Shareholder Incentives for Gas DSM: Experience with One Canadian Utility

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ABSTRACT

This paper reviews a unique shareholder performance incentive mechanism established in 1999 for Enbridge Gas Distribution (EGD) in Ontario to encourage more effective demand-side management (DSM). The sole metric of performance is the present value of net economic benefits to ratepayers calculated using the total resource cost test. EGD's actual performance each year is compared to a target set for that year. After an audit of its savings claims, EGD shareholders are awarded incentives equal to a percentage of all net benefits above the target (initially they also faced symmetrical penalties for falling short of the target).

This mechanism has had important impacts on EGD's performance. Perhaps most importantly, EGD's *total* incremental annual savings have doubled – despite greater scrutiny that lowered net *per measure* savings assumptions. They are also double (as a percent of sales) those of an adjacent utility that is not eligible for performance incentives.

The incentive mechanism has also raised some difficult issues. For example, it has taken several years to sort out rules governing target-setting, when targets can be retrospectively adjusted, and assumptions used to estimate actual benefits for comparison to targets. The incentives have also led to great emphasis on short-term savings from retrofit measures and limited investment in lost opportunity markets and market transformation.

Introduction

Substantial increases in natural gas prices and concerns about their future volatility appear to have increased interest in natural gas efficiency programs in the past few years. A recent report by the American Council for an Energy Efficient Economy (ACEEE) found that 22 states currently have utility-funded natural gas efficiency programs and four others are currently considering them (Kushler et al. 2003). Gas DSM programs are also currently being implemented in several Canadian provinces.

There is wide variation in the aggressiveness and likely effectiveness of all of these efforts. This variation is driven, at least in part, by differences in regulatory frameworks for gas DSM. For example, ACEEE's study noted that all nine of the states and provinces that had the strongest gas DSM programs today had both explicit mechanisms for cost-recovery of program expenditures and either legal requirements (in seven cases) or strong regulatory encouragement for such programs.[1] Several of these nine jurisdictions had lost revenue recovery and shareholder incentives for good DSM performance (Kushler et al. 2003). This paper more closely examines the impact of one of these policy instruments – shareholder incentives – in one of the nine leading gas DSM jurisdictions – Ontario.

[1] According to ACEEE, the nine leading jurisdictions are California, Massachusetts, Minnesota, New Jersey, Ontario, Oregon, Vermont, Washington, and Wisconsin.

Gas DSM Policy in Ontario

The Canadian province of Ontario has been something of a DSM anomaly over the past decade in that it has had gas but no electric DSM requirements and efforts.[2] Gas DSM began in 1995 following the Ontario Energy Board's (OEB's) landmark order in 1993 (EBO-169) that established extensive "rules" the two gas utilities in the province would be expected to follow in developing and implementing annual DSM plans. Chief among those rules were requirements that the utilities pursue cost-effective DSM up to the point where it created "undue" rate impacts, that the societal cost test be used to assess cost-effectiveness and that DSM portfolios be balanced and equitable (i.e. so all ratepayers can participate). Although interpretation of the application of these rules has been contentious and litigated at times, they have clearly led to substantial gas efficiency programs, energy savings and economic benefits to Ontario ratepayers.

In subsequent years, the OEB adopted several additional policies designed to provide incentives (or remove disincentives) to effective gas utility DSM efforts. For example, since 1999 the OEB has permitted both gas utilities to recover revenues lost due to do DSM through a Lost Revenue Adjustment Mechanism. In 1998, one of the two gas companies – Enbridge Gas Distribution (EGD) – proposed (for the first time) a shareholder incentive mechanism. After substantial input from various stakeholders the OEB approved such a mechanism. EGD has been eligible for shareholder incentives related to its DSM performance ever since. Interestingly, the other gas company – Union Gas – has yet to propose a shareholder incentive mechanism that is acceptable to the regulators. As a result, it still operates without one.

Shareholder Incentive Design

From the beginning, the sole metric of EGD's performance has been the present value of the net economic benefits its DSM programs collectively produce for ratepayers, calculated using the total resource cost test. EGD's performance each year is compared to a net economic benefits target for its portfolio of programs previously set for the year. The shareholders' incentive is a function of the difference between the company's results and the target.

The incentive mechanism was originally designed to be symmetrical. That is, shareholders could either receive incentives for exceeding the target or pay a penalty for failing to meet the target. Initially (i.e. for fiscal year 1999), the incentive or penalty was equal to 35% of the difference between actual and target net benefits. For example, if the company had a target of $100 million of net benefits and it produced $110 million, its shareholders were eligible for a reward of $3.5 million. Alternatively, if the company produced only $90 in net benefits, shareholders would be penalized $3.5 million. This quickly came to be known as EGD's Shared Savings Mechanism (SSM).

Beginning with fiscal year 2002, the incentive/penalty factor was reduced to 20%. This change grew out of two concerns. First, EGD earned substantial incentives ($4.8 million Canadian) in its first year for producing savings and net benefits well in excess of its target. That prompted several stakeholders to begin expressing concern about the magnitude of the potential shareholder rewards. Second, EGD's avoided costs increased, substantially increasing the net benefits associated with a unit of gas savings.

[2] This situation is about to change. The Ontario government recently announced that electric DSM will resume in the province in 2005.

The SSM mechanism was changed again for fiscal year 2003. There were three major changes. First, the potential for penalties for under-performance was eliminated. Second, the incentive factor was reduced. Third, rather than remaining constant, the incentive factor declines as the amount by which the company exceeds its performance target grows (much like the inverse of a graduated income tax). Specifically, shareholders earn 18% of all net benefits up to 10% above the target, 15% of the second 10% above the target, 12% of the third 10% above target, 9% of the fourth 10% above the target and 6% of any net benefits in excess of 40% above the target. This is shown in the following table using $150 million as an example net benefits target.

Table 1. 2003 Shareholder Incentive Assuming $150 Million TRC Target

Improvement over Target (%)	NPV Net Benefits ($ millions)	Improvement over Target ($ millions)	Incremental Incentive (%)	Incremental Incentive ($ millions)	Cumulative Incentive ($ millions)
0%	$150	$0	0%	$0.00	$0.00
5%	$158	$8	18%	$1.35	$1.35
10%	$165	$15	18%	$1.35	$2.70
15%	$173	$23	15%	$1.13	$3.83
20%	$180	$30	15%	$1.13	$4.95
25%	$188	$38	12%	$0.90	$5.85
30%	$195	$45	12%	$0.90	$6.75
35%	$203	$53	9%	$0.68	$7.43
40%	$210	$60	9%	$0.68	$8.10
45%	$218	$68	6%	$0.45	$8.55
50%	$225	$75	6%	$0.45	$9.00

These changes were originally proposed by the Green Energy Coalition[3] in regulatory testimony (Neme 2003). The rationale behind the proposal was to reduce risk to both the company – by eliminating potential penalties – and stakeholders concerned about the potential for large shareholder incentives – by paying smaller and declining marginal incentives. This proposal was accepted by almost all parties in settlement negotiations and later endorsed by the OEB. However, several parties continue to believe that further refinement to the mechanism is needed. Some of the concerns underlying those beliefs are explained in later in this paper.

Results

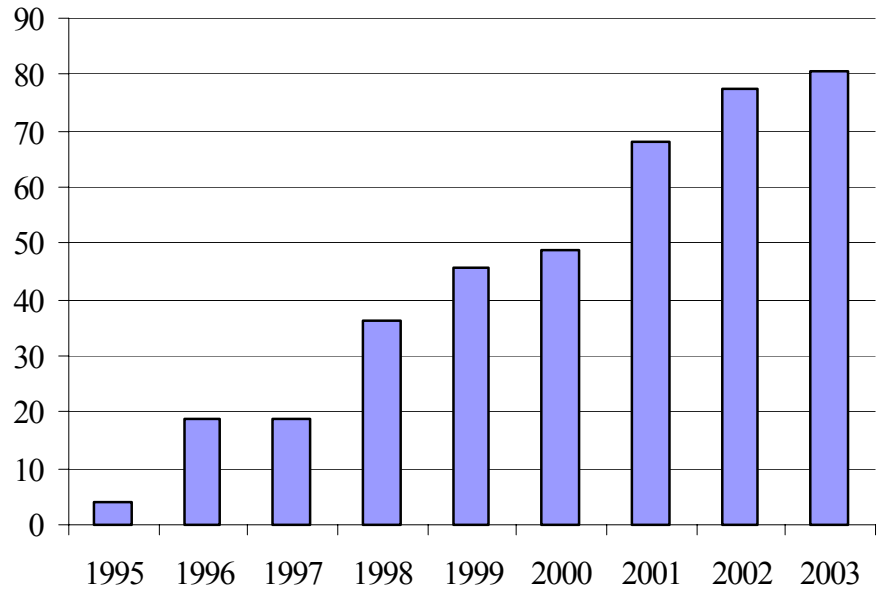
There is no question that EGD's shareholder incentive mechanism has had a major impact on the gas DSM landscape in Ontario. In this section we summarize some of the key results.

[3] The Green Energy Coalition is a coalition of environmental groups that has been actively involved in regulatory proceedings regarding DSM issues in Ontario for more than a decade. The coalition currently includes the David Suzuki Foundation, the Energy Action Council of Toronto, Greenpeace Canada and the Sierra Club of Canada.

Increase in Gas Savings

By several measures, EGD's shareholder incentive mechanism has substantially increased the amount of gas savings from efficiency investments in its service territory. Perhaps most importantly, as Figure 1 demonstrates, EGD's annual incremental savings have increased considerably since it became eligible for shareholder incentives. Indeed, they more than doubled between 1998 – its last year without the SSM – and 2002. The fact that savings claims have received much greater scrutiny (and in many cases been adjusted downward) since the SSM went into effect makes this difference all the more striking.[4]

Figure 1. EGD Incremental Annual Gas Savings (millions cubic meters)[5]



Moreover, the savings the company has realized are providing enormous economic benefits to its ratepayers. Indeed, in recent years, the company has been generating more than $10 in net benefits for every dollar it spends on DSM.[6]

It is also instructive to compare EGD's performance to that of its neighboring gas utility – Union Gas – which has no shareholder performance incentive. As Figure 2 illustrates, Enbridge has always achieved greater savings as a percent of total sales than Union has achieved. However, the differences have grown since EGD shareholders became eligible for DSM performance incentives. For example, in 1997 and 1998, EGD's DSM savings as a percent of

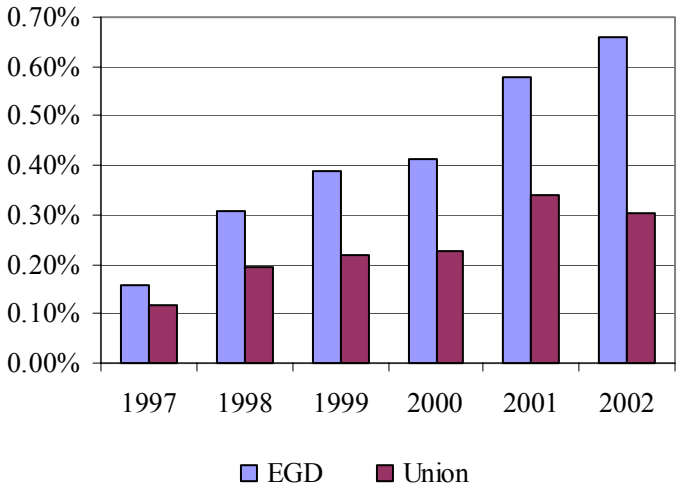
[4] All savings and net benefits numbers shown in Table 2 for 1999 and subsequent years are adjusted for changes in assumptions that have resulted from this scrutiny (including increased evaluation). The figures for 1995 through 1998 do not reflect such adjustments because the measure level data needed to make them are not sufficiently accessible.

[5] Gas consumption and savings is measured in cubic meters rather than therms in Ontario. A cubic meter is approximately 35,000 BTUs or a little more than one-third of a therm.

[6] In 2002, the Company estimates that it generated over $139 million in net economic benefits with DSM spending of $11.2 million. Those values are still undergoing an external audit. Preliminary data for 2003 suggest the Company generated $131 million in net economic benefits with DSM spending of $11.5 million.

sales were 37% and 58% higher than Union's. Since EGD's incentive mechanism went into effect in 1999, EGD's savings have ranged from 70% to 117% higher than Union's.

Figure 2. EGD & Union Gas Incremental Annual DSM Savings as % of Sales



Three factors make these differences even more compelling than they may initially appear. First, the two utilities have important differences. Specifically, Enbridge has more residential customers (1.5 million vs. 1.1 million for Union), but smaller total sales (11.8 billion cubic meters vs. 14.1 for Union in 2003) due primarily to smaller industrial sales. Both utilities have found that it is less expensive to obtain savings from their industrial sectors than from their residential and commercial sectors.[7] This experience is not unique to Ontario. Indeed, recent analyses conducted by the American Council for an Energy Efficient Economy suggest that achievable gas savings potential in the industrial sector is roughly twice as large as the achievable potential in the residential and commercial sectors (Elliott 2003, Elliott 2004). Second, Union's annual DSM savings goals have been repeatedly compared to EGD's in annual regulatory proceedings. Union has also been well aware that such comparisons were coming. As a result, its savings may be indirectly influenced by EGD's shareholder incentive mechanism. Finally, EGD and Union occasionally collaborate on DSM initiatives. This could also be a source of indirect influence of EGD's shareholder incentive mechanism.

Shareholder Incentive Payments

Thus far, a regulatory determination of EGD's shareholder incentive has been made for three different fiscal years: 1999, 2000 and 2001. As Table 2 shows, EGD earned an incentive in each of those years, with the average being a little more than $4 million per year.

[7] This is important given that both utilities operate each year with essentially fixed DSM budgets and savings targets.

Table 2. EGD Shareholder Incentive Payments to Date

Year	Shareholder Incentive (Millions)
1999	$4.8
2000	$3.5
2001	$4.6

A determination has not yet been made as to whether EGD is eligible for either a shareholder incentive or penalty for 2002. EGD has completed its initial assessment for that year. In contrast with previous years, that assessment suggests that the company's incremental annual savings for the year were virtually identical to its goal for the year (actually 0.1% lower) and that the net economic benefits it produced ($171.1 million) were only 0.4% higher than its target. As a result, the company has proposed that it receive a shareholder incentive of just $0.14 million (EGD 2003). However, that claim, like others, is currently being subjected to an independent "audit" that is overseen by representatives from the company, as well as representatives from three different stakeholders.[8] Once the audit is complete, it will be presented to a broader group of stakeholders and ultimately filed with the OEB. The Company may also file an updated shareholder incentive claim. The OEB will then rule (following a regulatory proceeding in which any party with standing can contest the Company's claim) on the shareholder incentive or penalty to which the company is entitled.

Controversy over Savings Claims

The process for approval of EGD's first shareholder incentive went relatively smoothly. The Company made an initial claim of $6.9 million (Quantum 1999). After the audit, several concerns about specific savings claims were raised by the Green Energy Coalition. Ultimately, all stakeholders agreed to a settlement in which the shareholder incentive was reduced to $4.8 million. That settlement was later approved by the OEB.

The process for awarding EGD shareholder incentives for 2000 and 2001 was much more contentious. It began with an audit of EGD's 2000 evaluation report and savings claim. The auditor identified a number of assumptions underlying EGD's savings claim for the year that it found to not reflect best available information. For example, the auditor suggested that EGD's assumption about the life of efficient water heaters be reduced from 15 to 12.6 and that the life of retrofit hot water tank temperature setbacks be reduced from 15 years to 6.3 years (since the average water heater treated could be reasonably expected to be half way through its useful life). There were a variety of other suggestions regarding assumptions for what came to be called "prescriptive measures" – i.e. measures for which average assumptions are applied to an entire population of participants because it is uneconomic or otherwise unreasonable to develop

[8] The OEB requires both EGD and Union to hire an independent auditor to assess the reasonableness of their annual DSM savings claims. Such auditors are typically firms with significant DSM expertise, particularly in the area of DSM evaluation. Their roles have been to assess both whether there is sufficient documentation for savings claims (e.g. whether savings recorded in the utility's tracking system are consistent with reasonably thorough documentation on individual projects or groups of projects, vendor reports and invoices, etc.) and whether the savings claims for efficiency measures themselves are reasonable given both evaluation data available from the utility and experience in other jurisdictions. They do not usually do any primary data collection. The authors of this paper have, between them, served on every such committee for both audits of both company's savings claims (including the current audit of EGD's 2002 performance).

assumptions for each unique application. There were also a few suggestions regarding changes in assumptions regarding "custom measures" – i.e. measures, typically for large commercial and industrial applications, for which savings estimates are developed and recorded separately for each application. The most important of these was the suggestion that the free rider rate for custom projects was probably more like 49% than the 10% EGD had been assuming (Xenergy 2002).[9] This was a particularly important finding because roughly half of EGD's estimated net economic benefits were coming from custom commercial and industrial projects.

Although the findings were interesting and important in their own right, they ultimately became secondary to a broader policy dispute that they caused to bubble to the surface. At the heart of the dispute were disagreements over whether or when new data should be used to update assumptions underlying savings and net benefits calculations and whether and when the original target savings and net benefits levels should be retrospectively adjusted.[10] For example, with respect to custom projects, should shareholder incentives be calculated using:

1. the newly found free rider rate of 49% for actuals and compared to a target based on the old 10% assumption (this came to be known as "yes/no")?
2. the newly found 49% for actuals and compared to a target retroactively adjusted using the same 49% (this came to be known as "yes/yes")? or
3. the old 10% for both actuals and the target (this came to be known as "no/no")?[11]

Different arguments around these different options were based, in part, on different perspectives as to what the most important function of the shareholder incentives should be. Those in favor of the "yes/no" approach (number 1 above) argued that the burden for developing a defensible target lies with the company and that the actual net benefits used to compare to the target should be as accurate as possible so that any shareholder incentives were indeed "shared savings" (the name given to the shareholder incentive mechanism – shared savings mechanism – became important here). Others, including the authors of this paper, held that the principle purpose of the shareholder incentives was to encourage the company to perform better than expected. Thus, they argued that the company should be rewarded or penalized only for those factors over which it had control. This meant applying the "no/no" approach (number 3 above) to all prescriptive measure assumptions and some custom measure assumptions, including free ridership.[12] Further, they argued that the total net benefits from the company's DSM efforts

[9] 49% was the mid-point of a range estimated by the auditor. It is also worth noting that this estimate was developed as a result of an evaluation of custom project free ridership that was rolled into the audit. This was a departure from the traditional role of the auditor (they typically only review evaluation work done by others). However, EGD and the other members of the audit committee decided to authorize the auditor to pursue such evaluation work because no other independent evaluation of custom project free ridership had been conducted.

[10] This dispute centered only around which assumptions should be used to calculate shareholder incentives. All parties agreed that best available information should be used to estimate lost revenues.

[11] "Yes/No" was shorthand for using best available information to adjust assumptions underlying calculations of actual savings and net benefits, but not for assumptions underlying the previously established target. "Yes/Yes" referred to using new information to both calculate actuals and adjust targets. "No/No" essentially meant using the original assumptions to calculate actuals, regardless of what new information says, and not adjusting the target.

[12] This faction did note that the "no/no" approach should be applied to such assumptions only if there were no major program design changes during the course of the year. If there were such changes and the company could reasonably expect such changes to affect any key assumptions underlying net benefits calculations (i.e. the change in net benefits was under the company's control), the target should remain unchanged and actual net benefits should be calculated using the best available information.

were so large that there was no chance that any adjustments to DSM measure assumptions would change the fact that the company and its ratepayers were, in fact, sharing savings.

A big part of the problem in this debate was that the rules governing how and when assumptions should be changed were not made clear when the shareholder incentive mechanism was initially established. The problem was corrected when the OEB endorsed a settlement agreement among most parties that clearly laid out rules for how different prescriptive and custom measure assumptions would be treated (Settlement Proposal 2003). The rules essentially endorse the "no/no" approach for prescriptive measure assumptions (so that participant numbers and program costs are the only parts of actual net benefits calculations that will differ from the target calculations). They also effectively endorse the "no/no" approach for several custom measure assumptions, including measure lives and free rider rates (so that participant numbers, program costs, measure savings and measure incremental costs are the only parts of actual net benefits calculations that will differ from the target calculations).

Excessive Focus on Retrofit Opportunities

One other important result of EGD's shareholder incentive mechanism is that it has the company focusing intensely on savings and net benefits that can be achieved in the current year. That has, in turn, meant that the company has focused very heavily on retrofit savings opportunities. Put another way, with a couple of exceptions, the company has historically invested relatively little in key lost opportunity markets (i.e. new construction and equipment replacement).[13] Moreover, they do not have a single comprehensive program with long-term market transformation as a key objective.

A quick review of the company's 2002 residential efforts helps illustrate this point. In that year, 44% of the company's annual incremental residential gas savings and 57% of the company's incremental residential net benefits came from programs designed to install low flow showerheads, install of hot water pipe wrap and setback hot water tank temperatures. Most of the rest of the savings and net benefits came from a program in which the company (together with Union Gas) worked with water heater manufacturers to increase the fleet average Energy Factor of units they sell in Ontario by 0.03. Virtually none of the company's residential savings or net benefits came from efforts to improve construction practices for new homes or from promoting the sale of efficient windows to existing homes. Only small portions came from efforts to promote efficient furnaces. The company had no efforts underway to promote efficient appliances, such as clothes washers, from which substantial gas savings could be realized.

A few stakeholders, led by the authors of this paper, have become increasingly concerned about the focus on retrofit and lack of focus on lost opportunity markets with potential for long-term market transformation. This concern will likely lead to proposals to further revise the shareholder incentive mechanism. One option that is being considered is to establish longer-term goals for specific efficiency markets with specific shareholder incentives being made available for meeting those goals (e.g. increase in market share for ENERGY STAR clothes washers from 20% to 50% over the next three years).[14] The effect of this approach would be to begin limiting the use of current year net benefits as the metric for retrofit-focused efforts and other longer-term

[13] In its landmark order establishing a policy framework for gas DSM in Ontario in 1993 (EBO-169), the OEB stated that lost opportunity resources should be considered the highest priority resources for utilities to pursue. However, this guidance has never been adequately followed or enforced.

[14] This is purely a hypothetical example.

market indicators as the metrics for lost opportunity-focused efforts. This approach has been pursued in other regulatory jurisdictions.[15] It remains to be seen whether it (or other changes) are ultimately adopted.

Conclusions

We believe Ontario's experience with shareholder incentives offer a number of useful insights for other jurisdictions. Chief among these are:

1. **Shareholder incentives motivate utilities**. EGD's DSM performance has clearly improved since it became eligible for a shareholder incentive.
2. **It is critically important that the goals and rules associated with shareholder incentives are clear from the beginning**. Had they been clear in EGD's case, much of the contentiousness of recent proceedings would have been avoided.
3. **The performance metrics must be carefully selected if expectations about what DSM will accomplish are to be realized**. In particular, if a focus on lost opportunity markets is considered important (particularly if market transformation is an objective), you need to establish goals tied to something other than just aggregate savings and/or net benefits from one year's implementation of a portfolio of DSM programs. The same holds for interest in low income and/or small commercial programs. Because the market barriers are often steeper for low income and small commercial customers than for others, it is more expensive to obtain savings from them. Thus, as long as a DSM administrator is operating with a fixed budget, exclusive reliance on portfolio level savings and/or net benefits performance metrics will likely result in limited investments in hard to reach market segments.
4. **Shareholder incentives increase scrutiny of savings goals and claims**.[16] Various stakeholders who may otherwise not be as interested become much more willing to get into the details (where the devil definitely resides). In Ontario, this has generally been a healthy development. While one result is that savings and/or net benefits claimed from various efficiency measures and programs are lower than they used to be, they are undoubtedly a lot more accurate.[17] Thus, energy policy is better informed (e.g. we know better what our options are for addressing climate change goals).

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[15] For example, it is consistent with the current performance incentive mechanisms for electric DSM in Vermont, Massachusetts and Connecticut.

[16] It is also worth noting that the LRAM claims by the Ontario gas utility without shareholder incentives – Union Gas – have also received increased scrutiny, with similar results (i.e. generally lower savings assumptions).

[17] It is also important to note that the savings being generated are still extremely cost-effective. Indeed, only in a couple of rare instances have the changes in savings assumptions have rendered any of the efficiency measures or programs in question not cost-effective.

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