

Take a deep breath; It's time to clean the air

One of the only things that we don't have to pay for is the air that we breathe. The right to eat, drink, and discard waste, three other essential human functions have been turned into a commodity—and, therefore, now require money. However, although air is free to breathe, it still comes with costs. The air in cities throughout this country contains dangerous chemicals. Air in many rural areas is polluted as well, compromised by urban air blowing through or dust and agricultural chemicals (and odors) from neighboring farms and animal factories. Despite government propaganda to the contrary, the air that we are breathing is not healthy. Yet, it should be! Everyone has the right to breathe clean air. Clean air is a human right which shouldn't be violated or superseded by industrial interests. Somewhere along the way we gave our air to the large-scale pollution makers. It is time we took it back. Too many of us are sick. Too many of us are missing work and school. Too much productivity is being lost to the economy. And, too many of us are actually dying.

And take it back, we are. All across the United States, states and localities are saying "no more." The state of Minnesota, just last week, became the latest state to put the clamps on mercury polluters. Earlier this month, the PG&E Hunters Point power plant, the largest polluter in the city of San Francisco, was turned "off" after many years of activism by the residents of that community and the non-governmental organization (NGO) Greenaction for Health and Environment Justice. This January, after a ten-year struggle, a coalition of organizations, including the American Lung Association, got the city of Chicago (and soon afterwards Cook County, its county seat) to eliminate smoking in places of employment, restaurants and many other public places. Chicago joined New York City and Los Angeles among cities to have reclaimed the right to breathe healthier indoor air. Undeterred by current and past U.S. presidents who were unwilling to support the Kyoto Protocol (an international agreement to reduce the emission of climate change inducing gases), two-hundred and thirty-one mayors all across the country have signed the Climate Protection Agreement (to see where these cities are located and what the Agreement is all about, go to: www.ci.seattle.wa.us/mayor/climate/). So you see, there is a movement afoot, and it is time that all of us joined it. This year figures to be a year when Illinois takes significant strides to clean up its air. There is definitely much work to be done and many exciting opportunities for you to get involved.

The primary focus of Illinois campaigns to clean the atmosphere we breathe centers on outdoor air—particularly those pollutants coming from coal power plants and diesel trucks and buses. Why does our air need cleaning in the first place?

Air pollution, defined as substances in the air that are harmful to living things, is nothing new. Humans have long breathed in atmospheric matter that was damaging to them. One of the more common sources of air pollutants in the past was fire which produces harmful byproducts during the combustion process. As any person who has watched a fireplace burn various plant materials can attest to, burning objects results in the production of particulates (small particles, such as, ash and soot) and



The Crawford coal-fired power plant (just five miles from downtown Chicago) looms large over the health of the people of Little Village and other residents and visitors

gases. Many of these substances are quite dangerous to the body when they enter lungs and the blood stream.

It turns out that most of our air pollution problems today stem from burning materials as well. In this case, the substances being burned are not recent plant products, rather they are fossilized living materials known as fossil fuels, e.g. coal and petroleum. The burning of these substances produces particles and gases, which are injurious to humans. And, given our species' massive population as well as the energy intensive lifestyle demanded by people in the industrialized world, it is not surprising to learn that these pollutants can often be found at dangerous levels in the atmosphere. These particles and gases are entering our lungs, our bloodstreams, and even our breasts and brains and, in so doing, causing serious problems for far too many of us.

Since coal is the dirtiest fossil fuel to burn, it is receiving the bulk of the attention in policy circles. Burning coal releases nitrogen oxides, sulfur oxides, mercury, arsenic, particulate matter, dioxin and, secondarily, ozone. Each of these substances, once absorbed into the body, does measurable harm. Nitrogen oxides (NOx) decrease lung function and have been shown to contribute to respiratory disease in children. NOx is also a major precursor for the production of ozone in the presence of sunlight. Ozone is one of the more serious pollutants in terms of making asthma worse and its probable association with infant cardiac defects, low birth weight, and inhibited lung growth. Short term exposure to ozone has also been shown to cause respiratory problems (such as wheezing, coughing, and shortness of breath) and weaken immune systems as well (which makes people more vulnerable to other sources of infection). Sulfur dioxide (SO₂) aggravates asthma and can even affect heart rhythms. It is also contributes to low birth weight. Both NOx and SO₂ (collectively known as NOx and SOx, and pronounced as "KNOX" and "SOCKS") can also be converted to harmful particulates in the atmosphere. Particulates, once inhaled, get into the blood stream and can cause inflammation

of the heart and premature death (even among infants). Fine particulates (that are smaller than 2.5 microns in diameter, usually referred to as PM_{2.5}) get deeper into the lungs and are much harder for the body to expel or combat (*Children at Risk*). Fine particles decrease lung function in all humans, increase both the frequency and severity of asthma in children and adults and may actually cause asthma. Mercury is a neurological toxin that affects the brain and entire nervous system. It disrupts children's development resulting in learning and behavioral disorders, lower IQs, and even autism. It can cause brain damage in both adults and children. It is also suspected to affect blood pressure and heart rate.

To give you an idea of the immense quantities that are released when we burn coal, consider the emissions from one of the two coal power plants located in the city of Chicago. Over the course of a year, the Crawford plant (located just 5 miles southwest of Michigan Avenue) emits the following into the atmosphere: 11,000,000 pounds of nitrogen oxides, 19 million pounds of sulfur dioxide, 370,000 pounds of fine particulates, 586,000 pounds of large particulates (particles larger than 2.5 microns but less than 10 microns, referred to as PM₁₀), 104,000 pounds of volatile organic compounds (VOCs), and 366 pounds of mercury (data from 2000). (Closer to home, there are four coal power plants within 60 miles of Galesburg, two near Peoria, one at Duck Creek in Fulton County, and one at Havana in Mason County.) Considering that there are 24 coal-fired power plants in Illinois alone, the actual total pollution input from this single source is clearly gargantuan. In fact, coal power plants are the focus of many efforts to reduce air pollution precisely because of the enormity of their contribution to the problem. For example, in the Midwest, 30 percent of all NOx pollution comes from coal-fired power plants (*Nitrogen Oxide*). Nationally, more sulfur is emitted into the air by coal power plants than all cars, trucks and factories combined (*Sulfur Dioxide*). And coal power plants are also responsible for one-third

of all human releases of mercury into the environment (*Mercury*).

Are these releases dangerous? While it is always difficult to determine exactly how much damage comes by way of a specific pollutant in the atmosphere, recent studies suggest that the problems caused by pollution from coal power plants is extensive. In the past six years, Abt Associates, an independent research organization, conducted an extensive investigation of the health impacts of power plant pollution. Their research led to two studies which concluded that fine particle pollution from U.S. power plants causes premature death in ~24,000 people each year—with the average life-years lost by individuals due to exposure being roughly 14 years (*Dirty Air*). These astounding results weren't unexpected. A Harvard study (referred to as the Six Cities Study) released in 1993 as well as a American Cancer Society study done two years later both determined significant levels of premature death due to particulate emission. Closer to home, Levy *et al.*'s 2002 study focused on the impacts of power plant emissions in the state of Illinois. The two power plants located within the city limits of Chicago, Crawford (in Little Village) and Fisk (in Pilsen) were found to be responsible for 41 premature deaths, 550 emergency room visits, and 2,800 asthma attacks per year. And to make matters worse, this study only looked at the impacts of particulate emissions (not ozone, arsenic, mercury, nor VOCs) and not the effects of the other three coal plants which are located within thirty miles of the city. According to the American Lung Association, human deaths in the Metropolitan Chicago region due to power plant emissions are larger in number than deaths caused by drunk driving (by nearly 3 times), HIV/AIDS (by more than 2 times), and homicide (by over 200) (*Asthma Plan*). Similar horrifying statistics can be found all across the country.

Given these results, it isn't surprising to find asthma so prevalent in Chicago. In Cook County, the county where Chicago is located, it is estimated that over 317,000 adults and over 121,000 children have asthma (numbers which don't reflect many other respiratory ailments found in these communities). Nationwide, approximately 20 million people currently have asthma, with more than half of them having experienced an asthma attack within the past year (*Asthma Action*).

Health impacts aren't the only way pollutants can take a toll on a community. Asthma is the leading chronic illness causing kids to miss school (U.S. Department of Education). Nearly 15 million school days are missed because of asthma (*Asthma Action*). And when kids miss school, parents miss work. This only reduces family income and heightens financial insecurity. Loss of income also decreases the purchasing power of a community which hurts small business owners. Though these economic and educational losses may not have been well-quantified at this point (although the U.S. Department of Health puts the annual costs of asthma at \$16 billion), their significance cannot be underestimated.

Air pollution also has environmental justice (EJ) components (for more on EJ, see essays in 6/30/05 and 7/28/05 issues). African American and Hispanic communities are disproportionately harmed by poor air quality and pollutants from coal power

plants. Recent data, taken in 2002, suggests that 71 percent of African Americans and 71 percent of Latinos (as compared to 58 percent of whites) live in U.S. counties that violate federal air quality standards. Additionally, people of color bear an undue burden due to coal as well. Whereas only 56 percent of whites live within 30 miles of a coal-fired power plant (the distance considered the zone of greatest detrimental health impact), 68 percent of African Americans live in these zones. Meanwhile, the two coal-fired plants within Chicago are both in the majority Hispanic communities of Pilsen and Little Village (over 95 percent Latino) (*Air of Injustice I & II*).

Not surprisingly then, people of color exhibit unequal health impacts. According to the American Lung Association, Non-Hispanic blacks have asthma death rates 200 percent higher (Hispanics 15 percent higher) than non-Hispanic whites. And again, despite sensationalizing and stigmatizing news stories which regularly highlight the excessive presence of violence in the inner city, power plant emissions are killing 37 percent more people than homicide in the Metropolitan Chicago area (*Asthma Plan*). Certainly, if the press reported this statistic as regularly as they do a shooting or a stabbing, there is no question in my mind that the air quality in Chicago would have improved dramatically by now.

Sadly, the pollution from coal power plants need not be as damaging as it is. Technologies exist to greatly reduce the emissions from the coal power plants in the United States. Many of the active plants in 2006 were built before 1977 when the New Source Review (NSR) regime was incorporated as part of that year's Clean Air Act. The NSR required that the best available pollution control technologies be incorporated in all future power plants. But since many "old" power plants were built before the Act was passed, they need not abide by modern emission standards. It is a loophole that has long since outlived any purpose it may have had. And since the costs of incorporating these technologies dwarfs the profits made by the companies involved, it seems absolutely absurd that we, the people that have to breathe these toxins, haven't yet forced the government to require the adoption of them. It also reflects very poorly on our elected officials and their overly-strong ties to industry (rather than their constituents).

Let's now move to the policy arena where there has been a lot going on lately, particularly in Illinois. Most initiatives have focused on reducing mercury and NOX & SOX. However, these two emission forms (i.e., heavy metal and gases) get treated separately largely because the cleaning technologies that exist are specific to particular pollutants. For example, a fabric filter or sorbent injection is best suited to reduce mercury, while selective catalytic removal (SCR) is well-suited to take out NO_x, and sulfur-scrubbers and various coal cleansing techniques can tackle SO₂. There is no question that we have the technologies available to reduce the emissions of coal-fired power plants by 90 percent or more. Considering the existence of these technologies, it can be said that the "old," pre-1977 power plants which dot the landscape of the U.S. pollute up to 10 times more material (per energy unit produced) than modernized and retrofitted coal power plants would. It is time to demand that all coal plants modernize (or shut down and let cleaner energy forms, such as wind and solar flourish in their absence) (*Illinois' Dirty Power Plants*).

Laws control pollutants in different ways. Some chemicals are banned (such as lead in gasoline). Others are reduced in concentration or amount of effluent rather than banned. Sulfur dioxide emissions have been reduced this way, under a system known as "cap and trade." Cap and trade

regulations put limits on overall emissions of a pollutant (the "cap") but allow polluters to "trade" (i.e., sell) pollution credits (which they have received for reducing their emissions amounts) to other polluters who, having purchased these "extra" credits, may increase their emission of a particular pollutant. In this way, the total emission of a pollutant will be reduced but this regime of trading doesn't handle "where" these reductions occur. That is, under the "cap and trade" paradigm, some areas may actually see increases in pollutants despite the law's intentions. This is exactly what has happened. From 1995 to 2000, 60 percent of the 500 power plants increased their SO₂ emissions and 53 percent increased their NO₂ emissions (*Darkening Skies*) despite overall reductions in these gases. Obviously, the majority of communities have gotten more polluted with "cap and trade" policies—a clear violation of environmental justice protections. Something more effective must be incorporated to protect our health.

So how has the U.S. government sought to control coal power plant pollutants in the past and what is on tap for the future? Regarding mercury, practically nothing has been done in the past to rid the sky, the ground, the surface water or ground water of this toxic substance. The Bush Administration has tried to treat mercury under the "cap and trade" regime. As this is inadequate to protect all communities, it is suggested that we require all plants to reduce their emissions. This is exactly what some states have begun to mandate. Minnesota is the latest to do so. A law there, that the governor just signed last week, calls for a 90 percent reduction in mercury emissions at its three largest coal power plants in the next 3 to 9 years. The technologies necessary to reduce mercury are relatively cheap (\$1-2 million per plant). And the relative cheapness of removing mercury, along with the fact that nearly everyone in society is harmed by mercury, especially those of us that eat the fish that have absorbed this emitted mercury, it is a pollutant given high priority and attention. Illinois Governor Blagojevich has been pressing for a strong mercury bill for the past year or so. Blagojevich's efforts lead to a piece of legislation that has been presented to the state legislature which calls for the 90 percent reduction of mercury emissions in **all** coal power plants by 2012; note: the bolding of the "all" represents a clear rejection of the adequacy of the "cap and trade" paradigm. This may seem like an amazing change especially considering that there have been no regulations on mercury emissions before. However, it is very reachable economically and it should be done on the grounds of environmental health anyway.

However, reducing mercury emissions will not reduce NO_x or SO₂ emissions. In terms of damaging our lungs, hearts and general health, it is these gases (and the particulates that they become once they enter the atmosphere) that are the major culprits. Regulation of these gases (and many others) began with the 1970 Clean Air Act. And while the incentives provided in this act helped motivate industry to clean up somewhat, subsequent weakening of the Act and industry-favorable enforcement of the law leaves us with, more than 30 years later, serious air quality problems. In response to insufficient reductions, sulfur dioxide was targeted in the 1990 Clean Air Act. And, since 1995 (when the acid rain provisions of the Act went into effect), sulfur dioxide has been regulated under the "cap and trade" regime. As noted earlier, under this regime, most coal power plants saw increases in SO₂ emissions, and as such, this regulatory mode is inadequate. Unfortunately, under the Bush Administration's current CAIR (Clean Air Interstate Rule) program, NOX and SOX are going to continue to be regulated under the "cap and trade" system. And while

this system, if properly orchestrated and enforced, will reduce NOX and SOX levels in the long term, it still will not address the inequity issues raised earlier in terms of EJ considerations. Governor Blagojevich has proposed firmer NOX rules for Illinois than have been offered at the national level but, one again, "cap and trade" is the method being considered. We need to demand that the CAIR rules that are passed in IL adopt the same paradigm of protection (read, **all** rather than *some*) as the Governor has proposed for mercury. We must also demand that they eliminate as much of the NOX **and** SOX as is possible with modern technologies. To do otherwise is to continue trading our health from industry profits.

At a city level, the Chicago City council has been sitting on a Clean Power Ordinance for over four years now. The Ordinance which is in the process of being rewritten, in order to take into account the latest technological advancements, sets out to reduce NOX and SOX emissions at the city's two coal-fired power plants by ~65 percent over a given period. The new Ordinance plans to increase the reductions required to perhaps 90-95 percent, given that existing technologies are available to do so.

So where does all leave us? Residents of Illinois can contact their governor as well as their state representatives and tell them that we support a strong mercury bill for coal power plants as well as a strong NOX and SOX bill. The laws that will have greatest impact on human health and economic benefit are ones that will require significant reductions in the emissions of these pollutants on a timeline that is short (5 years maximum). Additionally, laws that do not rely on "cap and trade" regimes will protect all Illinois citizens, not just ones that live in affluent and powerful districts. (Governor Blagojevich can be reached by phone at 217-782-0244, (312) 814-2121 or (888) 261-3336. For information about your state representatives go to: <www.illinois.gov/government/>.) For those of you that live in or near Chicago (or visit it on occasion), contact Mayor Daley or any one of the 50 Alderman in the city; contact information for these politicians can be obtained at: <egov.cityofchicago.org>. Tell them that a strong Chicago Clean Power Ordinance is best for the city because too much pain and suffering is coming to its residents and visitors (and too many children are missing school and too many parents are missing work, as well). If you want to be more involved and/or just want to stay informed on this issue, please visit the Chicago Clean Power Coalition's website: <www.chicagocleanpower.org>

(something I helped develop during my recent sabbatical stint in the Windy City).

There is no better time than now to be involved in cleaning our air. Everywhere we look more and more people are getting on board. It is high time that we all contributed to protect our lungs and our children's and grandchildren's lungs and education. If you want to breathe clean air, what are you waiting for?

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(all works can be found in full text at www.chicagocleanpower.org)

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