UPDATE ON STATUS OF RECOMMENDATIONS



Power for the Future

Towards a Sustainable Electricity System for Ontario



Pembina Institute
for Appropriate Development

Canadian Environmental Law Association

Acknowledgements

The Pembina Institute for Appropriate Development and the Canadian Environmental Law Association would like to thank the Oak Foundation for its financial support of this project.

Layout and Design by Green Living Communications

Publication Date: November 2005

Author: Mark Winfield, Ph.D.

ISBN#1-897043-42-1

CELA Publication Number: 525

About the author

Mark S. Winfield, Ph.D.

Mark Winfield is Director of the Pembina Institute's Environmental Governance Program. Prior to joining Pembina he was Director of Research with the Canadian Institute for Environmental Law and Policy. Dr. Winfield holds a Ph.D. in Political Science from the University of Toronto, and has published reports and articles on a wide range of environmental policy issues. He is also a member of the associate faculty with the University of Toronto's Centre for the Environment.

About the Pembina Institute

The Pembina Institute is an independent, not-for-profit environmental policy research and education organization specializing in the fields of sustainable energy, community sustainability, climate change and corporate environmental management. Founded in 1985 in Drayton Valley Alberta, the Institute now has offices in Calgary, Edmonton, Vancouver, Ottawa and Toronto.

For more information on the Institute's work, please visit our website at www.pembina.org.

About the Canadian Environmental Law Association

The Canadian Environmental Law Association (CELA) is a public interest law group founded in 1970 for the purpose of using and improving laws to protect the environment and public health and safety. Funded as a legal aid clinic specializing in environmental law, CELA lawyers represent individuals and citizens' groups in the courts and before tribunals on a wide variety of environmental protection and resource management matters. In addition, CELA staff members are involved in a range of initiatives related to law reform, public education and community organization. Please visit our website at www.cela.ca.

Towards a Sustainable Electricity System for Ontario?

A Provincial Progress Report

I. Introduction

Ontario's Electricity Situation

The past seven years have been a period of extraordinary upheaval in the institutions and policies related to electricity in Ontario. More changes have occurred in the electricity sector since 1998 than over the preceding nine decades following the creation of the Ontario Hydro-Electric Power Commission (HEPC) in 1906.

The *Energy Competition Act* of 1998 divided the HEPC's successor, Ontario Hydro, into four separate entities: Ontario Power Generation (OPG), Hydro One, the Ontario Electricity Financial Corporation (OEFC), and the Electrical Safety Authority. In addition, under the legislation, competitive retail and wholesale electricity markets were introduced in May 2002, supervised by the Ontario Energy Board (OEB) and an Independent Market Operator (IMO). However, the government terminated the competitive retail electricity market six months later in the context of high and unstable electricity prices.

Meanwhile, from 1997 onwards, a significant portion of the province's nuclear generating facilities were taken out of service for safety and maintenance overhauls. This, in turn, led to an increased reliance on coal-fired generation to meet the province's electricity needs, a situation that has significantly exacerbated the severe air quality problems regularly experienced in southern Ontario.

The new provincial government elected in October 2003 made a strong commitment to the phase out of OPG's coal-fired plants by 2007 (later extended to 2009)[1] due to the severe environmental and health impacts of their operation.[2] The situation is further complicated by the consideration that all of the province's existing nuclear generating facilities would reach the end of their normal projected operational lifetimes by 2018. The Electricity Supply and Conservation Task Force illustrated the potential future gap between installed generating capacity and electricity demand with the following figure in its January 2004 report.

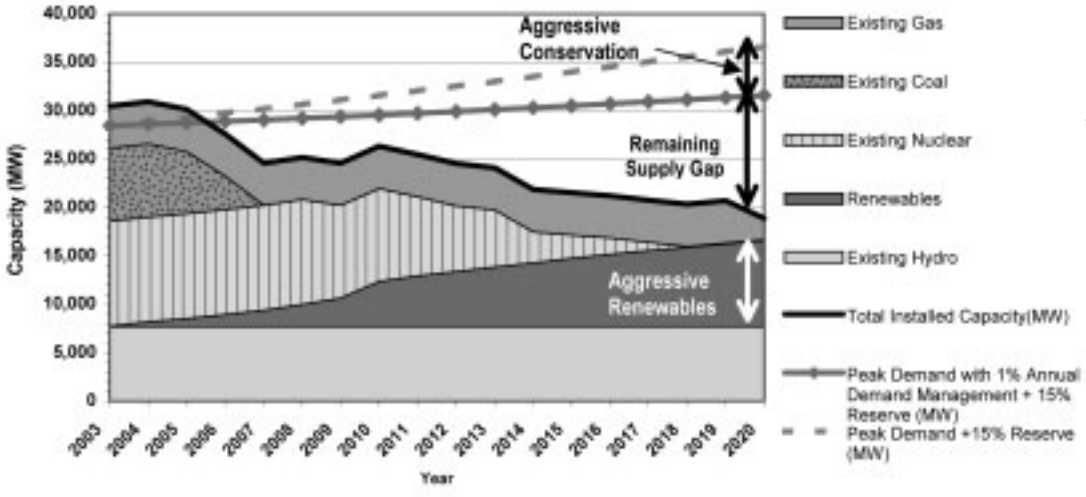


Figure 1: Electricity Supply and Conservation Task Force Projection of Generation vs. Peak Demand—With Renewables

The combination of the projected end of life of the province's existing coal-fired and nuclear generating stations and predictions of growing electricity demand have led the province to conclude that there is a need to replace or renew approximately 25,000 MW of generating capacity over the next 20 years, at an estimated cost of $25-$40 billion.[3] The situation has prompted a major debate over the province's future electricity needs and how those needs should be met.

Power for the Future: Key Findings

In this context, the Pembina Institute and the Canadian Environmental Law Association published *Power for the Future: Towards A Sustainable Electricity System for Ontario* in May 2004.[4] The study assessed the potential for energy efficiency and low-impact renewable energy sources to contribute to meeting future electricity demand in Ontario.

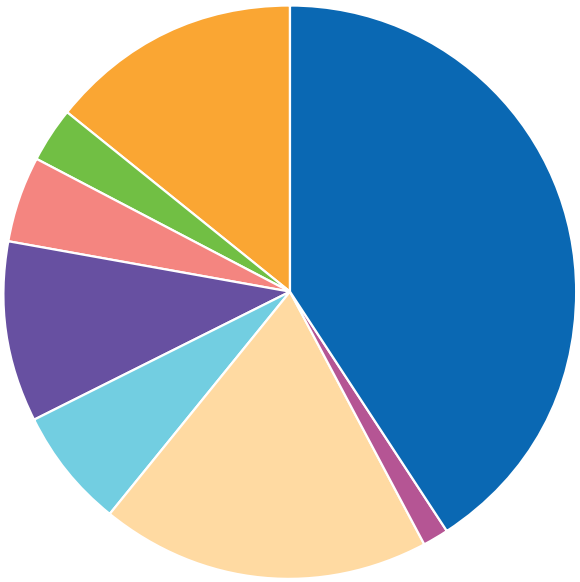
Power for the Future identified a major potential to reduce the province's future electricity demand through energy efficiency measures, increased cogeneration and fuel switching. Modeling conducted in conjunction with the Energy and Materials Research Group at Simon Fraser University concluded that it was possible to reduce projected demand by more than 40% by 2020 relative to business-as-usual scenarios using proven technologies that are commercially available today.

The achievement of these savings would allow the province to avoid the need to construct more than 12,000 MW of generating capacity. A capital investment of $18.2 billion would be required over the 2005-2020 period to achieve this result. However, energy consumers would recover 96% of their investments through energy savings that resulted from their adoption of more efficient technologies. By contrast, providing the equivalent amount of electricity through new nuclear generating facilities would cost in the range of $26 billion in construction expenses alone.[5] Operating, waste disposal and decommissioning costs would be in addition to this base construction cost.[6]

When the potential impact of demand response measures to reduce demand at peak periods was combined with the improvements in end-use efficiency and increased cogeneration, the potential reduction in peak electricity demand approached 50% relative to the 2020 business-as-usual projection. In particular, peak demand could be reduced from 30,000 to just over 15,000 MW.

When these potential savings were combined with the large scale – but feasible – expansion of the use of proven renewable energy technologies, particularly wind, low-impact hydro and waste-generated gas combustion, *Power for the Future* found that it would be possible to meet the province's electricity needs reliably and cost effectively while phasing out coal-fired generation not later than 2010 and nuclear power by 2018. The result would be an electricity system that is more reliable and environmentally and economically sustainable than the existing system. The contributions of conservation and supply sources to such a system are summarized in the following figure.

Figure 2:



Demand Reductions – Efficiency/Cogeneration	73,499
On-Site Solar Roofs Program	2,628
Existing Hydro	33,572
Existing Peak Gas and Replaced Oil	12,208
Wind	18,396
New Hydro	8,760
Biomass	5,606
New CCNG Base Load	25,623
Total Supply	**104,165**
Contingency	**292**

The Ontario Power Authority Supply Advice Request

Further restructuring of the electricity sector took place through Bill 100, the *Electricity Restructuring Act*, adopted at the end of 2004. Among other things, the Act provided for the establishment of a new entity, the Ontario Power Authority (OPA), to undertake long-term electricity system planning and to procure electricity supply and conservation programs. In May 2005, the provincial government mandated the Ontario Power Authority (OPA) to advise it on the shape of the province's future electricity supply mix. This advice, which is to be issued by December 1, 2005, is expected to provide the basis for an integrated electricity system plan to be developed by the OPA for the province. This plan, in turn, will set the direction for the province's long-term approach to electricity supply and demand.

Report Structure and Methodology

Power for the Future presented 20 specific recommendations for action by the province to achieve its vision for a reliable, and environmentally and economically sustainable electricity system.

This report assesses the progress made by the province in relation to these recommendations since the publication of *Power for the Future* in May 2004.

The assessment relies on press releases and backgrounders, *Environmental Bill of Rights* Registry postings, and public statements and other documents from the Ministry of Energy, Ontario Power Authority, the Office of the Chief Conservation Officer, and Ontario Power Generation.

The evaluation is presented in tabular form in the following section. The overview table is followed by a discussion of the level of progress achieved on the recommendations, as well as conclusions and recommendations for immediate action by the province.

The information contained in this report was up to date as of November 21, 2005.

II. Assessing Provincial Progress against the Power for the Future Recommendations

The *Power for the Future* recommendations are provided in the left-hand column of **Table 1**, government action to date in the middle column. Comments and observations are provided in the right hand column.

Table 1: Government of Ontario Action of Power for the Future Recommendations: November 2005

Power for the Future Recommendation	Government Action to date	Comments
1. The Government of Ontario should adopt minimum energy efficiency standards under the *Energy Efficiency Act* equivalent to the energy efficiency levels required for ENERGY STAR labeling for all major electricity-using devices and equipment when the market share for new or replacement energy efficient models surpasses 50%, and not later than 2010 for all devices. The province should develop its own energy efficiency standards for equipment not covered by ENERGY STAR. *Better efficiency standards are one of the most cost-effective ways of reducing electricity demand.*	Minimum Efficiency Levels were set for thermostats for electric space heating and industrial and commercial gas-fired package furnaces in March 2004. Updated standards for seven other products (power transformers, incandescent reflector lamps, gas-fired water heaters [with input ratings of 75,000 Btu per hour or less] household dishwashers, dusk-to-dawn luminaires, chillers, and residential electric ranges) were adopted at the same time.[7] February 2005 proposal for minimum standards for three new products (large residential gas-fired furnaces, HID LPS lamps, and refrigerated display cabinets); to establish an Energuide labeling requirement for gas fireplaces; and update standards for 10 products (residential and commercial central air conditioners/heat pumps; packaged terminal air conditioners and heat pumps; commercial and industrial unitary air conditioners, heat pumps, and air-conditioning condensing units; water-loop heat pumps used to heat and cool commercial buildings; residential electric water heaters; residential gas-fired water heaters, clothes washers, gas-fired low pressure steam boilers, and gas-fired hot water boilers).[8] These proposed standards have yet to be adopted.	Unclear if Ministry of Energy currently has adequate resources to undertake a major updating project.

	No specific targets for the rate at which new or updated *Energy Efficiency Act* standards are to be developed have been established.	
2. The provincial Building Code should be amended to require R2000, Canadian Building Improvement Program (CBIP) or equivalent energy efficiency performance for all new buildings and building renovations by 2010. *This, again, is a very cost-effective method of incorporating high levels of energy efficiency into new buildings.*	No Action to date.	
3. The *Planning Act* should be amended to permit municipalities to make energy efficiency design requirements a condition of site approvals for buildings. *This would give municipalities greater leverage to drive increases in energy efficiency and reduce the environmental and health impacts of energy generation and use on their communities.*	Possibility of additional municipal powers related to green community and building design were included in October 2005 consultations on further *Planning Act* reform. The March 2005 *Planning Act* Provincial Policy Statement includes provisions stating that planning authorities shall support energy efficiency and improved air quality through land use and development patterns that promote design and orientation that maximizes the use of alternative or renewable energy, such as solar and wind energy, and the mitigating effects of vegetation (s.1.8.1.(e))	The schedule for the introduction and adoption of *Planning Act* amendments is unknown.
4. The most energy-efficient technologies in all sectors and end-uses should be labeled through the ENERGY STAR program or, if not included in ENERGY STAR, through a provincial labeling system. *Such labeling programs make it easy for consumers to readily identify energy efficient goods and services.*	No action to date on appliances. A pilot ENERGY STAR labeling program for new homes in Ontario was announced by Natural Resources Canada in January 2005.[9]	
5. The Ontario Energy Board (OEB) performance-based rate setting and Demand Side Management (DSM) incentive mechanism model currently applied to Enbridge Gas Distribution should be extended to Hydro One and all of Ontario's electrical distribution utilities. All distribution	Rate system Conservation/Demand Management (CDM) incentives for Local Distribution Companies (LDCs – e.g., local utilities and Hydro One) have been implemented by the Ontario Energy Board (OEB). For the 2005	In 2005, 84 of 95 LCDs applied and received approval of CDM funds to

utilities should be required to set targets for energy efficiency gains and be allowed to then share in the benefits of DSM programs. The incentive mechanisms should allow utilities without DSM capabilities to meet their targets by contracting the delivery of DSM programs to other electrical and gas utilities, the energy service industry or specialized non-profit agencies. *Such a system allows utilities to retain a small share of the cost savings they generate for customers through utility-delivered energy efficiency programs.*	rate year, LDCs implementing CDM programs are permitted to retain the third tranche of their allowable market based rate of return. The effect of this provision will be to make $160 million available to LDCs for CDM programs over three years.[10]	be invested over three years. Only nine have applied for additional funds in 2006.[11]
6. The Government of Ontario should expand its current net metering policy to include all industrial, commercial/institutional, and residential users, and develop grid inter-tie specifications and training programs for utility staff. A series of annual special RFPs or feed-in tariffs should be issued to encourage smaller industries and large commercial and institutional facilities to develop their cogeneration potential. *Net metering allows end users who generate some or all of their own power to draw power from the grid as needed and to feed surplus power to the grid. For smaller self-generators, a set offer price for power sent to the grid can be more attractive than competing in complex competitive bidding processes for new supply.*	A regulation requiring net metering for generators up to 500kW was adopted in October 2005.[12] Consultations on Standard Offer Contracts for small generators (<10 MW) of clean or renewable energy were initiated by the OPA in October 2005.[13] Bill 21, the proposed *Electricity Conservation Responsibility Act*, introduced November 3, 2005 includes provisions related to the implementation of net metering.	The schedule for the adoption of Bill 21 is uncertain.
7. The Government of Ontario should establish a partnership with utilities, financial institutions, energy service companies, municipalities, and other stakeholders to offer a series of financing mechanisms to assist electricity consumers in all sectors to finance the adoption of energy efficient products and technologies or other measures that can be financed out of the savings they will achieve through these investments. *The up-front costs of purchasing energy efficient goods or services can be a significant hurdle for many consumers despite the net savings that will be generated over the more efficient product's lifecycle.*	No action to date.	

8. The Government of Ontario should enter into an agreement with the federal government under the auspices of the federal government's Kyoto Protocol implementation plan to share the costs of providing the following financial incentives for the adoption of energy efficient technologies: · Grants for high efficiency home energy retrofits and new R2000 homes · Grants towards the additional cost of new high-efficiency commercial buildings and commercial building retrofits · Sales tax rebates for all ENERGY STAR products in all sectors and small-scale renewable energy power sources · Business tax credits for industrial energy efficiency equipment and cogeneration systems. These incentives should focus initially on technologies where the largest reductions can be achieved at the lowest cost, such as commercial HVAC and lighting and industrial drive power. The incentives should be in effect only until the market share of the efficient technology reaches 50%. *This is a cost-effective way for Canada to achieve significant domestic greenhouse gas reductions.*	No reported progress to date on a Kyoto Protocol implementation agreement. A Provincial Sales Tax rebate on ENERGY STAR rated appliances ended July 2004. Sales tax rebates on residential wind energy, micro hydro-electric and geothermal energy systems extended to November 2007.[14]	
9. Mechanisms to ensure the delivery of programs to low-income consumers should be incorporated into the DSM mandates and incentives provided to energy and electrical distribution utilities. A specific portion of DSM spending should be set aside for this purpose, including revenues from the Public Benefits Charge proposed in Recommendation 11. *Low income households are often the most vulnerable to rising energy costs. Programs specifically targeted to low-income households can help alleviate the impact of rising rates.*	A low-income mandate was not included in the LCD incentives. However, an October 2005 Ministerial Directive requires the OPA to procure 100 MW in savings from residents of low income and social housing through implementation of a low-income program.	
10. The Government of Ontario should adopt legislation creating a new agency, the Ontario Sustainable Energy Authority, reporting to the	Bill 100, the *Electricity Restructuring Act* provided for the establishment of a conservation bureau led by a Chief	The institutional structure for the OPA and

Minister of Energy to lead and coordinate the province's energy efficiency and electricity planning efforts. The agency's functions should include: · The coordination and oversight of the development and implementation of provincial energy efficiency standards and labeling programs; · Ensuring the consideration of energy efficiency in the policies and programs of provincial government agencies · The ongoing assessment of the effectiveness of energy efficiency programs being delivered by utilities and provincial agencies, including low-income programs, and the provision of recommendations for their improvement to the provincial government and the OEB; · The forecasting of the province's future electricity needs; · Research, development, education, and information dissemination on energy-efficient technologies and practices; · The proposed Ontario Power Authority, responsible for issuing requests for proposals for the construction of new generating capacity, should be a division of the new agency. *By emphasizing efficiency and conservation over new supply, Ontario can dramatically improve its low levels of electricity productivity and increase its economic competitiveness.*	Conservation Officer within the Ontario Power Authority. The first Chief Conservation Officer was appointed in April 2005. The Chief Conservation Officer's First Annual Report was tabled November 2005.[15] New conservation-related positions have been established within the Ministry of Energy: the ADM Conservation and Strategic Policy, and the Manager of Conservation.	Conservation Bureau adopted via Bill 100 is the reverse of that recommended in *Power for the Future*.
11. A Public Benefits Charge (PBC) of 0.3 cents/kWh should be applied on all electricity sales to finance energy efficiency and low-income assistance programs. *Such charges are common in other leading jurisdictions, such as California, and recognize the importance of providing funds for driving innovation and efficiency in the electricity sector.*	No action on general public benefits charge.	The OPA may be able to access resources via Bill 100 mechanisms, but has not made significant use of these mechanisms for conservation purposes to date.

12. The Government of Ontario should implement the following demand response policies: · The OEB should be directed to undertake a generic proceeding on demand response to consider the various issues impeding demand response and develop appropriate policies and codes to encourage greater demand response in the Ontario market. · The Government of Ontario should assess the infrastructure needed to encourage and facilitate demand response in the Ontario market. A portion of the revenues generated by the PBC proposed in Recommendation 11 should be used to meet the costs of providing the required infrastructure. · All electricity consumers should be able to participate in demand response programs and should not be capped in terms of the level of their participation. *Reducing peak demand reduces the need for new generation and transmission infrastructure and reduces peak spot market prices and price volatility.*	The OEB issued recommendations in January 2005 on the implementation of a smart metering program for 800,000 homes by 2007 and all homes by 2010 in response to a request from the government. Time-of-day pricing was introduced by the OEB on April 1, 2005. The OPA was directed by the Minister of Energy in June 2005 to procure 250 MW of DSM/Demand Response initiatives.[16] The OPA issued an RFP for 20 MW of demand response programs in Northern York region as the first phase of procurement in October 2005.	Time-of-day pricing is not currently available to residential customers.
13. The Government of Ontario should undertake a design and costing study for a 200,000 unit solar PV roof program modeled on those undertaken in Europe and the United States and implement this program using a feed-in tariff funding mechanism. *A solar roofs program would offer a way to help deal with summer peak electricity demand, while creating significant economies of scale and avoiding transmission losses by delivering power where it is being used.*	No action to date.	
14. The Government of Ontario should issue, through the IMO, RFPs for supply from wind, upgraded existing or new small-scale hydro, solar, the use of waste-generated methane from municipal, agricultural, industrial sources and other low-impact renewable energy sources. The initial RFPs should seek to have 4,500 MW of capacity in place by 2010, followed by additional calls for supply up to 7,100 MW by 2015 and 9,800 MW by 2020.	The provincial government has established the following targets for Renewables: 5 per cent (1,350 MW) of all generating capacity is to come from new renewable sources by 2007 and 10 per cent (2,700 MW) by 2010.[17] Three RFPs for renewable supply have been issued to date: · June 2004: 1st RFP for 300 MW renewables. Ten successful projects	

The aggressive development of new renewable energy sources can diversify the province's power mix, create a more flexible and reliable power system and reduce the health and environmental impacts of electricity generation.	were announced in November 2004:[18] – 31 MW Small Hydro – 354.6 MW Wind – 7.5 MW Landfill Gas · April 2005: 2nd RFP for 1,000 MW Renewables from projects greater than 20 MW – 22 proposals for 2,029 MW were received as of September 2005. – Contracts announced for nine projects totaling 975 MW in November 2005 – 20 MW are hydroelelectric, the remainder are wind projects.[19] · July 2005: 3rd RFP for 200 MW renewables from projects less than 20 MW.[20]	
15. The Government of Ontario should undertake, on an urgent basis, a complete up-to-date assessment of the potential contributions from onshore and offshore wind generation, small-scale hydro and the use of waste digestion-generated methane to the province's future energy supply. This effort should include primary research as required, including detailed wind potential mapping. *This will provide the province with a realistic assessment of the potential of these low-impact energy sources.*	OPA believed to be undertaking work in this area as part of its supply mix advice to be delivered by December 1, 2005.	
16. The Government of Ontario should initiate a research and development program on renewable energy technologies funded through the PBC proposed in Recommendation 11. This should include both technology development and the resolution of grid integration issues. *Ontario lags many other jurisdictions in the development of new energy technologies and industries, an area poised for huge growth in coming decades.*	No action to date	The Conservation Bureau's Conservation Fund may play a research and development role in the future.
17. The Independent Market Operator (IMO – now the Independent Electricity System Operator (IESO)) should adopt management practices	Action to date unknown.	

designed to forecast power outputs from wind-power capacity, run-of-river hydro and solar PV systems and be prepared to dispatch hydro storage and existing natural gas facilities as needed to provide base load capacity. *This will allow the more effective integration of these power sources into Ontario's electricity system.*		
18. The Government of Ontario should establish and expedite the completion of a consultative process to develop land-use guidelines for the siting of renewable energy generating facilities. *Such guidelines can help streamline the siting of new projects while ensuring that environmental impacts are minimized.*	A revised Planning Act Provincial Policy Statement (PPS) came into force in March 2005. The new PPS includes provisions that: · "opportunities for increased energy generation, supply and conservation, including alternative energy and renewable energy systems" should be provided (s.1.7.1(h)) · "increased energy supply should be promoted by providing opportunities for energy generation facilities to accommodate current and projected needs, and the use of renewable energy systems and alternative energy systems where possible. (s.1.8.2.) · Alternative energy systems and renewable energy systems shall be permitted in settlement areas, rural areas and prime agricultural areas in accordance with provincial and federal requirements. In rural areas and agricultural areas, these systems should be designed and constructed to minimize impacts on agricultural operations." (s.1.8.3.)	Additional specific policy guidance may be needed regarding renewable projects.
19. The Government of Ontario should develop guidelines, in conjunction with the federal government, for the approval of offshore wind power generation facilities. *There is potential for offshore wind generation in the Great Lakes, for example.*	No action to date.	

20. The Government of Ontario should issue, through the IMO, a request for proposals for long-term base load supply that meets the construction time, cost, reliability, and environmental, health, and safety performance standards of combined-cycle natural gas generating facilities. The call for proposals should seek to have 4,200 MW of new base load supply in place by 2007 and 4,500 MW in place by 2020. *Such an approach would ensure a level playing field for all generators interested in supplying base load power.*	June 2004: RFP for 2,500 MW of new generation and DSM plus 300 MW of renewables issued. Niagara Tunnel Project Announced. The Beck 2 expansion project has the potential to increase capacity by 194 MW.[21] Work on the project began in September 2005. April 2005: Announcements re: responses to June 2004 RFP.[22] -1,575 MW Gas (two projects Sarnia Lampton) -90 MW Cogen GTAA -10 MW DSM Loblaws May 2005 Two additional 280 MW gas projects in Mississauga (560 MW total) announced.[23] The OPA was subsequently directed by the Ministry of Energy to expand these projects to a total of 900 MW.[24] The proponent subsequently withdrew one of the proposed plants. June 2005 The Minister of Energy directs OPA to procure up to 1,000 MW combined heat and power, including industrial cogeneration and district energy projects in Western GTA. An RFP is to be released by the OPA in November 2005. August 2005 Acceptance of 1st phase bid in which Ontario is a partner regarding development of lower Churchill River in Labrador announced. The project has the long-term potential to provide 945 MW generating capacity for Ontario.[25]	Delays have been encountered finalizing contracts and actually initiating construction on new supply projects.

October 2005
Ontario-Manitoba Agreement re: electricity imports announced. The agreement provides for 150 MW in imports to Ontario in 2006, to rise to 400 MW by 2009 with transmission upgrades. Phase 2 (under discussion) may involve imports of up to 3,000 MW dependent on the construction of new generating facilities and transmission infrastructure. An OPA request for qualifications for 1,000 MW supply in western GTA by 2009 issued.[26]

November 2005
OPG is directed to convert the 326 MW Thunder Bay coal-fired plant to natural gas.[27]

Major provincial actions outside of the Power for the Future recommendations.

The province has taken a number of steps related to electricity demand and supply in addition to those recommended in *Power for the Future*. The key developments have included the following:

- On June 15, 2005 the government announced its intention to extend the deadline for the phase-out of coal-fired generation from the original target date of 2007 to 2009. Specifically, while the Lakeview, Thunder Bay, Atikokan, and Lambton facilities will be retired or converted to natural gas combustion by 2007, the Nanticoke facility will continue in service until 2009.[28]
- On October 17, 2005, the province announced that it had entered into an agreement with Bruce Power to re-start the Bruce A nuclear generating Units 1 and 2 by 2009/2010, refurbish Unit 3, and replace Unit 4's steam generation equipment. Under the agreement Bruce Power:[29]
  - Can pass on up to 75 per cent of its cost overruns on the Unit 1 and 2 refurbishment projects, and up to 100 pre cent of its capital cost increases on the Unit 3 refurbishment to Ontario electricity consumers via the OPA.
  - Is guaranteed fixed prices, with inflation indexing, for the power generated at the Bruce facility.
  - Is entitled to full reimbursement of all of its reasonably incurred nuclear fuel supply costs at the Bruce A plant.
  - In addition, the Bruce facility's decommissioning and waste fuel disposal costs will continue to be covered by OPG. It has been subsequently revealed that the government has directed OPG to reduce the annual rent paid by Bruce Power to OPG for the Bruce facility from $25 million to $5 million.[30]

  It has been pointed out that the terms of the Bruce Power agreement are dramatically less favourable to the Government of Ontario and electricity ratepayers than recent contracts the province has entered into for natural gas and renewable power.[31]
- On November 3, 2005 the Minister of Energy introduced Bill 21, *The Energy Conservation Responsibility Act, 2005*. In addition to a number of provisions related to the implementation of smart metering, the proposed legislation includes provisions for the requirement of energy conservation plans for public sector agencies.

III. Summary of current status of recommended actions

The status of the *Power for the Future* recommendations can be classified into four categories:

- Implemented or substantial progress towards implementation
- Partial Implementation or implementation in progress
- Under study or consultation
- No substantial progress.

The status of the recommendations is summarized in the following table.

Recommendation	Comments
Fully implemented/Substantial progress	
5. CDM incentive for LDCs via rate structure.	It is unclear how many LCDs will actually establish CDM programs. Only nine of 95 have applied for funds for 2006 to date.
6. Net metering regulation for small generators.	Net metering regulation for generators up to 500kw adopted October 2005.
18. Clarification of planning policies re: renewable energy development.	Additional specific policy guidance may be required beyond what is contained in the PPS.
Partial implementation/In progress	
1. Adoption of revised energy efficiency standards under the *Energy Efficiency Act*.	The only new standards adopted since October 2003 were actually initiated by the previous government. Further standards are under study. There is no schedule for the overall updating of standards. The Ministry of Energy's current capacity, particularly staffing levels, to undertake a major updating project is doubtful.
4. ENERGY STAR or equivalent labeling of most efficient technologies in all sectors and uses.	A pilot project on buildings is being developed by Natural Resource Canada. No action on appliances and equipment except gas fireplaces.
9. Low income energy efficiency programs.	A low-income mandate was not included in the LCD CDM rate incentives, but the OPA was directed to procure 100 MW in savings from low-income and social housing in October 2005.
10. Creation of Ontario Sustainable Electricity Authority	A Conservation Bureau and Office of Chief Conservation Officer have been established within the Ontario Power Authority. However, the OPA's overall orientation is strongly towards conventional supply.

14. RFPs for renewables with targets of 4,500 MW by 2010 and 9,800 MW by 2020	RFPs for 1,500 MW of renewables have been issued to date, plus approval of the Niagara Tunnel Expansion (192 MW). Contracts are in place for 1,348 MW of renewables, principally wind, in response to RFPs.
15. RFPs for 4,200 MW Combined Cycle Natural Gas (CCNG) or equivalent performance new base load supply by 2007; 4,500 MW by 2020.	RFPs for 2,500 MW have been issued to date, plus the Thunder Bay conversion directive.
Under study/Consultation	
3. *Planning Act* revisions to promote green/energy efficient building and community design.	Expected date of introduction of further *Planning Act* amendments unknown.
12. Rate-based demand response measures via smart metering	Implementation legislation (Bill 21) has only received First Reading to date.
6. Standard-offer contracts for small-scale generators.	Under study by OPA.
15. Assess low-impact renewable supply potential	Under study by OPA.
17. Intermittent supply grid integration.	Status unknown.
No substantial progress	
2. Energy efficiency revision of building code	
7. Innovative financing mechanisms for the adoption of energy efficient products and technologies.	
8. Kyoto Implementation agreement with federal government with financing mechanisms.	No visible progress.
11. Public Benefits Charge to finance efficiency measures.	OPA may be able to access funding for conservation via Bill 100 mechanisms, but no significant action to do so to date.
13. Investigate potential for solar roofs program to help address summer peaks.	
16. Research and development program on renewable energy technologies.	
19. Clarification of approvals for off-shore wind projects.	

Discussion and Analysis

Of the 20 recommendations presented in *Power for the Future*, only three have been substantially implemented to date: the establishment of a CDM incentive mechanism for LDC's; the establishment of net metering rules for small generators; and the clarification of provincial land-use planning policies with respect to renewable energy development. Even within this group of recommendations, it is important to note that it is still unclear to what extent LDCs will establish conservation programs on the basis of the incentive mechanisms.

There has been progress on a number of other *Power for the Future* recommendations, particularly with respect to electricity supply. RFPs and directives have been issued in relation to both renewable energy and more conventional – particularly gas-fired – sources. However, considerable difficulties have been encountered in the finalization of contracts and the actual construction of facilities. The province's total financial commitments to supply side initiatives, including the October 2005 Bruce Power Agreement, have been estimated at $10.5 billion.[32]

A Conservation Bureau and Office of the Chief Conservation Officer have been created within the Ontario Power Authority. However, the institutional structure adopted through Bill 100 is effectively the reverse of that proposed in *Power for the Future*. *Power for the Future* recommended the establishment of an energy authority with a very strong conservation and sustainability orientation with supply procurement as a sub-component. Instead, Bill 100 established a supply- oriented entity with a relatively small substructure focused on conservation.

Progress on the adoption of updated energy efficiency standards under the *Energy Efficiency Act* has been extremely slow. This is due to a combination of an apparent absence of strong political direction and a lack of adequate resources within the Ministry of Energy to accelerate the standards development process.

A number of key initiatives recommended in *Power for the Future* are at the consultative or study stage. Bill 21, *The Energy Conservation Responsibility Act*, which includes provisions essential to the actual implementation of a "smart metering" program, was only introduced on Nov. 3, 2005. The schedule for the introduction of further amendments to the *Planning Act*, including proposals related to green or energy efficient building and community design, is uncertain. The concept of standard-offer contracts for small generators is under study by the OPA. The larger questions of the overall potential supply contributions from low-impact renewable energy sources are also under study.

The largest single area of potential for energy efficiency identified in *Power for the Future* was the improvement of building shells and heating as well as ventilation and air conditioning in the commercial/institutional sector, with potential savings of nearly 30,000 Gwh per year. Unfortunately, there has been no visible progress on revising the Ontario Building Code to help realize this potential with respect to new construction and renovations. Similarly, with the exception of a pilot project on energy efficient buildings led by Natural Resources Canada, there has been almost no progress on improving the labeling of energy efficient technologies in the marketplace.

There is a significant lack of progress in the area of financing mechanisms for CDM activities and programs. A Kyoto Protocol implementation agreement with the federal government, for example, would offer Ontario the opportunity to access substantial federal funding for energy efficiency purposes. However, there has been no apparent progress in this area. Mechanisms established through Bill 100, *The Electricity Restructuring Act*, permit the Ontario Power Authority to raise funds for its operations via surcharges on electricity rates. No significant use has been made of this capacity for conservation purposes to date. Nor has there been any progress on the establishment of a broader public benefits charge to finance conservation programs and activities undertaken by agencies other than the Power Authority or LDCs.

Power for the Future identified the establishment of financing mechanisms to permit investments by energy consumers in energy efficient products and technologies, to be paid for out of the resulting savings, as having a major potential to contribute to the rapid adoption of these products and technologies in the marketplace. No progress has been made on such a mechanism to date. In fact, the only significant funding committed for CDM initiatives is the $163 million made available through the LDC incentives.

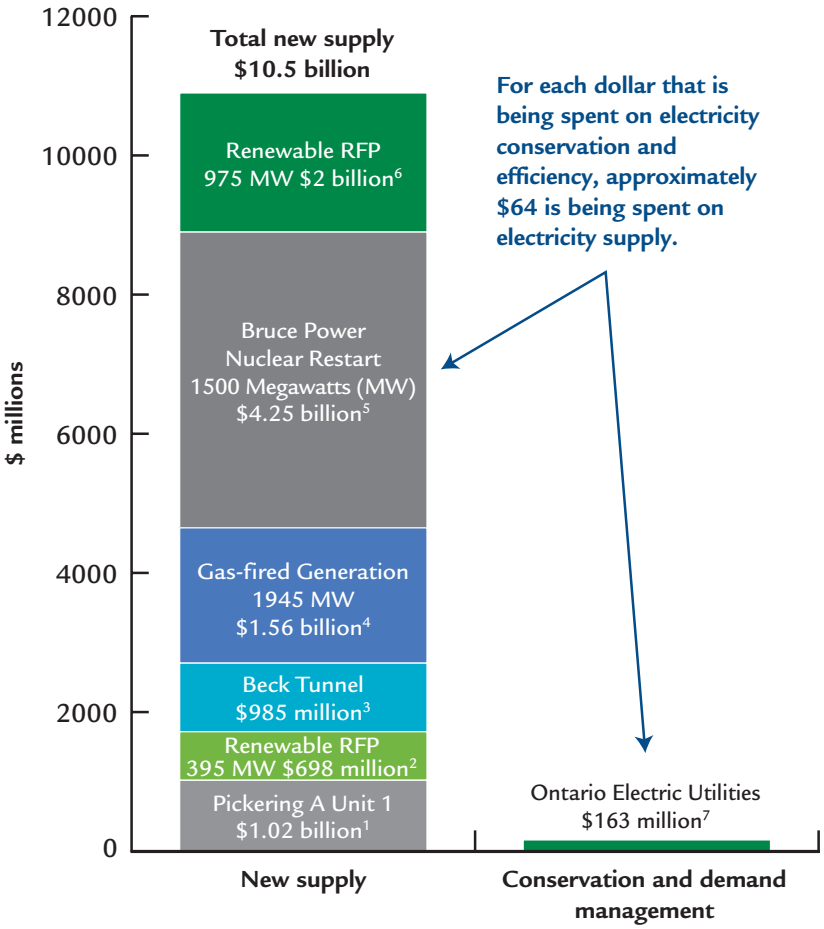
Significant gaps also remain with respect to research and development activities. The Conservation Bureau's Conservation Fund initiative is still at a formative stage and the location of broader responsibility for research and development with respect to renewable energy and energy efficiency remains uncertain.

IV. Conclusions and Recommendations

In reviewing the province's electricity policy initiatives over the past two years, a number of themes become apparent.

Despite the very large potential in Ontario for cost-effective reductions in future electricity demand through energy efficiency measures, the overwhelming emphasis of the government's actions to date have been on the supply side. This supply-side orientation is highlighted by the commitment of an estimated $10.5 billion to supply initiatives against the $163 million made available for conservation and efficiency, a dollar-to-dollar ratio of 64:1. The overall situation can be summarized as following:

Figure 3:



The percentage breakdown of supply-side monetary commitments is 50% nuclear, 23% renewables (excluding the Niagara Tunnel Project), and 15% natural gas.

In addition, the government has defined demand-side initiatives largely, to date, in terms of demand response, seeking to shift peak loads, rather than reduce overall electricity consumption. This theme is emphasized by the government's high-profile smart metering initiative. Demand response measures may be extremely useful in dealing with periods of extremely high peak demand, but their ultimate potential to improve energy efficiency and reduce energy consumption is limited.

In contrast to the focus on demand response through smart metering, there has been very little action on end-use efficiency. This is despite the fact that end-use efficiency improvements were identified in *Power for the Future* as offering the greatest potential for energy savings. In combination with fuel switching and cogeneration, end-use efficiency improvements were found to have the potential to reduce projected consumption by more than 40%, compared to an estimated potential peak demand reduction of 10% via demand response activities.

The lack of movement on financing mechanisms for demand-side measures beyond the LDC rate incentive is a major gap. At the same time, progress on the use of labeling requirements, energy efficiency standards and building code revisions to improve the energy efficiency of the province's economy has been extremely slow.

The Institutional arrangements around the actual delivery of conservation programs and research and development activities remain unclear. More generally, even in areas where there has been significant policy progress, such as the LDC rate incentive, program implementation that would result in actual energy savings is at a very preliminary stage. The overall lack of progress on energy efficiency initiatives is particularly remarkable given the government's repeated statements regarding its intention to create a "conservation culture" in Ontario.[33]

The province must significantly accelerate its efforts with respect to energy efficiency and low-impact renewable energy supplies. Rapid action is needed to avoid the economic and environmental risks and costs associated with unnecessary

future reliance on conventional, non-renewable sources of electricity, particularly fossil fuels and nuclear energy.

Recommendations

Energy Efficiency.

The province should:

- Establish an aggressive schedule for the updating of *Energy Efficiency Act* standards and the provincial Building Code and commit the necessary resources to achieve these outcomes.
- Significantly expand its use of market incentives, including labeling, financial incentives and innovative financing mechanisms for energy efficiency investments.
- Introduce amendments to the *Planning Act* in support of energy efficient building and community design as soon as possible.
- Expand the financial base for CDM programs through a combination of:
  - OPA rate mechanisms
  - The application of a general public benefits charge to electricity rates
  - Accessing federal funding via a Kyoto Protocol implementation agreement.
- Clarify institutional roles in program design and delivery.

Low Impact Renewable Energy.

The province should:

- Accelerate the development and implementation of standard-offer contract arrangements for small renewable energy and cogeneration projects.
- Resolve technical grid integration issues for small-scale and intermittent supply.

Conclusion

A failure to make significant progress on energy efficiency and low-impact renewable energy sources will leave the province with few options other than the pursuit of expensive new and/or refurbished conventional sources of electricity. The October 2005 Bruce Power Agreement demonstrates the extent of the potential risks and costs to Ontario electricity ratepayers and taxpayers associated with that path. A more environmentally and economically sustainable vision needs to define the province's energy future.

Endnotes

1. Ministry of Energy, "McGuinty Government Unveils Bold Plan to Clean Up Ontario's Air," *News Release*, June 15, 2005.

2. See generally DSS Management Consultants and RDWI Air Inc., *Cost-Benefit Analysis: Replacing Ontario's Coal-Fired Electricity Generation* (Toronto: Ministry of Energy, April 2005).

3. Notes for Remarks, The Hon. D. Duncan, Minister of Energy, to the Canadian Club of Toronto, May 2, 2005.

4. Available at www.pembina.org

5. Based on the ACEL's estimated cost of $2.1 million per MW capacity for the Advanced CANDU Reactor.

6. If the investment in new nuclear generation were made in lieu of investments in efficiency, the total cost would exceed $40 billion, as the electricity that could be saved via efficiency would have to be purchased.

7. EBR Registry No. RO03E0002.

8. EBR Registry No. RO05E0011.

9. Natural Resources Canada, "Energy saving housing program launched in Ontario," January 12, 2005.

10. Office of the Chief Conservation Officer, *Our Conservation Challenge: 2005 Annual Report* (Toronto: Ontario Power Authority, November 2005) pg. 33.

11. Pers. comm., Ontario Energy Board, November 21, 2005.

12. Ministry of Energy, "McGuinty Government Stimulates More Green Power in Ontario," *News Release*, October 25, 2005.

13. OPA, "New program will reduce barriers for small electricity generators," *News Release*, October 25, 2005.

14. Ministry of Energy, "McGuinty Government to Extend Tax Rebate on Green Energy Systems," *News Release*, November 24, 2004.

15. Office of the Chief Conservation Officer, *Our Conservation Challenge: 2005 Annual Report* (Toronto: Ontario Power Authority, November 2005).

16. *Our Conservation Challenge*, pg.10.

17. See http://www.energy.gov.on.ca/index.cfm?fuseaction=english.renewable

18. Ministry of Energy, "McGuinty Government Gives Green Light to Renewable Energy Projects," *News Release*, November 24, 2004.

19. Ministry of Energy, "McGuinty Government Announces Nine New Renewable Energy Projects," *News Release*, November 21, 2005.

20. Ministry of Energy, "McGuinty Government Opens the Door to More Green Power," *News Release*, July 12, 2005.

21. Ministry of Energy, "McGuinty Government Gives Green Light to Expand Electricity Generation at Niagara Falls," *News Release*, June 25, 2004.

22. Ministry of Energy, "McGuinty Government Boosting Electricity Supply," *News Release*, April 13, 2005.

23. Ministry of Energy, "McGuinty Government Gives Green Light to Two New Gas Plants," *News Release*, May 30, 2005.

24. OPA "Power Authority to procure 3,000 MW for Ontario Grid," *News Release*, October 28, 2005.

25. Ministry of Energy, "Ontario Bid Moves on to the Second Phase for a Major Hydroelectric Project in Labrador," *News Release*, August 8, 2005.

26. OPA, "Ontario Power Authority to procure 3,000 MW for Ontario Grid," *News Release*, October 28, 2005.

27. Reported in the Globe and Mail, K.Howlett, "Ontario keeping a tight grip on OPG," *The Globe and Mail*, November 12, 2005.

28. Ministry of Energy, "McGuinty Government Unveils Bold Plan to Clean Up Ontario's Air," *News Release*, June 15, 2005.

29. For a detailed discussion of the Bruce Power Agreement see Ontario Clean Air Alliance "The Bruce Power Deal: A Comparative Analysis," November 9, 2005.

30. Reported in the Globe and Mail, K.Howlett, "Ontario keeping a tight grip on OPG," *The Globe and Mail*, November 12, 2005.

31. For a detailed discussion of the Bruce Power Agreement see Ontario Clean Air Alliance "The Bruce Power Deal: A Comparative Analysis," November 9, 2005.

32. Ontario Clean Air Alliance, Air Quality Issues Fact Sheet #16, "McGuinty Government's Electricity Supply and Conservation Spending" Nov. 22, 2005.

33. See, for example, Notes for Remarks by the Hon. D. McGuinty, "Building a Culture of Conservation" Statement to the Legislative Assembly, April 19, 2004. http://www.premier.gov.on.ca/english/news/Energy041904_speech.asp