



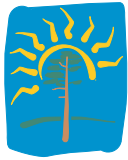
Too Big, Too Costly & Too Polluting – Part 2

*Who benefits and who loses from the proposed
Northern York Region power plant*



Ontario Clean Air Alliance

MAY 7, 2008



The Ontario Clean Air Alliance is a coalition of health and environmental organizations, faith communities, unions, utilities, municipalities, 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.

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City of Guelph
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City of Kitchener
Town of Markham
City of Peterborough
City of Stratford
City of Toronto
City of Windsor
Regional Municipality of Durham
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COMPANIES

AIM PowerGen Corporation
Bullfrog Power
Enviro-Energy Technologies Inc.
Enwave Energy Corporation
Hydro 2000
Indigo Wind Energy Systems
Mississippi River Power Corporation
Oshawa Power and Utilities Corporation
Prince Edward County Wind Co-op Inc.
Sky Generation
Sudbury Hydro
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ORGANIZATIONS AND ASSOCIATIONS

Algoma Manitoulin Environmental Awareness
Algoma Manitoulin Nuclear Awareness
Allergy/Asthma Information Association
Association of Local Public Health Agencies
Canadian Association of Physicians for the Environment
Canadian Institute of Child Health
Canadian Institute for Environmental Law and Policy
Cashmere Avenue Public School EnviroClub
CAW CANADA
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Citizens Advocating Renewable Energy
Citizens Environment Alliance of Southwestern Ontario
Citizens' Environment Watch
Citizens for Renewable Energy
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Community Action Parkdale East
Community Environmental Alliance
Conservation Council of Ontario
Conserver Society of Hamilton and District, Hamilton
Chapter

Earth Day Canada
EarthWorks
Echo Lake Association
Energy Action Council of Toronto (EnerACT)
Environment North
Environmental Defence Canada
The Evergreen Foundation
Federation of Ontario Cottagers' Associations
GASP (Good Air, Safe Power)
Glanbrook Conservation Committee
Globespotter.com
Greenest City
Hearthmakers Energy Cooperative
The Humane Society of Canada
Lakeshore Area Multi Services Project
The Lakewatch Society (Canada)
Learning Disabilities Association of Ontario
North East Sutton Ratepayers Association Inc.
One Change - Project Porchlight
Ontario College of Family Physicians
Ontario English Catholic Teachers' Association
Ontario Forestry Association
Ontario Highlands Friends of Wind Power
Ontario Lung Association
Ontario Public Health Association
Ontario Public Interest Research Group - University of Guelph
Ontario Public Interest Research Group - McMaster University
Ontario Public Interest Research Group - Queen's University
Ontario Public Interest Research Group - University of Toronto
Ontario Society for Environmental Education
Peel Environment Network
Pesticide Action Group/Waterloo
Pollution Probe
South Riverdale Community Health Centre
Thames Region Ecological Association
Toronto Green Community
Tree Canada
Unitarian Fellowship of Sarnia-Port Huron
Unitarian Congregation of South Peel
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Wildlands League
Women's Healthy Environments Network
World Wildlife Fund of Canada

Introduction

On January 31, 2008, Energy Minister Gerry Phillips directed the Ontario Power Authority (OPA) to enter into a contract with a private sector developer for the construction of a 350 to 400 megawatt (MW) simple-cycle gas-fired power plant in Northern York Region (NYR). This directive was made despite the fact that in September 2005 the OPA told the Ontario Energy Board (OEB) that NYR needed only 60 to 140 MW of new gas-fired generation to meet its peak electricity demand.

In this report we will review the key findings of the OPA's September 2005 and October 2007 reports to the OEB with respect to NYR's electricity needs. We will also analyze who benefits and who loses from Minister Phillips' decision to procure: a) an extra 210 to 340 MW of gas-fired generation and b) the least energy efficient gas-fired generation technology (simple-cycle) for NYR. We will conclude with our recommendations for a more balanced, cost-effective and Ontario-focused energy plan for NYR.

Background

NYR's and Ontario's peak demand for electricity occurs on very hot summer days when air-conditioners are running full out. In fact, during these peak demand hours, 40% of the total output of all of Ontario's electricity generating stations is being used simply to power air-conditioners. Fortunately, this huge spike in the demand for electricity occurs on only a few very hot summer days and lasts for just 4 to 6 hours on these days.

In 2005, Ontario's then Minister of Energy, Dwight Duncan, directed the OPA to establish a Working Group to explore options to meet NYR's peak day electricity needs as its population and economy continue to grow.^A The NYR Working Group (OPA, municipal officials, local electric utility representatives and concerned citizens) commenced work during the summer of 2005.

On September 9, 2005, the OPA released the Working Group's three-pronged strategy to meet NYR's electricity needs.

- 1) The aggressive promotion of energy conservation and demand management.
- 2) The installation of a new transformer station in the vicinity of Holland Junction in King Township; plus an additional transformer station preferably in northern Aurora.
- 3) A new natural gas-fired generating facility in NYR.¹

While the Working Group produced excellent recommendations, it is important to note that it did not address two key issues:

- 1) How large should the new natural gas-fired generating facility be?
- 2) What type of natural gas-fired generating technology is appropriate for NYR? That is, should it be a high or low efficiency?

Northern York Region Electricity Supply Study

On September 30, 2005, the OPA submitted its *Northern York Region Electricity Supply Study* to the Ontario Energy Board. The *Study's* key findings with respect to: a) electricity load growth; b) the required size of the new gas plant; c) the appropriate generation technology for the new gas plant; and d) the potential for energy conservation to eliminate the need for new gas-fired electricity generation are summarized below.

Electricity Load Growth

According to the *Study*, in the absence of conservation and demand management, electricity demand is forecast to grow by 3.25% per year in NYR.

A For electricity planning purposes NYR has been defined by the OPA to include the area serviced by the Armitage Transformer Station in Newmarket. This area includes Newmarket, Aurora, Whitchurch Stouffville, East Gwillimbury, part of the Township of King and part of Bradford-West Gwillimbury.

“The forecast for load growth at Armitage TS is 3.25% per year for the next ten years *before adjustment for conservation and demand management*...While there are some shortcomings in the Northern York Region forecast, the OPA considers the forecast sufficient for this initiative.”² [emphasis added].

Required Size of the New Gas Power Plant

According to page 48 of the *Study*, NYR will need 140 MW of new gas-fired generation within the next ten years.

“In the next 10 years the load forecast shows that there will be a need for an additional 140 MW of bulk supply.”³

However, on page 41, the study noted that while NYR will require 140 MW of gas generation if this generation is directly connected to Hydro One’s high-voltage *transmission* network, it will only need 60 MW of new gas generation if the generation is connected to Newmarket Hydro’s or PowerStream’s *distribution* network.

“Firm capacity is defined as the capacity of a generating plant with the single largest generating unit unavailable. For generators connected to the 44 kV distribution network, the requirement was a minimum 60 MW of firm capacity and for those on the 230 kV transmission network, it was 140 MW.”⁴

The Appropriate Generation Technology for the New Gas Plant

There are three types of natural gas-fired electricity generation technologies: a) simple-cycle; b) combined-cycle; and c) combined heat and power.

Simple-cycle turbines are the least efficient gas technology for power generation. According to the OPA, simple-cycle turbines have an energy efficiency of only 36%.⁵

Natural gas combined-cycle and combined heat and power plants are much more energy efficient than simple-cycle turbines. Specifically, combined-cycle plants can have energy efficiencies

of 55 to 60%; and combined heat and power (cogeneration) systems can have energy efficiencies of 80 to 90%.⁶

According to the *Study*, either simple-cycle or combined-cycle generation could be used to meet NYR’s electricity needs.⁷ The *Study* did not specifically recommend either simple or combined-cycle generation to meet NYR’s needs. In addition, the *Study* did not address the potential to use natural gas-fired combined heat and power generation to meet NYR’s needs.

In this context, it is important to note that small-scale combined heat and power plants in NYR would be connected to the local utilities’ *distribution* networks, not Hydro One’s high-voltage 230 kV transmission network. Therefore, according to the *Study*, NYR’s electricity needs could be met by 60 MW of combined heat and power generation.

The Potential for Energy Conservation to Eliminate the Need for New Gas Generation

The *Study* acknowledged that the aggressive promotion of conservation and demand management could eliminate the need for new generation to meet NYR’s needs. However, according to the *Study*, even if this were to occur the power plant would still be useful to meet the peak power needs of the rest of Ontario.

“One suggestion put forward during a working group session was to have ‘decision points’ and reconsider at the last possible opportunity whether or not generation is still needed and should go ahead or if the load growth has tapered sufficiently through effective CDM [conservation and demand management] or otherwise to eliminate this need. While this suggestion has merit, in the context of a province with a need for peaking generation and the already significant needs of Northern York Region, the risk of developing stranded assets is minimal. Consistent with this, the sooner the generator is available to support the capacity needs in the province, the better.”⁸

Phase II Northern York Region Report

On October 15, 2007, the OPA submitted its *Phase II Northern York Region Report* to the OEB. The *Report's* key findings are: a) conservation and demand management (CDM) is reducing the demand for electricity in NYR; b) a 30 MW cap has been imposed on the OPA's most successful NYR CDM program; and c) the supply situation in NYR is tight but manageable.

Conservation and Demand Management Is Reducing Demand in NYR

According to the *Report*, the demand for electricity in NYR fell in 2007, declining from 365 MW in 2006 to 359 MW in 2007. In addition, the *Report* forecasts that the demand for electricity in NYR will fall by an additional 2% in 2008 relative to 2007.⁹ To put this forecast in context, the Independent Electricity System Operator is forecasting that Ontario's total demand for electricity will fall by only 1% in 2008.¹⁰ That is, NYR's demand for electricity is forecast to fall at *double* the province-wide rate this year.

It is also worth noting that the OPA is forecasting that as a result of its conservation programs, Ontario's province-wide demand for electricity will *fall* each and every year between now and 2015.¹¹

30 MW Cap Imposed on NYR's Most Successful Demand Management Program

The OPA has established an excellent program to pay large commercial, institutional and industrial customers in NYR (e.g., Magna, Royal Group Technologies, Regional Municipality of York) to shift some of their consumption from peak to off-peak hours on very hot summer days. This program is administered by Rodan Energy.

In addition, Hydro One, Newmarket Hydro and PowerStream have energy conservation and demand management programs.

Table 1 provides a summary of the demand reductions provided by each of these companies' programs in NYR in 2007.

Table 1: Demand Reductions Achieved in NYR in 2007 by Rodan Energy and the Local Utilities¹²

Rodan Energy	16.6 MW
Hydro One	1.4 MW
PowerStream	0.6 MW
Newmarket Hydro	0.2 MW
Total	18.8 MW

As Table 1 reveals, Rodan Energy's York Region Demand Response program provided 88% of the demand reductions achieved in NYR in 2007. Nevertheless, according to the OPA's *Report*, it has imposed an arbitrary 30 MW cap on the quantity of demand reductions it is willing to purchase from large volume electricity consumers in NYR via Rodan Energy's program.¹³

In addition, we have learned that the OPA's payments to Rodan Energy's customers for demand reductions in NYR are *substantially lower* per MW than its payments for similar demand reductions in downtown Toronto.

The Supply Situation in NYR Is Tight, but Manageable

According to the OPA's October 2007 *Report*, the supply situation in NYR for the summers of 2008 and 2009 is tight, but manageable:

"An assessment of summer 2008 and summer 2009 found that the supply situation is expected to be tight, but just manageable due to the planned mitigation measures that are, or will be, in place. Most notably during this period are two feeders to transfer roughly 30 MW of load to Brown Hill TS, approximately 26-29 MW of Conservation, 30 MW of post-contingency relief through back-up feeders from PowerStream, and the location of a spare transformer on-site at Armitage TS to shorten the restoration time should a transformer fail. Recent developments indicate that Holland Junction TS should be in-service in 2009. This will go a long way to providing relief to some of the area supply constraints; however, the construction of gas-fired generation and a second new transformer station is required to provide further relief."¹⁴

Gerry Phillips' Decision

As we have noted above, in September 2005 the OPA told the Ontario Energy Board that:

- NYR needs 60 to 140 MW of new gas-fired generation;
- But successful conservation and demand management programs could eliminate the need for new gas-fired generation in NYR.

Nevertheless, despite the fact that the demand for electricity *fell* in NYR last year and is forecast to *fall* by an additional 2% this year, on January 31, 2008 Ontario's Energy Minister, Gerry Phillips, directed the OPA to enter into a contract with a private sector developer for the construction of a 350 to 400 MW *simple-cycle* power plant in NYR.¹⁵ That is, Minister Phillips has directed the OPA to contract for 210 to 340 MW *more* gas-fired generation than the OPA told the Ontario Energy Board, on September 30, 2005, was needed to meet NYR's needs. In addition, Minister Phillips' has chosen the least energy efficient gas-fired generation technology to meet NYR's needs. In his letter to the OPA, the only reason Minister Phillips' gave for his directive was that "load in NYR is forecast to grow at above 3 per cent per annum" – a statement which we have noted above is not supported by the facts.

On April 28, 2008 the OPA announced its intention to award a contract to build a 350 to 400 MW simple-cycle power plant in NYR to one of the following five companies: EPCOR, Northland Power, Pristine Power, Sithe Global Canadian Power Services, TransCanada Energy.

Who *Benefits* from Minister Phillips' Decision to Contract for an Extra 210 to 340 MW of Gas-Fired Generation in NYR?

1. A Big Power Developer

Pursuant to Minister Phillips' directive, the OPA is planning to enter into a 20 year contract with one of the five above-noted power developers to build a 350 to 400 MW power plant. This contract will cover all of the developer's capital, fuel and operating costs plus profits. The larger the power plant, the greater the developer's profits. Therefore, by increasing the project's size by 210 to 340 MW, Gerry Phillips' directive will also significantly increase the selected power developer's profits.

2. Status quo power planning

Signing one contract with one power developer for 350 to 400 MW of supply is a more straightforward option than pursuing multiple smaller scale projects covering a spectrum of activities, including conservation, demand management, renewable power and small-scale combined heat and power. It is an approach that fits well with the status quo centralized approach that has dominated power planning in Ontario for the past 50 years. But it is also inflexible, inefficient and unsuited to the development of a "culture of conservation."

Who *Loses* from Minister Phillips' Decision to Contract for an Extra 210 to 340 MW of Gas-Fired Generation in NYR?

1. Ontario's electricity consumers

The full cost of the extra 210 to 340 MW of gas-fired generation will be added to the electricity rates of all of Ontario's electricity consumers.

Alternatively, NYR's and Ontario's electricity needs could be met at a lower cost by deploying aggressive energy conservation and demand management programs, new renewables, combined heat and power and/or by converting one or more of the Lambton Generating Station's boilers from coal to natural gas.

Currently, Ontario's dirty coal plants, including the Lambton Generating Station near Sarnia, are largely used to meet peak day demands. However, as a result of a Government of Ontario regulation, these generating stations will not be permitted to burn coal after December 31, 2014. During his first term, Premier McGuinty phased-out approximately one-third of Ontario's coal-fired electricity production. During the 2007 election campaign, he promised to reduce coal-fired electricity generation by an additional one-third by 2011.

Demand response programs (e.g. Rodan Energy's demand response program noted above) are the lowest cost option for meeting NYR's and Ontario's peak day electricity needs. However, if demand response programs, new renewables and combined heat and power are not sufficient, in the short term, to meet all of our electricity needs then converting Lambton's boilers to burn natural gas is a lower cost solution to meet our peaking needs than building a new simple-cycle power plant in NYR. The capital cost per MW of converting one or more of Lambton's coal boilers to burn natural gas is 80% lower than the capital cost of building a new simple-cycle gas plant in NYR.¹⁶

While the converted Lambton plant will be less efficient than a combined heat and power gas plant, its use can be strictly limited and eventually eliminated by the development and implementation of strong conservation and demand management programs. And because the up-front capital costs of the conversion will be much less than the costs of building a new gas plant, the financial savings can be used to finance aggressive conservation and demand management programs.

Therefore, by choosing the highest cost option to meet NYR's and Ontario's peak day demands (a new simple cycle gas plant), Minister Phillips is imposing higher than necessary rate increases on Ontario's consumers.

Who *Benefits* from Gerry Phillips' Decision to Contract for Simple-Cycle Gas-Fired Generation in NYR?

1. Alberta

As noted earlier, there are three types of natural gas-fired electricity generation technologies: simple-cycle (36% efficient); combined-cycle (55-60% efficient) and combined heat and power (80-90% efficient). Minister Phillips has directed the OPA to contract for the construction of a simple-cycle power plant in NYR.

Since simple-cycle generation is the least efficient generation technology, it requires more gas imported from Alberta to produce a kWh of electricity than the more efficient options. Therefore, this option is in the best interests of the Province of Alberta since it will increase Ontario's demand for non-renewable natural gas.

Who *Loses* from Gerry Phillips' Decision to Contract for Simple-Cycle Gas-Fired Generation in NYR?

1. Ontario

By directing the OPA to contract for the least energy efficient gas technology for power generation, Minister Phillips' decision will lower the energy efficiency of Ontario's electricity industry, thereby requiring more Ontario dollars to flow to Alberta to purchase more natural gas. If Minister Phillips had chosen the more efficient and lower cost options (conservation and demand management, combined heat and power) he would have increased Ontario's electricity productivity and helped make Ontario's industries more competitive (e.g., Magna has numerous auto plants in NYR that could benefit from energy efficiency programs).

If Minister Phillips had directed the OPA to pay electricity consumers in NYR to install small-scale, high-efficiency combined heat and power plants in their buildings and factories then more jobs would be created and saved in Ontario for the following reasons. First, since combined heat and power plants are more complex than simple-cycle plants, they create more jobs when they are being built. Second, since they consume less gas to produce a kWh of electricity, they reduce the outflow of Ontario dollars to purchase natural gas from Alberta. Third, by improving a factory's electricity productivity and hence competitiveness, they help protect Ontario's existing manufacturing jobs.

2. Public Health and the Environment

A simple-cycle power plant uses many more BTUs of natural gas to produce a kWh of electricity than a high-efficiency combined heat and power plant. As a consequence its air pollution emission rates per kWh are much greater than those of a

combined heat and power plant. For example, the greenhouse gas emission rate of a simple-cycle power plant is double that of a combined heat and power plant.

Who *Benefits* from the OPA's Decision to Arbitrarily Cap Rodan Energy's Demand Response Program at 30 MW and to Pay Less for Demand Reductions in NYR than in Toronto?

1. All of Ontario's Private Sector Power Producers

Rodan Energy's demand response program reduces NYR's and Ontario's peak day electricity demands. As a result, Rodan's program is directly contrary to the financial self-interest of Ontario's private sector power producer's for two reasons. First, by reducing our peak day electricity demands, it reduces the need for the OPA to contract for additional gas-fired peaking generation capacity. Second, Ontario's spot market electricity commodity prices typically spike on hot summer high demand days.

By reducing demand, demand response programs can dramatically reduce peak day electricity commodity prices and hence the profits of private sector power producers. For example, according to National Economic Research Associates, a 2-5% reduction in demand on peak days could reduce spot prices by 50% or more.¹⁷ Therefore, the OPA's arbitrary 30 MW cap on the quantity of demand reductions it will purchase from NYR consumers via the Rodan Energy program is protecting the profits of Ontario's private sector power producers.

Who *Loses* from the OPA's Decision to Arbitrarily Cap Rodan Energy's Demand Response Program at 30 MW and to Pay Less for Demand Reductions in NYR than in Toronto?

1. Ontario's residential, commercial, institutional and industrial electricity consumers

As noted above, demand response programs have the potential to reduce spot electricity prices by 50% or more on peak demand days. As a result, aggressive and unfettered demand response programs will reduce the electricity bills of Ontario's consumers and make our industries more competitive. Therefore, the OPA's decision to cap the Rodan Energy York Region Demand Response Program at 30 MW and to pay less for demand reductions in NYR than it pays for similar demand reductions in downtown Toronto is directly contrary to the best interests of Ontario's electricity consumers and the competitiveness of our manufacturing industries.

2. Public Health and the Environment

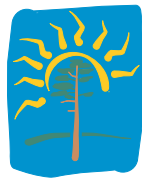
The aggressive and unfettered pursuit of demand reductions will reduce the need for energy inefficient and excessively polluting peaking electricity generation. Therefore, the OPA's arbitrary restrictions on Rodan Energy's York Region Demand Response Program are also detrimental to public health and the environment.

The Ontario Clean Air Alliance's Recommendations for Energy Minister Phillips

1. Immediately rescind the January 31, 2008 directive to the OPA that requires it to contract with a private sector developer for the construction of a 350 to 400 MW simple-cycle gas power plant in NYR.
2. Direct the OPA to immediately remove its 30 MW cap on the amount of demand reductions it will purchase in NYR via Rodan Energy's York Region Demand Response Program.
3. Direct the OPA to pay the same price, per MW, for demand reductions in NYR as it is paying for demand reductions in downtown Toronto.
4. Direct the OPA to dramatically increase its funding for Hydro One's, Newmarket Hydro's and PowerStream's conservation and demand management programs.
5. Direct the OPA to pay large electricity consumers in NYR to install small-scale, high-efficiency natural gas-fired combined heat and power plants in apartment buildings, condominiums, municipal buildings, hospitals, shopping centres, office buildings and factories. In addition to helping to meet NYR's peak day electricity needs, combined heat and power plants can reduce Ontario's need for new, higher cost nuclear power plants and make NYR's industries more energy efficient and competitive.
6. Direct the OPA to re-constitute the NYR Working Group (OPA, municipal officials, local utility representatives and concerned citizens) to develop a balanced and cost-effective energy plan to meet NYR's electricity needs (i.e., conservation and demand management, renewables, small-scale, high-efficiency natural gas-fired combined heat and power plants and district energy and, if necessary, no more than 30 MW of simple-cycle generation).

Endnotes

- 1 Ontario Power Authority, News Release, “Northern York Region Needs Balanced Electricity Supply Solution”, (September 9, 2005).
- 2 Ontario Power Authority, Northern York Region Electricity Supply Study, (September 30, 2005), p. i.
- 3 Ontario Power Authority, Northern York Region Electricity Supply Study, (September 30, 2005), p. 48.
- 4 Ontario Power Authority, Northern York Region Electricity Supply Study, (September 30, 2005), p. 41.
- 5 Ontario Power Authority, Integrated Power System Plan, Exhibit G, Tab 2, Schedule 1, p. 7.
- 6 Danny Harvey, “Clean building: contribution from co-generation, trigeneration and district energy”, *Cogeneration and On Site Power Production*, (September-October 2006), pp. 108, 110; and Ontario Power Authority, Supply Mix Analysis Report, Volume 2, (December 2005), pp. 210 & 212.
- 7 Ontario Power Authority, Northern York Region Electricity Supply Study, (September 30, 2005), p. 42.
- 8 Ontario Power Authority, Northern York Region Electricity Supply Study, (September 30, 2005), pp. 46 & 47.
- 9 Michael Lyle, General Counsel, Ontario Power Authority, Phase II Northern York Region Report, (October 15, 2007), p. 14, Table 11.
- 10 In 2007 Ontario’s peak demand was 25,737 MW. The IESO is forecasting that it will fall to 25,493 MW in 2008. See www.ieso.ca.
- 11 Ontario Power Authority, Integrated Power System Plan, Exhibit D, Tab 1, Schedule 1, Attachment 2, p. 1 and Exhibit D, Tab 4, Schedule 1, p. 16.
- 12 Michael Lyle, General Counsel, Ontario Power Authority, Phase II Northern York Region Report, pp. 4 & 5.
- 13 Michael Lyle, General Counsel, Ontario Power Authority, Phase II Northern York Region Report, p. 4.
- 14 Michael Lyle, General Counsel, Ontario Power Authority, Phase II Northern York Region Report, p. 16.
- 15 Letter from the Honourable Gerry Phillips, Minister of Energy to Jan Carr, CEO, OPA re: Procuring Approximately 350 MW of New Gas-Fired Electricity Generation for Northern York Region (January 31, 2008).
- 16 OPA, Integrated Power System Plan, Exhibit E, Tab 5, Schedule 1, p. 16; and Exhibit G, Tab 2, Schedule 1, p. 7.
- 17 Michael Rosenzweig et al., “Market Power and Demand Responsiveness: Letting Customers Protect Themselves”, *Electricity Journal*, (May 2003).



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