DIRTY ENERGY'S ASSAULT ON OUR HEALTH: OZONE POLLUTION

MARCH 2011

ENVIRONMENT NEW MEXICO
RESEARCH & POLICY CENTER

DIRTY ENERGY'S ASSAULT ON OUR HEALTH: OZONE POLLUTION

Lauren Randall

March 2011

ACKNOWLEDGEMENTS

Environment New Mexico Research & Policy Center would like to thank Paul Billings, Vice President, National Policy and Advocacy, American Lung Association; David Schoengold, Principal, MSB Energy Associates; Conrad Schneider, Advocacy Director, Clean Air Task Force; Dr. Jeffery Corbin, Assistant Professor, Biology, Union College; Scott Daniels, Deputy Director, Kitsap County Health District, Washington; and Minnie Sagar, Public Health Program/ Policy Analyst, Health and Human Services Agency, California for their review of this report. Additional thanks to Travis Madsen and Tony Dutzik of the Frontier Group, and Nathan Willcox of Environment America Research & Policy Center for editorial support.

Environment New Mexico Research & Policy Center is grateful to the New York Community Trust making this report possible.

The author bears responsibility for any factual errors. The recommendations are those of Environment New Mexico Research & Policy Center. The views expressed in this report are those of the author and do not necessarily reflect the views of our funders or those who provided review.

© 2011 Environment New Mexico Research & Policy Center

Environment New Mexico Research & Policy Center is a 501(c)(3) organization. We are dedicated to protecting America's air, water and open spaces. We investigate problems, craft solutions, educate the public and decision makers, and help Americans make their voices heard in local, state and national debates over the quality of our environment and our lives. For more information about Environment New Mexico Research & Policy Center, please visit www.environmentnewmexico.org/center.

Cover Photos: Background: flickr.com, alicialee17; Inset: flickr.com, lon2000
Layout: Sproutreach

TABLE OF CONTENTS

EXECUTIVE SUMMARY **7**

INTRODUCTION **9**

GROUND-LEVEL OZONE POLLUTION THREATENS PUBLIC HEALTH AND THE ENVIRONMENT **10**

OZONE: BENEFICIAL UP HIGH, HARMFUL DOWN LOW 11

GROUND-LEVEL OZONE HARMS PUBLIC HEALTH 12

GROUND-LEVEL OZONE POLLUTION DAMAGES THE ENVIRONMENT 15

PROTECTING OUR WORLD AND OUR HEALTH: RECOMMENDATIONS FOR REDUCING GROUND-LEVEL OZONE POLLUTION **17**

EMISSIONS OF OZONE-FORMING POLLUTION FROM POWER PLANTS ARE STILL TOO HIGH 17

NATIONAL AIR QUALITY STANDARDS SHOULD BE STRENGTHENED 18

ACCELERATING THE TRANSITION TO CLEAN ENERGY 19

APPENDICES **20**

APPENDIX A: States Ranked by Total Nitrogen Oxides Emitted from Power Plants in 2009 20

APPENDIX B: Tons of Nitrogen Oxides Emitted From All Power Plants in 2009 21

APPENDIX C: Power Plants Ranked by Tons of Nitrogen Oxides Emitted in 2009 43

APPENDIX D: Unhealthy Air Quality for Metropolitan Areas Due to Air Pollution, from 2008 63

METHODOLOGY **64**

NOTES **65**

DIRTY ENERGY'S ASSAULT ON OUR HEALTH: OZONE POLLUTION

Lauren Randall

Executive Summary

Dirty energy pollutes the air we breathe, threatening our health and our environment.

When power plants burn coal, oil or gas, they create the ingredients for ground-level ozone pollution, one of the main components of "smog" pollution. Especially on hot summer days, across wide areas of the United States, ozone pollution reaches levels that are unhealthy to breathe, putting our lives at risk. In 2009, U.S. power plants emitted more than 1.9 million tons of ozone-forming nitrogen oxide pollution into the air.

In order to better protect public health, the United States Environmental Protection Agency (EPA) should issue a new air quality standard to reduce ground-level ozone pollution. To achieve these reductions in pollution, the United States should increase pollution control technologies for power plants and accelerate the transition to clean electricity sources, including wind and solar power. In addition, the United States should reduce ozone-forming pollution from mobile sources.

Emissions from power plants contribute to widespread ozone pollution in the United States.

- More than half of the people in the United States —56 percent— live in areas with unhealthy levels of ozone.
- Power plants emitted 1,927,569.3 tons of nitrogen oxide pollution, a key precursor to ozone pollution, into the environment in 2009.
- Emissions from power plants in just eleven states account for 50 percent of the total nitrogen oxide pollution emitted by power plants into our environment. See ES Figure 1 for the top 15 most polluting states.

ES Figure 1: Nitrogen Oxide Emmissions From Power Plants in the Top 15 Most Polluting States

National Rank	State	NOx (tons) Emitted by All Plants in 2009
1	TX	138,576.00
2	PA	109,043.70
2	IN	97,544.17
4	OH	95,811.04
5	FL	94,162.84
6	MI	79,013.19
7	KY	78,794.03
8	OK	73,325.39
9	NM	66,553.27
10	WY	66,221.23
11	AZ	65,608.17
12	ND	62,295.80
13	UT	62,068.81
14	GA	57,533.58
15	MO	53,604.01

(See Appendix A for full list of total nitrogen oxide emissions from power plants in all states.)

Ground-level ozone pollution puts our health at risk.

- Repeated exposure to ozone can cause permanent lung damage and can even kill. According to a RAND Corporation health study, in California alone, high levels of ozone pollution contributed to nearly 30,000 emergency room visits and hospital admissions and $193 million in hospital medical care from 2005 to 2007.

- Children and adults suffer more asthma attacks and increased respiratory difficulty when exposed to ozone pollution. Approximately 3.9 million children and more than 10.7 million adults with asthma live in regions with very high levels of ozone pollution. According to the United States Department of Health and Human Services, approximately 5,000 asthma-related deaths occur each year in the U.S.

- Children are particularly vulnerable. Children who grow up in areas with high levels of ozone pollution may develop diminished lung capacity, putting them at greater risk of lung disease later in life.

- Ozone exposure can impact prenatal health, with research finding that in-utero exposure to ozone is associated with lower birth weight and intrauterine growth retardation.

Emission controls are helping to reduce health-threatening, ozone-forming pollution from power plants.

- In the last five years, thanks to standards set by EPA, coal-fired power plants achieved reductions in their emissions of nitrogen oxides by an average of 74 percent.

- Overall electric-sector nitrogen oxide pollution has dropped by almost half without noticeably affecting electricity prices or the reliability of the power system.

However, federal standards for ground-level ozone are not sufficiently protective of public health and power plant emissions are still too high.

- Research shows that the current 8-hour ground-level ozone standard of 75 parts per billion (ppb) set in March 2008 under the Bush administration actually leaves millions at risk.

- EPA analysts project that a standard in the range of 60-70 ppb would prevent as many as 12,000 premature deaths per year from heart or lung diseases, along with thousands of cases of bronchitis, asthma and nonfatal heart attacks.

More action is necessary to protect our health and environment from ground-level ozone pollution.

- To protect our health and our environment, EPA should establish a National Ambient Air Quality Standard for ground-level ozone of no higher than 60 parts per billion.

- Power plants should continue to implement more advanced emission control technologies like selective catalytic reduction systems to reduce ozone-forming nitrogen oxide emissions, and ultimately help areas meet the EPA air quality standard.

- Additionally, to help reduce pollution, state and federal governments should accelerate the transition away from fossil fuels and toward a clean energy economy. Important steps include:

  ◊ Establishing or increasing renewable electricity standards to ensure that at least 25 percent of U.S. electricity comes from renewable sources of energy such as wind and solar by 2025;

  ◊ Strengthening energy efficiency standards and codes for appliances, and requiring all new buildings use zero net energy by 2030;

  ◊ Ramping up investment in solar power through tax credits, specific solar generation targets in state renewable electricity standards, requirements for "solar ready homes," rebate programs, and other measures; and

  ◊ Ending subsidies for fossil fuel industries.

Introduction

Air pollution in the United States is a serious and persistent problem.

According to the American Lung Association, more than half of the nation's population suffers from air pollution levels that are too often dangerous to breathe.[1]

Ozone pollution in particular poses major health risks, especially for children and the elderly. Ozone pollution shortens lives, sends people to the hospital and the emergency room, and triggers asthma attacks. And these are merely the most visible signs of the health threats posed by polluted air.

Alexandra McCarthy, of Winchester, Massachusetts, must cope with this reality first-hand. In an interview with Environment America Research & Policy Center she explained that when her asthma is acting up on unhealthy air days, "It feels like not enough air is able to enter my lungs. It's as if my lungs are working at half-capacity. If I'm exercising, I have to take frequent breaks to avoid a feeling of hyperventilation. There is a heavy, tight feeling in my chest and exhalation feels like someone is squeezing my lungs. When I notice that my lungs are only able to accommodate shallow breaths, it creates a sense of panic."

It wasn't supposed to be this way – not in 2011. When Congress adopted the federal Clean Air Act in 1970, it established the goal of setting and achieving air quality standards protective of human health by 1975. While air quality has markedly improved since then, America's air still fails to meet established federal health standards.

However, solutions do exist. From cost-effective emissions controls like selective catalytic reduction technology for power plants, to renewable energy sources like wind and solar power, we have the technological know-how to significantly reduce air pollution.

By adopting public policies that put these and other technologies to work, states and the federal government can reduce air pollution and help thousands of people live longer and healthier lives.

Ground-Level Ozone Pollution Threatens Public Health and the Environment

Air pollution in the United States makes people sick, cuts lives short, reduces agricultural productivity, and pollutes our waterways. Ground-level ozone is one of the most harmful air pollutants.

Much of ozone pollution comes from burning fossil fuels for energy—in power plants, industrial facilities, cars, and trucks. Pollutants emitted from these sources mix together in the atmosphere and react with sunlight to form a toxic soup.

On summer days, when the sun is most intense, visibility plummets and the air looks thick and hazy. (See Figure 1.)

Figure 1: Clear and Polluted Days in Berks County, Pennsylvania

August 25, 2005—a clear day.

June 22, 2005—a polluted day, with high levels of soot and ground-level ozone forming a thick haze.

Source: Haze Cam, Berks County Environmental Advisory Council

Ozone: Beneficial Up High, Harmful Down Low

Ozone is a caustic gas composed of three oxygen atoms that occurs both in the Earth's upper atmosphere and at ground level.

Ozone that occurs in the upper atmosphere —the stratosphere— is generally natural in origin and forms a protective layer that shields life on Earth from the sun's harmful ultraviolet rays. This "good" ozone layer extends upward from approximately 6 to 30 miles.[2]

Ground-level or "bad" ozone is harmful to our health and environment. It is dangerous to breathe and it damages crops, trees and other vegetation. It is also the main ingredient of smog.[3]

Ground-level or "bad" ozone is not emitted directly into the air, but is created by chemical reactions between nitrogen oxides (NOx) and volatile organic compounds (VOC) in the presence of sunlight.[4] Ozone pollution is of particular concern during the summer months because strong sunlight and hot weather result in the build-up of harmful ozone concentrations.[5]

Emissions from industrial facilities and power plants, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of nitrogen oxides and volatile organic compounds. According to the U.S. Environmental Protection Agency, car exhaust accounts for approximately half of all nitrogen oxides and half of all volatile organic compounds emitted into the air.[6] Power plants emitted 1,927,569.3 tons of nitrogen oxides in 2009[7], and account for almost one-quarter of all nitrogen oxides emitted into the air.[8]

Table 1 lists the top fifteen states with the highest levels of nitrogen oxide emissions from power plants. Just the top 11 states account for 50 percent of total nitrogen oxide pollution emitted into our environment by power plants.

Table 1. Nitrogen Oxide Emissions from Power Plants in the Top 15 Most Polluting States

National Rank	State	NOx (tons) Emitted by All Plants in 2009
1	TX	138,576
2	PA	109,043.70
2	IN	97,544.17
4	OH	95,811.04
5	FL	94,162.84
6	MI	79,013.19
7	KY	78,794.03
8	OK	73,325.39
9	NM	66,553.27
10	WY	66,221.23
11	AZ	65,608.17
12	ND	62,295.80
13	UT	62,068.81
14	GA	57,533.58
15	MO	53,604.01

(See Appendix A for full list of total nitrogen oxide emissions from power plants in all states.)

Ground-Level Ozone Harms Public Health

Repeated exposure to ozone can cause permanent lung damage and can even kill.[9]

More than half of the people in the United States —56 percent— live in areas with unhealthy levels of ozone.[10] According to the American Lung Association's 2010 State of the Air Report, counties that were given an "F" for ozone levels due to unhealthy air days had a combined population of almost 167.3 million. The actual number of people who breathed unhealthy levels of ozone was likely much larger, as this number does not include people who live in counties where no ozone monitors exist.[11]

Table 2 lists unhealthy air days in metropolitan areas due to ozone and other dangerous pollutants. As opposed to the ozone-forming pollution emitted by power plants and stationary sources that contributes to unhealthy air days in much of the United States, southern California's ozone pollution is primary caused by mobile-source emissions.[12] The table's definition of "sensitive groups" includes people with lung disease, older adults, and children. For a full description of the table, refer to the methodology section of the report.

Table 2. Unhealthy Air Quality in Metropolitan Areas Due to Air Pollution, from 2008		
Number of Days Air Quality was Unhealthy for Sensitive Groups	**Number of Days Air Quality was Unhealthy**	**Metropolitan Area**
16	0	Birmingham, AL
67	26	Bakersfield, CA
43	28	Los Angeles - Long Beach,CA
56	15	Fresno,CA
79	53	Riverside - San Bernadino, CA
84	24	Visalia - Tulare - Porterville, CA
29	4	San Diego, CA
28	7	Modesto, CA
27	9	Merced, CA
31	0	Ventura, CA
41	27	San Luis Obispo- Atascadero - Paso Robles, CA
37	20	Sacramento, CA
15	4	Redding, CA
24	4	Atlanta, CA
16	0	Cincinnati, OH - KY - IN
19	4	Baltimore, MD
26	4	Philadelphia, PA - NJ
18	1	Middllesex - Somerset - Hunterdon, NJ
17	1	Monmouth - Ocean, NJ
15	7	Albuquerque, NM
19	11	Las Cruces, NM
18	1	New York, NY
34	1	Pittsburgh, PA
15	0	Reading, PA
26	3	Charlotte - Gastonia - Rock Hill, NC - SC
15	1	Greenville - Spartanburg - Anderson, SC
23	0	Knoxville, TN
20	2	Houston, TX

Ozone quickly reacts with airway tissues and produces inflammation similar to a sunburn on the inside of the lungs. This inflammation makes lung tissues less elastic, more sensitive to allergens, and less able to ward off infections.[13] Minor exposure to ozone can cause coughing, wheezing, and throat irritation. Constant exposure to ozone over time permanently damages lung tissues, decreases the ability to breathe normally, and exacerbates or even causes chronic diseases like asthma.[14]

On days with elevated levels of ozone pollution:

- Deaths from cardiovascular and respiratory causes increase, according to a 14-year study conducted in 95 U.S. cities.[15]

- Hospitals admit increased numbers of patients for respiratory and cardiovascular disease.[16] Scientists have estimated that typical summertime ozone pollution is responsible for up to half of all respiratory hospital admissions on bad air days.[17]

- More people visit hospital emergency rooms for asthma, pneumonia and upper respiratory infections.[18] According to a RAND Corporation health study, in California alone, high levels of ozone pollution contributed to nearly 30,000 emergency room visits and hospital admissions and $193 million in hospital medical care from 2005 to 2007.[19]

- Children and adults suffer more asthma attacks, increased respiratory difficulty, and reduced lung function.[20] Approximately 3.9 million children and more than 10.7 million adults with asthma live in regions with very high levels of ozone pollution.[21] According to the U.S. Department of Health and Human Services, approximately 5,000 asthma-related deaths occur each year in the U.S.[22]

- Even healthy adults can experience a 15 to more than 20 percent reduction in lung function from exposure to low levels of ozone over several hours of moderate exercise.[23]

- More adults miss work and more children miss school due to illness.[24]

While breathing ozone pollution can be physically painful, damaging health effects from ozone pollution can also occur without any noticeable signs. People who live in areas with frequently high ozone levels may find that their initial symptoms go away over time – particularly when exposure to high ozone levels continues for several days.[25] Yet ground-level ozone pollution still causes lung damage even when acute symptoms are not noticeable. Ozone exposure can also impact prenatal health, with research finding that in-utero exposure to ozone is associated with lower birth weight and intrauterine growth retardation.[26]

Children, older adults, people who are active outdoors, and people with existing respiratory system ailments suffer most from ozone's effects. The American Lung Association estimates that approximately 60 million people under the age of 18 or over the age of 65 live in parts of the United States with very high levels of ozone pollution.[27] Because children's respiratory systems are still developing, children who grow up in areas with high levels of ozone pollution are at risk for developing permanently diminished lung capacity, increasing the risk of lung disease later in life.[28] Additionally, older adults exposed to high levels of ozone pollution may experience an accelerated decline in lung function.[29]

For individuals suffering from asthma, ozone exposure can make the lungs more sensitive to allergens and/or trigger a narrowing of the pathways of the lungs, so that breathing becomes like trying to suck a thick milk shake through a straw.[30] Asthmatics are also more severely affected by the reduced lung function and irritation that ozone pollution causes.[31]

Additionally, ozone pollution poses greater risks to people suffering from chronic bronchitis, emphysema, cardiovascular disease, and diabetes.[32]

Ground-Level Ozone Pollution Damages the Environment

Ozone pollution also harms our environment, reducing agricultural productivity, damaging forests, impairing visibility in national parks, and polluting waterways.

Ozone pollution damages vegetation and ecosystems. It interferes with the ability of plants to produce and store food and leads to reduced agricultural crop and commercial forest yields, reduced growth and survivability of tree seedlings, and increased susceptibility to diseases, pests and other stresses such as harsh weather.[33]

When ozone pollution is high, plants respond by closing their "mouths" – called stomata.[34] This function reduces the amount of ozone affecting plants, but it also means that plants are taking in less of the vital building blocks they need to grow and thrive, like carbon dioxide. Plants use carbon dioxide with light and water to produce food and oxygen through photosynthesis. If plants don't get enough carbon dioxide, they don't grow as much as they should.

As a result, ozone exposure reduces yields for economically important crops such as soybeans, kidney beans, wheat, and cotton.[35] In 2003, EPA estimated that in the United States alone, ozone pollution was responsible for $500 million in reduced crop production.[36]

In 2008, David Karnosky, a forestry professor at Michigan Tech University, conducted a long-running experiment in northern Wisconsin where some trees were exposed to extra doses of ozone and others were not. At the beginning of the experiment in 1998, existing trees were removed and almost 5,000 aspen, birch, and maple trees were planted, so that total growth could be monitored. Karnosky found that ozone-exposed trees grew twenty-five percent less than those with less exposure.[37] The levels of ozone that the trees experienced are comparable to the levels that could exist in northern Wisconsin by 2050, if ozone pollution is not reduced.[38]

Ozone exposure also decreases the natural beauty of landscapes in cities, national parks, forests, and recreation areas. By weakening sensitive vegetation, ozone pollution makes plants more susceptible to environmental stresses. As a result, exposure can kill or damage leaves so that they fall off the plants too soon or become spotted or brown.[39]

The National Park Service found that Shenandoah National Park, which is believed to have more plant and animal species than live in all of Europe, is damaged by ground-level ozone pollution.[40] Ozone pollution contributes to vegetative discoloration and growth disruption in plants and trees in Shenandoah National Park.[41] Additionally, visibility in the park has drastically declined in part due to the effects of ground-level ozone pollution reacting with light. The park's natural views of 100 miles now extend only 24 miles on average, and less than one mile on days with the worst air pollution. Park visitors can no longer reliably see the Washington Monument, and some visitors may not even be able to see the next mountain ridge.

Ground-level ozone pollution also adversely impacts ecological functions such as mineral nutrient cycling, which negatively affects species' habitats. For example, one of the key precursors of ozone pollution, nitrogen oxides, contributes to fish kills and algae blooms in the Chesapeake Bay.[44]

Additionally, according to the United Nations Intergovernmental Panel on Climate Change, ground-level ozone is a potent greenhouse gas and contributes to global warming. Like other greenhouse gases, ozone absorbs reflected energy from land and oceans and traps heat in the atmosphere.

Ozone's role in global warming poses major threats to the environment. For example, as global warming persists, tree species are expected to move toward the north and upslope, where there are already signs of increasing destructive impacts from invasive species and insect pests, some of which may be linked to rising temperatures. The changing climate also poses obvious and very real risks to wildlife. Rising global temperatures move an increasing number of plant and wildlife species towards extinction.

Protecting Our World and Our Health: Recommendations for Reducing Ground-Level Ozone Pollution

Thanks to EPA, emission controls are helping to reduce dangerous ozone-forming pollution from power plants. However, federal standards for ozone pollution are not sufficiently protective of public health, and power plant emissions are still too high. Power plants continue to contribute to thousands of deaths every year due to ozone-forming emissions.

To meet the health standards that scientists agree would better protect us from this dangerous pollution, EPA should establish a National Ambient Air Quality Standard —or NAAQS— for ground-level ozone of no higher than 60 ppb. Power plants should implement more and better advanced emission control technologies like selective catalytic reduction systems to reduce ozone-forming nitrogen oxide emissions, and ultimately help areas meet a safe EPA air quality standard. Additionally, state and federal governments should accelerate the transition away from fossil fuels and toward a clean energy economy.

Emissions of Ozone-Forming Pollution from Power Plants are Still Too High

While measures are being taken to reduce ozone-forming pollution from power plants, power plant pollution continues to put our health at risk.

Nationally, ground-level ozone concentrations were 10 percent lower in 2008 than in 2001.[47] Much of this reduction in ozone can be attributed to EPA standards that targeted nitrogen oxide pollution emitted by power plants. In the last five years, some coal-fired power plants implemented emissions control technologies like selective catalytic reduction systems that helped reduce their emissions of nitrogen oxides by an average of 74 percent.[48] Overall electric-sector nitrogen oxide pollution has dropped by almost half without noticeably affecting electricity prices or the reliability of the power system.[49]

Additionally, the EPA's Clean Air Transport Rule, which is expected to be finalized by June 2011, is the most current standard that would achieve the largest amount of nitrogen oxide reductions from power plants. The Transport Rule will replace the EPA's Clean Air Interstate Rule and will require 31 states and the District of Columbia to significantly improve air quality by reducing power plant emissions of nitrogen oxides and sulfur dioxide. While the Transport Rule will be effective in significantly reducing nitrogen oxide pollution, and thus ground-level ozone pollution, it doesn't go far enough to meet what scientists say is a safe level of ozone pollution in the air. Additional emission reductions will be needed to effectively protect public health from ozone pollution.[50]

Reductions in nitrogen oxide pollution have led and will lead to improvements in our health and the health of our environment, but the reality is that far too many Americans live in areas where the air is still unsafe to breathe due to ozone pollution. So in order to sufficiently protect public health with an adequate margin of safety, power plants must further limit emissions of dangerous nitrogen oxide pollution.

This is doubly true considering that federal standards for ground-level ozone are not sufficiently protective of public health.

National Air Quality Standards Should Be Strengthened

EPA sets national air quality standards under the authority of the federal Clean Air Act. Under the law, EPA is supposed to review the standards—called the National Ambient Air Quality Standards - every five years and adjust them based on the latest scientific knowledge of what will protect public health with an adequate margin of safety.[51]

Because of industry resistance, the current standards fail to reflect the scientific community's understanding of the danger posed by air pollution. EPA tightened standards for ground-level ozone in 1997, based on accumulating evidence that exposure was more harmful than previously believed. However, the American Trucking Associations led a coalition of industries in a lawsuit against the new standards. Ultimately, the Supreme Court rejected industry arguments and upheld the standards in 2001.[52] But this legal battle delayed implementation of the new standards for years.

Researchers have published hundreds of studies since the last standard-setting review, showing serious health risks at pollution levels well below current "safe" standards. However, the Bush administration disregarded the advice of these experts. The Administration proposed standards weaker than recommended by its own scientists. The proposed standard of 75 ppb (measured over 8 hours) went into effect in 2008.

After EPA published its decision, the Agency's own scientific advisors sent a rare letter to the EPA administrator stating that they disagreed with the decision. These scientists, members of the Clean Air Scientific Advisory Committee, informed the Administrator that they "do not endorse the new primary ozone standard as being sufficiently protective of public health."[53] They urged the Administrator or his successor to set a standard in the next review cycle that would better protect public health, in the range of 60-70 ppb.[54] EPA analysts project that if a standard in this range is adopted, as many as 12,000 premature deaths per year from heart or lung diseases could be avoided, along with thousands of cases of bronchitis, asthma and nonfatal heart attacks.[55]

The American Lung Association, the American Academy of Pediatrics, the American Public Health Association, the Asthma and Allergy Foundation of America and many others agree that an ozone standard of 60 ppb is what is necessary to protect public health and our environment. EPA should issue a new National Ambient Air Quality Standard to reduce ground-level ozone pollution to 60 ppb by July 2011.[56]

Reducing Vehicle Pollution

Because vehicles are a major source of the pollutants that make up ground-level ozone, accounting for approximately half of all nitrogen oxides and half of all volatile organic compounds emitted into the air, measures must be taken to clean up our cars and trucks. EPA should implement stronger emissions standards for gasoline powered cars and light trucks.

Additionally, certain fuels are cleaner than gasoline because they emit less nitrogen oxides or hydrocarbons, and because the hydrocarbons they do emit are less likely to react in the atmosphere to form ozone. One such fuel is electricity. Battery-powered cars have the potential for zero tailpipe and evaporative hydrocarbon and nitrogen oxide emissions.[57] Transitioning to more battery-powered cars will reduce ozone pollution and protect our health.

Finally, local, state and federal governments need to do more to expand public transportation options so that more Americans can travel between point A and point B without getting in a car at all. Reducing the miles traveled in personal cars and trucks is one of the best ways to reduce overall emissions of nitrogen oxides and volatile organic compounds from vehicles.

Accelerating the Transition to Clean Energy

Achieving improved air quality so that pollution is reduced to below 60 ppb nationwide will require reducing pollution from all sources. Additionally, accelerating a broad transition to clean energy sources in America is an important tool that can lead to better health for all of us.

Reducing nitrogen oxide pollution is especially important. A study conducted by the University of California Davis found that it is more effective to reduce nitrogen oxides than volatile organic compounds to limit ozone pollution.[58] Because power plants are the second largest emitter of nitrogen oxides in the United States, power plants must further reduce emissions in order to prevent dangerous levels of ozone buildup.

Table 2 lists the top 10 worst polluting power plants for nitrogen oxides in the United States.

Table 2. Top Ten Most Polluting Power Plants for Nitrogen Oxides in 2009

State	Facility	NOx (tons) Emitted in 2009
NM	Four Corners Steam Electric Station	42,510.52
AZ	Navajo Generating Station	30,500.62
UT	Intermountain	24,814.83
PA	Hatfields Ferry Power Station	21,198.34
MI	Monroe	20,374.36
WY	Jim Bridger	20,032.57
IN	Rockport	19,762.18
PA	Conemaugh	18,979.93
FL	Crystal River	18,547.69
NM	San Juan	18,359.04

(See Appendix C for full list of Power Plants Ranked by Tons of Nitrogen Oxides Emitted in 2009.)

Power plants should continue to implement more and better advanced emission control technologies like selective catalytic reduction systems. This technology works by adding a gas or liquid like ammonia or urea to exhaust gases before they exit a power plant's smokestack. This causes a reaction that then converts nitrogen oxide emissions into pure, benign nitrogen and water vapors.

In addition to implementing more advanced emission control technologies, accelerating the transition away from fossil fuels and towards cleaner sources of energy can help reduce nitrogen oxide emissions and prevent damage from ground-level ozone pollution.

Important steps to increase the use of clean energy sources include:

- Establishing or increasing renewable electricity standards to ensure that at least 25 percent of U.S. electricity comes from renewable sources of energy such as wind and solar by 2025;
- Strengthening energy efficiency standards and codes for appliances and buildings, and requiring all new buildings use zero net energy by 2030;
- Ramping up investment in solar power through tax credits, specific solar generation targets in state renewable electricity standards, requirements for "solar ready homes," rebate programs, and other measures; and
- Ending subsidies for fossil fuel industries.

APPENDIX A: States Ranked by Total NOx Emitted From Power Plants in 2009[59]

National Rank	State	NOx (tons) Emitted by All Plants in 2009
1	TX	138,576
2	PA	109,043.70
3	IN	97,544.17
4	OH	95,811.04
5	FL	94,162.84
6	MI	79,013.19
7	KY	78,794.03
8	OK	73,325.39
9	NM	66,553.27
10	WY	66,221.23
11	AZ	65,608.17
12	ND	62,295.80
13	UT	62,068.81
14	GA	57,533.58
15	MO	53,604.01
16	CO	52,510.23
17	AL	49,273.91
18	KS	47,862.97
19	NE	46,314.35
20	NC	40,779
21	IA	40,469.22
22	LA	40,308.39
23	IL	37,032.33
24	MN	36,202.84
25	WV	36,125.56
26	AR	33,908.21
27	WI	33,535.70
28	TN	28,028.89
29	MS	26,353.64
30	VA	25,513.13
31	NY	23,387.47
32	SC	21,270.84
33	MT	20,370.97
34	MD	16,964.24
35	NV	12,494.27
36	SD	11,849.02
37	WA	10,584.20
38	MA	7,797.47
39	OR	6,999.05
40	NJ	6,866.26
41	DE	4,084.37
42	CA	3,825.03
43	NH	3,762.92
44	CT	1,670.04
45	RI	542.87
46	ME	471.619
47	ID	140.938
48	VT	114.174

APPENDIX B: Tons of NOx Emitted From All Power Plants in 2009

State	Plant Name	NOx (tons) Emitted in 2009
AL	AMEA Sylacauga Plant	2.131
AL	Barry	8440.868
AL	Calhoun Power Company I, LLC	29.569
AL	Charles R Lowman	3193.01
AL	Colbert	4424.481
AL	Decatur Energy Center	108.564
AL	Discover	1.609
AL	E B Harris Generating Plant	160.291
AL	E C Gaston	10292.32
AL	Gadsden	795.335
AL	Gorgas	5373.364
AL	Greene County	4379.629
AL	Hog Bayou Energy Center	14.958
AL	James H Miller Jr	7929.218
AL	McIntosh (7063)	17.269
AL	McWilliams	125.414
AL	Morgan Energy Center	123.13
AL	Plant H. Allen Franklin	279.361
AL	Tenaska Central Alabama Gen Station	34.386
AL	Tenaska Lindsay Hill	22.631
AL	Widows Creek	3526.372
AR	Carl Bailey	22.587
AR	Cecil Lynch	31.82
AR	City Water & Light - City of Jonesboro	12.796
AR	Dell Power Plant	26.106
AR	Flint Creek Power Plant	3782.247
AR	Fulton	5.322
AR	Hamilton Moses	19.904
AR	Harry D. Mattison Power Plant	8.102
AR	Harvey Couch	233.665
AR	Hot Spring Energy Facility	70.869
AR	Hot Spring Power Co., LLC	115.863
AR	Independence	14338.11
AR	Lake Catherine	191.427
AR	McClellan	165.513
AR	Oswald Generating Station	47.805
AR	Thomas Fitzhugh	35.158
AR	Union Power Station	277.551
AR	White Bluff	14523.37
AZ	APS Saguaro Power Plant	62.801
AZ	APS West Phoenix Power Plant	103.511
AZ	Agua Fria Generating Station	164.227
AZ	Apache Station	4972.537
AZ	Arlington Valley Energy Facility	28.519
AZ	Black Mountain Generating Station	39.196
AZ	Cholla	9211.297
AZ	Coronado Generating Station	12133.76
AZ	De Moss Petrie Generating Station	0.91
AZ	Desert Basin Generating Station	53.697

State	Plant Name	NOx (tons) Emitted in 2009
AZ	Gila River Power Station	288.518
AZ	Griffith Energy Project	64.341
AZ	Irvington Generating Station	1010.558
AZ	Kyrene Generating Station	30.376
AZ	Mesquite Generating Station	235.361
AZ	Navajo Generating Station	30500.62
AZ	New Harquahala Generating Company, LLC	86.106
AZ	Ocotillo Power Plant	78.779
AZ	Redhawk Generating Facility	175.079
AZ	Santan	103.341
AZ	South Point Energy Center, LLC	73.874
AZ	Springerville Generating Station	5914.586
AZ	Sundance Power Plant	24.504
AZ	Yucca Power Plant	251.675
CA	AES Alamitos	214.137
CA	AES Huntington Beach	92.182
CA	AES Redondo Beach	123.842
CA	Agua Mansa Power	2.32
CA	Almond Power Plant	5.619
CA	Anaheim Combustion Turbine	7.157
CA	Barre Generating Station	0.249
CA	Blythe Energy	55.776
CA	Broadway	1.654
CA	Cabrillo Power I Encina Power Station	45.676
CA	CalPeak Power - Border LLC	1.012
CA	CalPeak Power - El Cajon LLC	1.16
CA	CalPeak Power - Enterprise LLC	1.094
CA	CalPeak Power - Panoche LLC	0.564
CA	CalPeak Power - Vaca Dixon LLC	0.617
CA	Calpine Sutter Energy Center	77.45
CA	Carson Cogeneration Company	13.862
CA	Center Generating Station	0.329
CA	Chula Vista Energy Center	1.277
CA	Contra Costa Power Plant	11.184
CA	Coolwater Generating Station	49.881
CA	Cosumnes Power Plant	62.314
CA	Creed Energy Center	1.015
CA	Delta Energy Center, LLC	141.753
CA	Donald Von Raesfeld	12.797
CA	Dynegy South Bay, LLC	36.277
CA	El Centro	299.792
CA	El Segundo	23.119
CA	Escondido Energy Center, LLC	0.488
CA	Etiwanda Generating Station	20.013
CA	Feather River Energy Center	6.091
CA	Gateway Generating Station	91.706
CA	Gilroy Energy Center, LLC	8.835
CA	Gilroy Energy Center, LLC for King City	1.199
CA	Glenarm	11.866
CA	Goose Haven Energy Center	1.298
CA	Grapeland Generating Station	0.154

State	Plant Name	NOx (tons) Emitted in 2009
CA	Grayson Power Plant	26.891
CA	Harbor Generating Station	28.028
CA	Haynes Generating Station	95.756
CA	Humboldt Bay	1109.187
CA	Indigo Generation Facility	8.993
CA	Kings River Conservation District Malaga	6.92
CA	La Paloma Generating Plant	137.885
CA	Lake	0.619
CA	Lambie Energy Center	1.15
CA	Larkspur Energy Faciity	5.51
CA	Long Beach Generating Station	9.781
CA	Los Esteros Critical Energy Fac	11.428
CA	Magnolia	33.728
CA	Malburg Generating Station	91.728
CA	Mandalay Generating Station	4.647
CA	Metcalf Energy Center	74.066
CA	Mira Loma Generating Station	0.233
CA	Miramar Energy Facility	4.043
CA	Morro Bay Power Plant, LLC	52.425
CA	Moss Landing	116.558
CA	Mountainview Power Company, LLC	105.018
CA	NCPA Combustion Turbine Project #2	1.877
CA	Niland Gas Turbine Plant	2.019
CA	Olive	0.686
CA	Ormond Beach Generating Station	12
CA	Otay Mesa Energy Center, LLC	18.214
CA	Palomar Energy Center	73.288
CA	Panoche Energy Center	19.91
CA	Pastoria Energy Facility	111.428
CA	Pittsburg Power Plant (CA)	18.493
CA	Potrero Power Plant	31.004
CA	Redding Power Plant	0.275
CA	Ripon Generation Station	2.374
CA	Riverside Energy Resource Center	1.278
CA	Riverview Energy Center	1.361
CA	Roseville Energy Park	18.318
CA	Scattergood Generating Station	16.005
CA	Valley Gen Station	72.514
CA	Walnut Energy Center	36.749
CA	Wolfskill Energy Center	1.291
CA	Woodland Generation Station	8.852
CA	Yuba City Energy Center	26.739
CO	Arapahoe	2481.742
CO	Arapahoe Combustion Turbine Facility	31.054
CO	Blue Spruce Energy Center	76.63
CO	Brush Power Projects	27.27
CO	Cameo	519.335
CO	Cherokee	7497.119
CO	Comanche (470)	3859.766
CO	Craig	14356.58
CO	Fort St. Vrain	843.263
CO	Fountain Valley Power Plant	216.982
CO	Frank Knutson Station	20.56
CO	Front Range Power Plant	289.897
CO	Hayden	6692.752

State	Plant Name	NOx (tons) Emitted in 2009
CO	Lamar	256.718
CO	Limon Generating Station	3.206
CO	Manchief Generating Station	132.151
CO	Martin Drake	4509.507
CO	Nucla	1639.958
CO	Pawnee	2588.782
CO	Rawhide Energy Station	2083.805
CO	Ray D Nixon	2071.521
CO	Rocky Mountain Energy Center	102.282
CO	Spindle Hill Energy Center	164.392
CO	Valmont	2040.438
CO	Valmont Combustion Turbine Facility	4.515
CT	Alfred L Pierce Generating Station	3.281
CT	Branford	0.315
CT	Bridgeport Energy	146.218
CT	Bridgeport Harbor Station	847.471
CT	Cos Cob	7.16
CT	Devon	9.115
CT	Exeter Energy Limited Partnership	42.666
CT	Franklin Drive	0.687
CT	Lake Road Generating Company	76.12
CT	Middletown	215.306
CT	Milford Power Company LLC	94.389
CT	Montville	44.587
CT	New Haven Harbor	115.384
CT	Norwalk Harbor Station	40.142
CT	Norwich	1.173
CT	South Meadow Station	10.716
CT	Torrington Terminal	0.845
CT	Tunnel	0.327
CT	Wallingford Energy	6.506
CT	Waterbury Generation	5.875
CT	Waterside Power, LLC	1.752
DE	Christiana Substation	1.884
DE	Delaware City	0.069
DE	Edge Moor	559.174
DE	Hay Road	265.987
DE	Indian River	3235.496
DE	McKee Run	11.593
DE	NRG Energy Center Dover	8.257
DE	Van Sant	0.657
DE	Warren F. Sam Beasley Pwr Station	1.172
DE	West Substation	0.079
FL	Anclote	2114.578
FL	Arvah B Hopkins	245.738
FL	Auburndale Cogeneration Facility	137.77
FL	Auburndale Peaker Energy Center	12.944
FL	Avon Park	125.167
FL	Bayboro	199.224
FL	Bayside Power Station	514.651
FL	Big Bend	9653.103
FL	Brandy Branch	84.236
FL	C D McIntosh Jr Power Plant	2882.971
FL	Cane Island	78.839
FL	Cape Canaveral	3650.232

State	Plant Name	NOx (tons) Emitted in 2009
FL	Cedar Bay Generating Co. LP	1608.803
FL	Charles Larsen Memorial Power Plant	24.192
FL	Crist Electric Generating Plant	3967.966
FL	Crystal River	18547.69
FL	Curtis H. Stanton Energy Center	7404.048
FL	Debary	151.141
FL	Deerhaven	1444.456
FL	Desoto County Energy Park	5.875
FL	Fort Myers	1002.396
FL	G E Turner	91.226
FL	Hardee Power Station	380.81
FL	Higgins	184.306
FL	Hines Energy Complex	659.752
FL	Indian River (55318)	212.659
FL	Indian River (683)	19.923
FL	Intercession City	324.53
FL	J D Kennedy	29.832
FL	J R Kelly	26.936
FL	Lansing Smith Generating Plant	3347.79
FL	Lauderdale	2367.55
FL	Manatee	1834.381
FL	Martin	4601.317
FL	Midulla Generating Station	432.278
FL	Northside	2541.053
FL	Oleander Power Project	95.964
FL	Osprey Energy Center	102.686
FL	P L Bartow	812.275
FL	Polk	373.777
FL	Port Everglades	4018.22
FL	Putnam	2029.118
FL	RRI Energy Osceola	52.724
FL	Riviera	99.9
FL	Roy E Hansel Power Plant	10.3
FL	S O Purdom	163.851
FL	Sanford	1231.787
FL	Santa Rosa Energy Center	52.583
FL	Scholz Electric Generating Plant	41.213
FL	Seminole (136)	4401.534
FL	Shady Hills	163.539
FL	St. Johns River Power	7095.893
FL	Stanton A	102.915
FL	Stock Island	1.587
FL	Suwannee River	467.886
FL	Tom G Smith	10.244
FL	Treasure Coast Energy Center	32.921
FL	Turkey Point	1747.221
FL	Vandolah Power Project	21.76
FL	Vero Beach Municipal	23.203
FL	West County Energy Center	99.373
GA	AL Sandersville	3.887
GA	Allen B Wilson Combustion Turbine Plant	20.531
GA	Bowen	6947.24
GA	Chattahoochee Energy Facility	101.582
GA	Dahlberg (Jackson County)	43.026
GA	Effingham County Power, LLC	108.985
GA	Hammond	3164.406
GA	Harllee Branch	12960.15

State	Plant Name	NOx (tons) Emitted in 2009
GA	Hartwell Energy Facility	39.79
GA	Hawk Road Energy Facility	1.208
GA	Jack McDonough	2592.531
GA	Kraft	3884.517
GA	MPC Generating, LLC	3.703
GA	McIntosh (6124)	37.953
GA	McIntosh Combined Cycle Facility	190.869
GA	McManus	42.673
GA	Mitchell (GA)	95.906
GA	Murray Energy Facility	118.65
GA	Robins	8.407
GA	SEGCO Bainbridge	2.167
GA	Scherer	17171.59
GA	Sewell Creek Energy	66.636
GA	Smarr Energy Facility	5.453
GA	Talbot Energy Facility	13.128
GA	Tenaska Georgia Generating Station	0.567
GA	Walton County Power, LLC	28.425
GA	Wansley (6052)	2370.748
GA	Wansley (7946)	55.856
GA	Washington County Power, LLC	10.174
GA	West Georgia Generating Facility	2.299
GA	Yates	7440.537
IA	Ames	942.935
IA	Burlington (IA)	1243.803
IA	Centerville	1.036
IA	Dayton Avenue Substation	0.857
IA	Dubuque	683.333
IA	Earl F Wisdom	23.05
IA	Electrifarm	73.537
IA	Emery Station	41.075
IA	Exira Station	1.808
IA	Fair Station	305.009
IA	George Neal North	8473.075
IA	George Neal South	4431.579
IA	Greater Des Moines Energy Center	15.019
IA	Grinnell	1.328
IA	Lansing	3123.271
IA	Lime Creek	2.725
IA	Louisa	4135.673
IA	Marshalltown CTs	53.199
IA	Milton L Kapp	507.337
IA	Muscatine	2670.923
IA	Ottumwa	3893.155
IA	Pella	229.262
IA	Pleasant Hill Energy Center	5.785
IA	Prairie Creek	277.166
IA	Riverside (1081)	603.41
IA	Streeter Station	85.617
IA	Summit Lake	3.63
IA	Sutherland	1291.473
IA	Sycamore Combustion Turbine	31.375
IA	Walter Scott Jr. Energy Center	7317.773
ID	Bennett Mountain Power Project	35.864
ID	Evander Andrews Power Complex	27.707
ID	Rathdrum Combustion Turbine Project	13.779
ID	Rathdrum Power, LLC	63.588

State	Plant Name	NOx (tons) Emitted in 2009
IL	Alsey Station	6.698
IL	Baldwin Energy Complex	4096.647
IL	Calumet Energy Team, LLC	7.457
IL	Coffeen	2207.379
IL	Cordova Energy Company	6.478
IL	Crete Energy Park	5.072
IL	Dallman	1259.837
IL	Duck Creek	1233.747
IL	E D Edwards	3805.032
IL	Elgin Energy Center	4.029
IL	Elwood Energy Facility	30.548
IL	Factory Gas Turbine	0.019
IL	Freedom Power Project	0.274
IL	Gibson City Power Plant	2.809
IL	Goose Creek Power Plant	7.294
IL	Grand Tower	26.269
IL	Havana	373.076
IL	Hennepin Power Station	1660.47
IL	Holland Energy Facility	24.676
IL	Hutsonville	725.15
IL	Interstate	5.484
IL	Joppa Steam	4443.69
IL	Kendall Energy Facility	174.904
IL	Kincaid Station	6987.003
IL	Kinmundy Power Plant	0.635
IL	Lakeside	16.549
IL	Lee Energy Facility	4.156
IL	Lincoln Generating Facility	0.674
IL	Marion	1449.072
IL	Meredosia	819.948
IL	NRG Rockford Energy Center	4.585
IL	NRG Rockford II Energy Center	3.593
IL	Newton	3821.084
IL	PPL University Park Power Project	12.627
IL	Pinckneyville Power Plant	30.401
IL	RRI Energy - Aurora	3.606
IL	RRI Energy Shelby County	0.762
IL	Raccoon Creek Power Plant	0.708
IL	Rocky Road Power, LLC	10.566
IL	Southeast Chicago Energy Project	5.142
IL	Tilton Power Station	21.516
IL	University Park Energy	16.9
IL	Venice	9.373
IL	Vermilion Power Station	967.743
IL	Wood River Power Station	2716.855
IL	Zion Energy Center	21.789
IN	A B Brown Generating Station	1720.865
IN	Anderson	2.853
IN	Bailly Generating Station	2459.355
IN	Broadway Avenue Generating Station	21.104
IN	Cayuga	3460.555
IN	Clifty Creek	8018.792
IN	Edwardsport	227.973
IN	F B Culley Generating Station	1021.417
IN	Frank E Ratts	2424.122
IN	Georgetown Substation	3.009
IN	Gibson	9568.628
IN	Harding Street Station (EW Stout)	2721.777

State	Plant Name	NOx (tons) Emitted in 2009
IN	Henry County Generating Station	18.249
IN	Hoosier Energy Lawrence Co Station	9.567
IN	IPL Eagle Valley Generating Station	1461.536
IN	Lawrenceburg Energy Facility	36.83
IN	Merom	4220.484
IN	Michigan City Generating Station	1095.73
IN	Montpelier Electric Gen Station	18.786
IN	Noblesville	9.728
IN	Petersburg	9657.994
IN	R Gallagher	3088.075
IN	R M Schahfer Generating Station	10565.83
IN	Richmond (IN)	0.423
IN	Rockport	19762.18
IN	State Line Generating Station (IN)	5990.934
IN	Sugar Creek Generating Station	46.472
IN	Tanners Creek	3529.309
IN	Vermillion Energy Facility	15.066
IN	Wabash River Gen Station	5974.515
IN	Wheatland Generating Facility LLC	17.559
IN	Whitewater Valley	369.329
IN	Worthington Generation	5.131
KS	Chanute 2	39.549
KS	Cimarron River	141.447
KS	East 12th Street	21.725
KS	Emporia Energy Center	149.873
KS	Fort Dodge aka Judson Large	378.279
KS	Garden City	102.781
KS	Gordon Evans Energy Center	1038.866
KS	Great Bend Station aka Arthur Mullergren	151.004
KS	Holcomb	4355.391
KS	Hutchinson Energy Center	204.292
KS	Jeffrey Energy Center	17209.91
KS	La Cygne	9704.512
KS	Lawrence Energy Center	4001.148
KS	McPherson 3	8.644
KS	Murray Gill Energy Center	426.099
KS	Nearman Creek	3258.424
KS	Neosho Energy Center	0.941
KS	Osawatomie Generating Station	0.417
KS	Quindaro	3239.958
KS	Riverton	1146.495
KS	Tecumseh Energy Center	2277.999
KS	West Gardner Generating Station	5.214
KY	Big Sandy	4869.678
KY	Bluegrass Generation Company, LLC	13.641
KY	Cane Run	5738.219
KY	Coleman	5065.349
KY	D B Wilson	990.329
KY	E W Brown	4279.959
KY	East Bend	2436.246
KY	Elmer Smith	3008.53
KY	Ghent	6413.208
KY	Green River	1419.712

State	Plant Name	NOx (tons) Emitted in 2009
KY	H L Spurlock	3215.15
KY	HMP&L Station 2	1038.245
KY	John S. Cooper	3362.436
KY	Marshall	9.128
KY	Mill Creek	7906.916
KY	Paddy's Run	0.828
KY	Paradise	8350.107
KY	R D Green	3694.438
KY	Riverside Generating Company	17.204
KY	Robert Reid	86.324
KY	Shawnee	13607.3
KY	Smith Generating Facility	100.394
KY	Trimble County	1144.748
KY	Tyrone	77.15
KY	William C. Dale	1948.792
LA	Acadia Power Station	186.046
LA	Arsenal Hill Power Plant	19.951
LA	Bayou Cove Peaking Power Plant	10.071
LA	Big Cajun 1	55.677
LA	Big Cajun 2	11433.51
LA	Brame Energy Center	3973.037
LA	Coughlin Power Station	251.772
LA	D G Hunter	414.037
LA	Doc Bonin	171.093
LA	Dolet Hills Power Station	4589.779
LA	Hargis-Hebert Electric Generating Statio	44.407
LA	Houma	98.362
LA	Lieberman Power Plant	128.52
LA	Little Gypsy	3269.078
LA	Louisiana 1	1472.366
LA	Michoud	1703.577
LA	Morgan City Electrical Gen Facility	25.69
LA	Ninemile Point	5020.19
LA	Ouachita Plant	60.126
LA	Perryville Power Station	102.193
LA	R S Nelson	5421.038
LA	Sterlington	39.774
LA	T J Labbe Electric Generating Station	13.845
LA	Teche Power Station	891.183
LA	Waterford 1 & 2	535.35
LA	Willow Glen	377.714
MA	ANP Bellingham Energy Company, LLC	58.518
MA	ANP Blackstone Energy Company, LLC	48.136
MA	Bellingham	96.613
MA	Berkshire Power	29.699
MA	Blackstone	75.598
MA	Brayton Point	4991.691
MA	Canal Station	256.781
MA	Cleary Flood	29.686
MA	Doreen	0.813
MA	Fore River Station	80.36
MA	Framingham Station	1.506
MA	Kendall Square	52.304
MA	Medway Station	17.835
MA	Milford Power, LP	28.155
MA	Millennium Power Partners	74.748
MA	Mount Tom	355.373
MA	Mystic	321.412
MA	New Boston	0.498

State	Plant Name	NOx (tons) Emitted in 2009
MA	Potter	6.129
MA	Salem Harbor	986.293
MA	Somerset	99.372
MA	South Boston Combustion Turbines	5.774
MA	Stony Brook	91.845
MA	Waters River	7.301
MA	West Springfield	80.486
MA	Woodland Road	0.545
MD	Brandon Shores	3473.146
MD	C P Crane	2121.674
MD	Dickerson	3242.98
MD	Gould Street	4.892
MD	Herbert A Wagner	1704.036
MD	Mirant Chalk Point	4101.063
MD	Mirant Morgantown	1950.732
MD	Perryman	43.378
MD	R. Paul Smith Power Station	239.267
MD	Riverside	7.425
MD	Rock Springs Generating Facility	24.636
MD	Vienna	51.007
ME	Maine Independence Station	116.351
ME	Rumford Power	24.89
ME	Westbrook Energy Center	98.213
ME	William F Wyman	232.165
MI	48th Street Peaking Station	3.098
MI	B C Cobb	2585.062
MI	Belle River	10443.9
MI	DTE East China	2.076
MI	Dan E Karn	1329.425
MI	Dearborn Industrial Generation	210.801
MI	Delray	0.768
MI	Eckert Station	1266.797
MI	Endicott Generating	423.625
MI	Erickson	1230.655
MI	Grayling Generating Station	219.393
MI	Greenwood	110.911
MI	Hancock Peakers	1.292
MI	Harbor Beach	460.407
MI	J B Sims	378.843
MI	J C Weadock	3013.274
MI	J H Campbell	8495.197
MI	J R Whiting	2268.668
MI	Jackson MI Facility	102.768
MI	James De Young	227.408
MI	Kalkaska Ct Project #1	4.564
MI	Mistersky	137.281
MI	Monroe	20374.36
MI	New Covert Generating Project	32.195
MI	Presque Isle	5945.712
MI	Renaissance Power	61.363
MI	River Rouge	4340.231
MI	Shiras	246.789
MI	St. Clair	9378.145
MI	Sumpter Plant	0.682
MI	Thetford	6.833
MI	Trenton Channel	5161.137
MI	Wyandotte	549.531

State	Plant Name	NOx (tons) Emitted in 2009
MN	Allen S King	1456.334
MN	Black Dog	6162.446
MN	Blue Lake Generating Plant	14.589
MN	Boswell Energy Center	11228.75
MN	Cambridge Station	39.07
MN	Cannon Falls Energy Center	8.706
MN	Cascade Creek	12.225
MN	Elk River	4.867
MN	Faribault Energy Park	21.576
MN	Fox Lake	17.333
MN	High Bridge	43.117
MN	Hoot Lake	720.289
MN	Hutchinson - Plant 2	1.598
MN	Inver Hills	26.24
MN	Lakefield Junction Generating	12.681
MN	Laskin Energy Center	656.033
MN	Mankato Energy Center	15.183
MN	Maple Lake Station	4.108
MN	Minnesota River Station	0.443
MN	Montgomery	0.516
MN	Northeast Station	7.203
MN	Pleasant Valley Station	34.822
MN	Riverside (1927)	44.322
MN	Rock Lake Station	3.504
MN	Sherburne County	13873.71
MN	Silver Lake	71.967
MN	Solway Plant	12.455
MN	St. Bonifacius Station	45.198
MN	Taconite Harbor Energy Center	1663.544
MO	Asbury	794.331
MO	Audrain Power Plant	5.161
MO	Blue Valley	59.59
MO	Chamois Power Plant	1895.762
MO	Chillicothe	8.301
MO	Columbia	306.427
MO	Columbia Energy Center (MO)	0.337
MO	Dogwood Energy Facility	37.902
MO	Empire District Elec Co Energy Ctr	44.952
MO	Essex Power Plant	3.522
MO	Fairgrounds	1.299
MO	Greenwood Energy Center	59.276
MO	Hawthorn	1589.643
MO	Higginsville Municipal Power Plant	1.286
MO	Holden Power Plant	14.043
MO	Howard Bend	7.02
MO	Iatan	1923.384
MO	James River	987.841
MO	Labadie	9199.908
MO	Lake Road	1809.184
MO	McCartney Generating Station	23.517
MO	Meramec	4808.587
MO	Mexico	3.539
MO	Moberly	0.027
MO	Montrose	6269.823
MO	Moreau	4.095
MO	New Madrid Power Plant	3222.443
MO	Nodaway Power Plant	1.402
MO	Northeast Generating Station	24.369
MO	Peno Creek Energy Center	33.985
MO	Ralph Green Station	0.826

State	Plant Name	NOx (tons) Emitted in 2009
MO	Rush Island	3861.36
MO	Sibley	2933.791
MO	Sikeston	2051.982
MO	Sioux	6638.72
MO	South Harper Peaking Facility	17.839
MO	Southwest	773.829
MO	St. Francis Power Plant	41.059
MO	State Line (MO)	60.329
MO	Thomas Hill Energy Center	4082.997
MO	Viaduct	0.319
MS	Attala Generating Plant	38.173
MS	Batesville Generation Facility	394.752
MS	Baxter Wilson	4267.111
MS	Caledonia	171.483
MS	Choctaw Gas Generation, LLC	93.93
MS	Crossroads Energy Center (CPU)	1.302
MS	Daniel Electric Generating Plant	7357.528
MS	Gerald Andrus	324.03
MS	Hinds Energy Facility	14.084
MS	Kemper County	7.729
MS	Magnolia Facility	64.678
MS	Moselle Generating Plant	347.988
MS	R D Morrow Senior Generating Plant	5187.052
MS	RRI Energy Choctaw County Gen	10.785
MS	Red Hills Generation Facility	2519.018
MS	Rex Brown	115.823
MS	Silver Creek Generating Plant	17.704
MS	Southaven Combined Cycle	367.507
MS	Sweatt Electric Generating Plant	0.55
MS	Sylvarena Generating Plant	46.576
MS	Watson Electric Generating Plant	5005.836
MT	Colstrip	17516.05
MT	Glendive Generating Station	1.468
MT	Hardin Generating Station	456.251
MT	J E Corette	1641.096
MT	Lewis & Clark	756.105
NC	Asheville	650.039
NC	Belews Creek	2765.341
NC	Blewett	8.21
NC	Buck	374.229
NC	Butler-Warner Generation Plant	16.786
NC	Cape Fear	1965.372
NC	Cliffside	1048.264
NC	Craven County Wood Energy	406.843
NC	Dan River	256.468
NC	Elizabethtown Power	22.95
NC	G G Allen	3821.341
NC	H F Lee Steam Electric Plant	3059.806
NC	L V Sutton	4279.444
NC	Lincoln	9.869
NC	Lumberton Power	13.177
NC	Marshall	9743.614

State	Plant Name	NOx (tons) Emitted in 2009
NC	Mayo	1606.162
NC	NCEMC Anson Plant	63.981
NC	NCEMC Hamlet Plant	15.748
NC	Plant Rowan County	71.213
NC	Richmond County Plant	234.65
NC	Riverbend	542.077
NC	Rockingham County Combustion Turbine	28.539
NC	Rosemary Power Station	86.579
NC	Roxboro	6627.005
NC	W H Weatherspoon	1149.158
NC	Westmoreland Partners Roanoke Valley I	1618.141
NC	Westmoreland Partners Roanoke Valley II	293.997
ND	Antelope Valley	14736.63
ND	Coal Creek	10646.5
ND	Coyote	11051.89
ND	Leland Olds	9219.162
ND	Milton R Young	14046.37
ND	R M Heskett	957.981
ND	Stanton	1637.261
NE	Beatrice	8.918
NE	C W Burdick	8.667
NE	Canaday	16.265
NE	Cass County Station	6.356
NE	Gerald Gentleman Station	14986.56
NE	Gerald Whelan Energy Center	1067.327
NE	Lon D Wright Power Plant	387.936
NE	Nebraska City Station	15136.93
NE	North Omaha Station	5745.555
NE	Platte	1273.507
NE	Rokeby	18.797
NE	Sarpy County Station	12.414
NE	Sheldon	7636.649
NE	Terry Bundy Generating Station	8.47
NH	Granite Ridge Energy	125.533
NH	Lost Nation	0.551
NH	Merrimack	2306.459
NH	NAEA Newington Energy LLC	70.355
NH	Newington	228.435
NH	Schiller	1031.064
NH	White Lake	0.521
NJ	B L England	1105.089
NJ	Bergen	456.853
NJ	Burlington Generating Station	48.95
NJ	Carlls Corner Energy Center	21.459
NJ	Carneys Point	925.22
NJ	Cedar Energy Station	38.751
NJ	Cumberland Energy Center	1.202
NJ	Deepwater	147.197
NJ	Edison	91.98
NJ	Essex	336.065
NJ	Forked River	1.314
NJ	Gilbert Generating Station	10.531
NJ	Howard M Down	46.55
NJ	Hudson Generating Station	1889.203
NJ	Kearny Generating Station	51.397
NJ	Linden Generating Station	169.969

State	Plant Name	NOx (tons) Emitted in 2009
NJ	Logan Generating Plant	766.1
NJ	Mercer Generating Station	661.314
NJ	Mickleton Energy Center	4.204
NJ	Middle Energy Center	0.254
NJ	Missouri Avenue Energy Center	0.21
NJ	National Park	0.504
NJ	Ocean Peaking Power, LP	9.613
NJ	Pedricktown Cogeneration Plant	16.099
NJ	Salem	2.56
NJ	Sayreville	6.905
NJ	Sewaren Generating Station	45.254
NJ	Sherman Avenue	4.389
NJ	Werner	6.016
NJ	West Station	1.111
NM	Afton Generating Station	40.864
NM	Bluffview Power Plant	77.694
NM	Cunningham	837.231
NM	Escalante	3607.039
NM	Four Corners Steam Elec Station	42510.52
NM	Hobbs Generating Station	66.959
NM	Lordsburg Generating Station	28.819
NM	Luna Energy Facility	87.286
NM	Maddox	306.898
NM	Milagro Cogeneration and Gas Plant	38.546
NM	Person Generating Project	0.815
NM	Pyramid Generating Station	14.248
NM	Reeves Generating Station	83.823
NM	Rio Grande	493.485
NM	San Juan	18359.04
NV	Apex Generating Station	124.152
NV	Chuck Lenzie Generating Station	256.296
NV	Clark	38.027
NV	El Dorado Energy	143.832
NV	Fort Churchill	610.044
NV	Harry Allen	2.388
NV	North Valmy	5690.491
NV	Reid Gardner	4641.982
NV	Silverhawk	78.674
NV	TS Power Plant	286.299
NV	Tracy	524.643
NV	Walter M. Higgins III Generating Station	97.442
NY	23rd and 3rd	4.465
NY	59th Street	624.161
NY	74th Street	357.975
NY	AES Cayuga, LLC	2110.208
NY	AES Greenidge	371.69
NY	AES Somerset (Kintigh)	3748.124
NY	AES Westover (Goudey)	212.972
NY	Allegany Station No. 133	6.696
NY	Arthur Kill	351.717
NY	Astoria Energy	88.386
NY	Astoria Gas Turbine Power	203.55
NY	Astoria Generating Station	735.587
NY	Athens Generating Company	156.543
NY	Bayswater Peaking Facility	5.007

State	Plant Name	NOx (tons) Emitted in 2009
NY	Bethlehem Energy Center (Albany)	101.853
NY	Bethpage Energy Center	77.184
NY	Black River Generation, LLC	81.276
NY	Bowline Generating Station	133.678
NY	Brentwood	0.9
NY	Caithness Long Island Energy Center	16.45
NY	Carr Street Generating Station	2.464
NY	Charles Poletti	1121.576
NY	Dynegy Danskammer	2667.476
NY	Dynegy Roseton	420.957
NY	E F Barrett	815.304
NY	East Hampton Facility	67.807
NY	East River	301.688
NY	Edgewood Energy	2.404
NY	Far Rockaway	46.596
NY	Freeport Power Plant No. 2	2.731
NY	Glenwood	33.888
NY	Glenwood Landing Energy Center	4.353
NY	Gowanus	6.618
NY	Harlem River Yard	0.945
NY	Hawkeye Energy Greenport, LLC	5.897
NY	Hell Gate	1.015
NY	Hillburn	0.622
NY	Holtsville Facility	319.642
NY	Hudson Avenue	293.987
NY	Huntley Power	1541.094
NY	NRG Dunkirk Power	2270.374
NY	Narrows	98.292
NY	Niagara Generation, LLC	136.315
NY	North 1st	0.754
NY	Northport	2044.738
NY	Oswego Harbor Power	88.293
NY	Poletti 500 MW CC	78.829
NY	Port Jefferson Energy Center	303.713
NY	Pouch Terminal	2.787
NY	Ravenswood Generating Station	777.997
NY	Richard M Flynn (Holtsville)	166.363
NY	S A Carlson	283.165
NY	Shoemaker	0.947
NY	Shoreham Energy	2.833
NY	Vernon Boulevard	1.19
NY	WPS Syracuse Generation, LLC	8.635
NY	Wading River Facility	74.354
NY	West Babylon Facility	2.404
OH	AMP-Ohio Gas Turbines Bowling Green	0.114
OH	AMP-Ohio Gas Turbines Galion	0.199
OH	AMP-Ohio Gas Turbines Napoleon	0.117
OH	Ashtabula	1015.926
OH	Avon Lake Power Plant	5112.609
OH	Bay Shore	3691.912
OH	Cardinal	1964.945
OH	Conesville	11324.37
OH	Darby Electric Generating Station	3.154
OH	Dicks Creek Station	2.125
OH	Eastlake	7087.134
OH	Frank M Tait Station	5.695

State	Plant Name	NOx (tons) Emitted in 2009
OH	Gen J M Gavin	6904.027
OH	Greenville Electric Gen Station	9.524
OH	Hamilton Municipal Power Plant	263.929
OH	Hanging Rock Energy Facility	84.491
OH	J M Stuart	8297.043
OH	Killen Station	2883.875
OH	Kyger Creek	3229.549
OH	Lake Shore	428.423
OH	Madison Generating Station	25.575
OH	Miami Fort Generating Station	4337.776
OH	Muskingum River	7808.598
OH	Niles	1028.795
OH	O H Hutchings	252.438
OH	Picway	358.69
OH	R E Burger	906.419
OH	Richard Gorsuch	1800.354
OH	Richland Peaking Station	3.121
OH	Robert P Mone	5.382
OH	Rolling Hills Generating LLC	8.57
OH	Tait Electric Generating Station	12.803
OH	Troy Energy, LLC	5.642
OH	W H Sammis	12177.72
OH	W H Zimmer Generating Station	3651.755
OH	Walter C Beckjord Generating Station	10952.99
OH	Washington Energy Facility	49.033
OH	Waterford Plant	38.864
OH	West Lorain	3.032
OH	Woodsdale	74.338
OK	Anadarko	10.696
OK	Chouteau Power Plant	122.974
OK	Comanche (8059)	2448.677
OK	Grand River Dam Authority	14346.41
OK	Green Country Energy, LLC	365.269
OK	Horseshoe Lake	1006.087
OK	Hugo	3225.87
OK	McClain Energy Facility	351.181
OK	Mooreland	380.568
OK	Muskogee	15150.23
OK	Mustang	736.382
OK	Northeastern	14973.88
OK	Oneta Energy Center	399.074
OK	Ponca	8.355
OK	Redbud Power Plant	229.925
OK	Riverside (4940)	2684.267
OK	Seminole (2956)	3614.302
OK	Sooner	10470.09
OK	Southwestern	1889.516
OK	Spring Creek Power Plant	47.159
OK	Tenaska Kiamichi Generating Station	582.16
OK	Tulsa	282.315
OR	Boardman	6560.813
OR	Coyote Springs	158.042
OR	Hermiston Power Plant	193.016
OR	Klamath Energy LLC	4.457
OR	Port Westward	82.718
PA	AES Ironwood	167.06

State	Plant Name	NOx (tons) Emitted in 2009
PA	Allegheny Energy Hunlock Unit 4	3.375
PA	Allegheny Energy Unit 1 and Unit 2	13.208
PA	Allegheny Energy Unit 8 and Unit 9	20.906
PA	Allegheny Energy Units 3, 4 & 5	26.11
PA	Armstrong Energy Ltd Partnership, LLLP	6.625
PA	Armstrong Power Station	914.446
PA	Bethlehem Power Plant	53.42
PA	Bruce Mansfield	7452.072
PA	Brunner Island	12818.28
PA	Brunot Island Power Station	3.215
PA	Chambersburg Units 12 and 13	24
PA	Cheswick	2999.045
PA	Conemaugh	18979.93
PA	Cromby	1143.693
PA	Croydon Generating Station	6.784
PA	Eddystone Generating Station	3915.238
PA	Elrama	1097.015
PA	Fairless Energy, LLC	188.139
PA	Fairless Hills Generating Station	66.884
PA	Fayette Energy Facility	71.656
PA	Handsome Lake Energy	10.6
PA	Hatfields Ferry Power Station	21198.34
PA	Homer City	10508.3
PA	Hunlock Power Station	711.099
PA	Hunterstown Combined Cycle	73.581
PA	Keystone	3718.499
PA	Liberty Electric Power Plant	117.258
PA	Lower Mount Bethel Energy	90.374
PA	Martins Creek	806.533
PA	Mitchell Power Station	1379.808
PA	Montour	5378.679
PA	Mountain	10.578
PA	New Castle	1286.708
PA	North East Cogeneration Plant	3.296
PA	Northeastern Power Company	97.18
PA	Ontelaunee Energy Center	64.702
PA	Portland	3067.844
PA	Richmond	1.958
PA	Schuylkill	22.907
PA	Seward	2038.704
PA	Shawville	4690.012
PA	Sunbury	1985.296
PA	Titus	1528.44
PA	Tolna	2.996
PA	WPS Westwood Generation, LLC	278.839
PA	Warren	0.071
RI	Manchester Street	277.959
RI	Ocean State Power	71.475
RI	Ocean State Power II	77.219
RI	Rhode Island State Energy Partners	61.814
RI	Tiverton Power	54.403
SC	Broad River Energy Center	70.952
SC	Canadys Steam	1975.976

State	Plant Name	NOx (tons) Emitted in 2009
SC	Columbia Energy Center (SC)	33.337
SC	Cope Station	940.439
SC	Cross	5903.727
SC	Darlington County	94.238
SC	Dolphus M Grainger	407.518
SC	H B Robinson	1460.249
SC	Hagood	19.658
SC	Hilton Head Gas Turbine Site	5.437
SC	Jasper County Generating Facility	144.75
SC	Jefferies	689.606
SC	John S. Rainey Generating Station	141.053
SC	McMeekin	1507.898
SC	Mill Creek Combustion Turbine Sta	1.098
SC	Myrtle Beach Gas Turbine Site	9.755
SC	Urquhart	980.58
SC	W S Lee	548.087
SC	Wateree	1381.52
SC	Williams	1700.493
SC	Winyah	3254.47
SD	Angus Anson	7.675
SD	Big Stone	11814.55
SD	Groton Generating Station	20.836
SD	Huron	1.709
SD	Lange	4.251
TN	Allen	2605.6
TN	Brownsville CT	10.99
TN	Bull Run	1270.723
TN	Cumberland	5347.88
TN	Gallatin	4837.826
TN	Gleason Generating Facility	1.767
TN	John Sevier	4845.131
TN	Johnsonville	8520.994
TN	Kingston	549.318
TN	Lagoon Creek	38.658
TX	Alex Ty Cooke Generating Station	74.844
TX	Barney M. Davis	332.131
TX	Bastrop Clean Energy Center	318.973
TX	Big Brown	5777.017
TX	Bosque County Power Plant	662.148
TX	Cedar Bayou	236.192
TX	Cedar Bayou 4	52.104
TX	Channelview Cogeneration Facility	294.101
TX	Coleto Creek	4198.112
TX	Colorado Bend Energy Center	111.473
TX	Copper Station	23.974
TX	Cottonwood Energy Project	232.52
TX	Decker Creek	1015.005
TX	Decordova	380.606
TX	Exelon Laporte Generating Station	6.874
TX	FPLE Forney, LP	903.512
TX	Frontera Generation Facility	351.265
TX	Gibbons Creek Steam Electric Station	2114.03
TX	Graham	681.796

State	Plant Name	NOx (tons) Emitted in 2009
TX	Greens Bayou	163.759
TX	H W Pirkey Power Plant	3327.617
TX	Handley Generating Station	38.609
TX	Hardin County Peaking Facility	4.939
TX	Harrington Station	7524.729
TX	Harrison County Power Project	42.791
TX	Hays Energy Project	187.914
TX	J K Spruce	2519.178
TX	J T Deely	3657.615
TX	Jack County Generation Facility	189.927
TX	Johnson County Generation Facility	166.601
TX	Jones Station	920.705
TX	Knox Lee Power Plant	359.782
TX	Lake Creek	62.247
TX	Lake Hubbard	94.991
TX	Lamar Power (Paris)	578.873
TX	Laredo	21.816
TX	Leon Creek	27.709
TX	Lewis Creek	197.402
TX	Limestone	12019.44
TX	Lone Star Power Plant	2.05
TX	Lost Pines 1	199.266
TX	Magic Valley Generating Station	353.369
TX	Martin Lake	15702.54
TX	Midlothian Energy	192.232
TX	Monticello	11938.4
TX	Moore County Station	41.235
TX	Morgan Creek	63.986
TX	Mountain Creek Generating Station	121.39
TX	Mustang Station	348.345
TX	Mustang Station Units 4 and 5	11.326
TX	New Gulf Power Facility	33.67
TX	Newman	1748.933
TX	Nichols Station	716.403
TX	O W Sommers	1061.494
TX	Oak Grove	66.797
TX	Odessa-Ector Generating Station	655.21
TX	Oklaunion Power Station	5057.446
TX	Paris Energy Center	270.593
TX	Permian Basin	362.138
TX	Plant X	688.144
TX	Power Lane Steam Plant	48.817
TX	Quail Run Energy Center	85.932
TX	R W Miller	479.269
TX	Ray Olinger	40.472
TX	Rio Nogales Power Project, LP	242.629
TX	Roland C. Dansby Power Plant	45.075
TX	Sabine	3116.479
TX	Sam Bertron	299.076
TX	Sam Rayburn Plant	27.319
TX	Sam Seymour	6221.718
TX	San Jacinto County Peaking Facility	5.16
TX	San Jacinto Steam Electric Station	98.633
TX	San Miguel	3168.534
TX	Sand Hill Energy Center	135.309
TX	Sandow	4911.851
TX	Sandow Station	299.938
TX	Silas Ray	20.793

State	Plant Name	NOx (tons) Emitted in 2009
TX	Sim Gideon	516.359
TX	Spencer	10.072
TX	Stryker Creek	318.54
TX	Sweetwater Generating Plant	2.877
TX	T C Ferguson Power Plant	696.451
TX	T H Wharton	203.749
TX	Tenaska Frontier Generation Station	717.859
TX	Tenaska Gateway Generating Station	303.926
TX	Tolk Station	7164.165
TX	Tradinghouse	230.203
TX	Trinidad	64.273
TX	Twin Oaks	1478.684
TX	V H Braunig	971.86
TX	Valley (TXU)	533.818
TX	Victoria Power Station	23.847
TX	W A Parish	5059.821
TX	W B Tuttle	10.183
TX	Welsh Power Plant	10145.32
TX	Wilkes Power Plant	666.289
TX	Winchester Power Park	5.825
TX	Wise County Power Company, LLC	264.72
TX	Wolf Hollow I, LP	431.843
UT	Bonanza	6252.933
UT	Carbon	3513.993
UT	Currant Creek Power Project	83.093
UT	Gadsby	227.185
UT	Hunter	17286.67
UT	Huntington	9769.279
UT	Intermountain	24814.83
UT	Lake Side Power Plant	46.683
UT	Millcreek Power	15.725
UT	Nebo Power Station	35.505
UT	West Valley Generation Project	22.905
VA	Altavista Power Station	226.124
VA	Bellemeade Power Station	66.404
VA	Bremo Power Station	1602.916
VA	Buchanan -- Units 1 and 2	13.805
VA	Chesapeake Energy Center	2312.56
VA	Chesterfield Power Station	3760.723
VA	Clinch River	1804.163
VA	Clover Power Station	8868.041
VA	Commonwealth Chesapeake	17.048
VA	Darbytown Combustion Turbine	69.44
VA	Doswell Limited Partnership	337.813
VA	Elizabeth River Combustion Turbine Sta	73.273
VA	Glen Lyn	912.053
VA	Gordonsville Power Station	91.342
VA	Gravel Neck Combustion Turbine	71.202
VA	Hopewell Power Station	180.429
VA	Ladysmith Combustion Turbine Sta	83.726
VA	Louisa Generation Facility	18.859
VA	Marsh Run Generation Facility	25.476
VA	Mecklenburg Power Station	674.255
VA	Possum Point Power Station	471.702
VA	Potomac River	977.003

State	Plant Name	NOx (tons) Emitted in 2009
VA	Remington Combustion Turbine Station	66.966
VA	Southampton Power Station	398.926
VA	Tasley Energy Center	1.324
VA	Tenaska Virginia Generating Station	85.288
VA	Wolf Hills Energy	15.319
VA	Yorktown Power Station	2286.95
VT	J C McNeil	114.174
WA	Centralia	10202.63
WA	Chehalis Generation Facility	90.473
WA	Encogen Generating Station	41.501
WA	Frederickson Power LP	35.691
WA	Fredonia Generating Station	7.458
WA	Goldendale Generating Station	37.555
WA	Grays Harbor Energy Center	55.531
WA	River Road	72.136
WA	Sumas Generating Station	41.221
WI	Alma	1288.095
WI	Bay Front	915.093
WI	Blount Street	67.944
WI	Columbia	4766.137
WI	Combined Locks Energy Center, LLC	1.941
WI	Concord	15.59
WI	DTE Stoneman, LLC	65.404
WI	Depere Energy Center	5.266
WI	Edgewater (4050)	2962.196
WI	Elk Mound Generating Station	0.175
WI	Elm Road Generating Station	71.176
WI	Fitchburg Generating Station	8.607
WI	French Island	6.34
WI	Genoa	1528.011
WI	Germantown Power Plant	53.023
WI	Island Street Peaking Plant	7.304
WI	J P Madgett	3635.563
WI	Manitowoc	217.307
WI	Neenah Energy Facility	4.597
WI	Nelson Dewey	2381.653
WI	Paris	14.455
WI	Pleasant Prairie	2605.442
WI	Port Washington Generating Station	111.462
WI	Pulliam	3384.034
WI	Riverside Energy Center	46.787
WI	Rock River	33.753
WI	Rockgen Energy Center	21.457
WI	Sheboygan Falls Energy Facility	0.736
WI	Sheepskin	11.195
WI	South Fond Du Lac	2.305
WI	South Oak Creek	3629.628
WI	Valley (WEPCO)	1814.729
WI	West Marinette	17.572
WI	Weston	3809.771
WI	Wheaton Generating Plant	30.947
WV	Albright Power Station	655.931
WV	Big Sandy Peaker Plant	15.069

State	Plant Name	NOx (tons) Emitted in 2009
WV	Ceredo Generating Station	4.893
WV	Fort Martin Power Station	5711.337
WV	Harrison Power Station	4737.356
WV	John E Amos	3439.053
WV	Kammer	3269.066
WV	Kanawha River	2410.678
WV	Mitchell (WV)	2247.009
WV	Mount Storm Power Station	3695.894
WV	Mountaineer (1301)	2673.705
WV	North Branch Power Station	294.379
WV	Phil Sporn	3940.743
WV	Pleasants Energy, LLC	12.549
WV	Pleasants Power Station	2564.066
WV	Rivesville Power Station	83.688
WV	Willow Island Power Station	370.139
WY	Dave Johnston	10520.31
WY	Jim Bridger	20032.57
WY	Laramie River	16527.06
WY	Naughton	12914.36
WY	Neil Simpson II	702.477
WY	Neil Simpson II (CT2)	0.691
WY	Wygen I	580.989
WY	Wygen II	297.3
WY	Wyodak	4645.478

APPENDIX C: Power Plants Ranked by Tons of Nitrogen Oxides Emitted in 2009

State	Facility	NOx (tons) Emitted in 2009
NM	Four Corners Steam Elec Station	42510.52
AZ	Navajo Generating Station	30500.62
UT	Intermountain	24814.83
PA	Hatfields Ferry Power Station	21198.34
MI	Monroe	20374.36
WY	Jim Bridger	20032.57
IN	Rockport	19762.18
PA	Conemaugh	18979.93
FL	Crystal River	18547.69
NM	San Juan	18359.04
MT	Colstrip	17516.05
UT	Hunter	17286.67
KS	Jeffrey Energy Center	17209.91
GA	Scherer	17171.59
WY	Laramie River	16527.06
TX	Martin Lake	15702.54
OK	Muskogee	15150.23
NE	Nebraska City Station	15136.93
NE	Gerald Gentleman Station	14986.56
OK	Northeastern	14973.88
ND	Antelope Valley	14736.63
AR	White Bluff	14523.37
CO	Craig	14356.58
OK	Grand River Dam Authority	14346.41
AR	Independence	14338.11
ND	Milton R Young	14046.37
MN	Sherburne County	13873.71
KY	Shawnee	13607.3
GA	Harllee Branch	12960.15
WY	Naughton	12914.36
PA	Brunner Island	12818.28
OH	W H Sammis	12177.72
AZ	Coronado Generating Station	12133.76
TX	Limestone	12019.44
TX	Monticello	11938.4
SD	Big Stone	11814.55
LA	Big Cajun 2	11433.51
OH	Conesville	11324.37
MN	Boswell Energy Center	11228.75
ND	Coyote	11051.89
OH	Walter C Beckjord Generating Station	10952.99
ND	Coal Creek	10646.5
IN	R M Schahfer Generating Station	10565.83
WY	Dave Johnston	10520.31
PA	Homer City	10508.3
OK	Sooner	10470.09
MI	Belle River	10443.9
AL	E C Gaston	10292.32
WA	Centralia	10202.63
TX	Welsh Power Plant	10145.32
UT	Huntington	9769.279
NC	Marshall	9743.614
KS	La Cygne	9704.512
IN	Petersburg	9657.994
FL	Big Bend	9653.103
IN	Gibson	9568.628
MI	St. Clair	9378.145

State	Facility	NOx (tons) Emitted in 2009
ND	Leland Olds	9219.162
AZ	Cholla	9211.297
MO	Labadie	9199.908
VA	Clover Power Station	8868.041
TN	Johnsonville	8520.994
MI	J H Campbell	8495.197
IA	George Neal North	8473.075
AL	Barry	8440.868
KY	Paradise	8350.107
OH	J M Stuart	8297.043
IN	Clifty Creek	8018.792
AL	James H Miller Jr	7929.218
KY	Mill Creek	7906.916
OH	Muskingum River	7808.598
NE	Sheldon	7636.649
TX	Harrington Station	7524.729
CO	Cherokee	7497.119
PA	Bruce Mansfield	7452.072
GA	Yates	7440.537
FL	Curtis H. Stanton Energy Center	7404.048
MS	Daniel Electric Generating Plant	7357.528
IA	Walter Scott Jr. Energy Center	7317.773
TX	Tolk Station	7164.165
FL	St. Johns River Power	7095.893
OH	Eastlake	7087.134
IL	Kincaid Station	6987.003
GA	Bowen	6947.24
OH	Gen J M Gavin	6904.027
CO	Hayden	6692.752
MO	Sioux	6638.72
NC	Roxboro	6627.005
OR	Boardman	6560.813
KY	Ghent	6413.208
MO	Montrose	6269.823
UT	Bonanza	6252.933
TX	Sam Seymour	6221.718
MN	Black Dog	6162.446
IN	State Line Generating Station (IN)	5990.934
IN	Wabash River Gen Station	5974.515
MI	Presque Isle	5945.712
AZ	Springerville Generating Station	5914.586
SC	Cross	5903.727
TX	Big Brown	5777.017
NE	North Omaha Station	5745.555
KY	Cane Run	5738.219
WV	Fort Martin Power Station	5711.337
NV	North Valmy	5690.491
LA	R S Nelson	5421.038
PA	Montour	5378.679
AL	Gorgas	5373.364
TN	Cumberland	5347.88
MS	R D Morrow Senior Generating Plant	5187.052
MI	Trenton Channel	5161.137
OH	Avon Lake Power Plant	5112.609
KY	Coleman	5065.349
TX	W A Parish	5059.821
TX	Oklaunion Power Station	5057.446
LA	Ninemile Point	5020.19
MS	Watson Electric Generating Plant	5005.836
MA	Brayton Point	4991.691
AZ	Apache Station	4972.537
TX	Sandow	4911.851
KY	Big Sandy	4869.678

State	Facility	NOx (tons) Emitted in 2009
TN	John Sevier	4845.131
TN	Gallatin	4837.826
MO	Meramec	4808.587
WI	Columbia	4766.137
WV	Harrison Power Station	4737.356
PA	Shawville	4690.012
WY	Wyodak	4645.478
NV	Reid Gardner	4641.982
FL	Martin	4601.317
LA	Dolet Hills Power Station	4589.779
CO	Martin Drake	4509.507
IL	Joppa Steam	4443.69
IA	George Neal South	4431.579
AL	Colbert	4424.481
FL	Seminole (136)	4401.534
AL	Greene County	4379.629
KS	Holcomb	4355.391
MI	River Rouge	4340.231
OH	Miami Fort Generating Station	4337.776
KY	E W Brown	4279.959
NC	L V Sutton	4279.444
MS	Baxter Wilson	4267.111
IN	Merom	4220.484
TX	Coleto Creek	4198.112
IA	Louisa	4135.673
MD	Mirant Chalk Point	4101.063
IL	Baldwin Energy Complex	4096.647
MO	Thomas Hill Energy Center	4082.997
FL	Port Everglades	4018.22
KS	Lawrence Energy Center	4001.148
LA	Brame Energy Center	3973.037
FL	Crist Electric Generating Plant	3967.966
WV	Phil Sporn	3940.743
PA	Eddystone Generating Station	3915.238
IA	Ottumwa	3893.155
GA	Kraft	3884.517
MO	Rush Island	3861.36
CO	Comanche (470)	3859.766
NC	G G Allen	3821.341
IL	Newton	3821.084
WI	Weston	3809.771
IL	E D Edwards	3805.032
AR	Flint Creek Power Plant	3782.247
VA	Chesterfield Power Station	3760.723
NY	AES Somerset (Kintigh)	3748.124
PA	Keystone	3718.499
WV	Mount Storm Power Station	3695.894
KY	R D Green	3694.438
OH	Bay Shore	3691.912
TX	J T Deely	3657.615
OH	W H Zimmer Generating Station	3651.755
FL	Cape Canaveral	3650.232
WI	J P Madgett	3635.563
WI	South Oak Creek	3629.628
OK	Seminole (2956)	3614.302
NM	Escalante	3607.039
IN	Tanners Creek	3529.309
AL	Widows Creek	3526.372
UT	Carbon	3513.993
MD	Brandon Shores	3473.146
IN	Cayuga	3460.555
WV	John E Amos	3439.053
WI	Pulliam	3384.034
KY	John S. Cooper	3362.436
FL	Lansing Smith Generating Plant	3347.79

State	Facility	NOx (tons) Emitted in 2009
TX	H W Pirkey Power Plant	3327.617
LA	Little Gypsy	3269.078
WV	Kammer	3269.066
KS	Nearman Creek	3258.424
SC	Winyah	3254.47
MD	Dickerson	3242.98
KS	Quindaro	3239.958
DE	Indian River	3235.496
OH	Kyger Creek	3229.549
OK	Hugo	3225.87
MO	New Madrid Power Plant	3222.443
KY	H L Spurlock	3215.15
AL	Charles R Lowman	3193.01
TX	San Miguel	3168.534
GA	Hammond	3164.406
IA	Lansing	3123.271
TX	Sabine	3116.479
IN	R Gallagher	3088.075
PA	Portland	3067.844
NC	H F Lee Steam Electric Plant	3059.806
MI	J C Weadock	3013.274
KY	Elmer Smith	3008.53
PA	Cheswick	2999.045
WI	Edgewater (4050)	2962.196
MO	Sibley	2933.791
OH	Killen Station	2883.875
FL	C D McIntosh Jr Power Plant	2882.971
NC	Belews Creek	2765.341
IN	Harding Street Station (EW Stout)	2721.777
IL	Wood River Power Station	2716.855
OK	Riverside (4940)	2684.267
WV	Mountaineer (1301)	2673.705
IA	Muscatine	2670.923
NY	Dynegy Danskammer	2667.476
TN	Allen	2605.6
WI	Pleasant Prairie	2605.442
GA	Jack McDonough	2592.531
CO	Pawnee	2588.782
MI	B C Cobb	2585.062
WV	Pleasants Power Station	2564.066
FL	Northside	2541.053
TX	J K Spruce	2519.178
MS	Red Hills Generation Facility	2519.018
CO	Arapahoe	2481.742
IN	Bailly Generating Station	2459.355
OK	Comanche (8059)	2448.677
KY	East Bend	2436.246
IN	Frank E Ratts	2424.122
WV	Kanawha River	2410.678
WI	Nelson Dewey	2381.653
GA	Wansley (6052)	2370.748
FL	Lauderdale	2367.55
VA	Chesapeake Energy Center	2312.56
NH	Merrimack	2306.459
VA	Yorktown Power Station	2286.95
KS	Tecumseh Energy Center	2277.999
NY	NRG Dunkirk Power	2270.374
MI	J R Whiting	2268.668
WV	Mitchell (WV)	2247.009
IL	Coffeen	2207.379
MD	C P Crane	2121.674
FL	Anclote	2114.578
TX	Gibbons Creek Steam Electric Station	2114.03
NY	AES Cayuga, LLC	2110.208
CO	Rawhide Energy Station	2083.805
CO	Ray D Nixon	2071.521

State	Facility	NOx (tons) Emitted in 2009
MO	Sikeston	2051.982
NY	Northport	2044.738
CO	Valmont	2040.438
PA	Seward	2038.704
FL	Putnam	2029.118
PA	Sunbury	1985.296
SC	Canadys Steam	1975.976
NC	Cape Fear	1965.372
OH	Cardinal	1964.945
MD	Mirant Morgantown	1950.732
KY	William C. Dale	1948.792
MO	Iatan	1923.384
MO	Chamois Power Plant	1895.762
OK	Southwestern	1889.516
NJ	Hudson Generating Station	1889.203
FL	Manatee	1834.381
WI	Valley (WEPCO)	1814.729
MO	Lake Road	1809.184
VA	Clinch River	1804.163
OH	Richard Gorsuch	1800.354
TX	Newman	1748.933
FL	Turkey Point	1747.221
IN	A B Brown Generating Station	1720.865
MD	Herbert A Wagner	1704.036
LA	Michoud	1703.577
SC	Williams	1700.493
MN	Taconite Harbor Energy Center	1663.544
IL	Hennepin Power Station	1660.47
MT	J E Corette	1641.096
CO	Nucla	1639.958
ND	Stanton	1637.261
NC	Westmoreland Partners Roanoke Valley I	1618.141
FL	Cedar Bay Generating Co. LP	1608.803
NC	Mayo	1606.162
VA	Bremo Power Station	1602.916
MO	Hawthorn	1589.643
NY	Huntley Power	1541.094
PA	Titus	1528.44
WI	Genoa	1528.011
SC	McMeekin	1507.898
TX	Twin Oaks	1478.684
LA	Louisiana 1	1472.366
IN	IPL Eagle Valley Generating Station	1461.536
SC	H B Robinson	1460.249
MN	Allen S King	1456.334
IL	Marion	1449.072
FL	Deerhaven	1444.456
KY	Green River	1419.712
SC	Wateree	1381.52
PA	Mitchell Power Station	1379.808
MI	Dan E Karn	1329.425
IA	Sutherland	1291.473
WI	Alma	1288.095
PA	New Castle	1286.708
NE	Platte	1273.507
TN	Bull Run	1270.723
MI	Eckert Station	1266.797
IL	Dallman	1259.837
IA	Burlington (IA)	1243.803
IL	Duck Creek	1233.747
FL	Sanford	1231.787
MI	Erickson	1230.655
NC	W H Weatherspoon	1149.158
KS	Riverton	1146.495
KY	Trimble County	1144.748

State	Facility	NOx (tons) Emitted in 2009
PA	Cromby	1143.693
NY	Charles Poletti	1121.576
CA	Humboldt Bay	1109.187
NJ	B L England	1105.089
PA	Elrama	1097.015
IN	Michigan City Generating Station	1095.73
NE	Gerald Whelan Energy Center	1067.327
TX	O W Sommers	1061.494
NC	Cliffside	1048.264
KS	Gordon Evans Energy Center	1038.866
KY	HMP&L Station 2	1038.245
NH	Schiller	1031.064
OH	Niles	1028.795
IN	F B Culley Generating Station	1021.417
OH	Ashtabula	1015.926
TX	Decker Creek	1015.005
AZ	Irvington Generating Station	1010.558
OK	Horseshoe Lake	1006.087
FL	Fort Myers	1002.396
KY	D B Wilson	990.329
MO	James River	987.841
MA	Salem Harbor	986.293
SC	Urquhart	980.58
VA	Potomac River	977.003
TX	V H Braunig	971.86
IL	Vermilion Power Station	967.743
ND	R M Heskett	957.981
IA	Ames	942.935
SC	Cope Station	940.439
NJ	Carneys Point	925.22
TX	Jones Station	920.705
WI	Bay Front	915.093
PA	Armstrong Power Station	914.446
VA	Glen Lyn	912.053
OH	R E Burger	906.419
TX	FPLE Forney, LP	903.512
LA	Teche Power Station	891.183
CT	Bridgeport Harbor Station	847.471
CO	Fort St. Vrain	843.263
NM	Cunningham	837.231
IL	Meredosia	819.948
NY	E F Barrett	815.304
FL	P L Bartow	812.275
PA	Martins Creek	806.533
AL	Gadsden	795.335
MO	Asbury	794.331
NY	Ravenswood Generating Station	777.997
MO	Southwest	773.829
NJ	Logan Generating Plant	766.1
MT	Lewis & Clark	756.105
OK	Mustang	736.382
NY	Astoria Generating Station	735.587
IL	Hutsonville	725.15
MN	Hoot Lake	720.289
TX	Tenaska Frontier Generation Station	717.859
TX	Nichols Station	716.403
PA	Hunlock Power Station	711.099
WY	Neil Simpson II	702.477
TX	T C Ferguson Power Plant	696.451
SC	Jefferies	689.606
TX	Plant X	688.144
IA	Dubuque	683.333
TX	Graham	681.796
VA	Mecklenburg Power Station	674.255
TX	Wilkes Power Plant	666.289

State	Facility	NOx (tons) Emitted in 2009
TX	Bosque County Power Plant	662.148
NJ	Mercer Generating Station	661.314
FL	Hines Energy Complex	659.752
MN	Laskin Energy Center	656.033
WV	Albright Power Station	655.931
TX	Odessa-Ector Generating Station	655.21
NC	Asheville	650.039
NY	59th Street	624.161
NV	Fort Churchill	610.044
IA	Riverside (1081)	603.41
OK	Tenaska Kiamichi Generating Station	582.16
WY	Wygen I	580.989
TX	Lamar Power (Paris)	578.873
DE	Edge Moor	559.174
MI	Wyandotte	549.531
TN	Kingston	549.318
SC	W S Lee	548.087
NC	Riverbend	542.077
LA	Waterford 1 & 2	535.35
TX	Valley (TXU)	533.818
NV	Tracy	524.643
CO	Cameo	519.335
TX	Sim Gideon	516.359
FL	Bayside Power Station	514.651
IA	Milton L Kapp	507.337
NM	Rio Grande	493.485
TX	R W Miller	479.269
VA	Possum Point Power Station	471.702
FL	Suwannee River	467.886
MI	Harbor Beach	460.407
NJ	Bergen	456.853
MT	Hardin Generating Station	456.251
FL	Midulla Generating Station	432.278
TX	Wolf Hollow I, LP	431.843
OH	Lake Shore	428.423
KS	Murray Gill Energy Center	426.099
MI	Endicott Generating	423.625
NY	Dynegy Roseton	420.957
LA	D G Hunter	414.037
SC	Dolphus M Grainger	407.518
NC	Craven County Wood Energy	406.843
OK	Oneta Energy Center	399.074
VA	Southampton Power Station	398.926
MS	Batesville Generation Facility	394.752
NE	Lon D Wright Power Plant	387.936
FL	Hardee Power Station	380.81
TX	Decordova	380.606
OK	Mooreland	380.568
MI	J B Sims	378.843
KS	Fort Dodge aka Judson Large	378.279
LA	Willow Glen	377.714
NC	Buck	374.229
FL	Polk	373.777
IL	Havana	373.076
NY	AES Greenidge	371.69
WV	Willow Island Power Station	370.139
IN	Whitewater Valley	369.329
MS	Southaven Combined Cycle	367.507
OK	Green Country Energy, LLC	365.269
TX	Permian Basin	362.138
TX	Knox Lee Power Plant	359.782
OH	Picway	358.69
NY	74th Street	357.975
MA	Mount Tom	355.373
TX	Magic Valley Generating Station	353.369

State	Facility	NOx (tons) Emitted in 2009
NY	Arthur Kill	351.717
TX	Frontera Generation Facility	351.265
OK	McClain Energy Facility	351.181
TX	Mustang Station	348.345
MS	Moselle Generating Plant	347.988
VA	Doswell Limited Partnership	337.813
NJ	Essex	336.065
TX	Barney M. Davis	332.131
FL	Intercession City	324.53
MS	Gerald Andrus	324.03
MA	Mystic	321.412
NY	Holtsville Facility	319.642
TX	Bastrop Clean Energy Center	318.973
TX	Stryker Creek	318.54
NM	Maddox	306.898
MO	Columbia	306.427
IA	Fair Station	305.009
TX	Tenaska Gateway Generating Station	303.926
NY	Port Jefferson Energy Center	303.713
NY	East River	301.688
TX	Sandow Station	299.938
CA	El Centro	299.792
TX	Sam Bertron	299.076
WY	Wygen II	297.3
WV	North Branch Power Station	294.379
TX	Channelview Cogeneration Facility	294.101
NC	Westmoreland Partners Roanoke Valley II	293.997
NY	Hudson Avenue	293.987
CO	Front Range Power Plant	289.897
AZ	Gila River Power Station	288.518
NV	TS Power Plant	286.299
NY	S A Carlson	283.165
OK	Tulsa	282.315
AL	Plant H. Allen Franklin	279.361
PA	WPS Westwood Generation, LLC	278.839
RI	Manchester Street	277.959
AR	Union Power Station	277.551
IA	Prairie Creek	277.166
TX	Paris Energy Center	270.593
DE	Hay Road	265.987
TX	Wise County Power Company, LLC	264.72
OH	Hamilton Municipal Power Plant	263.929
MA	Canal Station	256.781
CO	Lamar	256.718
NC	Dan River	256.468
NV	Chuck Lenzie Generating Station	256.296
OH	O H Hutchings	252.438
LA	Coughlin Power Station	251.772
AZ	Yucca Power Plant	251.675
MI	Shiras	246.789
FL	Arvah B Hopkins	245.738
TX	Rio Nogales Power Project, LP	242.629
MD	R. Paul Smith Power Station	239.267
TX	Cedar Bayou	236.192
AZ	Mesquite Generating Station	235.361
NC	Richmond County Plant	234.65
AR	Harvey Couch	233.665
TX	Cottonwood Energy Project	232.52
ME	William F Wyman	232.165
TX	Tradinghouse	230.203
OK	Redbud Power Plant	229.925

State	Facility	NOx (tons) Emitted in 2009
IA	Pella	229.262
NH	Newington	228.435
IN	Edwardsport	227.973
MI	James De Young	227.408
UT	Gadsby	227.185
VA	Altavista Power Station	226.124
MI	Grayling Generating Station	219.393
WI	Manitowoc	217.307
CO	Fountain Valley Power Plant	216.982
CT	Middletown	215.306
CA	AES Alamitos	214.137
NY	AES Westover (Goudey)	212.972
FL	Indian River (55318)	212.659
MI	Dearborn Industrial Generation	210.801
KS	Hutchinson Energy Center	204.292
TX	T H Wharton	203.749
NY	Astoria Gas Turbine Power	203.55
TX	Lost Pines 1	199.266
FL	Bayboro	199.224
TX	Lewis Creek	197.402
OR	Hermiston Power Plant	193.016
TX	Midlothian Energy	192.232
AR	Lake Catherine	191.427
GA	McIntosh Combined Cycle Facility	190.869
TX	Jack County Generation Facility	189.927
PA	Fairless Energy, LLC	188.139
TX	Hays Energy Project	187.914
LA	Acadia Power Station	186.046
FL	Higgins	184.306
VA	Hopewell Power Station	180.429
AZ	Redhawk Generating Facility	175.079
IL	Kendall Energy Facility	174.904
MS	Caledonia	171.483
LA	Doc Bonin	171.093
NJ	Linden Generating Station	169.969
PA	AES Ironwood	167.06
TX	Johnson County Generation Facility	166.601
NY	Richard M Flynn (Holtsville)	166.363
AR	McClellan	165.513
CO	Spindle Hill Energy Center	164.392
AZ	Agua Fria Generating Station	164.227
FL	S O Purdom	163.851
TX	Greens Bayou	163.759
FL	Shady Hills	163.539
AL	E B Harris Generating Plant	160.291
OR	Coyote Springs	158.042
NY	Athens Generating Company	156.543
FL	Debary	151.141
KS	Great Bend Station aka Arthur Mullergren	151.004
KS	Emporia Energy Center	149.873
NJ	Deepwater	147.197
CT	Bridgeport Energy	146.218
SC	Jasper County Generating Facility	144.75
NV	El Dorado Energy	143.832
CA	Delta Energy Center, LLC	141.753
KS	Cimarron River	141.447
SC	John S. Rainey Generating Station	141.053
CA	La Paloma Generating Plant	137.885
FL	Auburndale Cogeneration Facility	137.77
MI	Mistersky	137.281
NY	Niagara Generation, LLC	136.315

State	Facility	NOx (tons) Emitted in 2009
TX	Sand Hill Energy Center	135.309
NY	Bowline Generating Station	133.678
CO	Manchief Generating Station	132.151
LA	Lieberman Power Plant	128.52
NH	Granite Ridge Energy	125.533
AL	McWilliams	125.414
FL	Avon Park	125.167
NV	Apex Generating Station	124.152
CA	AES Redondo Beach	123.842
AL	Morgan Energy Center	123.13
OK	Chouteau Power Plant	122.974
TX	Mountain Creek Generating Station	121.39
GA	Murray Energy Facility	118.65
PA	Liberty Electric Power Plant	117.258
CA	Moss Landing	116.558
ME	Maine Independence Station	116.351
AR	Hot Spring Power Co., LLC	115.863
MS	Rex Brown	115.823
CT	New Haven Harbor	115.384
VT	J C McNeil	114.174
TX	Colorado Bend Energy Center	111.473
WI	Port Washington Generating Station	111.462
CA	Pastoria Energy Facility	111.428
MI	Greenwood	110.911
GA	Effingham County Power, LLC	108.985
AL	Decatur Energy Center	108.564
CA	Mountainview Power Company, LLC	105.018
AZ	APS West Phoenix Power Plant	103.511
AZ	Santan	103.341
FL	Stanton A	102.915
KS	Garden City	102.781
MI	Jackson MI Facility	102.768
FL	Osprey Energy Center	102.686
CO	Rocky Mountain Energy Center	102.282
LA	Perryville Power Station	102.193
NY	Bethlehem Energy Center (Albany)	101.853
GA	Chattahoochee Energy Facility	101.582
KY	Smith Generating Facility	100.394
FL	Riviera	99.9
FL	West County Energy Center	99.373
MA	Somerset	99.372
TX	San Jacinto Steam Electric Station	98.633
LA	Houma	98.362
NY	Narrows	98.292
ME	Westbrook Energy Center	98.213
NV	Walter M. Higgins III Generating Station	97.442
PA	Northeastern Power Company	97.18
MA	Bellingham	96.613
FL	Oleander Power Project	95.964
GA	Mitchell (GA)	95.906
CA	Haynes Generating Station	95.756
TX	Lake Hubbard	94.991
CT	Milford Power Company LLC	94.389
SC	Darlington County	94.238
MS	Choctaw Gas Generation, LLC	93.93
CA	AES Huntington Beach	92.182
NJ	Edison	91.98
MA	Stony Brook	91.845
CA	Malburg Generating Station	91.728
CA	Gateway Generating Station	91.706

State	Facility	NOx (tons) Emitted in 2009
VA	Gordonsville Power Station	91.342
FL	G E Turner	91.226
WA	Chehalis Generation Facility	90.473
PA	Lower Mount Bethel Energy	90.374
NY	Astoria Energy	88.386
NY	Oswego Harbor Power	88.293
NM	Luna Energy Facility	87.286
NC	Rosemary Power Station	86.579
KY	Robert Reid	86.324
AZ	New Harquahala Generating Company, LLC	86.106
TX	Quail Run Energy Center	85.932
IA	Streeter Station	85.617
VA	Tenaska Virginia Generating Station	85.288
OH	Hanging Rock Energy Facility	84.491
FL	Brandy Branch	84.236
NM	Reeves Generating Station	83.823
VA	Ladysmith Combustion Turbine Sta	83.726
WV	Rivesville Power Station	83.688
UT	Currant Creek Power Project	83.093
OR	Port Westward	82.718
NY	Black River Generation, LLC	81.276
MA	West Springfield	80.486
MA	Fore River Station	80.36
FL	Cane Island	78.839
NY	Poletti 500 MW CC	78.829
AZ	Ocotillo Power Plant	78.779
NV	Silverhawk	78.674
NM	Bluffview Power Plant	77.694
CA	Calpine Sutter Energy Center	77.45
RI	Ocean State Power II	77.219
NY	Bethpage Energy Center	77.184
KY	Tyrone	77.15
CO	Blue Spruce Energy Center	76.63
CT	Lake Road Generating Company	76.12
MA	Blackstone	75.598
TX	Alex Ty Cooke Generating Station	74.844
MA	Millennium Power Partners	74.748
NY	Wading River Facility	74.354
OH	Woodsdale	74.338
CA	Metcalf Energy Center	74.066
AZ	South Point Energy Center, LLC	73.874
PA	Hunterstown Combined Cycle	73.581
IA	Electrifarm	73.537
CA	Palomar Energy Center	73.288
VA	Elizabeth River Combustion Turbine Sta	73.273
CA	Valley Gen Station	72.514
WA	River Road	72.136
MN	Silver Lake	71.967
PA	Fayette Energy Facility	71.656
RI	Ocean State Power	71.475
NC	Plant Rowan County	71.213
VA	Gravel Neck Combustion Turbine	71.202
WI	Elm Road Generating Station	71.176
SC	Broad River Energy Center	70.952
AR	Hot Spring Energy Facility	70.869
NH	NAEA Newington Energy LLC	70.355
VA	Darbytown Combustion Turbine	69.44
WI	Blount Street	67.944
NY	East Hampton Facility	67.807
VA	Remington Combustion Turbine Station	66.966

State	Facility	NOx (tons) Emitted in 2009
NM	Hobbs Generating Station	66.959
PA	Fairless Hills Generating Station	66.884
TX	Oak Grove	66.797
GA	Sewell Creek Energy	66.636
VA	Bellemeade Power Station	66.404
WI	DTE Stoneman, LLC	65.404
PA	Ontelaunee Energy Center	64.702
MS	Magnolia Facility	64.678
AZ	Griffith Energy Project	64.341
TX	Trinidad	64.273
TX	Morgan Creek	63.986
NC	NCEMC Anson Plant	63.981
ID	Rathdrum Power, LLC	63.588
AZ	APS Saguaro Power Plant	62.801
CA	Cosumnes Power Plant	62.314
TX	Lake Creek	62.247
RI	Rhode Island State Energy Partners	61.814
MI	Renaissance Power	61.363
MO	State Line (MO)	60.329
LA	Ouachita Plant	60.126
MO	Blue Valley	59.59
MO	Greenwood Energy Center	59.276
MA	ANP Bellingham Energy Company, LLC	58.518
DC	Benning Generation Station	56.622
GA	Wansley (7946)	55.856
CA	Blythe Energy	55.776
LA	Big Cajun 1	55.677
WA	Grays Harbor Energy Center	55.531
RI	Tiverton Power	54.403
AZ	Desert Basin Generating Station	53.697
PA	Bethlehem Power Plant	53.42
IA	Marshalltown CTs	53.199
WI	Germantown Power Plant	53.023
FL	RRI Energy Osceola	52.724
FL	Santa Rosa Energy Center	52.583
CA	Morro Bay Power Plant, LLC	52.425
MA	Kendall Square	52.304
TX	Cedar Bayou 4	52.104
NJ	Kearny Generating Station	51.397
MD	Vienna	51.007
CA	Coolwater Generating Station	49.881
OH	Washington Energy Facility	49.033
NJ	Burlington Generating Station	48.95
TX	Power Lane Steam Plant	48.817
MA	ANP Blackstone Energy Company, LLC	48.136
AR	Oswald Generating Station	47.805
OK	Spring Creek Power Plant	47.159
WI	Riverside Energy Center	46.787
UT	Lake Side Power Plant	46.683
NY	Far Rockaway	46.596
MS	Sylvarena Generating Plant	46.576
NJ	Howard M Down	46.55
IN	Sugar Creek Generating Station	46.472
CA	Cabrillo Power I Encina Power Station	45.676
NJ	Sewaren Generating Station	45.254
MN	St. Bonifacius Station	45.198
TX	Roland C. Dansby Power Plant	45.075
MO	Empire District Elec Co Energy Ctr	44.952
CT	Montville	44.587
LA	Hargis-Hebert Electric Generating Statio	44.407
MN	Riverside (1927)	44.322

State	Facility	NOx (tons) Emitted in 2009
MD	Perryman	43.378
MN	High Bridge	43.117
GA	Dahlberg (Jackson County)	43.026
TX	Harrison County Power Project	42.791
GA	McManus	42.673
CT	Exeter Energy Limited Partnership	42.666
WA	Encogen Generating Station	41.501
TX	Moore County Station	41.235
WA	Sumas Generating Station	41.221
FL	Scholz Electric Generating Plant	41.213
IA	Emery Station	41.075
MO	St. Francis Power Plant	41.059
NM	Afton Generating Station	40.864
TX	Ray Olinger	40.472
CT	Norwalk Harbor Station	40.142
GA	Hartwell Energy Facility	39.79
LA	Sterlington	39.774
KS	Chanute 2	39.549
AZ	Black Mountain Generating Station	39.196
MN	Cambridge Station	39.07
OH	Waterford Plant	38.864
NJ	Cedar Energy Station	38.751
TN	Lagoon Creek	38.658
TX	Handley Generating Station	38.609
NM	Milagro Cogeneration and Gas Plant	38.546
MS	Attala Generating Plant	38.173
NV	Clark	38.027
GA	McIntosh (6124)	37.953
MO	Dogwood Energy Facility	37.902
WA	Goldendale Generating Station	37.555
IN	Lawrenceburg Energy Facility	36.83
CA	Walnut Energy Center	36.749
CA	Dynegy South Bay, LLC	36.277
ID	Bennett Mountain Power Project	35.864
WA	Frederickson Power LP	35.691
UT	Nebo Power Station	35.505
AR	Thomas Fitzhugh	35.158
MN	Pleasant Valley Station	34.822
AL	Tenaska Central Alabama Gen Station	34.386
MO	Peno Creek Energy Center	33.985
NY	Glenwood	33.888
WI	Rock River	33.753
CA	Magnolia	33.728
TX	New Gulf Power Facility	33.67
SC	Columbia Energy Center (SC)	33.337
FL	Treasure Coast Energy Center	32.921
MI	New Covert Generating Project	32.195
AR	Cecil Lynch	31.82
IA	Sycamore Combustion Turbine	31.375
CO	Arapahoe Combustion Turbine Facility	31.054
CA	Potrero Power Plant	31.004
WI	Wheaton Generating Plant	30.947
IL	Elwood Energy Facility	30.548
IL	Pinckneyville Power Plant	30.401
AZ	Kyrene Generating Station	30.376
FL	J D Kennedy	29.832
MA	Berkshire Power	29.699
MA	Cleary Flood	29.686
AL	Calhoun Power Company I, LLC	29.569
NM	Lordsburg Generating Station	28.819

State	Facility	NOx (tons) Emitted in 2009
NC	Rockingham County Combustion Turbine	28.539
AZ	Arlington Valley Energy Facility	28.519
GA	Walton County Power, LLC	28.425
MA	Milford Power, LP	28.155
CA	Harbor Generating Station	28.028
TX	Leon Creek	27.709
ID	Evander Andrews Power Complex	27.707
TX	Sam Rayburn Plant	27.319
CO	Brush Power Projects	27.27
FL	J R Kelly	26.936
CA	Grayson Power Plant	26.891
CA	Yuba City Energy Center	26.739
IL	Grand Tower	26.269
MN	Inver Hills	26.24
PA	Allegheny Energy Units 3, 4 & 5	26.11
AR	Dell Power Plant	26.106
LA	Morgan City Electrical Gen Facility	25.69
OH	Madison Generating Station	25.575
VA	Marsh Run Generation Facility	25.476
ME	Rumford Power	24.89
IL	Holland Energy Facility	24.676
MD	Rock Springs Generating Facility	24.636
AZ	Sundance Power Plant	24.504
MO	Northeast Generating Station	24.369
FL	Charles Larsen Memorial Power Plant	24.192
PA	Chambersburg Units 12 and 13	24
TX	Copper Station	23.974
TX	Victoria Power Station	23.847
MO	McCartney Generating Station	23.517
FL	Vero Beach Municipal	23.203
CA	El Segundo	23.119
IA	Earl F Wisdom	23.05
NC	Elizabethtown Power	22.95
PA	Schuylkill	22.907
UT	West Valley Generation Project	22.905
AL	Tenaska Lindsay Hill	22.631
AR	Carl Bailey	22.587
TX	Laredo	21.816
IL	Zion Energy Center	21.789
FL	Vandolah Power Project	21.76
KS	East 12th Street	21.725
MN	Faribault Energy Park	21.576
IL	Tilton Power Station	21.516
NJ	Carlls Corner Energy Center	21.459
WI	Rockgen Energy Center	21.457
IN	Broadway Avenue Generating Station	21.104
PA	Allegheny Energy Unit 8 and Unit 9	20.906
SD	Groton Generating Station	20.836
TX	Silas Ray	20.793
CO	Frank Knutson Station	20.56
GA	Allen B Wilson Combustion Turbine Plant	20.531
CA	Etiwanda Generating Station	20.013
LA	Arsenal Hill Power Plant	19.951
FL	Indian River (683)	19.923
CA	Panoche Energy Center	19.91
AR	Hamilton Moses	19.904
SC	Hagood	19.658
VA	Louisa Generation Facility	18.859

State	Facility	NOx (tons) Emitted in 2009
NE	Rokeby	18.797
IN	Montpelier Electric Gen Station	18.786
CA	Pittsburg Power Plant (CA)	18.493
CA	Roseville Energy Park	18.318
IN	Henry County Generating Station	18.249
CA	Otay Mesa Energy Center, LLC	18.214
MO	South Harper Peaking Facility	17.839
MA	Medway Station	17.835
MS	Silver Creek Generating Plant	17.704
WI	West Marinette	17.572
IN	Wheatland Generating Facility LLC	17.559
MN	Fox Lake	17.333
AL	McIntosh (7063)	17.269
KY	Riverside Generating Company	17.204
VA	Commonwealth Chesapeake	17.048
IL	University Park Energy	16.9
NC	Butler-Warner Generation Plant	16.786
IL	Lakeside	16.549
NY	Caithness Long Island Energy Center	16.45
NE	Canaday	16.265
NJ	Pedricktown Cogeneration Plant	16.099
CA	Scattergood Generating Station	16.005
NC	NCEMC Hamlet Plant	15.748
UT	Millcreek Power	15.725
WI	Concord	15.59
VA	Wolf Hills Energy	15.319
MN	Mankato Energy Center	15.183
WV	Big Sandy Peaker Plant	15.069
IN	Vermillion Energy Facility	15.066
IA	Greater Des Moines Energy Center	15.019
AL	Hog Bayou Energy Center	14.958
MN	Blue Lake Generating Plant	14.589
WI	Paris	14.455
NM	Pyramid Generating Station	14.248
MS	Hinds Energy Facility	14.084
MO	Holden Power Plant	14.043
CA	Carson Cogeneration Company	13.862
LA	T J Labbe Electric Generating Station	13.845
VA	Buchanan -- Units 1 and 2	13.805
ID	Rathdrum Combustion Turbine Project	13.779
KY	Bluegrass Generation Company, LLC	13.641
PA	Allegheny Energy Unit 1 and Unit 2	13.208
NC	Lumberton Power	13.177
GA	Talbot Energy Facility	13.128
FL	Auburndale Peaker Energy Center	12.944
OH	Tait Electric Generating Station	12.803
CA	Donald Von Raesfeld	12.797
AR	City Water & Light - City of Jonesboro	12.796
MN	Lakefield Junction Generating	12.681
IL	PPL University Park Power Project	12.627
WV	Pleasants Energy, LLC	12.549
MN	Solway Plant	12.455
NE	Sarpy County Station	12.414
MN	Cascade Creek	12.225
CA	Ormond Beach Generating Station	12

State	Facility	NOx (tons) Emitted in 2009
CA	Glenarm	11.866
DE	McKee Run	11.593
CA	Los Esteros Critical Energy Fac	11.428
TX	Mustang Station Units 4 and 5	11.326
WI	Sheepskin	11.195
CA	Contra Costa Power Plant	11.184
TN	Brownsville CT	10.99
MS	RRI Energy Choctaw County Gen	10.785
CT	South Meadow Station	10.716
OK	Anadarko	10.696
PA	Handsome Lake Energy	10.6
PA	Mountain	10.578
IL	Rocky Road Power, LLC	10.566
NJ	Gilbert Generating Station	10.531
FL	Roy E Hansel Power Plant	10.3
FL	Tom G Smith	10.244
TX	W B Tuttle	10.183
GA	Washington County Power, LLC	10.174
TX	Spencer	10.072
LA	Bayou Cove Peaking Power Plant	10.071
NC	Lincoln	9.869
CA	Long Beach Generating Station	9.781
SC	Myrtle Beach Gas Turbine Site	9.755
IN	Noblesville	9.728
NJ	Ocean Peaking Power, LP	9.613
IN	Hoosier Energy Lawrence Co Station	9.567
OH	Greenville Electric Gen Station	9.524
IL	Venice	9.373
KY	Marshall	9.128
CT	Devon	9.115
CA	Indigo Generation Facility	8.993
NE	Beatrice	8.918
CA	Woodland Generation Station	8.852
CA	Gilroy Energy Center, LLC	8.835
MN	Cannon Falls Energy Center	8.706
NE	C W Burdick	8.667
KS	McPherson 3	8.644
NY	WPS Syracuse Generation, LLC	8.635
WI	Fitchburg Generating Station	8.607
OH	Rolling Hills Generating LLC	8.57
NE	Terry Bundy Generating Station	8.47
GA	Robins	8.407
OK	Ponca	8.355
MO	Chillicothe	8.301
DE	NRG Energy Center Dover	8.257
NC	Blewett	8.21
AR	Harry D. Mattison Power Plant	8.102
MS	Kemper County	7.729
SD	Angus Anson	7.675
WA	Fredonia Generating Station	7.458
IL	Calumet Energy Team, LLC	7.457
MD	Riverside	7.425
WI	Island Street Peaking Plant	7.304
MA	Waters River	7.301
IL	Goose Creek Power Plant	7.294
MN	Northeast Station	7.203
CT	Cos Cob	7.16
CA	Anaheim Combustion Turbine	7.157
MO	Howard Bend	7.02

State	Facility	NOx (tons) Emitted in 2009
CA	Kings River Conservation District Malaga	6.92
NJ	Sayreville	6.905
TX	Exelon Laporte Generating Station	6.874
MI	Thetford	6.833
PA	Croydon Generating Station	6.784
IL	Alsey Station	6.698
NY	Allegany Station No. 133	6.696
PA	Armstrong Energy Ltd Partnership, LLLP	6.625
NY	Gowanus	6.618
CT	Wallingford Energy	6.506
IL	Cordova Energy Company	6.478
NE	Cass County Station	6.356
WI	French Island	6.34
MA	Potter	6.129
CA	Feather River Energy Center	6.091
NJ	Werner	6.016
NY	Hawkeye Energy Greenport, LLC	5.897
CT	Waterbury Generation	5.875
FL	Desoto County Energy Park	5.875
TX	Winchester Power Park	5.825
IA	Pleasant Hill Energy Center	5.785
MA	South Boston Combustion Turbines	5.774
OH	Frank M Tait Station	5.695
OH	Troy Energy, LLC	5.642
CA	Almond Power Plant	5.619
CA	Larkspur Energy Faciity	5.51
IL	Interstate	5.484
GA	Smarr Energy Facility	5.453
SC	Hilton Head Gas Turbine Site	5.437
OH	Robert P Mone	5.382
AR	Fulton	5.322
WI	Depere Energy Center	5.266
KS	West Gardner Generating Station	5.214
MO	Audrain Power Plant	5.161
TX	San Jacinto County Peaking Facility	5.16
IL	Southeast Chicago Energy Project	5.142
IN	Worthington Generation	5.131
IL	Crete Energy Park	5.072
NY	Bayswater Peaking Facility	5.007
TX	Hardin County Peaking Facility	4.939
WV	Ceredo Generating Station	4.893
MD	Gould Street	4.892
MN	Elk River	4.867
CA	Mandalay Generating Station	4.647
WI	Neenah Energy Facility	4.597
IL	NRG Rockford Energy Center	4.585
MI	Kalkaska Ct Project #1	4.564
CO	Valmont Combustion Turbine Facility	4.515
NY	23rd and 3rd	4.465
OR	Klamath Energy LLC	4.457
NJ	Sherman Avenue	4.389
NY	Glenwood Landing Energy Center	4.353
SD	Lange	4.251
NJ	Mickleton Energy Center	4.204
IL	Lee Energy Facility	4.156
MN	Maple Lake Station	4.108
MO	Moreau	4.095
CA	Miramar Energy Facility	4.043
IL	Elgin Energy Center	4.029

State	Facility	NOx (tons) Emitted in 2009
GA	AL Sandersville	3.887
GA	MPC Generating, LLC	3.703
IA	Summit Lake	3.63
IL	RRI Energy - Aurora	3.606
IL	NRG Rockford II Energy Center	3.593
MO	Mexico	3.539
MO	Essex Power Plant	3.522
MN	Rock Lake Station	3.504
PA	Allegheny Energy Hunlock Unit 4	3.375
PA	North East Cogeneration Plant	3.296
CT	Alfred L Pierce Generating Station	3.281
PA	Brunot Island Power Station	3.215
CO	Limon Generating Station	3.206
OH	Darby Electric Generating Station	3.154
OH	Richland Peaking Station	3.121
MI	48th Street Peaking Station	3.098
OH	West Lorain	3.032
IN	Georgetown Substation	3.009
PA	Tolna	2.996
TX	Sweetwater Generating Plant	2.877
IN	Anderson	2.853
NY	Shoreham Energy	2.833
IL	Gibson City Power Plant	2.809
NY	Pouch Terminal	2.787
NY	Freeport Power Plant No. 2	2.731
IA	Lime Creek	2.725
NJ	Salem	2.56
NY	Carr Street Generating Station	2.464
NY	Edgewood Energy	2.404
NY	West Babylon Facility	2.404
NV	Harry Allen	2.388
CA	Ripon Generation Station	2.374
CA	Agua Mansa Power	2.32
WI	South Fond Du Lac	2.305
GA	West Georgia Generating Facility	2.299
GA	SEGCO Bainbridge	2.167
AL	AMEA Sylacauga Plant	2.131
OH	Dicks Creek Station	2.125
MI	DTE East China	2.076
TX	Lone Star Power Plant	2.05
CA	Niland Gas Turbine Plant	2.019
PA	Richmond	1.958
WI	Combined Locks Energy Center, LLC	1.941
DE	Christiana Substation	1.884
CA	NCPA Combustion Turbine Project #2	1.877
IA	Exira Station	1.808
TN	Gleason Generating Facility	1.767
CT	Waterside Power, LLC	1.752
SD	Huron	1.709
CA	Broadway	1.654
AL	Discover	1.609
MN	Hutchinson - Plant 2	1.598
FL	Stock Island	1.587
MA	Framingham Station	1.506
MT	Glendive Generating Station	1.468
MO	Nodaway Power Plant	1.402
CA	Riverview Energy Center	1.361
IA	Grinnell	1.328
VA	Tasley Energy Center	1.324
NJ	Forked River	1.314
MS	Crossroads Energy Center (CPU)	1.302

State	Facility	NOx (tons) Emitted in 2009
MO	Fairgrounds	1.299
CA	Goose Haven Energy Center	1.298
MI	Hancock Peakers	1.292
CA	Wolfskill Energy Center	1.291
MO	Higginsville Municipal Power Plant	1.286
CA	Riverside Energy Resource Center	1.278
CA	Chula Vista Energy Center	1.277
GA	Hawk Road Energy Facility	1.208
NJ	Cumberland Energy Center	1.202
CA	Gilroy Energy Center, LLC for King City	1.199
NY	Vernon Boulevard	1.19
CT	Norwich	1.173
DE	Warren F. Sam Beasley Pwr Station	1.172
CA	CalPeak Power - El Cajon LLC	1.16
CA	Lambie Energy Center	1.15
NJ	West Station	1.111
SC	Mill Creek Combustion Turbine Sta	1.098
CA	CalPeak Power - Enterprise LLC	1.094
IA	Centerville	1.036
NY	Hell Gate	1.015
CA	Creed Energy Center	1.015
CA	CalPeak Power - Border LLC	1.012
NY	Shoemaker	0.947
NY	Harlem River Yard	0.945
KS	Neosho Energy Center	0.941
AZ	De Moss Petrie Generating Station	0.91
NY	Brentwood	0.9
IA	Dayton Avenue Substation	0.857
CT	Torrington Terminal	0.845
KY	Paddy's Run	0.828
MO	Ralph Green Station	0.826
NM	Person Generating Project	0.815
MA	Doreen	0.813
MI	Delray	0.768
IL	RRI Energy Shelby County	0.762
NY	North 1st	0.754
WI	Sheboygan Falls Energy Facility	0.736
IL	Raccoon Creek Power Plant	0.708
WY	Neil Simpson II (CT2)	0.691
CT	Franklin Drive	0.687
CA	Olive	0.686
MI	Sumpter Plant	0.682
IL	Lincoln Generating Facility	0.674
DE	Van Sant	0.657
IL	Kinmundy Power Plant	0.635
NY	Hillburn	0.622
CA	Lake	0.619
CA	CalPeak Power - Vaca Dixon LLC	0.617
GA	Tenaska Georgia Generating Station	0.567
CA	CalPeak Power - Panoche LLC	0.564
NH	Lost Nation	0.551
MS	Sweatt Electric Generating Plant	0.55
MA	Woodland Road	0.545
NH	White Lake	0.521
MN	Montgomery	0.516
NJ	National Park	0.504
MA	New Boston	0.498
CA	Escondido Energy Center, LLC	0.488

State	Facility	NOx (tons) Emitted in 2009
MN	Minnesota River Station	0.443
IN	Richmond (IN)	0.423
KS	Osawatomie Generating Station	0.417
MO	Columbia Energy Center (MO)	0.337
CA	Center Generating Station	0.329
CT	Tunnel	0.327
MO	Viaduct	0.319
CT	Branford	0.315
CA	Redding Power Plant	0.275
IL	Freedom Power Project	0.274
NJ	Middle Energy Center	0.254
CA	Barre Generating Station	0.249
CA	Mira Loma Generating Station	0.233
NJ	Missouri Avenue Energy Center	0.21
OH	AMP-Ohio Gas Turbines Galion	0.199
WI	Elk Mound Generating Station	0.175
CA	Grapeland Generating Station	0.154
OH	AMP-Ohio Gas Turbines Napoleon	0.117
OH	AMP-Ohio Gas Turbines Bowling Green	0.114
DE	West Substation	0.079
PA	Warren	0.071
DE	Delaware City	0.069
MO	Moberly	0.027
IL	Factory Gas Turbine	0.019

APPENDIX D: Unhealthy Air Quality in Metropolitan Areas Due to Air Pollution, from 2008

Number of Days Air Quality was Unhealthy for Sensitive Groups	Number of Days Air Quality was Unhealthy	Metropolitan Area
16	0	Birmingham, AL
67	26	Bakersfield, CA
43	28	Los Angeles - Long Beach,CA
56	15	Fresno,CA
79	53	Riverside - San Bernadino, CA
84	24	Visalia - Tulare - Porterville, CA
29	4	San Diego, CA
28	7	Modesto, CA
27	9	Merced, CA
31	0	Ventura, CA
41	27	San Luis Obispo- Atascadero - Paso Robles, CA
37	20	Sacramento, CA
15	4	Redding, CA
24	4	Atlanta, CA
16	0	Cincinnati, OH - KY - IN
19	4	Baltimore, MD
26	4	Philadelphia, PA - NJ
18	1	Middllesex - Somerset - Hunterdon, NJ
17	1	Monmouth - Ocean, NJ
15	7	Albuquerque, NM
19	11	Las Cruces, NM
18	1	New York, NY
34	1	Pittsburgh, PA
15	0	Reading, PA
26	3	Charlotte - Gastonia - Rock Hill, NC - SC
15	1	Greenville - Spartanburg - Anderson, SC
23	0	Knoxville, TN
20	2	Houston, TX

METHODOLOGY

The data found in Appendix A, B, and C of the report comes from the Environmental Protection Agency's Clean Air Markets website, from the Continuous Emissions Monitoring System. The website contains power plant units that are required to report data to EPA under one of the programs administered by the Clean Air Markets Division of EPA. These programs include the Acid Rain Program; the Clean Air Interstate Rule for sulfur dioxide, nitrogen oxides, and the nitrogen oxides ozone season program; the SIP nitrogen oxides program; and the regional greenhouse gas initiative. Under these programs, units are required to report emissions of sulfur dioxide, nitrogen oxides, and carbon dioxide.

This report looks at the annual amount of nitrogen oxides emitted into the environment by operating electric generating utilities in 2009, the last year for which complete data is available. The data represents all facilities that reported data to EPA under any one of the above listed programs.

The data found in Appendix D of the report comes from the EPA's AirData website. The EPA's AirData website provides access to annual summaries of U.S. air pollution data, taken from the EPA's air pollution databases, including the Air Quality System and the National Emission Inventory. The Air Quality System database provides air monitoring data – ambient concentrations of criteria and hazardous air pollutants at monitoring sites, primarily in cities and towns. The National Emission Inventory database provides estimates of annual emissions of criteria and hazardous air pollutants from different sources.

The AirData website includes information about how much pollution is in the air outside our homes and work places through the "monitoring" portion of the website. Ambient concentrations of pollutants in outdoor air are measured at more than 4,000 monitoring stations owned and operated mainly by state environmental agencies. These agencies forward the hourly or daily measurements of pollutant concentration to the EPA's database, and EPA computes a yearly summary for each monitoring station. Agencies report data to EPA for six criteria air pollutants: carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, particulate matter, and lead.

The data found in Appendix D of the report describes the number of days that air quality was "unhealthy for sensitive groups," and "unhealthy," and comes specifically from the Air Quality Index report that monitors air pollution measurements under the AirData website. The report solely includes data that shows 15 or more days that were "unhealthy for sensitive groups."

The Air Quality Index focuses on health effects someone may experience within a few hours or days after breathing polluted air. When the air quality is "unhealthy for sensitive groups" people with lung disease, older adults and children are at a greater risk from exposure to ozone. When the air quality is "unhealthy" everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects. The data is from 2008, which is the last year for which complete data is available.

NOTES

[1] American Lung Association, State of the Air 2010, downloaded from www.stateoftheair.org on 3 March 2011.

[2] U.S. Environmental Protection Agency, "Ozone: Good Up High, Bad Nearby," 2003. Hereafter referred to as "Ozone: Good Up High, Bad Nearby."

[3] "Ozone: Good Up High, Bad Nearby."

[4] U.S. Environmental Protection Agency, "Our Nation's Air – Status and Trends through 2008," 2010.

[5] "Ozone: Good Up High, Bad Nearby."

[6] "Ozone: Good Up High, Bad Nearby."

[7] The figure was computed from data provided by the Environmental Protection Agency's Clean Air Markets Website, down loaded from http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard&EQW_datasetSelection. Units are required to report emissions of nitrogen oxides to the EPA under one of the programs administered by the Clean Air Markets Division of the EPA. These programs include the Acid Rain Program, the Clean Air Interstate Rule for sodium dioxide, nitrogen oxides, and the nitrogen oxides ozone season program, the SIP nitrogen oxides program, and the regional greenhouse gas initiative. The data represents the annual amount of nitrogen oxides emitted into the environment in 2009 by electric generating units and independent power producers that reported emissions under one of the above listed EPA programs.

[8] "Ozone: Good Up High, Bad Nearby."

[9] Lung Damage: U.S. *EPA, Smog—Who Does it Hurt? What You Need to Know About Ozone and Your Health*, July 1999; Kill: Michael Jerrett et al., "Long Term Ozone Exposure and Mortality," *The New England Journal of Medicine 360*: 1085-1095, 12 March 2009; K. Ito, S.F. de Leon and M. Lippmann, "Associations Between Ozone and Daily Mortality," *Epidemiology* 16: 446-57, July 2005.

[10] American Lung Association, *State of the Air*, 2010.

[11] American Lung Association, *State of the Air*, 2010.

[12] Balmes, Dr. John R., "Outdoor Air Pollution," *Current Occupational & Environmental Medicine*, Fourth Edition, 2007.

[13] M. Lippman, "Health Effects of Ozone: A Critical Review," *Journal of the Air Pollution Control Association* 39: 672-695, 1989; I. Mudway and F. Kelley, "Ozone and the Lung: A Sensitive Issue," *Molecular Aspects of Medicine* 21: 1-48, 2000; M. Gilmour et al., "Ozone-Enhanced Pulmonary Infection with *Streptococcus Zooepidemicus* in Mice: The Role of Alveolar Macrophage Function and Capsular Virulence Factors," *American Review of Respiratory Disease* 147: 753-760.

[14] Kendall Powell, "Ozone Exposure Throws Monkey Wrench Into Infant Lungs," Nature Medicine, Volume 9, Number 5, May 2003; R. McConnell et al., "Asthma in Exercising Children Exposed to Ozone: A Cohort Study," *The Lancet* 359: 386-391, 2002; N. Kunzli et al., "Association Between Lifetime Ambient Ozone Exposure and Pulmonary Function in College Freshmen – Results of a Pilot Study," *Environmental Research* 72: 8-16, 1997; I.B. Tager et al., "Chronic Exposure to Ambient Ozone and Lung Function in Young Adults," Epidemiology 16: 751-9, November 2005.

[15] Bell, Michelle L., et al. "Ozone and Short-term Mortality in 95 Urban Communities, 1987-2000," 17 November 2004.

[16] Joel Schwartz, "Air Pollution and Hospital Admissions for the Elderly in Birmingham, Alabama," *American Journal of Epidemiology* 139: 589-98, 15 March 1994; Joel Schwartz, "Air Pollution and Hospital Admissions for the Elderly in Detroit, Michigan," *American Journal of Respiratory Critical Care Medicine* 150: 648-55, 1994; Joel Schwartz , "PM10, Ozone, and Hospital Admissions for the Elderly in Minneapolis-St. Paul, Minnesota," *Archives of Environmental Health* 49: 366-374, 1994; Joel Schwartz, "Short-Term Fluctuations in Air Pollution and Hospital Admissions of the Elderly for Respiratory Disease," *Thorax* 50: 531-538, 1995; J. Schwartz and R. Morris, "Air Pollution and Hospital Admissions for Cardiovascular Disease in Detroit, Michigan," *American Journal of Epidemiology* 142: 23-25, 1995; Joel Schwartz, "Air Pollution and Hospital Admissions for Respiratory Disease," Epidemiology 7: 20-28, 1996; Joel Schwartz, "Air Pollution and Hospital Admissions for Cardiovascular Disease in Tucson," *Epidemiology* 8: 371-377, 1997.

[17] George Thurston et al., "Respiratory Hospital Admissions and Summertime Haze Air Pollution in Toronto, Ontario: Consideration of the Role of Acid Aerosols," *Environmental Research* 65: 271-290, 1994; R. Burnett et al., "The Role of Particulate Size and Chemistry in the Association Between Summertime Ambient Air Pollution and Hospitalization for Cardio-respiratory Disease," *Environmental Health Perspectives* 105: 614-620, 1997; R. Burnett et al., "Association Between Ozone and Hospitalization for Respiratory Diseases in 16 Canadian Cities," *Environmental Research* 72: 24-31, 1997.

[18] R. Cody et al., "The Effect of Ozone Associated with Summertime Photochemical Smog on the Frequency of Asthma Visits to Hospital Emergency Departments," *Environmental Researc*h 58: 184-194, 1992; C. Weisel et al., "Relationship Between Summertime Ambient Ozone Levels and Emergency Department Visits for Asthma in Central New Jersey," *Environmental Health Perspectives* 103, Supplement 2: 97-102, 1995; Jennifer Peel et al., "Ambient Air Pollution and Respiratory Emergency Department Visits," *Epidemiology* 6:164-174, March 2005.

[19] Romley, John A. et al, "The Impact of Air Quality on Hospital Spending," RAND Health, 2010, downloaded from http://www.rand.org/pubs/technical_reports/2010/RAND_TR777.pdf.

[20] George Thurston et al., "Summertime Haze Air Pollution and Children with Asthma," *American Journal of Respiratory Critical Care Medicine* 155: 654-660, February 1997; A. Whittemore and E. Korn, "Asthma and Air Pollution in the Los Angeles Area," American Journal of Public Health, 70: 687-696, 1980; J. Schwartz et al., "Acute Effects of Summer Air Pollution on Respiratory Symptom Reporting in Children," *American Journal of Respiratory Critical Care Medicine* 150: 1234-1242, 1994; M. Friedman et al., "Impact of Changes in Transportation and Commuting Behaviors During the 1996 Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma," *Journal of the American Medical Association* 285: 897-905, 2001; Janneane Gent et al., "Association of Low-level Ozone and Fine Particles with Respiratory Symptoms in Children with Asthma," *Journal of The American Medical Association* 290, 1859-1867, 8 October 2003; E.W. Triche et al, "Low Level Ozone Exposure and Respiratory Symptoms in Infants," *Environmental Health Perspective*s doi:10.1289/ehp.8559 (available at dx.doi.org), online 29 December 2005.

[21] American Lung Association, *State of the Air*, 2010.

[22] U.S. Department of Health and Human Servies, National Heart, Lung, and Blood Institute, "National Asthma Education and Prevention Program."

[23] U.S. Environmental Protection Agency, "Health and Environment Effects of Ground-Level Ozone," 9 February 2011.

[24] B. Ostro and S. Rothschild, "Air Pollution and Acute Respiratory Morbidity: An Observational Study of Multiple Pollutants," *Environmental Research* 50: 238-47, 1989; F. Gilliland et al., "The Effects of Ambient Air Pollution on School Absenteeism Due to Respiratory Illness," *Epidemiology* 12: 43-54, 2001; H. Park et al., "Association of Air Pollution with School Absenteeism Due to Illness," *Archives of Pediatric and Adolescent Medicine* 156: 1235-1239, 2002.

[25] U.S. Environmental Protection Agency, "Ozone and Your Health," 2010.

[26] Salam MT, Millstein J, Li Y-F, Lurmann FW, Margolis HG, Gilliland FD, "Birth outcomes and prenatal exposure to ozone, carbon monoxide, and particulate matter: results from the children's health study," 2005.

[27] American Lung Association, *State of the Air*, 2010.

[28] Kunzli N, Lurmann F, Segal M, Ngo L, Balmes J, Tager IB. Association Between Lifetime Ambient Ozone Exposure and Pulmonary Function in College Freshmen - Results of a Pilot Study. *Environmental Research*, 1997.

[29] U.S. Environmental Protection Agency, "Ozone and Your Health," 2010.

[30] Allergens: U.S. Environmental Protection Agency, "Ozone and Your Health," 2010; Asthma attack impacts: U.S. Environmental Protection Agency, "Health and Environment Effects of Ground-Level Ozone," 9 February 2011.

[31] Santa Barbara County Air Pollution Control District, "

[32] American Lung Association, *State of the Air*, 2010.

[33] "Ozone: Good Up High, Bad Nearby."

[34] Weier, Anita, "State studies show rising ozone levels threaten trees, crops," *The Capitol Times*, 11 June 2008.

[35] U.S. Environmental Protection Agency, "Health and Environment Effects of Ground-Level Ozone," 9 February 2011.

[36] "Ozone: Good Up High, Bad Nearby."

[37] Weier, Anita, "State studies show rising ozone levels threaten trees, crops," *The Capitol Times*, 11 June 2008.

[38] Weier, Anita, "State studies show rising ozone levels threaten trees, crops," *The Capitol Times*, 11 June 2008.

[39] U.S. Environmental Protection Agency, "Health and Environment Effects of Ground-Level Ozone," 9 February 2011.

[40] National Parks Conservation Association, "Shenandoah National Park: Air Quality at Risk," downloaded from http://www.npca.org/darkhorizons/pdf/SHEN.pdf.

[41] National Park Service, U.S. Department of the Interior, "Shenandoah National Park: Air Pollution – Its Nature, Sources, and Effects," June 2006, from http://www.nps.gov/shen/naturescience/airpollution.htm.

[42] National Parks Conservation Association, "Shenandoah National Park: Air Quality at Risk," downloaded from http://www.npca.org/darkhorizons/pdf/SHEN.pdf.

[43] National Parks Conservation Association, "Shenandoah National Park: Air Quality at Risk," downloaded from http://www.npca.org/darkhorizons/pdf/SHEN.pdf.

[44] U.S. Environmental Protection Agency, "Health and Environment Effects of Ground-Level Ozone," 9 February 2011.

[45] U.S. Environmental Protection Agency, "Our Nation's Air – Status and Trends through 2008," 2010.

[46] Thomas R. Karl, Jerry M. Melillo and Thomas C. Peterson (eds.), U.S. Global Change Research Program, Global Climate Change Impacts in the United States, 2009.

[47] U.S. Environmental Protection Agency, " Our Nation's Air – Status and Trends through 2008," 2010.

[48] Clean Air Task Force, "The Toll from Coal," 2010. Data from EPA Continuous Emissions Monitoring System (CEMS) data available at: http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard

[49] Clean Air Task Force, "The Toll from Coal," 2010.

[50] U.S. Environmental Protection Agency, "Proposed Transport Rule Would Reduce Interstate Transport of Ozone and Fine Particle Pollution," downloaded from http://www.epa.gov/airtransport/pdfs/FactsheetTR7-6-10.pdf.

[51] Clean Air Act, § 108.

[52] Whitman v. American Trucking Assoc., 531 U.S. 457, 2001.

[53] Letter from Dr. Rogene Henderson, Chair, Clean Air Scientific Advisory Committee to Stephen L. Johnson, Administrator, U.S. Environmental Protection Agency, re Clean Air Scientific Advisory Committee Recommendations Concerning the Final Rule for the National Ambient Air Quality Standards for Ozone, EPA –CASAC 08-009, April 7, 2008.

[54] Letter from Dr. Rogene Henderson, Chair, Clean Air Scientific Advisory Committee to Stephen L. Johnson, Administrator, U.S. Environmental Protection Agency, re Clean Air Scientific Advisory Committee Recommendations Concerning the Final Rule for the National Ambient Air Quality Stanards for Ozone, EPA –CASAC 08-009, April 7, 2008.

[55] U.S. Environmental Protection Agency, "Fact Sheet: Supplement to the Regulatory Impact Analysis for Ozone," 7 January 2010.

[56] American Lung Association, "EPA Proposes Stronger Ozone Air Quality Standard," 2010.

[57] U.S. Environmental Protection Agency Office of Mobile Sources, "Automobiles and Ozone."

[58] Green, Peter. "Volatile Organic Compounds and Ozone Formation," 2008, downloaded from airquality.ucdavis.edu/pages/events/2008/green_acres/GREEN.pdf.

[59] Data table excludes Alaska and Hawaii because the EPA Clean Air Markets website did not include figures from these states.

ENVIRONMENT
NEW MEXICO
RESEARCH & POLICY CENTER