

Mercury Falling

Emissions Decline Nationwide, But Some States, Facilities Buck Trend



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ACKNOWLEDGEMENTS

This report was researched and written by Kira Burkhardt and Eric Schaeffer of the Environmental Integrity Project.

THE ENVIRONMENTAL INTEGRITY PROJECT

The Environmental Integrity Project (<http://www.environmentalintegrity.org>) is a nonpartisan, nonprofit organization established in March of 2002 by former EPA enforcement attorneys to advocate for effective enforcement of environmental laws. EIP has three goals: 1) to provide objective analyses of how the failure to enforce or implement environmental laws increases pollution and affects public health; 2) to hold federal and state agencies, as well as individual corporations, accountable for failing to enforce or comply with environmental laws; and 3) to help local communities obtain the protection of environmental laws.

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PHOTO CREDITS

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Mercury emissions from U.S. coal-fired power plants have been cut in half over the last ten years, according to the latest reports filed with the U.S. Toxics Release Inventory. That is welcome news, since lower emissions will reduce exposure to a highly toxic pollutant that is especially harmful to developing fetuses or young children.

But the progress is uneven, as a handful of sources continue to release very large amounts of mercury which, in its organic form (as methylmercury) falls into nearby lakes and rivers. As of 2011, the US Environmental Protection Agency reports that over 1.1 million river miles and 16.4 million acres of lakes are covered by advisories that warn people to limit their consumption of fish due to mercury contamination of those waters.¹ Just 1/70 of a teaspoon of mercury is enough to pollute a 25 acre lake and make its fish unsafe to eat.²

Mercury Emissions Decline as Power Companies Clean up or Retire Coal Plants

Emissions of mercury from power plants declined from 94,526 pounds in 2004 to 43,877 pounds in 2014, a 53.6% decrease. EPA projects that compliance with Mercury Air Toxics Standards announced in April of 2012 will reduce mercury emissions from power plants to about 18,000 pounds by 2025.³ Over the same ten year span, mercury emissions from all other industrial sources combined dropped by about a third, from 48,734 to 32,902 pounds. Plants smelting or recycling steel and other metals bucked that trend, however, with reported mercury emissions rising from 10,929 to 15,384 between 2004 and 2014, as shown in Table 1 below:

TABLE 1. MERCURY AIR EMISSIONS AND TRENDS OF TRI REPORTING INDUSTRIES

Industry	2004 Emissions (lbs)	2014 Emissions (lbs)
Electric Utilities	94,526.3	43,877.0
Primary Metals	10,929.4	15,384.2
Cement	13,191.9	7,553.5
Chemicals	12,107.7	2,371.6
Petroleum	2,008.2	2,237.4
Other	10,496.3	5,355.7
Subtotal	48,733.5	32,902.4
Total	143,259.8	76,779.4

Coal combustion accounts for almost all of the mercury pollution from electric power generators. Three factors explain emission reductions from this sector:

- Coal consumption declined more than 16% between 2004 and 2014 as aging plants retired, or reduced their output in the face of competition from gas and renewable energy.⁴
- The installation of wet scrubbers and sorbent injection systems to meet current or anticipated Clean Air Act standards had an undoubted impact.

- Several state laws imposed limits well in advance of federal standards that will take full effect in 2016. For example, Maryland’s coal plants were required to reduce mercury emissions 80% by 2010 and 90% by 2013.⁵

Luminant Power Plants in Texas Account for Three of Top Five Mercury Emitters

Three of the Luminant Corporation’s power plants in Texas are the first, third, and fifth largest mercury emitters in the US. The Lehigh Southwest cement kiln in California and a steel recycler in Alabama are the second and fourth largest, respectively (Table 2). See Appendix A for top 50 polluters.

TABLE 2. TOP 10 MERCURY EMITTERS, ALL INDUSTRIES

Rank	Facility	Owner	City, State	Industry Sector	2014 Air Emissions (lbs)
1	Martin Lake Steam Electric Station & Lignite Mine	Luminant Corp	Tatum, TX	Electric Utilities	1,376
2	Lehigh Southwest Cement Co	Lehigh Hanson	Tehachapi, CA	Cement	1,347
3	Big Brown Steam Electric Station & Lignite Mine	Luminant Corp	Fairfield, TX	Electric Utilities	1,107
4	Steel Dust Recycling LLC	NA	Millport, AL	Primary Metals	929
5	Sandow Steam Electric Station	Luminant Corp	Rockdale, TX	Electric Utilities	881*
6	P4 Production LLC	Monsanto Co	Soda Springs, ID	Chemicals	875
7	Independence Steam Electric Station	Entergy Corp	Newark, AK	Electric Utilities	840
8	Arcelormittal Burns Harbor LLC	Arcelormittal USA LLC	Burns Harbor, IN	Primary Metals	778
9	Bruce Mansfield Power Plant	FirstEnergy Corp	Shippingport, PA	Electric Utilities	748
10	Pirkey Power Plant	American Electric Power	Hallsville, TX	Electric Utilities	739
Top 10 Subtotal					9,620
All Facilities Total					76,779

*Facility total includes Sandow Steam Electric Station and Sandow 5 Generating Plant, two units sharing the same site.

Five States Account for About 1/3 of Mercury Emissions Reported to TRI: Texas, Alabama, Ohio, Pennsylvania, and Indiana

Texas power plants and other large sources released 11,786 pounds of mercury in 2014, more than any other state and more than 15% of the US total for industries reporting TRI emissions. Texas continues to challenge standards adopted by EPA in 2012⁶, although the state has simultaneously warned Texas residents to limit consumption of fish from some of the state’s most popular recreational lakes, due to their high mercury concentrations.⁷ Alabama and Ohio reported the

second and third highest amount of mercury emissions to TRI in 2014, with over 5,000 and 4,000 pounds, respectively. The ten states with the highest reported TRI emissions are listed in Table 3, below. See Appendix B for all US States.

TABLE 3. TOP 10 MERCURY EMITTING STATES

Rank	State	2004 Emissions (lbs)		2014 Emissions (lbs)	
		Electric Utilities	All Industries	Electric Utilities	All Industries
1	Texas	10,816	14,913	8,437	11,786
2	Alabama	5,462	8,028	2,030	5,035
3	Ohio	6,581	8,988	1,982	4,166
4	Pennsylvania	6,651	8,489	2,859	4,118
5	Indiana	5,021	6,587	1,853	3,922
6	Missouri	3,327	3,857	2,075	3,068
7	California	54	4,588	0.2	3,046
8	Arkansas	1,187	2,493	1,760	2,951
9	Kentucky	3,649	3,836	1,644	2,530
10	Michigan	2,950	3,834	1,934	2,388
Top 10 Subtotal		45,697	65,613	24,574	43,011
All States Subtotal		94,526	143,260	43,877	76,779

Mercury Especially Toxic to Young Children

The World Health Organization (WHO) considers mercury one of the top ten chemicals of public health concern. Exposure to mercury can lead to serious health problems, and is especially harmful to the development of children in utero and early life. Mercury exposure through inhalation “can produce harmful effects on the nervous, digestive and immune systems, lungs and kidneys, and may be fatal.”⁸ While mercury occurs naturally in the environment, the majority of human exposure comes from anthropogenic sources, such as fossil fuel combustion for energy, medical and other waste incineration, and the mining of metals like gold and mercury. Atmospheric mercury eventually settles and deposits in the environment and most commonly affects humans through the food chain.⁹

It should be noted that not all facilities and industries are required to report to the TRI. Only facilities with 10 or more full-time employees, facilities which manufacture/process/use specified chemicals in EPA established thresholds, and those facilities included in a TRI-covered North American Industry Classification System (NAICS) code must report to TRI.¹⁰ Despite being a major source of mercury emissions, not all waste incinerators are required to report to the TRI, and are therefore not captured in this analysis.

METHODS

Emissions data for mercury and mercury compounds was downloaded from EPA's publicly available, online database TRI Explorer.¹¹ Using the database, the Environmental Integrity Project looked at facility, state, and industry level data from 2004 and 2014. Total air emissions recorded in this report are combined totals of fugitive air emissions and point source air emissions reported to the TRI.

NOTES

¹ "2011 National Listing of Fish Advisories," (December 2013), U.S. Environmental Protection Agency, at <http://www2.epa.gov/sites/production/files/2015-06/documents/technical-factsheet-2011.pdf>

² "Environmental impacts of coal power: air pollution," Union of Concerned Scientists, at http://www.ucsusa.org/clean_energy/coalvswind/c02c.html#.VITURnarTcs

³ Table ES-2, "Regulatory Impact Analysis for the Final Mercury and Air Toxic Standards," (December 2011), U.S. Environmental Protection Agency, at <http://www3.epa.gov/ttn/ecas/regdata/RIAs/matsriafinal.pdf>

⁴ Table 6.2, Coal Consumption by Sector, November 2015 Monthly Energy Review, (November 24, 2015), Energy Information Administration, U.S. Department of Energy, at <http://www.eia.gov/coal/data.cfm#consumption>

⁵ COMAR 26.11.27.03D, Maryland Division of State Documents, at <http://www.dsd.state.md.us/comar/comarhtml/26/26.11.27.03.htm>

⁶ "Texas v. the Feds: A Look at the Lawsuits," Texas Observer (July 31, 2015) at <http://www.texastribune.org/2015/07/31/texas-vs-federal-government/>

⁷ Texas Fish Consumption Bans and Advisories, 2015-2016, Texas Parks and Wildlife Commission, available online at <https://tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/fish-consumption-bans-and-advisories>

⁸ "Mercury and Health," World Health Organization, at <http://www.who.int/mediacentre/factsheets/fs361/en/>

⁹ Tan, S.W., Meiller, J.C., and Mahaffey, K.R. (2009). "The endocrine effects of mercury in humans and wildlife." *Critical Reviews in Toxicology*, 39(3): 228-269. <http://www.safeminds.org/wp-content/uploads/2013/04/The-endocrine-effects-of-mercury-in-humans-and-wildlife.pdf>

¹⁰ U.S. Environmental Protection Agency, "TRI Threshold Screening Tool," at <http://www2.epa.gov/toxics-release-inventory-tri-program/tri-threshold-screening-tool>

¹¹ U.S. Environmental Protection Agency, TRI Explorer, at http://iaspub.epa.gov/triexplorer/tri_release.facility

APPENDIX A. TOP 50 MERCURY EMITTERS OF 2014

Rank	Facility	Owner	City, State	Industry Sector	2014 Air Emissions (lbs)
1	Martin Lake Steam Electric Station & Lignite Mine	Luminant Corp	Tatum, TX	Electric Utilities	1,376
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5	Sandow Steam Electric Station	Luminant Corp	Rockdale, TX	Electric Utilities	881*
6	P4 Production LLC	Monsanto Co	Soda Springs, ID	Chemicals	875
7	Independence Steam Electric Station	Entergy Corp	Newark, AK	Electric Utilities	840
8	Arcelormittal Burns Harbor LLC	Arcelormittal USA LLC	Burns Harbor, IN	Primary Metals	778
9	Bruce Mansfield Power Plant	FirstEnergy Corp	Shippingport, PA	Electric Utilities	748
10	Pirkey Power Plant	American Electric Power	Hallsville, TX	Electric Utilities	739
11	Alcoa World Alumina LLC	Alcoa Inc	Point Comfort, TX	Primary Metals	715
12	Chaparral Steel Midlothian LP	Gerdau USA Inc	Midlothian, TX	Primary Metals	663
13	Shawville Station	NRG Energy Inc	Shawville, PA	Electric Utilities	636
14	Basin Electric	Basin Electric	Beulah, ND	Electric Utilities, Chemicals	613
15	Navajo Generating Station	Salt River Project	Page, AZ	Electric Utilities	610
16	Gerald Gentleman Station	Nebraska Public Power District	Sutherland, NE	Electric Utilities	570
17	WA Parish Electric Generating Station	NRG Energy Inc	Thompsons, TX	Electric Utilities	565
18	Miller Steam Plant	Southern Co	Quinton, AL	Electric Utilities	559
19	Homer City Generation LP	NRG Energy Inc	Homer City, PA	Electric Utilities	557
20	Greene County Steam Plant	Southern Co	Forkland, AL	Electric Utilities	544
21	Conemaugh Power Plant	NRG Energy Inc	New Florence, PA	Electric Utilities	525
22	Nucor Steel - Jewett Texas Div	Nucor Corp	Jewett, TX	Primary Metals	520
23	Pacificorp Jim Bridger Plant & Bridger Co	Berkshire Hathaway Inc	Point of Rocks, WY	Electric Utilities	507
24	Conesville Plant	American Electric Power	Conesville, OH	Electric Utilities	506
25	White Bluff Generating Plant	Entergy Corp	Redfield, AR	Electric Utilities	503
26	Monticello Steam Electric Station & Lignite Mine	Energy Future Holdings Corp	Mount Pleasant, TX	Electric Utilities	502
27	San Miguel Electric Cooperative Inc	San Miguel Electric Cooperative Inc	Christine, TX	Electric Utilities	480
28	Big Cajun 2	NRG Energy Inc	New Roads, LA	Electric Utilities	479
29	Coal Creek Station	Great River Energy	Underwood, ND	Electric Utilities	474
30	Rockport Plant	American Electric Power	Rockport, IN	Electric Utilities	469
31	Nucor Steel - Arkansas	Nucor Corp	Blytheville, AR	Primary Metals	460
32	Nucor-Yamato Steel Co	Nucor Corp	Blytheville, AR	Primary Metals	455
33	Savannah River Ops	US Department of Energy	Aiken, SC	Other	442
34	Amos Plant	American Electric Power	Winfield, WV	Electric Utilities	440
35	Nucor Steel - A Div of Nucor Corp	Nucor Corp	Plymouth, UT	Primary Metals	434
36	Northeastern Plant	American Electric Power	Oologah, OK	Electric Utilities	431
37	Cholla Power Plant	Pinnacle West Capital Corp	Joseph City, AZ	Electric Utilities	430
38	Riverside Cement Oro Grande Plant	Martin Marietta Materials Inc	Oro Grande, CA	Cement	423
39	Nucor Steel Decatur LLC	Nucor Corp	Trinity, AL	Primary Metals	411
40	J H Campbell Generating Plant	CMS Energy	West Olive, MI	Electric Utilities	408
41	Eramet Marietta Inc	Eramet Manganese Alliance	Marietta, OH	Primary Metals	404
42	Ameren Missouri Labadie Energy Center	Ameren Corp	Labadie, MO	Electric Utilities	400
43	Continental Cement Co LLC	Summit Materials LLC	Hannibal, MO	Cement	400
44	Limestone Electric Generating Station	NRG Energy Inc	Jewett, TX	Electric Utilities	398
45	Nucor Steel - Berkeley	Nucor Corp	Huger, SC	Primary Metals	397
46	Welsh Plant	American Electric Power	Pittsburg, TX	Electric Utilities	389
47	Kentucky Utilities Co Ghent Station	PPL Corp	Ghent, KY	Electric Utilities	376
48	Jeffrey Energy Center	Westar Energy Inc	Saint Marys, KS	Electric Utilities	374
49	Gaston Steam Plant	Southern Co	Wilsonville, AL	Electric Utilities	374
50	AK Steel Corp	AK Steel Holding Corp	Middletown, OH	Primary Metals	365
Top 50 Subtotal					28,825
All Facilities Total					76,779

*Facility total includes Sandow Steam Electric Station and Sandow 5 Generating Plant, two units sharing the same site.

APPENDIX B. 2014 MERCURY EMISSIONS BY STATE

Rank	State	2004 Emissions (lbs)		2014 Emissions (lbs)	
		Electric Utilities	All Industries	Electric Utilities	All Industries
1	Texas	10,816	14,913	8,437	11,786
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5	Indiana	5,021	6,587	1,853	3,922
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7	California	54	4,588	0.2	3,046
8	Arkansas	1,187	2,493	1,760	2,951
9	Kentucky	3,649	3,836	1,644	2,530
10	Michigan	2,950	3,834	1,934	2,388
11	Iowa	2,477	3,232	1,351	2,101
12	Illinois	4,190	5,629	785	2,013
13	South Carolina	1,026	2,143	247	2,009
14	West Virginia	3,797	5,202	1,538	1,923
15	Arizona	1,555	1,747	1,409	1,813
16	North Dakota	2,438	2,469	1,709	1,792
17	Wyoming	1,845	1,975	1,647	1,714
18	Nebraska	1,139	1,642	1,282	1,597
19	Florida	1,905	2,251	620	1,474
20	Louisiana	1,643	5,182	906	1,412
21	Oklahoma	1,343	1,584	1,165	1,380
22	Nevada	170	5,218	115	1,361
23	Kansas	1,839	2,575	1,166	1,308
24	Tennessee	2,020	3,588	565	1,277
25	North Carolina	2,909	3,930	293	1,270
26	Wisconsin	2,505	3,869	783	986
27	Minnesota	1,692	1,811	760	985
28	Mississippi	952	1,045	653	969
29	Idaho	-	721	-	886
30	Georgia	3,783	4,937	694	881
31	Utah	509	1,221	63	804
32	Virginia	1,245	1,912	316	757
33	Colorado	855	1,358	254	606
34	Washington	-	353	148	489
35	New York	772	1,693	165	458
36	Maryland	1,621	2,077	64	293
37	New Jersey	373	954	11	270
38	Montana	1,010	1,108	148	241
39	South Dakota	209	228	155	162
40	New Mexico	1,405	1,418	114	131
41	Delaware	375	736	21	79
42	Puerto Rico	225	481	55	73
43	Oregon	160	2,318	11	54
44	Alaska	39	91	10	53
45	Maine	-	56	-	47
46	Northern Mariana Islands	-	-	-	43
47	Hawaii	130	135	17	23
48	New Hampshire	141	143	10	15
49	Massachusetts	235	295	5	5
50	Connecticut	105	120	4	5
51	District Of Columbia	-	0.001	-	5
52	Rhode Island	-	0.001	-	3
53	Vermont	-	0.3	-	1
Total		94,526	143,260	43,877	76,779