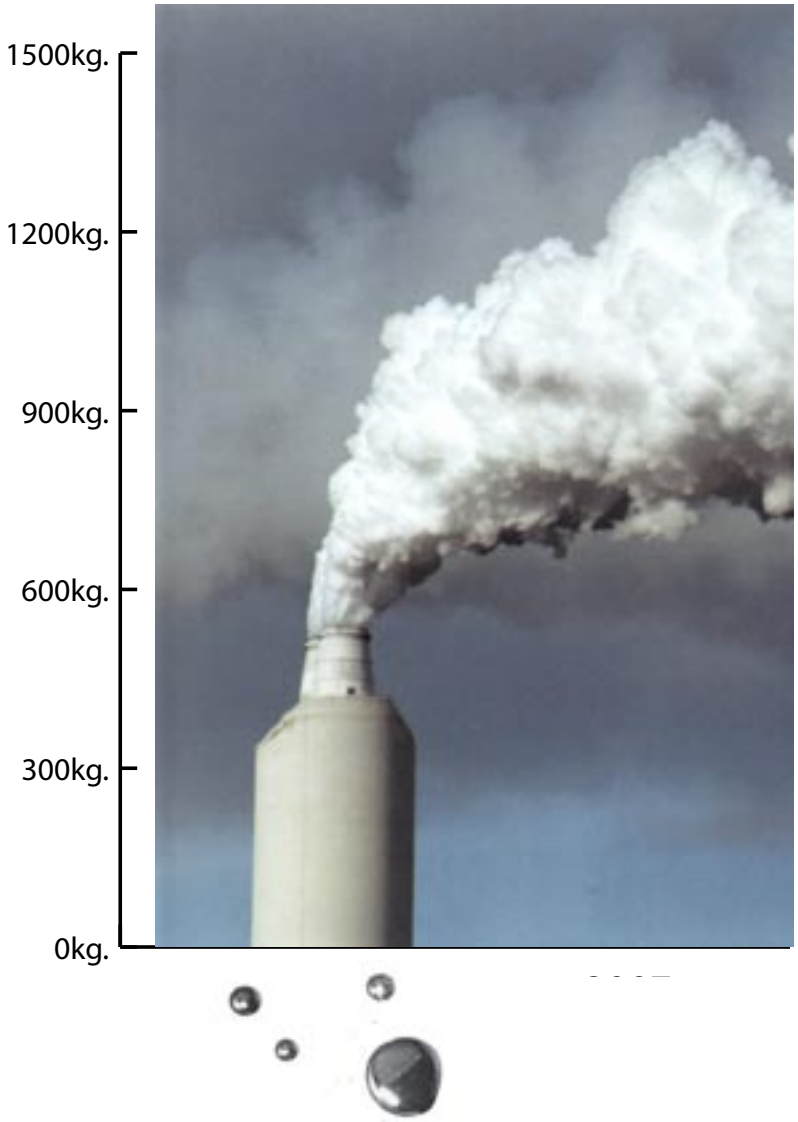
# Mercury Rising:

## Mercury Emissions from Ontario Power Generation's Coal-fired Plants




**By Sarah Rang, Environmental Economics International, for the Ontario Clean Air Alliance**

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**By Sarah Rang**
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### About the Ontario Clean Air Alliance

The Ontario Clean Air Alliance (OCAA) is a coalition of health, environmental and consumer organizations, municipalities, utilities, faith communities, unions and individuals working for cleaner air through strict emission limits and the phase-out of coal in the electricity sector. Our partner organizations represent over six million Ontarians.

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# Executive Summary

Each day, Ontario Power Generation's (OPG's) coal-fired power plants emit tonnes of pollutants known to be toxic. OPG, which is fully owned by the province of Ontario, operates five coal-fired power plants in Ontario (see Appendix B for locations).

This report focuses on OPG's emissions of one toxic pollutant – mercury -- because of its serious health and environmental impacts. As this report will outline, Ontario's five coal plants are a leading source of emissions of mercury:

- The five coal-fired power plants operated by OPG emitted 527 kilograms of mercury to the air in 2002.
- These five coal-fired power plants contributed 39% of the total amount of mercury emitted into the air in Ontario in 2002 (as reported to the federal government's National Pollutant Release Inventory).
- OPG coal-fired plants were the largest single source of mercury emissions to the air in Ontario in 2002.
- The Nanticoke Generating Station is ranked #1 in Ontario for the largest emissions of mercury to the air in 2002.
- The Lambton Generating Station is ranked #2 in Ontario for the second largest emissions of mercury to the air in 2002.
- Many sectors have reduced their mercury emissions since 1988, leading to an overall reduction in mercury releases in Ontario of 83% from 1988 to 2001. However, one sector — coal-fired power plants — has lagged behind and has actually increased its mercury emissions by 16% since 1988.

**Impacts of a coal phase-out on mercury emissions in Ontario:**

- Phasing-out OPG coal-fired plants by 2007 could cut Ontario's airborne mercury emissions by 39%.
- Phasing-out OPG coal-fired plants would allow Ontario to achieve the proposed Canada Wide Standard for mercury emissions three years early.
- Phasing-out coal-fired plants would help Ontario and Canada achieve their goal of a 90% mercury reduction under the renewed *Canada Ontario Agreement* three years early.
- Phasing-out coal-fired plants would also help Ontario and Canada to meet their pollution reduction commitments under a number of binational, trilateral and international agreements

**Impacts of mercury:**

- Methyl mercury is a neurotoxin, considered toxic under the Canadian Environmental Protection Act, a possible carcinogen and is associated with developmental damage in children. Mercury can cross the placental and blood-brain barrier and can cause pre-natal harm.
- Mercury is persistent in the environment and bioaccumulates (increasing in concentration as it moves up the food chain) and is damaging to wildlife and people, particularly women of childbearing age, pregnant women and children who consume mercury contaminated fish.

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# 1. Introduction

This report focuses on air emissions of mercury from Ontario Power Generation's (OPG's) five coal-fired power plants (see Appendix B for locations). Mercury is persistent (remains in the environment for months or years), bioaccumulative (becomes more concentrated as it moves up the food chain), a neurotoxin and is considered toxic under the Canadian Environmental Protection Act.

Previous reports from the Ontario Clean Air Alliance have identified the wide range of pollutants released by OPG's coal-fired power plants, including acid gases such as sulphur dioxide and nitrogen oxides that are associated with acid rain and smog, and particulates, especially the very small-size particulates associated with respiratory disease, asthma, heart attacks and stroke. (For a copy of these previous reports -- "Up the Stack" and "Particularly Harmful" -- please see the OCAA web site at www.cleanairalliance.org.) OPG's coal-fired power plants are also large emitters of greenhouse gases.

This report focuses on OPG emissions of mercury because of mercury's serious health and environmental effects. The report poses four questions:

- What are the health and environmental effects of mercury?
- How much mercury is emitted from the five coal-fired plants operated by Ontario Power Generation?
- What are the trends for mercury emissions in Ontario?
- How much will emissions of mercury be reduced by the phasing-out of OPG's coal-fired power plants?

For a current picture of mercury emissions, this report uses 2002 data from the federal government's National Pollutant Release Inventory (NPRI). NPRI is the only nationwide, publicly accessible program that provides information on pollutants being released to the air, land, water, injected underground and/or transferred off-site. A facility is required to report to NPRI if its employees worked a total of 20,000 hours or more a year (equivalent to 10 full-time employees). In general, facilities such as power plants are required to report releases and transfers of mercury and its compounds to NPRI if it is manufactured, processed or otherwise used at any concentration in a quantity of five kilograms or more in the calendar year.

However, there are some general limitations to NPRI data:

- It only covers sources meeting certain thresholds
- It does not include emissions from area sources, such as gas stations and dry cleaners; mobile sources, such as cars and trucks; or from natural sources, such as forest fires
- It relies on self-reporting and a variety of different methods can be used to estimate emissions
- It does not cover all chemicals known to be of concern (e.g., it does not include greenhouse gases)

The NPRI website provides detailed guidance on reporting, data summaries, maps of communities and their facilities, and proposed future changes. See www.ec.gc.ca/pdb/npri for more information.

This report uses 2002 NPRI data dated March 12, 2004 taken from Environment Canada's NPRI website. This 2002 NPRI data is the most current publicly available data.

In recent years, Environment Canada has recognized the need for NPRI to improve the picture it provides of persistent bioaccumulative and/or toxic substances such as mercury. In 2000, Environment Canada introduced special NPRI reporting requirements for mercury. The reporting threshold for mercury and its compounds was lowered from 10,000 kilograms to five kilograms and the 1% concentration threshold was eliminated. Certain types of facilities, such as incinerators, cement kilns and wastewater treatment plants, which are sources of mercury, were required to report regardless of their number of employees.

The results of lowering the mercury-reporting threshold were dramatic: The number of facilities reporting

mercury and its compounds jumped from 18 facilities in 1999 to almost 300 facilities in 2000 and the amounts of mercury and its compounds reported increased 350%.

However, NPRI data is generally from larger industrial sources (smelters, power plants, factories) and does not include some sources, such as consumer products, which can be important sources of mercury in the environment. Fortunately, NPRI data is not the only source of information about mercury emissions.

Other sources of information about mercury emissions include monitoring data, emission inventories and modeling data. Environment Canada and the provinces have developed a mercury inventory for Canada, which is described at www.ec.gc.ca/mercury.

Due to the change in NPRI reporting thresholds in 2000, it is not possible to develop current time trends based on NPRI data. Therefore, for time trends, data from the mercury inventory developed by Environment Canada and the Ontario Ministry of Environment was used in this report. This inventory is based on estimates of mercury releases.

## 2. What is mercury?

Mercury is a metal that has been mined for centuries because of its unique properties: It is a liquid at room temperature and readily combines with other metals. Mercury has historically been used in many consumer products such as paints, pesticides, electrical switches, batteries, thermometers and dental amalgam. The use of mercury in some consumer products, such as paints and batteries, has, however, been declining. Mercury is no longer mined in Canada.

Mercury is released into the environment from coal-fired power plants, incinerators, mining operations, smelters, cement plants, chloro-alkali plants and through the disposal of consumer products. Mercury can also be released from natural sources such as volcanoes and erosion from mercury-containing rocks. The sediments at the bottom of many lakes and rivers or soil can also contain mercury from historical contamination.

Mercury exists in a number of different forms: elemental, inorganic and organic. Mercury is often released into the environment as an inorganic compound. Inorganic mercury can be converted by bacteria or chemical processes into organic mercury, often methyl mercury. Methyl mercury is considered the most toxic form of mercury.

Mercury is a trace contaminant in coal. When coal is burned in a power plant, mercury is released into the air through the smokestack. Mercury can also be found in the ash which is left after burning coal or that is collected from stacks and equipment. This ash is often landfilled at the power plant or sent off-site for disposal or recycling. Blowing dust from these landfills has been identified as one of the potential sources of mercury exposure from power plants.

Mercury emitted to the air from power plants can be deposited in the local area, in the region or can travel long distances across the globe. Mercury emitted into the air falls to the ground through settling and rain or snow and is often deposited in lakes, rivers and streams. Mercury can persist for years in sediments and soils.

Mercury that enters the water is readily taken up by aquatic plants, algae and insects. Fish take in mercury from water by eating plants and smaller fish that have absorbed mercury. In this way, mercury is passed up the food chain and becomes more and more concentrated. A large predatory fish can have mercury levels that are 10,000 times the levels of mercury in the water it inhabits. This ability of mercury to bioaccumulate results in higher concentrations in large animals and in people who consume fish.

## 3. What are the health and environmental impacts of mercury?

The nervous system is very sensitive to all forms of mercury. However, methyl mercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic or organic mercury can permanently damage the brain, kidneys, and the developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing and memory problems[1].

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation [1].

Exposure to mercury may also damage the cardiovascular system and immune system[2]. Methyl mercury compounds are also considered a possible carcinogen (Group 2B, IARC).[3] The severity of mercury damage will depend on many factors, including the type of mercury, concentration, route and length of mercury exposure.

Adults are most often exposed to mercury though eating contaminated fish and shellfish and, to a lesser extent, through dental fillings and breathing contaminated air. Because mercury can be transported long distances by atmospheric forces, food sources hundreds or even thousands of kilometers from release points can be contaminated by mercury. For example, fish such as some tuna, bass, walleye and pickerel can contain high levels of mercury and, increasingly, pregnant women and children are being advised to limit their consumption of such fish.

Unborn children can be exposed in-utero because both elemental and methyl mercury can cross the blood-brain and placental barriers. This can result in mercury blood concentrations in the fetus equal to or higher than those in the mother[2]. Newborns can be further exposed through breast milk.

The U.S. Environmental Protection Agency (EPA) estimates that one in six women of childbearing age in the United States have mercury levels in their blood that would pose a risk to a developing fetus [4]. This translates into 630,000 newborns in the U.S. each year that are threatened with neurological damage from in-utero exposure to mercury [5]. In some Arctic communities, the level of mercury in some mother's blood exceeds the Health Canada acceptable level.
As well as the threat of prenatal exposure and absorption through breast milk, newborns and children are generally at higher risk of mercury exposure due to their metabolisms and behaviours. Children take in more air, water and food per kilogram than adults. They have a more rapid metabolic rate, which can lead to a potentially greater absorption of methyl mercury into blood. Their cellular repair mechanisms and detoxification mechanisms are also not yet fully developed. Children also often have more contact with contaminated surfaces such as floors and toys, potentially increasing their exposure to some toxics, including mercury[6].

One of the first demonstrations of the health impacts of methyl mercury occurred in the 1950s in Minamata, Japan, where residents regularly ate fish contaminated with methyl mercury. Children born during this period showed mental retardation, disturbance in gait, speech, sucking and swallowing and abnormal reflexes despite the fact that their mothers often showed no signs of mercury poisoning.

More recent studies show a significant correlation between prenatal mercury exposure and impairment in language, attention and memory. Affected children may show developmental delays, reduced coordination and growth, lower intelligence, poor hearing and verbal skills and behavioural problems [2].

As we learn more about the long-term effects of chronic mercury exposure, the levels of mercury considered "safe" have been consistently lowered. Health Canada, for example, has recently provisionally lowered the tolerable daily intake for mercury for children and women of childbearing age[7]. According to the U.S. National Academy of Science, individuals with high methylmercury exposure from frequent fish eating may have little or no margin of safety[8].

Mercury also damages wildlife. Mercury bioaccumulates in fish, leading to fish consumption advisories for many lakes and rivers in Canada. In fact, over 98% of fish consumption advisories for inland lakes in Ontario are due to mercury contamination [7].

The damage does not stop there. Birds that eat fish, such as loons, osprey, mergansers, eagles, herons and kingfishers, accumulate high levels of mercury in their bodies. High mercury levels in loons are suspected of reducing their growth and reproduction, thereby reducing loon populations[2]. Other fish-eating animals, such as otters and mink, can also accumulate mercury and suffer damage.

For more information on the health and environmental effects of mercury, please see the mercury primer available at www.pollutionprobe.org, as well as www.ec.gc.ca/mercury. To check if fish caught from your lake or river is recommended to be eaten, please see "*Guide to Eating Ontario Sport Fish: 2003-2004*" at www.ene.gov.on.ca.

## 4. How much mercury is released into the air in Ontario?

Using the most recent data from the NPRI, in 2002 the total amount of mercury and its compounds released into the air from reporting facilities in Ontario was 1,359.66 kilograms (Table 1).

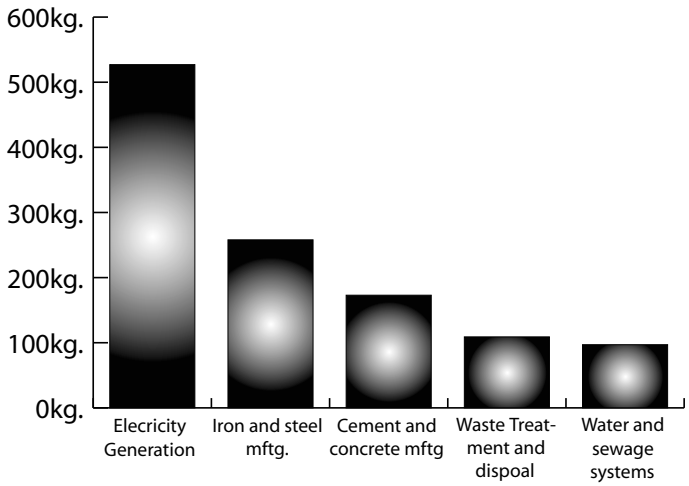
The five coal-fired power plants operated by Ontario Power Generation emitted **527.00 kilograms** of mercury and its compounds in 2002. These five OPG coal-fired power plants are responsible for **38.8%** of the total amount of mercury and its compounds emitted into the air from reporting facilities in Ontario in 2002.

The 2002 NPRI data indicate that OPG power plants also released mercury to water (0.724 kg) and to on-site landfills (368.20 kg). Another 214.576 kg was sent off-site for recycling.

## 5. Are coal-fired power plants a major source of mercury emissions?

Yes. The Canadian Council of Ministers of the Environment (CCME) notes that the electricity-generation sector is the largest single remaining man-made source of mercury emissions in Canada [9]. This is also true in Ontario. Using 2002 NPRI data, we can see that the five OPG coal-fired power plants (North American Industry Classification Code Electricity Generation and Transmission 2211) represent the sector emitting the largest amounts of mercury in Ontario in 2002 (Figure 1).

Figure 1: The industrial sectors with the largest air emissions of mercury and its compounds in Ontario in 2002 (in kilograms as reported to NPRI).




## 6. Which facilities are the top emitters of mercury in Ontario?

All five OPG coal-fired power plants were in the top 10 list of NPRI reporting facilities releasing mercury to the air in Ontario in 2002. Together, these five OPG coal-fired power plants were responsible for more than one-third (38.8%) of the total amount of mercury and its compounds emitted to the air in Ontario in 2002 (Table 1) from all facilities reporting to NPRI.

OPG's Nanticoke Generating Station, which emitted 241 kg of mercury in 2002, is **ranked #1 in Ontario** for mercury emissions to the air. This plant released almost 18% of all the reported mercury and its compounds emitted in Ontario in 2002.

OPG's Lambton Generating Station is ranked #2, and emitted almost 10% of Ontario's total reported mercury emissions in 2002.

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Table 1: NPRI Facilities with the largest air emissions of mercury and its compounds in Ontario in 2002 (kilograms)

| Rank | Name of facility | Location | Air emissions of mercury and its compounds - kg | Percent of Ontario's mercury emissions |
|---|---|---|---|---|
| 1 | Ontario Power Generation Inc. Nanticoke Generating Station | Nanticoke | 241.000 | 17.7% |
| 2 | Ontario Power Generation Inc. Lambton Generating Station | Courtright | 130.000 | 9.6% |
| 3 | Dofasco Inc. | Hamilton | 94.600 | 7.0% |
| 4 | Clean Harbors Canada Inc. Lambton facility | Corunna | 94.000 | 6.9% |
| 5 | ESSROC Canada Inc. Picton | Picton | 92.700 | 6.8% |
| 6 | Gerdau Ameristeel Inc- Whitby | Whitby | 73.464 | 5.4% |
| 7 | Ontario Power Generation Inc. Thunder Bay Generating Station | Thunder Bay | 72.000 | 5.3% |
| 8 | Regional Municipality of Durham- Duffin Creek Water Pollution Control Plant | Pickering | 49.570 | 3.6% |
| 9 | Ontario Power Generation Inc. Lakeview Generating Station | Mississauga | 46.000 | 3.4% |
| 10 | Ontario Power Generation Inc. Atikokan Generating Station | Atikokan | 38.000 | 2.8% |
| | | **Ontario Power Generation Total** (5 coal-fired power plants) | **527.000** | **38.8%** |
| | | **Ontario Total** (121 facilities) | 1,359.660 | |

## 7. Are industrial sectors reducing their mercury emissions?

The amount of mercury in the environment has been estimated to be increasing at 1-3% per year since industrialization[9], which means that current environmental levels of mercury are about two to four times pre-industrial levels[2]. Because we know that mercury can persist in the environment for months or even years, it is important to reduce mercury emissions as soon as possible.

But despite successful efforts in many sectors to reduce mercury emissions, recent reports indicate that mercury levels are continuing to rise, mainly because of the demand for more energy and the associated mercury releases from generating facilities[9].

We used the mercury inventory developed by Environment Canada and the Province of Ontario to develop time trends of mercury emissions in Ontario. According to these trend lines, many sectors have made significant progress in reducing mercury emissions since 1988 (Table 2). Overall, mercury emissions to the Great Lakes have fallen by 83% from 1988 to 2001[7].

However, one sector — coal-fired power generation — has not made progress in reducing mercury emissions. In fact, the coal-fired power generation sector had increased mercury emissions (rising 16%) from 1988 to 2001. This trend means that the coal-power generating sector accounts for an ever-increasing percentage of Ontario's mercury releases.

In Ontario, there are currently no enforceable air emission standards for mercury from coal-fired power plants. The Canadian Council of Ministers of the Environment has, however, committed to developing a Canada Wide Standard (CWS) to reduce mercury emissions from coal-fired power plants by 2010. This standard would "explore the national capture of mercury from coal burned in the range of 60-90% and align with US standards for mercury" [10].

Table 2 : Working Draft of the Inventory of Mercury Releases in Ontario under the Canada- Ontario Agreement (mercury release estimates in kilograms)

| Source | 1988 | 2001 | Percent change 1988-2001 |
|---|---|---|---|
| Municipal sources | 2802 | 739 | - 74% |
| Coal-fired Power Plants | 500 | 582 | +16% |
| Transportation | 5 | 2 | - 60% |
| Industrial Sources | 2422 | 885 | - 63% |
| Agricultural Sources | 8181 | 150 | - 98% |
| Other | 20 | 20 | 0% |
| Total | 13,930 | 2,378 | -83% |

Source: Ministry of Environment, 2004

Note: Municipal sources include sewage treatment plants and incinerators

Transportation includes vehicles

Industrial sources includes iron and steel manufacturing, mining and smelting, chemical production, pulp and paper

Agricultural sources include consumer products such as paints and pesticides

Other includes miscellaneous boilers

CCME has already developed CWS standards for mercury emissions from other sectors. However, even if the CWS for coal burning is finally developed and endorsed by the Ministers of the Environment, it will not be legally enforceable until written into permits or regulations.

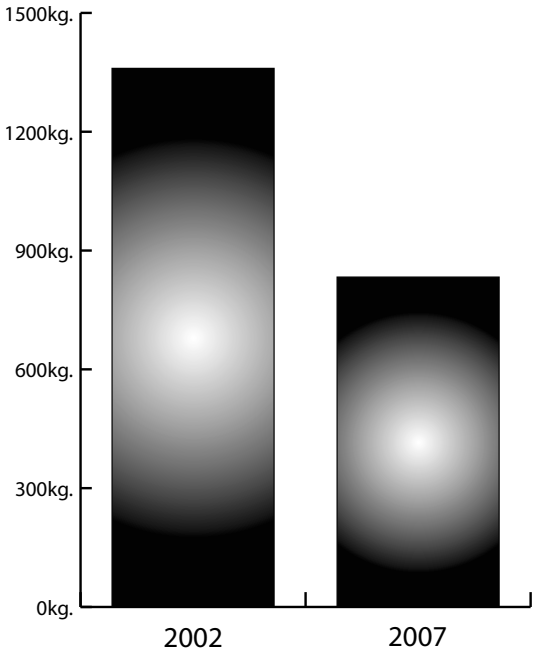
For its part, OPG is participating in a two-year mercury-testing program, known as the Canadian Uniform Data Collection Program. Early results are available at www.ceam-mercuryprogram.ca. OPG is also investigating technologies to control mercury from power plants.

## 8. How much will mercury emissions be reduced when coal-fired power plants are phased out?

The Government of Ontario has committed to a phase-out of coal-fired power plants by the end of 2007. **Phasing-out Ontario's coal-fired plants will reduce the total reported airborne emissions of mercury in Ontario by over one-third or 527 kilograms a year.**

If no other changes are made, it is estimated that this phase-out of coal-fired power plants will reduce air emissions of mercury in Ontario from 1,360 kilograms in 2002 to 833 kilograms in 2007 (as reported to NPRI).

Figure2: Projected reduction in air emissions of mercury in Ontario in 2007 ( in kilograms) with the phase-out of coal-fired plants.




## 9. How would phasing out coal-fired power plants help Ontario and Canada achieve their goals for mercury reduction?

The phase-out of coal-fired power plants by 2007 will:

1. Reduce the province of Ontario's total reported emissions of the neurotoxin mercury by over one-third or 527 kilograms per year
2. Contribute to the reduction in mercury loadings in the environment
3. Contribute to the eventual reduction in prenatal or childhood exposure to mercury, which can reduce coordination and growth, lower intelligence, impair hearing and verbal development and contribute to behavioural problems[2], as mercury levels in the environment decrease.
4. Allow Ontario to be a provincial leader by reaching the proposed Canada Wide Standard for mercury emissions from power plants three years early.
5. Allow Ontario to achieve its goal for mercury emissions under the renewed Canada-Ontario Agreement three years early.
6. Enable Ontario and Canada to achieve the commitments contained in a number of agreements with the U.S. and other countries to reduce mercury emissions (see Appendix A for a list of these).
7. Put Ontario in a powerful position when negotiating for mercury reductions with other jurisdictions (e.g., coal-dependent U.S. states).

Under the *Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem* (COA), Canada and Ontario are committed to achieving the virtual elimination of persistent bioaccumulative toxic substances such as mercury. The 1994 COA agreement called for a 90% reduction in the use, generation or release of mercury by the year 2000. While mercury reductions close to 75% were achieved by 2000, the goal of 90% was not achieved [11].

Under the renewed *Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem* (COA), signed in March 2002, Canada and Ontario committed to an 85% reduction in mercury releases by 2005

and a 90% reduction by 2010, with 1988 levels as the baseline (see www.ec.gc.ca/laws/coa for a copy of the agreement).

Ontario is well on its way to achieving a 90% mercury reduction by 2010. In Ontario, mercury releases have been reduced by more than 11,000 kilograms since 1988 [12]. Mercury emissions to the Great Lakes have similarly fallen by 83% from 1988 to 2001 (Table 2) [7].

However, mercury emissions need to be reduced by an additional 7% or about 1,000 kg to reach the 90% COA reduction goal by 2010. Additional reductions in mercury emissions are expected from some Ontario municipal and hospital incinerators and sewage treatment plants thanks to new programs to reduce mercury inputs and the installation of additional pollution-control devices.

But a phase-out of coal-fired power plants will yield over half of the mercury reductions needed (about 582 kg) to reach the 90% goal. A coal phase-out will therefore be a significant contributor to the goal of reaching a 90% reduction under the COA agreement.

In North America, a number of technologies have been explored to reduce mercury emissions from coal plants. Results vary widely depending on the technology, type of coal used and operating conditions. However, currently, these technologies are not capable of achieving the same significant reductions that can be achieved by phasing-out coal. As well, a full coal phase-out has the additional benefit of reducing or eliminating emissions of a number of other toxic substances and air pollutants, including greenhouse gases.

## 10. Conclusions

This report finds that the five coal-fired power plants operated by Ontario Power Generation were a significant source of mercury emissions to the air in Ontario in 2002. In fact, at a time when other industries have dramatically reduced their mercury emissions, these plants now represent an ever-increasing percentage of the remaining annual mercury emissions to the province's environment. Even more alarmingly, mercury emissions from Ontario's coal plants actually increased (by 16%) between 1988 and 2001 during a period when all other major reported sources were declining.

With an international consensus developing that no level of exposure to mercury is safe, the urgency to reduce or eliminate human-caused releases of mercury is significant. With 98% of current fish consumption advisories for inland lakes being the result of mercury contamination, we already have a clear indication of the wide-ranging health and environmental impacts of mercury releases to air, land and water.

Phasing-out coal power will reduce total reported airborne mercury emissions in Ontario by more than one-third and will put the province well on its way to achieving its goal of a 90% reduction in mercury emissions by 2010.

Given the persistence of mercury in the environment and the potential for this toxic element to be transported long distances by atmospheric forces, eliminating mercury releases from coal burning in Ontario will probably not result in an immediate decline in environmental mercury levels in the province. However, the elimination of such a major source of toxic emissions is a critical step along the path to an eventual drop in environmental mercury levels, both through the direct result of decreasing deposition and through the precedent it sets for reducing emissions from other coal-burning facilities.

A coal phase-out has major advantages over an end-of-pipe solution to reducing mercury. First, no current emissions control system can match the reduction (100%) in mercury emissions that a coal phase-out can deliver. Second, a coal phase-out will also eliminate a slew of other toxins, dangerous particulates and significant quantities of greenhouse gases released by coal burning.

Alternative power sources such as high-efficiency natural gas and renewable sources and aggressive conservation programs can also more effectively deliver a wide range of environmental advantages, including the virtual elimination of mercury, than end-of-pipe systems.

Therefore, a coal phase-out is clearly an effective, efficient means of addressing the threat posed by mercury to our health and our environment.

## Appendix A: List of Binational and International Agreements to Reduce Mercury Emissions In Ontario

Phasing out coal-fired power plants could help Ontario and Canada achieve their commitments to reduce mercury emissions under a number of agreements:

| Name of Agreement | Mercury Goal | Web site |
|---|---|---|
| Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem-2002 | An 85% reduction in mercury releases by 2005 and a 90% reduction by 2010, with 1988 as a baseline | www.ec.gc.ca/laws/coa |
| Great Lakes Binational Toxics Strategy- 1997 | The Canadian challenge is to "seek by 2000, a 90% reduction in the release of mercury, or where warranted, the use of mercury, from polluting sources resulting from human activity in the Great Lakes Basin."<br><br>The US challenge is to "seek by 2006, a 50% reduction nationally in the deliberate use of mercury and a 50% reduction in the release of mercury from sources resulting from human activity" | www.binational.net |
| CEC North American Regional Action Plan on Mercury | Calls for implementation of best available techniques to reduce mercury from power plants | http://www.cec.org/programs_projects/pollutants_health/smoc/ |
| Arctic Council Action Plan mercury project | To support Arctic governments in their efforts to take remedial and preventive actions relating to contaminants | www.arctic-council.org/ |
| UN Economic Commission for Europe Convention on Long Range Transboundary Air Pollution (LTRAP) | Under the 1998 Aarhus Protocol on Heavy Metals, countries are required to reduce mercury emissions to levels below 1990 emissions | www.unece.org/lrtap |
| UN Environment Program Global Mercury Program | Finds sufficient evidence of significant global adverse effects from mercury to warrant countries to reduce mercury releases and emissions | www.chem.unep.ch/mercury/ |
| Conference of New England Governors/Eastern Canadian Premiers - Mercury Action Plan (Note: Ontario is not a member ) | Goal of virtual elimination of the discharge of anthropogenic mercury into the environment<br>Action plan interim target of 50% reduction by 2003 | www.cap-cpma.ca/ |

## Appendix B: OPG's coal-fired generating stations

Ontario Power Generation (formerly Ontario Hydro), owned by the Province of Ontario, operates five coal-fired power plants in Ontario:

| Name | Location |
|---|---|
| Atikokan Generating Station | Atikokan (west of Thunder Bay) |
| Lakeview Generating Station | Mississauga |
| Lambton Generating Station | Courtright (near Sarnia) |
| Nanticoke Generating Station | Nanticoke (north shore of Lake Erie) |
| Thunder Bay Generating Station | Thunder Bay |

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# Ontario Clean Air Alliance member list

**MUNICIPALITIES**
Guelph
Hamilton
Kitchener
Markham
Peterborough
Regional Municipality of Durham
Regional Municipality of Peel
Regional Municipality of Waterloo
Stratford
Toronto
Windsor

**COMPANIES**
AIM PowerGen Corporation
Breathe Smog Masks Inc.
Enwave District Energy Limited
Hydro 2000
Mississippi River Power Corporation
Oshawa Power and Utilities Corporation
Peterborough Utilities Services
Sudbury Hydro
Toronto Hydro
Torrie Smith Associates
Veridian Corporation
Vertebrae Technologies Inc.
Wellington Electric Distribution Company
Whitby Hydro Energy Service Corp.

**ORGANIZATIONS & ASSOCIATIONS**
Algoma Manitoulin Environmental Awareness
Algoma Manitoulin Nuclear Awareness
Allergy/Asthma Information Association
Association of Local Public Health Agencies
Canadian Association of Physicians for the Environment
Canadian Institute for Environmental Law and Policy
Canadian Institute of Child Health
Cashmere Avenue PS EnviroClub
CAW Canada*
CAW Durham Regional Environment Council
CAW Windsor Regional Environment Council
Canadian Unitarians For Social Justice, South Peel Chapter
Citizens Advisory Committee on Air Quality - Waterloo
Citizens Advocating Renewable Energy
Citizens Environmental Alliance of Southwestern Ontario**
Citizens Network on Waste Management
Community Action Parkdale East
Community Environmental Alliance
Conservation Council of Ontario
Conserver Society of Hamilton and District, Hamilton Chapter
Consumers Association of Canada (Ontario)
EarthDay Canada
EarthWorks
Echo Lake Association
Energy Action Council of Toronto (EnerACT)**
Energy Probe
Environmental Defence Canada
Environment North
Evergreen Foundation
Federation of Ontario Cottagers' Associations
For A Safe Environment
GASP (Good Air, Safe Power)
Green Channel
Greenest City
Hearthmakers Energy Cooperative
Kingston Environmental Action Project
Lakeshore Area Multi-Services Project Inc.
Learning Disabilities Association of Ontario
North Toronto Green Community
Ontario College of Family Physicians
Ontario English Catholic Teachers' Association
Ontario Forestry Association
Ontario Lung Association
Ontario Public Health Association
Ontario Public Interest Research Group – McMaster University
Ontario Public Interest Research Group – Queen's University
Ontario Public Interest Research Group – University of Guelph
Ontario Public Interest Research Group – University of Toronto
Ontario Society for Environmental Education
Pesticide Action Group/Waterloo
Pollution Probe
South Riverdale Community Health Centre
Thames Region Ecological Association
Unitarian Fellowship of Sarnia-Port Huron
The United Church of Canada
Wastewise
Wildlands League
World Wildlife Fund Canada

* *CAW Canada is opposed to the privatization of Hydro One and Ontario Power Generation*

** *Citizen's Environmental Alliance of Southwestern Ontario and EnerACT support a full phase-out of nuclear energy*

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