


TROUBLE IN THE



Sara Bono lives in a heavily air-conditioned split-level along a quiet rural street outside of Butler, Pa., where a handful of other tidy subdivision homes are arranged on manicured lawns. In this suburb north of Pittsburgh, a neighbor's laundry flutters in the summer breeze and forested hills roll toward the horizon. There are no smokestacks in sight. No plumes of acrid industrial emissions. No hiss of traffic. Nothing that can be seen or heard, smelled or tasted to suggest that pollutants fill the air. But Sara, a severely asthmatic 18-year-old, knows better. On days when news reports warn of high air pollution concentrations, "I don't even go outside," she says. "To even walk from the house to the car is a struggle. And it's pretty immediate. It's all of a sudden hard to catch my breath, like my chest has a load of bricks on it."

Jeff Fraser is a Pittsburgh-based freelance writer and frequent contributor to h. His last story, published in the Annual Report issue, reported on how changes in Pennsylvania's energy policy, particularly the new focus on alternative sources such as wind power, offer environmental and economic benefits to the Pittsburgh region.

AIR

PITTSBURGH HAS COME A LONG WAY SINCE BOSTON AUTHOR JAMES PARTON DESCRIBED IT IN 1868 AS "HELL WITH THE LID OFF." BUT WHILE THE SKIES LOOK CLEANER, SOME COMMUNITY, NONPROFIT AND GOVERNMENT LEADERS ARE GRAPPLING WITH HOW TO ADDRESS THE UNHEALTHY LEVELS OF MICROSCOPIC POLLUTANTS THAT EARNED THE REGION THE SECOND-WORST RANKING IN THE COUNTRY FOR FINE-PARTICLE AIR POLLUTION. BY JEFFERY FRASER

What Sara's condition alerts her to is a troubling fact confirmed by scientists, public health officials and regional air-quality monitors: The air over western Pennsylvania is dirty with dangerous pollutants that are often invisible to the naked eye, even though the infamous era that saw heavy industrial soot turn afternoons as dark as night is history. Despite Rand McNally's Places Rated Almanac crowning Pittsburgh the nation's most livable city last year, the region was ranked the second worst in America for fine-particle air pollution, behind grimy Los Angeles, in a report by the American Lung Association. And although the region is not the worst in Pennsylvania for ozone pollution, or smog—that distinction is held by Philadelphia—it is not far behind with levels high enough to earn it an "F" on the same report card.

These high-profile rankings cast the spotlight on an air pollution problem that is one of the most persistent and complex in the nation. Underscoring the dilemma is the grim regulatory fact that the region's most densely populated county, Allegheny, has been in violation of federal Clean Air Act standards for ozone and particle pollution ever since the thresholds for both were last tightened in 1997.

The costs of allowing such a problem to linger are high.

Scientific research provides a growing body of evidence linking air pollution to higher risks of serious disease, including elevated rates of asthma, heart disease and cancers that increase human suffering and burden the economy with high health care costs. Air pollution degrades other natural resources, such as water—a particular concern in western Pennsylvania where the rivers hold fish found to contain high levels of mercury.

Poor air quality also threatens development of new economic engines, such as the region's budding green building industry whose members are sensitive to the environmental health of where they choose to sink roots. And failure to clean up its own backyard weakens the region's legal position to sue for relief from pollutants vented by Ohio Valley power plants and other upwind sources that today account for a significant share of the fine particulates western Pennsylvanians breathe.

"Gone are the days when air pollution was the smell of money," says Caren Glotfelty, Environment Program director for The Heinz Endowments. "The regions of the country that will prosper in the future will be those that offer quality of life

Sara Bono looks out the door of her home on a quiet street in rural Butler, Pa., where even the absence of urban traffic does not protect the 18-year-old asthmatic from breathing difficulties.

as a competitive advantage. Southwestern Pennsylvania cannot afford to ignore the costs of health care for its existing population, but, more important, we must not underestimate the value of our increasingly green image as an economic driver."

A Complex Problem

A half-century ago, political leaders in Allegheny County and Pittsburgh made clearing the region's air a priority, but many current elected officials have been on the sidelines, with only a select few pursuing air-quality improvements as part of a government agenda. Environmental activists attribute this lack of political muscle to improve western Pennsylvania's air, at least in part, to what they see as most elected and civic leaders caring more about economic development than environmental progress.

Pittsburgh City Councilman William Peduto, one of the local government officials who is more vocal on environmental issues, has a blunter assessment: "Trees don't vote," he says. "I mean that seriously. Politics sometimes becomes mired in pushing policies that will be rewarded with re-election."

He hopes that a growing public awareness about the importance of clean air and water will demonstrate to local officials that residents support including environmental issues in a legislative agenda. Members of the public-private Green Government Task Force that Peduto co-chairs with Pittsburgh Mayor Luke Ravenstahl want to stimulate that awareness through a Green Summit in February.

Some civic and business leaders, however, insist that they do care about the environment, and they say they understand that companies interested in moving into the region consider air quality when making decisions about relocating.

At a Dec. 13 media briefing organized by the Allegheny Conference on Community Development, one of the region's most influential economic development organizations, a group of environmental lawyers and consultants along with Allegheny Conference officials said many companies in the region were not anti-environment. But these firms were concerned about what the group described as the inefficient and unnecessary local regulatory efforts by the county Health Department's Air Quality Program. Members of the group said companies they worked with would welcome the administration of sound air-quality policies by state and federal officials.



Photo: Joshua Franzos

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Sara Bono, 18

However, as part of the recent debates about the fate of the Air Quality Program, several environmental groups have contended that suggestions to transfer the program's air monitoring responsibilities from local to state authorities illustrate the lack of commitment some business and government leaders have to developing a clean-air agenda for the region—despite assurances otherwise.

In fact, efforts to address air-quality problems in southwestern Pennsylvania have been primarily carried out by private nonprofit organizations, such as environmental organizations and the Endowments, which has financed a diverse strategy for improving air quality with more than \$29 million in grants over the past 10 years.

And the complexity of the task can appear formidable. In decades past, Pittsburgh and the surrounding industrial valleys famously polluted themselves. But the decline of steel and other heavy industries, tighter industrial emissions standards and other factors have changed the equation. Today, much of the gases and soot that foul the air are imported from coal-fired power plants, industries and cities in the Ohio River valley and elsewhere in the Midwest. One local expert, Cliff Davidson, a professor of civil and environmental engineering at Carnegie Mellon University who has

A COMPLEX PROBLEM

NO ONE FACTOR IS TO BLAME FOR SOUTHWESTERN PENNSYLVANIA'S AIR-QUALITY PROBLEMS. POLLUTION IS PRODUCED LOCALLY AND BLOWS IN FROM AREAS OUTSIDE THE REGION. THE ROLLING TOPOGRAPHY PREVENTS AN EVEN DISTRIBUTION OF AIR AND POLLUTANTS, CREATING "HOT SPOTS" OF INTENSE AIR POLLUTION. AND THERE ARE ASSERTIONS — AT LEAST ON THE PART OF SOME ENVIRONMENTAL ACTIVISTS — THAT PUBLIC OFFICIALS AREN'T DOING ENOUGH TO PROMOTE AIR-QUALITY IMPROVEMENTS.

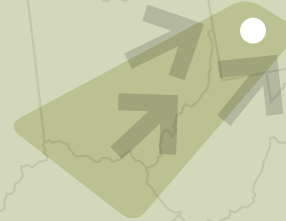


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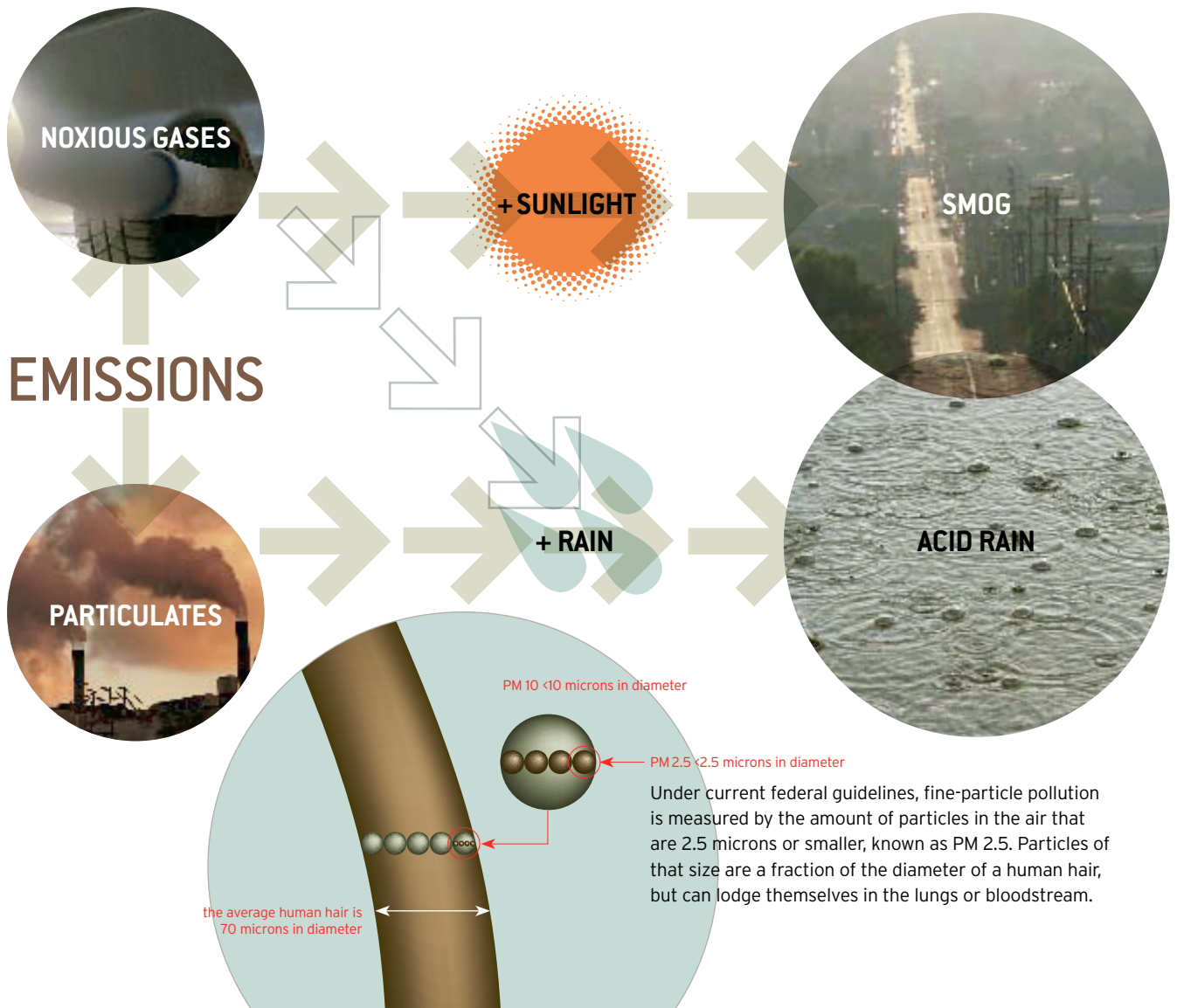
BORDER PATROL

Experts say more than half of the region's fine-particle pollution comes from out-of-state sources. It rides on wind currents from factories in states that are west and southwest of Pennsylvania.



POLLUTION 101

Two types of emissions contribute to much of the pollution we have today. Noxious gases from fuel burned by cars, buses, trucks, factories and other sources react with sunlight to create smog, or the gases combine with water to create acid rain. Particle pollution, or soot, is a mixture of solid and liquid compounds from sources such as diesel engines; coal-burning power plants; and steel, coke-making and other heavy industries. When mixed with moisture, these particulates also can form acid rain.



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spent 35 years studying air pollution, estimates that on a long-term average, “well over half” of the region’s fine-particle pollution originates from out-of-state sources.

“The air entering Allegheny County is not clean,” he says. “Yes, we are creating our own pollution, and there are parts of the county where [locally produced pollution] is dominating. But there are many times when we have high concentrations of pollution that are caused by sources in upwind areas that can be hundreds of miles away.”

Particle pollution, or soot—one of the two most widespread air pollutants—is a mixture of solid and liquid particles emitted by sources such as diesel engines; coal-burning power plants; and steel, coke-making and other heavy industries. At 2.5 microns or smaller, fine particulates, or PM 2.5, are a fraction of the diameter of a human hair and able to dodge the body’s natural defenses, lodge themselves in the lung or slip into the bloodstream.

These fine particles hitch a ride on wind currents that most often blow into the region from the west and southwest. In some areas, such as South Fayette in Allegheny County, migrating PM 2.5 has a significant impact on air quality. Although South Fayette is upwind from the Monongahela River valley, where the county’s more prolific sources of fine particulates reside, the annual reading from a monitor atop the high school is less than a microgram under the federal limit of 15 micrograms per cubic centimeter. The reason, according to the Allegheny County Health Department, is that the majority of PM 2.5 being detected drifts in from the Ohio Valley.

“Go to Steubenville and take a trip north or south. You’ll see smokestack after smokestack after smokestack,” says Roger Westman, the Health Department’s Air Quality Program manager.

The other widespread air pollutant, ozone, also comes from local and outside sources. Ozone, or smog, is a gas formed by a reaction of sunlight and the vapors emitted when fuel is burned by cars, buses, trucks, factories and other sources—a process that takes three or more hours to complete. That means with a five-mile-per-hour breeze, automobile exhaust from a Pittsburgh rush hour won’t make ozone until it travels 15 or more miles downwind, contributing to pollution in other parts of the region.

Western Pennsylvania’s air-quality problems are exacerbated by its rolling topography and homegrown pollution. Major local sources of ozone are cars and buses—the usual suspects. The chief local causes of particle pollution include diesel trucks

and buses, the 11 coal-fired power plants in the region, and metallurgical industries and coke-making facilities, the most notable being U.S. Steel Corp.’s Clairton Coke Works, the largest in the nation, if not the world.

The region’s hills and valleys prevent the kind of even mixing and distribution of air and pollutants that more level geographic areas experience. These factors tend to create “hot spots”—pockets of intense air pollution. In Allegheny County, the hottest of the hot spots is the cluster of Mon Valley communities around Liberty Borough immediately downwind of the Clairton Coke Works. There, the monitor that measures the quality of the air some 25,000 people breathe reports the second-highest annual PM 2.5 reading in the nation.

At the end of November, U.S. Steel officials announced plans for a \$1 billion upgrade of the Clairton facility that would include state-of-the-art environmental controls, the creation of more than 600 construction jobs, and a new plant that would use gas produced by the coke-making process to generate electricity for the coke works and two other company sites.

While the plans still must be approved by the steel producer’s board of directors, elected leaders were heartened by the prospect of a large, long-term investment in the region that doesn’t call for public money. However, environmental leaders warned that the potential economic benefits should not prevent a thorough analysis of whether the changes will meet clean-air standards, especially if production increases, though U.S. Steel officials say the coke works’ capacity would stay the same.

“We’re cautiously optimistic,” says Rachel Filippini, executive director of the local environmental organization Group Against Smog and Pollution, or GASP. “But we need to know more about how much of a reduction in pollution there will be and how much the changes will affect the air and human health.”

Health Hazards

Those who remember can’t deny that the air is better than it was several decades past when all of the mills were up and running on full production schedules, contributing to the visible smoke, sooty residue and rotten-egg odor that was part of daily life in and around Pittsburgh. But with the discovery of stronger links between lower levels of air pollution exposure and a long list of serious health problems, it has become clear that better is not good enough.

COMPETITIVE STATE AND A DIRTY STATE IS UNCOMPETITIVE.

THE INCOME WE WANT BY TRASHING OUR AIR.” John Hanger, president and CEO, PennFuture

The potential harm to human health is the basis for emission standards for pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide and ozone. Many were first set in the 1970 Clean Air Act and later tightened as more was learned about the risks they pose.

The wake-up call had come decades earlier in the Washington County mill town of Donora. For four days in October 1948, an inversion clamped a lid on the Monongahela River town, trapping soot and gases vented from its steel, wire, zinc and other industrial works, killing about 20 people and sickening thousands.

“People began to understand that if a lot of pollution in a small amount of time can kill, it raises the question: What does exposure to a lesser amount of pollution over a long period of time mean to our health?” says Devra Davis, author, epidemiologist and director of the University of Pittsburgh Cancer Institute Center for Environmental Oncology.

For Davis, who survived the Donora inversion as a toddler, the answer to that question was in the health of relatives and neighbors. She remembers her grandmother and many other Donora grandmothers as bedridden invalids tethered to oxygen tanks. “There were people who went house to house fixing hair because these women could not get down the steps to get to the beauty parlor.”

Studies report that particle pollution damages the body in ways similar to cigarette smoking. The research links long- and short-term exposure to respiratory ailments, stroke, heart disease, cancer and other health problems. In one recent study, researchers at the University of Southern California found that Los Angeles residents living in areas with the highest average level of fine particulates in the air have thicker carotid arteries — a sign of more atherosclerosis — than those living in less polluted areas. And in western Pennsylvania, preliminary data from an ongoing University of Pittsburgh study suggests that among pregnant women, those exposed to higher levels of particle pollution are more likely to have pre-term deliveries.

“There is no doubt that what we thought of in the past as fairly low levels of air pollution can affect our health,” says Conrad Daniel Volz, an assistant professor in the University of Pittsburgh Graduate School of Public Health and coordinator for exposure assessment at the University of Pittsburgh Cancer Institute Center for Environmental Oncology.

Ozone particularly irritates the respiratory tract. Short-term exposure can exacerbate asthma and trigger attacks that

leave sufferers gasping for breath, like Sara Bono who finds it nearly impossible to walk the length of her front yard on Ozone Action Days. Long-term exposure raises the risk of reduced lung function, pulmonary congestion and heart disease. One of the more telling ozone studies was done in Atlanta during the weeks the city hosted the 1996 Summer Olympics. When citywide traffic-reduction strategies were in effect, Atlanta’s ozone levels fell 30 percent and acute asthma cases logged by doctors and hospitals dropped by nearly 42 percent.

Such findings come as no surprise to western Pennsylvania doctors who treat asthma patients. “Whenever we have a string of Ozone Action Days, we get very busy with acute visits — people coming in needing breathing treatments for their attack,” says Dr. Deborah Gentile, an asthma, allergy and immunology specialist at Allegheny General Hospital.

Children’s Hospital of Pittsburgh experiences emergency room visits for asthma at a rate nearly four times higher than the national average. What is driving these volumes up is unclear, but air pollution, indoor molds and cigarette smoke are on the list of suspects. Across Pennsylvania, the percentage of adults with diagnosed asthma rose from 10.7 percent to 12.3 percent from 1999 to 2005, and prevalence among children increased from 6.6 percent to nearly 10 percent, according to the state Department of Health. In hospital charges alone, the cost of treating asthma across the state jumped from \$171 million to \$406 million.

“We’re swamped,” Gentile says. “There are two of us in our program, and we can’t keep up with it. We used to get a lull in July and early August. Now, we’re booked solid.”

Bad for Business

As for the economic impact of air pollution, the Surface Transportation Policy Project, a national nonprofit, estimated in a 2003 report that, in terms of dollars, the cost of illness and premature death in western Pennsylvania related to air pollution from transportation sources alone exceeds \$227 million a year. Poor air quality also detracts from the quality of life of a state, city or region and, in doing so, makes them less attractive to businesses, investment and workers.

“We argue all the time that, in this day and age, a clean state is a competitive state and a dirty state is uncompetitive,” says John Hanger, president and chief executive officer of Citizens for Pennsylvania’s Future, also known as PennFuture,



Photo: Corbis

a statewide environmental nonprofit. “We are not going to build the jobs and the income we want by trashing our air.”

Recent reports of dirty air, such as the American Lung Association rankings, “will certainly show up on the radar of companies that are sensitive to environmental issues,” says Rebecca Flora, executive director of the nonprofit Green Building Alliance in Pittsburgh.

In a period when environmentally friendly technology, or “cleantech,” is one of the fastest growing sectors for investment nationally and when western Pennsylvania is trying to promote its green innovations, bad air could hurt business. And local opportunities for green economic development are expanding.

For example, the Pittsburgh region is otherwise well positioned to capture a piece of a domestic green-building-products market that, if estimates hold true, could reach \$60 billion in a few years. Pittsburgh already enjoys a reputation as a green building leader, ranking third among U.S. cities in the number of buildings certified under the Leadership in Energy and Environmental Design program of the United States Green Building Council. The City Council recently passed a measure allowing LEED-certified buildings to be as much as 20 percent higher, and have 20 percent more floor space than noncertified new buildings in their zoning areas. The region also is located near key markets and has a robust building-products sector and considerable research assets.

“When a study comes out that says we have such poor air quality,” Flora says, “it almost totally undermines what we are trying to do to promote the city as a green city and counters the image we have been able to create through green building leadership.”

A Multi-Pronged Approach

Western Pennsylvania has long faced a daunting challenge to clean its air. Pittsburgh is no longer the “Smoky City” of 1945, when atmospheric smoke was recorded on all but five days of the year. By 1980, the number of smoky days had fallen to fewer than 50 and, five years later, Allegheny County managed to meet the annual limit for PM 10, then the Clean Air Act particle pollution standard.

But such successes have proven to be deceptive. Today, the struggle is over how to bring the region into compliance with stricter air-quality standards and solve an air-pollution problem that is more complex and dangerous than realized only a few decades ago.

Air quality was among the first issues the Endowments’ Environment Program began to address after it was established as a formal grant-making program in the mid-1990s. Since then, the foundation has emerged as the region’s leading philanthropic supporter of efforts to battle air pollution. Its strategies have been broadened over the years from a focus on conservation and sound public air-quality policy to include efforts to build the capacities of environmental nonprofits and promote renewable energy, green building and more effective coalitions of advocates for a healthier environment.

“We’ve tried to tackle this from all angles of the problem,” says Ellen Dorsey, the Endowments’ Environment senior program officer. “We have to simultaneously respond to the effects of pollution, promote better public policies and invest in transformative technology.”

The John E. Amos plant in Winfield, W.Va., is the Columbus-based American Electric Power Corp.'s largest generating plant. American Electric has been ordered to install \$4.6 billion worth of pollution controls in its Midwest and Mid-Atlantic plants, including Amos, which is considered to be among the sources of polluting emissions that drift into southwestern Pennsylvania.

Early grants were made to support the efforts of Boston-based Clean Air Task Force and others to press for federal policy that would choke off emissions from aging Midwest power plants. Those awards recognized that much of the pollutants western Pennsylvanians breathe is imported from states west of them.

State and local air-quality policy was another focus. The strategies included grants to build the capacity of GASP, whose work for decades relied solely on volunteers, and to support Clean Water Action, a national nonprofit that has been instrumental in alerting policymakers and the public to the high levels of mercury that coal-fired power plants and other sources deposit in the region's rivers. The Endowments also helped establish and support PennFuture, which has become the leading environment nonprofit in the state with the attorneys, lobbying expertise and large base of supporters that make it a powerful voice for environment-friendly regulation and legislation in Pennsylvania.

Still, Glotfelty notes that in hindsight the Endowments could have been more aggressive in the early days with its support of local advocacy, especially in light of current elected officials' lack of urgency in addressing air quality.

"We didn't realize how important local leadership would be in addressing air quality, which we initially saw as a state and national issue. We should have figured out how to get to western Pennsylvania community and business leaders early on to convince them that we have a problem and to advocate for solving it," she says. "We should have invested even more in national and state-level groups and partnered them with local organizations to create a much more sophisticated capacity than we even have today."

The important inroads that have nonetheless been made include the Clean Air Task Force seeing its decade-long fight to curb the interstate migration of power plant pollution rewarded with the implementation of the 2005 federal Clean Air Interstate Rule, which requires 927 power plants east of the Mississippi River to reduce the amount of nitrogen oxides and sulfur dioxide they emit by up to 75 percent.

When the new regulation will deliver to western Pennsylvania much-needed relief from out-of-state air pollutants depends largely on enforcement. It took an eight-year court battle to settle a landmark lawsuit brought by Clean Air Task Force,

12 other environmental groups, eight states and the U.S. Environmental Protection Agency against the Columbus-based American Electric Power Corp. The company was ordered to comply with federal air standards and to install \$4.6 billion worth of pollution controls in its Midwest and Mid-Atlantic coal-burning power plants. The settlement, signed in October, is expected to cut by 813,000 tons a year acid rain-producing emissions that drift into Pennsylvania and other downwind states.

Relief also may depend on the so-called "clean hands doctrine," the argument that a state or region stands a better chance of getting the remedy it seeks against upwind polluters if it has taken effective steps to clean up its own air pollution. "The clean hands doctrine goes to what the remedy will be," says Conrad Schneider, Clean Air Task Force advocacy director. "If you are pointing your finger upwind, but you are as dirty or dirtier as your upwind neighbors, chances are the court is not going to order them to be cleaner."

Nonprofits also played important roles in several recent Pennsylvania regulations and laws that have the potential to improve air quality and curb the impact airborne pollutants have on other environmental resources.

This year, a new regulation won the support of Gov. Edward Rendell's administration that requires Pennsylvania's 36 coal-fired power plants to reduce their mercury emissions by 90 percent—an estimated 3.6 million fewer tons of mercury each year. Mercury, a dangerous air pollutant, seriously degrades other environmental resources, most notably waterways. "Not only is people breathing air pollution the problem," says Volz, "but large volumes of heavy metals in stack gases are being deposited in the watershed. So we have air pollution creating a water pollution problem."

Volz and his Pitt colleagues recently reported that fish caught in the Allegheny, Monongahela and Ohio rivers near Pittsburgh contained more than three times more mercury than the EPA considers safe, and the mercury levels in fish caught in the Allegheny near Kittanning were 19 times higher than the EPA standard.

The new rule was the focus of a statewide campaign organized around the potential for neurological damage and other health risks such high levels of mercury pose to children.

The coalition of stakeholders that took action over the issue included environmental groups, sportsmen, women's organizations and public health advocates. PennFuture filed the petition for the mercury rule, then successfully blunted industry efforts to overturn it in the legislature. The nonprofit also was influential in getting legislation on the books that requires new cars sold in Pennsylvania to meet tougher California standards for emissions and fuel efficiency in the near future.

And in a step toward allowing Pennsylvania to depend less on burning coal to light homes and power industry, a coalition of advocacy organizations worked with legislators and the Rendell administration to pass the state's first Alternative Energy Portfolio Standards Act. The act, signed into law in 2004, requires that 18 percent of the electricity sold come from alternative energy sources, including 8 percent from renewables, such as wind and solar, that today account for less than 1 percent of electricity sales.

Almost immediately, the state witnessed a surge in new industry to meet the demand, including Vitoria, Spain-based Gamesa Corp.'s four wind turbine plants that brought \$50 million in investment and nearly 1,000 new jobs to Pennsylvania.

Close to Home

For Jim Berent, though, it wasn't soot from power plants or steel mills or coke ovens that gave him problems. It was diesel exhaust, which contains both ozone gases and particulates. At the Penn Hills School District bus garage, where he is the supervisor, it would blacken the walls. At home, his wife wouldn't allow him in the house until he changed out of his work clothes, which reeked of exhaust. She lifted the restriction two years ago after Penn Hills, as part of a Health Department pilot project, became one of the first districts to retrofit its 83 school buses with diesel oxidation catalysts that reduce sooty emissions by 60 percent.

"My clothes don't smell anymore like they used to," says Berent. "At the shop, we've been amazed at the difference. These walls would get so black we'd have to wash them down every summer. It's been two years since we painted and even now you can't see any soot."

GASP and Clean Water Action staffs are hoping to see similar benefits from a new program they are managing with a

\$500,000 grant from the Endowments to retrofit the Pittsburgh Public Schools' buses with similar diesel filters. A recent Clean Air Task Force study found that particulate matter from diesel exhaust routinely entered school bus cabins and, at some stops, was as much as 10 times higher than levels in the outdoor air. The nonprofits also are exploring ways to get other diesel sources to clean up, including city waste haulers and Port Authority buses.

Public awareness campaigns have been organized to educate residents, schoolchildren and the local news media about western Pennsylvania's air pollution and what they can do about it. And in the region's hot spots, citizen watchdog groups quietly conduct surveillance, providing the county Health Department with snapshots and videotape that officials say have led them to emissions violations they might otherwise not have detected.

"People who live next to plants come to know there are good days and bad days and why there are bad days," says Myron Arnowitz, Clean Water Action's director for Pennsylvania.

Kurt Miller is one of them. His Mon Valley neighbors include a chemical plant, a small coal-burning power plant and, only five miles downriver, the Clairton Coke Works. In the 12 years since he moved his family into their Jefferson Hills home, he's noticed that the air quality has gotten better. But there are still days when they need to close the windows against the pollutants he knows are there. He knows these things because he samples the air himself.

His tools include a crude air monitor provided by Clean Water Action that is fashioned from a five-gallon bucket, a plastic bag and a hand-sized vacuum cleaner. It was effective enough to once detect high levels of several carcinogens, including benzene, in the neighborhood air. Through GASP, he became a certified "smoke reader" trained to spot possible emissions violations from the plumes vented by industry. He sits on the chemical plant's community advisory committee, has the cell phone numbers of plant officials and has not been shy about using them. Air quality is important to him. His wife and three children all have asthma.

"I feel that as long as I'm here doing this—and [company officials] know I'm doing this—maybe that will keep them honest," he says. "I know there are cleaner places to live, but we like our home here." *h*