s)	1,407	172	111	26	1,717
1995	R5,221.3	R30.2	R1.3	(s)	1,414	173	106	32	1,725
1996	R5,396.4	R29.3	R1.2	(s)	1,457	168	105	36	1,766
1997	R5,471.2	R29.3	R1.2	(s)	1,490	168	104	38	1,800
1998 ^P	5,483.9	28.8	1.2	(s)	1,495	165	103	40	1,803

¹ Emissions of greenhouse gases were weighted based upon their relative global warming potential, with carbon dioxide gas equal to a weight of one, and were converted to carbon (for carbon dioxide) or to equivalent units of carbon (for other gases) by dividing by 3.667.

R=Revised. P=Preliminary. (s)=Less than 0.05 million metric tons.

Notes: • HFCs = hydrofluorocarbons; PFCs = perfluorocarbons; and SF₆ = sulfur hexafluoride.
• Emissions are from anthropogenic sources. Anthropogenic means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. • Because estimation methods for

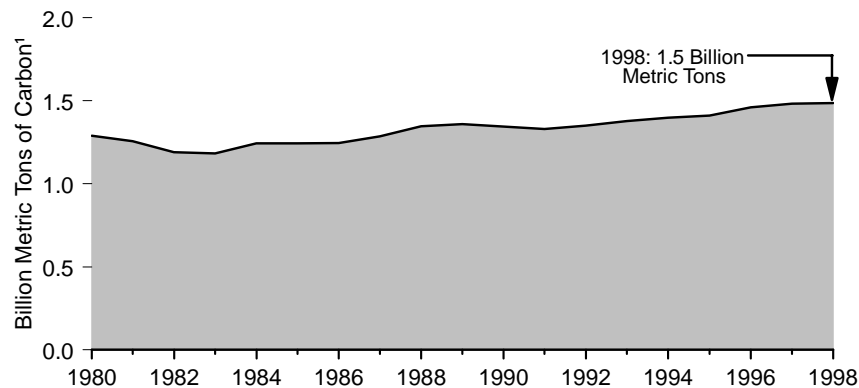
greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community. For some of the gases, such as carbon dioxide, revisions are a small percentage of the total (on the order of 1 percent), but for other gases, such as nitrous oxide, they may be on the order of 100 percent.

Web Page: <http://www.eia.doe.gov/environment.html>.

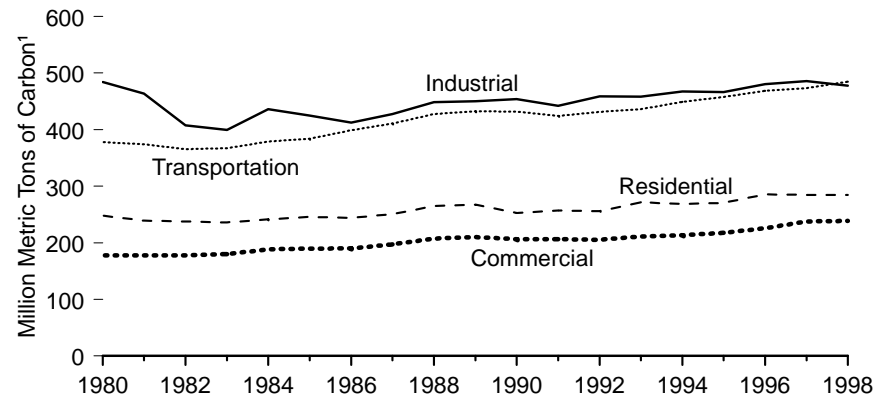
Sources: • 1985-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999).

Figure 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1980-1998

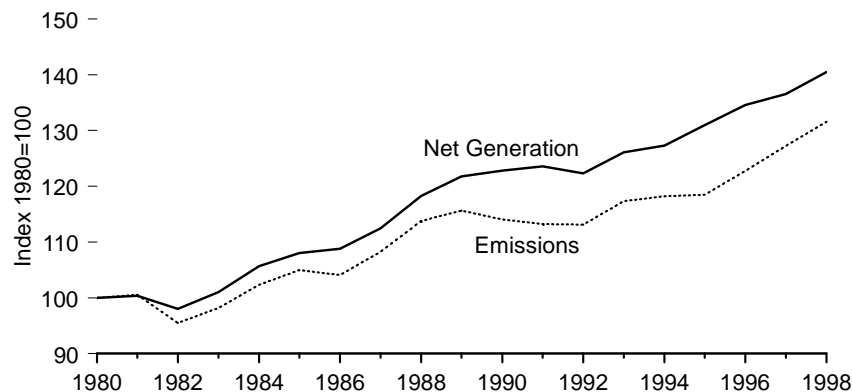
End-Use Total



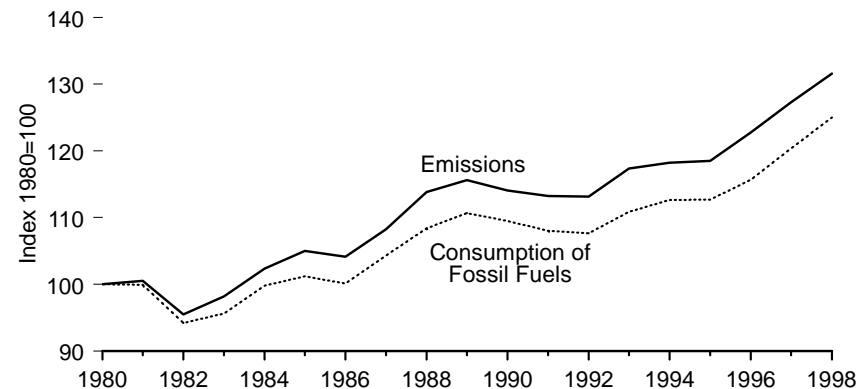
By End-Use Sector



Electric Utility Net Generation of Electricity and Electric Utility Carbon Dioxide Emissions



Electric Utility Consumption of Fossil Fuels and Electric Utility Carbon Dioxide Emissions



¹ Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

Sources: Tables 8.1, 8.8, and 12.2.

Table 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1980-1998
(Million Metric Tons of Carbon¹)

Year	Residential	Commercial	Industrial	Transportation	End-Use Total	Electric Utilities ²
1980	R248.2	R178.2	484.6	378.1	R1,289.0	R417.9
1981	R239.7	R178.2	463.7	374.1	R1,255.7	R420.1
1982	R237.5	R178.1	R407.8	365.6	R1,189.0	R399.0
1983	R236.1	R179.9	R399.3	366.9	R1,182.2	R410.2
1984	R241.1	R188.7	R436.0	379.0	R1,244.8	R427.7
1985	245.8	R189.6	R424.5	R384.3	R1,244.2	R438.8
1986	R244.0	R190.4	R412.2	R399.0	R1,245.6	R435.2
1987	251.0	197.2	R427.3	R411.0	R1,286.5	R452.5
1988	R264.8	207.6	R448.2	R427.3	R1,347.9	R475.7
1989	R267.5	R209.9	R450.1	R432.6	R1,360.0	R483.2
1990	253.1	R206.7	R453.7	R431.8	R1,345.2	R476.7
1991	R257.1	206.4	R442.2	R424.3	R1,330.0	R473.3
1992	R255.9	R205.4	R458.8	R431.1	R1,351.3	R472.8
1993	R271.7	R211.3	R458.5	R436.4	R1,377.8	R490.5
1994	R268.3	R213.6	R467.1	R449.3	R1,398.3	R494.0
1995	270.3	R217.7	R466.2	R457.7	R1,411.9	R495.2
1996	R285.9	R225.8	R480.2	R468.8	R1,460.7	R513.0
1997	R284.6	R237.6	R485.8	R473.6	R1,481.7	R531.9
1998 ^P	284.5	238.4	477.8	484.9	1,485.5	549.8

¹ Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

² Electric utility emissions are distributed across end-use sectors.

R=Revised. P=Preliminary.

Notes: • Includes energy from petroleum, natural gas, and coal. • Totals may not equal sum of

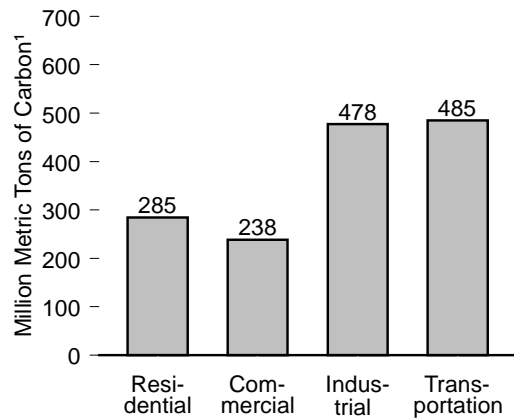
components due to independent rounding.

Web Page: <http://www.eia.doe.gov/environment.html>.

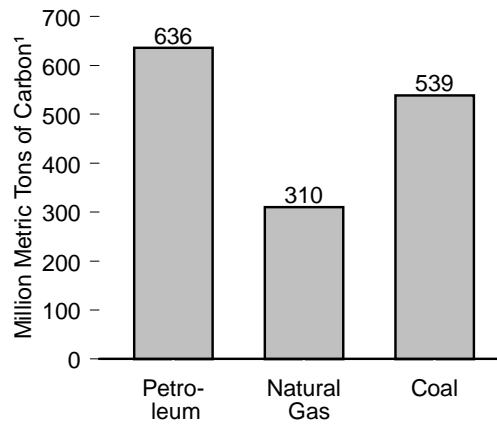
Sources: • 1980-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Table 5.

Figure 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source, 1998

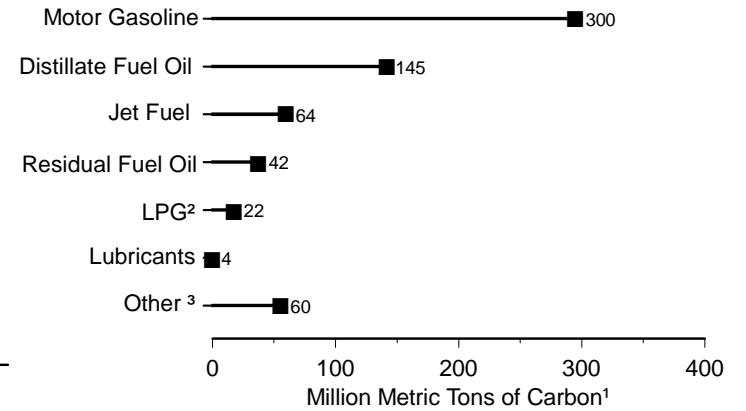
By End-Use Sector



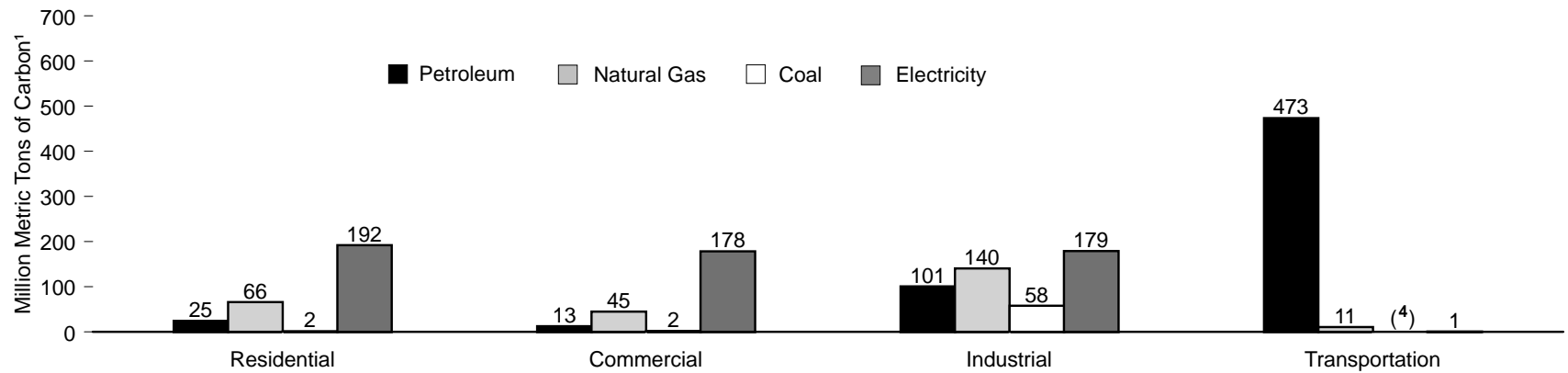
By Fuel



By Petroleum Product



By End-Use Sector and Source



¹ Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

² Liquefied petroleum gases.

³ Aviation gasoline, kerosene, and other products.

⁴ Coal used in the transportation sector is included in the industrial sector. Source: Table 12.3.

Table 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source, 1998
(Million Metric Tons of Carbon¹)

Energy Source	Residential	Commercial	Industrial	Transportation	End-Use Total	Electric Utilities	Total
Petroleum	24.8	12.9	100.5	473.4	611.6	24.8	636.3
Aviation Gasoline	—	—	—	0.7	0.7	—	0.7
Distillate Fuel	15.4	8.3	21.9	96.9	142.6	² 2.5	145.1
Jet Fuel	—	—	—	64.2	64.2	—	64.2
Kerosene	2.1	0.6	0.4	—	3.2	—	3.2
Liquefied Petroleum Gases	7.2	1.3	13.3	0.2	22.1	—	22.1
Lubricants	—	—	1.9	1.8	3.7	—	3.7
Motor Gasoline	—	0.8	4.2	294.6	299.7	—	299.7
Residual Fuel	—	1.9	4.5	14.9	21.3	³ 20.7	42.0
Other	—	—	54.2	—	54.2	⁴ 1.5	55.7
Natural Gas	66.3	44.9	140.4	10.8	262.4	47.8	310.1
Coal	1.5	2.2	⁵ 58.1	(⁶)	61.8	477.3	539.0
Electricity	191.9	178.4	178.8	0.7	549.8	—	—
Total	284.5	238.4	477.8	484.9	1,485.5	⁷ 549.8	1,485.5

¹ Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

² Light fuel oil.

³ Heavy fuel oil.

⁴ Petroleum coke.

⁵ Industrial coal includes net imports of coke.

⁶ Included in the industrial sector.

⁷ Electric utility emissions are distributed across end-use sectors.

— = Not applicable.

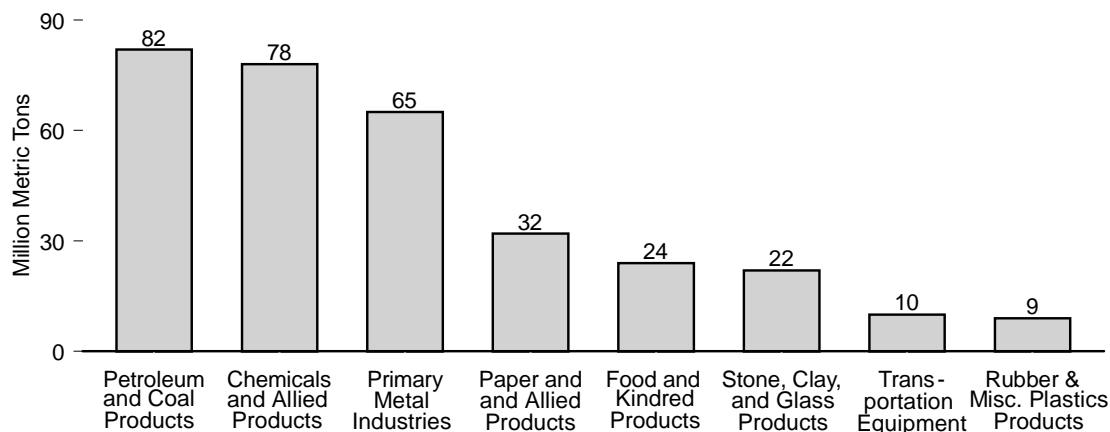
Note: Totals may not equal sum of components due to independent rounding. All values are considered preliminary.

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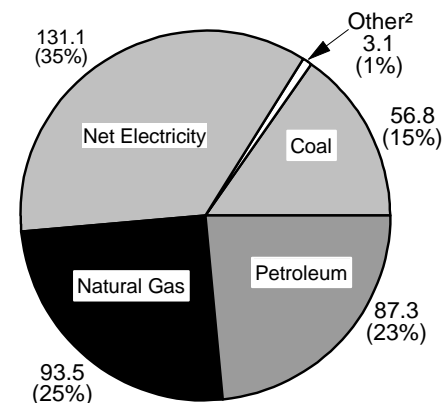
Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Tables 7 and 9-13.

Figure 12.4 Carbon Dioxide Emissions From Energy Consumption for Manufacturing Industries, 1994

Carbon Emissions by Top Industry Groups

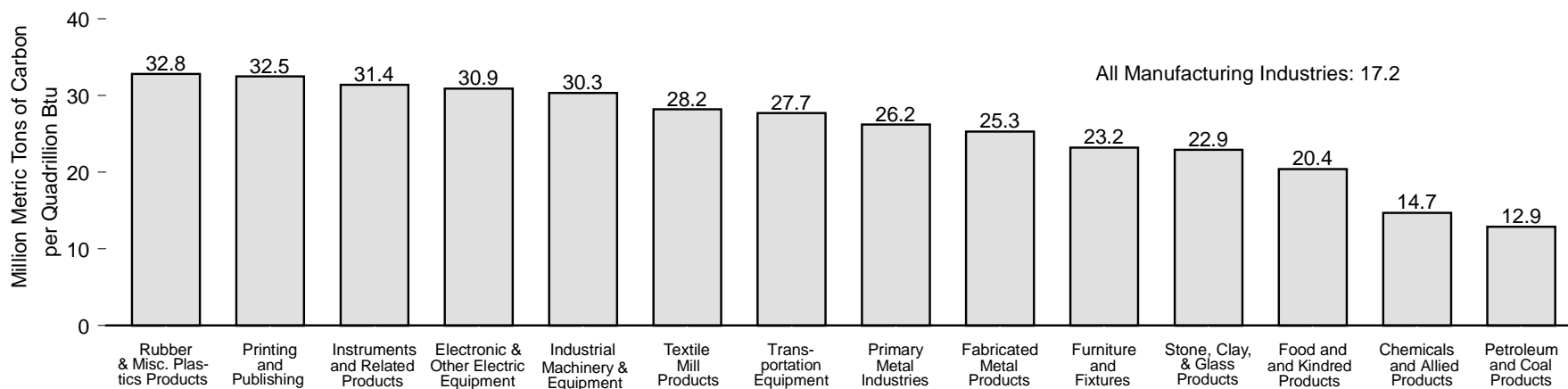


Carbon Emissions by Energy Source¹



**Total Emissions:
371.7 million metric tons**

Carbon Intensity by Top Industry Groups



¹ Sum of shares does not equal 100 percent due to independent rounding.

² All other types of energy that respondents indicated were consumed.

Source: Table 12.4.

Table 12.4 Carbon Dioxide Emissions From Energy Consumption for Manufacturing Industries, 1994

SIC ² Code	Major Group	Carbon ¹ Emissions (million metric tons)					Carbon Intensity ⁵	
		Coal	Natural Gas	Petroleum	Net Electricity ³	Other ⁴		Total
20	Food and Kindred Products	W	9.1	W	9.8	0.1	24.4	20.44
21	Tobacco Products	W	W	W	0.1	W	W	W
22	Textile Mill Products	1.0	1.7	0.6	5.5	0.0	8.7	28.21
23	Apparel and Other Textile Products	W	0.4	W	1.3	W	W	W
24	Lumber and Wood Products	W	0.7	W	3.4	0.2	4.9	9.98
25	Furniture and Fixtures	0.1	0.3	(s)	1.1	0.1	1.6	23.19
26	Paper and Allied Products	7.8	8.3	4.3	11.0	0.3	31.6	11.88
27	Printing and Publishing	0.0	0.7	W	2.9	0.0	3.6	32.52
28	Chemicals and Allied Products	7.8	32.1	12.4	25.7	0.4	78.3	14.70
29	Petroleum and Coal Products	W	11.7	64.2	6.0	(s)	81.8	12.91
30	Rubber and Miscellaneous Plastics Products	0.1	1.6	0.3	7.4	(s)	9.4	32.81
31	Leather and Leather Products	0.0	W	W	0.1	(s)	W	W
32	Stone, Clay, and Glass Products	7.2	6.2	2.0	6.1	0.1	21.6	22.85
33	Primary Metal Industries	26.2	11.7	1.3	24.3	0.9	64.5	26.20
34	Fabricated Metal Products	W	3.2	W	5.7	Q	9.3	25.33
35	Industrial Machinery and Equipment	W	1.6	W	5.4	0.0	7.5	30.32
36	Electronic and Other Electric Equipment	W	1.3	0.1	5.6	Q	7.5	30.91
37	Transportation Equipment	0.8	2.3	0.4	6.5	0.1	10.0	27.65
38	Instruments and Related Products	W	0.4	W	2.3	0.0	3.4	31.38
39	Miscellaneous Manufacturing Industries	(s)	0.3	0.1	0.9	W	W	W
—	Total	56.8	93.5	87.3	131.1	3.1	371.7	17.16

¹ Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon is equal to 3.667 tons of carbon dioxide gas.

² Based on 1987 Standard Industrial Classification system.

³ "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It excludes electricity generated from combustible fuels.

⁴ All other types of energy that respondents indicated were consumed.

⁵ Carbon intensity is million metric tons of carbon per quadrillion Btu. In the carbon intensity calculations electricity was evaluated as site electricity, the electricity delivered to the end user. Site electricity is equal to 3,412 Btu per kilowatt-hour.

W=Withheld to avoid disclosure of data for individual establishments. Q=Data withheld because the relative standard error was greater than 50 percent.

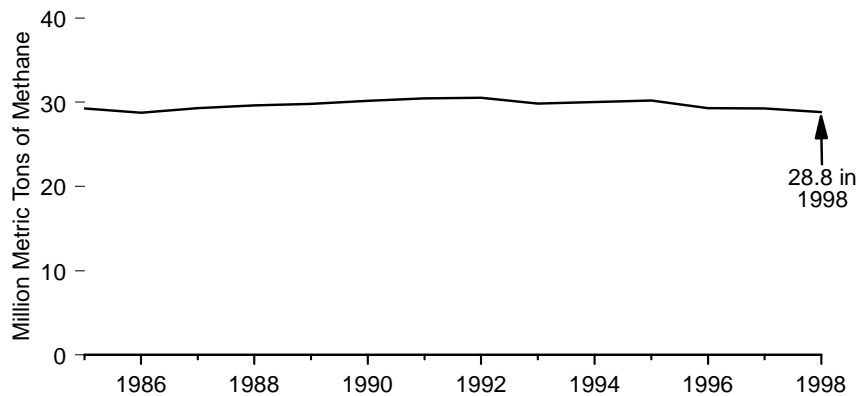
Notes: • The estimates are for the first use of energy for heat and power and as feedstocks or raw material inputs. First use is defined as the consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy. • See Table 2.2 for manufacturing energy use. • Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/consumption>.

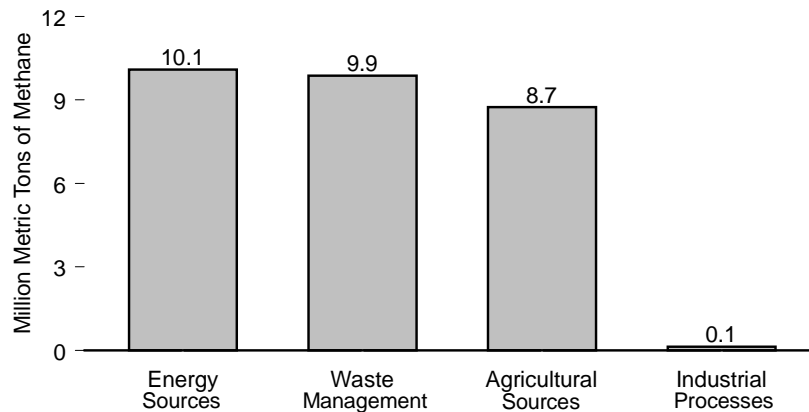
Sources: Energy Information Administration, Form EIA-846, "1994 Manufacturing Energy Consumption Survey" and Form EIA-810, "Monthly Refinery Report."

Figure 12.5 Methane Emissions

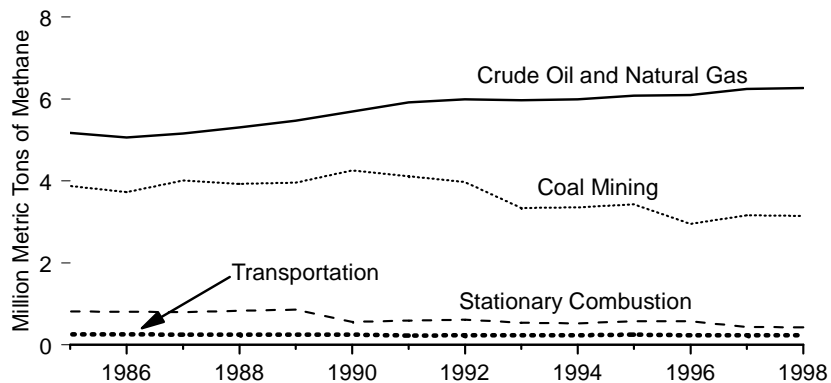
Total, 1985-1998



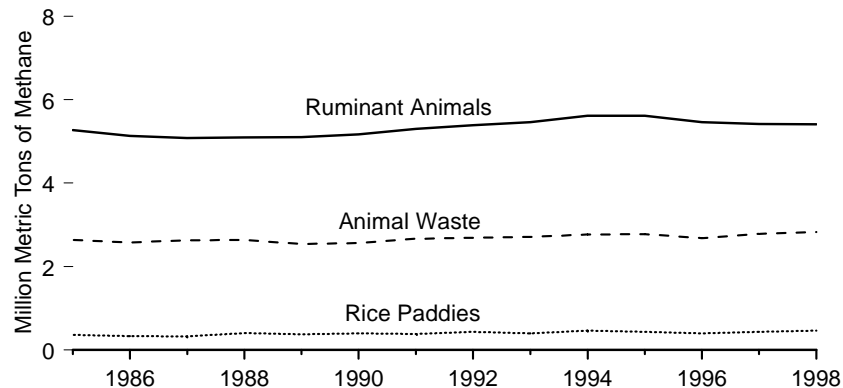
By Source, 1998



Energy Sources by Type, 1985-1998



Agricultural Sources by Type, 1985-1998



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.5.

Table 12.5 Methane Emissions, 1985-1998
(Million Metric Tons of Methane)

Year	Energy Sources					Waste Management			Agricultural Sources					Industrial Processes	Total
	Crude Oil and Natural Gas	Coal Mining	Transportation	Stationary Combustion	Total	Landfills	Wastewater Treatment	Total	Ruminant Animals	Animal Waste	Rice Paddies	Crop Residue Burning	Total		
1985	R5.17	3.88	0.26	R0.82	R10.13	R10.56	0.14	R10.70	5.27	2.64	0.36	0.04	8.31	0.11	R29.25
1986	R5.06	3.73	0.26	R0.81	R9.85	R10.56	0.15	R10.71	5.13	2.58	0.34	0.03	8.09	0.10	R28.74
1987	R5.16	4.01	R0.25	R0.80	R10.22	R10.78	0.15	R10.93	5.08	2.63	0.33	0.03	8.07	0.11	R29.32
1988	R5.31	3.93	0.25	R0.83	R10.31	R10.86	0.15	R11.01	5.10	2.64	0.41	0.03	8.18	0.12	R29.62
1989	R5.47	3.96	R0.25	R0.86	R10.54	R10.93	0.15	R11.08	5.11	2.54	0.38	0.04	8.08	0.12	R29.81
1990	5.70	4.26	0.25	R0.56	R10.77	R10.97	0.15	R11.12	5.17	2.57	0.40	0.04	8.18	0.12	R30.19
1991	5.92	4.12	R0.23	R0.59	R10.86	R10.94	0.15	R11.09	5.30	2.67	0.39	0.04	8.40	0.11	R30.47
1992	5.99	3.97	0.24	R0.62	R10.82	R10.90	0.15	R11.05	5.39	2.69	0.44	0.04	8.56	0.12	R30.55
1993	5.97	3.34	0.24	R0.54	R10.10	R10.86	0.16	R11.01	5.47	2.71	0.40	0.03	8.62	0.12	R29.85
1994	5.99	3.36	R0.24	R0.53	R10.11	R10.74	0.16	R10.90	5.62	2.77	0.47	0.04	R8.91	0.13	R30.05
1995	6.08	3.43	R0.25	R0.58	R10.34	R10.69	0.16	R10.85	5.62	R2.78	0.44	0.03	R8.87	0.13	R30.20
1996	6.10	2.95	R0.24	R0.58	R9.87	R10.54	0.16	R10.70	5.47	2.68	0.40	0.04	R8.60	0.13	R29.30
1997	R6.25	R3.16	0.24	R0.44	R10.09	R10.20	0.16	R10.36	R5.42	R2.79	R0.44	0.04	R8.69	0.13	R29.27
1998 ^P	6.27	3.15	0.24	0.43	10.09	9.70	0.16	9.87	5.41	2.83	0.47	0.04	8.74	0.13	28.84

R=Revised. P=Preliminary.

Notes: • Emissions are from anthropogenic sources. Anthropogenic means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. • Estimates of methane emissions are, in general, highly uncertain. The level of precision is probably on the order of 30 to 50 percent. For additional information, see "Appendix C, "Uncertainty in Emission Estimates" in the source report, page 110.

• Ruminant animals, such as cattle, buffalo, sheep, goats, and camels, emit methane as a product of the digestive process. • Under certain conditions, methane may be produced via anaerobic decomposition of

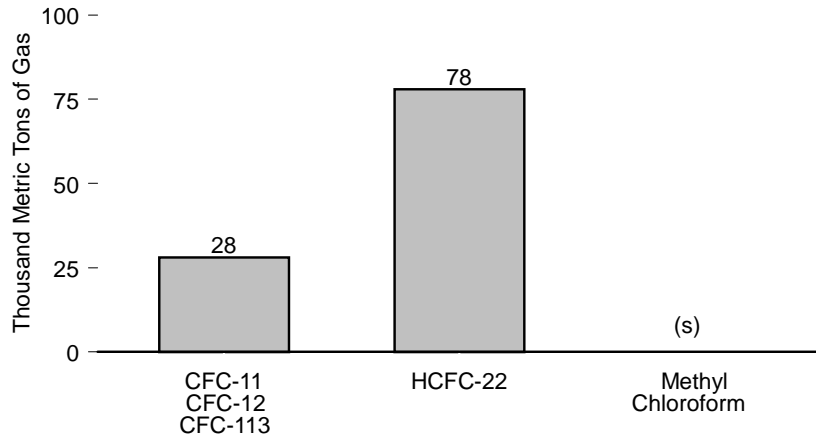
organic materials in landfills, animal wastes, and rice paddies. • Because inventory methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community. • Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/environment.html>.

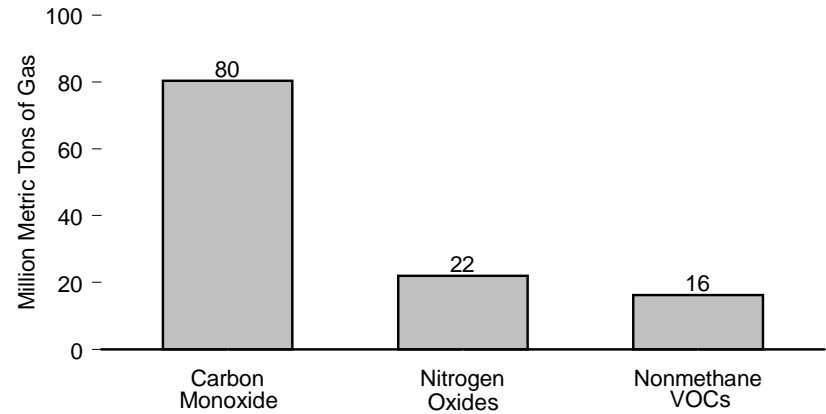
Sources: • 1985-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Table 15.

Figure 12.6 Ozone Depleting Substances and Criteria Pollutants

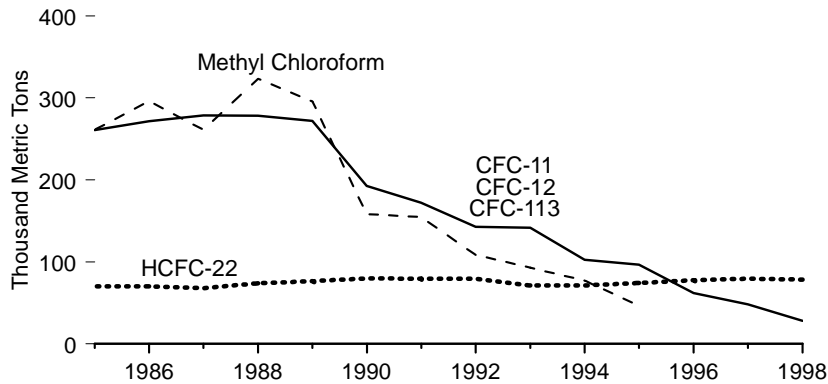
Ozone Depleting Substances, 1998



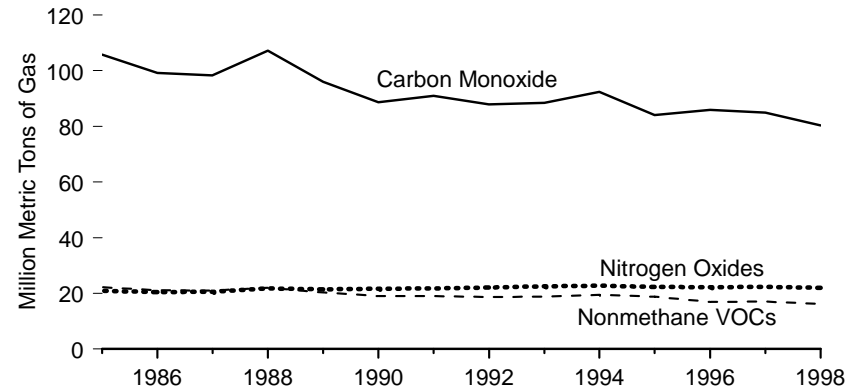
Criteria Pollutants, 1998



Ozone Depleting Substances, 1985-1998



Criteria Pollutants, 1985-1998



(s)=Less than 0.5 thousand metric tons of gas.

Notes: • CFC=chlorofluorocarbons; HCFC=chlorodifluoromethane; VOCs=volatile organic compounds. • Because vertical scales differ, graphs should not be compared.

Source: Table 12.6.

Table 12.6 Ozone Depleting Substances and Criteria Pollutants, 1985-1998

Year	Ozone Depleting Substances (thousand metric tons of gas)			Criteria Pollutants (million metric tons of gas)		
	CFC-11 CFC-12 CFC-113	HCFC-22	Methyl Chloroform	Carbon Monoxide	Nitrogen Oxides	Nonmethane VOCs
1985	260.7	70.3	261.1	R105.7	R20.9	R22.2
1986	271.4	70.3	296.1	R99.2	R20.5	R21.2
1987	278.5	68.1	261.1	R98.3	R20.6	21.0
1988	278.2	74.0	323.4	R107.2	R21.8	R22.0
1989	271.9	76.4	295.6	R96.0	R21.5	R20.4
1990	192.5	79.8	158.3	R88.7	R21.7	R19.0
1991	172.4	79.5	154.7	R90.9	R21.8	19.1
1992	142.7	79.5	108.3	R87.9	R22.1	18.7
1993	141.8	71.2	92.9	R88.4	R22.5	18.9
1994	102.8	71.4	77.4	R92.4	R22.8	19.5
1995	96.6	74.2	46.4	R84.0	R22.4	R18.9
1996	62.1	77.5	(s)	R85.9	R22.2	R16.9
1997	48.2	79.6	(s)	R85.0	R22.3	R17.1
1998 ^P	28.3	78.4	(s)	80.4	22.0	16.2

R=Revised. P=Preliminary. (s)=Less than 0.05 thousand metric tons.

Notes: • CFC = chlorofluorocarbons; HCFC = chlorodifluoromethane; and VOCs = volatile organic compounds. • Ozone depleting substances are gases containing chlorine that are being controlled because they deplete ozone. They are thought to have some indeterminate impact on greenhouse gases. • Criteria pollutants are regulated as urban air pollutants. They are thought to have indirect effects on climate because they promote the formation of ozone, itself a greenhouse gas. • Because estimation methods for greenhouse gases are currently being developed, data are frequently revised on an annual

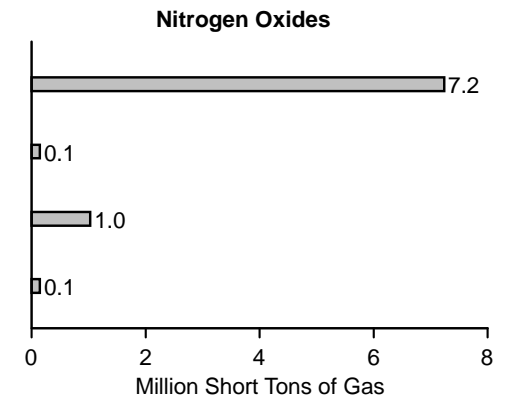
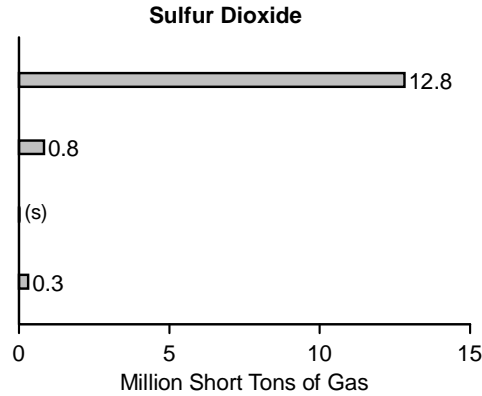
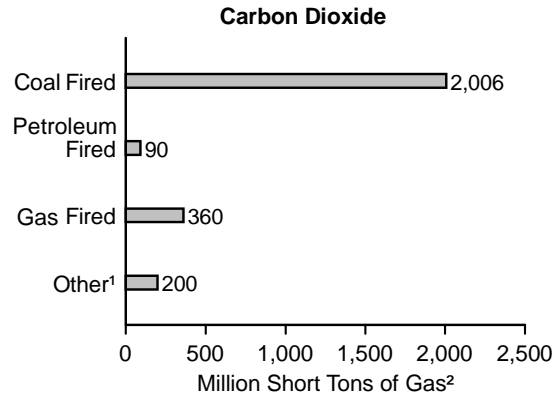
basis in keeping with the latest findings of the international scientific community.

Web Page: <http://www.eia.doe.gov/environment.html>.

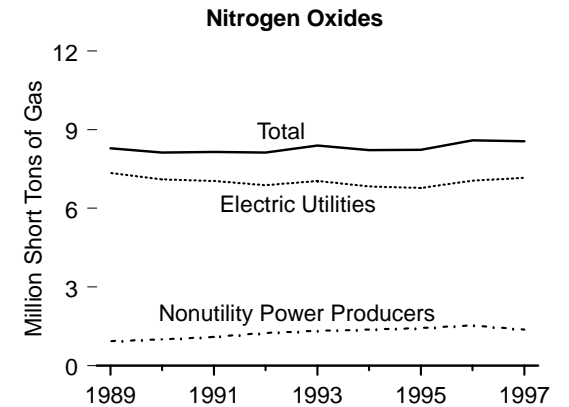
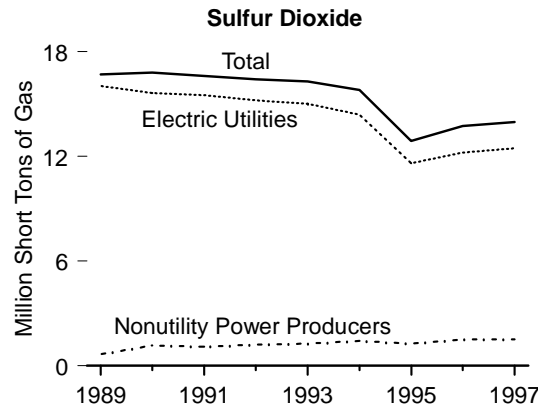
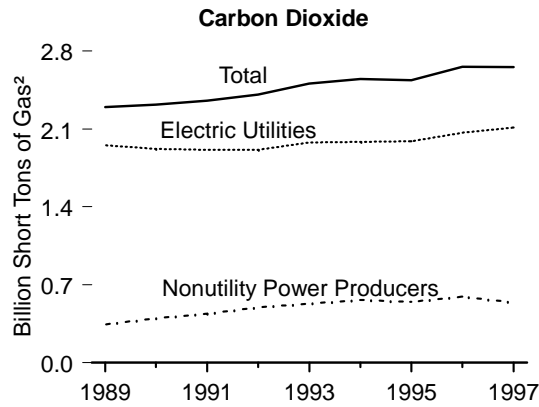
Sources: **Ozone Depleting Substances:** • 1985-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999). **Criteria Pollutants:** • 1985-1998—EIA, Office of Integrated Analysis and Forecasting estimates based upon Environmental Protection Agency, *National Air Pollutant Emission Trends Report 1900-1998* (March 2000).

Figure 12.7 Emissions From Electric Generating Units

Emissions by Type of Generating Unit, 1997



Total Emissions, 1989-1997



¹ Plants fired by light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse.

² Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas. Short tons can be converted to metric tons by dividing by 1.102.

(s)=Less than 0.05 million short tons.

Note: Because horizontal and vertical scales differ, graphs should not be compared.

Source: Table 12.7.

Table 12.7 Emissions From Electric Generating Units, 1989-1998

(Thousand Short Tons of Gas)

Year	Coal Fired			Petroleum Fired			Gas Fired			Other ¹			Total		
	Carbon Dioxide ²	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide ²	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide ²	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide ²	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide ²	Sulfur Dioxide	Nitrogen Oxides
Electric Utilities															
1989	1,651,813	15,196	6,764	135,734	819	221	161,051	1	359	4,092	4	8	1,952,691	16,020	7,352
1990	1,655,344	14,972	6,600	102,003	648	164	158,227	1	341	4,711	5	9	1,920,285	15,626	7,114
1991	1,653,114	14,838	6,548	97,246	662	156	159,816	1	335	3,756	4	8	1,913,932	15,505	7,047
1992	1,668,404	14,643	6,449	77,516	554	118	160,296	1	306	4,333	4	8	1,910,548	15,202	6,882
1993	1,738,068	14,378	6,625	82,459	625	126	154,141	1	297	3,362	3	6	1,978,029	15,007	7,054
1994	1,737,512	13,836	6,399	75,959	537	111	168,314	1	323	3,415	7	6	1,985,200	14,382	6,840
1995	1,753,974	11,254	6,340	52,702	334	78	179,631	1	363	3,322	10	6	1,989,628	11,599	6,787
1996	1,851,875	11,821	6,651	58,122	384	83	153,085	1	320	3,608	2	6	2,066,691	12,207	7,060
1997	1,903,460	12,014	6,834	60,758	435	81	145,433	1	252	4,003	2	7	2,113,654	12,452	7,174
1998 ^P	1,911,627	11,671	6,701	100,895	759	137	195,868	1	377	897	1	7	2,209,287	12,432	7,222
Nonutility Power Producers															
1989	72,360	548	282	14,884	90	36	142,974	1	531	114,944	27	89	345,162	665	938
1990	71,957	740	280	17,408	193	40	158,355	1	577	150,930	230	113	398,651	1,164	1,011
1991	83,461	661	323	18,704	160	44	174,315	1	617	164,794	281	116	441,274	1,102	1,100
1992	91,833	668	367	23,510	254	56	204,158	1	704	179,943	288	127	499,444	1,211	1,254
1993	97,281	709	395	27,304	266	62	219,859	1	749	185,343	296	132	529,787	1,272	1,337
1994	102,914	797	413	33,612	327	73	232,485	1	763	194,879	301	133	563,889	1,425	1,382
1995	99,500	689	404	29,287	305	65	232,808	1	839	185,514	283	136	547,110	1,278	1,444
1996	105,508	788	422	31,445	410	71	248,891	1	904	207,676	319	148	593,520	1,518	1,545
1997 ^P	102,279	803	405	29,726	396	65	215,019	1	774	195,595	305	138	542,619	1,505	1,382
Total															
1989	1,724,173	15,744	7,046	150,618	909	257	304,025	2	890	119,036	31	97	2,297,852	16,686	8,290
1990	1,727,301	15,711	6,881	119,411	842	204	316,583	2	918	155,641	235	122	2,318,936	16,790	8,125
1991	1,736,575	15,499	6,870	115,950	822	200	334,131	2	953	168,550	285	124	2,355,207	16,607	8,147
1992	1,760,237	15,311	6,816	101,027	808	174	364,454	2	1,010	184,275	292	135	2,409,992	16,413	8,136
1993	1,835,349	15,087	7,019	109,763	891	188	374,000	2	1,046	188,705	299	138	2,507,817	16,279	8,391
1994	1,840,426	14,633	6,812	109,571	864	185	400,799	2	1,086	198,294	308	139	2,549,089	15,807	8,221
1995	1,853,473	11,943	6,744	81,989	639	143	412,439	2	1,203	188,836	293	141	2,536,738	12,877	8,231
1996	1,957,384	12,609	7,072	89,567	793	155	401,976	2	1,224	211,283	322	154	2,660,210	13,726	8,604
1997 ^P	2,005,739	12,818	7,239	90,484	831	146	360,453	2	1,026	199,598	307	145	2,656,274	13,957	8,556

¹ Plants fired by light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse.

² Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas. Short tons can be converted to metric tons by dividing by 1.102.

P=Preliminary.

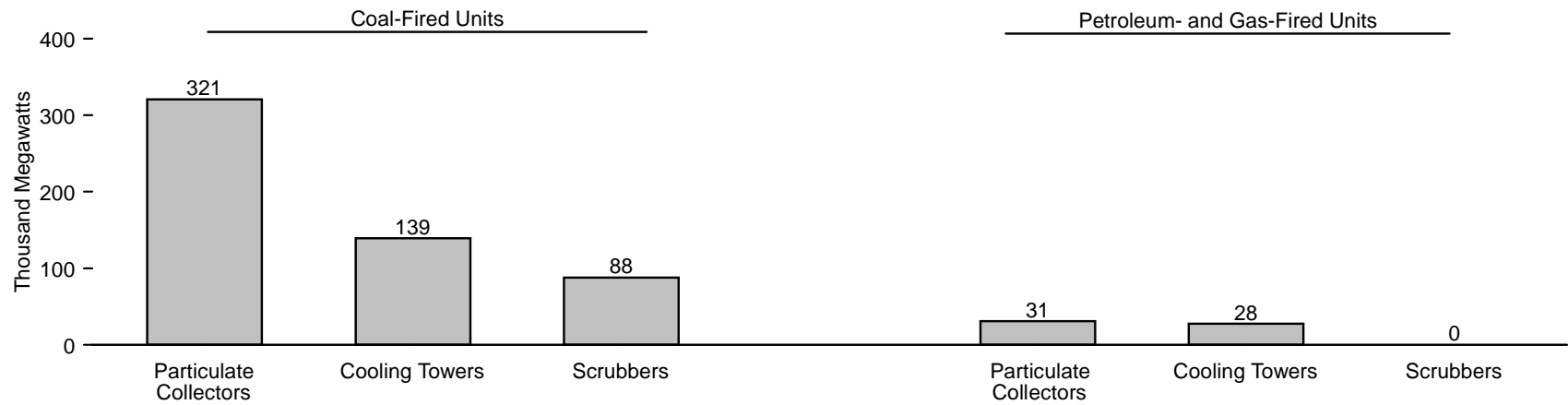
Note: See Technical Notes in the *Electric Power Annual* Volume II.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

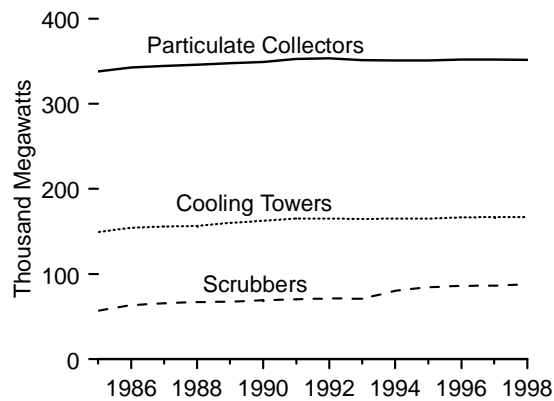
Sources: **Electric Utilities:** • 1989-1993—Energy Information Administration (EIA), *Electric Power Annual*, annual reports. • 1994 forward—EIA, *Electric Power Annual 1998, Volume II, annual reports*. **Nonutility Power Producers:** • 1989 forward—EIA, Form EIA-860B "Annual Electric Generator Report-Nonutility."

Figure 12.8 Installed Nameplate Capacity of Steam-Electric Generators for Electric Utility Plants With Environmental Equipment

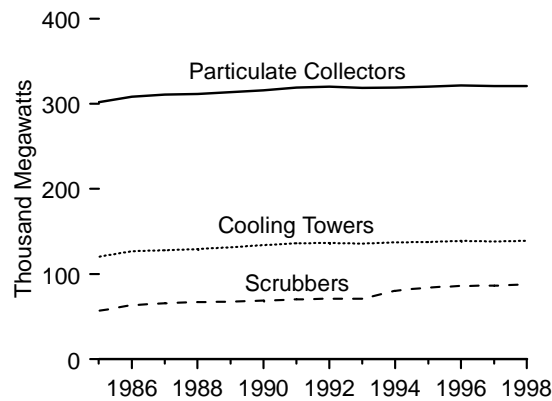
By Fuel and Equipment Type, 1998



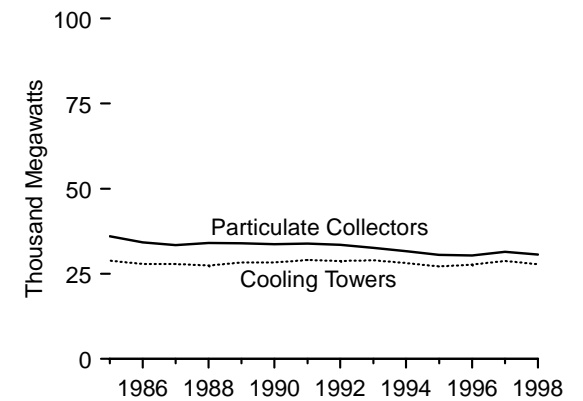
Total Units by Equipment Type, 1985-1998



Coal-Fired Units by Equipment Type, 1985-1998



Petroleum- and Gas-Fired Units by Equipment Type, 1985-1998



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.8.

Table 12.8 Installed Nameplate Capacity of Steam-Electric Generators for Electric Utility Plants With Environmental Equipment, 1985-1998
(Megawatts)

Year	Coal Fired				Petroleum and Gas Fired				Total			
	Particulate Collectors	Cooling Towers	Scrubbers	Total ¹	Particulate Collectors	Cooling Towers	Scrubbers	Total ¹	Particulate Collectors	Cooling Towers	Scrubbers	Total ¹
1985	302,056	120,591	56,955	304,706	36,054	28,895	65	62,371	338,110	149,486	57,020	367,078
1986	308,566	126,731	63,735	311,217	34,258	27,919	65	59,618	342,825	154,650	63,800	370,835
1987	311,043	127,875	65,688	312,885	33,431	27,912	65	58,783	344,474	155,786	65,753	371,668
1988	311,776	129,366	67,156	313,618	34,063	27,434	65	58,937	345,839	156,800	67,221	372,555
1989	313,708	131,697	67,506	315,549	33,975	28,386	65	59,736	347,655	160,087	67,534	375,257
1990	315,681	134,199	69,057	317,522	33,639	28,359	65	59,372	349,319	162,557	69,122	376,894
1991	319,127	136,270	70,294	319,189	33,864	29,067	260	59,773	352,990	165,337	70,554	378,963
1992	320,016	136,542	71,157	320,078	33,509	28,764	195	59,116	353,525	165,306	71,351	379,194
1993	318,830	136,028	70,890	318,893	32,620	28,922	0	58,580	351,451	164,951	70,890	377,473
1994	319,309	137,266	80,617	319,600	31,695	28,186	0	57,123	^R 351,180	165,452	80,617	^R 376,899
1995	320,268	137,825	84,260	320,467	30,513	27,187	0	54,942	^R 351,198	^R 165,295	^R 84,677	^R 375,691
1996	321,721	139,065	86,359	321,785	30,349	27,685	0	55,275	^R 352,254	166,749	86,359	^R 377,244
1997	320,832	138,120	86,605	320,896	31,422	28,766	0	56,485	352,254	166,886	86,605	377,381
1998 ^P	321,082	139,082	87,783	321,353	30,708	27,814	0	55,764	351,790	166,896	87,783	377,117

¹ Components are not additive because some generators are included in more than one category.
R=Revised. P=Preliminary.

Notes: • Historical data are revised to include emissions from other fuels (including light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse); to incorporate reevaluation and resubmission of data by respondents to The Clean Air Act Amendments of 1990; and to reflect revisions to the methodology used to estimate emissions. • All data are preliminary and may be revised in future

publications. • Data cover only plants with fossil-fueled steam-electric capacity of 100 megawatts or greater.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: • 1985-1987—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1988-1993—EIA, *Electric Power Annual*, annual reports. • 1994 forward—EIA, *Electric Power Annual Volume II*, annual reports.

