Designing an Appropriate Lost Revenue Adjustment Mechanism (LRAM) for Electricity CDM Programs In Ontario

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Table of Contents

1 BACKGROUND

In Ontario, as in most other jurisdictions, local distribution companies ("LDCs") recover their fixed distribution-related costs primarily through a variable energy charge (¢/kWh). One consequence of this approach to rate design is that distributors recover less than their revenue requirement (i.e., suffer a revenue shortfall) in years when the actual energy consumption is less than the forecast that was used for rate-setting purposes.[1] Conversely, in years when consumption exceeds the forecast, the LDC's actual revenue will exceed the allowed revenue requirement (i.e., customers "overpay" for distribution service). Regulators generally expect these variances to cancel out over time so that, on average, each LDC will collect revenue that roughly equals its revenue requirement.

The factors that cause actual energy consumption to vary from the forecast can be divided into two categories: uncontrollable factors and controllable factors.

Uncontrollable factors: The primary uncontrollable factor that causes consumption to vary from the forecast is weather, with the temperature (cooling and/or heating degree days, depending on location) being the most significant single factor driving year-to-year variances in the demand for electricity. Other uncontrollable factors include variances in the rate of economic growth, housing starts, and the short-term business decisions of commercial and industrial customers.

These variances in volume cause corresponding variances in the distributors' revenue and net income; hence, the use of variable energy charges to recover fixed costs creates demand-related risk for distributors. The most common regulatory approach used to address the risk related to these uncontrollable factors is to approve an appropriate risk-adjusted rate of return on equity for rate setting purposes.

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[1] For purposes of this discussion, the "forecast" used for rate-setting purposes is the test year total energy throughput. This could be a forecast for a future test year, actual energy throughput for an historic test year, or an adjusted historical value (e.g., weather normalized). The discussion in this paper is not affected by the method used to derive the reference volume throughput used to determine the level of rates necessary to recover a distributor's allowed revenue requirement.

Some jurisdictions, however, have adopted a variance/deferral account, or an equivalent mechanism, to stabilize revenues by passing through to customers the revenue deficiencies and sufficiencies that result from variances from the sales forecast used for rate-setting purposes.[2] This approach allows the distributor to stabilize its net income by "booking" the deferred revenue in the year it is "earned" taking into account the stabilization mechanism.

Controllable factors: Actual consumption is also affected by factors that are controlled, or at least influenced, by the actions, programs and policies of distributors. Controllable factors include both marketing programs that increase demand and conservation and demand management (CDM) programs that reduce demand. Once rates have been set for a particular year, distributors have a financial incentive to manage these controllable factors so as to maximize actual energy consumption in the year. The financial incentives are clear: net income improves when marketing programs are successful and/or when CDM programs fall short of the targeted savings.

The traditional (i.e., non-incentive ratemaking) regulatory approach to dealing with the revenue impacts of throughput variances does not differentiate between controllable and uncontrollable factors. Hence, under traditional regulatory models the variances from forecast due to controllable factors are to the account of the company and constitute part of the utility's demand-related risk. In those jurisdictions where revenue is stabilized by charging/crediting back to customers the impact of both controllable and uncontrollable variances, however, both the financial impact of the variances and the incentive to manage controllable factors so as to increase throughput are eliminated. Hence, both the incentive to outperform the forecast of marketing volume growth and the incentive to under-perform in achieving CDM savings are eliminated.

This Report examines the effectiveness of the primary strategies for addressing the CDM disincentive in the context of Ontario's electricity industry.

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[2] For example, Terasen Gas (British Columbia Utilities Commission regulated) has had a Revenue Stabilization Adjustment Mechanism (RSAM) in place for a decade. Also, Gaz Métro (Régie de l'énergie regulated) has had its revenues stabilized since 1981 by its "closing of the books" process.

1.1 REGULATORY INCENTIVES AND RISKS

One of the concerns with traditional cost of service regulation (COSR) is that the normal stimulus to enhance efficiency that characterizes competitive markets is often muted or absent under COSR.[3] For example, regulated companies often face asymmetric risk-reward opportunities that can result in utilities being penalized for below "target" performance, while not being rewarded for above-target performance, when they pursue goals that are in the public interest such as:

1. setting aggressive marketing goals,
2. fully exploiting opportunities to outperform their forecast of volume growth, and
3. adopting innovative strategies with uncertain outcomes to cut costs, increase sales or enhance customer value.

The asymmetry arises because:

1. the benefit of aggressive targets flow through to the customer because they are embedded in rates, while shortfalls in results are borne by the company;
2. outperforming modest goals tends to result in the regulator establishing more challenging expectations in subsequent years, which increases the risk of under-performing and suffering a sub-standard equity return in those later years; and
3. when risky innovation is undertaken, the benefits of success flow to the customer (i.e., the anticipated savings are embedded in rates and savings in excess of forecast are passed on to customers when rates are rebased), while costs associated with unsuccessful innovation may be disallowed.

Prudent LDC's therefore have an implicit incentive to minimize these risk by:

- setting marketing targets that are easily achievable,
- managing to their approved targets rather than maximizing growth, and
- avoiding innovations that are not extremely safe.

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[3] See for example, the discussion of cost of service regulation in Mark Newton Lowry (Pacific Economics Group), *Second-Generation Incentive Regulation for Ontario Power Distributors*, 13 June 2006, pages 5-9. This study was prepared for the Ontario Energy Board in connection with the 2nd Generation Incentive Regulation Mechanism process (EB-2006-0089).

The weakness of COSR is a bit different in the context of CDM in that distributors have an incentive to under-perform relative to their forecast CDM results. Falling short of CDM targets has the same impact as exceeding marketing targets – it results in throughput and revenue that is above forecast. However, as with over-achievement in marketing, there is regulatory risk associated with under-achievement on CDM. A prudent utility will therefore minimize risk by adopting CDM targets that are "safe" in that management can manage to the target with little risk of either exceeding or falling seriously short of the results embedded in the forecast of throughput used for rate-setting purposes.

Decades of experience have resulted in many regulators concluding that COSR tends to reward a "culture of caution" in regulated monopolies. This observation has been a key driver for the move to incentive ratemaking in many jurisdictions, including Ontario.[4]

The basic premise of incentive regulation is that every regulatory regime embeds implicit/unintended incentives that influence the behaviour of distributors. To avoid implicit incentives that may be counter-productive, incentive regulation models contain explicit incentives that are designed to reward utilities for producing results that further the objectives of the regulator such as cost reductions, enhanced customer value and CDM savings. A well-designed incentive regulation regime aligns the interests of the company and its customers not only by removing the disincentives noted above, but also by creating positive incentives to pursue all forms of efficiency improvements.

The basic concepts of incentive regulation are as applicable to performance in relation to CDM as they are to other types of efficiency gains. However, CDM requires a special incentive design because, as noted above, if the standard rule is utilized for CDM – that is if the LDC is allowed to retain some of the financial benefits of CDM variances from forecast – it would create a reward for under-performing rather than over-performing on CDM results. In contrast to other efficiency activities that increase the LDC's bottom line, successful CDM results in lost revenue and reduced net income rather than increased net income.

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[4] Ibid., pages 9-12.

1.2 THE CURRENT LRAM FOR ELECTRICITY DISTRIBUTORS

The Ontario Energy Board (Board or OEB) has recognized that the CDM disincentive that is inherent in the current rate design undermines the policy objective of the Ontario Government. As a consequence, the OEB has determined that it is appropriate to adopt a Lost Revenue Adjustment Mechanism (LRAM) for Ontario electricity distributors sector that mitigates the negative financial impact of CDM.

On December 6, 2004, the Ontario Energy Board heard a motion brought by Pollution Probe. This motion requested that the Board establish a lost revenue adjustment mechanism (LRAM) and shared savings mechanism (SSM) with respect to expenditures on CDM by local electricity distribution companies (LDCs) in 2005. The motion was supported by the Electricity Distributors Association (EDA), the Coalition of Large Distributors (CLD), as well as various other parties, including the Green Energy Coalition and the Canadian Energy Efficiency Alliance.

The decision of the Board (RP-2004-0203) was to adopt a voluntary LRAM for lost revenues incurred by LDCs as a result of CDM initiatives in 2005. The determination of the LRAM formula was left to the 2006 Electricity Distribution Rate decision (RP-2004-0188). The report of the Board on the 2006 EDR Handbook (RP-2004-0188) states:

> *In its December 2004 Decision RP-2004-0203, the Board concluded that an LRAM was appropriate and that it should apply to 3rd tranche expenditures. The Board indicated, at that time, that the LRAM formula would be established as part of the 2006 proceeding.*
>
> *The Board continues to believe that an LRAM is appropriate and concludes that it will be retrospective, not prospective. At this time, greater accuracy will be achieved if the LRAM is calculated after the fact based on actual results.*
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> *Accordingly, a distributor will be expected to calculate the energy savings by customer class and to value those energy savings by the Board-approved distribution charge appropriate to that class. The resulting amount may be claimed in a subsequent rate year as compensation for lost revenue. As in the case of the gas distributors, the Board will continue the practice of allowing distributors to establish deferral accounts to record these expenses. As a result, no claims for lost revenue should be made as part of the 2006 rate applications.*
>
> *The Board does not believe that it would be appropriate at this point to move to a fixed distribution charge. While this approach might reduce the costs associated with calculating an LRAM, the Board does not believe that those costs will be*

onerous. Moreover, moving to a fixed distribution charge would raise additional issues, including cost allocation issues, which cannot be addressed at this time.

It should be noted that an LRAM is only one element of the design of an incentive regime for CDM activities. An LRAM serves the limited purpose of removing the disincentive to reducing electricity demand that results from lost revenues and the resulting reduced earnings. Hence, the LRAM simply creates an environment of financial indifference to achieving higher or lower energy savings. Hence, no matter how well designed an LRAM is, it will not provide a positive financial incentive for distributors to aggressively pursue CDM. In jurisdictions that wish to create a positive financial incentive to reduce energy consumption, an incentive mechanism such as a Shared Savings Mechanism (SSM) is typically adopted. For example, SSMs have been in place for several years for the both of Ontario's major gas distributors. In the absence, of an SSM, distributors may view CDM as a regulatory obligation that must be fulfilled. While it can be hoped that distributors will embrace CDM for non-financial reasons, an LRAM by itself does not exploit the profit motive to encourage distributors to focus their efforts on encouraging consumers to conserve.

1.3 THE ROLE OF LDCS IN CDM IN 2007

The Conservation Bureau of the Ontario Power Authority issued a document entitled ***Role of LDCs in CDM in 2007: Options Paper for Consultation*** on April 28, 2006 (Options Paper) prepared by IndEco Strategic Consulting and Navigant Consulting. The Options Paper sought stakeholder comments as input to assist it in providing a report to the OEB by the end of June 2006. Given the timing frame for comment, it appears that the issues addressed (i.e., the appropriate level of CDM spending in 2007; the role of LDCs in CDM; and the source of LDC CDM funding) will not be resolved until the third quarter of 2006 at the earliest.

With respect to question of the role of an LRAM for Ontario electricity distributors, it is notable that the Options paper includes in the list of "Cons" for two of the three options regarding funding of CDM by LDCs that "regulatory uncertainty regarding LRAM is a disincentive for some LDCs to aggressively pursue CDM". The "Cons" for the third

option (any incremental CDM spending by LDCs funded by the OPA through the Global Adjustment Mechanism) states that "the OEB would still need to be responsible for dealing with LRAM for the LDCs to keep LDCs whole."

In light of the June 13, 2006 letter from the Minister of Energy to the Ontario Power Authority containing the Government's Supply Mix Directive for the OPA's Integrated Power System Plan it will be critically important that there are no impediments to Ontario LDCs pursuing the maximum achievable CDM gains. The Directive has set targets that will double energy efficiency through conservation relative to those contained in the OPA's Supply Mix Report.

The importance of implementing an effective LRAM has been made even more critical by the Government's 13 July 2006 directive to the OPA to make an additional $400 million in CDM funding available to LDCs over three years, funded through the Global Adjustment Mechanism. An LRAM that protects LDCs against being penalized for pursuing CDM clearly will be an important element of a CDM-friendly regulatory regime.

1.4 REGULATORY INCENTIVES IN ONTARIO

In his speech to the EDA Annual General Meeting on February 26, 2006, the Chair of the Ontario Energy Board, Howard Wetston outlined the Board's plans for evolving the rate-making process for electricity distributors in the next few years. In designing an LRAM that will be appropriate for Ontario electricity distributors, it is necessary to take into account the overall rate setting mechanism.

At its core, the LRAM is an incentive mechanism. If the Board were not concerned about the impact of the inherent disincentive effect of lost revenues due to successful CDM, there would be no need for an LRAM. The Chair's comments on incentive regulation are consistent with the views he has often advanced on behalf of the Board.

> *Of course, there's no greater incentive to efficiency than higher earnings and we're asking ourselves whether distributors shouldn't be able to keep more of the revenues realized through improved operations. At the moment, and so long as service quality is not compromised, we don't see any reason why utilities should not share in some of the benefits of improving efficiency. Indeed, that is likely to be the greatest incentive for achieving such efficiencies.*

I have said before there is a basic principal of economics, that all people respond to incentives.[5]

This principle of economics is not limited to people's motivation to achieve efficiency gains within their businesses. It applies to all facets of any business, including the CDM efforts of a distributor.

The fact that the Board has adopted an LRAM, which eliminates an undesirable incentive to minimize CDM results is evidence that conservation-related incentives are as necessary to achieve the conservation objectives of the Province and the Board as efficiency-related incentives are to achieving efficiency objectives.

Further, as has already been noted, an incentive-based approach to encouraging CDM will necessarily involve not only an LRAM to hold distributors whole with respect to CDM results and eliminate a disincentive which would otherwise serve as a deterrent to CDM, but also an SSM that creates a positive incentive to pursue CDM savings.

The Chair's speech also reiterated the intention of the Board to introduce a multi-year performance based regulation regime for electricity distributors. In a multi-year regime, variances from the forecast CDM results may accumulate through the term of the price plan. Whether the demand reductions are the result of programs controlled by distributors, the OPA's Conservation Bureau or others, a distributor will experience a revenue shortfall if CDM savings in its service area are greater than expected (all other things being equal). Conversely, it will financially benefit if CDM saving are less than expected.

The design of the LRAM adopted by the OEB will inevitably colour the attitude of distributors to CDM programs. Put simply, promoting CDM through programs that are included in the LRAM will have no negative financial impact on distributors, however, It will be contrary to the financial interests of distributors to promote the success of any CDM initiative that is not included in the LRAM.

[5] Howard I. Wetston, (27 February 2006) Speech, EDA Annual General Meeting, page 6.

2 THE NEED FOR AN ONTARIO ELECTRICITY LDC LRAM

The Ontario Energy Board is one of many regulators that recognizes that the successful implementation of CDM programs can be contrary to the financial interests of a distributor's shareholders. This observation, in combination with the generally accepted view of the OEB Chair that "people respond to incentives", has resulted in the adoption of an LRAM by many regulators, including the OEB. As London Economics stated in a report prepared for the Board in response to the question: "Do distribution shareholders need a specific CDM shareholder incentive?":

> *Yes – utility management would in fact be in breach of fiduciary duty were they to aggressively pursue programs which provide no financial return to their shareholders. Furthermore, it is important to emphasize that any incentive needs to be in addition to the normal allowed return, otherwise it does not serve as an incentive at all."*[6]

CDM incentives are conceptually consistent with the principles of incentive regulation (IR) and performance based ratemaking (PBR). CDM incentives are designed to align the interests of the distributor's shareholders with the interests of ratepayers (and society generally). It is readily evident that the financial interests of distributors are in direct conflict with the societal interest of realizing CDM benefits, whether or not the CDM program is controlled by the LDC, unless an LRAM is in place that eliminates the impact of CDM lost revenues on LDCs. Furthermore, a fundamental principle of incentive regulation is that giving the company an opportunity to enhance shareholder value will produce greater effort and better results than simply demanding that the company comply with regulatory obligations.

In part, the problem referred to by London Economics in the preceding quote is that CDM has the inherent negative impact on the distributor's revenues and earnings described in preceding sections. Consequently, CDM incentives, unlike productivity incentives, must first overcome the negative impact of success on utility earnings before going on to provide a positive incentive.

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[6] London Economics International LLC (20 December 2004) *Overview of C&DM practices in North America and potential Alternatives for Ontario*, prepared for the Ontario Energy Board, page 50.

The introduction of PBR will not reduce the need for a separate CDM incentive. In fact, the introduction of a multi-year rate-setting regime will increase the need for an LRAM because any variances from the forecast CDM impacts will persist and compound over the multi-year cycle of the rate-setting process until rates are rebased using an updated forecast of throughput, taking into account the achieved CDM results. Put simply, as regulatory lag is increased, so too is the impact of any variances from forecast.

A mechanism that will automatically build the LRAM adjustment into rates on an annual basis is therefore needed. The regulatory risk associated with deferring recovery until the end of the PBR cycle could undermine the effectiveness of the LRAM in mitigating the CDM disincentive. While this problem could be reduced by annually updating each LDC's sales forecast to reflect actual CDM results and adjusting rates accordingly, the resulting regulatory burden would conflict with the goal of streamlining the regulatory process. An automatic mechanism would be more consistent with PBR principles.

Increased reliance on PBR will increase the importance of implementing an effective LRAM that addresses the full impact that CDM programs have on the financial performance of LDCs.

3 DESIGNING AN ONTARIO ELECTRICITY LRAM

In designing an LRAM it is essential to recognize that CDM program success will reduce the earnings of distributor regardless of the entity responsible for the CDM programs.

Assume, for example, that a distributor is expecting annual energy demand to remain constant under normal weather conditions, taking into account all CDM programs that are expected to have an impact in its service area and that rates are set on that basis.

CDM programs for which results are controlled by the distributor: An LRAM will remove the financial disincentive for distributors to pursue more than minimal success in the CDM programs that they control. Consequently, it can be expected that an LRAM will increase the incentive to achieve greater savings for any CDM program for which the distributors exert partial of complete control over

results. It is therefore clear that, at a minimum, the Ontario electricity LRAM should take into account variance from forecast in the lost revenues attributable to programs for which results are controlled by the distributor.

CDM programs for which results are not controlled by the distributor: In principle, an LRAM should have no impact on the results achieved by any CDM program over which the distributor exerts no control. In this case, the absence of an LRAM should not matter. The presence or absence of an LRAM will, however, determine who bears the distribution revenue risk associated with the success of CDM programs. For example, when an LDC's rates are set for any year, the forecast energy demand and revenue will take into account the expected impact of CDM initiatives undertaken by the OPA, energy services companies and other entities. If the actual CDM results for all programs are greater than expected during the period for which rates have been set (possibly several years under a multi-year IR regime), then the LDC will suffer lost revenue corresponding to the reduction in demand resulting from the programs not included in the LRAM.

Conversely, if CDM results are less than expected, the distributor will benefit financially. If the distributor's LRAM takes into account these lost revenues, then the associated revenue shortfall or excess will be passed through to customers. Hence, the implication of including variances from forecast for CDM programs not controlled by the distributor is to transfer the risk related to CDM performance from the distributor to electricity consumers.

Conceptually, it may be reasonable to design an LRAM that addresses the revenues associated only with CDM programs that are controlled by LDCs. This approach would directly target the incentive effect of the lost revenue on the efforts of distributors to maximize the energy savings achieved by their CDM programs. However, implementing a targeted LRAM along these lines would face several serious challenges.

- First, a targeted LRAM would not fully mitigate the CDM disincentive if distributors influence the success of CDM programs that they do not control. For example, if it is reasonable to expect that the support of distributors for CDM of all types, whether controlled by them or not, will encourage superior CDM results

in the province, then there is a need to design a more comprehensive LRAM that captures the lost revenues associated with all CDM programs.

- Second, any targeted LRAM will have to draw a line between CDM programs that are controllable by the distributor and programs that are is not controlled by the distributor. However, given that the goal of the province and the Conservation Bureau of the OPA is to create a province-wide culture of conservation, it may be appropriate to ensure no aspect of this culture of conservation will financially compromise distributors.

As the illustrative example presented in Appendix A indicates, if there is no LRAM or if an LRAM is adopted that has limited applicability, Ontario's success in achieving a culture of conservation could be a primary determinant of the financial performance of LDCs. It is conceivable that the net income of LDCs could be increased or decreased by 10% to 20% by the variance between the expected and actual impact that Ontario's CDM programs have on energy throughput and peak demand. Whether or not the CDM programs are controlled by the LDCs, it would be hard to find a justification for designing a regulatory regime that rewards LDCs in the event that Ontario fails to achieve its CDM goals and penalizes them if CDM results exceed expectations. The only way to avoid this design irrationality will be to implement a comprehensive LRAM, along the lines discussed in the next sections, or the more practical alternative of a revenue stabilization mechanism.

Given the potential impact of Ontario's CDM initiatives on the financial performance of LDCs, it will be important to ensure that the LRAM for Ontario electricity distributors is designed to reinforce Ontario's goal of creating a culture of conservation. That consistency will not be achieved with a targeted LRAM. Ontario's aggressive CDM goals can only be met through an uninhibited effort by all market participants.

The best way to ensure the unconstrained support of LDCs for CDM will be to implement a comprehensive LRAM or an equally comprehensive alternative such as a revenue stabilization mechanism.

3.1 CHARACTERISTICS OF A COMPREHENSIVE LRAM

The discussion in the preceding sections leads to the conclusion that the effectiveness of any LRAM will be undermined unless it takes into account the lost revenues associated with all programs for which the results can be influenced positively or negatively by Ontario electricity distributors. The rationale for an LRAM is equally valid for all categories of CDM programs over which distributors are able to affect results.

CDM programs sponsored by an LDC: While distributors are unlikely to ignore all considerations other than maximizing profit, it is nevertheless clear that it will be in the financial self-interest of any distributor to minimize the actual reduction in energy demand resulting from its CDM initiatives unless an LRAM is in place that both (i) accurately measures the difference between the forecast and actual reduction in demand and (ii) provides full compensation for all lost revenue.

CDM programs sponsored by the OPA (Chief Conservation Officer) and by third-party energy services companies: The financial impacts of CDM programs sponsored by organizations other than the distributors themselves are no different than the impacts of distributor-sponsored CDM programs. To the extent that cooperation of distributors contributes to the success of any CDM program, LDCs will be penalized for cooperating constructively and effectively. Furthermore, even if a distributor cannot affect the results of a CDM program either directly or indirectly, its financial performance will be dependent in part on the success, or lack of success of the overall CDM efforts of the Province, the Chief Conservation Office and all other organizations that support Ontario's culture of conservation unless there is a comprehensive LRAM in place.

General market transformation efforts: If the goal of a conservation culture is to be achieved in Ontario, there will have to be a significant effort to transform the energy market in Ontario through strategies such as the adoption of higher efficiency standards for buildings, products, etc. The financial impact of market transformation initiatives on distributors is the same as the impact of CDM initiatives. To the extent that changes in efficiency standards affect energy use within the time frame of the rate-setting regime, the financial performance of

distributors will be affected by the rate at which the market is transformed. A comprehensive LRAM will remove the conflict between an LDCs financial interest and its support for transforming the market as quickly as possible.

If the OEB expects distributors to support all aspects of the provincial effort to create a culture of conservation, it would be appropriate to hold distributors harmless with respect to the success of this effort. To do so, it will be necessary to design an LRAM that takes into account the impact on throughput of all CDM initiatives, whether sponsored by the distributors themselves, the OPA's Conservation Bureau or others.

The primary rationale for limiting the scope of the LRAM is the potential regulatory burden of attempting to quantify the impact of all CDM programs, including market transformation initiatives. This concern is both real and significant. Given the challenge of quantifying the impact on a distributor's throughput not only for the distributor's CDM programs, but also for any initiative that has an impact on electricity demand in the distributor's service territory, it will be difficult for the distributors, the OPA and the OEB to administer a comprehensive LRAM.

The only practical options that will not involve excessive administrative and regulatory effort are likely to be:

a) **implementing an LRAM with limited scope, which will risk creating a conflict for LDCs between their conservation responsibilities and their fiduciary responsibilities, or else**

b) **adopting a simplified revenue stabilization mechanism that eliminates the impact of all variances from forecast in electricity demand, without the need to quantify the impact of specific CDM programs.**

4 THE REVENUE STABILIZATION MECHANISM ALTERNATIVE

If distributors exert some control over most or all CDM programs, even if they are not primarily responsible (e.g., promotion, supportive public relations, etc.), then the only approach that would fully address the conflict for distributors between their conservation responsibilities and their fiduciary responsibilities would be to cast the net of the LRAM very wide. The most practical way to achieve this goal would be to adopt a revenue stabilization mechanism that provides an LRAM-like adjustment for all variances from forecast. This approach would have three primary advantages.

- It would ensure that no CDM initiative would have a detrimental financial impact on distributors; thereby, removing this impediment to distributors adopting the culture of conservation wholeheartedly.
- It would eliminate the need to quantify the impact that specific CDM programs would have on electricity demand and in doing so would remove any risk that some stakeholders may seek to "game the system" by either underestimating or overestimating the impact of specific programs.
- The revenue stabilization approach is the approach that is most closely aligned with the broad principles of incentive regulation. That is, given that the goal is to reduce consumption, it leaves it to the distributors to determine how best to achieve that end in their individual services areas. There is no need for micro-management or to predetermine qualifying programs beyond the overall management of CDM that the Consevation Bureau of the OPA is expected to provide. Distributors would be free to exploit all CDM opportunities that arise within a rate-setting period, without being concerned about the potential impact on their financial results.

There are a number of possible design options that would meet the primary objective of holding LDCs whole with respect to CDM results. The preferred approach will depend on other policy considerations, such as regulatory burden and whether or not weather effects and customers growth variances should be included in the stabilization regime.

4.1 BASIC DESIGN OF A REVENUE STABILIZATION MECHANISM

The simplest design of a revenue stabilization mechanism would be to adopt a mechanism along the lines of the Revenue Stabilization Adjustment Mechanism ("RSAM") that is currently in place for Terasen Gas Inc.[7] The Terasen Gas RSAM was originally approved by the BCUC in 1994. The key features of the RSAM are as follows.

- Revenues attributable to variances from forecast winter volumes for weather sensitive customer classes (residential and commercial) are recorded in a deferral account. Hence, actual revenues are "stabilized" by the removal of revenues resulting from sales volumes that are above forecast or the addition of revenues due to below-forecast sales volumes.
- The deferral account is disposed of over a three-year amortization period in order to moderate the rate impact of the disposition of the deferral account. Using a three-year amortization period not only reduces the amount recovered in any one year, but it also provides and opportunity for positive and negative variances in subsequent years to create offsets within the deferral account so that the amount disposed of to customers is reduced.
- Interest accrues on the balance in the deferral account at the utility's short-term interest rate.

The BCUC's 1994 Decision identified a number of benefits of the RSAM.

> *In the Commission's view, the RSAM with a zero deadband should have the following beneficial effects.*
>
> - *The incentive for the Company to pursue short-run sales in the winter period would be eliminated, thereby eliminating the potential conflict between the demand-side pursuit of economically efficient energy services, including fuel-switching and short-run profit maximization for the gas utility.*

[7] British Columbia Utilities Commission (BCUC) Decision in the matter of BC Gas Utility Ltd. 1994/95 Revenue Requirements Application, Phase 2, dated August 4, 1994. The RSAM was most recently reviewed in the BCUC Decision in the matter of BC Gas Utility Ltd. 2003 Revenue Requirements Application, dated February 4, 2003.

- *An incentive would remain to pursue short-run sales in the summer period, with potential benefits to load factor for the entire system, for core customers in particular.*
- *Sales forecast risks to utility shareholders would be substantially reduced for sales to the weather sensitive residential and commercial customers throughout the winter period, which represents the major revenue volatility of the Utility.*
- *Because marginal cost pricing initiatives, such as seasonal rates, would no longer be associated with increased risks for shareholders, utility management would be less reticent to support such improvements.*
- *The contentiousness associated with regulatory review of short-run energy demand forecasting would be largely eliminated.*
- *The incentive for the Utility to operate as efficiently as possible at all times would not be diminished relative to the existing regulatory structure.*
- *The regulatory complexity of implementing the RSAM with zero deadband seems small relative to alternatives that have been discussed (notably ERAM type mechanisms, the previous weather stabilization mechanism of BC Gas and the proposal of the Energy Coalition).*[8] (Emphasis added)

Certain modifications to this basic approach would be appropriate given the differences between the BC gas market and the Ontario electricity market. In particular, an Ontario electricity revenue stabilization mechanism should apply to all months, not just winter months when natural gas demand is high due to heating load. In addition, because the Ontario electricity revenue stabilization mechanism would be serving as a broad-based LRAM, it should be applied to all customer classes that are target markets for CDM.

4.2 STABILIZING WEATHER NORMALIZED REVENUE

If the OEB were to determine that it does not wish to eliminate the impact of weather variances on the financial results of distributors along with the impact of variances from forecast CDM results, it would be feasible to use the weather normalized actual sales volume as the basis for determining the variance from forecast for revenue stabilization purposes. Hydro One has a sophisticated model for weather normalizing electricity demand for both heating and cooling degree-days that could be used for this purpose.

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[8] Ibid. 1994 Decision, pages 4-5.

Under this approach, revenue attributable to the variance between forecast and weather normalized actual sales would be recorded in the deferral account for disposition over the three-year amortization period.

4.3 STABILIZING REVENUE PER CUSTOMER

Another possible variant of the basic Terasen RSAM would be to base the stabilization mechanism on the variance from forecast in electricity use per customer. This approach could utilize either actual or weather normalization use per customer. Under this approach the amount recorded in the deferral account would be determined for each customer class by multiplying the variance in use per customer in the class by the number of customers in the class. The rationale for this approach is that it would remove from the stabilization mechanism variances attributable to customer growth that is either above or below forecast.

4.4 REAL-TIME REVENUE STABILIZATION

It is also worth noting that some North American gas and electric utilities have implemented a variety of other variants on the general concept of a rate stabilization mechanism that have enabled them to achieve other specific design objectives. For example, Baltimore Gas and Electric Company ("BGE") utilizes a mechanism that compares actual monthly revenue by rate class to the approved monthly revenues adjusted for the actual customer count. The difference is then rebated or charged to customers in the second succeeding month by adjusting the delivery price by an amount that equals the revenue variance divided by the forecast volume. Any difference between actual and estimated sales is therefore reconciled in the determination of the adjustment for a future month.

This approach is intended to achieve a near "real-time" stabilization mechanism. That is, when overall demand is high and bills are high, customers receive an almost immediate rebate rather than having to wait for a subsequent year.

5 CONCLUSIONS AND RECOMMENDATIONS

The role of the OPA, electricity LDCs and other market participants in future CDM programs is currently being addressed by a consultation process initiated by the OPA that will be making recommendations to the OEB. As a result, the role of LDCs is uncertain at this time. Nevertheless, given the high priority that has been placed on CDM by the Ontario Government, it can be anticipated that the Government, the OPA and the OEB will need to develop a policy environment that utilizes the unique capabilities of each player in the electricity market to achieve a culture of conservation in Ontario. While details such as the level and source of funding, the process for selecting and developing CDM programs, and the responsibility and accountability for program delivery have yet to be determined, there can be little doubt that the full potential of CDM will not be achieved without the full commitment of LDCs.

Despite this uncertainty, the OEB has already endorsed the implementation of an LRAM for distributors in order to address the inherent conflict between CDM program success and the financial interests of distributors. This initiative reflects the OEB's recognition that it would be unrealistic to expect any participant in the electricity market – whether that participant is a generator, distributor, retailer, customer or regulator – to commit wholeheartedly to maximizing CDM results if positive results will cause significant financial harm. As Appendix A shows, the potential impact on an LDC's equity return could be as much as 300 basis points, which is significant.

In a market where CDM programs are the exclusive responsibility of a few large distributors (as in the case of the Ontario natural gas market), an LRAM is an appropriate instrument for holding companies whole with respect to the lost revenues resulting from successful CDM (or DSM as it is called in the gas industry). In that circumstance, it is not an onerous task to develop estimates of the impact that each program has on total volume throughput and to quantify the lost revenue. In the Ontario electricity industry, however, it will be a near-impossible task to quantify the lost revenue with an accuracy that is reasonable within a multi-year PBR framework, where unmeasured lost revenues will accumulate and compound over several years.

The most practical approach to holding LDCs whole with respect to lost revenues will therefore be to implement a revenue stabilization mechanism that uses the variance between the forecast and actual energy consumption (possibly the weather adjusted actual energy consumption) as the basis for a lost revenue adjustment. Put simply, this approach assumes that as a matter of policy it is appropriate to hold both distributors and customers whole with respect to variances from forecast energy consumption. The essential effect of introducing a revenue stabilization mechanism of this type would be to collect from customers a proportionate share of the distributor's total revenue requirement that is based to the customer's actual share of energy consumed.

- If aggregate consumption is above forecast, the excess revenues collected by the LDC would be returned to customers through a rebate or reduction in future rates.
- If the aggregate consumption is below forecast, the distributor's revenue shortfall would be subsequently recovered from customers through a surcharge or a increase in future rates.

While this approach would stabilize both customer bills and distributor revenues, it differs from a fixed distribution charge in that customer bills reflect their individual usage level; hence, the financial conservation incentive that is inherent in billing customers for distribution service based on their usage would not be lost.

This approach would not preclude the OEB from determining that variances from forecast due to degree-day variances from normal weather should continue to be a distributor risk. If this approach is adopted, the net impact on distributor risk of adopting aggressive CDM targets and also implementing a revenue stabilization mechanism would be minimal.

While this approach will not produce a precise measure of the variance between the forecast and actual results of CDM programs in isolation from other factors, it will serve as a comprehensive LRAM methodology that is far less contentious and far less onerous for distributors, the Board and other stakeholders than a "bottom-up" estimation of lost revenues. Not only is this approach less complicated, it leaves no room for "gaming" the process of estimating the impact of CDM programs. If an SSM that is

based on the global trend in electricity use per customer were also adopted, regulatory burden could be minimized through an approach that is analogous to the rate cap approach discussed in section 2 of Mark Lowry's paper for the OEB.[9]

In addition, the top-down approach is likely to be at least as accurate as any practical approach to estimating the impact of CDM on energy consumption in an LDC's service area using a bottom-up approach that estimates the impact of individual programs. Further, a revenue stabilization mechanism is likely to be the only practical way to examine the impact of CDM programs on energy consumption in each distributor's service area regardless of the entity that has responsibility for program delivery.

Given the inherent conflict between the conservation goals and the fiduciary duties of LDCS, the more comprehensive the adjustment mechanism adopted by the Board, the more effective it will be in mitigating the conflict. Furthermore, if a revenue stabilization mechanism is implemented, distributors will be equally supportive of all initiatives whether they are initiated by the LDC itself, the OPA or others market participants.

The revenue stabilization mechanism will also provide a means of finessing the challenging task of recognizing the impact of difficult to quantify initiatives such as awareness programs, market transformation through the introduction of higher standards for products that affect energy efficiency, etc. The effect of these types of initiatives will be automatically captured by this global approach whether the impact is large or small, measurable or non-measurable, and sustainable or transitory.

It is therefore recommended that in implementing an LRAM in accordance with OEB Decisions RP-2004-0188 and RP-2004-0203, the Board adopt a revenue stabilization mechanism that captures the effect of variances from the volumetric forecast. This could be done either on a weather-normalized or non-weather-normalized basis and could be done on the basis of either total sales volume or use per customer.

[9] Op. cit., pages 13-30.

Appendix A: The Potential Impact of CDM on Ontario LDCs

ERA has examined the financial risk that Ontario LDCs may face as a result of the uncertainty associated with the results that may be achieved by Ontario's broad portfolio of CDM programs. This financial risk arises when regulated distribution rates are set on the basis of an energy consumption amount that implicitly or explicitly embeds an assumption about the impact of CDM on consumption. Variances from the expected impact of CDM will affect an LDCs revenues although its costs will not be affected.

The estimates contained in this Appendix should be considered to be an illustrative example of the potential impacts of CDM. The calculations are based on numerous assumptions about the design and impact of CDM programs as well as the regulatory approach to building CDM impacts into energy consumption estimates that are used for rate setting purposes.

ASSUMPTIONS ON WHICH THE ANALYSIS IS BASED

The Government of Ontario and the Chief Energy Conservation Officer for Ontario have targeted a 10 per cent reduction for electricity by 2007. In its Supply Mix Advice, the OPA adopted a more moderate energy efficiency potential of 5%, based on a report prepared by ICF Consulting on CDM Potential[10]. The ICF report identified a range of achievable energy efficiency potential with the low end of the achievable potential being roughly 5%. This analysis assumes that LDC load forecasts are adjusted by the 5% baseline to reflect achievable CDM potential. The analysis examines the impact on shareholders and ratepayers of variances between this forecast and actual CDM results, all other things being equal.

For example, if the proposed 5% reduction is used in setting LDC rates, but is not achieved (e.g., only 2% reduction is achieved), the LDCs revenue will exceed its revenue requirement. If, on the other hand, consumers respond aggressively to CDM

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[10] Part 4.2a – ICF Report on CDM Potential with appendices (August 2005); available at http://www.powerauthority.on.ca/Storage/18/1336_Part_4.2_a_ICF_Report_on_CDM_Potential_with_appendices_(August_2005).pdf

measures and demand declines by 10%, as the Chief Energy Conservation Officer and the Government are proposing, the LDC's revenue will collect less than its revenue requirement and its allowed return on equity will be below the allowed rate.

As an illustration of the effect of the successful implementation of CDM on the revenue and return of LDCs, ERA has calculated the impact of a 2% energy reduction and 10% energy reduction on the revenue and return of three LDCs – Barrie Hydro, Enersource Hydro Mississauga, and PUC Sault Ste. Marie – based on information in their 2006 EDR filings. A baseline scenario of 5% energy saving potential is assumed, consistent with the OPA Supply Mix Advice. Consequently, if CDM savings are only 2%, energy consumption will be 3% greater than forecast, resulting in higher volumetric revenue (revenue from volumetric based energy and demand charges). On the other hand, if CDM measures reduce energy consumption by 10%, LDC volumetric revenues will be 5% below forecast.

The effects of the revenue variation due to CDM will flow directly to return on equity since debt costs, OM&A, and other costs are essentially unaffected by the demand fluctuation. The net effect on return on equity is also affected by the proportion of total revenue from volumetric (variable) versus fixed charges and LDC capital structure. This is illustrated in the table below.

Effect of CDM On Return On Equity (assuming 5% load reduction is reflected in rates)

		Barrie Hydro		***Enersource***		***Sault Ste. Marie***	
		2% Demand Reduction ($000)	10% Demand Reduction ($000)	2% Demand Reduction ($000)	10% Demand Reduction ($000)	2% Demand Reduction ($000)	10% Demand Reduction ($000)
1	Net Revenue Increase/(Reduction)	$374.5	($624.2)	$2,170.5	($3,617.5)	$274.7	($457.8)
2	Equity Portion of Rate Base	$57,601.4	$57,601.4	$193,357.8	$193,357.8	$21,533.5	$21,533.5
3	Equity Return	$5,558.7	$4,559.9	$19,572.7	$13,784.7	$2,214.5	$1,482.1
4	Return On Equity	9.65%	7.92%	10.12%	7.13%	10.27%	6.88%

Notes: Based on 2006 EDR filings. Actual ROE is 9.0% when the expected 5% demand reduction is realized.