



POLLUTION PROBE

CLEAN AIR. CLEAN WATER.

January 15, 2007

Ontario Power Authority
Suite 1600
120 Adelaide Street West
Toronto, ON M5H 1T1

Submitted via email: OPA Stakeholder Submission Form

RE: Comments on Discussion Paper 6: Sustainability and Discussion Paper 7: Integrating the Elements – A Preliminary Plan.

Dear Ontario Power Authority,

The following comments consider the OPA's approach to sustainability in both Discussion Papers 6 and 7 (the Discussion Papers).

The OPA has done a poor job addressing sustainability and developing conservation targets in the Discussion Papers, which contravenes the *Electricity Restructuring Act, 2004, S.O. 2004, c.23 – Bill 100*. Pollution Probe therefore rejects the Preliminary Plan and calls on the OPA to revise both *Discussion Paper 6: Sustainability (the Sustainability Paper)* and *Discussion Paper 7: Integrating the Elements – A Preliminary Plan (the Preliminary Plan)*.

Part #1: Sustainability

Comments on:

- Concept of sustainability
- Evaluation criteria
- Indicators
- Preliminary Results of Environmental Performance

Concept of Sustainability

The discussion of sustainability in the Sustainability Paper is very weak. Reference should have been made to a range of sources, such as The Natural Step and the Ontario and National Round Tables on Environment and Economy. The Natural Step, for example, identifies four 'system conditions' for a sustainable society:

“In the sustainable society, nature is not subject to systematically increasing:

1. concentrations of substances extracted from the Earth's crust,
2. concentrations of substances produced by society
3. degradation by physical means

and, in that society ...

4. people are not subject to conditions that systematically undermine their capacity to meet their needs.”

The Natural Step’s system conditions are consistent with the three government policies highlighted by the OPA from in the *Electricity Restructuring Act (2004)*, which are:

1. the long-term goal of the creation of a conservation culture
2. a preference for renewable sources of energy, and
3. the replacement of coal-fired generation for environmental and health reasons.

The Preliminary Plan violates the above four ‘system conditions’ for a sustainable society,

“NO_x and PM_{2.5} emissions increase on an absolute basis...radioactive air emissions increase slightly on an absolute basis...water consumption and withdrawal increase on an absolute basis ...”.¹

Though the information is represented to indicate for example, a steady rate or slight decrease when quantified per person, all the above points state an overall absolute increase. This is not consistent with the above four ‘system conditions’ for a sustainable society. This is further exacerbated by a lack of quantifiable data as represented in Tables 3.10 - 3.14 in the Preliminary Plan. Nitrous Oxide (N₂O), identified as one of the six greenhouse gases (GHG) under the Kyoto Protocol, has a global warming potential (GWP) of 310 and an atmospheric lifetime of 120 years.² Only marginal data has been collected on N₂O and no data has been compiled for more potent GHGs, such as SF₆, which has a GWP of 23,900 and an atmospheric lifetime of 3,200 years.³ The most common use of SF₆ is as an electrical insulator in high voltage equipment that transmits and distributes electricity. The U.S. Environmental Protection Agency reports, “The electric power industry uses roughly 80% of all SF₆ produced worldwide”.⁴

In the Sustainability Paper, the OPA states, “**GHG emissions** are one of the three CESI indicators and were considered the **most important environmental category in the supply mix advice**”. SF₆ emissions data, as well as all other toxics, should be reported on especially given the OPA’s emphasis on GHG emissions. Reporting SF₆ emission levels, as well as the other six identified GHGs under the Kyoto Protocol, is a mandatory reporting requirement under the Kyoto Protocol.⁵ Collection of the data should inform the development of an SF₆ emission reduction program. Also, GHGs should be reported in both their carbon dioxide equivalent and in their raw form to accurately represent their effects.

¹ *The Preliminary Plan*, OPA, pp.101-102.

² *Emissions Trading Primer*, Pollution Probe, p. 55. See

<http://www.pollutionprobe.org/Publications/emissionstradingprimer.pdf>.

³ *Ibid.*

⁴ *SF₆ Emission Reduction Partnership for Electric Power Systems*, U.S. Environmental Protection Agency. See <http://www.epa.gov/electricpower-sf6/overview.html>.

⁵ Article 4(1)(a), Article 12 (1)(a), and Decision 3/CP.5 in the United Nations Framework Convention on Climate Change, requires Annex 1 Parties to submit an annual greenhouse gas (GHG) inventory report.

Evaluation Criteria

Pollution Probe believes the evaluation criteria should be guided by the broader view of sustainability offered by *The Natural Step* and other sources. In addition, three overarching environmental principles should guide decision making:

- polluter pays principle
- pollution prevention principle
- precautionary principle

These environmental principles and the priorities for ‘supplying’ electricity to various users should be reflected in the “Context Specific Evaluation Criteria.” The criteria noted on page 6 of the Sustainability Paper do not adequately incorporate these principles and priorities. For example, there is no mention of eliminating hidden subsidies and ensuring that all costs associated with a particular technology are transparent. There is no directionality in the criteria, as required by the *Electricity Restructuring Act (2004)*. There are no criteria that talks about avoiding increasing concentrations of substances extracted from the Earth’s crust. The evaluation criteria do not encompass the need to further research and develop more efficient and environmentally benign technologies.

In effect, the criteria in the Sustainability Paper tend to favour existing technologies and maintain the status quo. A much more visionary approach and set of related criteria are needed to bring Ontario’s electricity system closer to sustainability. The *Electricity Restructuring Act (2004)* contains visionary language, but the Sustainability paper falls short of specifying the criteria that are needed to guide decision making in this direction. If used as stated, the result will be a serious underinvestment in conservation and demand management, as well as in renewable energy technologies (both exiting and future technologies). Instead, a legacy of ever-increasing radioactive waste will result, with unknown implications for future generations (i.e., a violation of the precautionary principle and likely the polluter pays principle). As noted by *The Natural Step*,

“... what must at least be achieved is a halt to systematic increases in concentration of matter that is net-introduced to the biosphere from the Earth’s crust. ... The flows of molecules and nuclides that leak out from social activities must not be so large that they can neither be integrated into the natural cycles within the biosphere, nor be deposited safely into the lithosphere”.⁶

Indicators

The proposed indicators are deficient in several respects and parallel the criteria in omitting information that reflects the principles, sustainability conditions and priorities mentioned above. All technologies should be evaluated on a full life-cycle basis. The ability of the Earth to degrade and detoxify the wastes generated by a given technology should be part of the indicator set. The current and historical capacity factors and actual performance of all technologies should be

⁶ *The Natural Step Framework for Sustainability*. The Natural Step. See <http://www.naturalstep.ca/systemconditions.html>.

readily accessible. The conversion efficiency of all technologies should likewise be shown. If not done properly, Pollution Probe believes that the advantages of distributed generation and small-scale renewable energy technologies in general will be obscured, while the hidden costs and subsidies to conventional larger-scale technologies will not be transparent. Furthermore, the risks associated with all of the technologies should be clearly documented and reported on.

All appropriate emissions and wastes from electricity generation technologies should be reported. In particular, large GHG emitters should report against ISO14064 standards and should participate in the GHG Clean Projects™ Registry run by the Canadian Standards Association (CSA). This registry provides a consistent reporting, accounting and registry service for GHG inventories, projects and resulting emission reductions and removals that conform to ISO 14064.

Preliminary Results of Environmental Performance

Tables 3.10 to 3.14 in the Preliminary Paper, highlight the ineffective application of the sustainability concept.

Table 3.10 – Preliminary Results of Environmental Performance – Unit Basis⁷

Year	Air ^f											
	Conv. Normalized (wt kg/GWh)	NO _x (kg/GWh) ³	SO ₂ (kg/GWh)	PM _{2.5} (kg/GWh)	Mercury (kg/GWh)	Formaldehyde (kg/GWh)	Benzene (kg/GWh)	GHG Normalized (wt kg/GWh)	CO ₂ ² (T/GWh)	Methane (T/GWh)	N ₂ O (T/GWh)	Radio-activity (person SV/MWh)
2010	405	173	76	8.61	0.001	0.22	0.005	115	106	5.4	0.85	0.0001
2025	321	171	29	9.98	0	0.24	0	55	45	6.5	1.03	0.0001
% Change ⁴	-21%	-1%	-61%	16%	-100%	10%	-100%	-52%	-58%	20%	20%	-2%

Water ⁵		Land	
Withdrawal (MM m ³ /GWh)	Consumption (MM m ³ /GWh)	Waste (kg/GWh)	Land Use (ha/GWh)
5,173	0.79	2,613	1,340
5,148	0.82	37	1,827
-0.5%	3%	-99%	36%

Note: “wt” refers to the weighted indices for conventional contaminants and GHG emissions (see Appendix E for more information).

Source: OPA, SENES

Highlights

1. The air category does not report on all relevant emissions data, such as SF₆. The data itself has significant gaps – there is almost no data for mercury, formaldehyde and benzene. There is also no data for emissions from transmission. All of this data should be compiled and reported on for all electricity generation options and transmission.
2. All GHG emissions should be reported in both their original chemical form and in carbon dioxide equivalent (CO₂e).
3. All emissions data should also be represented on an absolute basis.

⁷ The Preliminary Plan, OPA, p. 99.

4. An additional line should be added to represent change on an absolute basis.
5. There is a disconnect between the Sustainability Paper and the Preliminary Plan. The Preliminary Plan states, “This (refers to water use) indicator includes not only use but, potential effects on aquatic biology and changes to physical characteristics such as temperature and dissolved oxygen”.⁸ This statement is located in an appendix, not in the main body of the document. Comparatively, the Sustainability Paper states, “The proposed indicator (water use) is the same as the water use indicator in the supply mix advice”.⁹ The Supply Mix Advice includes only water withdrawal and consumption. Though the Preliminary Plan may override the Sustainability Paper, there exists a disconnect within the Preliminary Plan itself.

Part #2: Conservation Demand Management

Comments on:

- Targets

Targets

The conservation demand management (CDM) targets outlined in the Preliminary Plan do not represent the achievable economic potential and therefore do not conform with the spirit of the *Electricity Act (2004)*.

<i>Preliminary Plan Targets (MW)</i>				<i>Pollution Probe Targets (MW)</i> ¹⁰	
2007-2010	2011-2015	2016-2027	Total	Technical Potential	Achievable Economic Potential
3,042	1,000	3,500	7,542	24,600	12,300

Part #3: Visioning

The process used to develop the Preliminary Plan is flawed. The sustainability framework within the plan is an afterthought, not a core component, and the plan’s direction reflects this. The modifiers, for example, are poorly constructed lacking in background information and an explanation of how they will be applied. A lack of information makes it difficult for stakeholders to comment. It appears the OPA has developed a plan and then tried to force the plan into a sustainability framework due to regulatory requirements. This process needs to be reversed. The OPA should develop a vision for sustainability, which provides direction on the types of technologies to be developed and integrated into the Ontario grid by 2025, and then work backwards to the present day. This sustainability-based vision will direct the development of the Preliminary Plan. By contrast, the Preliminary Plan supports the continued development and

⁸ *The Preliminary Plan*, OPA, p. 151.

⁹ *The Sustainability Paper*, OPA, p. 17.

¹⁰ *The Electricity Supply/Demand Gap and the Role of Efficiency and Renewables in Ontario*, ICF Consulting. See http://www.pollutionprobe.org/Reports/elec_supplydemandICF.pdf.

reliance on large-centralized generating facilities with the exception of marginal renewable energy and CDM development. The approach to transmission exemplifies this. The OPA states,

“In general, bulk transmission system upgrades are triggered by large, low-cost hydroelectric developments, not by smaller, higher-cost wind and bioenergy sites. After an upgrade is triggered by a large development, there may still be capacity available for further development of wind, hydro or bioenergy, in which case these developments could proceed without causing additional upgrade cost. Conversely, there are some areas which contain enough smaller resource sites to collectively trigger a bulk system upgrade. In these cases, the cost of the upgrade is allocated for costing purpose among each of the sites that will be using the upgrade”.¹¹

This approach to transmission facilitates the development of large centralized facilities, not the development of sustainable renewable energy technologies that are included in ‘smaller resource sites’. In this model, renewable energy technologies pay for transmission grid upgrades and conventional technologies do not. Transmission grid development should facilitate, not act as a barrier, to green power development. Preferential treatment should be given for green power technologies to connect and green power technologies should enjoy the same benefits as conventional technologies i.e. there should be no associated cost to green power developers to connect to the transmission grid. Preferential access to the transmission grid was one of two key aspects of the German feed-in tariff for which the standard offer contract program is modelled.

A recently released report by the Worldwatch Institute Center for American Progress entitled *American Energy: The Renewable Path to Energy Security* states,

“Renewable energy sources also provide grid operators with real economic benefits (in addition to their peaking value) that are just beginning to be recognized. Conventional power plants based on coal and nuclear power can take 5-15 years to plan and construct, a serious disadvantage given the uncertainties of future power demand and the risks of borrowing hundreds of millions of dollars while the plants are built. Construction lead times for large renewable projects are often in the range of 2-5 years, reducing the risk of utilities and allowing capacity to be added incrementally to match load growth. According to FPL Energy, it can take as little as 3-6 months from ground breaking to commercial operation with new wind farms. Once on line, renewable facilities can begin operation more rapidly than conventional power plants after blackouts, reducing associated economic and security costs”.¹²

The OPA statement above focuses on bulk transmission system upgrades versus smaller transmission upgrades that can facilitate renewable energy deployment and; does not reflect the benefits of integrating renewable energy technologies into the transmission grid.

¹¹ *The Preliminary Plan*, OPA, p. 47.

¹² *American Energy: The Renewable Path to Energy Security*, Worldwatch Institute Center for American Progress, p. 16. See <http://images1.americanprogress.org/i180web20037/americanenergynow/AmericanEnergy.pdf>.

Recommendations

Visioning

- The following hierarchy for a *Sustainable Electricity Future* should be used to guide the development of the IPSP.¹³
 1. Energy efficiency and conservation
 2. Green power that meets the criteria for EcoLogo certification
 3. Ecologically sustainable larger-scale hydro and other renewables
 4. Combined heat and power using natural gas, and
 5. The cleanest and safest technologies among the remaining options.

Full Life Cycle Assessment

- All technologies should be evaluated based on a full life-cycle assessment with associated costs including health effects.

Environmental Performance

- The water use indicator, measured in volume/MWh, should be expanded to include comprehensive effects on the aquatic system, such as effects caused by temperature changes.
- All emissions data for every generation option should be compiled and reported on as outlined in Tables 3.10 – 3.14 in the Preliminary Plan, including sulphur hexafluoride SF₆, and other GHGs and air pollutants where appropriate. Emissions data should be reported in accordance with ISO 14064 under the Canadian Standards Association GHG Registries for electric utility operations.
- Wastes Generated should also be evaluated based on toxicity, not solely based on waste produced per unit of electricity producing.

Modifiers

- Present detailed information on how the modifiers were developed and how they will be applied then re-submit the modifiers for stakeholder consultation.

Conservation Targets

- CDM targets should be increased to their achievable economic potential at a minimum.

¹³ Ibid.

Subsidies

- Eliminate hidden subsidies.
- Make all remaining subsidies transparent.

The Public

- A comprehensive public education and outreach strategy should be developed to inform Ontarians broadly about the Vision for a sustainable electricity future for Canada and to promote awareness of the benefits this future promises. Resources to support implementation of the Vision should be developed by use by community leaders, educators, NGOs and private sector.

Best Regards,



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