

Ontario At The Brink: A Government In The Dark

Implementation of Coal Emissions Reductions

EBR Registry Number: 0103530

Prepared by: Grant Church

Grant Church
3 Mohawk St. E., Box 842
Cayuga, Ontario
N0A 1E0
905-772-0677
churchg@sympatico.ca

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Honourable Premier and Members of the Government,

Executive Summary

Your coal closure plan was conceived in haste and without regard for the facts or the consequences of the action. Emission controls were available in 2003, and were in fact being installed when you came to power that deal effectively with hazardous air pollutants including smog and mercury. Your plan has been to largely replace coal with natural gas, as it takes a fossil fuel to provide the characteristics needed to operate the grid. You have ignored the advice of experts and citizens who have made clear the folly of your plan.

Minister Duncan said on Focus Ontario, "...if somebody can develop the technology that removes the mercury and removes the particulate, then our government or some future government will have to be compelled to look at it again." Even as he spoke, the technology was available, and in fact was operating at Lambton Generating Station. The addition of wet electrostatic precipitators will further reduce particulate emissions to that of natural gas.

When Donna Cansfield was minister of energy, she said, "Nanticoke burns a dirtier type of coal." It was the complete opposite. Because Nanticoke changed to a cleaner grade of coal, it was able to reduce its sulphur dioxide emission rate to one fifth of what it use to be, and together with the coal and new low NOx burners and SCRs the nitrous oxide rate was cut to one third of what it was. With these two pollutants, today's technology can cut the emission rate for NOx to that of natural gas and to nearly the rate for SO₂, less than 10 ppm.

The use of natural gas to make electricity to reduce CO₂ is an expensive half measure. If liquified natural gas is used, there is no benefit. What's the hurry? Technology is developing rapidly. It serves no benefit to this province to end the use of coal by replacing it with natural gas. If we don't burn the coal, China will buy it—and they are—and burn it, negating any benefit of your minimal gains by using natural gas.

Your coal closure plan is so much political spin, and it is not unlike the WWII battle Operation Market Garden, where **intelligence was ignored** and a paratroop division was deployed far behind enemy lines against a German armoured division. It was a needless disaster, as your plan will bring.

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Environmental Impact of the Ontario Coal Plants Overstated

The government has often insinuated that the Ontario coal plants are the sole source of smog in the province. It's implied in this paragraph that the coal plants are the only source of smog and \$9.6 billion in health and environmental costs, when in fact, they are only responsible for 7% of it. This begs the question: "Where is the other 93% coming from?" There's no mention of the fact that the smog components can be reduced to that of natural gas, and no mention that using gas as a fuel source causes global warming.

"Coal-fired plants create pollution that affects the quality of the air we breathe and contributes to global warming. According to a study produced for the Ontario government, **smog costs about \$9.6 billion each year in health care and environmental damage.** The Ontario government is planning to replace all coal-fired plants by 2009 with cleaner sources of electricity." (Our Energy, Our Future, Ministry of Energy)

The DSS Coal Cost Benefit Study indicated that with the other options (including cleaned up coal plants) than the status quo, the improvement in air quality would be minimal, because of other sources of pollution.

"Overall, closing down the CFG facilities is forecast to improve air quality in most parts of southern Ontario. In general, the other three scenarios result in quite large percent reductions in the ambient pollutant concentrations linked to emissions produced with Scenario 1 (Base Case). **However, these improvements are small compared to the overall ambient concentrations of these pollutants.** The ambient concentrations of these pollutants are influenced by various sources including transboundary air pollution and vehicle emissions." (DSS Coal Cost Benefit Study)

Haldimand Norfolk is the worst effected area by the Ontario coal plants. I live directly downwind from Nanticoke and the air is clear. There has been the rare instance when I have smelled coal smoke. It was faint and only for a few minutes. It was nothing compared to Hamilton, where at times I've found it difficult to breathe. Friends of mine like to come out to Haldimand because of the clean air.

A good example of the minimal impact of the coal plants on any given area was Lakeview Generating Station. In it's final years, it was serving as a peaking station. When it closed in April 2005, the Toronto area went on to have it's worst smog year ever. According to the DSS Coal Cost Benefit Study, the remaining coal plants only account for about 1% of Toronto's pollution.

Lakeview was considered to be the largest source of pollution in the GTA. It may have been the largest single source but not the largest source. Transportation is a far greater source. In November 2005 on a trip to Toronto from Cayuga, the sky was clear until I got to Toronto, which had a brown cloud hanging over the downtown. It would be the same case if the remaining coal plants closed.

Jack Gibbons of the Ontario Clean Air Alliance, who has long advocated replacing coal with natural gas, made it clear that the end of coal will make little difference.

“While he called the planned cut in emissions "a fantastic step forward," **Gibbons warned Ontarians won't notice much of a difference in overall air quality.** "There's going to be less pollution but pollution is still increasing from other sources, like cars," he said. "We'll still have smog days."” (Toronto Star, Coal Plants Ordered To Reduce Emissions, May 17, 2008)

Effectiveness of Emission Controls Underrated

The government has never wanted to listen to those who advocate emission controls and the continued use of coal, which is a very low cost fuel. Minister Duncan has said that clean coal technology is an oxymoron. Past governments have allowed emission controls to be installed, but this government denies that they exist. You want us to be proud that we are the only jurisdiction eliminating the use of coal, while our competitors continue to use low priced electricity produced with coal.

“Before I address the six specific questions you have posed, I want to reiterate what I have said in previous correspondence regarding clean coal technology alternatives. We are not prepared to take half measures when it comes to cleaning up Ontario's air. Emissions controls are a high cost, partial solution that does not address critical greenhouse gas causing emissions and other harmful emissions such as mercury.” (Letter From Dwight Duncan, August 12, 2005)

A technology that removes 90% of an emission is not a half measure. Using natural gas to make electricity to reduce CO₂ is a half measure, as CO₂ is reduced by approximately 50% at point of combustion. It is also far more expensive to use natural gas as a fuel source. Gas-produced electricity is about three times as expensive. Also, without coal we lose the profits that provide for the price offsetting Global Adjustment. A multi-pollutant control system costs between \$225 and \$300 per installed kilowatt.

Setting up for biomass co-firing is a relatively inexpensive way of reducing CO₂. It is also beneficial to other Ontario industries. Materials that otherwise would have been burned or placed in landfills could be utilized for electricity production.

By the time of the 2007 election, you were still understating the effectiveness of emission controls, even to the point of misquoting OPA documentation. Mr Tory's numbers reflect the reality.

“Tory Myth: Today in a press release Tory said that scrubbers are "proven to reduce sulfur dioxide, nitrogen oxides and mercury emissions by approximately 90%".

Fact: The Ontario Power Authority's detailed calculations on pollution reduction show that even the most expensive scrubbers on Nanticoke will only reduce sulphur dioxide by 34%, nitrogen oxide by 23% and mercury by 24%. (OPA Emission Control Alternatives for Ontario Coal Generators, April 2007, page 7.)”
(Ben Chin, Liberal News Release, September 13, 2007)

The latest scrubbers reduce SO₂ by over 99%, and the latest SCR's reduce NO_x by up to 93%. Mercury can be reduced by 95% or higher with a range of equipment. Other metals are removed by over 99% when a wet electrostatic precipitator is employed. New low NO_x burners are reducing NO_x by over 50%.

This passage demonstrates what we are achieving today in this province at Lambton Generating Station. It is very much at odds with what you have been saying.

“Burners: High-efficiency burners were installed on all four units between 1994 and 2002 to help maximize combustion efficiency and reduce the production of nitrogen oxides by 35%. There are forty-eight burners located on six elevations for each unit.

Flue Gas Desulphurization Units (FGD) (Units 3 and 4): This equipment sprays a fine mist of water and limestone into the gas stream to capture about 93 percent of the sulphur dioxide emissions. The reaction converts the wet limestone and the captured sulphur dioxide into gypsum, which is collected and sold for wallboard manufacturing. The limestone is fully saturated with water (limestone slurry) when it leaves the scrubber. The flue gas, which comes in contact with the limestone slurry, is cooled to about 55 degrees Celsius and is saturated with water. This creates Lambton's characteristic white stack plume.

The combination of precipitators, scrubbers and SCR captures up to 95% of the mercury in the flue gas.

Selective Catalytic Reduction Units (SCR) (Units 3 and 4): This recently installed technology works similar to a catalytic converter on a car's exhaust system. Passing over a series of special metal sheets, oxides of nitrogen in the flue gas react with injected ammonia converting over 80% into nitrogen and water.”

(Neighbours, Lambton Generating Station, Spring 2006)

Stéphane Dion, the federal Liberal leader and former environment minister, has promoted solving greenhouse gas problems with technology, even developing the technology and exporting it to the world.

Al Gore in his documentary, *An Inconvenient Truth*, never mentioned closing down coal plants, but he did point to carbon capture and said, “Watch this one.”

Sandra Pupatello, Ontario Minister of Economic Development and Trade, visited Canada's first supercritical boiler coal plant, Genesee 3, and was impressed. This plant has 24% lower CO₂ emissions than the plant it replaced.

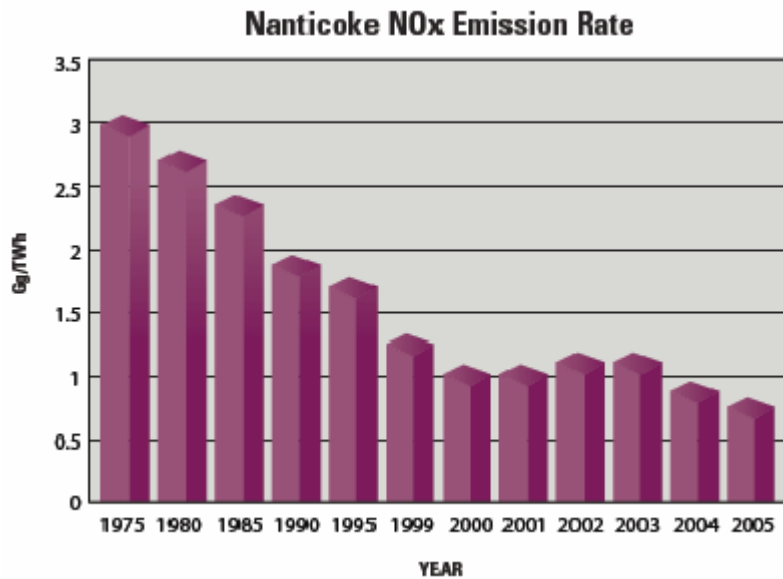
Germany is not closing its coal plants. They are building more efficient ones while maximizing renewable energy. They produce 6% of their power with wind. The newest coal unit at the Niederaussem plant has a thermal efficiency of 43%, as opposed to older units with 31%-36% resulting in sharply lower CO₂ emissions. They also make extensive use of co-firing biomass with the coal. Almost every coal unit has the SCR sulphur scrubber combination. To further optimize the removal of mercury, they add chloride to the coal.

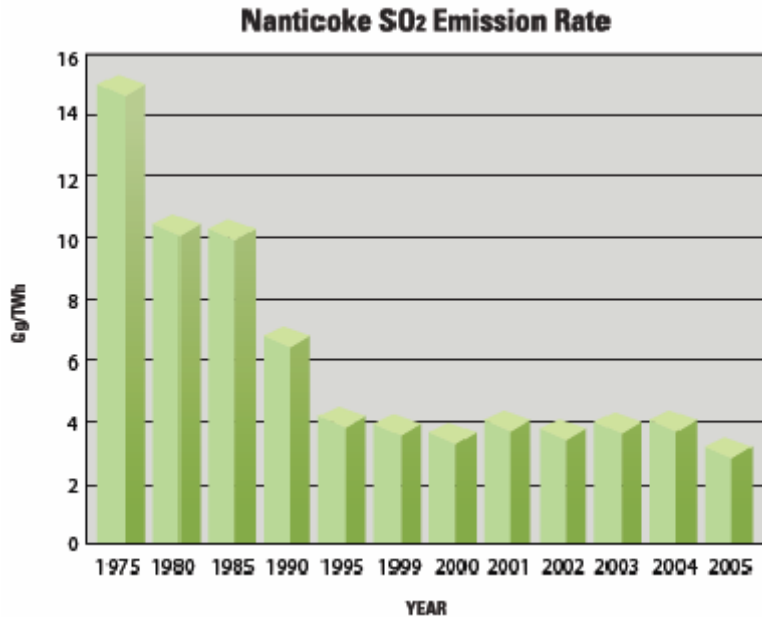
In North Dakota, a U.S. Department of Energy-funded coal drying system, which utilizes the surplus heat from the coal plant to dry it before burning it, was so successful the company is deploying it on the entire plant. Lignite coal used at this plant can have up to 40% moisture. Once the water is removed, it takes less coal to produce the same amount of power resulting in lower emissions. Atikokan could readily benefit from this technology, as it uses Lignite.

A company called CO₂ Solution has perfected a concept developed at the University of Laval that uses a biological catalyst to isolate the CO₂ and immobilize it in an inert solid. It has been successfully field tested at a garbage incinerator.

One of the most exciting technologies being developed employs algae to absorb CO₂. It is then used to make biofuels. (See Green Dreams in the October 2007 issue of National Geographic and www.greenfuelonline.com/press.html)

These graphs show the large reductions in the Nanticoke Generating Station emission rates. This is an achievement we can be proud of.





Economic Impact of Electricity Plan Not Considered

As I drove through North Western Ontario in June 2006, the newscaster started with, “Another day, another plant closing.” This could have been repeated dozens of times since then, as dozens of plants have closed and tens of thousands of people have lost their jobs.

“Ramesh Ramachandran, president of Dow Chemical Canada Inc., delivered a stinging warning to a natural gas conference in Calgary yesterday, saying high prices are wreaking permanent damage on the petrochemical industry.

And in an allusion to the title of the conference -- Walking the Tightrope, Supply and Demand in Delicate Balance -- the petrochemical executive said his company will not engage in any acrobatics to remain in North America, but will simply shift operations to less costly areas. "Tightrope walking is an act that belongs in circuses." (Globe and Mail March 9, 2005)

“Dow Chemical Co. is shutting down all its production at its operations in Sarnia, Ont., and closing two plants in Fort Saskatchewan, Alta.” (CBC News August 31, 2006)

Weyerhaeuser

“The second piece of the equation is power. I’m going to say, a little bit later, that this is one of the areas we would like you to consider to assist the industry. What

we've seen, from a power perspective, **since deregulation is a 36% increase in power costs.** That's what our electrical bill is. That 36% is outstanding enough when you hear that number, but I tell you that our electrical bill is \$20 million per year, so it's a very significant input into our business. . . .

The next major area of input is energy costs. I can make pretty well the same statement around energy. We operate right across North America. When we chart our energy costs in our mills, with the five states and four provinces we conduct business in with pulp and paper operations, the end of the cost curve that we come out on is the absolute wrong end. **We are the highest-cost jurisdiction from an energy perspective. . . .**

The third recommendation is to deal with the energy piece. We would ask for two things there. We would ask the government to impose a revenue cap until there truly is a competitive market in Ontario from an energy perspective. We're talking about a revenue cap. The second piece around energy is that **we would ask that the move to close down the lower-cost facilities be looked at again and put on hold until there are viable low-cost energy-producing alternatives. . . .**"
(Standing Committee on Finance and Economic Affairs, 25 January, 2006)

In the fall session of the legislature, it was mentioned by Howard Hampton that Inco was moving its copper smelting operations from Sudbury to Montreal, because the electricity is much cheaper there.

Ontario has the highest price for industrial power in Canada, according to a Hydro Quebec study.

CIBC World Markets estimated the commodity portion of the bill would rise 60-70% to 8 cents/kwh.

In November 2005, after the hurricanes knocked out oil and gas production in the Gulf of Mexico, the Ontario gas generators were asking 14cents/kwh; by December, Lennox was asking 19cents/kwh.

Coal sets the price about 56% of the time. With its removal, gas would be setting it about 85% (according to Union Gas) of the time insuring that the price of power would be sky high. Factor in the \$60 billion OPA plan and it's obvious that it will be much more expensive than what they say.

The government's electricity plan will cause a sharp price rise, but the Ontario Power Authority is severely underestimating the impact.

"Under the plan the real cost-to-customer increases are expected to be in the order of 15% to 20%, although Ontarians who aggressively conserve will likely see a decrease in their real costs." (OPA)

After reading the appropriate section of the IPSP and doing my own calculations, I found the increase to be 36% by 2015, the year after coal is to end. If the CIBC World Markets projection is inserted, the increase would be 46%. CIBC was accurate in their prediction that oil would rise to \$100. As oil rises, so will natural gas. They also predicted natural gas would be \$12-14/MMBtu by 2014. For 9 of the next 12 months, futures contracts are more than \$12, with four of those being over \$13.

The current gas prices are significantly higher than what the OPA used and double what was anticipated in the DSS coal cost benefit study.

It is clear that we are being priced out of the market, and that by closing the coal plants and replacing them with very expensive alternatives, the economy will be devastated.

Further, how is it Premier McGuinty that you came to Hamilton and offered Dofasco money to replace natural gas with coal to make them more competitive, while on the other hand, you are replacing coal with natural gas, which will make all Ontario industry less competitive?

Seclusion of the Use of Natural Gas to Make Electricity

In the fall throne speech, the Lieutenant Governor said, “Your government will replace coal, double renewables, double conservation and modernize our nuclear capacity.”

In the September 1, 2007 episode of Focus Ontario, Dwight Duncan, the then minister of energy, said that the Liberal government would double renewables and double conservation.

In an August 29, 2007 letter, Premier McGuinty states, “Our plan to replace coal-fired generation will help Ontario reduce greenhouse gas emissions by up to 30 megatonnes.”

At no time was it mentioned that the government was planning to more than double gas-fired generating capacity by adding a further 7,000MW or to almost triple production from gas to 30TWH, which can be found in OPA documentation. Any shortfall in conservation, renewables, or nuclear would be met with gas-fired power plants, increasing CO₂.

The government is virtually replacing coal MW for MW and TWH for TWH with gas-fired power plants, and there is not a word about it from these three sources.

Why are you hiding this? Why are you not being up-front and open? Is it because of the expense of gas-produced electricity or the reality that greenhouse gas emissions will not be cut by 30 megatonnes?

The average CO₂ output from the Ontario coal plants from 2003 to 2006 has been 27.396 megatonnes, with 2006 coming in at 24.650 megatonnes, which is less than it was in 1990 (24.720

megatonnes). Anybody can take a year of their choosing to make the numbers to their advantage. Power demand fluctuates from year to year, so I've taken an average for integrity purposes. There is no 30 megatonne reduction because there isn't that much to begin with. Also, the balance of coal CO₂ reduction would be about half, and non-existent when the life cycle emissions and the use of LNG are considered. Just co-fire the coal with biomass, and we'll have a reduction in CO₂ at a fraction of the cost, not to mention the inevitable development of a suitable technology to reduce CO₂ further.

Conclusion

Electricity impacts every aspect of our life and work in Ontario. Every product and service utilizes electricity, so the impact of higher energy costs has a compound and domino effect. Our price is already higher than many other jurisdictions, and any further rise will bring serious economic damage to the citizens and industry of this province. Ontario had anemic economic growth last year and is expected to be almost last this year. Your electricity plan would condemn us to a perpetual last place finish.

I implore you for the sake of the well being of the people of this province, especially the poor, to keep the coal plants open and clean them up. We have a high dollar, high taxes, high wages, and the highest industrial price for electricity in the country; don't make it worse.

Sincerely,

Grant Church

Table 14: Range of Unit Cost Estimates (\$/MWh)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Upper	103	104	109	110	112	115	116	121	122	123	125	128	129	126	124	123	124	124	126	127
Lower	85	87	89	90	93	96	96	101	102	102	102	103	105	99	97	96	97	97	98	98
Median	93	94	97	98	100	102	103	108	109	110	110	112	113	108	107	106	106	106	107	108

Source: OPA

Q. What is the cost to customer for the Plan period?

A. Table 15 below provides the cost per MWh for each cost category of the cost to customer model for the range of estimates. As illustrated in Table 15, the Debt Retirement Charge is assumed to no longer be a cost to customers as the stranded debt is estimated to be eliminated by 2021.

Table 15: Contribution to Unit Costs (2007 \$/MWh)

	UNIT RATES (\$2007/MWh)								
	2003	2004	2005	2006	2010	2015	2020	2025	
MEDIAN									
Conservation (*)					\$3.29	\$3.90	\$2.65	\$2.20	
Transmission	\$9.27	\$8.93	\$8.87	\$8.87	\$8.72	\$9.43	\$10.63	\$9.95	
Wholesale & net settlement	\$5.47	\$5.57	\$6.85	\$5.28	\$4.34	\$4.48	\$4.53	\$4.44	
Debt Retirement Charge	\$7.43	\$7.28	\$7.14	\$7.00	\$6.47	\$5.86	\$5.31	\$0.00	
Distribution	\$16.70	\$16.00	\$16.08	\$18.57	\$20.43	\$22.84	\$23.31	\$23.22	
Generation	\$47.99	\$46.17	\$57.76	\$48.42	\$53.52	\$61.80	\$66.63	\$65.95	
UPPER BOUND									
Conservation					\$3.62	\$4.29	\$2.91	\$2.42	
Transmission					\$9.59	\$10.37	\$11.69	\$10.94	
Wholesale					\$4.34	\$4.48	\$4.53	\$4.44	
Debt Retirement Charge					\$6.47	\$5.86	\$5.31	\$0.00	
Distribution					\$21.26	\$24.97	\$26.80	\$28.05	
Generation					\$63.94	\$71.14	\$78.20	\$78.22	
LOWER BOUND									
Conservation					\$2.96	\$3.51	\$2.38	\$1.98	
Transmission					\$7.85	\$8.48	\$9.57	\$8.95	
Wholesale					\$4.34	\$4.48	\$4.53	\$4.44	
Debt Retirement Charge					\$6.86	\$6.22	\$5.63	\$0.00	
Distribution					\$20.43	\$22.84	\$23.31	\$23.22	
Generation					\$46.93	\$55.81	\$59.15	\$58.00	
* Historically, conservation costs are included in the Distribution costs									
Total Cost to Customer - Lower					\$89	13% \$101	\$105	9% \$97	
Total Cost to Customer - MEDIAN		\$87	\$84	\$97	\$88	\$97	21% \$108	\$113	19% \$106
Total Cost to Customer - UPPER					\$109	36% \$121	\$129	37% \$124	

Source: OPA

* Conservation costs prior to 2007 are included within Distribution costs

BASE 2003-2006 \$89/MWh
 CIBC PROTECTION OF \$80/MWH FOR GENERATION COST FACTORED IN
 FOR 2015 IF COAL IS PHASED OUT
 MEDIAN: \$126.51 42%
 UPPER: \$129.97 46%

Major North American Cities

Average Prices for Large-Power Customers¹
(in ¢/kWh)²



1) For a monthly consumption of 3,060,000 kWh and a power demand of 5,000 kW; rates in effect April 1, 2007.
2) In Canadian dollars.