SUBMISSION TO:

THE
STANDING COMMITTEE
ON
FINANCE AND ECONOMIC AFFAIRS

SUBMISSION
for
REASSESSMENT OF FINANCIAL POLICIES
RELATING TO
RENEWABLE ENERGY PROJECTS

Karen Breitbach, Member Central Bruce-Grey Wind Concerns
223 Concession 9, RR 5, Kincardine, ON, N2Z 2X6
email: kbhiddencreek@gmail.com

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The German Trade and Investment group are preparing to head to Ontario's Canadian Clean Energy Conference, "Ontario Feed-In Tariff Forum" April 3-4, 2013 in Toronto. Preceding this event is the National Renewable Energy Forum on April 2, 2013.

Both venues feature CEOs from leading renewable energy companies, key personnel from banking and investment.

> "The Forum is the only event to attract decision-making delegates from across all renewable energy technologies, key policymakers and FIT scheme administrators to network and gather market intelligence."
> and
> … "the complete picture of project opportunities, regulatory developments, political agendas and business strategies for the renewables industry in Canada."
> http://www.ofit2013.com/

One may wonder why renewable energy companies' leading executives from all over the world are coming to Ontario. It could be that this is the last bastion where lucrative government subsidies and government green energy expansion programs are still available to assist these operations and ensure their profitability.

While countries such as Spain have severely curtailed government subsidies; while Italy is beset with Mafia corruption in the renewable energy sector; while Poland has shut its "border" closing transmission of Germany's intermittent wind energy to stop risks to Poland's grid; while Denmark's Vesta has been laying off workers; and the UK is having its own financial woes and power blackouts due to two concurrent severe winters and an inability to coordinate the flow of wind into its grid; Germany's situation when it comes to the ECONOMICS of wind could not be stated more clearly:

Dr. Claudia Kemfert of the German Institute for Economic Research frets over exposed ills of "green" energies.

P. Gosselin points out:

Over the last months the gruesome details of the reality of green energies have surfaced. Environment Minister Peter Altmaier, for example, recently informed the public that the transformation over to green energy would cost Germany 1 trillion euros by 2039 (all for a theoretical global warming prevention of a few hundredths of a degree Celsius by the year 2100).

Moreover, renewable energies such as wind and sun have proven to be wildly fluctuating, unreliable sources whose lifetimes are estimated to be only half of what manufacturers had promised.

As Germany suffers through a record fifth colder-than-normal winter in a row and global mean temperature stalling for 15 years, Germans are having serious doubts about catastrophic warming.
Also 600,000 poor families having their power turned off every year because they can no longer pay skyrocketing electric bills represents a real present danger, and not some year 2100 computer scenario.
Kemfert, unfortunately, appears unaware of these realities, and insists we deny them and simply have faith that wind and sun are the way to go.

By P Gosselin on 8. März 2013[1]

Yet here in Ontario expansion of renewable energy projects is increasing. While the wind and solar industry, investment banking, and government along with supporting NGO's are planning ways and means for expansion and profitable operations, there is a need to look at the ECONOMIC benefits this industry has brought to the people of this province in terms of jobs, and overall improvement in the state of Ontario's economy. In short, has a cost benefit analysis been done on renewable energy? Is this an industry a net contributor to our economy or is it an actual drain on Ontario's economic well-being?

To quote from the Auditor General, Jim McCarter's report: Chapter 3, Section 3.03 Electricity Sector-Renewable Energy Initiatives, December 2011:

> "Because the ministerial directions were quite specific about what was to be done, both the Ministry and the OPA directed their energies to implementing the Minister's requested actions as quickly as possible. As a result no comprehensive business case evaluation was done to objectively evaluate the impacts of the billion-dollar commitment. Such an evaluation would typically include assessing the prospective economic and environmental effects of such a massive investment in renewable energy on future electricity prices, direct and indirect jobs creation or losses, greenhouse gas emissions, and other variables."
>
> And furthermore, "No economic analysis or business case was done to determine whether the agreement with the consortium was economically prudent and cost-effective, and neither the OEB nor the OPA was consulted about the agreement."

Clearly from the very inception of the venture into renewable energy and the Green Energy Act the viability of renewables based on economic performance factors were not assessed before committing government funding to

[1] http://notrickszone.com/2013/03/08/leading-energy-expert-frustrated-that-germans-are-more-scared-of-renewable-energy-than-climate-change/#comments

these projects and the only reason such a commitment was made was ideological based on unverified scientific assumptions of global warming.

Due to renewable energy initiatives 40,000 jobs were to be created, although it turns out that 75% of those were only to be temporary construction jobs, and as verified in other jurisdictions; for each renewable energy job created other areas of the economy's manufacturing sector actually lost between 2-4 jobs due to the high cost of electricity.[2]

That the renewable energy sector would be a net creator of jobs was an assumption not proven in fact.

On the actual performance of wind energy systems, the Auditor General goes on to state, "We analysed the performance of all wind farms in Ontario in 2010 based on IESO data. Although the average capacity factor of wind throughout the year was 28% it fluctuated seasonally, from 17% in the summer to 32% in the winter. It also fluctuated daily, from 0% on summer days, when electricity demand was high, to 94% on winter days, when electricity demand was lower."

"Our analysis also indicated that wind output was out of phase with electricity demand during certain times of the day. For example, during the morning hours, around 6:00 a.m., wind output usually decreased just as demand was ramping up. Throughout the day demand remained high but wind output typically dropped to its lowest level for the day. During the evening hours, around 8:00 p.m., when demand was ramping down, wind output was rising, and it remained high overnight until early morning. This somewhat inverse relationship between daily average wind output and daily average demand was particularly pronounced during the summer and winter months."

"According to the study used by the Ministry and the OPA, 10,000MW of electricity from wind would require an additional 47% of non-wind power, typically produced by natural-gas-fired generation plants, to ensure continuous supply."

This analysis to date remains valid. In fact with additional projects that have come on stream since this report was issued in 2011 this inverse relationship has compounded the problem where increasingly economic liabilities are created by having to sell excess power when it is not needed at a loss yet having back-up generation on standby to supply power in case it is needed when demand is high, yet wind generation is not available. The current export price is under 2¢ per kWh and over the next five years is forecast to average less than 3¢. So, if Ontario is buying at the respective prices of 13.5 and 44.3¢ per kWh and selling at small fractions of that, an

[2] Auditor General's Report, Chapter 3, Section 3.03, Dec 2011

increasing volume will only make matters worse.[3] As a matter of fact, the Auditor General estimated (p. 112) that from 2005 to 2011, Ontario lost $1.8 billion on these transactions. Coping not only with the intermittency of wind, but its unpredictability has been an added cost of power generation, and a destabilization of the power grid itself. To consolidate the widely dispersed wind turbines for access to the grid, additional transmission lines have had to be built further adding to end costs to the consumer.

In an effort to stabilize the grid and to effect cost savings, IESO has attempted to negotiate terms of purchase, when it is not needed electricity from wind would not be purchased for an estimated saving of $220 million. The strenuous objections from the wind industry now have resulted in payment for non-production of power, or conversely, of other energy producers idling their capacity.

This political foray into alternative energy based on political ideology lacking any comprehensive and objective business case analysis has resulted in:

- An exodus of prime manufacturing with attending job losses due to the high cost of electricity
- Forced conservation due to the rising cost of electricity, coupled with decreased industrial use has led to an oversupply of electricity, sold at a loss, but expensed to the consumer
- Contractual commitments now force us Ontarians to pay twice over for electricity – that which is generated and that which has been contracted, but idled and not generated.
- Cancelled contractual obligations and the re-location of gas plants based strictly on political motives will again directly or indirectly negatively affect the consumer and Ontario's accumulating deficit
- A Turbine, although considered an industrial generating machine, for property tax evaluation has been capped at $40,000/MW value based on the value of the tower, not the total complex: A further subsidy to the wind operating company, but a revenue loss to the hosting Municipality, then further compounding the Municipal tax revenue loss based on property value diminution of homes within wind turbine projects.[4]

Since economical and abundant energy supply has supplanted the sailing vessel, at no other time of our history have greater strides been made in allowing our people a better standard of life. This is no longer the case. Any operating plant that produces at a capacity factor of between 24 and 34 percent cannot be termed as efficient or cost effective. A conservative table of Return on Investment was outlined in a report by John Harrison, entitled Viability of Ontario WEGS. It computes various returns under different capacity factors based on a 10 year operating period. A further table represents a full 20 year operating period with slightly

[3] Bruce Sharp, *professional engineer and 25-year veteran of the Ontario energy industry.*
http://opinion.financialpost.com/2012/04/04/ontarios-power-trip-the-great-electricity-bill-cover-up/
[4] Lansink Cash Studies, October 2012

different factors.[5] However, reports of operating life dates have been lately assessed closer to 10-15 years, at which time either major refurbishment or decommissioning would be necessary. Moreover actual output as a percentage of capacity analysed both in Ontario and Denmark over a period of 2-4 years has demonstrated that turbine efficiency decreases at a linear rate of 1.5%- 2% per annum.

As can be clearly seen from the analyses presented in both tables on the following pages, without aggressive government subsidization in the form of eco grants, accelerated depreciation allowance granted this industry in the form of full write-off within five years, and generous FIT pricing schedules allowing for a 5-6 cent premium over and above conventional power generation, generating electricity from wind turbines is not an economical alternative and not viable over the long term.

Table 2. Annual Return on Investment

Three Capacity Factor (CF) Scenarios Using Different Cost Assumptions; First 10 Years Only.			
	20% CF	25% CF	30% CF
Optimistic Costs: 6% Loan; $20/MWh O&M; Investor Cost: $0.5M/MW			
CARRYING COSTS/MW	$272,000	$272,000	$272,000
O&M/MW	$35,000	$44,000	$53,000
LAND-OWNER BENEFIT/MW	$5000	$5000	$5000
TOTAL COST/MW	$312,000	$321,000	$330,000
TOTAL REVENUE/MW	$237,000	$296,000	$355,000
NET REVENUE (LOSS)/MW	($75,000)	($25,000)	$25,000
RETURN ON INVESTMENT	**-15%**	**-5%**	**5%**
Realistic Costs: 8% Loan; $27/MWh O&M; Investor Cost: $0.5M/MW			
CARRYING COSTS/MW	$298,000	$298,000	$298,000
O&M/MW	$47,000	$59,000	$71,000
LAND-OWNER BENEFIT/MW	$5000	$5000	$5000
TOTAL COST/MW	$350,000	$362,000	$374,000
TOTAL REVENUE/MW	$237,000	$296,000	$355,000
NET REVENUE (LOSS)/MW	($113,000)	($66,000)	($19,000)
RETURN ON INVESTMENT	**-23%**	**-13%**	**-4%**

Table 3: Net Present Value and Internal Rate of Return

Three Annual Capacity Factor (CF) Scenarios Using Different Cost Assumptions			
	20% CF	25% CF	30% CF
Optimistic Costs: 6% Loan; $20/MWh O&M; Investor Capital Cost: $0.5M/MW			
NPV/MW (Project)	($1,200,000)	($750,000)	($330,000)
IRR (Project)	1.4%	3.7%	5.8%
NPV/MW (Equity)	**($540,000)**	**($120,000)**	**$290,000**
IRR (Equity)	**2.3%**	**6.3%**	**10.6%**
Realistic Costs: 8% Loan; $27/MWh O&M; Investor Capital Cost: $0.5M/MW			
NPV/MW (Project)	($1,500,000)	($1,100,000)	($660,000)
IRR (Project)	0.2%	2.3%	4.3%
NPV/MW (Equity)	**($840,000)**	**($430,000)**	**($40,000)**
IRR (Equity)	**0.3%**	**3.6%**	**7.1%**

NB: The NPV (Project) and IRR (Project) refer to the unlevered case, with no bank financing; these entries are for reference only. The NPV (Equity) and IRR

[5] Financial Viability of the Ontario Wind Energy Generating System, Dr. John Harrison, Dir.Research, 9/20/2011

In his Policy Analysis dated August 27, 1997 Robert Bradley included this statement:

"Despite its revered status within the orthodox environmental community, wind power poses several major dilemmas. First, wind remains uneconomic despite heavy subsidies from ratepayers and taxpayers over the last two decades. Second, from an environmental viewpoint, wind farms are noisy, land intensive, unsightly, and hazardous to birds, including endangered species. With the National Audubon Society calling for a moratorium on new wind development in bird-sensitive areas, and an impending electricity industry restructuring that could force all generation resources to compete on a marginal cost basis, wind power is a problematic choice for future electricity generation without a new round of government subsidies and preferences."[6]

Not only was Bradley's assessment prescient, but today in the year of 2013, it is verified.
Few knew about or shared Bradley's concerns at the time. Even more remarkably, (for the time) his analysis was at odds with the policy direction of his employer, Enron, as Ken Lay's political capitalism began promoting renewable investment as sustainable tax shelters.

To quote further:
"The policy implication of [a thorough examination of renewable technologies] is, stop throwing good money after bad. All renewable energy subsidies from all levels of government should cease."

"Such is the conclusion voiced today by a rising chorus of energy experts, economists, even politicians, after many years of failed renewables projects and more expensive utility bills in the growing shadow of a $16 trillion national debt"[7] in the US. In Ontario a similar scenario prevails with a debt which has mushroomed from $132.7 billion in 2002/3 and is currently listed as $238.4 billion. This amounts to $15,000 of debt for each person in Ontario.

Without heavy subsidization under FIT program, Eco grants, and the depreciation allowances given these projects, they would not produce sufficient returns for companies to venture further into this field. It has to be remembered, that each grant, subsidy, and tax deduction granted to these companies operating wind products come out of the revenue produced by taxpayers. On top of that the revenue paid to these companies for the purchase of electricity flows through our (government) utilities to them (the renewable energy companies) through the increased rates to the consumer. These increases in the cost of energy further detrimentally affecting the economics of this province at all levels.

When one looks at the dominating corporations in the field of wind power, most are in association with oil and gas companies (Suncor, Enbridge, Trans Canada) or other large utility corporations also involved in coal/gas/nuclear energy (Nextera) and largely foreign based with the ability to maximize on tax advantages available to minimize their profits realized through addition of governmental subsidization.

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[6] Policy Analysis, Robert L. Bradley, Jr. http://www.cato.org/pubs/pas/pa-280.html
[7] http://www.masterresource.org/category/book-reviews/not-green-book-reviews/

In view of the institution of various forms of carbon taxes in other parts of the world, impending in the US and Canada, now including Ontario, it was a natural fit for fossil fuel energy producers (deemed emission producing) to look for an offsetting partnership with wind and solar (deemed as emission saving). Additionally, since wind was intermittent and unpredictable thus requiring baseload backup, gas was a natural choice due to recent abundant supply. The abundant supply had depressed prices and required additional market demand. Based on this it is not surprising that the uneconomic performance is wind generating systems was secondary to these corporations in terms of overall profitability of their business.

The fact remains that because an uneconomic venture can be offset by the gains in another area by an industry, does not provide justification for an uneconomic industry to exist. Particularly so since it is advantageous financially only to the one industry engaged in it, offering no net benefit to the consumer to whom these costs are being passed and to the detrimental effects on the economy as a whole.

Aside from the economic considerations, the venture into wind and solar as an alternative source of energy to produce electricity might even be rationalized for use as supplemental to baseload electrical generation if it were not for the Unintended Consequences revealed in the WCO's position statement[8], outlining the contributing factors of the FIT program as contributory to a host of economic and environmental problems, including the harmful sound emissions that no research has proven to be safe to humans or animals residing within proximity of these installations.

In the words of Ross McKitrick, Professor of Economics at the University of Guelph:

> I am regularly contacted by members of the public who live in rural areas of Ontario under threat from the invasion of massive industrial-scale wind turbine installations. I am highly sympathetic to the plight of rural folks as they contemplate lost property values, increased stress and nuisance, destruction of scenery, and community divisions under this policy-induced menace. Making matters worse, the economics for the province as a whole are disastrous and the environmental benefits are mythical. From every angle the Ontario Green Energy Act looks like a calamity, except to the rent-seekers who are profiting from the Feed-in-Tariff program at the expense of their neighbours and fellow citizens.[9]

Undoubtedly this committee will hear requests for expanded funding rather than budget contractions. My appeal to this committee amounts to the latter and where possible, a balance in the hope of improving Ontario's current odious debt obligations for each individual of this Province and to hopefully allow ways and means of improving our economic stability.

The following then, is my request of this committee:

1. **STOP FUNDING OF PRODUCTION OF ENERGY NOT NEEDED**
   Rather than put the proverbial cart before the horse, since currently there is a documented glut of energy exported at a loss and at times even as an expense in this area, a pause in placing additional

[8] Unintended Consequences Position Statement on the Ontario Feed In Tariff Program, Wind Concerns Ontario Inc. 2012, Jane Wilson, Parker Gallant
[9] http://www.rossmckitrick.com/

electricity on stream when it is in an oversupply situation would be deemed to be judicial.

Based on economic factors alone further expansion of wind generation capacity is a liability to the financial health of this province. Of equal liability are the disruptive social factors engendered upon local communities and the environment.

2. **STOP PAYMENT FOR SERVICES NOT RENDERED**

No enterprise should be allowed to collect monetary rewards for non-delivery. No consumer should be asked to pay twice for the same product or for a product that does not exist. Since it appears that a contractual obligation may have been entered into without due foresight for this error, it appears that a situation is at hand requiring the "cleaning up of the balance sheet", i.e. the cost of this error must be written down as banks and businesses have had to do in the past. It is better to do a one-time write down than continue the obligation for years to come – to take the pain for future gain! In other words, the IESO decision to curtail WIND should stand since the current situation of wind first on the line threatens the safety net of energy supply at best and at worst with current situations of forcing Bruce Nuclear to take curtailment measure is a possible equipment failure waiting to happen.

3. **ALLOW LEGITIMATE TAX REVENUE COLLECTION**

The Wind Energy Systems currently in operation should contribute to a Municipality's tax base on a level playing field and be assessed according to any other industrial installation. By allowing Municipalities a strengthening of their tax base it will generate savings in transfer payments from the Province, and provide the Municipalities with financial means to accomplish their mandate which includes providing for the health and well-being of their citizens, now under stress.

4. **SUPPORT VERIFICATION OF HEALTH AND SAFETY OF WIND TURBINES**

Health and Safety issues that have arisen in conjunction with wind turbine operations are a factor that does affect budget considerations.

The problems or sleep deprivation and other health issues emerging among industrial wind turbine projects in operation over the last five years have been recognized and between the Federal and Provincial authorities more than 1 million dollars has been expended to research this phenomenon.

Whether or not current funding to verify these issues is monies deemed well spent is open for debate. This funding appears miniscule when compared to more than $100 million in grants to aid renewable energy development projects. Projects that are proving not only to be inefficient and cost prohibitive, but have yet to be proven safe to be placed among humans and the environment.

The savings generated in points 1 through 3 would allow time and funding for this verification process to be completed so that corrections can be made to safety regulations governing wind turbine operations.

In conclusion, my request of this committee is to allow financing ways and means to transfer the funding from what is no longer needed to what is necessary.

Assuredly this committee is well aware of their responsibility as elected official to the people of this province and not to corporate and other interests that seek to benefit at the expense of the people of Ontario, placing us further into debt. The wise decisions and recommendations of this committee can have far reaching consequences all of in our lives. Most certainly the many of us in Ontario look to this committee to recommend the changes in fund allocation so urgently required in this area of our economy and shall be eternally appreciative of their positive steps towards implementation of these re-assessments.

Submitted by:
Karen Breitbach
Member CBGWCO

March 2013

Attachments:

I. Pdf document compiling FOI information obtained
II. Ross McKitrick letter re Economics of Wind Power

Copies sent to:
Dipika Damerla, LIB / Mississauga East—Cooksville, ddamerla.mpp.co@liberal.ola.org
Steven Del Duca, LIB / Vaughan, sdelduca.mpp.co@liberal.ola.org
Victor Fedeli, PC / Nipissing, vic.fedelico@pc.ola.org
Catherine Fife, NDP / Kitchener—Waterloo, cfife-co@ndp.on.ca
Kevin Flynn, LIB / Oakville, kflynn.mpp.co@liberal.ola.org
Monte McNaughton, PC / Lambton--Kent—Middlesex, monte.mcnaughtonco@pc.ola.org
Michael Prue, NDP / Beaches--East York, mprue-co@ndp.on.ca
Peter Shurman, PC / Thornhill, peter.shurman@pc.ola.org
Soo Wong, LIB / Scarborough—Agincourt, swong.mpp.co@liberal.ola.org

On May 14, 2009 Ontario's Green Energy and Economy Act was passed: http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTA2NDQ5&statusId=MTU5NjQ1

"The Green Energy and Green Economy Act, 2009, was passed in the Legislature on May 14, 2009. The Act places a priority on expanding Ontario's use of clean and renewable sources of energy including wind, water, solar, biomass and biogas power. Developing these renewable resources is a cornerstone of this province's future prosperity."

The EBR registry (010-6516) on the Green Energy Act opened for public comment on June 9, 2009 and closed July 24, 2009.

Ontario Legislature Standing Committee testimony took place in April 2009. View calendar here: http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2145&detailPage=bills_detail_status

Regulations were worked on by ministry staff and publicly announced September 24, 2009.

The first 2 attachments are a ministry communication from March 2009.

Submissions to the EBR registry and at the standing committee hearings in April 2009 by the public, independent researchers, health professionals and engineers included testimonials and research on audible noise, low frequency noise, vibration, infrasound and electrical pollution in operating wind projects.

The next 4 attachments are a single page from EBR submitted comments (June/July) from CanWEA and some prominent developers regarding the topic of infrasound monitoring. (Aim Powergen, Canadian Hydro Developers, Suncor and there were others.)

The Ministry of Environment complied with industry wishes to omit requirements to measure and monitor low frequency noise and infrasound.

It was in August 2009 that Ministry of Environment field officers were working on an Abatement plan to help the families who were being impacted. The plan was shelved and some of these families still cannot live in their homes. (http://windvictimsontario.com/ministry-of-environment-confirm-adverse-health-effects-years-ago.html - Bottom of page)

All of this and much more was taking place before the Green Energy Act regulations were even released.

And just to be safe, the following was included in the updated Ministry of Environment Noise Complaint Protocol in August 2011.

"Complaints about wind turbine

noise in the infrasound or ultrasound ranges (i.e. outside the normal audio range), transformer substation noise, and other issues such as shadow flicker or health effects are beyond the scope of this document."

“Too often we excuse those who are willing to build their own lives on the shattered dreams of other human beings”
April 5, 1968…..U.S. Senator Robert F. Kennedy

College of Management and Economics
Department of Economics and Finance

Ross McKitrick, Ph.D.
Professor

March 12, 2013

To: Personnel involved in Ontario energy sector planning & approval

RE: Proposed Wind Power Project

DECLARATION OF INTEREST: The municipality in which I live is not currently considering a wind power project, nor do I have a financial interest either in the approval or disapproval of any particular wind turbine project. I am an Ontario electricity consumer, and in my capacity as Professor of Economics at the University of Guelph specializing in energy and environmental policy I have a professional interest in the electricity industry. With regard to projects under consideration at the Ontario Energy Board my comments are filed pursuant to Section 4.4 of the Ontario Energy Board Act.

SUMMARY OF COMMENTS: With regards to the criterion set out in Sct. 96(2) of the Ontario Energy Board Act, in my view the application is not in the public interest because (1) the proposed project will raise prices and decrease the reliability of the electricity system, and (2) the proposed project is inconsistent with pursuit of the stated goals of the Government of Ontario as regards development of the provincial energy grid.

DETAILS:

1. Regarding the "interests of consumers with respect to prices and the reliability and quality of electricity service" in my view this application fails to serve the public interest. It is aimed at expanding capacity for electricity production by means of new wind turbines. As was detailed in the 2011 report of the Auditor-General of Ontario (AGO),[1] the existing fleet of wind turbines is imposing large, unjustified costs on Ontario ratepayers, and expansion of the fleet will make the situation worse.

    a. **Ontario Auditor-General conclusions:** The AGO Report noted that, regarding the push for renewable power, "*no comprehensive business-case evaluation was done to objectively evaluate the impacts of the billion-dollar commitment.*" (p. 89, emphasis added.) It went on to say that such projects will have negative consequences both for prices and system reliability:

> "wind and solar renewable power will add significant additional costs to ratepayers' electricity bills. Renewable energy sources such as wind and solar are also not as reliable and require backup from alternative energy-supply methods such as gas-fired generation… a typical residential electricity bill would rise about 7.9% annually over the next five years, with 56% of the increase due to investments in renewable energy" (AGO Report p. 89).

[1] Auditor-General of Ontario (2011) (AGO) Annual Report of the Office of the Auditor-General of Ontario. Toronto: Queen's Printer. Available at http://www.auditor.on.ca/en/reports_2011_en.htm

b. **Certainty of cost increases:** Ontario already has surplus baseload generating capacity. In addition, wind output is out of phase with demand, peaking at hours and seasons when demand is at a minimum. Consequently Ontario frequently has to dump power on the export market at a substantial loss. Data available on the IESO website (http://www.ieso.ca/), supported by findings of the AGO report (p. 112) indicate that in every year since 2006, approximately 80% of the time that wind turbines have been supplying power to the grid, the entire output of the wind sector is surplus to current demand and has to be dumped on the export market. Because of the provisions of the Green Energy Act, the system operator is required to buy all available wind power at 13.5 ¢ per kWh, well above the domestic market price, and prices received for exported power are typically less than 4 ¢ per kWh (AGO 2011, p. 112). They are even negative at times, meaning we have to pay other jurisdictions to take the surplus power from us. The AGO estimated (p. 112) that from 2005 to 2011, Ontario lost $1.8 billion on these transactions. The IESO is reporting annual export losses of $200 million due to these forced buy-and-dump transactions.[2] This amount must be covered by ratepayers. Because electricity demand in Ontario is flat or declining, any addition of wind turbines to the grid will yield capacity at a cost of 13.5 ¢/kWh for power that will almost all be dumped on the export market for under 4 ¢/kWh, a net loss of 9.5 ¢/kWh. These costs must all be borne by ratepayers. Consequently, any expansion of wind energy under present and foreseen market conditions is against the interests of taxpayers and ratepayers.

c. **Structural mismatch of wind to demand:** The mismatch between wind energy and demand is structural and unique to wind. As the AGO report noted (p. 111), wind turbine output declines in the morning as demand is ramping up, and rises in the evening as demand is winding down. Also, wind output peaks in the mid-fall when seasonal demand is minimized because households are typically no longer using air conditioning nor have they yet started up wintertime electric heating systems. Data from the IESO website shows that wind output and demand are anticorrelated such that, on average, as wind production increases by 1%, system demand declines by 1%, and vice versa (calculations available on request). Therefore, addition of wind turbines to the Ontario grid is not a reliable way to match new capacity to the daily and seasonal power needs of Ontario consumers, a caution clearly indicated in the AGO Report.

d. **Unreliability of wind turbines:** An additional reason why wind power reduces the reliability of the electricity system is that wind turbines typically operate far below their rated capacity. IESO data indicates that, over the past two years, wind turbines operated at one-third or less of their rated capacity nearly two-thirds of the time. They operated below one-tenth of their rated capacity nearly a quarter of the time. So not only is wind out of phase with demand, but when the turbines are operating, they are extremely inefficient.

e. In sum, with regard to prices and the reliability of the Ontario electricity grid, wind energy unnecessarily inflates costs to taxpayers and ratepayers, it adds unreliable and inefficient capacity to the grid, and it is unsuitable for the purpose of matching supply to daily and seasonal cycles of demand.

2. Regarding the promotion of renewable energy sources "in a manner consistent with the policies of the Government of Ontario," in its response to the Auditor General Report, the Ontario Ministry of Energy said that the expansion of renewable energy was intended to support three policy goals: to reduce greenhouse gas emissions, to reduce criterion air contaminants associated with coal-fired power plants, and to create jobs (AGO Report p. 92.) This proposal, as with major wind projects

[2] http://www.thestar.com/business/2013/02/26/surplus_wind_power_could_cost_ontario_ratepayers_up_to_200_million_ieso.html

generally, fails to advance these priorities and thus does not promote renewable energy in a manner consistent with the policies of the Government of Ontario.

a. **Wind energy likely increases overall GHG and air contaminant emissions:** Since wind energy is intermittent, additions of wind turbines to the system also require additional gas-fired power plants, with a capacity of about 50% of the rated capacity of the wind turbines, to be spinning in the background, providing constantly-variable offsetting changes in power output (AGO Report p. 91). Thus wind energy, as actually utilized, is not zero-emissions. According to calculations by the Wind Energy Task Force of the Ontario Society of Professional Engineers, continued expansion of wind energy, in the context of Ontario's existing surplus of baseload power, will require replacement of non-emitting baseload sources (mainly nuclear) with a wind/gas mix. Since the grid operator is required by law to buy all the wind energy available, the system must be configured to absorb the maximum potential input from the wind turbine fleet. The existing surplus of baseload power means that, should additional wind capacity be added, in order to make the system able to absorb its full output, at least one nuclear generating unit will need to be removed from service.[3] The net effect of replacing nuclear with a wind/gas mix will be an increase in both criterion air contaminants and greenhouse gas emissions.

b. **Wind energy was not recommended by the DSS Report:** In its response to the AGO, the Ministry of Energy cited a 2005 cost-benefit analysis by DSS Consulting to justify its renewable energy strategy as a replacement for coal (p. 120). This was misleading, since the DSS study did not consider wind or solar options, and it did not recommend the province invest in wind energy as a replacement for coal. That study only examined the costs of retrofitting the existing coal-fired power plants with enhanced stack gas controls, or replacing them with a mix of new gas and nuclear plants. Both options were forecast to yield approximately the same improvements in Ontario air quality but at less than one-tenth of the costs associated with Ontario's expenditures to date on renewable energy. By appealing to the analysis in the DSS report, the Ministry of Energy has actually undermined the case for spending more money on renewables as a means of achieving its stated policy goals, since that report showed they could have been achieved by other means at a fraction of the cost.

c. **Wind energy harms job creation:** The AGO Report also emphasizes (pp. 117-118) that the province made no effort to validate its claims that investments in renewable energy will create jobs or improve the economy, and substantial evidence exists to suggest the opposite will happen. The Province claimed that the renewables strategy would create 50,000 new jobs. But the AGO found that 40,000 of these were at most temporary construction jobs lasting only a year or two at most. Also, evidence from other jurisdictions on which the Ontario policy was based showed that the increases in energy costs would dampen growth in other sectors to such an extent that for every permanent job created in the renewables sector, between two and four jobs would be lost in other sectors.

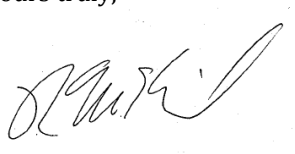
d. **Spanish and German experience shows inevitability of economic harm:** Ontario's renewables strategy was copied from German and Spanish systems. Hence, the subsequent experience of those jurisdictions shows us what the future will look like here. The Spanish and German governments have suffered heavy financial losses on renewable energy contracts amidst rapidly escalating energy prices and are bailing out on their commitments. This month, Spain introduced a new law that not only sharply rolls back subsidized tariff rates for wind and solar power producers, but it imposes a special tax on them to try and

[3] See "Wind and the Ontario Electrical Grid – The Good, the Bad and the Ugly"; OSPE presentation online at http://c.ymcdn.com/sites/www.ospe.on.ca/resource/resmgr/doc_advocacy/2012_pp_22mar_windelecgrid.pdf

recover some of the system-wide losses, which amount to over $37 billion in Spain alone.[4] The Germans are also rolling back subsidy rates for renewable power in response to consumer anger in advance of an election this fall.[5] These volatile swings in policy, driven by extreme political and economic exigencies, are costly both to investors and consumers. These problems will of necessity hit Ontario in the years ahead. They illustrate the public harm done through the inadequate, back-of-the-napkin planning behind the Green Energy Act, so forcefully criticized by the Auditor-General. The relevant point for this application is that to the extent the Government of Ontario desires an energy policy that promotes growth and job creation, expansion of the wind energy sector detracts from that goal.

e. In sum, promotion of renewable energy through the approval of new wind turbine installations is *inconsistent* with the stated policies of the Government of Ontario, since it will likely result in higher greenhouse gas and criterion air contaminant emissions, and will impair economic growth and job creation. As pointed out by the Auditor-General, the provincial government did not undertake any comprehensive analysis prior to adoption of its renewable energy strategy to examine these issues, and consequently has no basis on which to claim that further expansion of wind energy is an effective means to achieve its stated policy goals.

Yours truly,



Ross McKitrick
Professor of Economics
University of Guelph
Guelph ON N1G 2W1
(519) 824-4120 Ext. 52532
ross.mckitrick@uoguelph.ca

[4] See news article at http://planetark.org/wen/67930.

[5] See http://blogs.the-american-interest.com/wrm/2013/02/17/germany-and-spain-throw-green-energy-under-the-bus/.