

The Abell Report

What we think about, and what we'd like you to think about

Published as a community service by The Abell Foundation

Abell Salutes: Children's Literacy Initiative for helping poor children become successful students

It is a challenge to prepare young children from disadvantaged school districts to enter school as ready to learn as their counterparts in affluent school districts. Children's Literacy Initiative (CLI) has been working to meet this challenge in Baltimore City for three years; its programming provides children's books of a very high quality, professional development for teachers so that they are able to instruct more effectively, and supportive, literacy materials for classroom enrichment.

After three years, it's safe to say, CLI works.

Here are the results of three tests administered to the students participating in the CLI program, with comparisons to the school system's goals, and with children participating in the Head Start program.

Peabody Picture Vocabulary Test (PPVT) gains over time are uncommon for children of any background, because the test determines a child's vocabulary knowledge with respect to other children his/her age. Thus, in order for a child to

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A Burning Problem:

Air pollution from power plants and incinerators is a widespread cause of ill health in Maryland, but one that the state's policymakers can curb

In this article, the Maryland Public Interest Research Group (MaryPIRG) discusses the health effects of air pollution from power plants and incinerators in Maryland. Conclusion: Maryland's policymakers must take four basic steps to reduce the dangers.

I. OVERVIEW

The air that Marylanders breathe contains significant amounts of unhealthy pollutants, some of which now seem to be much more harmful than we understood just a year ago. Power plants and incinerators play a major role in producing these pollutants.

Power plant emissions raise your risks of heart and lung failure. During the last year, researchers were able for the first time to estimate the number of lives cut short in Maryland by microscopic particles formed from power plant emissions, as discussed later in this article. The estimate is 927 per year, more than the number of deaths per year from automobile accidents or murder. Research indicates that these microscopic particles cause death primarily by penetrating the body's defenses against larger particles and then triggering heart and lung failure.

Incinerator emissions raise your cancer risk. Also within the last year, the US Environmental Protection Agency

(EPA) concluded that an American's risk of getting cancer during his or her lifetime from dioxin may be as high as 1 in 100. Garbage and medical waste incinerators are a major source of dioxin.

Power plants and incinerators both increase your children's risk of being born with brain damage. A report funded by The Abell Foundation and written by the MaryPIRG Foundation last year revealed that Maryland fish contain concentrations of mercury as high as three times the level that triggers further investigation in the neighboring state of Delaware. Mercury can cause neurological impairment in fetuses of women who consume it in fish. It is released into the environment primarily from the smokestacks of power plants and incinerators.

However, there are solutions. Maryland's policymakers can take steps to greatly reduce the effect of power plants and incinerators on our health. This article will examine the problem and offer four recommendations for curtailing it:

- 1. Control power plant emissions and shift toward clean energy technologies**
- 2. Cease promotion of municipal solid waste incineration**
- 3. Minimize medical waste incineration and rely on better alternatives**
- 4. Warn Marylanders when fish have become dangerously contaminated with mercury.**

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**II. THE PROBLEM:
AIR POLLUTANTS FROM
POWER PLANTS AND
INCINERATORS**

Six of the most important air pollutants produced by power plants and incinerators are microscopic airborne particles, ozone smog, dioxin, mercury, other toxic chemicals, and global warming gases. During the last 12 months, researchers have upgraded the health risks posed by each of these six pollutants, as discussed in a profile of each pollutant, below.

1. Lethal airborne particles

“Fine particles” are defined as those with a diameter of less than 2.5 millionths of meter, or about one hundredth of the width of a human hair.

Health effects: Fine airborne particles are associated with asthma attacks, chronic bronchitis, other respiratory ailments, disruption of heart function, and deaths from heart and lung failure.

Role of power plants and incinerators: Fine airborne particles can be emitted directly, but most form from gaseous sulfur dioxide and nitrogen oxide emissions. In the eastern United States, power plant sulfur dioxide emissions are the leading cause of fine particle pollution. Incinerators, too, contribute to fine particle pollution.

Last year, a rigorous study co-funded by the automobile industry and the Environmental Protection Agency confirmed the findings of previous studies: there is a correlation between the amount of fine particles in the air and the death rate, and that correlation cannot be

**MARYLAND COUNTIES:
Estimated Premature Deaths Per Year
Due to Fine Particles from Power Plant Emissions**

County	Deaths	Deaths per 100,000 Adults
Allegany	28	48.0
Anne Arundel	63	23.0
Baltimore	142	31.0
Baltimore City	235	47.2
Calvert	7	21.3
Caroline	6	30.2
Carroll	20	26.6
Cecil	11	25.5
Charles	14	22.4
Dorchester	8	39.3
Frederick	23	24.2
Garrett	7	37.6
Harford	26	22.2
Howard	20	15.6
Kent	4	35.8
Montgomery	120	21.1
Prince Georges	110	23.4
Queen Annes	7	24.8
Somerset	5	34.8
St. Marys	12	25.4
Talbot	8	34.1
Washington	31	35.6
Wicomico	14	29.7
Worchester	7	30.5

Source: Abt Associates, analysis for “Death, Disease, and Dirty Power,” October 2000. “Death, Disease, and Dirty Power” is available at www.pirg.org and www.cleartheair.org

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explained by any other factor tested.

Based on the quantitative relationship between fine particle pollution and deaths, Abt Associates estimated the number of deaths per year in every county and city of the lower 48 United States resulting from fine particles that derive from power plant emissions. Abt Associates is the EPA's leading analytical contractor on the health effects of air pollution. Its analysis used models and methods approved by the Environmental Protection Agency, and was reviewed and endorsed by Professor John Spengler of the Harvard School of Public Health before publication.

According to Abt's analysis, fine particles deriving specifically from power plant emissions cut short approximately 30,100 lives per year in the United States, including approximately 927 in Maryland. (See table at left for county-by-county estimates.) They also cause an estimated 947,000 missed work days each year in Maryland. The study is available on the Internet at www.pirg.org/reports/enviro/dirty_power.

The elderly, people with respiratory disease, and children face a higher health risk from fine particles than the general public does.

2. Ozone smog

Health effects: Long-term effects include permanently reduced lung function in exposed children. Short-term effects include cough, sore throat, and asthma attacks.

Role of power plants and incinerators: Ozone smog forms from the combination of nitrogen oxides and volatile organic compounds in the presence of sunlight and heat. Nitrogen oxides are generally the limiting ingredient. Power plants produced approximately 35% of Maryland's nitrogen oxide emissions in

1999, a share expected to decline significantly as a result of new regulations on summertime nitrogen oxide emissions. Incinerators emit both nitrogen oxides and volatile organic compounds.

The media have reported that of all American cities, Los Angeles and Houston have the worst ozone smog. They have reported much less the fact that, on a statewide basis, Maryland has among the worst ozone smog in the nation. For instance, in 1999, Maryland registered more bad smog days per monitoring station than any other state except for Georgia.

Abt Associates has estimated that 180,000 of the asthma attacks and 3,900 of the emergency room visits in Maryland each year result from ozone smog.

3. Dioxin

Health effects: Cancer, developmental delays. Other effects may include depression of the immune system, endocrine and nervous system abnormalities, increased susceptibility to diseases such as adult-onset diabetes, and altered liver function.

Role of power plants and incinerators: Municipal solid waste (garbage) incinerators produced an estimated 40% of US dioxin emissions to the air in 1995, but their emissions have since declined by an unknown amount as a result of new regulations. Medical waste incinerators produced an estimated 17%, a figure that will soon decline as a result of new regulations. Much of the dioxin from incinerators results from the burning of plastics, and especially PVC plastic. Coal combustion produced an estimated 3% of dioxin emissions.

EPA concluded last year that an American's risk of getting cancer as a result of exposure to dioxin may be as high as 1 in 100 based on the amount currently in the average American's body.

Dioxin is persistent in the environ-

ment and tends to accumulate up the food chain. More than 90 percent of the intake of dioxin by humans is through food consumption. Dairy products, meat, fish, and eggs are the primary sources of exposure.

Once humans ingest dioxin, the dioxin is stored in fatty tissue where it remains unless it is transferred in breast milk to infants or via the placenta to fetuses. A 1999 study concluded that the daily intake of dioxin was, per kilogram of body weight, 50 times greater in breast-fed infants, and three times higher in toddlers, than in adults.

This article follows the convention of using the term "dioxin" to refer to a collection of dioxins, furans, and other related chemicals understood to have similar mechanisms of toxicity.

4. Mercury

Health effects: Exposed fetuses and children can suffer developmental impacts including weakened immune systems, lowered IQ, and behavior disorders. Other effects include endocrine disruption, kidney damage, central nervous system damage, and increased risk of heart attack.

Role of power plants and incinerators: Power plants burning coal and oil produced 39% of Maryland's reported mercury emissions to the air in 1998, as a result of mercury in these fuels. The EPA has indicated it may require a reduction in power plant mercury emissions. Municipal solid waste incinerators produced 32% of Maryland's reported mercury emissions to the air but have recently cut their emissions as a result of new regulations. Medical waste incinerators produced 23% but will release less by 2002 to meet new regulations. The mercury-containing items burned in incinerators include lighting tubes, batteries, and thermometers, among others.

Mercury released into the air returns to earth in rain and snow, much of it ending up in bodies of water. There it makes

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its way up the food chain, concentrating in the tissues of fish. Humans absorb mercury primarily from eating contaminated fish.

It is the effects of mercury on the developing fetus that have gained the most attention, because even relatively low levels of mercury can cross the placenta. The National Academy of Sciences (NAS) reported in 2000 that an estimated 60,000 U.S. children are born with an elevated risk of neurological impacts because of low-level mercury exposures in the womb—exposures resulting from their mothers' consumption of fish. Although the impact on an individual child may not be so severe that the parents would seek medical attention, NAS concluded that these children are among those that struggle to keep up in school and may need special education.

Some researchers have estimated that there has been a 50% increase in learning and behavioral disorders among children during the last decade. Mercury and other toxins in the environment are considered possible causes.

There is likely no "safe" level of mercury exposure at which there will definitely be no health effects. The level currently deemed "safe" by the EPA has been revised downward significantly.

5. Other toxic chemicals

Health effects: Toxic air pollutants in general pose a risk of effects ranging from cancer and organ damage to neurological disorders and birth defects.

Role of power plants and incinerators: Power plants released three times as much toxic air emissions as all other industries combined in Maryland in 1998, according to the EPA's Toxics Release Inventory.

The 1998 Inventory, released last

year, is the first in which power plants have been required to report their toxic emissions. In Maryland, of the toxic air pollutants included in the Inventory, power plants emitted 25 million pounds, while all other industries combined emitted 8 million pounds.

Acid gases constitute the vast majority of the power plant toxic air emissions. The power plant emissions also included toxic metals and a collection of other toxic chemicals.

Incinerators, too, emit an assortment of toxic chemicals including metals such as lead and arsenic, acid gases, volatile chlorinated organic compounds, and polycyclic aromatic compounds.

Power plants and incinerators emit hundreds of chemicals. In addition to the known toxic effects of some of these, there may be additional health effects not yet known. There is a pattern of discovering additional health impacts of power plant and incinerator emissions over time, as well as greater magnitudes of impacts already known.

6. Global warming gases

Health effects: According to a report earlier this year by the Intergovernmental Panel on Climate Change, global warming is raising average temperatures, altering climatic conditions, causing a rise in sea level, and increasing the frequency and intensity of extreme weather events such as droughts, hurricanes, and floods. Predicted health effects that may apply in Maryland include more deaths from excessive heat, greater illness from worsened smog, greater diffusion of some infectious diseases and allergens, and more deaths from extreme weather events.

Role of power plants and incinerators: Power plants produce approximately 40% of US human-induced emissions of carbon dioxide, the gas most responsible for global warming. There is dispute

about whether municipal solid waste incineration accelerates or diminishes global warming.

III. MARYLANDERS: IN HARM'S WAY

Every state is affected by pollution from power plants and incinerators, but Maryland is disproportionately affected. This is a result of highly polluting power plants in our state, our location downwind of other states' power plants, the concentration of our incinerators in populated areas, and the importance of fish in our diet.

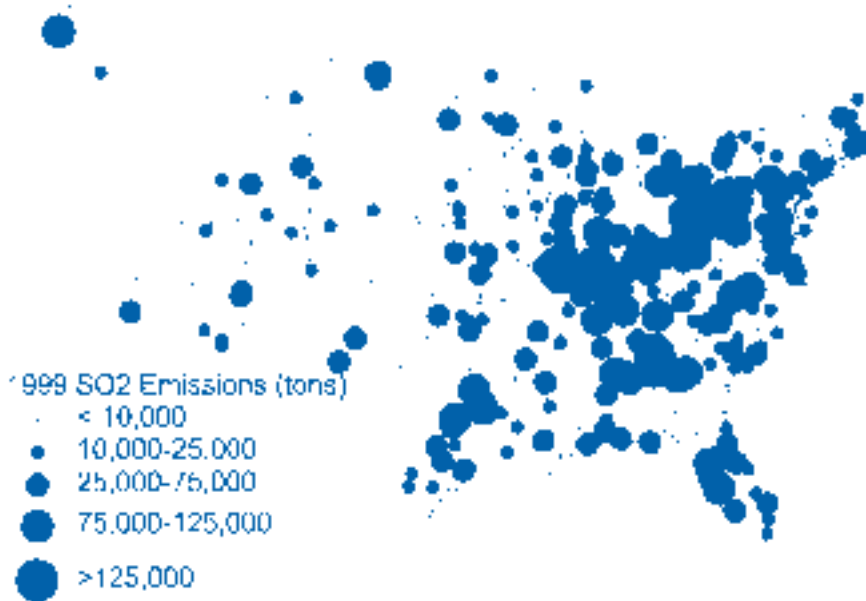
The leading cause of fine particle pollution in the air over the United States is sulfur dioxide emissions from power plants. Maryland has more electric utility power plant sulfur dioxide emissions per square mile than any state except Ohio, according to the latest data available from the EPA. The third and fourth highest-ranking states, West Virginia and Indiana, are upwind of Maryland, as is Ohio. In fact, Maryland is on the downwind side of the nation's great concentration of highly polluting power plants, which are clustered in a swath that extends from Kentucky and Illinois eastward into Maryland and Pennsylvania. (See map.) The air entering Maryland comes already laden with fine particles, ozone smog, and mercury from many of these power plants.

The Maryland Department of the Environment (MDE) has joined New York state and US EPA in a lawsuit against allegedly highly-polluting, old power plants in upwind states that have expanded without making pollution control improvements.

Incinerators as well are major contributors to air pollution, including dioxin and mercury. In recent years, Maryland has incinerated an 11% higher share of its municipal solid waste than the national

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Sulfur Dioxide Emissions from U.S. Power Plants



Maryland and the upwind states to the west of it produce much of the nation's power plant pollution, especially the sulfur dioxide emissions shown here, which form fine airborne particles associated with premature deaths.

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average and approximately 16% more medical waste per capita than the national average. Over 240,000 of Maryland's children live within two miles of one of the state's 41 medical waste incinerators.

Marylanders may be more exposed than residents in many other states to mercury in fish. Marylanders have a tradition of catching and eating fish and shellfish from the Bay and other bodies of water, so its citizens may eat considerably more fish than the national average.

Baltimore: More than its share of pollution

Baltimore City has some of the worst power plant and incinerator pollution in the state. With several power plants clustered in and near the city, Baltimore has a higher concentration of fine particle pollution from power plants than any Mary-

land county except Allegany. An estimated 235 Baltimore City residents die prematurely each year as a result of this power plant pollution.

The medical waste incinerator at Hawkins Point in Baltimore City is the largest in the world. In this incinerator and twelve others within its city limits, Baltimore alone hosts 84% of the state's medical waste incineration, or as much as the average US state.

Baltimore City is also home to the largest of Maryland's three municipal solid waste incinerators. This incinerator, including its large smokestack labeled "Baltimore RESCO," is adjacent to Interstate 95 in the southern part of the city. Together, Baltimore's 13 medical waste incinerators and one municipal solid waste incinerator release much of the state's incinerator pollution directly into the most densely populated part of the state.

IV. SOLUTIONS: IN THE HANDS OF MARYLAND'S POLICYMAKERS

Maryland's policymakers have opportunities to greatly reduce the problem of power plant and incinerator pollution in the state. The General Assembly, the governor, Maryland's members of Congress, the Maryland Department of the Environment, the Public Service Commission, the Baltimore City Council, and healthcare facilities each have a vital role to play in these solutions.

Solution #1: Control power plant emissions and shift toward clean energy technologies

Power plants are Maryland's leading cause of fine airborne particles and of mercury pollution. They are also a leading cause of ozone smog, of toxic air pollutants generally, and of heat-trapping carbon dioxide. Fortunately, there are ways to reduce power plant pollution.

Action items for Solution #1

1a. Cut pollution from existing power plants. The electric power industry has thus far not been required to take many of the measures it could take to greatly reduce harmful emissions. There are no regulations on mercury or carbon dioxide emissions. Most power plants are "grandfathered" out of modern limits on particle-forming emissions. As a result, enormous emission reduction opportunities remain. For example, scrubbers installed to remove contaminants from power plant exhaust remove more than 90% of the fine particle-forming sulfur dioxide, but are used by only about 20% of coal-burning power plants. Even greater reductions can be achieved by switching a power plant from burning coal to burning natural gas.

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In 2000, both houses of Congress saw bills to cut nationwide power plant emissions of smog- and particle-forming pollution by 75% and of mercury by 90% compared to the amounts emitted in 1997. The same bills would have cut power plant carbon dioxide emissions back to the quantity emitted in 1990. More than a quarter of the House of Representatives and 15 senators co-sponsored this legislation. Because Maryland is downwind of many highly polluting power plants, it would particularly benefit. Of the ten members of Maryland's congressional delegation, Representatives Gilchrest, Cummings, and Cardin co-sponsored the bill. The other seven were asked to do so, but declined. Similar bills are being introduced in March of this year.

1b. Promote use of clean, renewable energy resources. Pollution from the burning of fossil fuels can be reduced but not eliminated. Therefore, the eventual solution to the problem of power plant pollution is to generate most electric power from minimally polluting, renewable resources including wind, sun, organic waste, landfill gas, geothermal, and ocean energy. At present, 0.2% of the power generation in Maryland is from these sources, primarily landfill gas. Promoting the use of these resources allows the technologies for using them to advance, hastening the day when they are likely to become the least expensive energy resources in addition to being the least polluting.

Bills have been proposed in the Maryland General Assembly for the last two years that would direct electricity suppliers to derive a share of the electricity they sell from these kinds of resources. These bills are similar to policies already adopted in nine other states. Once expen-

sive, generation from these resources has become much less so. A 2000 report by the Maryland Public Service Commission estimated that Maryland could derive 5.5% of its electricity from wind, organic waste, and landfill gas with a 1.1% impact on electricity prices.

Already, arrays of large, modern wind turbines are operating in Pennsylvania and under development in West Virginia at locations close to the Maryland border. Each turbine generates enough electricity for hundreds of homes. Maryland, too, has sites suitable for "wind farms."

Earlier this year Governor Glendening took the lead in promoting Maryland's use of renewable energy. In an executive order, he set an immediate goal for state government of obtaining an electricity contract for itself in which six percent of the electricity is generated from renewable energy sources.

1c. Establish programs to help Marylanders use electricity more efficiently. In addition, Maryland can mini-

mize its need for electricity by investing in energy-saving measures that both reduce pollution and save money. A package of programs proposed to the Public Service Commission by energy expert groups and citizens' groups would save Marylanders more than \$500 million in the first ten years and in year ten would reduce carbon dioxide emissions by an amount equal to the annual emissions of 280,000 average automobiles. Programs of this kind are in place in three quarters of the states that, like Maryland, have deregulated the sale of electricity generation.

The Public Service Commission and the General Assembly both have the authority to establish programs to help Maryland families and businesses use electricity more efficiently.

Governor Glendening has already seized the opportunity to use energy more efficiently in government buildings. The executive order mentioned above requires state government facilities to improve their energy efficiency 10% by 2005 and 15% by 2010.

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Smokestack Emissions of Sulfur Dioxide at Nine Maryland Power Plants, 1998

PLANT NAME	TONS OF SO ₂	COUNTY
Morgantown	79,905	Charles
Chalk Point	56,453	Prince George's
Brandon Shores	50,343	Anne Arundel*
Dickerson	40,091	Montgomery
C P Crane	28,860	Baltimore
Herbert A. Wagner	28,608	Anne Arundel*
Vienna	2,962	Dorchester
R P Smith	2,379	Washington
Gould Street	426	Baltimore City

Source: EPA acid rain database, latest available data on March 25, 2001 at http://www.epa.gov/acidrain/emission/md/md_fsum.htm

*In northern Anne Arundel County, near Baltimore

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Solution #2: Cease promotion of municipal solid waste incineration

Many large municipal solid waste (garbage) incinerators generate electricity. The builders and owners of these incinerators are seeking to receive any favorable treatment afforded to generation from wind, sun, and other environmentally preferable renewable energy resources. Thus far in Maryland, they have had some success. The Maryland General Assembly has included municipal solid waste in its definition of “renewable energy resources” and directed electric utilities deriving any electricity from such resources to continue doing so. Governor Glendening has allowed up to half of the “green power” purchased for the state government to come from incineration of

municipal solid waste. In striking contrast, the General Assembly in the neighboring state of Delaware voted overwhelmingly last year to ban new municipal solid waste incinerators throughout most of that state.

Is municipal solid waste incineration an environmentally preferable source of energy, or is it highly polluting?

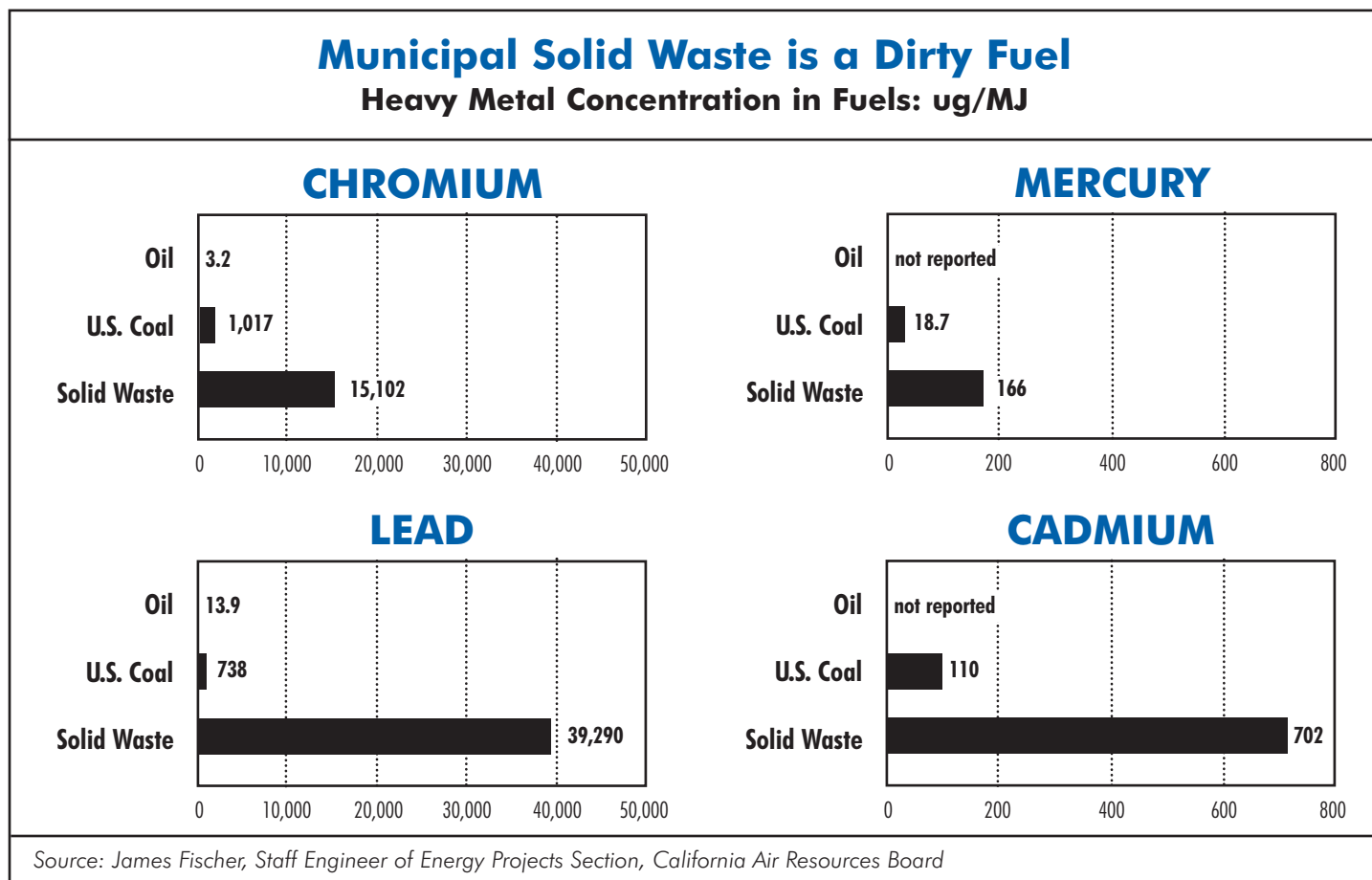
Municipal solid waste incineration produces harmful emissions

Smokestack emissions from municipal solid waste incineration contain a variety of harmful substances, including at least 14 of Maryland’s officially designated “priority air pollutants.” In particular, incinerators are likely to produce at least two extremely toxic pollutants, dioxin and mercury, at a much higher rate even than do power plants burning the most pollut-

ing fossil fuel, coal. Municipal solid waste combustion produced less than 0.4% of US energy but approximately 40% of US dioxin emissions to the air and 19% of US mercury emissions to the air before the implementation of new emission standards that took effect in December of 2000. The new standards reduce incinerator emissions, but by an uncertain amount, as discussed below.

Tougher new emission standards

In 1995, the EPA issued new rules for solid waste incineration facilities in response to changes in the Clean Air Act of 1990. The new requirements, implemented by the end of 2000, were intended to significantly reduce hazardous emissions. Dioxin emissions, for example, were projected to decline by approximately 90%.



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Questions about public health impacts, in spite of new standards

In 2000, the National Research Council (NRC) of the National Academy of Sciences released a major report, "Waste Incineration and Public Health." The 335-page report is the result of a multiyear investigation by a multidisciplinary team of experts.

The NRC report calls into doubt whether the EPA's new regulations will achieve the projected emission reductions, and whether the public will be safe even if they do.

One of the report's findings is that incinerator emissions may be substantially higher than official estimates, particularly for dioxin, heavy metals, and fine airborne particles. An incinerator's annual smokestack emission test is preannounced, and incinerator operators take steps to make sure emissions are minimized at the time of the test, which lasts a few hours. At other times, specifically during start-up, shut-down, and when some condition in an incinerator's burner is not optimal, emissions can be higher than those measured in the test. The NRC team reported on an emissions test conducted during the start-up of a burner at an incinerator. The resulting dioxin emissions were 40 to 96 times as high as those during a standard preannounced emission test. The team also examined emissions when conditions in a burner deviated from the optimum. When the burner contained extra air or less fuel than usual, dioxin emissions increased exponentially. Emissions were also much higher when the temperature dropped or the amount of oxygen in the burner deviated from its optimum.

Because incinerators burn a constantly changing waste stream, with variations in the composition and moisture content

of the waste, improper conditions in the burner can be quite common. Furthermore, start-up and shut-down can be slow and frequent. As a result, incinerators may spend a significant amount of time producing harmful emissions substantially greater than those measured during their preannounced annual stack tests.

Researchers De Fre and Wevers found that the average dioxin emissions per hour at an incinerator over a two-week period were 30 to 50 times as high as the average emissions per hour measured in a preannounced six-hour test.

The NRC report concludes that "more incinerator emissions information is needed, especially for dioxins and furans, heavy metals, and particulate matter [airborne particles]."

The report's other conclusions include the following:

"Substantial concerns about regional dioxin and furan exposures and moderate concerns about regional exposures to metals are not expected to be relieved by MACT regulations [the kind EPA has implemented], because the regulations may not adequately reduce risks attributable to cumulative emissions on a regional basis."

"Substantial concerns about [incineration] workers' exposures to particulate matter, lead, mercury, and dioxins and furans are not expected to be relieved by MACT compliance, because those regulations were not designed to affect workers' exposures."

Action items for Solution #2

2a. Keep municipal solid waste incineration out of programs to promote environmentally preferable energy technologies. Though the Maryland General Assembly has included municipal waste incineration in the definition of "renewable energy resources," incinera-

tion does not merit inclusion in programs for promoting the use of minimally polluting renewable energy resources such as wind, sun, and landfill gas. Three of the reasons follow: First, the possible negative health effects of incineration are too large. Second, the technologies promoted by these programs are emerging technologies that need assistance to develop toward maturity, while municipal waste incineration is already a mature technology. Third, including incinerators would crowd out other technologies that are minimally polluting and need assistance to mature. At present, incineration produces twice as much electricity in the mid-Atlantic region as all other non-hydro renewable energy resources combined.

The governor and his Green Buildings Council should revise the state government's "green energy" purchasing so that municipal solid waste incineration is not included.

2b. Determine how much pollution Maryland's incinerators are actually releasing. To allow a better understanding of the extent of the health threat posed by Maryland's incinerators, the Maryland Department of the Environment (MDE) should develop accurate estimates of incinerator emissions of dioxin and any other pollutants for which the current official estimates may be inaccurate. To do this, MDE will likely have to conduct unannounced or continuous emission tests for the pollutants in question during the full range of incinerator operating conditions. MDE should require that the incinerator emission test results be published in local newspapers and that unabridged test data be made available on the Internet or at a library near each incinerator.

The exposure of incinerator workers is another part of the pollution picture.

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Some recent studies, cited in the NRC report, have shown high worker exposure to pollutants at incinerators. Maryland should investigate the exposure levels of workers at Maryland incinerators.

The findings about how much pollution the incinerators are producing, along with other factors including the scientific community's advancing understanding of the effects of that pollution, will assist policymakers in deciding whether incineration should be altered to reduce emissions or worker exposure, moved away from Baltimore, ended, or allowed to continue unchanged.

Solution #3: Minimize medical waste incineration and rely on better alternatives

According to the Centers for Disease Control, 3-15% of a typical hospital's waste is considered infectious—possibly capable of transmitting an infectious disease—and must be treated, by incineration or some other method, to protect public health. Hospitals, however, routinely burn 75-100% of their waste, including materials such as mercury-containing thermometers and lighting tubes, “red

bags” colored with pigments containing lead, and products and packaging made from PVC that release especially large amounts of toxic pollutants when incinerated. The Abell Foundation has funded a MaryPIRG Foundation project to encourage the reduction of medical waste incineration in Maryland.

Problems with medical waste incinerators

Medical waste incinerators burn only 1% of Maryland's trash but produce a significant share of pollutants that are found in Maryland's water and air. Nationally, medical waste incinerators produce an estimated 17% of dioxin emissions; and Maryland's medical waste incinerators were responsible for approximately 23% of the 4,500 pounds of mercury that were released into the state's air in 1998. Medical waste incinerators also emit other toxic metals, hydrogen chloride, fine particles, carbon monoxide, sulfur dioxide, nitrogen oxides, and other harmful and potentially harmful compounds to the air.

Many medical waste incinerators are located in commercial or residential neighborhoods; 18% of Maryland's white population, 34% of the minority population, 43% of the low-income population, and over 240,000 children live within two

miles of a medical waste incinerator in Maryland.

Maryland burns approximately 42,000 tons of medical waste each year, including approximately 900 tons from other states. In the future, the amount of imported waste could greatly expand. The largest medical waste incinerator in the world, located at Hawkins Point in Baltimore City, is currently permitted to import waste within a 250-mile radius, extending as far as New York City.

MDE's missed opportunity to cut pollution

The US EPA is requiring the states to reduce incinerator emissions. The Maryland Department of the Environment has finalized new state regulations that merely fulfill EPA's minimum requirements, missing an opportunity to better protect Marylanders' health. MDE's regulations do not set emission standards for a number of important toxic pollutants, including arsenic, chromium, nickel, and PCBs. The regulations allow 19 times more dioxin emissions than standards in some European countries and nearly four times as much mercury as is allowed in Florida or New York. MDE's regulations require that medical waste incinerators add emission control devices to be in compliance with the emission standards by March 15, 2002, but the regulations do not require hospitals to explore less polluting waste treatment methods such as steam sterilization nor to implement pollution prevention programs such as modifying product purchasing, efficiently segregating waste, and adopting reduce, reuse, and recycle initiatives. By utilizing these strategies, hospitals can reduce their harm to public health and may be able to save money.

Typical Composition of Hospital Waste

Plastics	15-30%
Paper and Cardboard	45%
Food Waste	10%
Glass	7%
Wood	3%
Metals	10%
Other Materials	10%

Source: American Society for Healthcare Environmental Services of the American Hospital Association. "An Ounce of Prevention." 1993.

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Action items for Solution #3

3a. Apply the “Three R’s” model—reduce, reuse, and recycle—to purchasing and waste collection strategies in healthcare facilities. “Reduce” includes reducing the purchase of supplies containing mercury or PVC and instead favoring alternatives. By systematically reducing, reusing, and recycling, Maryland healthcare facilities can decrease the volume and toxicity of their purchases and their waste stream. Four years ago, Johns Hopkins Hospital incinerated all of its medical waste, but now it incinerates 24% less as a result of reduce, reuse, and recycle programs. Albany Medical Center in New York has saved \$4 million in the first six years of its reduce, reuse, and recycle programs.

3b. Use waste segregation to keep non-infectious waste out of incinerators. MDE should require and assist healthcare facilities and incinerator operators to develop and implement waste segregation plans for keeping most mercury, PVC, and regular garbage out of the infectious waste bound for incinerators. Beth Israel Hospital of New York City saves \$600,000 per year in medical waste disposal costs by keeping non-infectious waste out of its infectious waste “red bags.” Johns Hopkins Hospital has a program to separate mercury, lead, nickel, and cadmium out of its incinerator-bound waste.

3c. For infectious waste, explore alternative treatment methods that may include autoclaving, sterilizing and shredding, microwaving, or chemical disinfection. For the small portion of waste that must be treated as infectious, MDE and healthcare facilities should

explore methods other than incineration. Naples Community Hospital in Florida cut its disposal costs 80% and cut pollution by switching from incineration to autoclaving. Another alternative, developed by the Baltimore-based Antaeus Group, sterilizes the waste with superheated water and turns it into a confetti-like mixture that occupies only 20% as much volume as the original waste, according to the company.

3d. Make incinerator emission standards and testing practices more protective of public health. MDE should set stronger emission limits, including limits for arsenic, chromium, nickel, and PCBs, and hold small incinerators to the same emission standards as other incinerators. MDE should also require continuous emissions monitoring for carbon dioxide, hydrogen chloride, sulfur dioxide, nitrogen oxide, and oxygen; take into account the frequency of start-ups and shut-downs when permitting and monitoring incinerators; prohibit the averaging of test runs, so that one failure constitutes failing the test; and publish stack test results in the newspapers of the communities that host the incinerators.

3e. Rescind the special permission for the Hawkins Point incinerator to import medical waste from as far away as 250 miles. The current statute that allows for importation of medical waste brings pollution problems from elsewhere into Baltimore’s air. The legislation was originally passed when the company stated that in order to be competitive and retain its union workers, the incinerator needed to expand its catchment area. But shortly after the 250-mile radius was approved by the Baltimore City Council, the company locked out its well-trained union workers and replaced them with non-union workers whose jobs

are less protected if they attempt to report health or safety problems.

The City Council can prevent an imported air pollution problem by rescinding the Hawkins Point Incinerator’s special permission to import medical waste from outside of the Baltimore region.

Visit www.marypirg.org/medwaste for more materials on how healthcare facilities large and small can cut pollution and save money through better supply strategies and waste collection practices.

Solution #4. Warn Marylanders when fish have become dangerously contaminated with mercury

Airborne mercury from power plant and incinerator smokestacks ends up in bodies of water, where it makes its way up the food chain into fish. As reported above, a National Academy of Sciences report estimated that 60,000 children are born in the US each year with an elevated risk of neurological impairment because their mothers ate unsafe amounts of mercury in fish during pregnancy.

The solution to the mercury problem is to stop releasing significant amounts into the environment, in part by following the recommendations above. Until that happens, fish consumption advisories are the primary method of protecting Americans from particularly unsafe levels of mercury exposure.

Maryland’s advisory policy does not sufficiently protect its residents’ health

The states are responsible for advising citizens about mercury-contaminated fish in state waters. Maryland’s policy is to issue no advisories about mercury in fish unless the concentration reaches 0.5 parts per million (ppm) in tissue of fish that are captured and tested. At that concentration, the US EPA recommends that

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a person weighing 158 pounds consume no more than eight ounces of fish per month. Eight ounces is one typical “fish meal.” In contrast, ten percent of US women of childbearing age consume more than six times that amount of fish per month. Approximately 17 states have a lower threshold for action than Maryland does, ranging from zero to 0.35 ppm. Maryland’s current threshold of 0.5 ppm is a recent improvement from its earlier standard of 1.0 ppm.

Some examples of mercury in Maryland fish

Between 1985 and 1997, 62 samples of fish taken from Maryland waters were found to be contaminated with more than 0.12 ppm of mercury, the level that triggers further investigation in the neighboring state of Delaware. Here are some of the instances of high concentrations in multiple samples:

- The ten samples of bluefish taken in 1985 from just off Kent Island in the Chesapeake Bay had mercury concentrations averaging 0.31 ppm. In the subsequent 12 years, MDE tested no more bluefish at that location.
- The only samples in Garrett County’s Savage Reservoir after 1993, three samples of three different species, had mercury concentrations averaging 0.29 ppm.
- In the Baltimore region, the only samples from Liberty Reservoir after 1992, two of carp and one of largemouth bass, had mercury concentrations averaging 0.17 ppm.

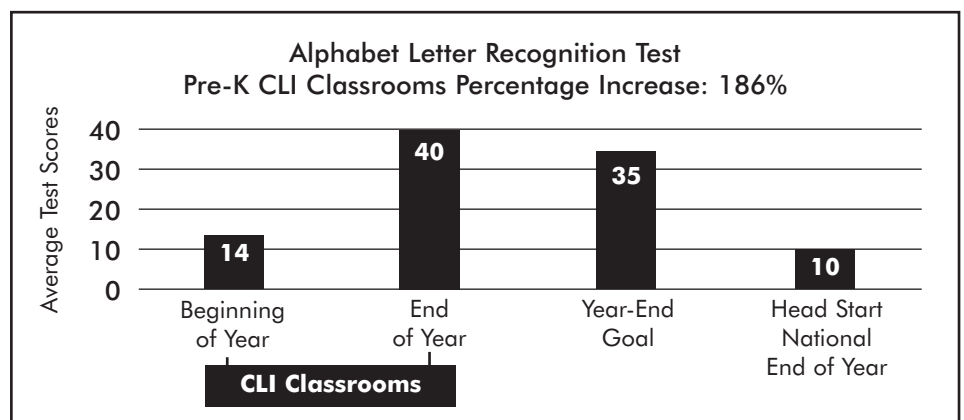
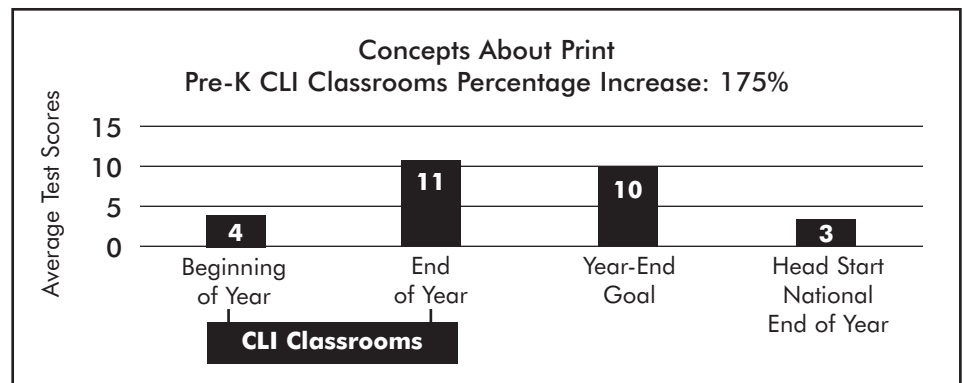
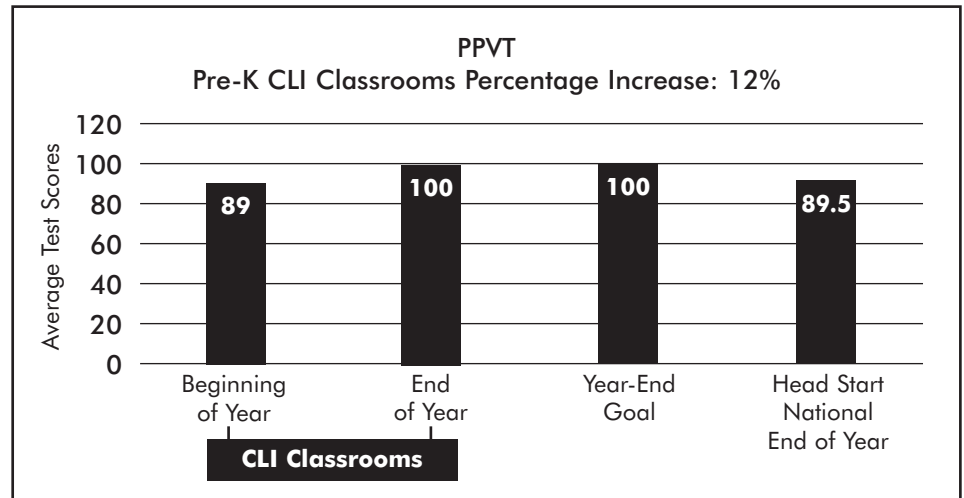
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ABELL SALUTES:

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increase her PPVT score from 89 to 100 in the course of a year, she has had to learn more words than child who had a score of 100 and kept it.

The Abell Foundation salutes young Children’s Literacy Initiative for leveling the playing field—for helping to provide children from high poverty neighborhoods with the same opportunity to succeed in school as their affluent peers.



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At mercury concentrations like those in the first two samples, the EPA recommends a limit of three eight-ounce fish meals per month. At the average concentration found in Liberty Reservoir, the EPA recommends a limit of four such fish meals per month.

Action items for Solution #4

4a. Tighten Maryland standard.

MDE should adopt a mercury-in-fish standard low enough that it will trigger advisories sufficient to protect all Marylanders, including children, nursing infants, fetuses, and people who consume large quantities of fish. MDE reports that it is considering a standard of 0.3 ppm. At that concentration, the EPA recommends consuming no more than three eight-ounce fish meals per month.

4b. Modify sampling and advisory programs. MDE should also modify its fish sampling and advisory programs as necessary to ensure that any fish and shellfish populations with unsafe mercury concentrations are identified, and that virtually all Marylanders who might eat unsafe quantities of these fish are warned of the danger. MDE reports that it is working to upgrade its sampling and advisory programs.

4c. Set uniform nationwide standard.

US EPA should issue new rules establishing a uniform mercury-in-fish standard for all states sufficient to protect all Americans.

V. CONCLUSION: SUMMARY OF NEXT STEPS FOR CURBING POWER PLANT AND INCINERATOR POLLUTION

Current regulations are not adequate to protect Marylanders from power plant and incinerator pollution, and there are major limitations on what citizens can do to protect themselves. The responsibility for curtailing this pollution rests with Maryland's policymakers. Fortunately, there is a great deal they can do.

Maryland's members of Congress can co-sponsor federal legislation to reduce smog- and fine particle forming emissions from power plants by 75%, mercury emissions by 90%, and carbon dioxide emissions back to their levels of 1990.

Maryland's state legislators and governor can begin shifting the state as a whole away from the burning of polluting fossil fuels for power generation by ensuring that a rapidly increasing share of Marylanders' electricity comes from clean renewable energy resources and by establishing extensive programs to help families and businesses use energy more efficiently.

If the General Assembly has not established such energy efficiency programs by the April 9th end of its 2001 session, **the Public Service Commission** can establish them by using the mandate for such programs already granted to it by the General Assembly. The PSC can also support legislation to increase the use of clean renewable energy.

The Baltimore City Council can rescind the Hawkins Point Incinerator's

special permission to burn medical waste from up to 250 miles away.

The state's **healthcare facilities** can improve their purchasing and waste collection strategies to keep non-infectious trash, mercury, and PVC out of the infectious waste stream. For the disinfection of infectious waste, they can explore alternatives to incineration. In the process, they can reuse and recycle more, reduce overall purchases and waste, and save money.

The Maryland Department of the Environment can ensure that healthcare facilities take these steps by requiring them to develop and implement plans for keeping most regular garbage, mercury, and PVC out of incinerators. MDE can also make medical waste incinerator standards and testing more protective of public health, as detailed in recommendation 3d earlier in this article.

To provide good information for policymaking related to municipal waste incinerators, MDE can conduct additional emission tests to more accurately estimate the emissions of dioxin and any other pollutants the emissions of which may be grossly underestimated by current testing methods.

Finally, MDE can warn Marylanders about populations of edible fish in Maryland waters that contain unsafe concentrations of toxic mercury, until steps such as those outlined above have reduced mercury pollution enough that such warnings are unnecessary.

Together, Maryland's policymakers can greatly reduce the amount of power plant and incinerator pollution in Marylanders' air and food.

The views in this article are those of the authors, who are staff members of the Maryland Public Interest Research Group (MaryPIRG) and can be reached at marypirg@pirg.org or 410-467-0439.

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A version of this article with endnotes is available at www.marypirg.org/abellreport.