

**Before the Ontario Energy Board**

**In the matter of a hearing respecting  
Electricity Conservation and Demand Management**

**(To be heard: December 22, 2005)**

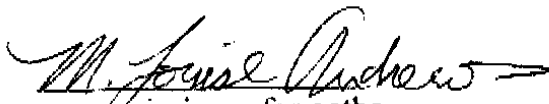
**Affidavit of Chris Neme**

I, CHRISTOPHER NEME OF THE CITY OF SHERBURNE, VERMONT MAKE OATH AND SWEAR:

1. I am the Director of Consulting Planning and Evaluation at Vermont Energy Investment Inc. in Burlington Vermont and have been engaged by the Green Energy Coalition to provide evidence in this matter and as such have knowledge of the matters hereinafter deposed.

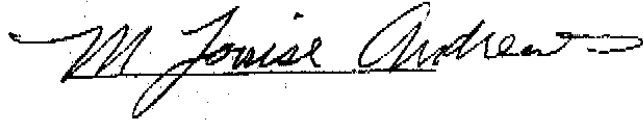
2. Attached as exhibit A to this affidavit is a true copy of my report entitled "Setting Ontario's Electric LDCs on a Path Towards a Conservation Culture" and dated December 2, 2005. I have prepared or overseen the preparation of the report in response to the three questions posed in the Board's notice of hearing. Included in the report is a true copy of my *curriculum vitae*. The report sets out my opinions, recommendations and the basis for those opinions and recommendations. I adopt the report as a true statement of my evidence in this matter.

Sworn before me this 2<sup>nd</sup> )  
day of December, 2005 )  
at Burlington, Vermont )

  
a commissioner for oaths

  
Christopher Neme

**This is Exhibit A of the Affidavit of  
Christopher Neme, Sworn before me on  
December 2, 2005**



**EB-2005-0523**

**Before the Ontario Energy Board**

**Setting Ontario's Electric LDCs on a Path  
Towards a Conservation Culture**

**Prepared by:**

**By Chris Neme**  
Vermont Energy Investment Corporation

For  
**The Green Energy Coalition**  
David Suzuki Foundation  
EnerAct  
Greenpeace Canada  
Sierra Club of Canada

December 2, 2005

## I. INTRODUCTION

The OEB has asked for input on three key questions in this proceeding. They can be summarized follows:

1. Should the Board order an LDC to spend money on CDM programs in an amount that is different from the amount proposed by the LDC in a test year and, if so, under what circumstances?
2. Should LDCs be required to demonstrate free ridership levels on a program by program basis?
3. Should an LDC be entitled to claim anything more than the *incremental* benefits associated with its participation in programs that are supported by other entities, particularly unregulated third parties such as federal and provincial government agencies.

These questions are all critically important. Their answers will fundamentally shape CDM policy – indeed, electricity policy – in Ontario. The stakes are high. At the most basic level, they include:

- A. Whether Ontario’s citizens will truly get anything close to least cost electric energy service;
- B. Whether Ontario’s citizens will realize many other benefits associated with cost-effective efficiency investments, including lower exposure to the real risks of fuel price volatility, lower pollution levels, and greater economic development than under alternative supply-side investments;
- C. Whether conservation will be perceived as fair and thus sustainable by Ontario’s electric ratepayers. Specifically, will they pay only for benefits they receive – and, conversely, whether LDCs will be rewarded for the actions of others rather than just for the progress for which they are responsible; and
- D. Whether Ontario’s commitment to a “conservation culture” will ever be realized.

The bottom line is that Ontario has quickly found itself at a cross-road with respect to electric CDM. A year and a half after the provincial government clearly stated that it wanted to create a culture of conservation, there has been some progress. Most notably LDCs have begun to launch CDM initiatives and some – such as Mississauga Hydro – are proposing to increase CDM spending beyond the initial “third tranche” requirements. In a couple of cases, LDCs have publicly committed to goals of reducing current energy use or current peak demand. For example, in a letter to the Ontario Clean Air Alliance, CEO David O’Brien indicated that Toronto Hydro had “established an internal target of reducing its system peak demand by 5% (250 MW) by 2007.”<sup>1</sup>

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<sup>1</sup> Letter from David O’Brien to Jack Gibbons, Ontario Clean Air Alliance, November 16, 2005.

However, this progress is tempered by a number of concerns. First, in contrast with Mississauga and several other smaller LDCs, Hydro One, Toronto Hydro, Hydro Ottawa, Powerstream and most other LDCs are doing (and proposing to do in the future) only the minimum necessary to meet their “third tranche” obligations. Second, most LDCs are devoting most of their CDM spending to load management, distributed generation, “smart meters” and/or supply-side efficiency improvements. Many of these things should be pursued in the normal course of good “supply management” (rather than demand management). As a result, they are spending relatively little on often much more valuable efficiency programs. Third, most of the LDCs efficiency program efforts are still extremely vague. Fourth, as far as one can tell, their efficiency programs miss some important and cost-effective efficiency opportunities<sup>2</sup> and, perhaps more importantly, do not have nearly enough funding to adequately address the opportunities which they are targeting. For example, Hydro Ottawa apparently had to shut down an old refrigerator turn-in program just weeks after it was launched because public demand was so high that it ran out of program budget.<sup>3</sup> Fifth, there have not even been any serious attempts to comprehensively assess efficiency opportunities, let alone more broadly estimate how large the achievable electric efficiency “resource” is, how much of it is cost-effective, how much of it could be captured over the next several years and which efficiency measures and markets offer the greatest potential.<sup>4</sup> Indeed, in most cases, LDCs have neither estimated the savings that will result from the programs they are already delivering nor analyzed whether they are cost-effective. Where they have estimated savings, most have not provided the basis for those estimates. This is a concern because some of the initial estimates do appear suspect. At the same time, there are much more serious plans to invest enormous sums of money on supply-side investments that CDM could potentially displace or defer at much lower cost.

At the root of all of these problems is that many LDCs do not appear to understand what their CDM obligations are or should be. Clear, incisive answers to the questions the OEB has posed in this proceeding could go a long way toward eliminating this confusion and moving electricity policy in Ontario in the right direction. In this evidence, I offer the Board information and policy perspective that should be useful in developing such answers.

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<sup>2</sup> Examples include sales and (more importantly) quality installations (proper sizing, refrigerant charge and airflow) of residential and small commercial central air conditioners and sales of computers with efficient power supplies. The latter can be implemented as a turn-key project under contract with ECOs Consulting, a firm that is working with utility CDM programs and computer manufacturers. As a result, it requires no ramp up, capacity building, etc.

<sup>3</sup> Peter Love, statement at Pollution Probe and Canadian Renewable Energy Alliance Workshop on “Developing a Renewable Energy and Energy Efficiency Strategy for Ontario”, November 15, 2005.

<sup>4</sup> The only publicly available assessment of achievable electric efficiency potential in Ontario is the Pembina Institute’s May 2004 report “Power for the Future: Toward a Sustainable Electricity System for Ontario”. That report suggested that 40% of projected “baseline” electricity consumption in the province in 2020 could be eliminated through (1) greater investment in efficiency measures; (2) increases in commercial and industrial cogeneration; and (3) fuel switching from electricity to natural gas heating in the residential and commercial sectors. However, it was a top-down study, so it does not provide any detail on how much of 40% reduction was due to each of its three components, let alone the level of market specific analysis necessary to have confidence in estimates of achievable potential from specific efficiency measures and markets.

I have previously filed testimony on CDM issues before the Ontario Energy Board on numerous occasions over the past decade (EBRO 487, EBRO 493/494, EBRO 497, EBRO 499, RP-1999-0001, RP-1999-0017, RP-2001-0029, RP-2001-0032, RP-2002-0133, RP-2003-0063, RP-2003-0203, EB-2005-0211, EB-2005-0001), as well as before similar regulatory bodies in Quebec, Vermont, Connecticut, Maine, New Jersey and Ohio. A copy of my curriculum vitae is provided as Attachment A to this document.

## II. CDM SPENDING

The Board's question regarding whether and when it should order LDCs to spend more on CDM than they have proposed is probably the most important of the three questions it has proposed. A proper answer needs to address a number of subsidiary questions. They are as follows:

- What is the rationale for electric CDM in Ontario?
- Is there a fundamental policy objective that should guide decisions on how much CDM spending is appropriate?
- How much CDM spending is necessary to achieve that objective?
- If CDM spending levels are too low today, how quickly should they increase?
- How should CDM funds be spent? On energy or peak demand savings? On immediate resource acquisition or longer-term market transformation efforts? With the goal of maximizing savings per dollar of spending or ensuring equitable access to CDM programs among all customer groups?
- How should CDM responsibilities in the province be shared, given the range of entities involved and the need to minimize confusion in the private sector?

I address each of these subsidiary questions below. I do not address the legal question of the extent of the Board's jurisdiction which I have presumed is adequate to implement my recommendations (i.e. I leave that issue to the lawyers to address).

### A. Rationale for Electric CDM in Ontario

The rationale for aggressive pursuit of electric CDM in Ontario is multi-faceted and compelling. Key elements of this rationale are as follows:

- **Ontario is facing a major capacity short-fall over the next 15 years.** Approximately 25,000 MW (i.e. 80%) of Ontario's electric generating capacity will be out of service by 2020. The cost of replacing that capacity is estimated to be between \$25 and \$40 billion.<sup>5</sup> CDM can fill a significant portion of that "supply gap". Moreover, it can do so at a much lower net cost than supply side alternatives.

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<sup>5</sup> Love, Peter, "Electricity, Conservation and the Office of the Chief Energy Conservation Officer", presentation at Pollution Probe and Canadian Renewable Energy Alliance Workshop on "Developing a Renewable Energy and Energy Efficiency Strategy for Ontario", November 15, 2005.

- **Economic benefits from avoided energy supply expenditures are likely to be huge.** Neither the LDCs nor other parties have conducted a full analysis of the economic benefits of reducing electricity use and demand through CDM potential. However, the avoided costs made available by the OEB in its TRC Guide are substantial (on the order of 4 to 12 cents per avoided kWh in 2006, depending on season and time of day) plus an additional \$80+ per avoided peak kW starting in 2008. These values exclude economic benefits of avoiding environmental externalities. Even so, they are much greater than most efficiency programs cost. To give just one example, an effective program to promote the sale of compact fluorescent light bulbs is likely to produce energy savings at both a utility cost and societal cost on the order of 2 cents per saved kWh. Just one year of a fully ramped up program in Ontario would produce approximately 300 GWh of annual energy savings, 50 MW of peak demand savings, and economic benefits of \$100 million.<sup>6</sup>
- **DSM can reduce job losses.** Numerous studies have shown that cost-effective DSM investments increase jobs. This happens for several reasons. First, since consumers have more disposable income, they are able to spend more on other goods that require jobs to create, distribute, sell, etc. Second, efficiency measures are typically more labor intensive to produce and distribute than energy supply alternatives. Finally, DSM can be targeted to businesses for which high energy prices can exacerbate competitive pressures in ways that threaten local jobs. Leading efforts in other jurisdictions have been effective in using DSM programs to help stem such job losses. For example, in my home state of Vermont, a substantial DSM project that is projected to save the largest employer in the poorest part of the state (Ethan Allen, a furniture manufacturer) more than a million dollars over ten years was hailed by that Company's Chief Financial Officer as a key to keeping operations and jobs in state. Such local economic benefits are not captured in avoided cost screening.
- **Environmental benefits are substantial.** Current projections have gas generating capacity on the margin.<sup>7</sup> Gas generation contributes significant emissions of CO<sub>2</sub> and NO<sub>x</sub>. The CO<sub>2</sub> emissions are particularly important given the Canadian government's commitment to the Kyoto climate change treaty. If new gas generation does not become available, the marginal fuel could include

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<sup>6</sup> The estimates of savings are all well grounded in experience and evaluation in other jurisdictions. The estimate of economic benefits is a little rougher in that it is not based on a detailed analysis of lighting load shapes and precise allocations of estimated savings to different costing periods (with their different avoided cost values). However, it should be accurate enough to support the point being made. It assumes an average avoided cost of energy of \$0.085/kWh (consistent with the mid-peak avoided cost values in the OEB TRC Guide), an average avoided demand cost of \$85 starting in 2008 (also consistent with the OEB TRC Guide), a CFL cost of \$5 (conservative relative to some market prices today), per CFL savings of 44 kWh for residential customers and 163 kWh for business customers (Efficiency Vermont assumption based on extensive New England evaluation), a CFL measure life of 5 years (consistent with current Energy Star labeling requirement and evaluation-based estimate of annual hours of use), Ontario CFL sales of approximately 1 per household (similar to leading CFL rebate programs in North America), 80% of CFL sales to residential customers and 20% to business customers (conservative relative to current Vermont levels) and a free rider rate of 10%.

<sup>7</sup> Navigant Consulting, "Avoided Cost Analysis for the Evaluation of CDM Measures", presented to Hydro One Networks, Inc., June 14, 2005, p. 47.

coal-fired imports or further delays in closing Ontario coal plants which generate even greater emissions of CO<sub>2</sub> and NO<sub>x</sub>, as well as significant SO<sub>2</sub>, mercury, heavy metal and other toxic emissions.

- **Enormous electric efficiency potential remains untapped.** There is no publicly available analysis of achievable electric efficiency potential, by measure or market, for Ontario. However, the enormous savings being realized today in states as diverse as Vermont and California suggest it is likely to be very large. Needless to say, Vermont and California are both different from Ontario. For example, both Vermont and California have electric rates that are more than 50% greater than Ontario's. However, all other things being equal, that should mean that there is less "natural conservation" in Ontario than in those states and therefore more DSM potential in Ontario. In addition, Vermont and California both currently have substantially lower (20% and 50% lower, respectively) per capita annual kWh consumption than Ontario. Again, all other things being equal, this suggests that there is a deeper pool of savings potential from which DSM programs in Ontario could draw. Finally, unlike Ontario, both Vermont and California have already made substantial investment in electric DSM over the past decade. This too suggests that – all other things being equal – the reservoir of efficiency potential in Ontario should be greater than in those states. Thus, important differences between Ontario and other leading jurisdictions suggest the potential in Ontario should be *even higher* than the results of those jurisdictions' DSM efforts suggest is possible.
- **There are important synergies between electric and gas CDM efforts.** The reintroduction of electric CDM in Ontario offers important opportunities. Many efficiency measures – e.g. making the thermal envelope of buildings more efficient – save both gas and electricity. Thus, electric CDM efforts should be able to leverage support from gas CDM providers (and vice versa).
- **Political support for efficiency is strong.** Last year the Ontario Premier made clear that he wants Ontario to be a leader in conservation in North America.<sup>8</sup> Leaving enormous reservoirs of cost-effective gas efficiency potential untapped while spending a tiny fraction of what leading jurisdictions spend (see below for additional discussion of spending levels) means falling well short of such leadership aspirations.

## **B. Fundamental CDM Policy Objective**

In the end, all spending decisions should be guided by the basic premise that CDM should be aggressively pursued whenever demand-side resources are cheaper than their supply-side alternatives. Put another way, LDCs and/or other CDM delivery entities should spend as much as is necessary to capture all cost-effective efficiency and other demand-side resources that the market is not capturing. This policy should be tempered only by the legitimate goals of ensuring that rate impacts are not so large as to create significant short-term economic disruption or hardship and ensuring that the rate of

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<sup>8</sup> [www.premier.gov.on.ca/english/News/Energy041904\\_Speech.asp](http://www.premier.gov.on.ca/english/News/Energy041904_Speech.asp)

increase in CDM spending (to get to maximum levels) can be managed effectively and efficiently.

This “primary directive” has been embodied in rules established in numerous regulatory jurisdictions across North America (from New England to California) over the past two decades. Moreover, it is essentially the rule the OEB itself adopted in 1993 (in EBO-169-III) for gas DSM. It is also worth noting that utilities have been penalized for inadequately following this prime directive. For example, in 1994 (Docket 5720), the Vermont Public Service Board (the state regulatory agency analogous to the OEB in Ontario) docked Central Vermont Public Service – the state’s largest utility – 75 basis points on its rate of return on equity for failing to adequately pursue and acquire cost-effective demand-side resources.<sup>9</sup>

Finally, it should be emphasized that this directive means treating efficiency as a resource that needs to be *acquired*, just like a power plant, long-term fuel or electricity supply contracts or transmission lines. Some stakeholders in Ontario, including the gas utilities, have recently raised concerns about “buying the market” for efficiency. However, that is precisely what resource procurement means. Of course, utilities should not spend any more than necessary to acquire cost-effective efficiency resources. But neither should they shy away from spending the money necessary to acquire such resources. If they do not buy all efficiency resources available at lower costs they will be forced to buy supply alternatives at higher costs. Put another way, subject to the caveats above, it is irrational to shy away from paying what it costs to acquire cost-effective efficiency resources.

### **C. CDM Funding Levels**

If Ontario is to truly commit to treating CDM as the highly cost-effective resource it can be – so that investments in CDM are made whenever they are cheaper than supply alternatives – it must be willing to dramatically increase CDM spending. In particular, it must be willing to dramatically increase spending on the end-use energy efficiency component of CDM (see below for further discussion on the need to distinguish between end use efficiency programs and other activities LDCs include in broader CDM portfolios).

As Table 1 shows, the top five LDCs in Ontario, which collectively account for more than half of all electricity sales and electric revenues in the province, are collectively planning to spend less than \$40 million in 2006 on CDM. Moreover, only about 30% of their proposed spending – i.e. only \$10.7 million – will be on end use efficiency measures. That translates to less than 0.2% of total revenues.<sup>10</sup> Those totals mask some important differences between the LDCs. For example, Mississauga is proposing to increase spending to more than 0.4% of revenues, or nearly three times the average for the other four LDCs.

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<sup>9</sup> Personal communication with John Plunkett, December 1, 2005. Mr. Plunkett was an expert witness in the proceeding on behalf of the Vermont Department of Public Service.

<sup>10</sup> Their weighted average spending on all CDM is approximately 0.6% of revenues.

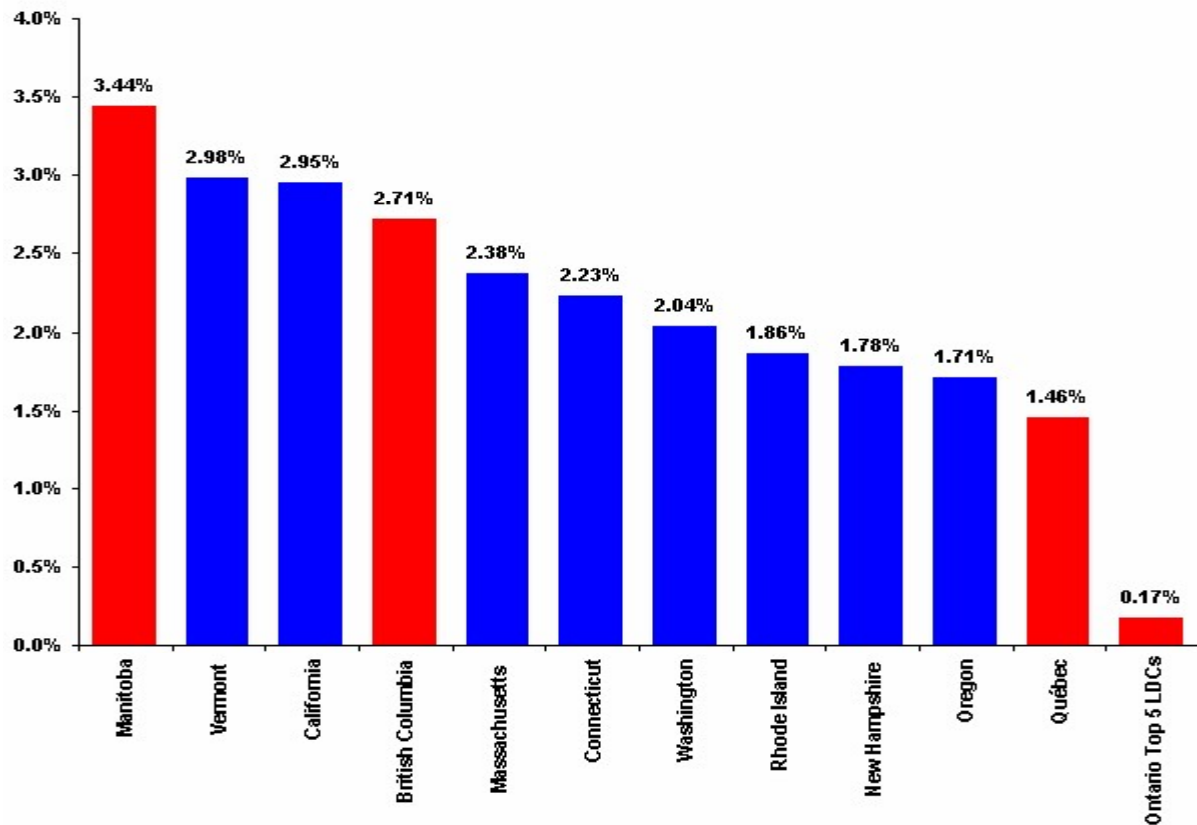


**Table 1: 2006 CDM and Efficiency Spending of Ontario's Largest LDCs<sup>11</sup>**

LDC	Annual Sales (GWh)	Revenue Requirement (\$ millions)	CDM Spending (\$ millions)	Efficiency Spending (\$ millions)	Efficiency Spending (% revenues)
Toronto Hydro	26,417	\$2,235	\$16.05	\$3.67	<b>0.16%</b>
Hydro One	23,112	\$2,368	\$10.15	\$2.80	<b>0.12%</b>
Hydro Mississauga	7,936	\$498	\$3.86	\$2.09	<b>0.42%</b>
Hydro Ottawa	7,702	\$599	\$3.30	\$0.86	<b>0.14%</b>
Powerstream	6,202	\$490	\$4.26	\$1.32	<b>0.27%</b>
Totals	71,369	\$6,190	\$37.61	\$10.74	<b>0.17%</b>

As Figure 1 demonstrates, numerous other jurisdictions across North America – both in the United States (blue) and in Canada (red) – are spending 10 to 30 times what the five largest LDCs in Ontario plan to spend on end-use energy efficiency programs in 2006.

**Figure 1: Efficiency Program Spending in Top Jurisdictions and Ontario  
(as % of Annual Revenue Requirements)**

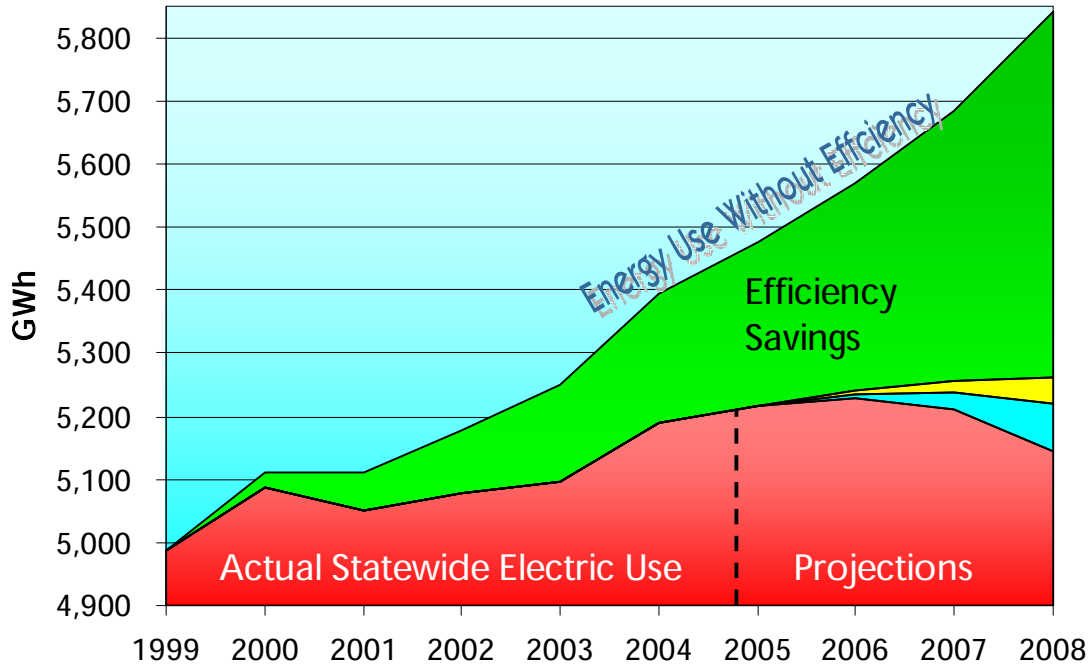


<sup>11</sup> The CDM and efficiency program spending levels shown in this table include both previous commitments and new proposals for 2006. The sales and revenue requirements (which include both distribution revenues and commodity costs) are for 2004 because forecasts of such values for 2006 were not readily available. This probably results in an overstatement of spending as a percent of revenues due to both rising commodity costs and small amounts of load growth.

Moreover, even these dramatically higher spending levels have been shown to be inadequate to acquire all cost-effective end use energy efficiency resources. As a result, several leading jurisdictions are already planning or are in the process of exploring further significant increases in spending. For example, in California, efficiency program spending by investor-owned utilities is projected to increase by about 50% between 2005 and 2008 as the utilities begin to adjust to state policy which requires that maximum cost-effective efficiency procurement be made before any supply investments are made.

In Vermont, the state legislature passed and the Governor signed into a law a bill that lifted a prior statutory cap on efficiency program spending in the first half of 2005. The state Public Service Board (PSB), which is analogous to the OEB in Ontario, is currently investigating whether and by how much such spending should be increased. In response to a request from the Board, the Vermont Energy Investment Corporation (VEIC), which currently delivers all statewide electric efficiency programs under contract to the PSB, just presented a preliminary analysis of the impacts of two different scenarios of increased spending: (1) ramp up to an increase of 33% in 2008; and (2) ramp up to an increase of 100% in 2008 (i.e. a doubling of spending). As Figure 2 shows, VEIC estimates that its next three year contract (for 2006 through 2008) based on existing levels of funding, will generate enough savings to reduce annual load growth from 1.5% to 0.1%. That is an estimate; however, VEIC has contracted to deliver that level of savings and has a portion of its financial compensation tied to achieving it. Although projections of impacts of additional spending were less rigorously developed and are therefore less precise, it appears clear that there would be negative load growth (i.e. declining electricity sales) with any significant spending increases. For example, under a 33% increase in spending in 2008, total electricity consumption in that year would be approximately 0.4% lower than in the previous year. Under a doubling of spending in 2008, total electricity consumption in that year would be approximately 1.3% lower than the previous year.

**Figure 2: Effects of Increasing DSM Spending on Vermont Load Growth**



It is worth noting that since Ontario is starting with lower annual load growth than Vermont would have absent DSM programs (0.9% in Ontario<sup>12</sup> vs. 1.5% in Vermont), it could probably turn load growth negative more easily and quickly.

#### D. CDM Spending Ramp Up

Needless to say, it is both unrealistic and imprudent to expect any jurisdiction to instantaneously begin spending money on DSM at the rate of leading jurisdictions across North America. It takes time to investigate program options, design programs, build staff or hire contractor resources to deliver and manage programs, etc.

That said, the rate of ramp up in Ontario to date and proposed for the next couple of years appears unnecessarily slow. Consider the following examples of other ramp-up efforts:

- The Vermont Energy Investment Corporation began running all statewide electric efficiency programs (under the marketing moniker of “Efficiency Vermont”) on March 1, 2000, less than two months after it was told it would get the contract. The total electric efficiency budget for those 10 months (including contract administration, evaluation and other costs) was \$6.6 million, or about 1.1% of annual revenues in just 10 months. The budget, both in absolute terms and as a percent of revenues, essentially doubled over the next two years. It grew by

<sup>12</sup> See Navigant avoided cost study.

- another 25% between 2002 and 2005. Moreover, when equalizing for differences in electric rates between Ontario and Vermont, the ramp up rates are even quicker than implied here. For example, the Efficiency Vermont spending per GWh of sales in 2000 – about \$1500 Canadian – was ten times greater than the top 5 Ontario LDCs plan for 2006, their second full year of operating such programs. Moreover, Efficiency Vermont spending was roughly \$3000 Canadian by its third year (2007 is the Ontario LDCs third year). That would be equivalent to approximately 3.5% of the largest Ontario LDCs total revenue requirement.
- In New York, the Long Island Power Authority began launched a new DSM portfolio virtually from scratch in 1999. In that year, it spent 0.4% of revenues on its program; two years later it was spending roughly 1.25% of revenues. However, it too has much higher rates than (about twice as high as) the largest Ontario LDCs. Thus, its spending per GWh of sales in its first year – more than \$500 Canadian – was three to four times higher than the largest Ontario LDCs are proposing for their *second* year. By its third year – equivalent to 2007 for the Ontario LDCs – it was spending approximately \$2000 Canadian on DSM. That would be equivalent to 2.3% of the largest LDCs total revenue requirement.
  - Hydro Quebec has gone from spending less than 0.4% of revenues in 2004 (i.e. less than Mississauga Hydro has proposed for 2006) to about a budget of about 1.5% of revenues in 2006.

Given these experiences and the immediacy of some of the capacity concerns in Ontario, it would be reasonable to expect *efficiency program* spending (not total CDM spending – it should be higher still) to be at approximately 1% of revenues in 2006, 2% of revenues in 2007, and 3% of revenues in 2008. Of course, as is the case with the three examples cited above and all other leading CDM jurisdictions, all programs funded through those expenditures should be required to pass cost-effectiveness screening.

### **E. Focus of CDM Spending**

As noted above, less than 30% of the CDM spending of the largest LDCs in Ontario is on efficiency programs. Most of their spending is on load management, distributed generation, reductions in line losses, “smart meters”, etc. While all of these activities may be beneficial and should be pursued if they are cost-effective, it is important to recognize that they are fundamentally different from procurement of end use efficiency resources.

First, some of the items included in the LDCs CDM portfolios do not deserve to be called CDM. For example, cost-effective reductions in line losses should be pursued as part of good “supply-side management” by any utility. It is analogous to not letting the heat rate of your power plants degrade due to poor maintenance.

While other items may be appropriately included under a CDM portfolio, they should be viewed differently from efficiency programs. For example, in contrast with efficiency programs, while load management can provide peak demand reductions, it saves no

electricity (or only imperceptible amounts of electricity). Thus, it has much less (if any) environmental value and offers much lower economic benefits to consumers. Furthermore, load management involves active behavioral changes by consumers and therefore implies a compromise on the quality of their electric service. Either they must shift the timing of their end-use of electricity, or curtail service. Consequently, load management is really the customer's acceptance of a lesser quality of service (even if only marginally so). Consumers should pay a lower price for lesser service, just as they should expect to pay a premium for particularly reliable service. Thus, rather than paying what are essentially discounts for lesser service out of what are, to date, very limited CDM funds, the Board should explore setting tariffs for varying degrees of service quality. Again, I want to emphasize that I am not saying that the load management initiatives by the LDCs should be rejected. If they pass cost-effectiveness screening, I would strongly support them. I am only saying that they are generally worth less than efficiency programs – particularly in an environment in which there is a commitment to shutting down coal plants and debates about the merits of nuclear plants, both of which are baseload rather than peaking concerns – and should be funded through different means. It should be noted that most regulatory jurisdictions that aggressively promote CDM fund efficiency programs and load management programs in different ways.

With respect to efficiency programs, it is also important for the Board to consider and endorse a variety of policy objectives, including:

- **Short-term resource acquisition** – a goal of capturing as much efficiency savings as quickly as possible;
- **Long-term market transformation** – a goal of fundamentally changing markets for efficiency products and services so that DSM market interventions are eventually no longer necessary; and
- **Equitable access to programs by all customers** – an important way to allay potential concerns about rate impacts.

All of these are worthy objectives. Most jurisdictions aim to create some balance among them. A portfolio of programs that aims to make progress towards all three of these objectives will cost more than one which aims to maximize resource acquisition.

## **F. CDM Roles**

There appears to be some uncertainty about CDM roles today in Ontario. In particular, there appears to be confusion about the role of the OPA and how its efforts will interface with those of the LDCs. While some confusion is understandable in a province with many utilities and other stakeholders in its first year of pursuing electric CDM, it is important that it not slow the progress that should be made. The OEB can ensure that progress continues at an appropriately quick pace by making three things clear:

1. **There is a need for province-wide consistency in some CDM programs.** It is imperative that efficiency programs addressing lost opportunity markets such as new construction or equipment replacement have the same core components

- across the province. In particular, the same efficiency standards, the same technical training curricula and the same general approach to promoting efficiency should be used province-wide. Ideally, key market actors that serve numerous utility service territories (e.g. manufacturers, large distributors, corporate headquarters of chain stores, etc.) should have a single point of contact in the province. Also, for products that are mass marketed, it will be important to have the same incentive levels province-wide. If this consistency is not present, it will be very difficult to be successful. Large builders and commercial architects who construct new homes and design new commercial buildings across the province – if not the country – will not redesign their buildings 10 different ways (or even two different ways) in order to work with numerous small (in their view) utilities promoting different efficiency standards. Home Depot stores that serve customers in two or three different utility service territories will not be willing to carry two or three different utility lighting rebate coupons.
2. **Whenever OPA is not playing a coordinating role to ensure that there is province-wide consistency where it is needed, LDCs should collaborate with each other to fill the void.** The kind of collaboration necessary to meet the needs of key trade allies has been successfully achieved by utilities in numerous other jurisdictions. For example, I myself have helped different utilities in Massachusetts and New Jersey collaboratively develop common statewide programs, jointly hire contractors to deliver consistent services to trade allies on their behalf, and – where appropriate – designate individual utilities or their staff as key contacts for different programs. Others have done the same in California and other jurisdictions. The efforts of the largest LDCs to come together under the “Coalition of Large Distributors” is a great sign that this can be accomplished in Ontario as well.
  3. **In markets where consistency is not as important or where there may be value to building on a core set of province-wide program features, LDCs are encouraged to show leadership, test new ideas and share the results with others.** There are many markets in which consistency across the province is not necessary because you are not dealing with trade allies who serve multiple utility service territories. This is generally true of both residential (including low income) and commercial & industrial retrofit programs. There are also many markets that require common province-wide elements, but leave room for service-territory specific features as well. For example, efforts to promote improved sizing and installation of residential central air conditioners would benefit from a common definition of a quality installation and common training procedures while also allowing individual utilities to provide supplemental marketing, incentives, quality control procedures, etc. in their service territories. Similarly, a province-wide CFL rebate program could be effectively supplemented by community-based promotions that may differ substantially from one part of the province to another. In this way, individual utilities who desire to be leaders in particular areas have extensive flexibility to be so without creating market confusion.

### III. PROGRAM SPECIFIC FREE RIDERS

The Board's second question, as to whether free rider rates can be generic or should be customized on a program-by-program, or utility-by-utility basis is also crucial in guiding the cost-effective allocation of CDM budgets.

Free riders are program participants who would have installed the measure on his or her own initiative even without the program.

While certain savings characteristics for many technologies can be treated as generic (for example unit savings and unit costs for many technologies) free rider rates are fundamentally different, since they are not a characteristic of the technology itself, but of the program, and program designs can differ widely.

Two major factors influence free rider rates in energy efficiency programs. First, the way in which a program or technology is marketed can influence who is exposed to the opportunity and participates. For example, assume that the existing market share for high efficiency central air conditioners in the new home construction market is 75%. If a DSM program promotes efficient central air conditioners widely to all new home builders in the market, the free rider rate for in the program will likely be quite high.<sup>13</sup> On the other hand, if the marketers of the program had identified the smaller number of builders or municipalities where lower efficiency equipment was still being routinely installed and focused their marketing efforts only there, then the free rider rate could be dramatically lower.

A second factor that heavily influences the free rider rate in a program is the level and effectiveness of the incentives in the program. For example, assume the incremental cost of building a new, ENERGY STAR-qualified home is \$3000. If a utility's program offers an incentive of \$100, it is unlikely to persuade many builders to participate. However, those few builders who were already planning to build ENERGY STAR homes (let's assume it was 5%) would be happy to accept the utility's incentive (assuming the paperwork requirements were not too great), and will show up as participants in the utility's reporting. Needless to say, this program would have low participation rates but very high free rider rates. In contrast, if the utility offers a \$1500 incentive towards the construction of a new ENERGY STAR-qualified home, it would likely get not only get the builders who were already building to the ENERGY STAR standard to participate, but many builders who otherwise would not have considered building to that standard.<sup>14</sup> Put another way, if paperwork and other barriers are minimized, free riders generally participate in a program no matter how high the financial incentive is. All other things being equal, non-free riders show up in much larger numbers when incentives or other inducements are high.

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<sup>13</sup> Probably at least as high, if not higher than the baseline market share of 75%.

<sup>14</sup> The use of incentive payments in this hypothetical example is not intended to suggest that incentives are the only important way to generate program participation. It is generally necessary to combine incentives with other program services to generate substantial program participation, including participation of non-free riders.

Thus, a policy which allows a generic fixed free rider rate to be used for a CDM technology or program is inviting program designers to engage in poor program design and not be held accountable for whether real savings are produced or not. In virtually all other jurisdictions in which I have worked, including Ontario with respect to gas DSM, utilities are responsible for estimating probable free rider rates in advance of obtaining approval for their programs and budgets (and the estimates are subject to regulatory testing), or they are held accountable after the fact when savings claims are evaluated, audited and settled. Where there are shareholder incentives in place this may affect the utility's incentive. In these cases there is a strong incentive for the company to carry out careful market research on the technology in advance, and design the program in a way that minimizes free rider rates.

With so many electric LDCs in Ontario, some may have concerns about the ability to achieve accountability on free rider rates without engendering extensive duplication of effort. The bases for those concerns may not be as great as they initially seem. Indeed, in forming the Coalition for Large Distributors, the largest LDCs in the province have already created a mechanism for collaboration that could ensure a common set of free rider assumptions is put forward for programs for their service territories. It is highly likely that other LDCs will simply adopt the Coalition's assumptions if they are approved by the OEB. For different programs promoted by other LDCs, there may be some additional regulatory review required. However, if utilities are put on notice that the OEB is expecting them to document the basis for any free rider assumptions before providing any SSM (or even CDM plan approval in the future), they will have a strong incentive to either hire experts who can help develop defensible assumptions and/or consult with other stakeholders who may otherwise challenge assumptions with the aim of providing consensus recommendations to the Board. As the utilities and the OEB gain experience with electric CDM and more evaluation work is done, the analytical and regulatory burden should decline over time.

The bottom line is that ensuring accountability for free ridership is essential to ensuring effective spending of CDM funds. It is not a minor issue to be traded off for regulatory convenience. Indeed, a utility pursuing SSM rewards that is not required to return unspent CDM budget to customers via a DSMVA (or that has a fixed CDM budget) will have an incentive to favor programs with sub-optimal customer incentives and high actual free ridership if free rider rates are generically pre-specified as under the existing rules. The utility will enjoy the rewards and preserve budget at the expense of energy efficiency. Further, the benefits of proper free rider analysis are not limited to avoiding undeserved SSM payouts. Good analysis leads to better designed programs with less budget waste that achieve more energy efficiency. These benefits are likely to far outstrip any added analysis and regulatory costs.



#### IV. ATTRIBUTION ISSUES

The Board's third question regarding whether an LDC be entitled to claim anything more than the *incremental* benefits associated with its participation in programs that are supported by other entities ( particularly unregulated third parties such as federal and provincial government agencies) is also critically important. I addressed it in some detail in my evidence in the recent Enbridge Gas rate case (EB-2005-0001). I will attempt to quickly summarize key points for the Board to consider in this section of my evidence.

It is probably worth beginning by noting that this question about "attribution" of savings is really a question about one kind of free rider. In the context of utility CDM initiatives, a free rider is a program participant who would have installed a measure on his or her own initiative even without the utility's involvement. In a case in which there is a well-funded federal program – such as EnerGuide for Houses – many consumers will participate irrespective of whether the utility promotes the program in any way. We know that for an absolute fact because there is extensive participation in that program in both large parts of Ontario and the rest of Canada in which there is no real utility support (i.e. the federal government's incentives and promotion efforts are enough for some consumers). Thus, any utility effort to promote EnerGuide for Houses should not be allowed to claim all program participants in its service territory as non-free riders. Permitting them to do so would be tantamount to treat one subset of free riders (those who would have installed measures due to the government's influence) differently from other free riders (e.g. those who would have installed measures due the influence of their neighbors, or contractor or price signals). There is no rationale for such differences. The bottom line is that the utility should not be permitted to claim savings that would have occurred if it had done nothing. They should only get credit for the incremental savings that their efforts truly produced. To allow them to do otherwise would (1) provide utilities an incentive to pursue ineffective program designs because they would earn SSM rewards for savings that they did not produce; (2) discredit CDM in the eyes of consumers and policy-makers; and (3) lead to greater and more expensive investments in electric supply than would have occurred if the utilities had invested in programs that really generated additional savings.

That is not to say that utilities cannot influence participation in programs such as EnerGuide for Houses. They can. Moreover, they should be encouraged to do so. The more significant their efforts – whether in marketing it, providing additional incentives, or other means – the greater the incremental effect of their efforts will be. Indeed, it would not be unreasonable to suggest that the combination of aggressive marketing and matching the federal government's financial incentive could triple participation in a utility service territory. However, the utility should only be allowed to claim savings from two-thirds of its participants in that case.

## V. CONCLUSIONS & RECOMMENDATIONS

The electricity sector in Ontario faces enormous challenges in the coming years. The ultimate answers to the questions the OEB has raised in this proceeding will go a long way toward determining how well the province faces those challenges. It is in that context that I offer the following recommendations to the Board:

1. **The Board should issue a fundamental policy directive that LDCs should pursue and acquire all CDM resources that are cheaper than supply alternatives.** This directive could be constrained only if a utility could compellingly demonstrate that either (1) rate impacts would create significant short-term economic disruption and/or hardship, or (2) increases in spending necessary to acquire maximum possible cost-effective CDM resources cannot be managed effectively or efficiently (i.e. that a slower ramp up is prudent). Utilities should be precluded from making any supply side investments unless they can demonstrate that they have exhausted cost-effective CDM opportunities.
2. **The Board should make clear that failure of an LDC to achieve adequate levels of cost-effective CDM is grounds for a finding that distribution supply investments are imprudent and/or that a lower return on equity is appropriate.** Failure to acquire cost-effective CDM, by definition, raises total costs to consumers by increasing supply costs. Therefore, under-acquiring cost-effective CDM resources amounts to a failure of the utility to fulfill its obligations as a distributor.
3. **The Board should order the electric LDCs to increase spending on end use efficiency components of CDM to at least 1% of total (distribution and commodity) revenues in 2006.** If the OEB believes that this is impractical at this point in time for smaller LDCs, it could limit this requirement for 2006 to the largest utilities. In either case, this would be a “floor”. Utilities should be free to request even greater levels of efficiency program spending if they should find such spending to be cost-effective and can ramp up efforts efficiently.
4. **The Board should make clear that it expects LDCs to be spending approximately 2% of total revenues on efficiency programs in 2007 and 3% in 2008.** Any utility coming forward with lower spending levels would be expected to present a compelling case that the levels requested by the Board would result in rate impacts that create significant short-term economic disruption and/or hardship, or that ramp-up could not be accomplished efficiently. In other words, the burden of proof for doing less should be on the utility.
5. **The Board should make clear that it expects utilities to develop portfolios of efficiency programs that collectively balance and address three goals: (1) short-term resource acquisition; (2) long-term market transformation; and (3) equitable access to programs for all customers.** Utilities would be expected to demonstrate in future filings how their portfolios address all three of these three things.
6. **The Board should make clear that it expects the LDCs to continue and expand the collaboration that has begun under the auspices of the Coalition of Large Distributors.** Such collaboration – expanded to include OPA and other

- LDCs as appropriate – should ensure that there are consistent, province-wide approaches to key lost opportunity markets such as new construction and equipment replacement/purchasing.
7. **The Board should also make clear that there is a role for individual LDCs to develop and implement unique approaches to delivery of some CDM services.** This is particularly true for retrofit programs and community-based enhancements to equipment purchasing programs and new construction.
  8. **The Board should require LDCs to develop, present and be prepared to defend program-specific free rider assumptions.** Again, collaboration on such assumptions, both between different LDCs and between LDCs and other stakeholders, should be encouraged.
  9. **The Board should make clear that utilities can only claim the incremental savings resulting from their CDM efforts.** There is no justification for claiming savings that would have occurred through a government program (or due to any other factor) in the absence of the utility's efforts.

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Chris Neme is an economist with over eighteen years experience in analyzing utility resource planning. He has extensive experience in economic analysis and the management of projects to assess the adequacy, design, cost-effectiveness and evaluation of utility demand-side management programs.

**PROFESSIONAL EXPERIENCE**

**Director of Planning & Evaluation, Vermont Energy Investment Corp.** (since 1993)

Manage staff of eight conducting energy efficiency program design, implementation planning and evaluation work for a variety of clients. Reviewed and analyzed the DSM programs of more than 30 electric and gas utilities for clients in more than 20 states and provinces. Led extensive program design work on behalf of public interest group-utility "collaboratives" in six states. Prepared and defended regulatory testimony for utility planning and rate cases in both the United States and Canada. Have also led work on efficiency projects sponsored by the U.S. Environmental Protection Agency's ENERGY STAR program, the Consortium for Energy Efficiency, Northeast Energy Efficiency Partnerships and several other government agencies and non-profit organizations. Current and recent projects include:

- Efficiency Vermont: Lead all residential program planning and evaluation work (since EVT's inception in March 2000). This includes negotiation with the Public Service Board and Department of Public Service on program goals, development of program design modifications, development of reports and filings, development of savings assumptions and assistance to the DPS in evaluation planning.
- New Jersey Utilities-Natural Resources Defense Counsel Collaborative: Oversaw all technical assistance on the design and implementation of eight statewide residential DSM programs and one renewable energy program. Personally led work on two programs (Electric and Gas HVAC). This involved facilitation of monthly meetings with all seven electric and gas utilities in the state; negotiations with the utilities on budgets, goals, and program designs; and extensive assistance on development of marketing plans and evaluation plans.
- New York State Energy Research and Development Authority (NYSERDA): Led analysis of residential electric efficiency potential (over the next 20 years) for the state of New York and five regions within the state. Scenarios analyzed include technical potential, economic potential, potential likely to be captured by existing initiatives and potential that would be captured as part of least cost approach to meeting greenhouse gas emission reduction targets.
- Long Island Power Authority Clean Energy Plan: Led team that designed the four major residential programs (three efficiency, one PV) incorporated into the plan in 1999. Currently oversee extensive technical support to the implementation of those programs. This involves assistance with the development of goals and budgets, development of savings algorithms,

cost-effectiveness screening, and on-going program design refinements.

- Northeast Energy Efficiency Partnerships Residential HVAC Initiative: Serve as NEEP's Residential HVAC Program Manager (since the inception of the initiative in late 1997). Responsible for promoting NEEP's program design concept to utilities in the Northeast, providing technical support to efforts to implement the design, and promoting the adoption of improved federal efficiency standards (and ENERGY STAR standards) for central air conditioners, furnaces and boilers.
- Coalition of Quebec Environmental Groups – Helped manage team that reviewed and critiqued Hydro Quebec's efficiency programs and analyzed achievable electricity savings potential in the province. Testified on results of work before the Quebec Energy Board. Also testified on alternative models for DSM delivery before a Quebec Parliamentary Commission.
- Green Energy Coalition (Ontario) – Reviewed and filed testimony on Enbridge Gas and Union Gas DSM plans on more than a dozen occasions since 1993. Also regular member of both gas company DSM audit committees.

**Energy Consultant**, *Lawrence Berkeley Laboratory, Gaborone, Botswana (1992)*

Conducted both economic and institutional analyses of the potential for cost-effective end-use energy efficiency improvements in southern Africa. Principal focus was on the electricity sector in Botswana. Initiated discussions between the Botswana government and LBL on the benefits of energy efficient building codes and the possibility of LBL developing such a code for Botswana.

**Sr. Policy Analyst**, *Center for Clean Air Policy, Washington, D.C. (1986-1991)*

Served as chief assistant to Executive Director of non-profit policy research institute. Responsible for economic and political analysis of state, federal and international policies to address various air utility-related pollution problems and energy inefficiency. Duties included managing policy research projects, including the work of both junior staff members and technical consultants; organizing and mediating policy dialogues between environmentalists, industry representatives and government officials; and providing guidance to state Governors, members of Congress and White House officials on energy and environmental policy. Project responsibilities included \$300,000/year effort to promote utility investments in DSM programs in Ohio (including regulatory testimony) and several detailed analyses of the magnitude of and options (including DSM) for reducing emissions mercury, sulfur dioxide, carbon dioxide and other emissions of from fossil-fuel fired power plants.

## **EDUCATION**

**University of Michigan**, *Institute of Public Policy Studies*  
**Master of Public Policy**; GPA: 3.85 (on 4.00 scale); 1986

**University of Michigan**  
**Bachelor of Arts in Political Science**; *Magna Cum Laude*; 1985

## **PUBLICATIONS AND REPORTS**

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"Promoting High Efficiency Residential HVAC Equipment: Lessons Learned from Leading Utility Programs", Proceedings of ACEEE 1998 Summer Study Conference on Energy Efficiency in Buildings, Volume 2, pp. 153-164. (with Jane Peters and Denise Rouleau).

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