

Renewable Energy Not so Green and Costly – Ron Higgins

Renewable Energy is not as green as it is being touted to be, is more expensive and CO2 reduction programs are being implemented totally wrong by the Government. I promote green as much as everyone else but this renewable energy program is absurd. Due to my stance on this issue I have had comments saying that I am not green and not looking after our future so it prompted me to start educating everyone based on the following table. The following table will be continually expanded as new information is found and/or released. Continuing on the current Green Energy program is costly and is actually adding CO2 to the earth – not decreasing it.

Fact	Source
<p>The atmospheric source of 65% of the mercury in the Canadian North comes principally from North America, and that amount is decreasing</p> <p>\$2.7 billion is wasted every year because of the Green Energy Act (GEA). Green energy contracts are for 20 years. That’s a minimum of \$54 billion. The Auditor General’s report clearly suggests that all technical and economic analyses were ignored because of the word green. As Ontario doubles the amount of connected wind capacity, that amount will likely double to some \$100 billion. It will get worse as even more is connected. The Fraser Institute estimates the Green Energy Act cost could be \$38B per year.</p>	<p>BY RON BERGERON, P.ENG Electrical Business Jan 2016</p>
<p>The Green Energy Act was proclaimed for three main reasons:</p> <ol style="list-style-type: none"> 1. Attract investment in renewable energy The GEA did attract investors. In fact, the response was overwhelming. Investors were salivating because return was calculated at 11% after tax on equity. That’s 11% guaranteed for 20 years—certainly much better than the average GIC 2. Increase job opportunities Other jurisdictions have shown that most jobs are temporary construction jobs. As for permanent jobs, for every green energy job created, two to four jobs are lost in other sectors of the economy because of higher electricity prices. 3. Reduce greenhouse gas emissions Ontario could have closed all five coal plants simply by utilizing all the hydropower it had available. Wind and sun produce less than 5% of Ontario’s energy while over 50% of hydroelectric potential goes wasted. 	
<p>The DSS Management Consultants report (2005) to Ontario’s Ministry of Energy—as summarized by a Fraser Institute Report (2013)—never recommended renewable</p>	

<p>power. It outlined a plan of pollution control methods that would have yielded the same environmental benefits as the GEA, but at a 10th of the current cost.</p>	
<p>Wind Farms add to CO2 The manufacture and construction of wind farms contributes more to global CO2 emissions than they will save in their useful life (which is approximately between 15 and 20 years). The construction of one typical turbine involves the use of heavy equipment to create roads to the site; dig a hole 10 feet deep and 100 feet wide. Into this are deposited 53 truckloads of concrete and 96,000 lbs of steel rebar. Then eight truckloads of components arrive: a base tower weighing 87,450 lbs; a mid-section of 115,500 lbs; a top tower of 104,167 lbs, and then the rotor assembly and blades. The transportation and erection of these components require the building of wide roads for use of use of heavy machinery and large cranes. These facts are taken from a video produced by a wind energy company. The total CO2 emissions to build one turbine is estimated at 241.85 tons. The supreme irony is that in Baoding, China’s most polluted city, the major industry is the production of turbine towers and blades. The power for this industry is supplied by several large coal-fired plants. By attempting to cut Canadian emissions (currently 1.6 per cent of global totals), we are adding to China’s emissions, at 24.1 per cent and growing.</p>	<p>Christine Whitaker is a freelance writer from Edgeley.</p>
<p>Minister of Energy stated that the last renewable energy brings in low prices for electricity. No, not “low” like Ontario’s dysfunctional market price for electricity, which was less than two cents/kilowatt-hour (kWh) over half of all hours in 2015. And not “low” like the average 1.2 cents/kWh rate that electricity bound for New York and Michigan has sold for this year. When the Ontario government says “low,” it means seven to fourteen times as much as that, with the IESO reporting the weighted-average price of the new wind power at 8.6 cents/kWh and new solar at 15.7 cents/kWh. Under the current version of the FIT program, the government will buy wind power from small projects at a 50 per cent premium over the competitive wind price, and solar power at a 30 to 90 per cent premium over competitive solar prices.</p>	<p>Tom Adams and Scott Luft, Special to Financial Post </p>
<p>The Province of Ontario, sadly, is a classic example of how not to tackle fossil fuels. Why? Because of green. Governments want to look like they’re doing the right thing, but they often get so excited about anything green that they lose common sense, like lemmings rushing to the sea.</p>	<p>By Ron Bergeron, P.ENG In Electrical Business January 215</p>
<p>Green energy contracts are for 20 years. That’s a minimum of \$54 billion.</p>	

<p>The AG’s report clearly suggests that all technical and economic analyses were ignored because of the word green. As Ontario doubles the amount of connected wind capacity, that amount will likely double to some \$100 billion. It will get worse as even more is connected. The Fraser Institute estimates the GEA cost could cost \$38B/year.</p>	
<p>Emission reduction Does Green really reduce emissions? Wind power must be backed-up nearly 50% by spinning gas-fired systems in case the wind drops. Ontario could have closed all five coal plants simply by utilizing all the hydropower it had available. Wind and sun produce less than 5% of Ontario’s energy while over 50% of hydroelectric potential goes wasted.</p>	
<p>The DSS Management Consultants report (2005) to Ontario’s Ministry of Energy—as summarized by a Fraser Institute Report (2013)—never recommended renewable power. It outlined a plan of pollution control methods that would have yielded the same environmental benefits as the GEA, but at a 10th of the current cost.</p>	
<p>In 2015, electricity supply exceeded demand by some 50% causing us to deliver power below our costs to the States—Ontario’s major competitor—all in the name of green. Between 2006 and 2013, the cost of exporting power exceeded revenues by \$2.6 billion</p>	
<p>Original Goals for Electricity System Transformation</p> <ul style="list-style-type: none"> • Reduce CO2 emissions from power plants: <ul style="list-style-type: none"> ○ Phase out coal plants and build new efficient CCGT gas plants. ○ Restart 4 nuclear units at Bruce A and 2 units at Pickering A. ○ Add wind, solar, bio---energy and small hydro generation. ○ Refurbish nuclear units as they reach end of design life. • Create new green energy sector jobs: <ul style="list-style-type: none"> ○ FIT program to accelerate deployment of renewables. ○ Create 50,000 jobs in new green sector. • Keep transformation costs within 1% per year in additional costs: <ul style="list-style-type: none"> ○ Install smart meters with Time---of---Use (TOU) rates. ○ Encourage peak reduction and load flattening 	<p>Ontario Society of Professional Engineers Energy Task Force April 2015</p>
<p>A careful engineering analysis and grid simulation would have shown that the policy goals could not have been economically accomplished because:</p> <ul style="list-style-type: none"> • Backup generation is required for wind and solar. Consequently, wind and solar are displacement energy sources. • The total value of displacement sources to the consumer is only the economic value of the displaced fuel. For hydroelectric and nuclear it’s 0.5 cents/kWh. For natural gas its 4 cents/kWh plus a carbon reduction benefit of 1 cent/kWh for each \$30 per ton CO2 of environmental costs. • The policy to eliminate coal in Ontario reduced the carbon 	<p>Ontario Society of Professional Engineers Energy Task Force April 2015</p>

<ul style="list-style-type: none"> reduction benefit of wind and solar by 2.5x because gas is cleaner than coal 	
<p>Technology Limitations</p> <p>Hydroelectric is clean but:</p> <ul style="list-style-type: none"> Large land areas are required. Most economic sites in Ontario have been developed. Output flexibility requires much larger storage ponds. Impacted by climate change (affects capacity factor). <p>Wind is clean but:</p> <ul style="list-style-type: none"> Impacts negatively on natural views and quiet enjoyment of property near turbines. Output is intermittent --- backup generation/storage is needed. Capacity factor is low (30%) so more transmission required. 40% of energy arrives when load demand is low --- low energy value. Total integration costs are high (100% wind means 2x retail price). <p>Solar is clean but:</p> <ul style="list-style-type: none"> Produces most of its energy mid---day, none at night. Output is intermittent so backup generation/storage needed. Capacity factor is very low (15%) so more transmission required. Total integration costs are very high (100% solar means 6x retail price). <p>Nuclear is clean but:</p> <ul style="list-style-type: none"> Produces long term nuclear waste. Safe but public concerns regarding accidents and nuclear waste. Output is not very flexible. Total integration costs are moderate (100% nuclear means 1.5x retail price). <p>Natural Gas is the cheapest energy source today but:</p> <ul style="list-style-type: none"> Natural gas price is very volatile. Future LNG facilities will drive natural gas price higher. Emits 40% of CO2 emissions of a coal plant (about 400 grams CO2 per kWh). Public health concerns regarding fine soot and NOx (Nitrogen Oxide) emissions especially at lower load levels. Output is not flexible in lower 40% of load range (CCGT plants). Integration costs are low (100% natural gas means the same retail price). <p>Bio---Energy is clean with post combustion filters but:</p> <ul style="list-style-type: none"> Insufficient bio---energy fuel to meet all of our electrical energy needs. Public concerns regarding odors and emissions. 	<p>Ontario Society of Professional Engineers Energy Task Force April 2015</p>

<ul style="list-style-type: none"> • Output is not very flexible – often tied to local facility needs not the grid. • Total integration costs are moderate (100% bio---energy means 1.5x retail price). 																													
<p>Costing Exports in 2014 averaged less than 4 cents/kWh.</p> <ul style="list-style-type: none"> • OEB estimated 2014 energy price for electricity inside Ontario was 8.9 cents/kWh. • According to OEB estimates, the cost of electricity production was: <table border="1" data-bbox="186 556 941 856"> <thead> <tr> <th>Nov – Apr 2013</th> <th>May – Nov 2014</th> <th>May – Nov 2015</th> <th>Generation Type</th> </tr> </thead> <tbody> <tr> <td>4.8</td> <td>5.1</td> <td>5.6</td> <td>Hydroelectric</td> </tr> <tr> <td>6.0</td> <td>5.9</td> <td>6.6</td> <td>Nuclear</td> </tr> <tr> <td>12.0</td> <td>12.3</td> <td>12.5</td> <td>Wind</td> </tr> <tr> <td>12.6</td> <td>12.9</td> <td>21.1</td> <td>Bio---energy</td> </tr> <tr> <td>13.5</td> <td>14.2</td> <td>12.7</td> <td>Natural Gas</td> </tr> <tr> <td>48.9</td> <td>47.6</td> <td>47.3</td> <td>Solar</td> </tr> </tbody> </table>	Nov – Apr 2013	May – Nov 2014	May – Nov 2015	Generation Type	4.8	5.1	5.6	Hydroelectric	6.0	5.9	6.6	Nuclear	12.0	12.3	12.5	Wind	12.6	12.9	21.1	Bio---energy	13.5	14.2	12.7	Natural Gas	48.9	47.6	47.3	Solar	<p>Ontario Society of Professional Engineers Energy Task Force April 2015</p>
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<p>Emissions Double as We Add Wind and Solar Plants</p> <ul style="list-style-type: none"> • Wind and Solar require flexible backup generation. • Nuclear is too inflexible to backup renewables without expensive engineering changes to the reactors. • Flexible electric storage is too expensive at the moment. • Consequently natural gas provides the backup for wind and solar in North America. • When you add wind and solar you are actually forced to reduce nuclear generation to make room for more natural gas generation to provide flexible backup. • Ontario currently produces electricity at less than 40 grams of CO2 emissions/kWh. • Wind and solar with natural gas backup produces electricity at about 200 grams of CO2 emissions/kWh. Therefore, adding wind and solar to Ontario’s grid drives CO2 emissions higher. From 2016 to 2032 as Ontario phases out nuclear capacity to make room for wind and solar, CO2 emissions will double (2013 LTEP data). • In Ontario, with limited economic hydro and expensive storage, it is mathematically impossible to achieve low CO2 emissions at reasonable electricity prices without nuclear generation. 	<p>Ontario Society of Professional Engineers Energy Task Force April 2015</p>																												