

# Carbon Emission Trends in the United States

Manu Kolluru, Trip Bastian, John G. Kathe

# Datasets Used - U.S. EIA

<https://www.eia.gov/environment/emissions/state/>

**Table 2. State energy-related carbon dioxide emissions by year, adjusted (1990–2017)**

million metric tons of energy related carbon dioxide

State	1990	1991	1992	1993	1994	1995	1996
Alabama	109.7	114.0	121.0	125.2	123.2	131.0	136.9
Alaska	34.4	35.0	36.6	36.3	36.2	40.7	41.7
Arizona	62.7	63.6	66.6	68.6	71.4	66.3	68.1
Arkansas	50.8	49.7	51.4	50.4	54.2	57.6	60.2
California	356.6	344.1	349.4	337.9	353.9	342.8	341.4
Colorado	65.8	67.1	68.3	71.8	72.2	72.3	75.1
Connecticut	40.6	39.8	40.2	38.1	37.4	36.7	39.4
Delaware	16.6	17.4	16.3	17.7	17.0	16.0	16.6
District of Columbia	4.4	4.4	4.4	4.5	4.5	4.4	4.4

State related CO2  
emissions by year  
1990 - 2017

CO2 emissions by  
sector for each state  
in 2017

**Table 4. 2017 State energy-related carbon dioxide emissions by sector**

State	million metric tons of carbon dioxide						shares				
	Commercial	Electric Power	Residential	Industrial	Transportation	Total	Commercial	Electric Power	Residential	Industrial	Transportation
Alabama	2.1	51.0	1.7	20.3	33.9	109.0	1.9%	46.8%	1.6%	18.6%	31.1%
Alaska	2.1	2.4	1.7	16.6	11.6	34.3	6.0%	7.1%	4.8%	48.3%	33.8%
Arizona	2.9	43.8	2.1	4.4	33.0	86.1	3.4%	50.8%	2.4%	5.1%	38.3%
Arkansas	3.0	32.0	1.6	8.2	19.4	64.3	4.7%	49.8%	2.4%	12.8%	30.2%
California	19.0	33.0	25.1	66.6	217.3	360.9	5.3%	9.1%	7.0%	18.5%	60.2%
Colorado	4.1	35.2	7.3	12.5	28.6	87.6	4.6%	40.2%	8.4%	14.2%	32.6%
Connecticut	3.9	6.3	6.5	1.7	15.2	33.6	11.7%	18.6%	19.4%	5.0%	45.4%
Delaware	0.9	2.9	0.8	3.0	4.7	12.3	7.6%	23.8%	6.6%	23.9%	37.9%
District of Columbia	0.9	0.0	0.7	0.0	1.0	2.6	35.7%	0.0%	25.1%	0.8%	38.4%
Florida	6.9	103.2	1.2	11.1	105.6	228.0	3.0%	45.2%	0.5%	4.9%	46.3%

# Datasets Used - EPA

Emissions by source for the united states from 1990 - 2018

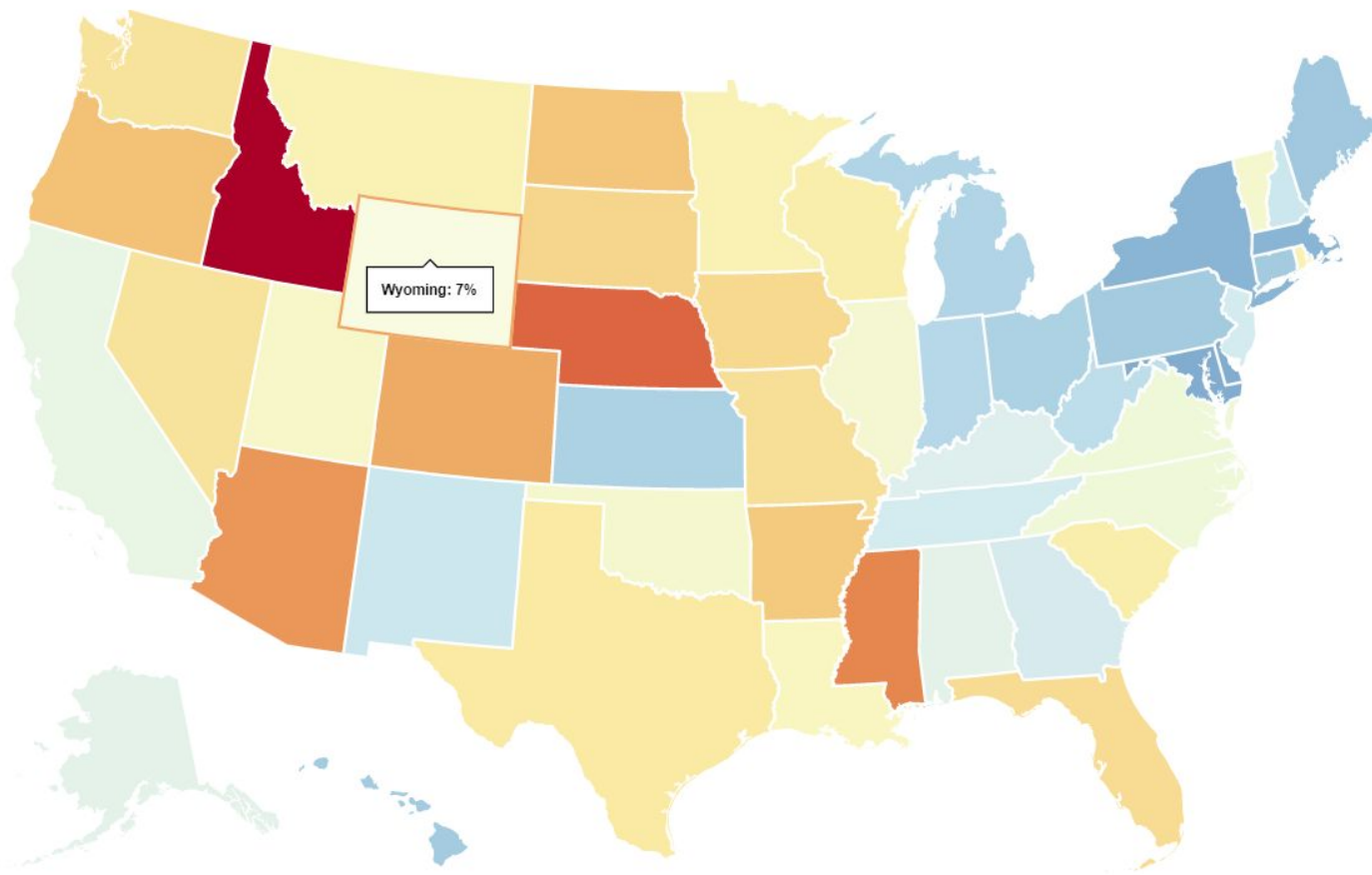
<https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>

Gas/Source	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
CO2	5128.3	5078.9	5182.7	5283.4	5377	5438.9	5626.9	5703.7	5751.1	5830.3	5998.1	5900.4	5942.7	5992	6107.6	6131.9
Fossil Fuel Combustion	4740	4691	4794.7	4907.1	4982.1	5033.5	5225.9	5289.6	5326.2	5393	5585.1	5516.7	5553.4	5614.2	5704	5740.7
Transportation	1469.1	1422.5	1477.8	1508.7	1553.8	1580.5	1627.2	1643.3	1678.6	1746	1779.4	1758.4	1799.9	1792.5	1837.2	1856.1
Electric Power	1820	1817.4	1830.7	1906.2	1930.5	1947.2	2020.2	2087.5	2176.6	2189.7	2296	2257.1	2272.1	2303.6	2335	2400
Industrial	857	840	871.6	869.5	878.8	891.1	926	923.4	886.5	852.1	867.3	863.6	850.2	849.8	874.3	850.1
Residential	338.2	347.3	353.6	365.6	356.7	352.8	383	364.6	331.2	350.5	370.7	362.1	360.1	379.1	368	357.9
Commercial	228.2	232.5	227.9	222.9	224.7	227.7	237.5	237.8	220.1	220.7	236.2	228.1	228.7	239.7	237.6	226.9
U.S. Territories	27.6	31.4	33.1	34.2	37.7	34.3	32.1	33	33.2	34	35.5	47.5	42.4	49.6	52	49.7
Non-Energy Use of Fuels	119.5	129.6	125.7	116.2	125.4	128.2	123.7	132.3	149.4	162.9	140.3	132.5	136.4	130	148.2	139.7
Iron and Steel Production & Metallurgical Coke Production	104.7	94.9	95.7	91.6	94.5	98.4	96.4	97.6	91.1	89	90.6	79.8	75.8	72.7	72.2	70.1
Cement Production	33.5	32.7	33	34.8	36.3	37.1	37.3	38.6	39.5	40.2	41.4	41.6	43.2	43.3	45.9	46.2
Petroleum Systems	9.6	9.9	9.9	10	10.3	10.8	11.2	11.6	11.5	10.9	11.1	11.2	11.3	11.6	11.9	12.2
Natural Gas Systems	32.2	31.2	31.1	30.9	30.8	28.7	26.9	26.7	24.5	25.1	25.3	24.9	25.4	25	25.2	25.3
Petrochemical Production	21.6	23.1	23.7	24.6	26.6	27.9	29.1	30.5	30.9	32.3	31.6	27.6	28.7	28.5	30.7	27.4
Ammonia Production	13	13.3	13.7	13.2	14.2	13.5	13.8	14	14.1	12.9	12.2	9.2	10.5	8.8	9.6	9.2
Lime Production	11.7	11.5	11.9	12.3	12.7	13.5	14.2	14.5	14.8	14.4	14.3	13.7	13.2	13.9	14.6	14.6
Incineration of Waste	8	8	9.5	9.8	10.8	11.3	11.9	11.8	10.8	11	11.1	11.4	11.8	12.1	12.4	12.5
Other Process Uses of Carbonates	6.3	5.7	5.6	5.2	5.6	7.6	8.2	7.8	8.1	8.9	6	6	6.5	5.1	6.9	7.6
Urea Fertilization	2	2	2.2	2.3	2.3	2.4	2.3	2.4	2.5	2.7	2.9	3	3.1	3.2	3.2	3.1
Carbon Dioxide Consumption	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.9	1	1.4	1.3	1.4	
Urea Consumption for Non-Agricultural Purposes	3.8	3.5	3.9	4.6	4.3	4.3	3.9	3.9	4.8	4.7	4.2	4.1	3.7	3.6	3.7	3.7
Liming	4.7	5	4.4	3.8	4.1	4.4	4.4	4.3	4.7	4.5	4.3	4.4	5	4.6	3.9	4.3
Ferroalloy Production	2.2	1.9	2	1.9	2	2	2.1	2.2	2.2	2.2	1.9	1.5	1.3	1.3	1.4	1.4
Soda Ash Production	1.4	1.4	1.5	1.4	1.4	1.6	1.6	1.7	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.7
Titanium Dioxide Production	1.2	1.2	1.4	1.4	1.5	1.5	1.5	1.7	1.7	1.7	1.8	1.7	1.8	1.8	2.1	1.8
Aluminum Production	6.8	6.9	6.8	6.2	5.5	5.7	6	6	6.2	6.3	6.1	4.4	4.5	4.5	4.2	4.1
Glass Production	1.5	1.4	1.5	1.6	1.7	1.8	1.7	1.6	1.5	1.4	1.7	1.4	1.7	1.6	1.6	1.9
Zinc Production	0.6	0.8	0.8	0.9	0.9	0.9	0.9	1	0.9	0.9	0.9	0.7	0.7	1.1	1	1
Phosphoric Acid Production	1.5	1.4	1.5	1.3	1.5	1.5	1.6	1.5	1.6	1.5	1.4	1.3	1.3	1.4	1.4	1.3
Lead Production	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6
Carbide Production and Consumption	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Abandoned Oil and Gas Wells	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Magnesium Production and Processing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Wood Biomass, Ethanol, and Biodiesel Consumption a	219.4	220.2	230.6	225.8	232.3	236.9	241.3	235.6	218.2	221.5	227.4	203.4	204.7	209.9	225.4	230.7
International Bunker Fuels b	103.5	117.6	107.9	97.8	95.7	98.5	99.7	107	110.5	102.7	101.7	93.7	94.4	98.3	108.4	113.1
CH4 c	774.4	778.9	777.8	796	772.2	765	757.6	741.8	726.7	708.9	703	695.7	688.4	688	681.7	679.6
Enteric Fermentation	164.2	164.4	169.2	171.6	174.7	178.7	177.5	174.1	172.3	172.4	170.6	169.6	169.8	170	166.8	168.9
Natural Gas Systems	183.3	186.4	184.7	184.9	185.3	178.5	175.9	174.5	168.9	163.6	163.3	164.7	161.8	160.2	159.8	158.1
Landfills	179.6	181.7	181.4	179.2	179	174.2	170.6	161.1	151.4	144.7	141.4	136.8	134.9	137.4	134.9	131.3
Manure Management	37.1	38.9	37.5	39.2	42	43.3	42.4	44.3	47.8	47.9	48	49.6	50.3	50.6	48.9	51.6
Coal Mining	96.5	93.3	90.7	77.3	77.6	76.4	76	75.4	75.7	71.2	68.3	68	63.8	64	65.3	64.1

# The Story We're Telling



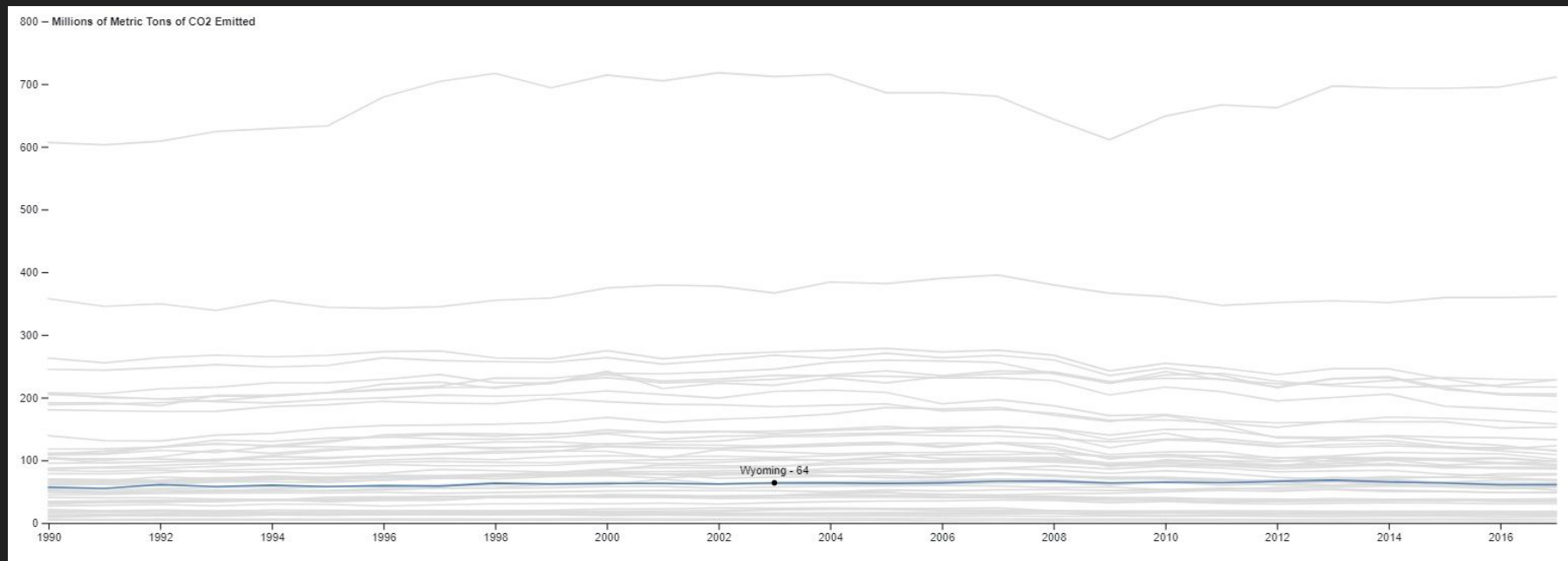
- Climate change is a serious issue to many Americans.
- Our goal was to investigate datasets to provide a tangible view of how states' carbon emissions have changed over time.
- Accordingly, we asked the following questions to illustrate our story with data visualizations for viewers.
  - Have states progressed or regressed regarding their total carbon emissions?
  - How have the states' emissions changed over time?
  - What are the key contributors to carbon emissions in the United States and how have they changed over time?



# Map (1970 vs 2017)

<https://manukolluru.github.io/>

# State Emissions Over the Years



# Sources of CO2 Over Time

