

ENVIRONMENTAL REVIEW TRIBUNAL

IN THE MATTER OF appeals by D&C Vander Zaag Farms Ltd. Conserve Our Rural Environment Dennis Sanford, Roselyn Bovaird, John Maguire, and Kathleen Kurtin on June 25, 2013 for a Hearing before the Environmental Review Tribunal pursuant to section 142.1 of the *Environmental Protection Act*, R.S.O. 1990, c. E.19 (“EPA”), as amended, with respect to Renewable Energy Approval Number 5460-98BPH8 (“REA”) issued by the Director, Ministry of the Environment, on June 10, 2013 to Dufferin Wind Power Inc. under section 47.5 of the EPA, regarding the construction, installation, operation, use and retiring of a Class 4 wind facility with a total name plate capacity of 99.1 megawatts at a location described in the REA as Dufferin Wind Power Project, Various Properties SWTS as in MEL3218, Lot 270, Concession 1, in the Township of Melancthon, County of Dufferin, Ontario.

AFFIDAVIT OF ROSS MCKITRICK

(Sworn on _____, 2013)

1. I, Ross McKitrick, of the City of Guelph, Province of Ontario, MAKE OATH AND SAY:
2. I have been engaged as an expert witness in the above-noted appeal. I therefore have knowledge of the matters to which I herein depose, save and except where I have been advised of the same, in which case I believe such information to be true.

Experience and Qualifications

1. I am a Full Professor of Environmental Economics at the University of Guelph and holder of the College of Management and Economics Fellowship in Sustainable Commerce. I have a Ph.D. in Economics (1996) from the University of British Columbia. I am author of the advanced text *Economic Analysis of Environmental Policy* published by the University of Toronto Press (2010). I am author or coauthor of 40 peer-reviewed journal articles on economics, environmental policy, climate change, air pollution and related topics, as well as dozens of book chapters, technical reports and other articles. My research has been published across the

economics and physical science disciplines, including in journals such as Journal of Environmental Economics and Management, Energy Economics, Proceedings of the National Academy of Sciences, Journal of the Royal Statistical Society, Journal of Geophysical Research and Climatic Change. I teach environmental economics at the undergraduate and graduate levels. Attached and marked as **Exhibit “A”** is a copy of my Curriculum Vitae.

2. My evidence will focus on the contents of a report I authored published in 2013 by the Fraser Institute Centre for Energy and Natural Resource Studies, of which I am a Senior Fellow, entitled “*Environmental and Economic Consequences of Ontario’s Green Energy Act*”, a copy of which is attached and marked as **Exhibit “B”**. I draw from it in a number of places, as well as from other publications of mine on related matters.

Comments on Wind Turbines as an “Essential” Response to the Threats of Air Pollution and Climate Change

3. The 2005 CBA to which the province repeatedly refers showed that shutting down Lambton and Nanticoke would have unmeasurably small effects on air quality in Southern Ontario (e.g. 8/100s of 1% of average daily ozone levels), and effectively equivalent reductions in smog-related air contaminants could have been obtained merely by completing the retrofit then underway on the power plant units.

Source: Fraser Report pages 6-7, drawing on DSS (2005) results

4. In the four decades preceding the introduction of the GEA, Ontario air quality had already improved considerably, and the underlying trends were all in the direction of continued improvement. There was no indication that Ontario air quality was deteriorating or in need of a costly change in policy direction. In the year prior to the introduction of the GEA, none of the 40 air quality monitoring stations in Ontario reported even a single violation of provincial standards for NO₂, CO₂, SO₂ or fine particulates (PM_{2.5}).

Source: Fraser Report pages 3—6, drawing on Ontario MOE and Environment Canada data.

5. The 2005 CBA did not recommend or even discuss reliance on wind energy, instead it only considered coal plant retrofits, nuclear and gas-fired generation options.

6. In 2011 (the most recent year for which data are available), Ontario's coal fired power plants emitted 475 tonnes of Total Particulate Matter (TPM). For comparison, commercial meat plants emitted 1,878 tonnes, residential wood fireplaces emitted 24,079 tons, agricultural tilling emitted 102,909 tonnes and dust from unpaved roads emitted 1,928,529 tonnes. TPM emissions from Ontario's coal-fired power plants could be offset ten times over by paving 2/10 of 1% of Ontario's dirt road surfaces. It makes no sense for the Province to argue that the TPM fraction coming from coal-based power plants is an urgent issue necessitating the proliferation of IWT's at any cost.

*Source: Environment Canada National Pollutant Release Inventory (NPRI) data base a copy of which is attached and marked as **Exhibit "C"**.*

7. Furthermore, wind turbine installations do not displace fossil fuel-based generation, instead they necessitate installation of more fossil generation capacity in the form of natural gas backup generators. If all the IWT's are eventually installed that the Province intends, the surplus baseload generating capacity will likely destabilize the Ontario electricity system and force the taking offline of a nuclear power plant, to be replaced by a combination of wind and gas generation. Consequently, the Provincial strategy is leading towards an eventual increase in the pollution and greenhouse gas emissions associated with the Ontario baseload generating capacity.

Source: Fraser Report pages 6, 7—8, drawing on information from the IESO, Auditor-General and others.

8. The cost of purchasing carbon offsets for the Lambton and Nanticoke plants at \$15 per tonne to cover their operating levels circa 2002 (substantially higher than present) was factored into the 2005 CBA. Taking those costs at face value, along with the alleged health costs of power plant emissions and the retrofit costs, yielded estimated costs of \$817 million annually (in 2010 dollars) to continue using the existing coal plants while achieving all the environmental benefits supposedly to be achieved under the GEA, with no upward pressure on household electricity prices. By contrast, the Ontario Clean Energy Benefit provides only partial compensation to Ontario households for the additional costs imposed by that Act, and it alone costs the Treasury \$1.1 billion annually. Adding in other costs, including cost-of-living increases due to commercial electricity price hikes, increases to the Global Adjustment, increased cost of grid expansion to accommodate renewables, and other, I estimate the current cost of GEA-related policies to be at least 5 times larger than the retrofit option would have been. Since measures proposed to date only yields one-tenth of the power obtained from Lambton and Nanticoke, if the Province actually attempts to hit its targets for full deployment of wind energy, the costs of a GEA-based strategy will turn out to be an order of magnitude larger or more, to obtain no greater environmental improvements than could have been obtained by the cheaper means.

Source: Fraser Report pages 10-15.

7. With respect to the “urgency” of addressing climate change, Ontario is not bound by the Kyoto Protocol nor any other international treaty. There are no legal obligations on the Province to act in an aggressive manner to reduce CO₂ emissions. Ontario patterned its Feed-In-Tariff policy in part on the German and Spanish approach, yet these countries are not phasing out coal use. Coal-fired power generation in Germany rose 13% last year and Spain’s remained constant.

The claimed “urgency” is an arbitrary, self-set goal. Attached and marked as **Exhibit “D”** is a copy of an article discussing this.

9. Further on the “urgency” issue, the new report of the Intergovernmental Panel on Climate Change acknowledges that 111 out of 114 climate model simulations used for the new report showed an overestimate of the rate of global warming in response to observed increases in greenhouse gas levels since the late 1990s (p. 9-27). The report also acknowledges that models exaggerate the level of tropospheric warming throughout the tropics (9-30). The report also deems *highly unlikely* or *exceptionally unlikely* the following catastrophes: collapse of the Gulf Stream, disintegration of Greenland or West Antarctic ice sheets and release of methane clathrates. It reports *Low Confidence* in any of the following projections: Tropical forest dieback, Boreal forest dieback, Increase in long-term droughts, collapse of Monsoonal circulation. (IPCC AR5 Table 12.4)

Karen Clark

10. Karen Clark states in her Affidavit at p. 4 that since the late 1990s air pollution levels in Ontario have been declining. In fact the reductions in air pollution levels in most cities began far earlier. Ontario and federal data show that, for example, particulate levels in Toronto fell from about 200 micrograms per cubic metre in the mid-1960s to about 60 micrograms in 1990. Likewise, sulphur dioxide levels fell sharply in the 1970s and 1980s, long before the introduction of the Green Energy Act. See charts of provincial and federal air pollution data in my Fraser Institute report at pages 4-5.

11. In 2005 the Province of Ontario commissioned a Cost-Benefit Analysis by DSS Management Consultants and RWDI Inc (hereinafter “CBA”). It is attached as an Appendix to the Affidavit of Karen Clark. The report is often cited by the Province in defence of its decision to

acquire a significant amount of electricity through wind generation. The CBA report, however, neither considered nor recommended adoption of wind power in Ontario. Its only recommendations concerned options to replace coal-fired power generation through expansion of nuclear and natural gas operations (CBA p. iv). Consequently, reliance on this report as justification for adoption of wind energy is inappropriate.

12. Furthermore, the CBA showed that closure of the Lambton and Nanticoke power plants would have imperceptibly small effects on Ontario air quality. The RWDI model traced changes in ground-level ozone (O₃) and fine particulates (PM₁₀). These are the two air contaminants that currently determine hourly levels of Ontario's Air Quality Index. See <http://airqualityontario.com/reports/summary.php>.

13. The chart on page 72 of the CBA shows that in the City of Toronto, shutting down the power plants would yield an ozone reduction of only 0.02 parts per billion (PPB), roughly 8/100 of 1% of average daily readings. This is identical to the predicted reductions under an alternative scenario under which the power plants continue to operate but a pollution control retrofit then partway complete would be finished. PM₁₀ levels were projected to fall by 1.1 µg/m³, essentially the same as the reduction under the retrofit scenario (0.8 µg/m³) and, again, only a minuscule percentage of average daily levels. The same trivial changes were projected in 55 of 57 locations across the province, the only exceptions being two places in the vicinity of the Nanticoke plant, where ozone levels would fall by just under 1 ppb and PM₁₀ levels by 2.7 µg/m³.

14. It is unsurprising that the report predicted such small effects from removal of Lambton and Nanticoke from the power generation system. According to the National Pollution Release Inventory of Environment Canada, in 2010 in Ontario, coal-fired power plants emitted 1,041 tonnes of PM₁₀. Attached and marked as **Exhibit "E"** is a copy of this document.

15. For comparison, emissions from all non-natural sources in Ontario that year (including industry, incinerators, construction, agriculture and so forth) were just under 1,130,000 tonnes, implying that coal-fired power plants were responsible for less than one-tenth of one percent of PM10 emissions. Residential wood-burning fireplaces alone contributed 24 times as much PM10 to Ontario air as did all coal-fired power plants.

16. The claim in Karen Clark's affidavit, that coal-fired power plant emissions were responsible for 668 premature deaths, 928 hospital admissions and 1,100 emergency room visits, is not based on actual counts of deaths or hospital documents. It is based on a spreadsheet model devised by DSS Consultants for the CBA report to the Ontario government. The arbitrary nature of such calculations is illustrated by the fact that the same consulting group (DSS and RWDI) did a nearly-identical study for Ontario Power Generation only two years earlier (2003) and reported far smaller estimates of mortality and morbidity. The 2003 study concluded that fewer than 5% of the various health effects of air pollution were attributable to emissions from coal-fired power plants. For instance, they attributed only 79 deaths and 38 hospital admissions to the base-case coal plant emissions. They also pointed out that most of these could be eliminated with additional installation of emission controls or conversion of some generating units to natural gas. Attached and marked as **Exhibit "F"** are the relevant pages from the 2003 DSS/RWDI report.

17. The remarkable difference in projected health effects was not due to differences in the estimated changes in air pollution, since the estimated effects on pollution from closing Lambton and Nanticoke were nearly identical between the two reports. Instead they arose from arbitrary changes in the spreadsheet coefficients that take air pollution levels and generate estimates of deaths and disease rates. While the 2003 study emulated a model used by the Ontario Medical Association, the 2005 report relied heavily on a small number of studies that had reported

unusually large mortality and morbidity coefficients. In particular they relied on a 1993 study by Dockery et al.¹ and a 2002 study by Pope et al.² Dockery et al. (p. 1758) actually found that air pollution effects were statistically insignificant for substantial subgroups of their sample population, including nonsmokers, former smokers, female current smokers, and those with no occupational exposure to fumes, gas or dust. Likewise Pope et al. found no significant pollution effects among people under age 70, people with more than high school education, etc. Despite the fact that both these studies ruled out pollution effects on large subsegments of the population, the model coefficients were applied in DSS05 to the entire population in Ontario. In my opinion this led to a substantial overstatement of the health consequences of coal-fired power generation in the 2005 study.

18. In 2010 I published a study, coauthored with two UK colleagues, which was the first long-term multicity examination of the link between air pollution and hospital admissions in cities across Canada that controlled for smoking rates, income, weather and statistical model uncertainty. A copy of this study is attached and marked as **Exhibit “G”**.

19. We examined 11 major Canadian cities over the interval 1974 to 1994, during which pollution levels were typically much higher than at present. If the kinds of large effects assumed in the DSS model were accurate we should have observed large correlations between pollution levels and admissions to hospital for lung-related problems. Instead, we found that while smoking contributed substantially to hospitalizations, variations in air pollution levels had effects that were small and statistically insignificant.

¹ Dockery D.W. et al. (1993). “An Association Between Air Pollution And Mortality In Six U.S. Cities.” *New England Journal of Medicine*, 329(24) pp 1753-1759.

² Pope, C.A., 3rd, R.T. Burnett, M.J. Thun, et al. (2002). “Lung Cancer, Cardiopulmonary Mortality, and Long-Term Exposure to Fine Particulate Air Pollution.” *Journal of the American Medical Association* 287: pp. 1132–1141.

Danny Harvey

20. The various observations of global warming over the 20th century, documented in the Affidavit of Danny Harvey, and the fraction of these changes that can be attributed to anthropogenic carbon dioxide (CO₂) emissions, do not constitute a justification for adoption of wind energy in Ontario. Ontario produces about 25% of Canada's CO₂ emissions, which in turn are about 1.5% of global CO₂ emissions as of 2010. Even if all fossil fuel consumption in Ontario were to cease in its entirety, global CO₂ levels would go down by only 0.4%, which is too small an amount to affect the future path of the global climate, irrespective of the effect of greenhouse gases on the global temperature. See <http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=18F3BB9C-1> and http://cdiac.ornl.gov/trends/emis/tre_glob_2010.html, copies of which are attached and marked as **Exhibit "H"**.

21. Nevertheless, if it is a policy goal of Ontario to reduce net CO₂ emissions by an amount equivalent to closure of the coal-fired power plants, computations in the 2005 CBA (pp. 32-33) showed that, for an average cost of \$15/tonne, adequate CO₂ offsets could be purchased for under \$400 million annually. This is about one-third of the amount Ontario now spends on the Clean Energy Benefit, which provides only partial compensation to Ontario households for energy cost increases attributable to the Green Energy Act. Attached and marked as **Exhibit "I"** is a copy of the Ontario Ministry of Finance Budget Estimates 2012-13. Moreover, adoption of wind energy is only expected to replace about 2/3 of the generating capacity lost by closing Lambton and Nanticoke and will require installation of new natural gas-fired generating capacity to compensate for fluctuating wind levels. In other words, the GEA strategy of pursuing wind-based energy can at best yield only partial reduction of net CO₂ emissions, and occurs at a cost many times higher

than an offset strategy that would fully eliminate net emissions from coal-fired power plants. Therefore, appeal to the need to reduce CO2 emissions in no way justifies expansion of wind energy, since a far less costly and more effective alternative is available.

22. Further on this point, wind energy does not effectively displace coal-fired power, since it contributes to baseload generating capacity and is not a controllable source. It mainly displaces nuclear power in Ontario, which generates no CO2 emissions, and replaces it with a wind/gas combination that does yield increased CO2 emissions. Consequently, it is likely that further addition of wind energy in Ontario will yield a net increase of both conventional air contaminants and CO2 emissions from the power generation system as a whole. For more detailed calculations on this see Acchione, Paul (2012). Wind and the Ontario Electricity Grid: the Good, the Bad and the Ugly. Presentation to the Energy Mini-Conference Series 2012, Toronto (March 22, 2012). Available in PDF at <<http://www.scribd.com/doc/124424281/Wind-and-the-Electrical-Grid>>, as of April 3, 2013.

23. Wind energy is also superfluous to Ontario's power generating needs. The wind in Ontario tends to blow at times when power demand is at a minimum and vice-versa. As a result, over the post-2006 interval, about 81% of Ontario's wind energy has been surplus baseload and has had to be dumped on the export market at a significant loss to the Independent Electricity System Operator. By definition this power is not displacing any generating capacity in Ontario. See calculations in my Fraser Institute report, pages 14-15, which uses data available from the IESO website.

24. It makes no sense to expand production of a power source that is already in excess supply and which is causing losses of about \$200 million annually to the Province, especially when there are no credible environmental benefits to it.

25. Ontario could obtain all the environmental benefits attributed to wind energy at far lower costs and with far less economic harm simply by pursuing strategies that were laid out in the 2005 CBA, namely conventional pollution abatement technology on the coal plant units, and marginal additions of natural gas and nuclear power.

SWORN BEFORE ME
at the _____,
in the Province of Ontario
on _____, 2013.

Commissioner for Taking Affidavits

ROSS MCKITRICK