



# Ohio's Biggest Mercury Polluters

How Cleaning Up Power Plants in the State  
and Across the Nation Will Protect Our Health



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## Executive Summary

Power plants continue to release large amounts of toxic mercury. **In 2010, more than two-thirds of all airborne mercury pollution in Ohio came from the smokestacks of coal-fired power plants.\***

Mercury is a neurotoxicant. When children are exposed to mercury during critical periods of development, it can contribute to irreversible deficits in verbal skills, damage to attention and motor control, and reduced IQ.

The U.S. Environmental Protection Agency (EPA) has developed the first national standards limiting mercury and other toxic pollution from power plants. Implementing these standards will protect public health.

### Coal-fired power plants in Ohio are a major source of airborne mercury pollution.

- The American Electric Power Gavin Plant in Cheshire emitted the most mercury pollution of any power plant in Ohio in 2010, releasing 829 pounds. This amount is significant. One small drop of mercury is enough to make the fish in a 25-acre lake unsafe to eat.
- The Gavin Plant ranked as the ninth most polluting power plant for mercury emissions in the nation.
- Eight of the top 100 most polluting power plants for mercury emissions in the country are located in Ohio.
- Among all states nationwide, Ohio ranked second in terms of the total amount of airborne mercury pollution released by power plants – 4,208 pounds.
- Table ES-1 ranks the top five largest power plant mercury polluters in Ohio.

**Table ES-1: Power Plants in Ohio Ranked by Airborne Mercury Emissions in 2010**

State Rank (of 27)	National Rank (of 457)	Facility Name	Airborne Mercury Pollution (pounds)	Owner	City	County
1	9	Gavin Plant	829	American Electric Power	Cheshire	Gallia
2	38	W.H. Sammis Plant	424	FirstEnergy Generation Corp.	Stratton	Jefferson
3	39	Kyger Creek Station	420	Ohio Valley Electric Corp.	Cheshire	Gallia
4	42	Cardinal Plant	407	American Electric Power	Brilliant	Jefferson
5	62	Muskingum River Plant	321	American Electric Power	Beverly	Washington

## **New EPA standards will limit mercury pollution from power plants and protect public health.**

- Under the authority of the Clean Air Act, EPA has developed the first national standard limiting releases of mercury and other toxic air pollutants from power plants. As proposed in March, 2011, these standards will require power plant owners to cut overall emissions of mercury by more than 90 percent using widely available, proven pollution control technologies.
- The new emission standards will improve public health. EPA estimates that for every dollar spent to reduce pollution from power plants, the American public and American businesses will see up to \$13 in health and economic benefits. In total, the rules could provide as much as \$140 billion worth of benefits annually.
- EPA should finalize and implement these new safeguards.

\*The data presented in this report focus on power plant emissions data reported to the U.S. Environmental Protection Agency's Toxics Release Inventory (TRI). Industries not required to report to TRI, or facilities with emissions below the reporting threshold, will not be represented in the data. For more detail, see the Methodology section on page 12.

# Mercury Pollution Threatens Public Health

Mercury is a neurotoxicant. Children are particularly vulnerable to the harmful impacts of mercury during critical windows of development that occur before birth, inside a mother's womb. Mercury exposure can lead to irreversible deficits in verbal skills, damage to attention and motor control, and reduced IQ.

Largely due to emissions from coal-fired power plants, mercury contaminates waterways across the United States, from coastal bays to the Great Lakes. Mercury does not decompose in the environment. Rather, it can accumulate in fish and rise up the food chain, all the way to humans.

Scientists at the U.S. Environmental Protection Agency have estimated that one in ten women of childbearing age in the United States has enough mercury in her bloodstream to damage her child's brain development should she become pregnant.<sup>1</sup> In other words, on the order of 320,000 to 640,000 children born every year are likely to suffer developmental damage from mercury exposure.<sup>2</sup>

## Mercury Is Toxic to Human Development

As documented by the U.S. National Academy of Sciences, children who are exposed to low-dosage levels of mercury while in the womb can develop brain damage, leading to delayed language development, deficits in verbal skills, damage to attention and motor control, and reduced IQ.<sup>3</sup> The effects appear irreversible. Scientists have found that deficits still persist at age 14.<sup>4</sup>

Even adults are vulnerable to mercury pollution. Low-level exposure can cause deficits in brain function, as well as fertility and cardiovascular problems.<sup>5</sup>

Researchers at Mt. Sinai School of Medicine, Harvard Medical School, Boston Children's Hospital and the Albert Einstein College of Medicine estimate that mercury pollution costs the nation \$8.7 billion annually in diminished intelligence of the population and resulting lost productivity.<sup>6</sup>

## Mercury Contamination Is Widespread

Mercury occurs naturally in our environment and can be found in coal and other underground rock deposits. When power plants burn coal, they emit mercury and other toxic pollutants into the air. After leaving the power plant smokestack, mercury pollution falls to the ground in raindrops and then washes into lakes, streams and the ocean.

Mercury does not readily decompose in the environment. Instead, small organisms can transform it into mercury compounds that do not readily leave the body. These compounds build up in fish tissues and tend to increase in concentration in species at the top of the food chain. People who eat contaminated fish end up with mercury in their bodies.<sup>7</sup>

According to the United States Environmental Protection Agency, mercury pollution impairs nearly 5,000 bodies of water across the country.<sup>8</sup> Mercury contamination affects:

- More than 14 million acres of bays, estuaries, lakes, reservoirs, and ponds;
- More than 60,000 miles of rivers and streams; and
- More than 6,600 miles of coastal shoreline.<sup>9</sup>

As a result of widespread mercury contamination, every state in the United States has issued an advisory warning against the consumption of species of fish that tend to have dangerous levels of mercury.<sup>10</sup> Every square inch of the Great Lakes is under a mercury advisory.<sup>11</sup>

Ohio has set a statewide advisory warning that fish from any lake are likely to be contaminated with mercury. Additionally, the state has set fish consumption advisories due to high mercury levels in more than 140 specific water bodies.<sup>12</sup>



# Power Plants in Ohio Continue to Emit Large Amounts of Mercury Pollution

Power plants are the largest source of airborne mercury emissions in Ohio. In 2010, more than two-thirds of all airborne mercury pollution in Ohio came from the smokestacks of coal-fired power plants.<sup>13</sup> In other words, power plants generate more airborne mercury pollution than all other sources – including steel mills and cement manufacturing plants – combined.

In total, power plants in Ohio emitted 4,208 pounds of mercury pollution into the air. This amount is significant. One small drop of mercury per year (just one-seventieth of a teaspoon) is enough to make the fish in a 25-acre lake unsafe to eat.<sup>14</sup>

Among all states nationwide, Ohio ranked second in terms of the total amount of airborne mercury pollution released by power plants. (See Table 1.)

**Table 1: Top Ten States Ranked by Total Power Plant Emissions of Airborne Mercury Pollution in 2010**

Rank	State	Airborne Mercury Emissions (pounds)
1	Texas	11,127
2	Ohio	4,218
3	Pennsylvania	3,964
4	Missouri	3,835
5	Indiana	3,175
6	Alabama	3,002
7	West Virginia	2,495
8	North Dakota	2,363
9	Kentucky	2,287
10	Michigan	2,253

The American Electric Power Gavin Plant in Cheshire emitted the most mercury pollution of any power plant in Ohio in 2010, at 829 pounds. (See Table 2.) This plant ranked as the ninth most polluting power plant for mercury emissions in the nation.

Eight out of the top 100 largest mercury polluting power plants in the country are located in Ohio. Table 2 presents a complete list of Ohio's power plants ranked by emissions of mercury to the air in 2010.

**Table 2: Power Plants in Ohio Ranked by Airborne Mercury Emissions in 2010**

State Rank (of 27)	National Rank (of 457)	Facility Name	Airborne Mercury Pollution (pounds)	Owner	City	County
1	9	Gavin Plant	829	American Electric Power	Cheshire	Gallia
2	38	W.H. Sammis Plant	424	FirstEnergy Generation Corp.	Stratton	Jefferson
3	39	Kyger Creek Station	420	Ohio Valley Electric Corp.	Cheshire	Gallia
4	42	Cardinal Plant	407	American Electric Power	Brilliant	Jefferson
5	62	Muskingum River Plant	321	American Electric Power	Beverly	Washington
6	65	Conesville Plant	318	American Electric Power	Conesville	Coshocton
7	72	Eastlake Plant	301	FirstEnergy Generation Corp.	Eastlake	Lake
8	88	Avon Lake Power Plant	246	GenOn Energy Inc.	Avon Lake	Lorain
9	104	Beckjord Generating Station	209	Duke Energy Corp.	New Richmond	Clermont
10	149	Zimmer Generating Station	135	Duke Energy Corp.	Moscow	Clermont
11	159	Miami Fort Generating Station	127	Duke Energy Corp.	North Bend	Hamilton
12	199	J.M. Stuart Station	86	The Dayton Power & Light Co.	Manchester	Adams
13	204	R.E. Burger Plant	81	FirstEnergy Generation Corp.	Shadyside	Belmont
14	206	Bayshore Plant	80	FirstEnergy Generation Corp.	Oregon	Lucas
15	248	Niles Power Plant	53	GenOn Energy Inc.	Niles	Trumbull
16	279	Lakeshore Plant	35	FirstEnergy Generation Corp.	Cleveland	Cuyahoga
17	282	Richard H. Gorsuch Station	34	American Municipal Power	Marietta	Washington
18	301	Ashtabula Power Plant	27	FirstEnergy Generation Corp.	Ashtabula	Ashtabula
19	311	Dover Light & Power	23	Dover Light & Power	Dover	Tuscarawas
20	356	Picway Plant	12	American Electric Power	Lockbourne	Pickaway

**Table 2: Power Plants in Ohio Ranked by Airborne Mercury Emissions in 2010  
(Continued)**

State Rank (of 27)	National Rank (of 457)	Facility Name	Airborne Mercury Pollution (pounds)	Owner	City	County
21	362	Killen Station	11	The Dayton Power & Light Co.	Manchester	Adams
21	362	O.H. Hutchings station	11	The Dayton Power & Light Co.	Miamisburg	Montgomery
23	374	Heritage-WTI Inc.	10	Heritage-WTI LLC	East Liverpool	Columbiana
24	376	City of Orrville Public Utilities Electric Dept.	9	City of Orrville	Orrville	Wayne
25	400	City of Painesville Power Plant	5	City of Painesville	Painesville	Lake
26	405	Shelby Municipal Light Plant	3	City of Shelby	Shelby	Richland
27	415	City of Hamilton Municipal Electric Plant	2	City of Hamilton	Hamilton	Butler

# New Pollution Standards Are Needed to Clean Up Power Plants

In December 2011, the U.S. Environmental Protection Agency (EPA) will finalize new standards that will require power plants to clean up their emissions of mercury and other toxic contaminants.<sup>15</sup>

This safeguard has been in development for more than 20 years. In 1990, Congress expanded the landmark Clean Air Act, requiring EPA to take action to reduce toxic air pollution, including mercury, to protect America's children and overall public health. In 2000, EPA proposed a national standard requiring all power plant owners to limit their emissions of mercury and other toxic pollutants. However, this common-sense action has been tied up in industry challenges and court battles for more than a decade.

The new standards, proposed in March 2011, will require many power plants to install widely available, proven pollution control technologies.<sup>16</sup> Slightly more than half of all coal-fired power plants already deploy pollution control equipment capable of delivering the performance necessary to meet the new standards. The remaining coal-fired power plants – the top polluters identified in this report – will have to clean up. For the first time, all power plants will have to operate on a level playing field across the country.

Once fully implemented, the new safeguard will reduce overall power plant emissions of mercury by more than 90 percent.<sup>17</sup>

This action will reduce public exposure to mercury and other toxic air pollutants, protecting the health of every American – especially children. In addition to reducing the insidious damage to brain development caused by mercury, the new rules will have broad health benefits. EPA estimates that when the rules are fully implemented – which could be up to four years after they go into effect – reduced emissions will annually prevent:

- 17,000 premature deaths,
- 11,000 heart attacks,
- 12,000 emergency room visits and hospital admissions,
- 120,000 cases of childhood asthma symptoms, and
- 850,000 fewer days of work missed due to illness.

According to EPA, every dollar spent to reduce pollution from power plants will deliver up to \$13 in health and economic benefits for the American public and American businesses.<sup>18</sup> In total, the rules could provide as much as \$140 billion worth of benefits annually.<sup>19</sup>

The proposed mercury and toxic pollution emission standards are a clear, common-sense step that will improve public health. EPA should follow through and finalize this action as soon as possible.

## Methodology

The emissions data presented in this report are derived from the U.S. Environmental Protection Agency (EPA), *Toxics Release Inventory, 2010 TRI Dataset*, 27 October 2011, available at [www.epa.gov/tri/tridata/preliminarydataset/index.html](http://www.epa.gov/tri/tridata/preliminarydataset/index.html). Toxics Release Inventory emissions data are self-reported by regulated facilities. The dataset we used was the first iteration of the 2010 inventory. EPA may update this information over time to capture late reporting and revisions.

We first selected any emitter listed in the database involved in electricity generation, by choosing facilities with a primary or secondary industry classification code (or NAICS code) beginning with 22111. We then examined emissions of mercury and mercury compounds to the air, including both fugitive emissions and emissions through power plant smokestacks. The analysis does not count any mercury emissions reported to TRI that do not involve atmospheric release.

The data represent only industries that are required to submit data to EPA under the Toxics Release Inventory program, and facilities with emissions exceeding the reporting threshold of 10 pounds per year, and is not necessarily a comprehensive listing of all power plants in each state.<sup>20</sup>

# Notes

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<sup>1</sup> Kathryn R. Mahaffey et al, U.S. Environmental Protection Agency, “Adult Women’s Blood Mercury Concentrations Vary Regionally in the United States: Association with Patterns of Fish Consumption (NHANES 1999-2004),” *Environmental Health Perspectives* 117: 47-53, 25 August 2008.

<sup>2</sup> Leonardo Trasande et al, “Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain,” *Environmental Health Perspectives* 115: 590-596, May 2005.

<sup>3</sup> National Academy of Sciences, National Research Council, *Toxicological Effects of Methylmercury*, (Washington, D.C.: National Academy Press) 2000; U.S. Environmental Protection Agency, *Mercury Study Report to Congress*, December 1997, vol. 1, pp. 2-5 & 2-6.

<sup>4</sup> Philippe Grandjean, Department of Environmental Health, Harvard School of Public Health, *Testimony at the Mercury MACT Rule Hearing*, sponsored by Congressman Thomas Allen, U.S. House of Representatives, 18 March 2004, available at [thomas.loc.gov/cgi-bin/query/F?r108:1:./temp/~r108Aoc9u1:e122363](http://thomas.loc.gov/cgi-bin/query/F?r108:1:./temp/~r108Aoc9u1:e122363).

<sup>5</sup> Edna M. Yokoo et al, “Low Level Methylmercury Exposure Affects Neuropsychological Function in Adults,” *Environmental Health*, 2(8), June 2003; J.T. Salonen et al, “Intake of Mercury from Fish, Lipid Peroxidation, and the Risk of Myocardial Infarction and Coronary, Cardiovascular, and Any Death in Eastern Finnish Men,” *Circulation* 91: 645-655, 1 February 1995; Eliseo Guallar et al, “Mercury, Fish Oils, and the Risk of Myocardial Infarction,” *New England Journal of Medicine* 347: 1747-1754, 28 November 2002; Y. Kinjo et al, “Profile of Subjective Complaints and Activities of Daily Living Among Current Patients with Minamata Disease After Three Decades,” *Environmental Research* 63: 241-251, November 1993.

<sup>6</sup> See note 2.

<sup>7</sup> U.S. Environmental Protection Agency, *Frequently Asked Questions about Mercury in Fish and Shellfish: What is Mercury and Methylmercury?*, 6 October 2011, available at [water.epa.gov/scitech/swguidance/fishshellfish/outreach/advice\\_index.cfm](http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/advice_index.cfm).

<sup>8</sup> U.S. Environmental Protection Agency, *Watershed Assessment, Tracking, & Environmental Results*, 28 October 2011, available at [iaspub.epa.gov/waters10/attains\\_nation\\_cy.control?p\\_report\\_type=T#tmdl\\_by\\_pollutant](http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T#tmdl_by_pollutant).

<sup>9</sup> U.S. Environmental Protection Agency, *Watershed Assessment, Tracking, & Environmental Results: National Summary of State Information*, 28 October 2011, available at [iaspub.epa.gov/tmdl\\_waters10/attains\\_nation\\_cy.control#prob\\_source](http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.control#prob_source).

<sup>10</sup> U.S. Environmental Protection Agency, *2010 National Listing of Fish Advisories* (presentation), 14 October 2011, available at [water.epa.gov/scitech/swguidance/fishshellfish/fishadvisories/upload/nlfa\\_slides\\_2011.pdf](http://water.epa.gov/scitech/swguidance/fishshellfish/fishadvisories/upload/nlfa_slides_2011.pdf).

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

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<sup>13</sup> The data presented in this section focus on power plant emissions data reported to the U.S. Environmental Protection Agency's Toxics Release Inventory (TRI). Industries not required to report to TRI, or facilities with emissions below the reporting threshold, will not be represented in the data. For more detail, see the Methodology section.

<sup>14</sup> Clean Air Network, *The Problem with Mercury* (factsheet), August 1999.

<sup>15</sup> U.S. Environmental Protection Agency, *Mercury and Air Toxics Standards: Final MATS to Be Issued by December 16, 2011*, 25 October 2011, available at [www.epa.gov/airquality/powerplanttoxics/](http://www.epa.gov/airquality/powerplanttoxics/).

<sup>16</sup> U.S. Environmental Protection Agency, *EPA Proposes First National Standard for Mercury Pollution from Power Plants / Mercury and Air Toxics Standards Represent One of Strongest Health Protections from Air Pollution Since Passage of Clean Air Act* (press release), 16 March 2011.

<sup>17</sup> Ibid.

<sup>18</sup> See note 15.

<sup>19</sup> Ibid.

<sup>20</sup> TRI Reporting threshold for mercury and mercury compounds of 10 pounds: U.S. Environmental Protection Agency, *List of Lists: Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 112(r) of the Clean Air Act*, May 2010.