AMERICA'S TOP POWER PLANT TOXIC AIR POLLUTERS

ENVIRONMENTAL INTEGRITY PROJECT

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Errata

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The rankings in this report are based entirely on data that electric utilities report to the U.S. Environmental Protection Agency (EPA). We are aware that industry-reported emissions data may contain errors and omissions, and we greatly appreciate those companies, regulators, and members of the media that have taken the time to provide the updated information, corrections, and/or explanations listed below.

- A representative of Plum Point Energy Center has stated that the company mis-reported its 2010 toxic emissions to the U.S. EPA's Toxic Release Inventory as follows: the plant emitted only 13 pounds of chromium (not the 12,179 pounds reported) and only one pound of lead (not the 759 pounds reported). Based on this new data, please note that the Plum Point Energy Center is not the top power plant toxic emitter as depicted in *Table 1*. In addition, the *Tables 4* and *5*, containing Plum Point's reported emissions of chromium and lead are also affected as follows: Plum Point is not the top chromium emitter and Plum Point is not the 27th highest lead emitter.

About the Environmental Integrity Project

The Environmental Integrity Project (EIP) is a nonpartisan, nonprofit organization dedicated to the enforcement of the nation's anti-pollution laws and to the prevention of political interference with those laws. EIP provides objective analysis of how the failure to enforce or implement environmental laws increases pollution and harms public health. We also help local communities obtain the protection of environmental laws.

Acknowledgement

Environmental Integrity Project legal and research assistant Marcie Alexander contributed to this report.

Data Limitations

EIP's rankings of the nation's top power plant toxic air polluters are based on company self reported data obtained through the U.S. Environmental Protection Agency Toxics Release Inventory. The data may contain errors due to inaccurate reporting by electric utilities. EIP is committed to ensuring that the data we present are as accurate as possible. We will correct any errors that are verifiable.

Please direct any questions, comments, or data corrections to:

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SUMMARY

The power plants that generate electricity to run our homes, businesses, and factories are also the largest source of dangerous toxic air pollution, including mercury, lead, arsenic, and other heavy metals as well as acid gases. These toxics can cause serious environmental impacts and health effects, especially for children, developing fetuses, and vulnerable populations. Exposure to the air toxics that are emitted from coal-fired power plants can cause cancer,[1] damage to the liver, kidney, and the nervous and circulatory systems,[2] and respiratory effects including asthma, decreased lung function, and bronchitis.[3]

For decades, the electric power industry has delayed cleanup and lobbied against public health rules designed to reduce pollution. But, the technology and pollution control equipment necessary to clean up toxic emissions are widely available and are working at some power plants across the country. There is no reason for Americans to continue to live with unnecessary risks to their health and to the environment.

The U.S. Environmental Protection Agency is now under a court-ordered deadline to finalize long delayed rules to clean up emissions of mercury and other harmful power plant air toxics. In addition to lowering mercury emissions, the rule will reduce other fine particle heavy metals like arsenic, chromium, and lead, saving thousands of lives and billions of dollars each year. EPA has estimated that the power plant air toxics rule will avoid between 6,800 and 17,000 premature deaths each year, and will result in annual savings of $48 to $140 billion.[4]

Power plant toxic emissions have declined over the past decade, but the decrease is being driven by a few companies that are installing modern pollution controls while the rest of the nation's power plants are doing very little. The data show that toxic emissions can be reduced, and have been at a number of plants, but that a strong national rule is needed to protect all Americans equally, and to force the dirtiest power plants to clean up.

In addition, a relatively small handful of the nation's most polluting power plants generate a disproportionate amount of reported toxic emissions.

DATA

This report presents data obtained from U.S. EPA's Toxics Release Inventory (TRI), and accessible to the public at http://www.epa.gov/tri/. All the rankings in this report are based on 2010 annual reported emissions, the most recent data available, from facilities classified as electric utilities under the North American Industrial Classification System (NAICS).

The report focuses on 6 toxic heavy metals emitted in relatively high quantities by the electric utility industry: Arsenic, Chromium, Lead, Mercury, Nickel, and Selenium. In addition, the report presents data on emissions of the acid gas Hydrochloric acid ("HCl"). The number of power plants that reported emissions of each of these toxics varies considerably from one pollutant to the next. For example, 479 U.S. power plants reported Lead emissions to TRI in 2010, whereas only 59 power plants reported Selenium emissions. Likewise, the number of power plants reporting emissions of Arsenic (145), Chromium (234), Mercury (452), Nickel (222), and Hydrochloric acid (413), also varies considerably. This variation is partly due to the reporting threshold for TRI. Generally, the reporting requirement is only triggered if the facility produces a total of 25,000 pounds of the chemical, although for certain highly toxic, bioaccumulative, or persistent chemicals like lead and mercury, the reporting threshold is much lower.[5] The fact that the TRI's reporting requirement is triggered based on each chemical considered individually explains some of the disparity between the number of plants reporting emissions of, for example, Lead (479 facilities) as compared to the number of power plants reporting emissions of Selenium (59 facilities).

As with all company self-reported data compiled by government agencies, the TRI data may contain errors and omissions. ***Appendix A*** is an electronic spreadsheet containing all the power plant reported air (emissions) data used in this report, searchable and sortable by pollutant, state, and individual facility. ***Appendix B*** is an electronic spreadsheet, separated by chemical, containing all facilities reporting emissions to TRI for each of the chemicals detailed in this report.[6]

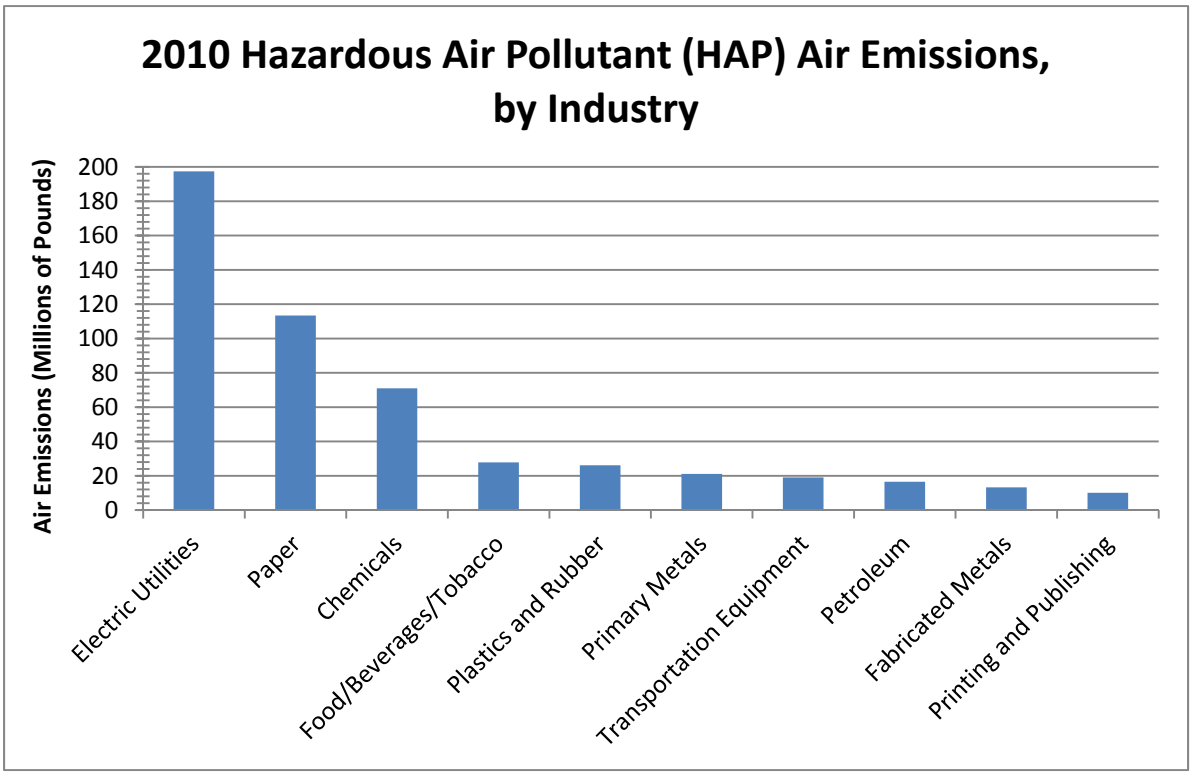
KEY FINDINGS

Over the years, EPA has evaluated exposures, hazards, and risks associated with at least 67 different power plant air toxics, and identified about 14 toxics of special concern. These include Arsenic, Beryllium, Cadmium, Chromium, Lead, Manganese, Mercury, Nickel, Hydrochloric acid, Hydrofluoric acid, Acrolein, Dioxins, Formaldehyde, and Radionuclides.[7] This report contains information on just seven of the many toxic air pollutants that coal-fired power plants emit into the atmosphere every year.

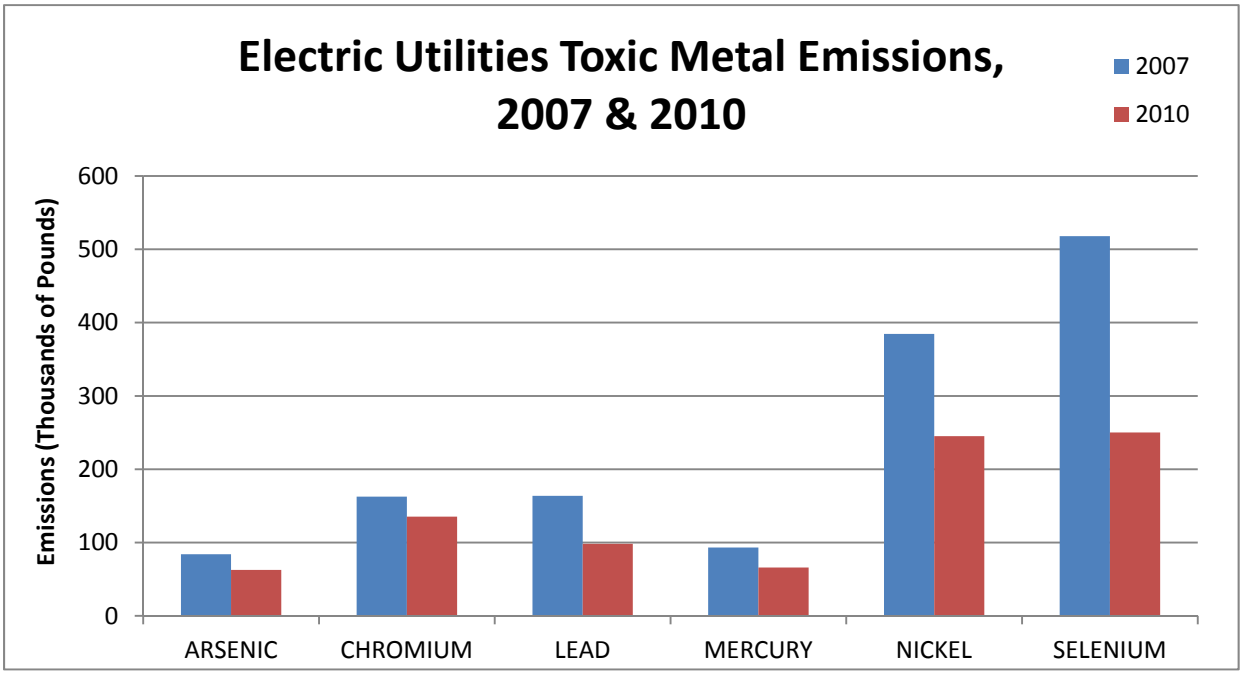
Power plants that burn coal and oil to make electricity are the largest industrial sources of mercury, arsenic, and selenium releases into the air. The electric utility sector is the number two emitter of nickel and chromium. These heavy metals are known to have very serious human health impacts, including various forms of cancer, central and peripheral nervous system disorders, gastrointestinal effects, and liver or kidney damage.[8,9]

After years of inaction, litigation, study, and delay, EPA is finally poised to adopt a power plant air toxics rule that will mainly target mercury, fine particulates (which contain heavy metals), and acid gases.

Electric power plants comprise a relatively small number of facilities, but, as shown in the graph below, their toxic emissions dwarf other industrial sectors. For example, whereas literally thousands of chemical plants and other industries reported toxic emissions to EPA's Toxics Release Inventory in 2010, only a few hundred power plants reported mercury and hydrochloric acid emissions, and only 59 power plants reported selenium emissions. Yet, despite the relatively small number of facilities, electric utilities emit more arsenic, mercury, selenium, and hydrochloric acid than any other industrial sector, and the utility industry emits the second highest total emissions of chromium and nickel of all industry sectors.



In recent years, some states have taken steps to protect the health of their residents by requiring power plants to reduce toxic emissions, mainly mercury. The chart below shows the declining trend in emissions of toxic metals from the electric power sector from 2007 to 2010.



Since 2002, 17 states have enacted laws to limit mercury pollution,[10] and mercury emissions in states such as Georgia, Maryland, Minnesota, Montana, and New York are on the decline, due in part to the passage of state laws requiring power plants to install modern pollution controls.[11] In addition, state and federal enforcement actions have forced some power companies to install modern pollution controls, which reduce mercury and other (non-mercury) metals.[12] Thus, many of the nation's power plants have already demonstrated that pollution reductions are readily achievable through available pollution controls such as sorbent injection, baghouses, sulfur dioxide scrubbers, and selective catalytic reduction, shuttering inefficient and outdated units, or switching to cleaner fuels.

But despite these gains, many of the nation's dirtiest power plants, and some states, continue to resist efforts to cut toxic air pollution. For example:

- Over the past decade, power plant arsenic emissions have dropped significantly in Virginia (from almost 10,000 pounds reported in 2000 to 352 pounds reported in 2010) and in Tennessee (from almost 8,000 pounds in 2000 to 637 pounds in 2010). Power plant arsenic emissions have also dropped in New York, North Carolina, and other states. But, power plant arsenic emissions in Georgia, Indiana, North Dakota, Texas, and Utah have remained flat or seen only modest reductions in power plant arsenic emissions over the past decade. Montana has reported a steady rise in that state's power plant's arsenic emissions over the past decade. Pennsylvania – by far the largest state in terms of power plant arsenic emissions – has actually increased its reported power plant arsenic

emissions over the past decade, from 15,861 pounds reported in 2001, to 17,666 pounds of arsenic reported in 2010.

- Over the past decade, power plant lead emissions have declined in several states including North Carolina and New York. But, power plant lead emissions have held steady in Texas and West Virginia. From 2009 to 2010, power plant lead emissions actually *increased* in sixteen states.

- Power plants in Arkansas reported more chromium emissions in 2010 than plants in any other state, due almost entirely to the newly-built Plum Point Energy Station, which reported 12,179 pounds of chromium, or 90 percent of the state's reported total in 2010.

Even while overall toxic power plant emissions are declining, a few of the nation's dirtiest power plants continue to emit high levels of toxics into the air. The following pages contain information and rankings of the nation's top 20 percent of the dirtiest power plants on a pollutant-by-pollutant basis for six heavy metals and one acid gas (hydrochloric acid).

Compiling a single ranking of the nation's most polluting power plants for toxic emissions is a challenge for several reasons. First, a pound of one toxic is not equivalent to a pound of another toxic in terms of health and environmental dangers. Second, power plants emit disproportionate amounts of one pollutant as compared to another. For example, power plants emit significantly more selenium and nickel than they do mercury and arsenic, in terms of sheer pounds. Third, the number of power plants reporting emissions of each chemical varies greatly from chemical to chemical. For example, only 59 power plants reported selenium emissions in 2010, whereas 479 plants reported lead emissions.

Table 1, below, presents one snapshot of the nation's most toxic power plant air polluters, by ranking the nation's power plants based on total pounds emitted of four highly toxic heavy metals: arsenic (Ar), chromium (Cr), lead (Pb), and mercury (Hg).

Table 1. Top 20 Power Plants for Emissions of Arsenic, Chromium, Lead, and Mercury, in Total Pounds				
Rank	**State**	**Facility**	**Owner**	**Emissions (lbs)**
1	AR	Plum Point Energy Station	Plum Point Services Company, LLC	13,110
2	KY	Paradise Fossil Plant	U.S. Tennessee Valley Authority	6,762
3	PA	Shawville Station	Genon Energy, Inc	6,466
4	WY	Laramie River Station	Basin Electric	6,122
5	MI	JH Campbell Generating Plant	Consumers Energy	6,043
6	PR	AES Puerto Rico LP	AES Corp	5,745
7	PA	EME Homer City Generation LP	Edison International	5,153
8	MI	DE Karn- JC Weadock Generating Plant	Consumers Energy	4,973
9	PA	Bruce Mansfield Power Plant	FirstEnergy Generation Corp	4,948
10	GA	Bowen Steam Electric Generating Plant	Southern Co	4,857
11	ND	Antelope Valley Station	Basin Electric	4,673
12	TX	Monticello Steam Electric Station	Luminant Generation Co LLC	4,672
13	ND	Milton R Young Station	Minnkota Power Cooperative, Inc.	4,587
14	PA	Brunner Island Steam Electric Station	PPL	4,318
15	KY	Big Sandy Plant	American Electric Power	4,055
16	PA	Keystone Power Plant	Genon Energy, Inc.	4,026
17	PA	Montour Steam Electric Station	PPL	3,946
18	NE	Gerald Gentleman Station	Nebraska Public Power District	3,640
19	KY	Ghent Station	LG&E & KU Energy LLC	3,635
20	MO	Labadie Energy Center	Ameren Corp	3,570

As shown above, the top 20 biggest emitters of arsenic, chromium, lead, and mercury released a total of 105,302 pounds, or almost 53 tons, of these four highly toxic metals into the nation's air in 2010.

State Rankings for Toxic Power Plant Emissions

The electric utility sector is the top emitter of arsenic, mercury, selenium, and hydrochloric acid of all industry sectors, and the utility sector is the second highest emitter of chromium, cobalt, and nickel of all industry sectors. Electric utilities also release high quantities of lead into the air each year. Based on these toxics as key indicators, five states – Ohio, Pennsylvania, Indiana, Kentucky, and Texas – are the top five states for power plant toxic emissions.

Table 2, State Averages of Eight Hazardous Air Pollutant Rankings, lists fifteen states by their average rank, based on each state's[13] ranking for the listed chemical. Power plants in fifty-two U.S. states and territories (including the District of Columbia, Guam, Puerto Rico, and the Virgin Islands) reported toxic emissions in 2010, according to EPA's Toxics Release Inventory. Idaho, Rhode Island, and Vermont reported no electric utility toxic emissions.

Table 2. State Averages of Eight Hazardous Air Pollutant Rankings

State	Arsenic Rank	Chromium Rank	Cobalt Rank	HCl Rank	Lead Rank	Mercury Rank	Nickel Rank	Selenium Rank	Average Rank
PA	1	7	1	2	1	3	6	3	3
OH	4	6	2	1	4	2	5	2	3.25
IN	5	4	4	3	3	5	4	11	4.875
KY	2	5	6	5	2	9	8	10	5.875
TX	13	3	9	13	6	1	9	1	6.875
WV	9	11	3	9	10	7	10	4	7.875
GA	6	8	5	8	7	22	12	9	9.625
MI	16	2	21	4	5	10	13	12	10.375
FL	12	20	10	7	9	15	7	8	11
AL	8	16	11	14	16	6	17	6	11.75
NC	11	17	14	6	14	24	11	5	12.75
ND	3	12	7	34	13	8	14	-	13
MO	17	18	17	20	15	4	19	-	15.71429
SC	10	15	23	10	12	29	22	15	17
WY	7	13	8	43	28	14	21	7	17.625

Some states not appearing on the list above still have high levels of power plant toxic air emissions. For example, power plants in Arkansas, Iowa, Tennessee, and Puerto Rico top the rankings for some toxic emissions, as detailed in the following pages.

AMERICA'S TOP POWER PLANT TOXIC AIR POLLUTERS

Arsenic

EPA has classified inorganic arsenic as a human carcinogen. Arsenic exposure in humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of arsenic in humans has been linked to a form of skin cancer and also to bladder, liver, and lung cancer. Short-term high-level inhalation exposure to arsenic dust or fumes can cause central and peripheral nervous system disorders, and long-term inhalation exposure is associated with gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, and liver or kidney damage in humans.[14]

As shown in chart below, the electric power sector is the top emitter of arsenic out of all other industries reporting to TRI.

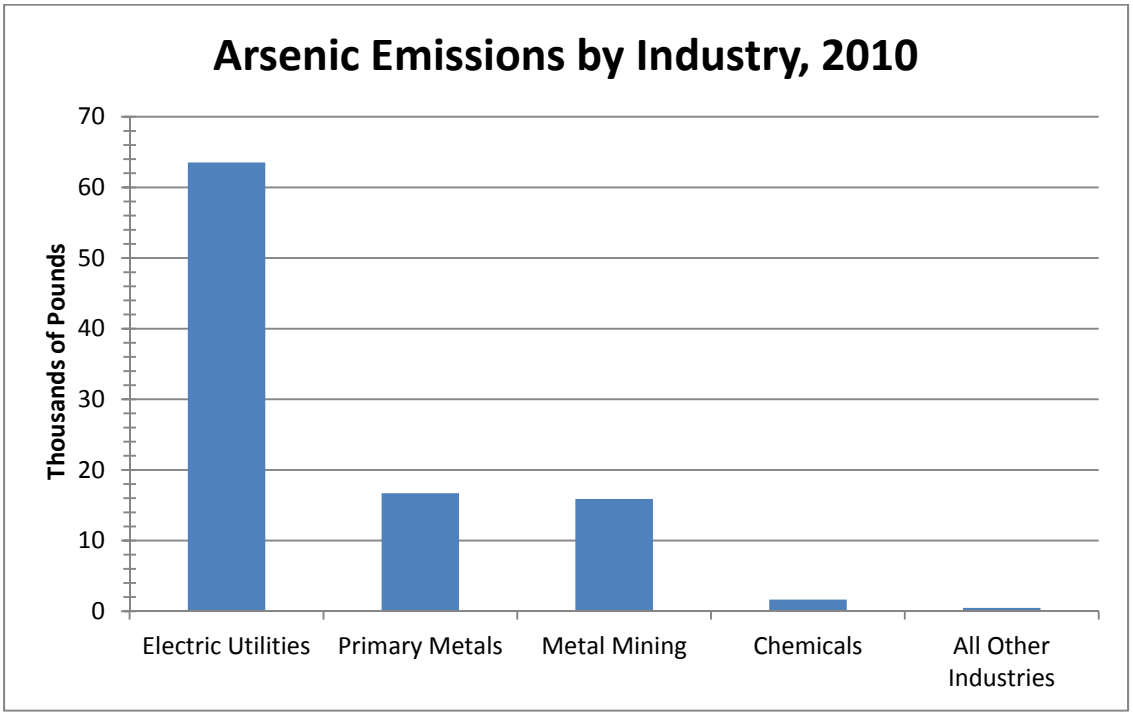


Table 3, below, shows the top 20 percent of arsenic emitters, or 29 power plants out of the 145 that reported arsenic emissions to TRI in 2010.

Table 3. Top Power Plant Arsenic Emitters - 2010				
Rank	**Facility Name**	**State**	**Owner**	**Arsenic (lbs)**
1	Shawville Station	PA	Genon Energy, Inc.	4,721
2	Laramie River Station	WY	Basin Electric	3,100
3	EME Homer City Generation LP	PA	Edison International	2,400
4	Antelope Valley Station	ND	Basin Electric	2,201
5	Keystone Power Plant	PA	Genon Energy, Inc.	2,116
6	U.S. TVA Paradise Fossil Plant	KY	Us Tennessee Valley Authority	2,105
7	Conemaugh Power Plant	PA	Genon Energy, Inc.	1,912
8	Bruce Mansfield Power Plant	PA	Firstenergy Generation Corp	1,606
9	Milton R Young Station	ND	Minnkota Power Cooperative, Inc.	1,520
10	Brunner Island Steam Electric Station	PA	PPL	1,517
11	Bowen Steam Electric Generating Plant	GA	Southern Co	1,400
12	Montour Steam Electric Station	PA	PPL	1,382
13	Big Sandy Plant	KY	American Electric Power	1,305
14	Leland Olds Station	ND	Basin Electric	1,300
15	Gorgas Steam Plant	AL	Southern Co	1,200
16	Wabash River Generating Station	IN	Duke Energy Corp	1,030
17	Ghent Station	KY	LG&E & KU Energy LLC	972
18	Gibson Generating Station	IN	Duke Energy Corp	969
19	Mill Creek Station	KY	LG&E & KU Energy LLC	960
20	Hatfield Power Station	PA	Allegheny Energy, Inc.	870
21	IPL Petersburg	IN	AES Corp	843
22	Wansley Steam Electric Generating Plant	GA	Georgia Power Co	840
23	Branch Steam Electric Generating Plant	GA	Southern Co	810
24	Coal Creek Station	ND	Great River Energy	796
25	Gaston Steam Plant	AL	Southern Co	780
26	Wateree Station - SCE&G	SC	SCANA	721
27	Gavin Plant	OH	American Electric Power	715
28	Amos Plant	WV	American Electric Power	695
29	Yates Steam Electric Generating Plant	GA	Southern Co	670
Total				**41,456**

Highlights:

- The top 20 percent of all power plant arsenic emitters reported 41,456 pounds, or almost 21 tons of the chemical in 2010 – 66 percent of all power plant arsenic emissions nationwide.

- The electric power industry emits almost two-thirds of the nation's industrial arsenic emissions.

- In 2010, power plants emitted almost 63,000 pounds, or 31.5 tons, of arsenic into the nation's air. Since 2000, power plants have emitted almost one million pounds, or 500 tons, of arsenic into the nation's air.

- The top 10 power plant arsenic air emitters account for a third of all arsenic air emissions from the electric utilities sector.

- Power plants in Pennsylvania emit 28 percent of the nation's power plant arsenic air emissions. Pennsylvania plants emitted more than twice as much arsenic as plants in Kentucky (ranked second).

- Pennsylvania power plants (Shawville, Homer City, Keystone, Conemaugh, Bruce Mansfield, and Brunner Island) occupy six out of the top 10 spots for the largest power plant arsenic emitters in the nation. Emissions from the Shawville power plant jumped from 418 pounds in 2009 to 4,721 pounds in 2010, a ten-fold increase.

- North Dakota has three power plants that emitted more than 1,000 pounds of arsenic in 2010. North Dakota's Antelope Valley Station emitted 2,201 pounds, or 37 percent of the state's total, in 2010.

- TVA's Paradise power plant, in Kentucky, emitted 2,105 pounds of arsenic in 2010, or 28 percent of the state's total.

Chromium

Chromium occurs in the environment primarily in two valence states, trivalent chromium (Cr III) and hexavalent chromium (Cr VI). Chromium III is an essential element in humans and is much less toxic than chromium (VI). Acute (short-term) and inhalation exposure to Cr VI can cause shortness of breath, coughing, and wheezing, and chronic (long-term) exposure can cause perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects. Human studies have clearly established that inhaled Cr VI is a human carcinogen, resulting in an increased risk of lung cancer. Animal studies have shown Cr VI to cause lung tumors via inhalation exposure.[15]

Table 4, below, shows the top 20 percent of chromium emitters, or 47 power plants out of the 234 that reported chromium emissions to TRI in 2010.

Table 4. Top Power Plant Chromium Emitters - 2010

Rank	Facility	State	Owner	Chromium (lbs)
1	Plum Point Energy Station	AR	Plum Point Services Company, LLC	12,179
2	AES Puerto Rico LP	PR	AES Corp	4,924
3	J H Campbell Generating Plant	MI	Consumers Energy	4,506
4	DE Karn JC Weadock Generating Plant	MI	Consumers Energy	3,802
5	Monticello Steam Electric Station	TX	Luminant Generation Co LLC	3,121
6	Gerald Gentleman Station	NE	Nebraska Public Power District	3,100
7	Laramie River Station	WY	Basin Electric	2,607
8	Paradise Fossil Plant	KY	U.S. Tennessee Valley Authority	1,910
9	Bowen Steam Electric Generating Plant	GA	Southern Co	1,900
10	Bruce Mansfield Power Plant	PA	FirstEnergy Generation Corp	1,853
11	Antelope Valley Station	ND	Basin Electric	1,802
12	Walter Scott Jr Energy Center	IA	Berkshire Hathaway	1,419
13	Big Sandy Plant	KY	American Electric Power	1,350
14	George Neal North	IA	Berkshire Hathaway	1,341
15	Keystone Power Plant	PA	Genon Energy, Inc.	1,304
16	EME Homer City Generation LP	PA	Edison International	1,301
17	Nebraska City Station	NE	Omaha Public Power District	1,272
18	Gavin Plant	OH	American Electric Power	1,250
19	Amos Plant	WV	American Electric Power	1,180
20	Twin Oaks	TX	PNM, Inc.	1,158
21	Coal Fired Complex	OK	Grand River Dam Authority	1,158
22	Rockport Plant	IN	American Electric Power	1,130
23	Leland Olds Station	ND	Basin Electric	1,104
24	Ghent Station	KY	LG&E & KU Energy LLC	1,101
25	IPL Petersburg	IN	AES Corp	1,073

Table 4. Top Power Plant Chromium Emitters - 2010				
Rank	**Facility**	**State**	**Owner**	**Chromium (lbs)**
26	Gibson Generating Station	IN	Duke Energy Corp	1,073
27	Baldwin Energy Complex	IL	Dynegy Inc.	1,050
28	Labadie Energy Center	MO	Ameren Corp	1,031
29	Mill Creek Station	KY	LG&E & KU Energy LLC	1,025
30	George Neal South	IA	Berkshire Hathaway	1,021
31	Clifty Creek Station	IN	Ohio Valley Electric Corp	1,005
32	Hatfield Power Station	PA	Allegheny Energy, Inc.	992
33	Columbia Energy Center	WI	Alliant Energy Corp	988
34	Brunner Island Steam Electric Station	PA	PPL	985
35	JM Stuart Station	OH	The Dayton Power & Light Co	971
36	Milton R Young Station	ND	Minnkota Power Cooperative, Inc.	966
37	H. W. Pirkey Power Plant	TX	American Electric Power	960
38	Brame Energy Center	LA	Cleco Corp	944
39	Montour Steam Electric Station	PA	PPL	908
40	Winyah Generating Station	SC	South Carolina Public Service Authority	906
41	Wansley Steam Electric Generating Plant	GA	Georgia Power Co	890
42	Jeffrey Energy Center	KS	Westar Energy, Inc.	862
43	Kammer/Mitchell Plant	WV	American Electric Power	830
44	Conesville Plant	OH	American Electric Power	830
45	Branch Steam Electric Generating Plant	GA	Southern Co	800
46	AES Thames LLC	CT	AES Corp	782
47	Cardinal Plant	OH	American Electric Power	780
Total				**79,445**

Highlights:

- The top 20 percent of all power plant chromium emitters reported 79,445 pounds, or almost 40 tons of the chemical in 2010. This is 59 percent of all power plant chromium emissions nationwide.

- The newly built Plum Point power plant in Arkansas reported far more chromium emissions than any other power plant in the nation. The Plum Point plant emitted 9 percent of all power plant chromium emissions nationwide.

- Two Michigan plants owned by Consumers Energy ranked 3rd and 4th in national power plant chromium air emissions. These two facilities emitted a total of 8,308 pounds of chromium, 86 percent of the state's total.

- Indiana has four power plants – Rockport, Tanners Creek, Gibson, and Petersburg – that each reported more than 1,000 pounds of chromium released into the air in 2010.

- American Electric Power owns four power plants in Kentucky, Ohio, West Virginia, and Indiana that each emitted more than 1,000 pounds of chromium in 2010.

- Berkshire Hathaway owns three plants in Iowa, and Basin Electric owns three plants in Wyoming and North Dakota, all of which emitted more than 1,000 pounds of chromium in 2010.

Lead

Exposure to lead can cause effects on the blood, as well as the nervous, immune, renal and cardiovascular systems. Early childhood and prenatal exposures are associated with slowed cognitive development, learning deficits and other effects. Exposure to high amounts of lead can cause gastrointestinal symptoms, severely damage the brain and kidneys, and may cause reproductive effects. Large doses of some lead compounds are known to cause cancer.[16]

Table 5, below, shows the top 20 percent of lead emitters, or 96 power plants out of the 479 that reported lead emissions to TRI in 2010.

Table 5. Top Power Plant Lead Emitters - 2010

Rank	Facility	State	Owner	Lead (lbs)
1	Paradise Fossil Plant	KY	U.S. Tennessee Valley Authority	2,607
2	Milton R Young Station	ND	Minnkota Power Cooperative, Inc.	1,557
3	Brunner Island Steam Electric Station	PA	PPL	1,513
4	Montour Steam Electric Station	PA	PPL	1,379
5	San Miguel	TX	San Miguel Electric Cooperative, Inc.	1,374
6	J H Campbell Generating Plant	MI	Consumers Energy	1,371
7	Bowen Steam Electric Generating Plant	GA	Southern Co	1,348
8	Bruce Mansfield Power Plant	PA	FirstEnergy Generation Corp	1,348
9	Gibson Generating Station	IN	Duke Energy Corp	1,291
10	Wabash River Generating Station	IN	Duke Energy Corp	1,289
11	Ghent Station	KY	LG&E & KU Energy LLC	1,230
12	Mill Creek Station	KY	LG&E & KU Energy LLC	1,201
13	Chena Power Plant	AK	Aurora Energy LLC	1,127
14	Hatfield Power Station	PA	Allegheny Energy, Inc.	1,062
15	Walter Scott Jr Energy Center	IA	Berkshire Hathaway	1,060
16	Big Sandy Plant	KY	American Electric Power	1,059
17	Shawville Station	PA	Genon Energy, Inc.	1,043
18	DE Karn JC Weadock Generating Plant	MI	Consumers Energy	1,022
19	EME Homer City Generation LP	PA	Edison International	905
20	Bonanza Power Plant	UT	Deseret Power Electric Cooperative	857
21	IPL Petersburg	IN	AES Corp	823
22	Clifty Creek Station	IN	Ohio Valley Electric Corp	805
23	Wansley Steam Electric Generating Plant	GA	Georgia Power Co	799
24	George Neal North	IA	Berkshire Hathaway	780
25	Birchwood Power Facility	VA	Birchwood Power Partners LLC	772
26	Colstrip Steam Electric Station	MT	PPL Montana LLC	772
27	Plum Point Energy Station	AR	Plum Point Services Company, LLC	759
28	Cope Station	SC	SCANA	724

Table 5. Top Power Plant Lead Emitters - 2010				
Rank	**Facility**	**State**	**Owner**	**Lead (lbs)**
29	Big Bend Power Station	FL	TECO Energy, Inc.	710
30	Harrison Power Station	WV	Allegheny Energy, Inc.	668
31	Boswell Energy Center	MN	Allete, Inc.	665
32	Baldwin Energy Complex	IL	Dynegy, Inc.	663
33	Gavin Plant	OH	American Electric Power	660
34	Wateree Station	SC	SCANA	659
35	JM Stuart Station	OH	The Dayton Power & Light Co	656
36	Branch Steam Electric Generating Plant	GA	Southern Co	655
37	Amos Plant	WV	American Electric Power	642
38	Kammer/Mitchell Plant	WV	American Electric Power	641
39	Labadie Energy Center	MO	Ameren Corp	636
40	Riverton Generating Station	KS	The Empire District Electric Co	589
41	St Johns River/Northside Generating Station	FL	JEA	580
42	Muskingum River Plant	OH	American Electric Power	574
43	L V Sutton Electric Plant	NC	Progress Energy, Inc.	570
44	Rockport Plant	IN	American Electric Power	563
45	Keystone Power Plant	PA	Genon Energy, Inc.	543
46	Reid/Green/HMP&L Station II	KY	Big Rivers Electric Corp	539
47	Cumberland Fossil Plant	TN	U.S. Tennessee Valley Authority	531
48	Yates Steam Electric Generating Plant	GA	Southern Co	531
49	Cayuga Generating Station	IN	Duke Energy Corp	516
50	Scherer Steam Electric Generating Plant	GA	Georgia Power Co	499
51	Pella Municipal Power Plant	IA	Pella Municipal Power & Light	499
52	JR Whiting Generating Plant	MI	Consumers Energy	498
53	Aguirre Power Generation Complex	PR	Puerto Rico Electric Power Authority	493
54	Monroe Power Plant	MI	DTE Energy Co	493
55	Gorgas Steam Plant	AL	Southern Co	482
56	Kyger Creek Station	OH	Ohio Valley Electric Corp	481
57	Avon Lake Power Plant	OH	Genon Energy, Inc.	458
58	Gaston Steam Plant	AL	Southern Co	451
59	Coal Creek Station	ND	Great River Energy	450
60	Crystal River Energy Complex	FL	Progress Energy, Inc.	448
61	EW Brown Station	KY	LG&E & KU Energy LLC	442
62	BC Cobb Generating Plant	MI	Consumers Energy	441
63	Conesville Plant	OH	American Electric Power	441
64	Merom Generating Station	IN	Hoosier Energy Rec Inc	437
65	AES Puerto Rico LP	PR	AES Corp	437
66	H F Lee Steam Electric Plant	NC	Progress Energy, Inc.	430
67	Montrose Generating Station	MO	Great Plains Energy	430

Table 5. Top Power Plant Lead Emitters - 2010				
Rank	**Facility**	**State**	**Owner**	**Lead (lbs)**
68	PacifiCorp Naughton Plant	WY	Berkshire Hathaway	426
69	South Coast Power Plant	PR	Puerto Rico Electric Power Authority	418
70	Monticello Steam Electric Station	TX	Luminant Generation Co LLC	417
71	Escalante Station	NM	Tri-State Generation & Transmission	415
72	Independence Steam Electric Station	AR	Entergy Corp	413
73	Widows Creek Fossil Plant	AL	U.S. Tennessee Valley Authority	411
74	Joliet Generating Station (#9 & #29)	IL	Edison International	403
75	Indian River Generating Station	DE	NRG Energy, Inc.	401
76	Prairie Creek Generating Station	IA	Alliant Energy Corp	398
77	Johnsonville Fossil Plant	TN	U.S. Tennessee Valley Authority	398
78	Hardin Generating Station	MT	Rocky Mountain Power LLC	398
79	Joppa Power Plant	IL	Electric Energy, Inc.	373
80	Palo Seco Steam Plant	PR	Puerto Rico Electric Power Authority	373
81	Pleasants Willow Island Power Stations	WV	Allegheny Energy, Inc.	364
82	JE Corette Steam Electric Station	MT	PPL	361
83	Beckjord Generating Station	OH	Duke Energy Corp	354
84	HW Pirkey Power Plant	TX	American Electric Power	352
85	Mount Storm Power Station	WV	Dominion Resources, Inc.	348
86	James River Power Station	MO	City Utilities Of Springfield MO	348
87	Plant Crist	FL	Southern Co	348
88	San Juan Steam Plant	PR	Puerto Rico Electric Power Authority	347
89	Cardinal Plant	OH	American Electric Power	342
90	Shawnee Fossil Plant	KY	U.S. Tennessee Valley Authority	341
91	San Juan Generating Station	NM	Public Service Co of New Mexico	340
92	Belews Creek Steam Station	NC	Duke Energy Corp	337
93	Cape Fear Steam Electric Plant	NC	Progress Energy, Inc.	330
94	Twin Oaks	TX	PNM, Inc.	329
95	Urquhart Generation Station	SC	SCANA	327
96	Cheswick Power Plant	PA	Genon Energy, Inc.	319
Total				**63,711**

Highlights:

- The top 20 percent of all power plant lead emitters reported 63,711 pounds, or almost 32 tons of the chemical in 2010. This is 65 percent of all power plant lead emissions nationwide.

Mercury

Mercury exists in three forms: elemental mercury, inorganic mercury compounds (primarily mercuric chloride), and organic mercury compounds (primarily methyl mercury). All forms of mercury are quite toxic, and each form exhibits different health effects. Acute (short-term) and chronic (long-term) exposure to high levels of elemental mercury in humans results in central nervous system effects such as tremors, mood changes, and slowed sensory and motor nerve function. The major effect from chronic exposure to inorganic mercury is kidney damage. Methylmercury – the form of mercury of primary concern from coal-fired power plant emissions – can cause central nervous system effects such as blindness, deafness, and impaired level of consciousness. Methylmercury can cause developmental disorders in infants born to women who have ingested high levels of methylmercury.[17]

Table 6, below, shows the top 20 percent, or 90 plants out of 452 power plants that reported emissions of mercury to EPA's Toxics Release Inventory in 2010. *Table 5*, below, shows the top 20 percent of mercury emitters, or 90 power plants out of the 452 that reported mercury emissions to TRI in 2010.

Table 6. Top Power Plant Mercury Emitters - 2010

Rank	Facility	State	Owner	Mercury (lbs)
1	Big Brown Steam Electric Station	TX	Luminant Generation Co LLC	1,610
2	Labadie Energy Center	MO	Ameren Corp	1,527
3	Martin Lake Steam Electric Station	TX	Luminant Generation Co LLC	1,420
4	Limestone Electric Generating Station	TX	NRG Texas Power LLC	1,150
5	HW Pirkey Power Plant	TX	American Electric Power	1,070
6	Miller Steam Plant	AL	Southern Co	1,037
7	Monticello Steam Electric Station	TX	Luminant Generation Co LLC	1,005
8	Big Cajun 2	LA	NRG Energy, Inc.	850
9	Gavin Plant	OH	American Electric Power	829
10	WA Parish Electric Generating Station	TX	NRG Texas Power LLC	820
11	Coal Creek Station	ND	Great River Energy	779
12	Shawville Station	PA	Genon Energy, Inc	702
13	Coal Fired Complex	OK	Grand River Dam Authority	670
14	Monroe Power Plant	MI	DTE Energy Co	660
15	Independence Steam Electric Station	AR	Entergy Corp	601
16	Amos Plant	WV	American Electric Power	585
17	Conemaugh Power Plant	PA	Genon Energy, Inc.	576
18	IPL Petersburg	IN	AES Corp	568
19	Navajo Generating Station	AZ	Salt River Project	566
20	White Bluff Generating Plant	AR	Entergy Corp	559
21	EME Homer City Generation LP	PA	Edison International	547

Table 6. Top Power Plant Mercury Emitters - 2010				
Rank	**Facility**	**State**	**Owner**	**Mercury (lbs)**
22	Gaston Steam Plant	AL	Southern Co	545
23	Milton R Young Station	ND	Minnkota Power Cooperative, Inc.	544
24	Calaveras Power Station	TX	City of San Antonio	540
25	Jeffrey Energy Center	KS	Westar Energy, Inc.	524
26	RM Schahfer Generating Station	IN	NiSource, Inc.	522
27	Jim Bridger Plant & Bridger Coal Co	WY	Berkshire Hathaway	494
28	Sandow Steam Electric Station	TX	Luminant Generation Co LLC	487
29	Greene County Steam Plant	AL	Southern Co	486
30	Columbia Energy Center	WI	Alliant Energy Corp	472
31	Coronado Generating Station	AZ	Salt River Project	472
32	Welsh Plant	TX	American Electric Power	470
33	Four Corners Steam Electric Station	NM	Pinnacle West Capital Corp	465
34	San Miguel	TX	San Miguel Electric Cooperative, Inc.	456
35	Antelope Valley Station	ND	Basin Electric	450
36	Rush Island Energy Center	MO	Ameren Corp	448
37	Newton Power Station	IL	Ameren Corp	435
38	W H Sammis Plant	OH	FirstEnergy Generation Corp	424
39	Kyger Creek Station	OH	Ohio Valley Electric Corp	420
40	Sherburne County Generating Plant	MN	Xcel Energy	411
41	Choctaw Generation LP	MS	Suez Energy Generation NA	410
42	Cardinal Plant	OH	American Electric Power	407
43	Nebraska City Station	NE	Omaha Public Power District	404
44	Kammer/Mitchell Plant	WV	American Electric Power	399
45	Meramec Energy Center	MO	Ameren Corp	399
46	Hatfield Power Station	PA	Allegheny Energy, Inc.	386
47	La Cygne Generating Station	KS	Great Plains Energy	380
48	Crystal River Energy Complex	FL	Progress Energy Inc	370
49	LCRA Fayette Power Project	TX	Lower Colorado River Authority/City of Austin	360
50	Louisa Generating Station	IA	Berkshire Hathaway	360
51	Neil Simpson Complex	WY	Black Hills Corp	359
52	Ottumwa Generating Station	IA	Alliant Energy Corp	346
53	Gorgas Steam Plant	AL	Southern Co	345
54	Big Sandy Plant	KY	American Electric Power	341
55	Laramie River Station	WY	Basin Electric	340
56	Belle River Power Plant	MI	DTE Energy Co	335
57	Ghent Station	KY	LG&E & KU Energy LLC	332
58	Mount Storm Power Station	WV	Dominion Resources, Inc.	332
59	Centralia Coal Plant	WA	Transalta Centralia Generation/Mining	331
60	Clifty Creek Station	IN	Ohio Valley Electric Corp	330

Table 6. Top Power Plant Mercury Emitters - 2010				
Rank	**Facility**	**State**	**Owner**	**Mercury (lbs)**
61	Sioux Energy Center	MO	Ameren Corp	324
62	Muskingum River Plant	OH	American Electric Power	321
63	Walter Scott Jr Energy Center	IA	Berkshire Hathaway	320
64	George Neal South	IA	Berkshire Hathaway	320
65	Conesville Plant	OH	American Electric Power	318
66	Armstrong Power Station	PA	Allegheny Energy Inc	313
67	Mountaineer Plant	WV	American Electric Power	312
68	Mill Creek Station	KY	LG&E & Ku Energy LLC	308
69	Brunner Island Steam Electric Station	PA	PPL	303
70	North Omaha Station	NE	Omaha Public Power District	302
71	Tolk Station	TX	Xcel Energy	302
72	Eastlake Plant	OH	Firstenergy Generation Corp	301
73	Twin Oaks	TX	PNM, Inc	300
74	Springerville Generating Station	AZ	Tuscon Electric Power Company	295
75	Harrington Station	TX	Xcel Energy	292
76	Holcomb Unit 1	KS	Sunflower Electric Power Corp	280
77	Gallatin Fossil Plant	TN	U.S. Tennessee Valley Authority	280
78	Cholla Power Plant	AZ	Pinnacle West Capital Corp	279
79	Thomas Hill Energy Center	MO	Associated Electric Cooperative, Inc.	279
80	Montour Steam Electric Station	PA	PPL	277
81	Fort Martin Power Station	WV	Allegheny Energy, Inc.	276
82	Big Stone Plant	SD	Otter Tail Corp	272
83	Johnsonville Fossil Plant	TN	U.S. Tennessee Valley Authority	260
84	John Sevier Fossil Plant	TN	U.S. Tennessee Valley Authority	250
85	Leland Olds Station	ND	Basin Electric	250
86	Muskogee Generating Station	OK	OGE Energy Corp	249
87	Coyote Station	ND	Otter Tail Corp	248
88	Avon Lake Power Plant	OH	Genon Energy, Inc.	246
89	Plant Daniel	MS	Southern Co	242
90	Gerald Gentleman Station	NE	Nebraska Public Power District	240
Total				**43,020**

Highlights:

- The top 20 percent of all power plant mercury emitters reported 43,020 pounds, or almost 22 tons of the chemical in 2010. This is 65 percent of all power plant mercury emissions nationwide.

- The electric power industry emits two-thirds of the nation's industrial mercury emissions.

- Texas is by far the nation's top power plant mercury air polluter. Texas coal-fired power plants emitted 16.9 percent of the total U.S. mercury air emissions for 2010, and Texas is home to 11 of the top 50 mercury emitters in the nation. These top polluters include coal-fired power plants owned by Luminant (formerly TXU), NRG Energy, American Electric Power (AEP), the City of San Antonio, San Miguel Electric Cooperative, and the Lower Colorado River Authority and the City of Austin.

- Pennsylvania power plants rank among the top mercury emitters in the nation: Genon's Shawville and Conemaugh power plants, Edison International's EME Homer City plant, and Allegheny Energy's Hatfield's Ferry plant, are among the top mercury emitters nationwide.

- Texas-based Luminant (formerly TXU) operates the dirtiest power plant in the nation in terms of mercury emissions: Big Brown, located about halfway between Houston and Dallas. Three of Luminant's other large coal-fired power plants are also ranked among the top mercury emitters in the nation: Martin Lake (number 3), Monticello (number 7), and Sandow 4 (a single coal-fired boiler ranked number 28).

- Columbus, Ohio-based American Electric Power (AEP) operates many of the nation's top power plant mercury emitters, located in Ohio, Texas and West Virginia.

- Ameren's Labadie Energy Center, in Missouri, is the second-highest ranked power plant mercury air polluter in the nation. This large coal-fired power plant has emitted more than six tons of toxic mercury into the air since 2000, nearly a third of all mercury emissions from the entire state of Missouri over that same period of time. In 2010, out of the 18 coal-fired power plants operating in the state, the Labadie power plant was responsible for nearly 40 percent of all Missouri's power plant mercury emissions.

- New Jersey-based NRG Energy, Inc. owns three of the top 10 dirtiest power plant mercury emitters in the nation: the Limestone plant located between Houston and Dallas (number 4), Big Cajun located in Louisiana (number 8), and the Parish power plant just outside Houston (number 10).

Nickel

Nickel dermatitis, consisting of itching of the fingers, hands, and forearms, is the most common effect in humans from chronic (long-term) skin contact with nickel. Respiratory effects have also been reported in humans from inhalation exposure to nickel. Human and animal studies have reported an increased risk of lung and nasal cancers from exposure to nickel refinery dusts and nickel subsulfide. Animal studies of soluble nickel compounds (i.e., nickel carbonyl) have reported lung tumors. EPA has classified nickel refinery dust and nickel subsulfide as human carcinogens, and nickel carbonyl as a probable human carcinogen.[18]

The highest nickel emissions are associated with oil-fired power plants. Hence, not surprisingly, the nation's top power plant nickel emitters are oil-fired power plants in Virginia, Puerto Rico, Hawaii, and Louisiana. Three power plants in Puerto Rico are in the top 5 emitters. The top 5 emitters account for almost 50 percent of power plant nickel air releases nationwide.

Petroleum coke – a byproduct of crude oil refining – is on the rise as a prospective source of fuel for many solid fuel-fired power plants, especially those power plants located near the Gulf Coast where close proximity to refineries and ports make pet coke an accessible fuel.

Table 6, below, shows the top 20 percent of nickel emitters, or 44 power plants out of the 222 that reported nickel emissions to TRI in 2010.

Table 7. Top Power Plant Nickel Emitters - 2010

Rank	Facility	State	Owner	Nickel (lbs)
1	Yorktown Power Station	VA	Dominion Resources, Inc.	27000
2	Aguirre Power Generation Complex	PR	Puerto Rico Electric Power Authority	25271
3	South Coast Power Plant	PR	Puerto Rico Electric Power Authority	23410
4	Kahe Generating Station	HI	Hawaiian Electric Industries, Inc.	23000
5	Palo Seco Steam Plant	PR	Puerto Rico Electric Power Authority	20747
6	FPL Manatee Power Plant	FL	Nextera Energy	4809.6
7	Brame Energy Center	LA	Cleco Corp	3095
8	Laramie River Station	WY	Basin Electric	2204
9	Roxboro Steam Electric Plant	NC	Progress Energy, Inc.	2104
10	Paradise Fossil Plant	KY	U.S. Tennessee Valley Authority	1910
11	George Neal North	IA	Berkshire Hathaway	1840
12	Riverton Generating Station	KS	The Empire District Electric Co	1804.49
13	Bowen Steam Electric Generating Plant	GA	Southern Co	1800
14	Bruce Mansfield Power Plant	PA	FirstEnergy Generation Corp	1739
15	J H Campbell Generating Plant	MI	Consumers Energy	1707.2
16	Amos Plant	WV	American Electric Power	1650
17	Gibson Generating Station	IN	Duke Energy Corp	1649
18	Bayshore Plant	OH	FirstEnergy Generation Corp	1608

Table 7. Top Power Plant Nickel Emitters - 2010				
Rank	Facility	State	Owner	Nickel (lbs)
19	De Karn - Jc Weadock Generating Plant	MI	Consumers Energy	1601.9
20	Antelope Valley Station	ND	Basin Electric	1601
21	Gavin Plant	OH	American Electric Power	1550
22	Rockport Plant	IN	American Electric Power	1550
23	St Johns River/Northside Generating Station	FL	JEA	1505
24	AES Puerto Rico LP	PR	AES Corp	1477
25	Keystone Power Plant	PA	Genon Energy, Inc.	1403
26	EME Homer City Generation LP	PA	Edison International	1402
27	A B Brown Generating Station	IN	Vectren Corp	1400
28	Monticello Steam Electric Station	TX	Luminant Generation Co, LLC	1386.03
29	Frank E Ratts Generating Station	IN	Hoosier Energy Rec, Inc.	1306
30	Conemaugh Power Plant	PA	Genon Energy, Inc.	1303
31	Big Sandy Plant	KY	American Electric Power	1250
32	Labadie Energy Center	MO	Ameren Corp	1247
33	Ghent Station	KY	LG&E & KU Energy LLC	1239
34	Walter Scott Jr Energy Center	IA	Berkshire Hathaway	1221
35	Coal Fired Complex	OK	Grand River Dam Authority	1196
36	Milton R Young Station	ND	Minnkota Power Cooperative Inc	1158
37	Cemex Construction Materials FL LLC	FL	Cemex Inc	1142
38	Mill Creek Station	KY	LG&E & KU Energy LLC	1129
39	Nebraska City Station	NE	Omaha Public Power District	1123
40	Brunner Island Steam Electric Station	PA	PPL	1043
41	Kammer/Mitchell Plant	WV	American Electric Power	1030
42	IPL Petersburg	IN	AES Corp	1023.76
43	Montour Steam Electric Station	PA	PPL	989
44	Big Bend Power Station	FL	TECO Energy, Inc.	970
Total				**180,594**

Highlights:

- The top 20 percent of all power plant nickel emitters reported 180,594 pounds, or more than 90 tons of the chemical in 2010. This is 74 percent of all power plant nickel emissions nationwide.

- Virginia's Yorktown Power Station reported the most Nickel in the nation in 2010.

- Florida Power & Light's Manatee Power Plant emitted half of the state's total power plant Nickel air emissions.

- Laramie River Station, owned by Basin Electric, emitted 78 percent of nickel of the state's six power plants.

Selenium

Selenium is a naturally occurring substance that is nutritionally an essential element, but it is toxic at high concentrations. Acute (short-term) exposure to elemental selenium, hydrogen selenide, and selenium dioxide by inhalation results primarily in respiratory effects, such as irritation of the mucous membranes, pulmonary edema, severe bronchitis, and bronchial pneumonia. Epidemiological studies of humans chronically (long-term) exposed to high levels of selenium in food and water have reported discoloration of the skin, pathological deformation and loss of nails, loss of hair, excessive tooth decay and discoloration, lack of mental alertness, and listlessness. The only selenium compound that has been shown to be carcinogenic in animals is selenium sulfide, which resulted in an increase in liver tumors from oral exposure.[19]

Only 59 power plants reported selenium emissions in 2010, representing just a fraction of the nation's power plants. *Table 8*, below, shows the top 20 percent of selenium emitters, or 12 power plants out of the 59 that reported selenium emissions to TRI in 2010.

Table 8. Top Power Plant Selenium Emitters - 2010

Rank	Facility	State	Owner	Selenium (lbs)
1	JM Stuart Station	OH	The Dayton Power & Light Co	17,745
2	Martin Lake Steam Electric Station	TX	Luminant Generation Co LLC	14,953
3	Big Brown Steam Electric Station	TX	Luminant Generation Co LLC	13,697
4	Monticello Steam Electric Station	TX	Luminant Generation Co LLC	10,190
5	Barry Steam Plant	AL	Southern Co	9,800
6	Basin Electric Laramie River Station	WY	Basin Electric	9,800
7	EME Homer City Generation LP	PA	Edison International	9,001
8	Crystal River Energy Complex	FL	Progress Energy, Inc.	8,904
9	Bowen Steam Electric Generating Plant	GA	Southern Co	7,800
10	Limestone Electric Generating Station	TX	NRG Texas Power LLC	7,000
11	Amos Plant	WV	American Electric Power	6,905
12	Belews Creek Steam Station	NC	Duke Energy Corp	6,839
Total				**122,634**

Highlights:

- The top 20 percent of all power plant selenium emitters reported 122,634 pounds, or more than 61 tons of the chemical in 2010. This is 49 percent of all power plant selenium emissions nationwide.

- Only 59 power plants representing the entire electric utility sector reported selenium emissions in 2010. Yet, the utility industry is still the top selenium emitter of all industry sectors, releasing 250,220 pounds, or125 tons, of selenium into the nation's air. That's 76.3 percent of all industrial selenium emissions.

- Texas-based Luminant's Martin Lake, Big Brown, and Monticello ranked 2nd, 3rd, and 4th in power plant selenium emissions. Together these three plants released 38,840 pounds of selenium into the air in 2010. Another Texas plant, NRG's Limestone power plant, ranked number 10 in selenium emissions.

- Texas plants account for 21 percent of national power plant selenium air emissions. Ohio and Pennsylvania power plants each account for about 13 percent, while West Virginia plants accounts for 11 percent.

- AEP's JM Stuart power plant, in Ohio, is the nation's top selenium emitter.

Hydrochloric Acid (HCl)

Hydrochloric acid (HCl) is corrosive to the eyes, skin, and mucous membranes. Acute (short-term) inhalation exposure can cause eye, nose, and respiratory tract irritation and inflammation and pulmonary edema in humans. Acute oral exposure can cause corrosion of the mucous membranes, esophagus, and stomach and skin contact can produce severe burns, ulceration, and scarring in humans. Chronic (long-term) occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in workers.[20]

Electric utilities are the top industrial source of HCl emissions into the air, accounting for 80 percent of all HCl air emissions nationwide. In 2010, the electric utilities industry released 164,839,701 pounds of HCl into the air.

Table 9, below, shows the top 20 percent of HCl emitters, or 96 power plants out of the 479 that reported HCl emissions to TRI in 2010.

Table 9. Top Power Plant Hydrochloric Acid Emitters - 2010

Rank	Facility Name	State	Owner	HCl (lbs)
1	Muskingum River Plant	OH	American Electric Power	5,300,000
2	Big Sandy Plant	KY	American Electric Power	4,900,000
3	Monroe Power Plant	MI	DTE Energy Co	4,500,000
4	EME Homer City Generation LP	PA	Edison International	4,100,005
5	Crystal River Energy Complex	FL	Progress Energy, Inc.	4,100,000
6	Branch Steam Electric Generating Plant	GA	Southern Co	3,800,000
7	Keystone Power Plant	PA	Genon Energy, Inc.	3,500,005
8	Yates Steam Electric Generating Plant	GA	Southern Co	3,100,000
9	Cardinal Plant	OH	American Electric Power	2,900,000
10	Johnsonville Fossil Plant	TN	U.S. Tennessee Valley Authority	2,700,000
11	Beckjord Generating Station	OH	Duke Energy Corp	2,460,000
12	Plant Watson	MS	Southern Co	2,400,000
13	State Line Generating Plant	IN	Dominion Resources Inc	2,360,000
14	Shawville Station	PA	Genon Energy, Inc.	2,300,005
15	Indian River Generating Station	DE	NRG Energy, Inc.	2,300,000
16	L V Sutton Electric Plant	NC	Progress Energy, Inc.	2,100,000
17	Philip Sporn Plant	WV	American Electric Power	2,100,000
18	Gallagher Generating Station	IN	Duke Energy Corp	2,010,000
19	Portland Power Plant	PA	Genon Energy, Inc.	2,000,005
20	Amos Plant	WV	American Electric Power	2,000,000
21	Rockport Plant	IN	American Electric Power	2,000,000
22	Chesterfield Power Station	VA	Dominion Resources, Inc.	2,000,000
23	Clifty Creek Station	IN	Ohio Valley Electric Corp	1,979,083
24	Eastlake Plant	OH	FirstEnergy Generation Corp	1,952,000

Table 9. Top Power Plant Hydrochloric Acid Emitters - 2010				
Rank	Facility Name	State	Owner	HCl (lbs)
25	Trenton Channel Power Plant	MI	DTE Energy Co	1,900,000
26	Kyger Creek Station	OH	Ohio Valley Electric Corp	1,870,780
27	Wilson Station	KY	Big Rivers Electric Corp	1,841,723
28	St Johns River/Northside Generating Station	FL	JEA	1,800,000
29	Merrimack Station	NH	Public Service Co of New Hampshire	1,800,000
30	HF Lee Steam Electric Plant	NC	Progress Energy, Inc.	1,800,000
31	Chesapeake Energy Center	VA	Dominion Resources, Inc.	1,800,000
32	Avon Lake Power Plant	OH	Genon Energy, Inc.	1,786,835
33	Cooper Power Station	KY	East Kentucky Power Cooperative, Inc.	1,700,000
34	Cliffside Steam Station	NC	Duke Energy Corp	1,643,904
35	Armstrong Power Station	PA	Allegheny Energy, Inc.	1,600,000
36	Eckert Power Station	MI	Lansing Board Of Water & Light	1,597,154
37	Brandon Shores & Wagner Complex	MD	Constellation Energy Group	1,500,000
38	Wateree Station	SC	SCANA	1,410,914
39	Cape Fear Steam Electric Plant	NC	Progress Energy, Inc.	1,400,000
40	Big Brown Steam Electric Station	TX	Luminant Generation Co LLC	1,397,748
41	Cheswick Power Plant	PA	Genon Energy, Inc.	1,312,686
42	Riverbend Steam Station	NC	Duke Energy Corp	1,274,424
43	Sunbury Generation LP	PA	Corona Power LLC	1,240,726
44	Kammer/Mitchell Plant	WV	American Electric Power	1,200,000
45	St. Clair Power Plant	MI	DTE Energy Co	1,200,000
46	Buck Steam Station	NC	Duke Energy Corp	1,171,057
47	Clinch River Plant	VA	American Electric Power	1,100,000
48	E W Brown Station	KY	LG&E & KU Energy LLC	1,081,000
49	Canadys Station	SC	SCANA	1,063,775
50	Lee Steam Station	SC	Duke Energy Corp	1,040,951
51	Brayton Point Power Station	MA	Dominion Resources, Inc.	1,008,303
52	Tanners Creek Plant	IN	American Electric Power	1,000,000
53	McMeekin Station	SC	SCANA	997,295
54	Sioux Energy Center	MO	Ameren Corp	972,436
55	Cedar Bay Generating Plant	FL	Cogentrix Energy LLC	949,088
56	WH Sammis Plant	OH	FirstEnergy Generation Corp	914,100
57	Kanawha River Plant	WV	American Electric Power	870,000
58	Gaston Steam Plant	AL	Southern Co	860,000
59	Mercer Generating Station	NJ	Public Service Enterprise Group	841,503
60	Danskammer Generating Facility	NY	Dynegy, Inc.	840,000
61	Alma Station	WI	Dairyland Power Cooperative	830,000
62	Wabash River Generating Station	IN	Duke Energy Corp	814,000
63	HB Robinson Steam Electric Plant	SC	Progress Energy, Inc.	810,000

Table 9. Top Power Plant Hydrochloric Acid Emitters - 2010				
Rank	Facility Name	State	Owner	HCl (lbs)
64	Miami Fort Generating Station	OH	Duke Energy Corp	803,000
65	Titus Power Plant	PA	Genon Energy, Inc.	790,005
66	Bowen Steam Electric Generating Plant	GA	Southern Co	750,000
67	Yorktown Power Station	VA	Dominion Resources, Inc.	743,000
68	Plant Crist	FL	Southern Co	710,000
69	Kingston Fossil Plant	TN	U.S. Tennessee Valley Authority	680,000
70	Charles R Lowman Power Plant	AL	PowerSouth Energy Cooperative	650,000
71	JH Campbell Generating Plant	MI	Consumers Energy	631,000
72	WH Weatherspoon Plant	NC	Progress Energy, Inc.	630,000
73	Greene County Steam Plant	AL	Southern Co	630,000
74	Dan River Steam Station	NC	Duke Energy Corp	628,853
75	Monticello Steam Electric Station	TX	Luminant Generation Co LLC	621,221
76	Richard H Gorsuch Station	OH	American Municipal Power	620,250
77	River Rouge Power Plant	MI	DTE Energy Co	590,000
78	Erickson Station	MI	Lansing Board Of Water & Light	570,096
79	Conesville Plant	OH	American Electric Power	530,000
80	Dale Power Station	KY	East Kentucky Power Cooperative, Inc.	520,000
81	Bremo Power Station	VA	Dominion Resources, Inc.	517,000
82	Jefferies Generating Station	SC	South Carolina Public Service Authority	514,239
83	George Neal North	IA	Berkshire Hathaway	513,420
Total				**131,743,589**

Highlights:

- The top 20 percent of all power plant HCl emitters reported 131,743,589 pounds, or 65,872 tons of the chemical in 2010. This is more than 80 percent of all power plant HCl emissions nationwide.

- The top five emitting plants together reported releasing 22.9 million pounds, or 14 percent of total HCl emissions.

ENDNOTES

[1] EPA Air Toxics Website, Arsenic Compounds, http://www.epa.gov/ttnatw01/hlthef/arsenic.html.

[2] EPA Website, Technical Factsheet on Selenium, http://www.epa.gov/ogwdw/pdfs/factsheets/ioc/tech/selenium.pdf; EPA Air Toxics Web Site, Cadmium Compounds, http://www.epa.gov/ttn/atw/hlthef/cadmium.html.

[3] EPA Air Toxics Website, Nickel Compounds, http://www.epa.gov/ttnatw01/hlthef/nickel.html.

[4] EPA's Regulatory Impact Analysis of the Proposed Air Toxics Rule, Table 1-2 and Table 1-3, *available at* http://www.epa.gov/ttn/atw/utility/utilitypg.html.

[5] http://www.epa.gov/tri/guide_docs/pdf/2000/00egf.pdf

[6] Appendix A and Appendix B are electronic spreadsheets, containing publically-available data from the TRI database. The spreadsheets are available with this report at https://www.environmentalintegrity.org

[7] Proposed National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-fired Electric Utility Steam Generating Units and Standards of Performance for Electric Utility Steam Generating Units, 76 Federal Register 24982 (May 3, 2011).

[8] *See* U.S. EPA Health Effects Notebook for Hazardous Air Pollutants, available at: http://www.epa.gov/ttn/atw/hlthef/hapindex.html (*Citing, e.g., for arsenic health effects references*: Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Arsenic* (Draft). U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998; Agency for Toxic Substances and Disease Registry (ATSDR). *Case Studies in Environmental Medicine. Arsenic Toxicity.* U.S. Public Health Service, U.S. Department of Health and Human Services, Altanta, GA. 1990; U.S. Environmental Protection Agency. *Health Assessment Document for Inorganic Arsenic*. EPA/540/1-86/020. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Washington, DC. 1984; U.S. Environmental Protection Agency. *Integrated Risk Information System (IRIS) on Arsine*. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999; U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993; U.S. Environmental Protection Agency. *Integrated Risk Information System (IRIS) on Arsenic*. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999; California Environmental Protection Agency (CalEPA). *Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Draft for Public Comment.* Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997; M. Windolz. *The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals.* 10th ed. Merck and Co., Rahway, NJ. 1983; American Conference of Governmental Industrial Hygienists (ACGIH). *1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices*. Cincinnati, OH. 1999; Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. *Code of Federal Regulations.* 29 CFR 1910.1000. 1998; National Institute for Occupational Safety and Health (NIOSH). *Pocket Guide to Chemical Hazards*. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.

[9] *Id, citing for chromium health effects references*: Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Chromium.* U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998; *SAIC. PM/Toxics Integration: Addressing Co-Control Benefits.* Submitted to U.S. Environmental Protection Agency, Office of Air Quality Plannng and Standards, Research Triangle Park, NC. 1998; U.S. Environmental Protection Agency. *Toxicological Review of Trivalent Chromium.* National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1998; U.S. Environmental Protection Agency. *Toxicological Review of Hexavalent Chromium.* National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1998; World Health Organization. *Chromium. Environmental Health Criteria 61*. Geneva, Switzerland. 1988; U.S. Department of Health and Human Services.

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[10] *See* "Mercury Falling," a 2011 report by the Center for American Progress, available at http://www.americanprogress.org/issues/2011/06/mercury_falling.html.

[11] *See* Minnesota Pollution Control Agency's "Reducing mercury emissions from power plants in Minnesota," http://www.pca.state.mn.us/index.php/view-document.html?gid=11651.

[12] For, example, EPA has taken enforcement actions against some of the nation's largest electric power companies to require installation of modern pollution controls on coal-fired power plants in Ohio, Indiana, Georgia, Florida, and Tennessee. http://www.epa.gov/compliance/resources/cases/civil/caa/ppsl.html. View EPA court settlements at: http://www.epa.gov/compliance/resources/cases/civil/caa/coal/index.html.

[13] Facilities from Puerto Rico, Guam, and the U.S. Virgin Islands report toxic emissions to TRI, and thus are included in this report.

[14] http://www.epa.gov/ttn/atw/hlthef/arsenic.html.

[15] http://www.epa.gov/ttn/atw/hlthef/chromium.html.

[16] http://www.epa.gov/ttn/atw/hlthef/lead.html.

[17] http://www.epa.gov/ttn/atw/hlthef/mercury.html.

[18] http://www.epa.gov/ttn/atw/hlthef/nickel.html.

[19]http://www.epa.gov/ttn/atw/hlthef/selenium.html, citing: Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Selenium* (Update). Public Health Service, Department of Health and Human Services, Atlanta, GA. 1996; U.S. Environmental Protection Agency. *Final Draft for the Drinking Water Criteria Document for Selenium.* Criteria and Standards Division. Office of Drinking Water, Washington, D.C. 1986; U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993; U.S. Environmental Protection Agency. *Integrated Risk Information System (IRIS) on Selenium and Compounds*. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999; California Environmental Protection Agency (CalEPA). Air Toxics Hot Spots Program Risk Assessment Guidelines: Part III. *Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels.* SRP Draft. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1999; American Conference of Governmental Industrial Hygienists (ACGIH). *1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices.* Cincinnati, OH. 1999; National Institute for Occupational Safety and Health (NIOSH). *Pocket Guide to Chemical Hazards*. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997; Occupational Safety and Health Administration (OSHA); Occupational Safety and Health Standards, Toxic and Hazardous Substances. *Code of Federal Regulations.* 29 CFR 1910.1000. 1998.

[20] http://www.epa.gov/ttn/atw/hlthef/hydrochl.html.