

Getting Warmer: US CO2 Emissions from Power Plants Emissions Rise 5.6% in 2010



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Carbon dioxide emissions from power plants rose 5.56% in 2010 over the year before, the biggest annual increase since the Environmental Protection Agency began tracking emissions in 1995. Electricity generators released 2.423 billion tons of carbon dioxide (CO₂) in 2010, compared to 2.295 billion tons in 2009, according to information available on EPA's "Clean Air Markets" database.¹ While the increase is worrisome, power plant emissions are still below the high water mark of 2.565 million tons set in 2007. Last year's rise was driven in part by a 3.0% net increase in overall generation for the 12 months ending in November of 2010², due to the economic recovery and unusually warm weather in some parts of the country.

Average global temperatures last year reached the 2005 level, the warmest year on record.³ CO₂ is the most prevalent of the greenhouse gases that cause global warming; the combustion of fossil fuels for electricity generation in the U.S. accounts for more than one third of our nation's total U.S. releases of CO₂, and more than nearly 5% of CO₂ emissions worldwide.⁴ Coal-fired boilers provided 45% of our electricity in 2010, but were responsible for 81% of total U.S. CO₂ emissions from electricity generation last year.

State	2009 CO ₂ Emissions	2010 CO ₂ Emissions
Texas	244,248,050	256,903,967
Florida	119,960,137	130,324,532
Ohio	119,793,429	124,966,156
Indiana	117,544,009	123,695,438
Pennsylvania	114,331,904	123,345,741
Illinois	102,752,939	107,082,729
Kentucky	92,614,351	99,246,065
Georgia	81,906,514	86,826,424
Alabama	74,033,748	84,734,388
Missouri	75,774,756	83,279,658

Texas power plants led the pack in 2010, with nearly 257 million ton of CO₂ emissions, as much as the next two states combined (Florida and Ohio), and more than 7 times the total CO₂ emissions from power plants in California. Despite a favorable climate for wind energy and falling natural gas prices, Texas opened three new coal plants toward the end of 2010, with a combined capacity of 2,156 megawatts.⁵ Emissions of CO₂ from the top ten states are listed at left.

Fifty coal-fired power plants accounted for 750 million tons of CO₂ emissions in 2010, or about a third of the total. The two largest carbon polluters, the Scherer and Bowen power plants in Georgia, together released more than 48 million tons of CO₂ in 2010. By comparison, emissions from all power plants in California were 37.1 million tons; in New York, 40.0 million tons; and in the six states of New England, 40.5 million tons.

Coal-fired generation rose 5.2% in the 12 months ending November 30, 2010, growing at a faster pace than the overall 3.0% increase in net generation over the same period. But net generation of wind powered electricity, although a much smaller fraction of total

output, rose from 73.6 to 92.7 million megawatts, for a 26% increase through the end of November last year. Net generation from natural gas fired plants, which release less than half as much carbon dioxide as coal plants on a per megawatt basis, rose 6.8% over the same period.⁶

Sulfur dioxide (SO₂) emissions from power plants decreased from 5.72 million to 5.11 million tons between 2009 and 2010, while nitrogen oxide (NO_x) emissions increased slightly over the same time span (See Appendix C for SO₂ data). Emissions of both pollutants have declined more than 50% over the past ten years, though progress is uneven. For

Power Plant	2009 CO ₂ Emissions	2010 CO ₂ Emissions
Scherer, GA	24,894,852	25,133,404
Bowen, GA	21,964,073	22,997,740
James H. Miller, Jr., AL	21,929,156	22,702,006
Martin Lake, TX	19,571,666	20,506,471
Gibson, IN	18,135,538	19,679,980
Monroe, MI	19,376,047	19,514,435
Labadie, MO	17,433,816	18,996,586
Colstrip, MT	15,471,751	18,733,243
Gen J M Gavin, OH	20,126,750	18,449,408
Rockport, IN	18,086,957	18,220,454

example, sulfur dioxide has actually increased slightly in Missouri, while declining more than 85% in Maryland. The overall trend is encouraging and emissions of SO₂ and NO_x should decline still further, unless the Republican House majority succeeds in derailing emission standards that are scheduled to take effect within the next four years. As indicated

Congress has declined to pass comprehensive legislation to address global warming. But the Clean Air Act and other environmental laws, falling natural gas prices, and the growing market for renewable energy could curb greenhouse gas emissions from coal-fired plants. Most of the more than one hundred proposals to build new coal plants that surfaced several years ago have been withdrawn, having been defeated by local opposition, legal challenges, and the erosion of marketplace advantages that coal-fired power use to enjoy.

Nearly 4.5 gigawatts of new coal-fired electric generation came on line in 2010, about half of that in Texas. But power companies have also announced plans to retire almost 12 gigawatts of coal-fired capacity within the next few years, including the announcement last month that Xcel would close nearly 900 megawatts of coal-fired capacity at four different power stations in Colorado.⁷ More announcements are expected this year, as companies wisely choose to shut down aging boilers, rather than pay to retrofit dirty and outdated plants to comply with federal air, waste and water standards.

These new rules include regulations requiring the cleanup of mercury and other toxic pollutants from power plants, additional reductions of sulfur dioxide and nitrogen oxide at plants that do not already have state-of-the-art controls, and potential new standards for ash disposal that will require closure of leaking ash ponds used to dispose of the industry's waste. This summer, the EPA will propose standards to limit CO₂ emissions from power plants under the Clean Air Act, in the wake of a 2007 Supreme Court decision finding that greenhouse gases were pollutants subject to regulation under the act.⁸ By law, any standard that EPA proposes must be affordable and technologically feasible, but even modest limits on CO₂ pollution would at least slow down the buildup of carbon in the earth's atmosphere.

The phase out of the worst polluters would make room for cleaner technologies, like the 3.6 gigawatts of wind power installed in 2010, which could add momentum to the economic recovery while reducing global warming and damage to the public's health from dirty coal plants.

The industry's allies on Capitol Hill are working hard to turn back the clock by repealing environmental standards for coal plants that are already many years overdue. Congress may weaken or even eliminate EPA's ability to stop coal plant pollution, and block further study of climate change. But even the most powerful legislature in the world is subject to the laws of science, and global warming will not disappear because our politicians choose to pretend it does not exist.

Top 50 2010 CO2 Emissions by State		
State	Year	CO2 Mass (Tons)
TX	2010	256,903,967
FL	2010	130,324,532
OH	2010	124,966,157
IN	2010	123,695,439
PA	2010	123,345,742
IL	2010	107,082,730
KY	2010	99,246,065
GA	2010	86,826,464
AL	2010	84,734,388
MO	2010	83,279,658
WV	2010	78,338,976
MI	2010	74,375,752
NC	2010	74,293,631
AZ	2010	60,713,242
LA	2010	51,867,719
WI	2010	50,047,776
OK	2010	49,871,771
WY	2010	49,382,465
TN	2010	46,425,781
IA	2010	45,401,248
CO	2010	45,130,511
SC	2010	43,754,659
NY	2010	40,031,704
KS	2010	39,751,566
CA	2010	37,065,278
UT	2010	36,985,780
AR	2010	36,254,482
MN	2010	34,123,976
ND	2010	33,534,159
NM	2010	32,653,177
VA	2010	32,441,939
MS	2010	30,618,950
NE	2010	26,402,128
MD	2010	26,328,311
MT	2010	21,356,366
MA	2010	19,499,495
NV	2010	16,956,569
NJ	2010	14,638,010
WA	2010	14,560,232
OR	2010	10,873,651
CT	2010	6,644,898
NH	2010	6,420,303
ME	2010	3,943,457
DE	2010	3,860,307
SD	2010	3,765,614
RI	2010	3,504,392
ID	2010	693,069
VT	2010	444,647
DC	2010	236,894

Top 50 2010 CO2 Emissions by Facility			
State	Facility Name	Year	CO2 Mass (Tons)
GA	Scherer	2010	25,133,404
GA	Bowen	2010	22,997,741
AL	James H Miller Jr	2010	22,702,007
TX	Martin Lake	2010	20,506,471
IN	Gibson	2010	19,679,980
MI	Monroe	2010	19,514,436
MO	Labadie	2010	18,996,587
MT	Colstrip	2010	18,733,243
OH	Gen J M Gavin	2010	18,449,408
IN	Rockport	2010	18,220,454
TX	W A Parish	2010	18,124,351
PA	Bruce Mansfield	2010	17,890,433
AZ	Navajo Generating Station	2010	17,798,384
WY	Jim Bridger	2010	16,278,550
SC	Cross	2010	16,003,418
NC	Roxboro	2010	15,972,697
KS	Jeffrey Energy Center	2010	15,963,886
WV	John E Amos	2010	15,833,972
TX	Monticello	2010	15,217,100
KY	Paradise	2010	14,929,854
MN	Sherburne County	2010	14,901,029
WY	Laramie River	2010	14,724,744
TN	Cumberland	2010	14,588,893
NM	Four Corners Steam Elec Station	2010	14,399,394
OH	J M Stuart	2010	14,378,504
TX	Limestone	2010	14,298,446
LA	Big Cajun 2	2010	13,707,365
NC	Belews Creek	2010	13,676,646
KY	Ghent	2010	13,413,886
PA	Keystone	2010	13,354,557
FL	Crystal River	2010	13,226,180
UT	Intermountain	2010	13,080,935
OH	W H Sammis	2010	13,007,678
IL	Baldwin Energy Complex	2010	12,937,246
IA	Walter Scott Jr. Energy Center	2010	12,742,797
NC	Marshall	2010	12,651,413
IN	Petersburg	2010	12,556,502
AR	Independence	2010	12,462,442
TX	Sam Seymour	2010	12,349,409
TX	Welsh Power Plant	2010	12,146,242
WV	Harrison Power Station	2010	12,125,976
PA	Conemaugh	2010	11,966,512
IN	R M Schahfer Generating Station	2010	11,890,244
AR	White Bluff	2010	11,823,841
GA	Wansley (6052)	2010	11,775,202
NM	San Juan	2010	11,741,411
AL	Barry	2010	11,348,498
AZ	Springerville Generating Station	2010	11,213,478
PA	Homer City	2010	11,151,430
WV	Mount Storm Power Station	2010	11,037,919

Ten Year Difference in SO2 Emissions by State				
State	2000 Emissions (Tons)	2010 Emissions (Tons)	2010 and 2000 Difference in Mass (Tons)	10 Year Decrease/Increase
AL	512074.659	202439.776	-309634.883	-60%
AR	75057.457	67083.708	-7973.749	-11%
AZ	71556.489	36445.121	-35111.368	-49%
CA	380.087	286.889	-93.198	-25%
CO	87175.579	45962.408	-41213.171	-47%
CT	36917.827	1954.961	-34962.866	-95%
DC	957.675	934.711	-22.964	-2%
DE	40290.542	14491.681	-25798.861	-64%
FL	570061.455	138297.663	-431763.792	-76%
GA	518745.615	218093.023	-300652.592	-58%
IA	137266.717	104649.8	-32616.917	-24%
ID	2.118	3.498	1.38	65%
IL	429849.968	220085.212	-209764.756	-49%
IN	874617.157	413864.433	-460752.724	-53%
KS	116285.044	45250.564	-71034.48	-61%
KY	584916.595	266203.824	-318712.771	-54%
LA	110401.263	98128.896	-12272.367	-11%
MA	112038.625	36964.787	-75073.838	-67%
MD	252829.223	28669.563	-224159.66	-89%
ME	10592.765	820.011	-9772.754	-92%
MI	369830.082	242182.284	-127647.798	-35%
MN	93072.049	41573.818	-51498.231	-55%
MO	222724.222	236201.884	13477.662	6%
MS	129913.061	54696.201	-75216.86	-58%
MT	20247.216	19895.755	-351.461	-2%
NC	453442.374	116627.178	-336815.196	-74%
ND	149805.877	124058.643	-25747.234	-17%
NE	60233.998	64184.363	3950.365	7%
NH	51326.386	36834.354	-14492.032	-28%
NJ	60037.234	13010.618	-47026.616	-78%
NM	68616.623	16570.253	-52046.37	-76%
NV	53203.111	7887.392	-45315.719	-85%
NY	283344.767	46774.574	-236570.193	-83%
OH	1209458.017	570045.216	-639412.801	-53%
OK	93417.294	85134.649	-8282.645	-9%
OR	14386.823	15695.913	1309.09	9%
PA	935167.819	393194.848	-541972.971	-58%
RI	5.994	17.807	11.813	197%
SC	200301.036	92068.408	-108232.628	-54%
SD	13532.882	12589.052	-943.83	-7%
TN	424973.072	118659.409	-306313.663	-72%
TX	557510.226	461467.386	-96042.84	-17%
UT	27202.061	21598.097	-5603.964	-21%
VA	214231.877	91576.5	-122655.377	-57%
VT	8.667	1.695	-6.972	-80%
WA	83623.011	2650.797	-80972.214	-97%
WI	196830.401	108649.126	-88181.275	-45%
WV	593314.907	106087.766	-487227.141	-82%
WY	80300.242	64848.778	-15451.464	-19%

End Notes

¹ All power plant and state-wide emissions data from Clean Air Markets Database, USEPA, available online at:

<http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard>

² Electric Power Monthly, Energy Information Administration, US Department of Energy, (February 2011), Executive Summary [hereinafter Electric Power Monthly], available online at . http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

³ National Environmental Satellite, Data, and Information Service, State of the Climate National Overview Annual 2010, available online at: <http://www.ncdc.noaa.gov/sotc/national/2010/13>

⁴ See, e.g., (Draft Inventory of Green House Gas Emissions and Sinks: 1990 – 2009) US Environmental Protection Agency, Table ES-2, pg 25, February 15, 2011.

⁵ Electric Power Monthly, at Table ES-3.

⁶ Id., at Table 1.1, 1.1A.

⁷ Does not include additional retirements contingent on other circumstances. See, e.g., “Coal Plant Retirements,” Table 2, available online at: http://www.sourcewatch.org/index.php?title=Coal_plant_retirements;

“Clean Air Clean Jobs Plant,” Xcel Energy, August 13, 2010, available online at:

http://www.xcelenergy.com/Colorado/Company/About_Energy_and_Rates/Pages/Clean-Air-Clean-Jobs-Plan.aspx

⁸ ***Massachusetts v. Environmental Protection Agency***, [549 U.S. 497](#)