Appendix A

Common Conversion Factors

Mass

1 kilogram	=	10^3 grams	=	2.20462 pounds
1 megagram (metric ton)	=	10^6 grams	=	2,204.62 pounds
1 gigagram	=	10^9	=	1,000 metric tons
1 teragram	=	10^{12}	=	1 million metric tons
1 short ton	=	$.9072 * 10^6$ grams	=	2,000 pounds

Energy

1 joule	=	.2388 calories	=	.0009478 Btu
1 terajoule	=	10^{12} joules	=	$9.478 * 10^8$ Btu
1 exajoule	=	10^{18} joules	=	$0.9478 * 10^{15}$ Btu
1 Mbtu	=	1000 Btu	=	$1 * 10^3$ Btu
1 Mmbtu	=	1 million Btu	=	$1 * 10^6$ Btu
1 Bbtu	=	1 billion Btu	=	$1 * 10^9$ Btu
1 Tbtu	=	1 trillion Btu	=	$1 * 10^{12}$ Btu
1 Qbtu	=	1 quadrillion Btu	=	$1 * 10^{15}$ Btu

Area

1 acre	=	0.4047 hectare (ha)	=	4,407 m^2
1 hectare	=	10,000m^2	=	2.47 acres

Volume

1 cubic centimeter	=	$3.5318 * 10^{-5}$ cubic feet
1 cubic foot	=	0.02832 cubic meters
1 cubic meter	=	35.3147 cubic feet
1 barrel	=	42 gallons

Density

1 thousand cubic feet methane	=	42.28 pounds methane
1 thousand cubic feet carbon dioxide	=	115.97 pounds carbon dioxide

Table B1. Energy-Related Carbon Dioxide Emissions from the Residential and Commercial Sectors, by Fuel Type, 1949-2003
(Million Metric Tons of Carbon Dioxide)

	Residential					Commmercial				
Year	Natural Gas	Petroleum	Coal	Electricity	Total	Natural Gas	Petroleum	Coal	Electricity	Total
1949	55.2	85.1	110.9	69.5	320.6	18.2	48.3	154.6	54.9	276.0
1950	65.1	101.2	109.7	74.0	349.9	21.5	57.4	153.0	58.4	290.2
1951	79.8	110.3	96.8	82.6	369.5	26.3	62.6	135.0	65.2	289.1
1952	87.8	113.1	88.1	88.1	377.1	28.9	64.2	122.9	69.6	285.6
1953	90.9	114.9	75.6	96.2	377.7	30.0	65.2	105.5	75.9	276.6
1954	102.1	122.8	65.8	100.8	391.4	33.6	69.7	91.8	79.6	274.6
1955	113.2	132.0	65.4	110.0	420.5	37.3	74.9	91.2	86.8	290.2
1956	125.1	137.9	60.7	118.9	442.6	41.2	78.3	84.7	93.8	298.0
1957	134.6	133.8	46.6	127.4	442.4	44.4	75.9	65.0	100.6	285.9
1958	147.3	143.5	45.4	129.4	465.6	48.5	81.4	63.4	102.2	295.5
1959	159.6	146.2	38.8	143.3	487.9	52.6	83.0	54.1	113.1	302.8
1960	169.6	160.5	38.8	155.2	524.0	55.7	91.3	53.2	122.5	322.7
1961	177.5	165.2	35.3	162.7	540.7	58.8	92.7	48.5	126.9	326.9
1962	190.1	172.8	33.7	173.7	570.3	65.9	95.0	47.8	135.5	344.3
1963	195.1	173.9	29.4	190.2	588.6	68.7	93.6	40.8	152.7	355.8
1964	205.9	167.7	25.9	205.1	604.6	74.5	92.4	34.9	163.2	365.1
1965	212.2	175.2	24.1	220.9	632.4	78.3	103.1	33.1	175.5	390.1
1966	224.9	174.2	23.2	244.0	666.4	88.1	106.8	33.3	193.9	422.1
1967	234.4	180.3	20.0	256.1	690.7	106.4	110.4	28.5	204.4	449.6
1968	241.7	189.2	18.1	289.8	738.8	112.7	112.2	25.6	226.1	476.5
1969	256.8	192.4	16.8	319.3	785.3	122.3	112.7	24.1	243.3	502.5
1970	261.5	193.7	14.6	351.5	821.3	129.6	115.1	20.2	265.9	530.7
1971	268.8	195.3	13.7	369.7	847.5	135.6	111.9	18.9	279.9	546.3
1972	277.5	203.4	10.5	399.8	891.3	141.2	113.1	14.6	306.6	575.5
1973	264.0	198.7	10.0	430.9	903.6	140.4	115.9	13.8	331.1	601.2
1974	258.6	181.0	9.8	420.0	869.4	138.0	105.2	14.1	319.8	577.1
1975	265.2	175.5	8.0	414.8	863.6	134.9	96.5	11.4	330.3	573.2
1976	271.8	191.6	7.8	437.9	909.1	143.4	107.8	11.2	355.1	617.4
1977	259.4	189.9	7.9	473.0	930.3	134.5	111.6	11.3	376.9	634.2
1978	263.3	184.7	7.9	479.8	935.6	139.5	106.8	11.9	378.3	636.5
1979	266.7	149.6	6.9	491.8	915.0	149.6	98.6	10.6	391.3	650.1
1980	256.3	123.1	5.7	523.9	909.0	140.7	95.6	8.3	407.9	652.5
1981	245.6	108.5	6.7	517.0	877.8	136.1	80.5	9.2	426.5	652.2
1982	250.8	101.2	7.1	513.1	872.2	141.0	74.5	10.6	428.1	654.1
1983	238.3	94.9	7.1	526.0	866.4	132.2	82.5	11.0	434.8	660.5
1984	247.3	93.7	7.7	537.1	885.8	136.9	87.4	11.9	457.4	693.7
1985	241.0	103.9	6.5	548.2	899.7	132.2	75.7	10.1	476.2	694.0
1986	234.0	102.0	6.5	552.7	895.2	125.8	80.3	10.0	482.7	698.8
1987	234.2	105.5	6.2	576.1	921.9	131.9	78.7	9.4	504.6	724.6
1988	251.2	109.4	6.2	602.9	969.6	144.8	75.7	9.6	529.9	760.0
1989	260.2	108.8	2.6	623.2	994.8	147.9	70.9	11.1	558.6	788.5
1990	238.8	98.0	2.4	609.1	948.3	142.6	69.4	12.1	553.0	777.2
1991	248.0	96.7	2.2	620.8	967.6	148.5	65.9	11.1	556.1	781.7
1992	255.2	99.3	2.3	611.7	968.5	152.6	62.0	11.2	556.0	781.8
1993	269.0	100.6	2.3	655.8	1027.6	155.3	56.6	11.2	583.8	807.0
1994	263.3	98.7	2.0	656.9	1020.9	157.3	57.2	11.1	594.7	820.3
1995	263.0	95.9	1.6	666.0	1026.5	164.3	53.0	11.0	608.9	837.3
1996	284.2	102.7	1.6	697.6	1086.1	171.3	54.2	11.5	631.6	868.5
1997	270.2	98.5	1.5	707.3	1077.5	174.3	50.6	12.2	674.8	911.9
1998	246.5	90.5	1.2	745.1	1083.3	163.5	47.4	8.7	710.7	930.3
1999	256.5	101.0	1.3	748.3	1107.1	165.2	47.2	9.7	721.5	943.7
2000	270.3	107.2	1.1	791.7	1170.4	172.4	53.6	8.6	769.8	1004.3
2001	259.7	105.8	1.1	796.7	1163.3	164.5	54.0	9.2	793.3	1021.0
2002	265.9	101.4	1.0	825.6	1193.9	168.7	48.6	8.6	793.9	1019.8
2003 P	276.8	103.3	1.1	833.5	1214.8	170.5	49.6	8.9	796.7	1025.7

Notes: P = Preliminary.

Sources: 1990-2002 Estimates documented in this report .
1960-1989 Calculated from energy data in the *State Energy Data Report* .
1949-1959 Calculated from energy data in the *Annual Energy Review* .

Table B2. Energy-Related Carbon Dioxide Emissions from the Industrial and Transportation Sectors, by Fuel Type, 1949-2003
(Million Metric Tons of Carbon Dioxide)

	Industrial					Transportation				
Year	Natural Gas	Petroleum	Coal	Electricity	Total/1	Natural Gas	Petroleum	Coal	Electricity	Total
1949	168.4	211.7	482.4	121.5	984.0	7.1	436.8	157.5	1.9	603.3
1950	187.4	241.8	514.1	140.8	1084.2	10.4	475.5	142.5	2.1	630.5
1951	213.8	258.5	549.6	156.0	1177.9	11.5	523.1	125.6	2.2	662.3
1952	220.7	262.6	489.4	160.3	1133.0	12.6	546.8	89.7	2.1	651.2
1953	227.0	269.4	526.5	180.0	1203.0	12.6	572.3	66.9	2.3	654.0
1954	228.1	275.4	419.8	177.8	1101.1	13.7	578.6	42.0	2.3	636.6
1955	248.1	303.8	498.7	221.7	1272.3	16.4	623.0	38.5	2.4	680.2
1956	257.1	312.1	502.7	239.6	1311.5	16.4	646.9	31.0	2.5	696.8
1957	269.8	307.9	490.6	240.0	1308.2	16.9	659.4	22.1	2.5	700.9
1958	275.0	314.5	402.3	224.7	1216.5	19.1	672.1	10.5	2.5	704.2
1959	298.3	331.3	391.7	247.3	1268.5	19.1	698.7	8.1	2.8	728.7
1960	315.3	328.2	403.9	249.8	1297.3	19.0	716.8	6.9	2.4	745.0
1961	318.5	326.6	386.1	255.5	1286.7	20.6	730.8	1.7	2.6	755.7
1962	333.1	337.3	390.0	268.6	1328.9	20.9	762.4	1.6	2.5	787.3
1963	349.2	342.9	408.2	286.4	1386.7	23.1	790.1	1.5	2.4	817.1
1964	367.9	361.4	436.8	305.6	1471.7	23.8	813.5	1.6	2.2	841.0
1965	379.5	374.4	454.6	325.4	1533.9	27.3	839.3	1.5	2.1	870.2
1966	403.2	387.0	461.8	357.0	1609.0	29.2	884.0	1.4	2.2	916.7
1967	416.4	386.8	437.7	365.2	1606.0	31.3	928.1	1.0	2.0	962.4
1968	445.1	393.2	430.7	395.8	1664.8	32.1	1005.5	0.9	1.9	1040.4
1969	476.1	408.0	415.7	418.5	1718.2	34.2	1047.7	0.7	1.8	1084.4
1970	490.4	407.2	408.7	430.4	1736.7	39.1	1082.6	0.6	1.9	1124.2
1971	508.6	407.9	347.7	436.3	1700.5	40.2	1125.6	0.4	1.8	1168.0
1972	510.2	445.2	352.1	475.8	1783.2	41.5	1193.3	0.3	1.9	1237.0
1973	539.6	470.8	358.1	510.4	1879.0	39.3	1260.5	0.2	1.8	1301.9
1974	517.4	444.3	347.2	497.5	1806.6	36.1	1230.1	0.2	1.9	1268.3
1975	442.5	420.1	325.9	485.1	1673.5	31.4	1245.2	0.0	2.1	1278.8
1976	454.5	465.5	323.3	544.5	1787.9	29.5	1308.6	0.0	2.2	1340.4
1977	448.4	505.4	306.9	576.3	1837.0	28.7	1361.4	0.0	2.2	1392.4
1978	444.2	498.2	304.6	575.5	1822.6	28.6	1418.3	0.0	1.9	1448.7
1979	443.2	526.6	323.6	606.4	1899.8	32.3	1405.2	0.0	2.2	1439.8
1980	434.1	477.4	284.6	594.9	1787.7	34.3	1349.6	0.0	2.3	1386.2
1981	426.4	413.8	284.5	590.9	1714.2	34.8	1334.6	0.0	2.3	1371.7
1982	367.1	387.5	230.6	523.7	1506.9	32.4	1305.9	0.0	2.2	1340.5
1983	349.1	349.7	225.8	543.4	1466.7	26.7	1316.4	0.0	2.2	1345.3
1984	381.7	397.0	258.5	576.6	1612.6	28.8	1358.4	0.0	2.4	1389.6
1985	362.5	375.4	253.3	577.6	1567.6	27.5	1378.8	0.0	2.6	1408.9
1986	341.5	381.2	242.1	560.2	1523.4	26.5	1433.8	0.0	2.6	1462.9
1987	373.2	386.1	244.1	581.3	1585.6	28.4	1476.0	0.0	2.5	1506.9
1988	392.1	398.9	259.4	605.2	1659.3	33.4	1530.6	0.0	2.7	1566.8
1989	412.7	375.6	254.3	636.9	1682.3	34.3	1547.3	0.0	2.7	1584.3
1990	433.5	380.4	249.5	623.1	1686.9	35.9	1530.9	0.0	2.7	1569.5
1991	439.8	354.4	234.8	614.8	1644.8	32.7	1514.0	0.0	2.7	1549.4
1992	459.9	400.0	225.7	635.5	1724.4	32.1	1535.8	0.0	2.6	1570.5
1993	465.3	369.0	224.8	643.8	1705.5	34.0	1554.1	0.0	2.5	1590.6
1994	464.6	382.0	226.1	656.2	1734.4	37.4	1591.1	0.0	3.3	1631.7
1995	489.4	365.6	224.3	646.7	1731.6	38.2	1620.1	0.0	3.2	1661.4
1996	505.7	393.2	219.0	663.7	1784.8	38.9	1663.3	0.0	3.2	1705.3
1997	506.1	394.9	215.3	678.6	1800.1	41.1	1678.4	0.0	3.2	1722.7
1998	495.0	387.1	201.2	693.1	1783.8	35.1	1719.5	0.0	3.3	1757.9
1999	473.6	404.4	196.6	691.7	1772.9	35.6	1767.1	0.0	3.2	1806.0
2000	479.7	381.4	200.2	706.6	1775.0	35.5	1805.2	0.0	3.6	1844.2
2001	438.7	416.4	193.5	638.8	1691.4	33.9	1798.2	0.0	3.6	1835.8
2002	449.8	404.2	178.1	633.5	1671.5	37.1	1825.5	0.0	3.4	1866.0
2003 P	421.3	413.2	180.3	645.6	1666.2	35.4	1835.8	0.0	3.5	1874.7

Notes: P = Preliminary.
1/ Industrial total includes net coke imports.

Sources: 1990-2002 Estimates documented in this report .
1960-1989 Calculated from energy data in the *State Energy Data Report* .
1949-1959 Calculated from energy data in the *Annual Energy Review* .

Table B3. Total Energy-Related Carbon Dioxide Emissions by End-Use Sector, and the Electric Power Sector, by Fuel Type, 1949-2003
(Million Metric Tons of Carbon Dioxide)

	End-Use Sector					Electric Power Sector			
Year	Residential	Commercial	Industrial	Transportation	Total	Natural Gas	Petroleum	Coal	Total/1
1949	320.6	276.0	984.0	603.3	2183.9	30.1	31.9	185.8	247.8
1950	349.9	290.2	1084.2	630.5	2354.8	34.3	36.6	204.4	275.3
1951	369.5	289.1	1177.9	662.3	2498.8	41.7	31.1	233.2	306.0
1952	377.1	285.6	1133.0	651.2	2446.8	49.6	32.7	237.9	320.2
1953	377.7	276.6	1203.0	654.0	2511.2	56.5	39.7	258.3	354.5
1954	391.4	274.6	1101.1	636.6	2403.7	63.9	32.7	263.9	360.4
1955	420.5	290.2	1272.3	680.2	2663.3	62.8	36.6	321.5	420.9
1956	442.6	298.0	1311.5	696.8	2748.8	67.6	35.0	352.1	454.7
1957	442.4	285.9	1308.2	700.9	2737.4	72.9	38.9	358.6	470.4
1958	465.6	295.5	1216.5	704.2	2681.8	75.0	38.1	345.6	458.7
1959	487.9	302.8	1268.5	728.7	2787.9	89.2	42.8	374.4	506.4
1960	524.0	322.7	1297.3	745.0	2889.0	94.2	43.0	392.7	529.9
1961	540.7	326.9	1286.7	755.7	2910.1	99.7	43.4	404.6	547.7
1962	570.3	344.3	1328.9	787.3	3030.9	107.4	43.5	429.4	580.3
1963	588.6	355.8	1386.7	817.1	3148.2	117.2	45.5	469.1	631.7
1964	604.6	365.1	1471.7	841.0	3282.5	127.2	49.3	499.7	676.2
1965	632.4	390.1	1533.9	870.2	3426.6	127.1	56.2	540.7	724.0
1966	666.4	422.1	1609.0	916.7	3614.3	143.2	68.7	585.2	797.1
1967	690.7	449.6	1606.0	962.4	3708.8	150.6	78.6	598.5	827.7
1968	738.8	476.5	1664.8	1040.4	3920.5	172.3	91.8	649.5	913.6
1969	785.3	502.5	1718.2	1084.4	4090.4	190.5	122.1	670.4	983.0
1970	821.3	530.7	1736.7	1124.2	4212.9	213.7	164.8	671.2	1049.7
1971	847.5	546.3	1700.5	1168.0	4262.3	216.0	193.9	677.8	1087.7
1972	891.3	575.5	1783.2	1237.0	4487.0	215.6	240.2	728.2	1184.0
1973	903.6	601.2	1879.0	1301.9	4685.7	197.3	272.9	804.0	1274.3
1974	869.4	577.1	1806.6	1268.3	4521.3	185.4	261.1	792.8	1239.3
1975	863.6	573.2	1673.5	1278.8	4389.1	170.6	245.7	816.0	1232.3
1976	909.1	617.4	1787.9	1340.4	4654.8	166.5	269.9	903.4	1339.7
1977	930.3	634.2	1837.0	1392.4	4793.8	173.3	302.7	952.4	1428.4
1978	935.6	636.5	1822.6	1448.7	4843.5	173.9	309.7	951.9	1435.4
1979	915.0	650.1	1899.8	1439.8	4904.7	190.3	255.3	1046.3	1491.8
1980	909.0	652.5	1787.7	1386.2	4735.4	200.8	202.8	1125.3	1529.0
1981	877.8	652.2	1714.2	1371.7	4616.0	198.4	169.6	1168.5	1536.7
1982	872.2	654.1	1506.9	1340.5	4373.8	176.1	120.8	1170.1	1467.1
1983	866.4	660.5	1466.7	1345.3	4338.8	158.0	119.0	1229.4	1506.5
1984	885.8	693.7	1612.6	1389.6	4581.7	169.7	99.1	1304.4	1573.5
1985	899.7	694.0	1567.6	1408.9	4570.3	166.7	84.0	1353.7	1604.6
1986	895.2	698.8	1523.4	1462.9	4580.3	141.9	112.0	1343.9	1598.2
1987	921.9	724.6	1585.6	1506.9	4738.9	154.9	96.9	1412.4	1664.5
1988	969.6	760.0	1659.3	1566.8	4955.7	143.0	120.6	1476.9	1740.7
1989	994.8	788.5	1682.3	1584.3	5049.8	171.5	141.5	1505.5	1821.4
1990	948.3	777.2	1686.9	1569.5	4981.9	175.3	102.1	1507.1	1787.9
1991	967.6	781.7	1644.8	1549.4	4943.5	178.7	94.2	1519.1	1794.4
1992	968.5	781.8	1724.4	1570.5	5045.2	185.9	78.4	1538.9	1805.8
1993	1027.6	807.0	1705.5	1590.6	5130.7	187.2	89.4	1606.6	1885.9
1994	1020.9	820.3	1734.4	1631.7	5207.2	210.3	84.0	1613.8	1911.1
1995	1026.5	837.3	1731.6	1661.4	5256.8	227.5	60.3	1633.9	1924.8
1996	1086.1	868.5	1784.8	1705.3	5444.8	204.2	65.4	1723.5	1996.1
1997	1077.5	911.9	1800.1	1722.7	5512.2	218.1	74.3	1768.3	2063.9
1998	1083.3	930.3	1783.8	1757.9	5555.3	247.1	104.4	1797.6	2152.1
1999	1107.1	943.7	1772.9	1806.0	5629.6	259.1	96.8	1805.8	2164.7
2000	1170.4	1004.3	1775.0	1844.2	5793.9	279.9	91.0	1897.7	2271.6
2001	1163.3	1021.0	1691.4	1835.8	5711.4	289.4	100.7	1839.4	2232.5
2002	1193.9	1019.8	1671.5	1866.0	5751.2	306.2	76.7	1870.2	2256.4
2003 P	1214.8	1025.7	1666.2	1874.7	5781.4	275.3	96.5	1904.3	2279.3

Notes: Emissions from the electric power sector are apportioned to each end-use sector according to their share of electricty sales.
P = Preliminary.
1/Electric power sector total includes emissions from municipal solid waste and geothermal electricity generation.

Sources: 1990-2002 Estimates documented in this report
1960-1989 Calculated from energy data in the *State Energy Data Report.*
1949-1959 Calculated from energy data in the *Annual Energy Review.*

Appendix C – State Energy-related Carbon Dioxide Emissions Estimates

For the first time in this report, EIA is providing estimates of State energy-related carbon dioxide emissions. Although energy-related carbon dioxide emissions do not encompass a full greenhouse gas inventory, the State energy-related carbon dioxide emissions do give a good indicator of the relative importance of individual States to the national greenhouse gas inventory since energy-related carbon dioxide emissions represent 83 percent of total U.S. greenhouse gas emissions.

EIA emissions estimates at the State level for energy-related carbon dioxide emissions are based on data contained in the State Energy Data System (SEDS) for the years 1990 to 2001.[1] The State-level emissions estimates include energy consumption data for the following fuel categories: coal, natural gas, and ten petroleum products, including asphalt and road oil, aviation gasoline, distillate fuel (including some kerosene jet fuel), jet fuel, kerosene, LPG, lubricants, motor gasoline, residual fuel, and other petroleum products (including aviation gasoline blending components; crude oil [including lease condensate]; petroleum feedstocks - naphtha less than 401° F; petroleum feedstocks - other oils equal to or greater 401° F; petroleum feedstocks - still gas; motor gasoline blending components; miscellaneous petroleum products; natural gasoline [including isopentane]; petroleum coke; plant condensate; pentanes plus; still gas; special naphthas; unfinished oils; unfractionated stream; and waxes).

The data are presented in three tables:

Table 1. 2001 State Energy-related Carbon Dioxide Emissions by Fuel – The fuel-based estimates are developed from primary fuel inputs of coal, natural gas and petroleum for 2001. The Btu values for State-level energy consumption are multiplied by national-level carbon emission factors used in the national emissions inventory. No attempt is made to adjust national carbon emission factors by State.

Table 2. 2001 State Energy-related Carbon Dioxide Emissions by Energy Sectors– Emissions from primary fuel inputs are estimated by end-use sector, as well as the electric power sector for 2001. At the national level, electric power sector emissions are shared out to the end-use sectors via the amount of electricity sales.[2] At the State-level, electric power sector emissions are not shared out to the other sectors but are represented independently. This avoids complicated trans-boundary issues between States that are not encountered when doing a national emission estimate. In other words, regardless of where the electricity is consumed, the emissions from the primary energy consumed to generate the electricity are attributed to the State in which the generation occurred. For some States slight discrepancies exist between the fuel and sector estimates (0.1 percent). When this occurs, the differences are shared out to the sectors so that the sector tables agree with the fuel tables.

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[1] See EIA website http://www.eia.doe.gov/emeu/states/_use_multistate.html.

[2] The electric power sector consists of NAICS-22 generators whose primary business is to produce electricity. Emissions from generators in the industrial and commercial sectors whose primary business is other than the generation of electricity remain in those sectors.

Table 3. Summary of State Energy-related Carbon Dioxide Emissions, 1990 - 2001 – A time series presents emissions estimates by State for 1990 to 2001. This table utilizes the fuel-based estimates to produce State totals.

Carbon Sequestered by Nonfuel Uses of Energy – All three tables net out carbon, and hence carbon dioxide emissions, that is sequestered due to the fact that a small portion of energy consumption is not combusted because it is used for nonfuel purposes. At the national level, carbon sequestered in nonfuel products is subtracted through a relatively complex process from total national-level emissions. Because of State-level data constraints, a more simplified process is used to allocate the national-level nonfuel sequestration values to the individual States. Three separate methods are used, depending on the nonfuel source.

1. For petroleum products, such as asphalt and road oil and lubricants, where all uses are nonfuel and the sequestration rates are straightforward, the amount of nonfuel sequestered was directly calculated based on State-level activity data and the related national-level carbon coefficients for the particular product.
2. For liquefied petroleum gases (LPG), industry data were used to apportion the total national-level nonfuel sequestration amounts for LPGs to the individual States.[3]
3. For petroleum products other than the above (petroleum coke, residual fuel, and distillate fuel), natural gas, and coal, value added at the NAICS 3251 Basic Chemicals level was used to apportion the total national-level nonfuel sequestration to the individual States.[4]

Municipal Solid Waste and Geothermal Power Generation - A line item for Municipal Solid Waste (MSW) and geothermal power generation is not apportioned to any State because it is not part of the SEDS database. This value fluctuates between 2.4 to 3.5 million metric tons during the 1990 to 2001 time frame. As such, this source ranges from 0.05 to 0.07 percent of total U.S. greenhouse gas emissions.

Balancing Item - The balancing item accounts for minor differences between the national-level inventory and state-level emissions calculations totals. Some of the difference is caused by adjustments that were made at the national level, but were more difficult to make at the state level. The balancing item is not attributed to any State. This source ranges from -12.9 million metric tons to 19.9 million metric tons. In percentage terms, the balancing item ranges form -0.3 to 0.37 percent of total U.S. greenhouse gas emissions.

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[3] American Petroleum Institute, *2001 Sales of Natural Gas Liquids and Liquefied Refinery Gases*. November 2002. Data were aggregated and averaged in order to avoid disclosure of proprietary material.
[4]U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, Annual survey of Manufactures, Geographic Area Statistics: 2000, Issued September 2002, http://www.census.gov/prod/2002pubs/m00as-3.pdf

Table C1. State Energy-related Carbon Dioxide Emissions by Fuel, 2001 (million metric tons carbon dioxide)

State Code	Coal	Petroleum	Natural Gas	Total
AK	1.5	19.9	21.8	**43.2**
AL	79.6	32.8	17.3	**129.6**
AR	25.8	25.6	12.0	**63.4**
AZ	40.0	35.8	12.9	**88.7**
CA	6.3	244.5	132.3	**383.1**
CO	37.7	30.7	20.3	**88.8**
CT	3.8	31.0	7.8	**42.6**
DC	0.1	2.4	1.6	**4.1**
DE	3.6	10.1	2.7	**16.4**
FL	68.4	140.4	29.9	**238.8**
GA	72.7	68.9	18.8	**160.5**
HI	1.7	17.4	0.2	**19.2**
IA	41.9	25.6	11.9	**79.4**
ID	1.0	10.1	4.3	**15.5**
IL	93.5	83.0	50.5	**227.1**
IN	147.5	55.9	26.9	**230.2**
KS	33.4	24.2	14.3	**71.9**
KY	95.2	45.9	11.0	**152.2**
LA	22.4	75.8	67.2	**165.3**
MA	10.3	53.7	19.2	**83.1**
MD	29.9	37.6	9.9	**77.4**
ME	0.7	16.6	5.3	**22.7**
MI	75.0	69.0	48.7	**192.7**
MN	33.3	44.4	18.2	**95.9**
MO	67.5	47.3	15.1	**129.9**
MS	18.7	32.6	17.7	**69.0**
MT	17.4	11.6	3.5	**32.4**
NC	71.3	63.1	11.0	**145.4**
ND	39.5	9.0	3.3	**51.8**
NE	21.4	14.9	6.5	**42.9**
NH	3.8	12.6	1.3	**17.7**
NJ	10.5	80.3	30.1	**120.9**
NM	28.0	17.3	13.8	**59.2**
NV	17.8	17.3	9.6	**44.6**
NY	29.6	118.7	63.2	**211.5**
OH	126.5	82.7	43.2	**252.3**
OK	35.5	39.6	29.0	**104.0**
OR	4.1	25.1	12.4	**41.6**
PA	129.8	97.3	34.8	**261.9**
RI	0.0	7.0	5.2	**12.2**
SC	39.0	29.4	7.1	**75.5**
SD	4.2	7.4	2.0	**13.5**
TN	64.7	43.6	13.1	**121.4**
TX	140.2	289.3	226.6	**656.1**
UT	36.7	17.8	8.9	**63.4**
VA	45.4	61.8	12.8	**119.9**
VT	0.0	6.1	0.4	**6.5**
WA	9.4	57.9	16.9	**84.2**
WI	46.6	44.0	19.1	**109.7**
WV	82.2	12.7	7.5	**102.3**
WY	47.1	10.7	5.5	**63.3**
State Total	**2,062.2**	**2,458.2**	**1,184.7**	**5,705.1**
MSW and Geothermal				**3.1**
Balancing Item				**3.2**
National Total				**5,711.4**

Notes: Most of the MSW and Geothermal emissions consist of Municipal Solid Waste (MSW) -- geothermal carbon dioxide emissions are 0.3 to 0.4 million metric tons per year. The balancing item accounts for other differences between the national-level inventory and state-level emissions calculations totals. Some of the difference is caused by adjustments that were made at the national level, but were more difficult to make at the state level.

Table C2. State Energy-related Carbon Dioxide Emissions by Energy Sectors, 2001
(million metric tons carbon dioxide)

State Code	Commercial	Electric Power	Residential	Industrial	Transportation	Total
AK	2.4	3.3	1.8	21.3	14.4	**43.2**
AL	2.0	73.8	3.6	19.0	31.2	**129.6**
AR	2.1	26.9	2.6	12.2	19.5	**63.4**
AZ	2.0	45.9	2.2	5.4	33.2	**88.7**
CA	14.7	55.8	28.7	73.5	210.4	**383.1**
CO	4.4	41.4	7.2	8.7	27.1	**88.8**
CT	4.2	9.6	8.3	3.8	16.7	**42.6**
DC	1.4	0.2	0.8	0.1	1.7	**4.1**
DE	0.6	5.2	1.2	4.7	4.7	**16.4**
FL	4.5	116.6	1.8	17.1	98.7	**238.8**
GA	3.7	70.1	7.4	18.8	60.5	**160.5**
HI	0.2	7.9	0.1	1.6	9.4	**19.2**
IA	3.6	36.1	4.8	16.0	18.9	**79.4**
ID	1.0	0.6	1.5	4.0	8.5	**15.5**
IL	11.7	85.7	24.1	39.8	65.7	**227.1**
IN	5.7	115.3	9.3	57.4	42.6	**230.2**
KS	2.5	34.9	4.2	13.2	17.3	**71.9**
KY	3.0	89.4	3.9	24.4	31.5	**152.2**
LA	2.1	37.6	3.2	69.2	53.3	**165.3**
MA	5.6	22.1	15.8	8.4	31.3	**83.1**
MD	4.7	30.3	6.8	7.1	28.4	**77.4**
ME	1.4	5.7	3.9	4.1	7.6	**22.7**
MI	10.8	72.8	23.0	29.8	56.2	**192.7**
MN	5.8	31.8	8.8	14.2	35.2	**95.9**
MO	5.0	67.1	8.5	10.0	39.3	**129.9**
MS	1.5	30.6	2.4	10.4	24.1	**69.0**
MT	0.9	17.5	1.4	5.1	7.6	**32.4**
NC	4.2	68.0	6.9	17.5	48.8	**145.4**
ND	0.9	30.6	1.3	13.1	6.0	**51.8**
NE	1.8	20.7	2.9	6.2	11.4	**42.9**
NH	1.3	4.2	2.8	2.1	7.2	**17.7**
NJ	9.7	18.7	16.1	14.0	62.4	**120.9**
NM	1.6	30.4	2.7	9.1	15.5	**59.2**
NV	1.4	24.2	2.0	2.5	14.5	**44.6**
NY	30.5	55.6	38.0	21.2	66.3	**211.5**
OH	11.1	118.2	19.3	35.0	68.8	**252.3**
OK	2.7	43.7	4.1	21.0	32.6	**104.0**
OR	2.1	8.6	2.7	6.6	21.5	**41.6**
PA	12.5	108.6	24.3	47.0	69.5	**261.9**
RI	1.2	3.2	2.6	0.6	4.6	**12.2**
SC	1.6	34.9	2.2	9.8	27.0	**75.5**
SD	0.7	3.9	1.1	2.1	5.8	**13.5**
TN	3.8	56.3	4.5	16.0	40.8	**121.4**
TX	11.8	217.4	14.1	224.2	188.6	**656.1**
UT	2.2	32.9	3.3	10.1	14.9	**63.4**
VA	5.2	42.5	7.5	16.5	48.2	**119.9**
VT	0.7	0.0	1.6	0.5	3.7	**6.5**
WA	3.8	14.0	6.0	18.0	42.4	**84.2**
WI	5.5	43.8	9.6	21.1	29.7	**109.7**
WV	1.9	74.8	2.5	10.8	12.4	**102.3**
WY	1.0	44.0	0.8	9.9	7.6	**63.3**
State Total	**226.8**	**2,233.4**	**366.3**	**1,033.9**	**1,844.7**	**5,705.1**
MSW and Geothermal						**3.1**
Balancing Item						**3.2**
National Total						**5711.4**

Notes: Most of the MSW and Geothermal emissions consist of Municipal Solid Waste (MSW) -- geothermal carbon dioxide emissions are 0.3 to 0.4 million metric tons per year. The balancing item accounts for other differences between the national-level inventory and state-level emissions calculations totals. Some of the difference is caused by adjustments that were made at the national level, but were more difficult to make at the state level.

Table C3. Summary of State Energy-related Carbon Dioxide Emissions, 1990-2001
(Million Metric Tons Carbon Dioxide)

State Code	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
AK	34.4	35.1	36.5	36.4	36.2	40.8	41.8	41.8	42.9	43.4	38.6	43.2
AL	107.6	111.5	118.2	122.9	120.8	128.3	133.0	129.7	128.8	131.0	138.0	129.6
AR	49.9	48.8	50.3	49.6	53.4	56.7	61.0	60.2	61.5	63.6	64.3	63.4
AZ	62.3	63.1	65.9	68.4	71.2	66.2	68.6	71.7	76.5	80.3	86.4	88.7
CA	362.5	349.4	353.5	343.6	360.5	349.3	347.5	349.9	359.6	363.4	378.8	383.1
CO	65.6	66.8	67.8	71.8	72.2	72.3	75.4	75.5	77.8	79.6	85.0	88.8
CT	40.7	39.9	40.3	38.4	37.7	36.9	40.6	43.7	41.3	42.6	43.9	42.6
DC	4.4	4.4	4.3	4.5	4.5	4.4	4.4	4.3	4.3	4.1	4.3	4.1
DE	17.6	17.9	17.5	19.2	18.5	17.5	18.2	16.9	16.3	16.5	16.9	16.4
FL	187.3	188.1	190.4	194.2	201.7	206.6	214.5	219.4	231.9	231.3	240.5	238.8
GA	138.0	131.2	130.9	140.7	143.5	151.6	155.1	156.2	157.2	159.6	168.6	160.5
HI	21.7	19.7	20.7	19.0	20.4	20.3	19.3	18.7	18.8	18.5	18.8	19.2
IA	62.7	64.5	63.2	67.7	68.8	72.2	74.4	73.9	77.7	78.9	80.5	79.4
ID	11.3	12.0	11.3	12.4	12.5	13.3	13.9	13.7	14.0	14.8	15.5	15.5
IL	193.9	195.2	191.4	208.4	208.7	212.1	222.6	226.4	216.6	226.7	235.2	227.1
IN	205.1	202.4	199.6	204.5	204.1	209.3	214.2	218.3	219.5	226.0	240.5	230.2
KS	69.3	67.8	65.6	70.9	71.2	68.5	74.6	71.7	70.6	74.3	76.4	71.9
KY	117.1	120.5	124.2	134.9	132.9	138.0	142.5	147.3	145.1	149.6	151.0	152.2
LA	178.8	173.3	179.2	181.0	185.8	186.3	178.4	181.2	167.6	167.7	190.0	165.3
MA	83.5	82.1	84.0	81.4	81.6	78.8	80.4	86.7	84.7	82.2	83.4	83.1
MD	69.6	68.6	66.6	69.0	70.1	69.5	71.6	71.8	74.8	77.4	77.3	77.4
ME	18.9	18.5	19.3	18.9	20.3	18.9	19.7	20.0	19.7	20.7	22.6	22.7
MI	181.1	180.7	179.7	180.4	188.5	190.9	196.7	194.4	193.3	201.3	197.4	192.7
MN	78.4	78.8	80.3	85.4	87.2	90.0	94.3	92.2	92.4	93.3	98.8	95.9
MO	103.9	102.4	102.1	100.6	108.1	115.1	120.9	124.4	129.0	129.7	125.3	129.9
MS	47.9	47.8	47.9	50.2	49.8	51.1	54.0	54.7	55.6	60.6	60.3	69.0
MT	27.5	28.6	29.9	27.9	30.6	30.0	27.3	29.2	31.2	31.8	31.1	32.4
NC	110.2	110.0	120.2	126.0	121.5	127.5	141.6	144.3	143.7	142.2	150.7	145.4
ND	44.2	45.2	46.9	47.3	47.7	47.6	48.4	47.1	48.2	49.3	50.9	51.8
NE	32.9	33.7	32.6	35.9	35.9	38.4	39.4	40.8	42.8	41.6	41.6	42.9
NH	14.6	14.2	14.3	14.9	15.0	15.0	16.1	17.4	17.4	17.6	18.3	17.7
NJ	114.6	114.8	121.7	118.3	128.0	127.2	123.1	125.0	120.2	124.0	124.0	120.9
NM	53.1	49.0	51.5	52.4	52.3	50.9	53.2	56.7	56.2	57.1	59.1	59.2
NV	30.4	32.2	33.2	33.8	36.0	35.2	37.7	37.7	40.4	41.1	45.3	44.6
NY	207.7	199.9	198.9	194.2	192.4	197.7	204.8	209.7	208.5	210.6	216.8	211.5
OH	244.2	242.4	247.3	252.6	249.1	250.9	263.0	258.7	257.8	256.9	264.9	252.3
OK	88.0	89.4	92.3	95.7	94.1	94.9	97.6	99.1	97.5	97.0	100.4	104.0
OR	30.6	34.4	35.5	35.8	37.2	34.5	36.6	36.1	41.8	43.1	41.6	41.6
PA	262.5	255.2	263.6	268.2	265.7	268.3	273.1	274.8	263.5	262.0	276.2	261.9
RI	8.8	10.7	13.0	10.8	12.8	12.0	13.5	13.5	13.8	13.2	11.7	12.2
SC	59.0	60.8	60.0	64.4	64.5	63.4	65.6	67.7	70.7	73.8	77.7	75.5
SD	11.8	11.5	11.6	12.4	13.0	12.8	12.7	13.2	12.8	13.4	14.2	13.5
TN	103.2	98.8	104.4	115.0	109.7	116.1	114.6	117.6	116.5	117.2	123.4	121.4
TX	552.6	547.3	553.4	566.2	565.7	568.7	619.5	640.3	645.6	629.2	657.5	656.1
UT	53.9	52.8	54.4	56.3	57.4	57.7	58.5	60.6	63.0	61.9	65.0	63.4
VA	94.2	95.8	97.1	101.6	100.6	102.6	107.6	109.8	111.6	113.6	123.0	119.9
VT	5.4	5.6	6.1	6.1	6.0	5.9	6.2	6.4	6.2	6.4	6.7	6.5
WA	70.0	71.2	79.3	75.2	79.9	77.5	79.8	78.1	81.9	83.1	82.8	84.2
WI	85.1	87.6	86.7	90.3	93.5	96.4	104.4	107.4	105.0	109.3	111.8	109.7
WV	106.7	96.9	98.9	100.0	107.5	105.7	104.3	107.7	111.4	112.1	112.2	102.3
WY	56.5	54.7	60.4	57.7	59.9	57.7	59.1	58.5	63.3	61.8	63.0	63.3
State Total	**4,980.8**	**4,932.9**	**5,023.9**	**5,133.2**	**5,206.3**	**5,259.3**	**5,445.3**	**5,522.1**	**5,548.4**	**5,606.6**	**5,808.1**	**5,705.1**
MSW and Geothermal	**3.5**	**2.4**	**2.7**	**2.7**	**2.9**	**3.0**	**3.0**	**3.1**	**3.1**	**3.1**	**3.0**	**3.1**
Balancing Item	**-2.4**	**8.2**	**18.6**	**-5.2**	**-2.0**	**-5.5**	**-3.5**	**-12.9**	**3.9**	**19.9**	**-17.1**	**3.2**
National Total	**4,981.9**	**4,943.5**	**5,045.2**	**5,130.7**	**5,207.2**	**5,256.8**	**5,444.8**	**5,512.2**	**5,555.3**	**5,629.6**	**5,793.9**	**5,711.4**

Notes: Most of the MSW and Geothermal emissions consist of Municipal Solid Waste (MSW) -- geothermal carbon dioxide emissions are 0.3 to 0.4 million metric tons per year. The balancing item accounts for other differences between the national-level inventory and state-level emissions calculations totals. Some of the difference is caused by adjustments that were made at the national level, but were more difficult to make at the state level.