ONTARIO CLEAN AIR ALLIANCE

www.cleanairalliance.org

AIR QUALITY ISSUES FACT SHEET **#6**

Selective Catalytic Reduction

▶ *OPG's plan promises more pollution*

On December 7, 2000 the governments of Canada and the United States signed the *Ozone Annex to the 1991 Canada-United States Air Quality Agreement*. The *Ozone Annex* requires fossil fuel power plants in southern Ontario to reduce their smog-causing nitrogen oxides emissions by approximately 50% by 2007.

The largest industrial source of nitrogen oxides emissions in Ontario are the five coal-fired power plants operated by Ontario Power Generation (OPG). OPG's Nanticoke plant on Lake Erie is the largest coal-fired power plant in North America and emits thousands of tonnes of nitrogen oxides each year.

In order to comply with the conditions of the newly signed Ozone Annex, OPG has announced that it will install selective catalytic reduction (SCR) units on four of its 16 coal-fired boiler units in southern Ontario, including two units at Nanticoke and two at its Lambton plant in Sarnia. Installation of SCRs will be extremely costly (OPG estimates it will cost $250 million) and largely ineffective in dealing with OPG's overall pollution problems – SCRs will not reduce emissions of any of the 30 pollutants released by OPG's coal plants other than nitrogen oxides.

SCRs can lead to increases in air pollution

Installation of SCRs would permit OPG to achieve compliance with the *Ozone Annex* while actually *increasing* its coal-fired electricity production and, therefore, its emissions of sulphur dioxide, mercury, carbon dioxide and five cancer-causing pollutants. According to OPG reports, OPG's coal-fired production and emissions of sulphur dioxide (smog and acid rain), mercury (potent nerve toxin), carbon dioxide (global warming and climate change) and five cancer-causing pollutants will *increase* by up to 26% between 1999 and 2012. A significant portion of the increased coal-fired electricity generated will be exported to the United States.

This means that after spending a quarter of a billion dollars, OPG will have reduced its smog-causing emissions of nitrogen oxides by just 25% while *increasing* its emissions of 29 other dangerous pollutants by up to 26%. Adding to the weakness of this plan is the fact that the SCRs themselves will actually add to OPG's pollution problems:

- the installation and operation of SCR units will require the use of anhydrous ammonia, an extremely hazardous substance. Ammonia is toxic if swallowed or inhaled and can irritate or burn the skin, eyes, nose or throat. Ammonia vapors may form an explosive mixture when mixed with air. A recent anhydrous ammonia spill in Alberta caused the evacuation of residents from a large surrounding area.
- ammonia that does not combine with nitrogen oxides in the SCR process leads to the creation and release of fine particulate matter – a serious health threat; and nitrous oxide – a powerful greenhouse gas; and can cause the acidification of soils and lakes.

How SCRs work

SCRs inject ammonia into the exhaust stream of coal plants. The ammonia molecules combine with nitrogen oxides emissions to form water and atmospheric nitrogen (a harmless gas). But in order to reduce nitrogen oxides emissions to levels that meet *Ozone Annex* standards, an excess amount of ammonia must be injected. This extra unused ammonia, called "slip", enters the atmosphere, leading to the formation of fine particulate matter and nitrous oxide.

The impact of releasing ammonia

Fine particulate matter

Ammonia slip discharged from SCRs combines with sulphur (also emitted by coal plants) to form fine particulate matter. Fine particulates, which lodge deeply in the lungs, have been linked to various health problems including asthma, lung disease and death. The Government of Canada has announced its intent to declare ammonia and fine particulate matter toxic substances under the *Canadian Environmental Protection Act*.

Federal Environment Minister David Anderson has stated that "Fine particulate matter in our air from industrial and transportation sources is responsible for 5,000 premature deaths per year, increased hospital visits and doctor visits. To effectively reduce the levels of particulate matter in the air we breathe, we must reduce the emissions of the chemical substances that pollute our air."

Acidification

Ammonia contributes to the acidification of soils and lakes.

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Climate Change and Ozone Layer Depletion
Ammonia emissions that land on soils are converted by soil microbes into nitrous oxide (N_2O), which is both a powerful greenhouse gas and a stratospheric ozone destroyer. The global warming potential of nitrous oxide is 320-times greater than that of carbon dioxide.

An environmentally responsible alternative to SCRs

Switching from coal to cleaner-burning natural gas for electricity generation is a cost-effective and comprehensive pollution prevention option for achieving compliance with the Ozone Annex and protecting public health and the environment. (See OCAA Air Quality Issues Fact Sheet #2 for more on converting coal plants to gas.) Replacing OPG's coal boilers with high-efficiency natural gas combined-cycle turbines would dramatically reduce or eliminate all of OPG's more than 30 harmful emissions, not just nitrogen oxides.

- sulphur dioxide emissions would be virtually eliminated
- emissions of nitrogen oxides would be reduced by more than 90%
- carbon dioxide emissions would be reduced by more than 60%
- mercury releases would be completely eliminated
- releases of cancer-causing substances would be completely eliminated
- emissions of heavy metals would be completely eliminated

OPG could also expand its pollution-free Sir Adam Beck Generating Station at Niagara Falls.

What you can do

Write to federal Environment Minister David Anderson and support the OCAA's request for a joint federal-provincial environmental assessment of Ontario Power Generation's selective catalytic reduction (SCR) proposal. Also write to Ontario Environment Minister Elizabeth Witmer and urge her to endorse a joint assessment of the proposal as well.

For Minister Anderson, you can note that he himself has identified fine particulate matter as a serious health and environmental problem and point out that the use of SCRs to reduce nitrogen oxides is a poor solution to our air-quality problems. You could also note that OPG's proposal to use SCRs to reduce nitrogen oxides levels recognizes only the letter and not the spirit of our international air-quality agreements, including the Ozone Annex. You can conclude by noting that OPG's proposed project will result in significant adverse public health and environmental impacts that should be carefully considered by a review panel.

For Minister Witmer, you can urge her to hold an assessment with full public hearings and you can remind her of the provincial government's repeated commitments to improve Ontario's air quality. Point out that OPG's proposal is extremely costly and will create more air-quality problems than it solves.

Write to:

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For more information

For more information on air-quality issues, the impact of coal power on our environment and our health and what you can do to promote better air quality in Ontario, please visit our website at: www.cleanairalliance.org or e-mail us at: info@cleanairalliance.org.

Other fact sheets available from the Ontario Clean Air Alliance:

#1 Going Green: A Consumers Guide to Choosing Cleaner Electricity
#2 Coal Must Go: Converting Ontario's Coal Plants to Natural Gas
#3 Emissions Trading: Pollution Control or Pollution Increases?
#4 Get Your Home Running at Peak Performance: Call in the Experts!
#5 Nanticoke: Canada's #1 Polluter
#7 Lambton Generating Station: Ontario's #2 Polluter

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