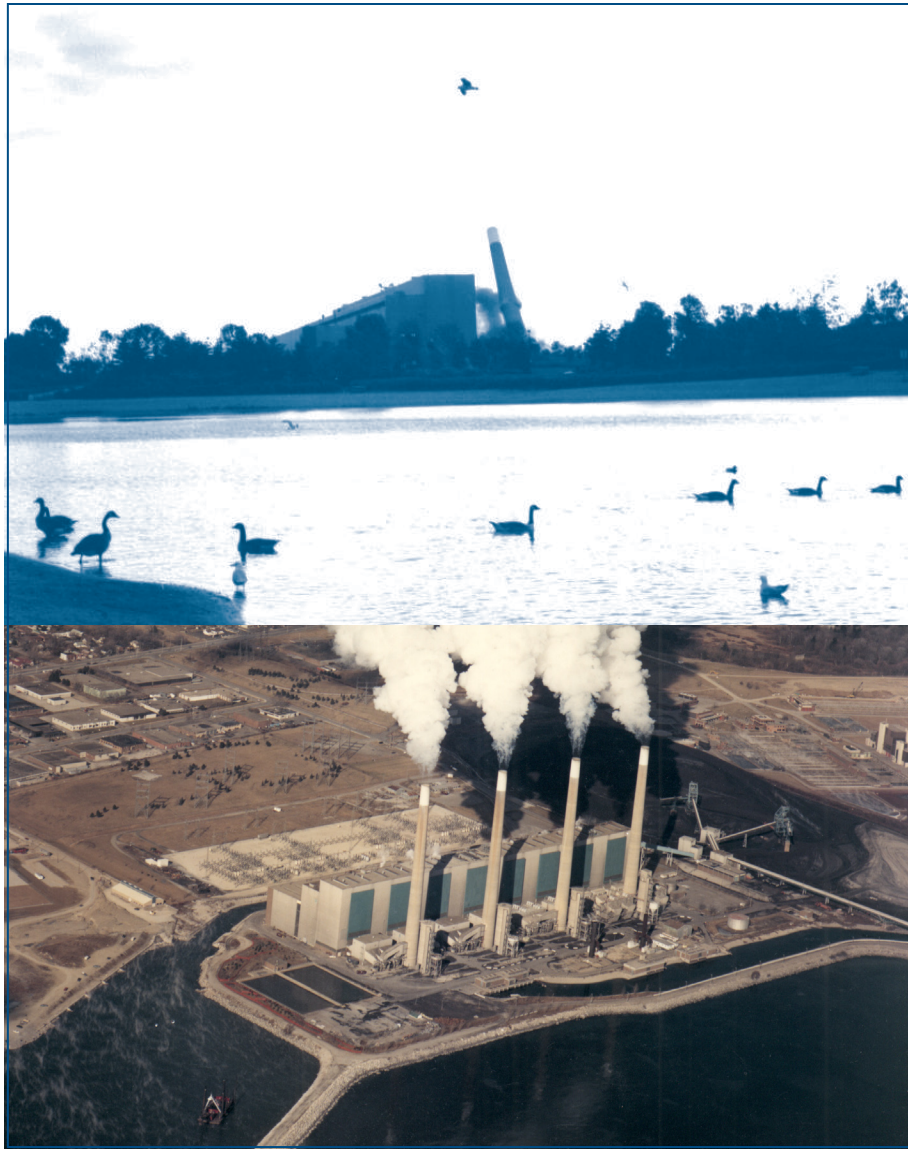
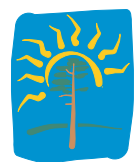


Phasing Out Coal:



2006 Progress Report



Ontario Clean Air Alliance

NOVEMBER 9, 2006

Table of Contents

Introduction	1
Ontario's progress to-date in achieving a complete coal phase-out by 2009 ..	3
<i>Calculating Ontario's coal-free electricity resources in 2009</i>	3
<i>Ontario's Coal-free Electricity Resources from 2010 to 2012</i>	4
<i>Ontario's Summer Peak Required Electricity Resources: 2009 to 2012.....</i>	5
<i>Coal Phase-Out Gap: 2009 – 2012</i>	5
Keeping the Coal Phase-Out by 2009 Promise	6
<i>Thunder Bay Conversion</i>	6
<i>Nanticoke Conversion.....</i>	6
<i>Alternative Options.....</i>	7
Looking ahead	7
Endnotes	8
Appendix A: OCAA Members	9

The Ontario Clean Air Alliance is a coalition of health, environmental, and consumer organizations, faith communities, municipalities, utilities, unions, corporations and individuals working for cleaner air through a coal phase-out and the shift to a renewable electricity future. Our partner organizations represent more than six million Ontarians.



Ontario Clean Air Alliance

625 Church Street, Suite 402
Toronto M4Y 2G1

Tel: (416) 926-1907 ext. 245

Fax: (416) 926-1601

E-mail: contact@cleanairalliance.org

Web Site: www.cleanairalliance.org

Cover photos of
Lakeview Generating
Station:
Top: Quentin Chiotti
Bottom: Karen Smith



Printed on 100% post-consumer recycled paper

Thanks to the Laidlaw Foundation for their financial support.



Introduction

On June 13, 2006 Premier Dalton McGuinty broke his promise to phase-out Ontario's four remaining coal-fired power plants by 2009 and, instead, directed the Ontario Power Authority (OPA) to develop a plan "for coal-fired electricity generation in Ontario to be replaced by cleaner sources in the earliest practical time frame that ensures adequate generating capacity and electricity system reliability in Ontario."¹

This report will:

1. Review the key milestones in Ontario's move towards a complete coal phase-out;
2. Review Ontario's progress to-date in achieving a coal phase-out by 2009; and
3. Outline the additional actions that Premier McGuinty can take to keep his promise to phase-out all of Ontario's coal-fired power plants by 2009.

Ontario Coal Phase-Out Milestones

1. In 2001, Ontario's then Minister of the Environment, Elizabeth Witmer, issued a legally binding regulation requiring the phase-out of coal burning at the Lakeview Generating Station, in Mississauga, by April 30, 2005.
2. On September 9, 2002 the Government of Ontario, under the leadership of former Premier Ernie Eves, promised to phase-out all of Ontario's coal-fired power plants by 2015.
3. In October 2003, Dalton McGuinty was elected Premier of Ontario and promised to phase-out all of Ontario's coal-fired power plants by 2007.
4. In April 2005, coal burning was phased-out at Lakeview pursuant to the Witmer Regulation.
5. On June 15, 2005, the Government of Ontario extended the coal phase-out date for the Nanticoke Generating Station to 2009 and directed Ontario Power Generation to convert the Thunder Bay Generating Station's boilers from coal to natural gas by 2007.²

6. On April 10, 2006, the Association of Major Power Consumers in Ontario, which represents some of the province's largest air polluters (e.g., Inco, Imperial Oil), called on Premier McGuinty to break his coal phase-out promise.

7. On June 9, 2006, the Independent Electricity System Operator (IESO) issued its *Ontario Reliability Outlook* report. According to the IESO's report, it had recently determined that Ontario needed an extra 2,500 to 3,000 megawatts (MW) of electricity resources to keep the lights on during peak summer demand days:

"The Independent Electricity System Operator (IESO) has revised its demand and supply assumptions for the Ontario resource adequacy assessment as a result of the recent summer experience, particularly in 2005, when hot weather conditions caused record electricity demands through increased air conditioner use, and drought-like conditions limited hydroelectric energy to meet those demands.

The change in planning assumptions highlights the need for an additional 2,500 to 3,000 megawatts (MW) of supply and demand-side initiatives over those previously identified."³

According to the IESO, the need for an additional 2,500 to 3,000 MW at the time of the system's summer peak would require a significant delay in Ontario's coal phase-out schedule:

"Significant delays in the current coal replacement schedule will be needed given the time required to implement the additional initiatives to maintain future reliability."⁴

8. On June 13, 2006, Premier Dalton McGuinty broke his promise to phase-out Ontario's four remaining coal-fired power plants by 2009 and directed the Ontario Power Authority (OPA) to develop a plan "for coal-fired electricity generation in Ontario to be replaced by cleaner sources in the earliest practical time frame that ensures adequate generating capacity and electricity system reliability in Ontario."⁵

-
9. On June 13, 2006, the Government of Ontario also directed Ontario Power Generation (OPG) to cancel its plans to convert the Thunder Bay Generating Station's boilers from coal to natural gas. This directive was made despite the fact that the IESO had concluded that the conversion of the Thunder Bay Generating Station to natural gas would permit the phase-out of coal-burning at the Atikokan and Thunder Bay Generating Stations in 2007 *without* jeopardizing electricity system reliability in Ontario.⁶

Ontario's progress to-date in achieving a complete coal phase-out by 2009

To phase-out coal-fired electricity generation and keep the lights on, Ontario's available coal-free electricity resources (in megawatts -- MW) must equal or exceed Ontario's electricity resources (MW) that are needed to meet Ontario's summer peak day demand.

Therefore to measure Ontario's progress at phasing-out coal by 2009 we must compare Ontario's available coal-free electricity resources to the required electricity resources on the projected peak demand day in the summer of 2009.

Calculating Ontario's coal-free electricity resources in 2009

Table 1 below shows Ontario's existing installed generation resources.

Table 1: Existing Installed Generation Resources⁷

Fuel Type	Total Capacity (MW)
Nuclear	11,414
Coal	6,434
Oil/Gas	5,103
Hydroelectric	7,768
Wind	305
Miscellaneous	70
Total	31,094

To calculate Ontario's existing coal-free generation resources, at the time of the summer peak day demand, the following subtractions must be made from Table 1:

- Subtract 6,434 MW of coal-fired generation;
- Subtract 1,768 MW of hydroelectric generation to reflect the IESO's assumption that only 6,000 MW of hydroelectric generation will be available at the time of the summer peak day demand;⁸

- Subtract 253 MW of wind generation to reflect the recent estimate that the capacity utilization rate of our wind resources is 17% at the time of the summer peak day demand;⁹ and
- Subtract 500 MW to reflect the IESO's planning assumption that approximately 500 MW of generation will be out of service during the summer peak.¹⁰

Table 2 shows Ontario's existing coal-free generation resources that are currently available at the time of Ontario's summer peak demand.

Table 2: Available Coal-Free Generation Resources on Summer Peak Demand Day

Fuel Type	Total Available Resources
Nuclear	11,414 MW
Oil/Gas	5,103
Hydroelectric	6,000
Wind	52
Miscellaneous	70
Planned Outage	-500
Total	22,139

However, as a result of actions taken by the Government of Ontario, there will be a significant increase in Ontario's coal-free electricity resources between today and the summer of 2009 (in-service dates are based on IESO information):

- The Bruce A Unit 1 and 2 nuclear reactors are expected to return to service in 2009 and 2010 respectively. However, Bruce Power also has plans for refurbishing Units 3 and 4 as necessary to maintain their reliability.
- The IESO is forecasting that Ontario's total nuclear generation available during the summer peak will increase by 786 MW to about 12,200 MW from 2009 to 2012;¹¹
- The Goreway combined-cycle natural gas power plant, in Brampton, will provide 860 MW by the summer of 2008;
- The Greenfield combined-cycle natural gas power plant, near Sarnia, will provide 1,005 MW in 2008;
- The St. Clair combined-cycle natural gas power plant, near Sarnia, will provide 570 MW in 2008;

- The Portlands combined-cycle natural gas power plant, Toronto, will provide 550 MW in the summer of 2009;¹²
- The Thorold cogeneration natural gas power plant will provide 236 MW commencing June 2009;¹³
- The Beck Tunnel, at Niagara Falls, will provide an additional 200 MW of hydroelectric resources commencing in the summer of 2009;¹⁴
- The Blue Highlands Wind Farm and the Renewables II RFP will provide an additional 1,004.9 MW of wind generation by 2008 of which 171 MW will be available on the summer peak demand day;
- The Trail Road Landfill Gas Generating Station will provide 5 MW by 2007;
- The Loblaws and Northern York Region demand response programs are providing 13 MW of resources;
- The OPA's other demand response programs will provide 500 MW by 2007; and
- The OPA's low income, social housing and residential conservation and demand management programs will provide 139 MW by 2007.¹⁵

Table 3 below shows Ontario's available coal-free electricity resources at the time of Ontario's summer peak demand in 2009.

Table 3: Ontario's Summer 2009 Available Coal-Free Electricity Resources

Fuel Type	Total Available Resources (MW)
Nuclear	12,200
Oil/Gas	8,324
Hydroelectric	6,200
Wind	223
Miscellaneous	75
Conservation and Demand Management	652
Planned Outage	-500
Total	27, 174

Ontario's Coal-free Electricity Resources from 2010 to 2012

In addition, the following coal-free electricity resources will come into service by the summer of 2010:

- The GTA West Trafalgar combined-cycle natural gas power plant will provide 600 MW by the summer of 2010;¹⁶
- In addition to the Thorold cogeneration project noted-above, Ontario will obtain another 178 MW of cogeneration capacity by May 2010;¹⁷ The Renewables III RFP will provide an additional 200 MW of renewable generation of which 34 MW will be available during the summer of 2010 if all of this new supply is wind generation;
- The Toronto Area Conservation and Demand Management program will provide 300 MW by 2010.¹⁸

Table 4 below shows Ontario's available coal-free electricity resources at the time of Ontario's summer peak day demands from 2010 to 2012 inclusive.

Table 4: Ontario's summer 2010 - 2012 available coal-free electricity resources

Fuel Type	Total Available Resources (MW)
Nuclear	12,200
Oil/Gas	9,102
Hydroelectric	6,200
Wind	257
Miscellaneous	75
Conservation and Demand Management	952
Planned Outage	-500
Total	28,286

Ontario's Summer Peak Required Electricity Resources: 2009 to 2012

Table 5 below shows the IESO's forecast of Ontario summer peak day required resources for the years 2009 to 2012.

Table 5: Ontario's summer peak day required resources from 2009 to 2012

Year	Normal Summer Peak Demand (MW) ¹⁹	Required Reserve Margin (MW)	Total Required Resources (MW)
2009	26,675	4,535	31,210
2010	26,973	4,585	31,558
2011	27,337	4,647	31,984
2012	27,697	4,708	32,405

Normal summer peak demand is the IESO's forecast of Ontario's maximum annual demand for electricity under normal weather conditions. However, our electricity system also requires a reserve margin to ensure that our lights will stay on if we experience extreme weather conditions (i.e., a hotter than normal summer) or if one or more of our generating stations experiences an unexpected forced outage. According to the IESO, Ontario's required reserve margin is equal to 17% of our normal summer peak demand.²⁰ Ontario's annual total required resources are the sum of our normal summer peak demand plus our required reserve margin.

Coal Phase-Out Gap: 2009 – 2012

Table 6 in the next column shows the existing gap between Ontario's total required resources and our available coal-free electricity resources from 2009 to 2012.

Table 6: Ontario's Required Resources and Available Coal-Free Resources from 2009 to 2012

Year	Total Required Resources (MW)	Available Coal-Free Resources (MW)	Reserve Above Requirement (MW)
2009	31,210	27,174	-4,036
2010	31,558	28,286	-3,272
2011	31,984	28,286	-3,698
2012	32,405	28,286	-4,119

In short, Table 6 reveals that Ontario must obtain approximately 4,000 MW of additional peak day coal-free electricity resources if it wishes to completely phase-out its coal-fired power plants by 2009.

Keeping the Coal Phase-Out by 2009 Promise

Premier McGuinty can keep his promise to completely phase-out Ontario's coal-fired power plants by 2009 by directing Ontario Power Generation to convert the Thunder Bay and Nanticoke Generating Stations' boilers from coal to natural gas.

Thunder Bay Conversion

As we have previously noted, according to the IESO coal burning can be phased-out at both the Atikokan and Thunder Bay Generating Stations if the latter station's boilers are converted to natural gas.

The Thunder Bay Generating Station has a capacity of 310 MW. Converting its boilers to burn natural gas would cost \$6.2 to \$18.6 million.²¹ The cost of building a 29 km natural gas pipeline from the TransCanada pipeline system to the Thunder Bay Generating Station is \$29.9 million.²² Therefore the total capital cost of the Thunder Bay conversion would be \$36.1 to \$48.5 million or \$116,000 to \$156,000 per MW.

Nanticoke Conversion

The Nanticoke Generating Station has a capacity of 4,000 MW. Converting its boilers to natural gas would cost \$80 to \$240 million.²³ The cost of building a natural gas pipeline from the TransCanada pipeline system to Nanticoke would be \$200 to \$300 million.²⁴ Therefore the total capital cost of the Nanticoke conversion would be \$280 to \$540 million or \$70,000 to \$135,000 per MW. Table 7 below compares the capital costs of: a) converting the Thunder Bay and Nanticoke boilers to natural gas; b) a simple-cycle natural gas turbine; c) a combined-cycle natural gas turbine; and d) the Pickering A Unit 4 nuclear reactor re-start.

Table 7: Capital Cost Comparison of Supply-Side Generation Options

Project	Cost per MW
Nanticoke Conversion	\$70,000 - \$135,000
Thunder Bay Conversion	\$116,000 - \$156,000
Simple Cycle Natural Gas Turbine	\$600,000 ²⁵
Combined-Cycle Natural Gas Turbine	\$900,000 ²⁶
Pickering A Unit 4 nuclear re-start	\$2.4 million ²⁷

As Table 7 reveals, converting Nanticoke's and Thunder Bay's boilers to natural gas is the lowest cost, clean supply-side option to meet Ontario's peak day demands.

Table 8 below shows Ontario's total required resources and available coal-free resources, from 2009 to 2012, if OPG converts Nanticoke's and Thunder Bay's boilers from coal to natural gas.

Table 8: Ontario's Required Resources and Available Coal-Free Resources from 2009 to 2012 if Nanticoke's and Thunder Bay's Boilers are Converted to Natural Gas

Year	Total Required Resources (MW)	Available Coal-Free Resources (MW)	Reserve Above Requirements (MW)
2009	31,210	31,484	274
2010	31,558	32,596	1,038
2011	31,984	32,596	612
2012	32,405	32,596	191

As Table 8 reveals, Ontario can completely phase-out its coal-fired electricity generation by 2009, without jeopardizing its electricity security and reliability, if Premier McGuinty directs OPG to convert Nanticoke's and Thunder Bay's boilers from coal to natural gas.

Conversion of Nanticoke's boilers to natural gas will have only a minor impact on Ontario's natural gas consumption since Nanticoke's boilers will only be needed to meet the reserve margin requirements, not normal day-to-day electricity demands. This means that if Nanticoke's boilers are converted to natural gas, they will only be run on extremely hot summer days or if there is an unexpected forced outage at another generating station.

Instead of directing OPG to convert all of Nanticoke's eight boilers to natural gas, Ontario could achieve a complete coal phase-out by 2009 by combining the complete phase-out of some of Nanticoke's boilers with one or more of the following options:

1. A more aggressive pursuit of conservation and demand management options.
2. Adopting more aggressive renewable procurement targets for 2010.
3. Procuring more cogeneration or combined heat and power resources. The OPA is in the process of procuring approximately 600 MW of cogeneration resources.²⁸ According to a report prepared for the Ontario Ministry of Energy, Ontario's total combined heat and power potential in 2020 is 16,514 MW.²⁹
4. Contracting with Sithe Global Canadian Power Services for the construction of its proposed 800 MW high-efficiency natural gas-fired combined cycle power plant in Mississauga. Sithe already has full environmental assessment approval for the construction of this project.

Looking ahead

In June 2006, in the light of unexpected new information from the IESO, the Ontario government hesitated on the path to cleaner air. Five months later, the smoke has cleared and we can see the way forward to a successful coal phase out that will dramatically reduce electricity-related smog and greenhouse gas emissions, reduce health care and productivity losses, and generally set the province on a groundbreaking path toward an innovative economy that delivers a high quality of life for the people of Ontario.

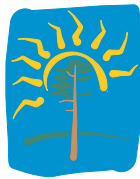
With the opportunity within our grasp to dramatically reduce smog-causing emissions of sulphur dioxide, nitrogen oxides and particulate matter, to eliminate releases of dangerous toxins like mercury and lead, and to obtain more than half the greenhouse gas emission reductions the entire province needs to meet its Kyoto Protocol obligations without in any way jeopardizing the security of the province's electricity supply, it would be an extremely short-sighted government that turned its back on this opportunity.

Endnotes

- 1 Ontario Ministry of Energy, Background, “Replacing Coal-Fired Generation In Ontario”, (June 13, 2006); and letter from the Honourable Dwight Duncan, Minister of Energy to Jan Carr, CEO, OPA re: Integrated Power System Plan, June 13, 2006.
- 2 Ontario Ministry of Energy, News Release, “McGuinty Government Unveils Bold Plan to Clean Up Ontario’s Air”, (June 15, 2005).
- 3 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), p. 1.
- 4 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), p. 1.
- 5 Ontario Ministry of Energy, Background, “Replacing Coal-Fired Generation In Ontario”, (June 13, 2006); and letter from the Honourable Dwight Duncan, Minister of Energy to Jan Carr, CEO, OPA re: Integrated Power System Plan, June 13, 2006.
- 6 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), pp. 6 – 9.
- 7 IESO, *18-Month Outlook: An Assessment of the Reliability of the Ontario Electricity System*, (September 25, 2006), p. 14.
- 8 Email from Dan Rochester, Manager, Reliability Standards & Assessments, IESO to Jack Gibbons, November 3, 2006.
- 9 IESO email bulletin, “New Study Highlights Wind Potential in Ontario”, (October 24, 2006).
- 10 Email from Dan Rochester, Manager, Reliability Standards & Assessments, IESO to Jack Gibbons, November 3, 2006.
- 11 Email from Dan Rochester, Manager, Reliability Standards & Assessments, IESO to Jack Gibbons, November 3, 2006.
- 12 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), p. 8.
- 13 Northland Power Inc., *Thorold Cogeneration Project Fact Sheet*, (October 2006).
- 14 Email from Dan Rochester, Manager, Reliability Standards & Assessments, IESO to Jack Gibbons, November 3, 2006.
- 15 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), pp. 8 & 9.
- 16 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), p. 8.
- 17 OPA, News Release, “Ontario secures \$800 million investment in province’s energy infrastructure”, (October 16, 2006).
- 18 Independent Electricity System Operator, *The Ontario Reliability Outlook*, Volume 1, Issue 2, (June 2006), p. 9.
- 19 Email from Andrew Trachsell, Reliability Standards & Assessment, IESO to Jack Gibbons, October 26, 2006.
- 20 Email from Dan Rochester, Manager, Reliability Standards & Assessments, IESO to Jack Gibbons, November 3, 2006.
- 21 According to the Ontario Ministry of the Environment, the cost of converting OPG’s coal boilers to natural gas is between \$20,000 and \$60,000 per MW. Ontario Ministry of the Environment, *Coal-Fired Electricity Generation In Ontario*, (March 2001), p. 42.
- 22 Ontario Energy Board Docket No. EB-2006-0004, Pre-filed Evidence of Union Gas, pp. 5 – 8.
- 23 According to the Ontario Ministry of the Environment, the cost of converting OPG’s coal boilers to natural gas is between \$20,000 and \$60,000 per MW. Ontario Ministry of the Environment, *Coal-Fired Electricity Generation In Ontario*, (March 2001), p. 42.
- 24 DDS Management Consultants Inc. and RWDI Air Inc., *Cost Benefit Analysis: Replacing Ontario’s Coal-Fired Electricity Generation*, (April 2005), p. 9.
- 25 DDS Management Consultants Inc. and RWDI Air Inc., *Cost Benefit Analysis: Replacing Ontario’s Coal-Fired Electricity Generation*, (April 2005), p. 9.
- 26 DDS Management Consultants Inc. and RWDI Air Inc., *Cost Benefit Analysis: Replacing Ontario’s Coal-Fired Electricity Generation*, (April 2005), p. 9.
- 27 The total capital cost of the Pickering A Unit 1 515 MW nuclear re-start was \$1.25 billion. Jake Epp, Peter Barnes & Robin Jeffrey, *Report of the Pickering “A” Review Panel*, (December 2003), pp. 3 & 4.
- 28 OPA, News Release, “Ontario secures \$800 million investment in province’s energy infrastructure”, (October 16, 2006).
- 29 Hagler Bailly Canada, *Potential for Cogeneration in Ontario: Final Report*, (August 2000), p. 25.

Appendix A: OCAA Members

AIM PowerGen Corporation
Algoma Manitoulin Environmental Awareness
Algoma Manitoulin Nuclear Awareness
Allergy/Asthma Information Association
Association of Local Public Health Agencies
Breathe Smog Masks Inc
Bullfrog Power
Canadian Association of Physicians for the Environment
Canadian Institute for Environmental Law and Policy
Canadian Institute of Child Health
Canadian Unitarians for Social Justice-South Peel Chapter
Cashmere Avenue PS EnviroClub
CAW Canada
CAW Durham Regional Environment Council
CAW Windsor Regional Environment Council
Citizen's Advisory Committee On Air Quality - Waterloo
Citizens Advocating Renewable Energy
Citizens Environment Watch
Citizens Environmental Alliance
Citizens For Renewable Energy
Citizens Network on Waste Management
City of Guelph
City of Hamilton
City of Kitchener
City of Peterborough
City of Stratford
City of Toronto
City of Windsor
Community Action Parkdale East
Community Environmental Alliance
Conservation Council of Ontario
Conserver Society/Hamilton Chapter
Consumers Assn. of Canada
Earth Day Canada
Earth Works
Echo Lake Association
EnerACT
Enviro-Energy Technologies Inc.
Environment North
Environmental Defence Canada
Enwave Energy Corporation
Evergreen Foundation
Federation of Ontario Cottagers' Associations
For a Safe Environment
GASP
Greenest City
Hearthmakers Energy Cooperative
Hydro 2000
Indigo Wind Energy Systems
Lakeshore Area Multiservice Project
Learning Disabilities Association of Ontario
Mississippi River Power Corporation
North Toronto Green Community
Ontario College of Family Physicians
Ontario English Catholic Teachers Assn.
Ontario Forestry Association
Ontario Highlands Friends of Wind Power
Ontario Lung Association
Ontario Public Health Association
Ontario Society for Environmental Education
OPIRG-Guelph
OPIRG-McMaster
OPIRG-Queen's
OPIRG-Toronto
Oshawa Power and Utilities Commission
Peel Environment Network
Pesticide Action Group-Waterloo
Peterborough Utilities Services
Pollution Probe
Prince Edward County Wind Co-Op Inc.
Regional Municipality of Durham
Regional Municipality of Peel
Regional Municipality of Waterloo
Selectpower
Sky Generation
South Riverdale Community Health Centre
Sudbury Hydro
Thames Region Ecological Association
Toronto Hydro
Town of Markham
Tree Canada
Unitarian Fellowship of Sarnia-Port Huron
United Church of Canada
Wastewise-Halton Hills
Wellington Electric Distribution Company
Wildlands League
Women's Healthy Environments Network
World Wildlife Fund Canada



Ontario Clean Air Alliance

625 Church Street, Suite 402

Toronto M4Y 2G1

Tel: (416) 926-1907 ext. 245

Fax: (416) 926-1601

E-mail: contact@cleanairalliance.org

Web Site: www.cleanairalliance.org