

June 18, 2004

Study Questions Coal Generation Air Quality Link

By Don MacKinnon
President, Power Workers' Union

The provincial government recently reaffirmed its plan to close Ontario's coal-fired electricity generators. The stated rationale for shutting down these plants, which account for 25% of the capacity in the province, is that the air pollution must be reduced to protect public health.

The economic consequences of this proposal are huge, given that coal-fired generation is one of our lowest cost alternatives.

The only technology that can quickly replace these units (though not by 2007) is gas-fired generation. (While conservation initiatives and renewables can play a major role in reducing future consumption, they cannot offset the coal-fired capacity.)

Not long ago, there was a widespread belief that natural gas supplies were plentiful and that price increases would be moderate for the foreseeable future. Instead, natural gas prices have soared by 200% in the last five years and 30% in the past six weeks alone. Forecasts indicate high gas prices for many years to come.

Replacing coal-fired plants with gas will alone increase natural gas consumption in Ontario by 35% -- and drive up both gas and electricity rates.

It is clear that closing our coal-fired plants and vastly increasing reliance on a volatile fuel like natural gas will harm Ontario's economic competitiveness. Many of our key industries -- auto production, steel, paper, smelting, and petrochemicals -- depend on competitive energy prices to keep up with U.S. and international firms.

Higher electricity prices in Ontario favour our competitors in Ohio, Pennsylvania, Illinois, and Michigan who will continue to have access to lower cost coal-fired electricity. They will happily accept the new jobs that will come their way as Ontario prices itself out of many industrial markets with higher electricity costs.

That may be a price Ontarians are willing to pay for cleaner air. But to be able to make that judgment, the public needs some clear answers to key questions.

1. Will eliminating the coal plants significantly reduce air pollution and improve human health?

Coal plants account for a small minority of the smog-creating pollutants in Ontario, some 17% compared to 50% from U.S. sources.

In a recent study (attached), Dr. Ross McKittrick, an Associate Professor of Economics at the University of Guelph, addressed the issue of the health impacts of closing Ontario coal plants. Based on a careful review of the scientific evidence he concluded that power plants play a small role in Ontario air quality and have little impact on severe air quality episodes.

Contrary to the public perception, he found that the air quality in Ontario has improved significantly since the early 1970s and that the scientific basis for connecting air pollution at the levels experienced in Ontario with significant disease and mortality is slight.

The study states:

“Against this background it must be pointed out that coal provides a reliable, low-cost source of electricity to Ontario. At a time of constrained supply and rising prices, there is considerable social benefit to having this power generation capacity on-line.

These considerations lead to the conclusion that thermal power plants are a net benefit to society and shutting them down is not in the public interest.

...In light of the substantial economic costs of abandoning the coal component of Ontario's power supply, and the evidence that Ontario's coal-plant emissions are unlikely to be the threat to life and health that has been claimed, the Ontario government should put on hold the planned phase-out of the coal power plants by 2007, pending an exhaustive review of the real costs and benefits.”

2. Are there alternatives that will provide similar reductions in emissions at a lower cost to both residential and business consumers?

The technology for reducing emissions from coal-fired plants exists, ranging from the catalytic reduction abatement technology already installed on a few Ontario units to newer circulated fluidized bed combustor systems. The bottom line is that equipment could be installed in Ontario coal-fired plants to reduce sulphur dioxide (SO₂) and particulate emissions by over 99%, nitrogen oxide (NO_x) by over 90%, and mercury by 75-90%.

This technology can be installed on the existing units in Ontario within the same time span that gas plants can be constructed. Cleaner coal plants are already a major electricity source in progressive jurisdictions like Sweden and Denmark.

The cost differential between gas and cleaner coal is huge. A recent electricity price comparison study found that cleaner coal technology would increase prices by 3% while a shift to natural gas

for the same amount of electricity would increase prices by at least 20% to 25%, and potentially much more.

On recent visits to the United States, Premier McGuinty called for stricter controls on emissions from American coal-fired plants. This is a laudable objective, recognizing that more than half of the smog-creating pollutants in Ontario come from U.S. sources.

Notably, he did not call for the American plants to be closed, knowing that this would not be realistic.

The U.S. is hugely dependent on coal-fired electricity generation. It has hundreds of years' worth of coal supply, while North American gas supplies are measured in a few decades. Much of world gas reserves are in locations of political instability like the Middle East and Russia. For all these reasons, no U.S. administration is going to abandon coal-based electricity production.

What is the advantage, then, of closing Ontario coal plants while simultaneously arguing for controlling emissions on U.S. plants?

Rather than placing ourselves at a major economic disadvantage, we should make Ontario coal plants world showcases for cleaner coal technology. Then we would really have the high ground over the U.S. in pushing for reduced emissions and improved air quality.

The Power Workers' Union represents employees in generation plants of many types around Ontario. We support a policy of stable, affordable, balanced energy supply for Ontario, utilizing the existing base of coal, nuclear and hydro plants as well as gas, co-generation and renewable alternatives. The key is to have a real, fact-based dialogue about the appropriate mix, without pre-determined conclusions.

POWER PLANTS, AIR QUALITY AND HEALTH:

The Case for Re-examining Ontario's Coal Policy

EXECUTIVE SUMMARY

The economic consequences of closing the province's thermal power plants may be significant. Nevertheless, if the health consequences of operating those plants are even more severe, the province may decide it is the right tradeoff to make. But the decision should not be made before hearing all sides of the debate and undertaking a level of due diligence appropriate to such a costly and far-reaching investment decision. That due diligence includes close scrutiny of the statistical claims that have recently been made concerning the health consequences of coal power plant emissions. This report offers a brief critique of this aspect of the reasoning behind the decision to close the power plants. The following questions are addressed.

1. How has Ontario air quality changed in recent decades?
2. How do power generation plants affect Ontario's air quality?
3. What is the scientific basis for connecting air pollution with disease and mortality in Ontario?
4. What are the main sources of uncertainty in these studies?

The findings are as follows.

1. *Air quality in Ontario has improved substantially since the early 1970s.* Most types of air contaminants have been reduced over the past three decades. Recent progress has been lacking in some areas, such as ground-level ozone,

although even on that issue long-term progress has been made. Fine particulate matter has been recently identified as a specific potential threat to lung and cardiac health. Unfortunately long term data are not available, though total particulate levels show substantial reductions. The introduction of the smog alert system in the early 1990s may have created a perception that air quality is worse now than in earlier decades.

2. *Power plants play a small role in Ontario air quality, and have little impact on severe air quality episodes.*

The air contaminants usually associated with power plants were serious problems back in the 1960s and 1970s. Investments in pollution control and the switch to low-sulphur coal yielded substantial reductions in these pollution emissions. While the power generation sector continues to be a factor in general air pollution, the current focus is on improving pollution levels primarily associated with motor vehicle use, as well as pollutants entering Ontario from the US northeast. Acute air quality episodes in Ontario have been shown to be almost entirely unrelated to power production.

3. *The scientific basis for linking health to air pollution consists primarily of correlation studies that suggest a small increased risk of mortality and morbidity from air pollution episodes.*

Epidemiological studies have compared air quality readings with model-generated estimates of “excess” mortality and morbidity rates. While results vary across studies, some have found a positive correlation. These correlations are usually reported as “relative risk” ratios, which have been used in simulation models to infer what proportion of observed deaths can be attributed to contemporaneous air pollution levels. The most prominent simulation models in the Ontario debate were from the Ontario Medical Association and the Toronto Public Health Board.

4. *The air pollution–health link remains highly uncertain; strong evidence exists against it.*

Epidemiological studies have found evidence of both positive and negative correlations between pollution and health. The negative correlations are routinely explained away on the grounds that correlation is not the same as causality, yet the *positive* correlations are cited as evidence of causality. Such contradictory findings suggests that there may be problems of measurement and/or inadequate controls for confounding factors. The commonly-cited studies by the Toronto Public Health Board and the Ontario Medical Association can be shown to lack credibility. Laboratory studies on the medical effects of pollution conflict with the implied toxicity suggested by the epidemiological studies, suggesting that there are no significant toxicities even at concentrations of air pollution much higher than commonly experienced. This contradiction between epidemiological correlations and experimental results was noted by Health Canada in a recent science assessment. New, more comprehensive statistical procedures are showing the epidemiological results to be weaker than earlier thought. And claims that air pollution causes asthma have not been supported by medical research. Taken together these findings suggest that the disease and death rates attributable to levels of ambient air pollution in Ontario are smaller and less certain than has recently been asserted.

Against this background it must be pointed out that coal provides a reliable, low-cost source of electricity to Ontario. At a time of constrained supply and rising prices, there is considerable social benefit to having this power generation capacity on-line.

These considerations lead to the conclusion that thermal power plants are a net benefit to society, and shutting them down at this time is not in the public interest.

It must be emphasized that the economically-risky path of closing down a quarter of the province's generating capacity, or even talking as if it is going to be done shortly, is irresponsible, without first having undertaken extensive due diligence on all aspects of the decision, something which has not been done. In

light of the substantial economic costs of abandoning the coal component of Ontario's power supply, and the evidence that Ontario's coal-plant emissions are unlikely to be the threat to life and health that has been claimed, the Ontario government should put on hold the planned phase-out of the thermal power plants by 2007, pending an exhaustive review of the real costs and benefits.