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**To Julie Green**

Senior Policy Advisor  
Ministry of Energy  
Regulatory Affairs and Strategic Policy  
Strategic Policy Branch  
880 Bay Street  
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Toronto Ontario  
M7A 2C1

**Reference EBR Registry number 011-9490 – input to Ontario’s Long Term Energy Plan**

Dear Ms Green,

On behalf of The Hamilton Association for Renewable Energy (HARE) the attached input is submitted to the Long Term Energy Plan. It is given in the form of answers to the “considerations” presented in the Making Choices – Reviewing Ontario’s Long Term Energy Plan.

We would also like to note some general points which are not included in responses to the “considerations”.

1. There appears to be insufficient understanding of the key drivers of long-term energy needs in the majority of the general public in Ontario. The overall need to reduce greenhouse gas production and to migrate our energy use away from fossil fuels is still not well accepted. As a result many important decisions become too easily politicized in ignorance of the real facts. Much more public education is needed on the nature of our energy based economy and how it will be affected by climate change mitigation and energy scarcity.
2. Better information is needed on the full costs of the different sources of electricity supply, including all of the costs of long term debt repayment, hazardous waste disposal and hidden liabilities.
3. Given the timeframe of the long-term plan, full consideration should be given to the impact of carbon taxes into the costing of the different alternatives. Although carbon taxes are anathema to the current Federal Government, the increasingly clear evidence of human caused climate change will undoubtedly cause their introduction in the next few years. Large scale energy companies are already doing their long term planning based on as much as \$68/ton price on carbon<sup>1</sup>. Any planning and costing should consider using \$50/ton as a minimum carbon price with higher alternative levels also considered. This may help the public understanding of the value of renewables.
4. On nuclear power - The Ministry notes that nuclear is “GHG free”. This is somewhat misleading. While fossil fuels are not burned for ongoing electricity generation, there is considerable embedded carbon in the

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<sup>1</sup> Shadow Carbon Pricing in the Canadian Energy Sector - Sustainable Prosperity Policy Brief March 2013

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requirement to construct power stations, mine and process uranium, provide power from alternate sources during the very long construction period of a nuclear power station and finally to dispose of nuclear waste. A recent study has shown that nuclear power has emission ranging from 16-55 g CO<sub>2</sub>-eq./kWh.<sup>2</sup>

5. The availability of public capital investment will be a key limiting factor. The very large investment needed to refurbish nuclear power stations has a strong likelihood of harming the ability of the Province to make the required progress in renewables. The cost impact should be made much clearer to all concerned – or disproved.

**We are strong supporters of the intentions and objectives of the Ontario Green Energy Act and hope that it will continue to be strengthened to ensure renewables form an ever increasing part of Ontario's power generation capacity.**

Yours sincerely,



**Nadine Bernacki**

**President, Hamilton Association for Renewable Energy**

**Endorsed by the Board of HARE**

**Dave Carson  
Beatrice Ekoko  
Ross Englefield  
Pauline Prowse  
Bill Thompson  
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<sup>2</sup> Greenhouse-gas Emissions from Solar Electric- and Nuclear Power: A Life-cycle Study Vasilis M. Fthenakis and Hyung Chul Kim

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<i>Questions for Consideration</i>	<i>Input</i>
<p><b><i>How do you think Ontario should balance ratepayer costs, system reliability and GHG emissions when it makes supply mix decisions?</i></b></p>	<p>The Plan should be based on overall long term priorities. Balance will mean some compromise but it must not be at the expense of the long term safety and security of Ontario citizens. If GHG emissions are not substantially reduced, we face major impacts to our way of life and costs that will be much higher than any energy cost increase could envisage.</p> <p>Reduction of greenhouse gas emissions is therefore a top priority and should not be significantly deferred because of short term pressures. The Provincial Government must find ways to communicate the importance of GHG reductions that help citizens understand why there may be some short term additional costs to be incurred.</p> <p>The switch to renewables, which is necessary to meet GHG reductions, can be helped if the distribution network is enhanced to take advantage of hydro-electric power imports from Manitoba and Quebec. There is also increasing evidence<sup>3</sup> that a smart distribution network, coupled with diversified renewable sources from wind, solar and biomass, can provide secure supplies. (In this case security of supply being equated to 24/7/365 availability of the required power supplies).</p>
<p><b><i>Should Ontario adjust and/or broaden its conservation goals, in light of current demand and supply forecasts?</i></b></p>	<p>Conservation should be aggressively promoted and enabled. One time conservation incentives which permanently reduce consumption are the cheapest source of energy supply.</p> <p>Existing supply forecasts depend on existing generation capabilities which each have limited lifetimes and high capital costs of replacement. Conservation, which reduces demand, can make a big contribution to reducing future supply needs. Supply forecasts which suggest an excess supply of power should not be used as rationale for reducing conservation incentives.</p> <p>Ontario should adopt the approach of amortizing the cost of conservation initiatives over time, rather than in the year in which they are incurred. This would lessen short-term rate impacts and provide a more equitable sharing of costs across all ratepayers, current and future, who benefit from the programs.</p> <p>Municipalities should be encouraged to use Local Improvement Charges to finance homeowner conservation expenditures.</p> <p>Mandatory Home Energy Audits at the time of house sale / resale should also be implemented; once all houses had their energy efficiency index made known, public demand would likely shift to higher energy ratings being required.</p> <p>Further conservation gains can be made if Ontario makes changes to the building code. The code still enables glass curtain wall condominium towers, putting appearance ahead of energy efficiency. The requirements for housing construction are still below the R2000 approach developed more than 25 years ago<sup>4</sup>.</p>

<sup>3</sup> ["The Base Load Fallacy" - Dr. Mark Diesendorf,, see also http://www.smartplanet.com/blog/take/designing-the-grid-for-renewables/135](http://www.smartplanet.com/blog/take/designing-the-grid-for-renewables/135)

<sup>4</sup> "Typically, R-2000 homes need 30 percent less energy to operate than conventional new homes." <http://oee.nrcan.gc.ca/residential/personal/new-homes/r-2000/standard/11018>

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<p><b>How can Ontario maximize its demand management potential?</b></p>	<p>Ontario can maximize its demand management potential by</p> <ul style="list-style-type: none"> <li>a) continuing to use residential “time of use” pricing and increasing peak period pricing</li> <li>b) increasing the use of smart controls which can automate power reductions during peak periods</li> <li>c) increasing incentives to high use industrial customers such as steel mills to reduce peak period consumption, enabling load shedding.</li> </ul>
<p><b>Nuclear power provides over half of Ontario's generation. What are your views on refurbishing existing nuclear units?</b></p>	<p>Ontario should follow the example of Germany and aim to reduce reliance on nuclear power through use of renewables. The Province's total capital investment in power generation is limited by various economic pressures. If scarce capital is employed in nuclear refurbishment, then the ability to meet the overarching goal of reduced GHG emissions will not be met.</p> <p>Past experience has shown that nuclear power expenditures consistently exceed cost estimates by a large percentage<sup>5</sup>. If we proceed to refurbish Darlington, the Province will face ever increasing capital costs which will add to the Provincial deficit &amp; debt for long periods of time before any new power is generated. Renewable investments have a much shorter development period and can produce a much faster return of generated energy from the capital invested. (Solar and wind projects can be planned, designed and implemented in 1-2 years compared to the minimum 4 years and as much as 10 years for nuclear).</p> <p>Use of nuclear power will also perpetuate the centralized model of power distribution, contrary to renewables, which enable a much more resilient distributed generation model. A distributed generation model is more in line with the distributed consumption realities.</p>
<p><b>How should we proceed with nuclear new build?</b></p>	<p>Comments above on refurbishing apply to new build as well.</p> <p>Following the March 2011 Fukushima disaster, we should all be much more conscious of the dangers of radioactive release following unforeseen damage to reactors. Over two years after the initial disaster, new related releases of radio-active materials are still occurring (Aug 22<sup>nd</sup> news).</p> <p>With several of Ontario's reactors placement close to Lake Ontario, which is also the source of Toronto's drinking water, we must never lose sight of the potential risks associated with nuclear power.</p> <p>Disposal of nuclear waste continues to have uncertain costs and consequences; currently storage is only “temporary” though it has been undertaken for over 40 years. The long term liabilities associated with nuclear waste disposal should not unfairly be placed on future generations to the benefit of current consumers. The full costs of disposal should be included in any comparative costing between nuclear and other sources of generation.</p>
<p><b>What further role should natural gas play in Ontario's</b></p>	<p>Natural gas plants can provide a “bridge” to renewables but the Province should study in depth the potential future price increases</p>

<sup>5</sup> Example, Darlington Construction started in 1981 at an estimated cost of \$7.4 Billion 1993-adjusted CAD, and finished in 1993 at a cost of \$14.5 billion.

[http://en.wikipedia.org/wiki/Economics\\_of\\_nuclear\\_power\\_plants](http://en.wikipedia.org/wiki/Economics_of_nuclear_power_plants)

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<p><i>supply mix?</i></p>	<p>that may come as natural gas markets change. There is growing evidence that the current North American optimism over natural gas supplies from hydraulic fracturing (fracking) is over-stated due to a) much faster depletion rates and b) the cost of drilling replacement wells and c) replacement wells are in lower yielding areas<sup>6</sup>. Further concerns would arise if natural gas plants need for fuel became a justification for any fracking in Ontario. There are serious concerns about the impact of this technique on air and water quality.</p> <p>Natural gas generation perpetuates our dependence on fossil fuels which are a source of GHG emissions. As we will have already displaced all our coal burning generation sources in 2014, use of natural gas generation can only slow down the rate at which the Province can meet GHG emissions reduction goals in future.</p>
<p><i>What is the best way to assess CHP to ensure generation is developed where it is specifically needed, meets system needs and maximizes value to electricity ratepayers and to heat customers?</i></p>	<p>As many industrial processes produce heat as a “waste” by-product, the creation of CHP systems that utilize this waste heat should reduce demand on other energy sources. In this regard such projects should be encouraged, as they reduce waste and alternate energy consumption.</p> <p>There is evidence that combined heat and power can make effective use of “energy from waste”<sup>7</sup>. However there is a danger that the use of energy from waste can remove motivation from municipalities to reduce waste generation, as it is perceived that there will then be insufficient waste to run the EFW system. As waste reduction must form an important part of any municipality’s overall GHG reduction, the source of any CHP system’s inputs must form a part of any project evaluation and permitting.</p> <p>The City of Hamilton has an installation which uses gas from waste, which is injected into the Natural Gas System. This is also a method that uses waste to reduce overall GHG emissions which could be supported by the Province through additional FIT tariffs.</p>
<p><i>Looking beyond 2018, what goal should Ontario set to ensure that non-hydro renewable energy continues to play an important role in meeting Ontario’s supply needs?</i></p>	<p>Ontario should set aggressive goals to grow the supply of non-hydro renewable energy. The additions to the FIT/MicroFIT programs announced by the Minister in May, amounting to 900Mw, are not enough. We need to aim much higher, using Germany as an example.</p> <p>True security for future generations will rely not only on GHG emissions reductions, to mitigate climate impacts, but also energy security based on renewables. Fossil fuels are a non-renewable resource and their availability at reasonable prices is declining.</p> <p>The concept of Energy Return on Energy Invested (EROEI), which has been analysed by an increasing number of economists, demonstrates increased risks for our economy and standard of living if we continue to rely on fossil fuels as a main source of energy.</p>
<p><i>What innovative strategies and technologies could Ontario pursue in order to</i></p>	<p>Better integration of renewable power can be accomplished by</p> <p>a) <b>Technologies</b> that will enable full adoption of the distributed</p>

<sup>6</sup> Snake Oil- How Fracking’s False Promise imperils our future – Richard Heinberg 2013 and Drill Baby Drill David Hughes, both published by Post Carbon Institute.

<sup>7</sup> See the articles on US EPA website <http://www.epa.gov/chp/basic/> and the many implementations in Denmark at <http://www.stateofgreen.com>

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<p><b><i>further develop and better integrate renewable energy generation into the system?</i></b></p>	<p>generation capacity that comes from renewable energy; this includes smart control technologies and distributed grid architectures.</p> <ul style="list-style-type: none"> <li>- Enabling the connection of electric vehicles to the network as a means of off-peak storage should be anticipated.</li> <li>- Enabling homes with solar panels to both use home generated power and to feed in that power to the network should be enabled.</li> </ul> <p>b) <b><i>Policies</i></b> that greatly encourage and enable local community ownership of renewable generation sources.</p> <p>Current resistance to wind power in Ontario stems from the fact that projects are driven by large businesses with commercial interests. In European jurisdictions, they have shown much higher adoption (reportedly around 50% individual and community owned in Germany) with resulting lower resistance to community owned power. The FIT program and similar approaches should provide for a much higher degree of incentive for community based power.</p> <p>Power Distribution Companies should have a stronger obligation to provide connectivity capacity for renewables; current limitations prevent many projects from proceeding and Distribution Companies do not have a strong enough obligation to provide connection.</p> <p>c) <b><i>Urban design</i></b> that sets solar panel capability (but not necessarily installation) as a standard requirement. In new developments this starts with the orientation of streets and houses and the design of the power distribution network. This could include requirements to change Property Rights to include a right to light. Currently the Property Limitations Act of Ontario states that no resident has the "right to light."</p>
<p><b><i>Should Ontario pursue further expansion of hydroelectric capacity?</i></b></p>	<p>Yes, hydro expansion should be pursued.</p> <p>This can include not only large scale hydro projects, but smaller scale local and run of the river projects.</p> <p>There are environmental concerns regarding the impact of large scale flooding behind hydro dams and these should be taken into account. However, in trading off the impact of fossil fuel generation, the environmental impact is much more local and manageable.</p> <p>Displacement of First Nations communities by hydro flooding is generally no longer acceptable, but could be explored with leadership from the First Nations communities affected.</p> <p>Local community run-of-river power generation will require some of the same community power involvement (and policies) as that required to overcome community resistance to wind power.</p>
<p><b><i>What role should storage play in meeting Ontario's future energy needs and how should it be valued?</i></b></p>	<p>Storage can play a role, where it can provide reasonable cost peak power.</p> <p>It is probable that the cost of providing electric power will increase into the future. This being so, it is reasonable to provide tariff incentives to provide peak power from storage facilities. In appropriate locations this could provide a cheaper source than other standby generation methods.</p> <p>Storage provided power should be valued with at least two components</p>

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	<p>a) a peak power purchase component; representing the alternate cost of generation by a standby power facility</p> <p>b) an incentive component to grow this capability in the next few years)</p>
<p><b><i>What kinds of local and electricity system benefits as well as broader economic, environmental and community benefits should be considered when selecting and implementing options to meet regional needs?</i></b></p>	<p>The creation of a more distributed system, as noted in some of the comments above, has a number of benefits.</p> <ul style="list-style-type: none"> <li>• Environmental impact reduction; specifically climate change caused by GHG emissions</li> <li>• Sustainability is increased; economies will suffer as fossil fuel prices increase; the use of renewables will become the core of a sustainable economy</li> <li>• Resilience is increased; the impact of a single large systems failure is greatly reduced with distributed generation</li> <li>• Community engagement increased; less resistance from implementing new facilities resulting from more local community ownership</li> <li>• Faster deployment of new power; by installing in smaller increments the long lead times from things like nuclear facilities are avoided</li> </ul>
<p><b><i>What transmission projects should be considered priorities and why?</i></b></p>	<p>1. Projects to enable a shared energy economy with neighbouring provinces.</p> <p>The grid should be enhanced to improve the ability for imports from Quebec and Manitoba. Both these provinces have surplus generation capacity from renewable (hydro) sources. We should develop the network to allow us to buy power from these sources.</p> <p>2. Projects to enhance distributed power generation capabilities.</p> <p>Many renewables projects are currently not approved, or deferred, because of lack of local network capacity. Local networks should be enhanced to enable many more small generation capabilities.</p>
<p><b><i>How should Ontario work with the federal government to support development of transmission projects to connect remote First Nation communities, including any required enhancements to the existing system?</i></b></p>	<p>No comment</p>
<p><b><i>Which technology and smart grid innovations do you believe could offer you the greatest benefit to your community and the system as a whole?</i></b></p>	<p>a) increasing the use of smart controls which can automate power reductions during peak periods</p> <p>b) development of electric car charging capabilities</p> <p>c) enabling solar panel users to use power they generate and route the surplus to the grid – with the capability of using that power also when the grid supply to their house is down. (Smarter controls could be developed to ensure safety of hydro workers under this scenario)</p>
<p><b><i>How should Ontario evaluate whether to expand transmission to take advantage of imports and</i></b></p>	<p>Given that we do not have a lot of new hydro power opportunities in Ontario, if Ontario can establish long term power import arrangements at a reasonable price which results in less dependence on nuclear or gas generation, we should consider expanding our</p>

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<b><i>other opportunities?</i></b>	transmission facilities to enable this.
<b><i>Looking forward, what are the most important tools to support Aboriginal community participation in Ontario's energy sector?</i></b>	No comment
<b><i>Is there a role for government to work with industry on applications of natural gas such as LNG and CNG?</i></b>	No comment
<b><i>Should government be working with industry to expand natural gas supply to new communities?</i></b>	Anything that is done to increase dependence on fossil fuels will slow down migration to renewables. If the main use of the supply is for home heating, then it should be avoided. The government focus should be on finding ways to meet the new communities' needs with renewables.
<b><i>Is the current federal regulatory process sufficient to meet Ontario's needs?</i></b>	No. The recent changes to the Environmental Assessment Act, the Fisheries Act and the Navigable Waters Act have greatly reduced the environmental protections we used to have from oil, gas and pipeline projects.