

**INCENTIVE CREATION  
AS THE KEY TO  
INCENTIVE REGULATION**

**A REVIEW OF THE ONTARIO ENERGY BOARD  
“STAFF DISCUSSION PAPER ON THE COST OF CAPITAL AND  
2<sup>ND</sup> GENERATION INCENTIVE REGULATION FOR ONTARIO’S  
ELECTRICITY DISTRIBUTORS”  
EB-2006-0089**

**PREPARED FOR**  
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by

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August 14, 2006

## Executive Summary

### *Background*

1. The Ontario Energy Board is in the process of developing a multi-year electricity distribution rate plan for the period 2007 to 2010. As part of that plan, Ontario Energy Board staff issued on June 19, 2006 the “Draft Staff Report: Proposals for Cost of Capital and 2<sup>nd</sup> Generation Incentive Regulation for Ontario’s Electricity Distributors”. After receiving comments from various stakeholders, Board staff issued its “Staff Discussion Paper on the Cost of Capital and 2<sup>nd</sup> Generation Incentive Regulation for Ontario’s Electricity Distributors” on July 25, 2006. The purpose of the present document is to provide a review of the portions of these documents that pertain primarily to incentive regulation.

2. Board Staff have proposed a simple price-cap mechanism of the form

$$\% \Delta P = K + \% \Delta GDPPI - X + Z$$

where  $\% \Delta P$  is annual percentage change in the price of distribution services,  $K$  is an adjustment for the cost of capital,  $\% \Delta GDPPI$  is the annual percentage change in the gross domestic product price index,  $X$  is an efficiency factor set at 1% and  $Z$  adjusts for a limited range of unusual events outside the control of utilities.

3. The intention is that the price-cap rule is to apply for up to three years, following which a more permanent incentive regulation mechanism would be instituted. During this interim period, two changes would take place to the cost of capital permitted for utilities. In 2007, an adjustment would be made to reflect new rates of return on equity. These rates would be applied to existing utility capital structures. In 2008, a further adjustment would be made to reflect an industry-wide prescribed capital structure. Both of these adjustments would take place via the “ $K$ ” factor.

4. Price-cap regulation is the most common form of incentive regulation. There is accumulating evidence that incentive regulation is beneficial when applied to private sector companies. Private companies are amenable to conventional incentive regulation for a number of reasons including:

- shareholders can sell shares signaling disaffection, leading to a decline in share price;
- if the company under-performs, management and even the board can be replaced;
- if the company exceeds expectations, there is greater scope for rewarding management and executives;
- companies are generally allowed to earn and retain additional returns for a period of time.

- 1 5. The extent to which price-cap regulation has been effective in the public sector is  
2 unclear and requires further study. For government owned firms, the potential for  
3 conventional and spontaneous incentive creation is more limited:
- 4     ▪ government / taxpayers are collective owners, so that individual shares  
5         cannot be sold;
  - 6     ▪ owner interests are more diffuse and indirect;
  - 7     ▪ there is generally less flexibility in rewarding employees for exceptional  
8         company performance and in effecting changes to management if the  
9         company performs poorly;
  - 10    ▪ public firms are frequently used as instruments of public policy.
- 11
- 12 6. These differences between private and public sector companies do not imply that  
13 incentive regulation would not be effective in Ontario. Distributors in Ontario  
14 have been “corporatized” with the apparent intent of putting them on a more  
15 commercial footing. However, greater attention needs to be paid to incentive  
16 creation and to ensuring that distributors and their shareholders will benefit from  
17 productivity improvements.

18  
19 *Conclusions and Recommendations*

- 20
- 21 7. The proposed interim price-cap rule comprises an important step in the process of  
22 improving regulation of Ontario distributors. It is simple and transparent, thereby  
23 easing regulatory burden for the regulator and the utilities. Although the proposed  
24 price-cap rule does not recognize differential efficiencies across utilities and  
25 requires a common productivity improvement of 1%, it is anticipated that future  
26 refinements will incorporate such differences.
- 27
- 28 8. A commitment by the regulator to proceed to incentive regulation would logically  
29 entail the protection, promotion and creation of incentives that are essential to its  
30 success.
- 31
- 32 9. The proposed interim regime is to be followed within three years by an incentive  
33 regulation mechanism which is yet to be developed and which may depend on  
34 future rebasing. Utilities may have a disincentive to achieve further efficiency  
35 improvements at this time if the resulting cost savings could be “clawed back” in  
36 the near future through rebasing. A mechanism which ensures that utilities  
37 continue to benefit from cost savings for a substantially longer period of time  
38 should therefore be considered.
- 39
- 40 10. Ontario distributors will continue to face considerable regulatory and political  
41 uncertainty in the upcoming years, even if the proposals put forth in the Board  
42 Staff Discussion Paper were implemented. First, the proposed interim regulatory  
43 rule is to be superseded by incentive regulation that is yet to be determined.  
44 Second, there has been increasing emphasis on conservation and demand  
45 management programs which require significant investments and will likely have  
46 an impact on distributor sales revenues. Third, rate freezes and moratoria have

1 led to low rates of return for many distributors in past years. There is concern that  
2 political pressures may again limit distributors' ability to recover fair rates of  
3 return. Given the various sources of regulatory and political uncertainty, it may  
4 be that the proposed rates of return on equity do not fully incorporate these risks.  
5 In any event, a fuller examination of the impact of regulatory and political risks  
6 on appropriate rates of return in the Ontario setting is warranted.

- 7
- 8 11. A price-cap rule applied to distribution utilities will not be especially effective  
9 unless their shareholders – in most cases municipalities -- can expect to benefit  
10 from superior utility cost performance. The appropriation or redirection of these  
11 returns by the Province fundamentally undermines an essential component in the  
12 incentive chain, potentially rendering the entire chain weak or ineffectual.  
13 Political exigencies or policy priorities may lead Provincial governments to  
14 engage in such appropriations again in the future. However, the government  
15 should have a clear understanding of the deleterious consequences for incentive  
16 regulation. Moreover, there may be mechanisms by which the regulator can  
17 mitigate such incentive destruction. For example, government constraints on  
18 recovery of a fair rate of return during one period may be compensated by  
19 revising the price-cap rule so that greater recovery is possible in a future period.  
20 In addition, political risk may be considered when determining the cost of capital.  
21
- 22 12. Regulatory uncertainty and political risk also have important implications for  
23 continued industry restructuring and consolidation. If utilities and their  
24 shareholders are uncertain about the potential for receiving benefits from mergers,  
25 they are unlikely to consider them, particularly in view of the significant  
26 transition and transactions costs that will certainly be incurred.  
27
- 28 13. A careful examination of mechanisms for enhancing the potential for incentive  
29 creation under price-cap regulation of government owned utilities would be  
30 desirable. One area which would likely merit further consideration by utilities is  
31 performance-based remuneration with a stronger incentive component. Such an  
32 approach involves potentially greater benefits to employees but also increased  
33 risks. The objective would be to establish a stronger link between performance-  
34 based regulation and performance-based compensation.  
35
- 36 14. The proposed price-cap rule incorporates distributor specific  $K$  factors which  
37 adjust for certain capital related costs. Board staff have devoted significant  
38 resources to benchmarking these costs. In contrast, rigorous analyses of  
39 distributor efficiencies, their overall cost structures and the impacts of their capital  
40 programs on future costs have not been performed. Thus, the proposal constitutes  
41 the rebasing of certain components of costs without rebasing others. Moreover,  
42 given that the estimated  $K$  factors appear to be generally negative, their  
43 implementation would further constrain the ability of many distributors to recover  
44 fair rates of return. It would therefore seem appropriate to consider delaying  
45 implementation of the  $K$  factor component and relying upon a price-cap rule of  
46 the form  $\% \Delta P = \% \Delta GDPPI - X + Z$ .

## **Table of Contents**

1		
2		
3	1. Introduction	1
4	2. Incentive Regulation	1
5	A. Background	1
6	B. Private vs. Public Ownership and Incentive Regulation	4
7	C. Price-Cap Regulation	6
8	D. Benchmarking and Regulation	6
9	3. Ontario Energy Board Staff Discussion Paper	8
10	A. The Proposed Price-Cap Rule	8
11	B. Retention of Productivity Savings	10
12	C. Incentive Creation in Publicly Owned Firms	11
13	D. Regulatory and Political Risk	14
14	4. Conclusions	17
15		
16	Appendix A: Curriculum Vitae – Adonis Yatchew	

# 1 Introduction

The Ontario Energy Board is in the process of developing a multi-year electricity distribution rate plan for the period 2007 to 2010. As part of that plan, Ontario Energy Board staff issued on June 19, 2006 the “Draft Staff Report: Proposals for Cost of Capital and 2<sup>nd</sup> Generation Incentive Regulation for Ontario’s Electricity Distributors”. After receiving comments from various stakeholders, Board staff issued its “Staff Discussion Paper on the Cost of Capital and 2<sup>nd</sup> Generation Incentive Regulation for Ontario’s Electricity Distributors” (henceforth, the “Discussion Paper”), on July 25, 2006.

The purpose of the present document is to provide a review of the portions of these documents that pertain primarily to incentive regulation.

## 2 Incentive Regulation

### A. Background

Early analysis of competitive markets emphasized their ability to deliver goods and services cost effectively and to promote innovation. The theory stated, and empirical evidence supported the view that market participants, acting in their own interest and responding to economic incentives, would advance the public good. Private ownership was seen as an important factor in the success of such markets.

However, in certain instances, for example when competitive forces were limited or absent, limitations or controls on economic behavior were required. The solution to such “market failures” was generally seen to be regulation, often accompanied by public ownership. While decentralized decision-making worked remarkably well in competitive

1 markets, a centralized planning approach was often taken, particularly in electricity  
2 markets. In some cases, ineffective control led to “regulatory failure”.<sup>1</sup>  
3  
4 Eventually, it was recognized that conventional cost-of-service regulation could be  
5 improved upon by developing and applying ideas derived from competitive markets.  
6 Incentive regulation was in effect a descendant which augmented or modified regulation  
7 with the fundamental driver of the competitive marketplace -- incentive creation (see  
8 Figure 1).  
9

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## Figure 1: Incentive Regulation

- **Competition** -- private property; market forces; decentralized decision making; market participants respond to economic incentives.
  - **Regulation** – limitations / controls on economic behaviour; a planning approach; public ownership.
  - **Incentive regulation** – combines elements from each.
- 

10  
11 In some jurisdictions the dictum became

12

13 *“Competition where possible, regulation where necessary.”*

14

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<sup>1</sup> For example, the problems recently experienced in the California electricity market were in part due to the failure of political and regulatory authorities to put appropriate mechanisms in place.

1 A variant on this which helps organize thinking about the issues considered at present by  
2 the Board is

3

4 *“Incentive creation where possible, regulation where necessary.”*

5

6 In order to gain a better perspective on the regulatory issues we will be considering  
7 below, it is important to recognize that firms advance their interests by competing or  
8 interacting in a variety of environments. They compete directly in markets for goods and  
9 services which they produce and indirectly in markets which offer substitutes for their  
10 products. They compete in labor markets for employees, management and other staff.  
11 They compete in capital markets to attract financing at favorable rates and in markets for  
12 materials and other inputs.

13

14 In regulatory arenas firms interact with regulators and other stakeholders, some of whom  
15 have similar interests and others that have opposing interests. Firms may also be active  
16 in political settings, seeking support for their business plans and objectives from  
17 municipal, provincial or federal governments.

18

19 A key objective of public policy and oversight by regulatory agencies is to create  
20 productive incentives in each of these settings.

21



1        **B. Private vs. Public Ownership and Incentive Regulation**

2  
3        Incentive or performance-based regulation<sup>2</sup> has several important objectives, most  
4        prominent among them are the following:

- 5            ▪ to strengthen incentives for cost minimization;  
6            ▪ to promote efficient capital expenditures;  
7            ▪ to ensure fair cost recovery for firms and a fair return on investment;  
8            ▪ to increase the efficacy of regulation and reduce regulatory burden.

9  
10        Price-cap regulation is the most common form of incentive regulation. There is  
11        accumulating evidence that incentive regulation is beneficial when applied to private  
12        sector companies. Private companies are more amenable to the usual forms of incentive  
13        regulation for a number of reasons:

- 14            ▪ shareholders can sell shares signaling disaffection, leading to a decline in share  
15            price;  
16            ▪ if the company under-performs, management and even the board can be replaced;  
17            ▪ if the company exceeds expectations, there is greater scope for rewarding  
18            management and executives;  
19            ▪ companies are generally allowed to earn and retain additional returns for a period  
20            of time.

21  
22        The extent to which price-cap regulation has been effective in the public sector is unclear  
23        and requires further study. For government owned firms, the potential for conventional  
24        and spontaneous incentive creation is more limited:

- 25            ▪ government / taxpayers are collective owners, so that individual shares cannot be  
26            sold;  
27            ▪ owner interests are more diffuse and indirect;

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<sup>2</sup> “Incentive regulation” and “performance-based regulation” are used interchangeably. The former term may be preferred because of its explicit reference to incentives which are fundamental to the efficacy of this type of regulation.

- 1       ▪ there is generally less acceptance and flexibility in rewarding employees for
- 2           exceptional company performance and in effecting changes to management if the
- 3           company performs poorly;
- 4       ▪ public firms are frequently used as instruments of public policy.

5  
6   The use of publicly owned firms as instruments of public policy by governments presents  
7   a major challenge to regulators in their efforts to balance competing objectives. It also  
8   complicates decision making within regulated firms as they often need to satisfy multiple  
9   levels of government, the regulator and various stakeholders at the same time that they  
10   are trying to minimize costs.

11  
12   The net effect is that the power of incentives can be substantially diminished. Regulatory  
13   tools which are well-suited to private companies need to be adapted and validated if they  
14   are to be efficacious for publicly owned entities such as electric utilities.

15  
16   The differences between private and public sector companies do not imply that incentive  
17   regulation would not be effective in Ontario. Distributors in Ontario have been  
18   “corporatized” with the apparent intent of putting them on a more commercial footing.  
19   However, greater attention needs to be paid to incentive creation and to ensuring that  
20   distributors and their shareholders will benefit from productivity improvements.

21  
22   Moreover, in Ontario, rate freezes and moratoria have effectively limited the ability of  
23   many distributors to achieve reasonable levels of net income and to earn rates of return  
24   commensurate with the degree of risk in their business. The relative ease with which  
25   such rate freezes are imposed on public firms engenders a kind of political risk  
26   experienced to a much lesser degree by privately owned regulated firms and may be  
27   given consideration in the determination of appropriate target rates of return.



- 1       ▪ to determine appropriate levels of inputs to achieve target output levels, that is to
- 2       determine production relationships;
- 3       ▪ to determine an appropriate productivity factor  $X$  ;
- 4       ▪ to set  $RPI$  , the inflation factor; and,
- 5       ▪ to establish targets for other performance indices such as service quality and
- 6       reliability.

7

8       A wide variety of techniques and analyses may be used depending on the particular  
9       categories of variables being benchmarked and the purposes to which the benchmarks  
10      may be applied. Return on equity has been benchmarked using models such as capital  
11      asset pricing models, discounted cash flow models and even financial market surveys.  
12      Appropriate capital structures have been analyzed using a variety of techniques including  
13      statistical analyses and industry studies.

14

15      The benchmarking of costs and production relationships can be done using techniques  
16      familiar to economists for many decades. Among these are standard regression  
17      techniques which are used to estimate cost and production functions. Also used are “data  
18      envelopment analysis” and “stochastic production or cost frontier estimation”, both of  
19      which attempt to estimate “best practices”. Productivity factors are often estimated using  
20      industry or economy-wide data, as are inflation factors.

21

22      In most cases, it is not the availability of techniques that limits or circumscribes the value  
23      of the benchmarking exercise, but the availability of relevant and representative data.

24

25      As a general proposition, incentive regulation tends to lead away from detailed cost  
26      analyses by regulators. Indeed one of the objectives of incentive regulation is to create  
27      incentives for firms to minimize costs thus obviating the need for detailed and frequent  
28      cost analyses by regulators. On the other hand, cost benchmarking may be necessary or  
29      desirable in certain circumstances, for example, if there is a need to:

- 30      ▪ rebase costs from time to time;
- 31      ▪ assess ongoing or future capital expenditure programs;

- 1       ▪ supplement incentive regulation where entities may be less amenable to
- 2           spontaneous incentive creation, such as government owned firms;
- 3       ▪ inform public policy on matters such as appropriate industry structure.

4

5   The cost of capital proposals put forth by Ontario Energy Board Staff are supported by a  
6   detailed technical analysis which, inter alia, attempts to benchmark return on equity using  
7   the capital asset pricing model.

8

9   In contrast, analyses of other costs which would determine the appropriateness of rates  
10   that should justifiably be charged, are evidently not part of the current phase. Among  
11   these are OM&A costs and capital program expenditures.

12

13

### 14       **3 Ontario Energy Board Staff Discussion Paper**

15

#### 16       **A. The Proposed Price-Cap Rule**

17

18   The OEB Staff Discussion Paper proposes a price-cap rule of the form

19

$$20                                   \% \Delta P = K + \% \Delta GDPPI - X + Z$$

21

22   where  $\% \Delta P$  is annual percentage change in price,  $K$  is a cost of capital adjustment  
23   factor,  $\% \Delta GDPPI$  is the annual percentage change in the gross domestic product price  
24   index,  $X$  is an efficiency factor set at 1% and  $Z$  adjusts for a limited range of unusual  
25   events outside the control of utilities.

26

27   The intention is that the mechanism would apply for up to three years, following which a  
28   more permanent 3<sup>rd</sup> generation incentive regulation would be put in place. During this  
29   interim period, two changes would take place to the cost of capital permitted for utilities.

30

1 Distributor specific  $K$  factors would adjust for certain capital related costs. In 2007, an  
2 adjustment would be made to reflect new rates of return on equity. These rates would be  
3 applied to existing utility capital structures. In 2008, a further adjustment would be made  
4 to reflect an industry-wide prescribed capital structure.

5  
6 Board staff have devoted significant resources to benchmarking these capital related  
7 costs. In contrast, rigorous analyses of distributor efficiencies, their overall cost  
8 structures and the impacts of capital programs on future costs have not been performed.  
9 Thus, the proposal constitutes the rebasing of some components of costs without rebasing  
10 others.

11  
12 Moreover, the estimated  $K$  factors appear to be generally negative. Preliminary  
13 calculations suggest that the 2007  $K$  factor adjustments would be in the range -2% to  
14 +2%. The 2008 adjustments would be between -1% and -3%.<sup>3</sup>

15  
16 As we will discuss in more detail below, in recent years Ontario distributors have been  
17 under constraints which have limited their ability to recover fair rates of return. The  
18 implementation of a  $K$  factor at this time would constrain many distributors in the near  
19 future. It would therefore seem appropriate to consider delaying its implementation and  
20 to rely upon a price-cap rule of the form  $\% \Delta P = \% \Delta GDPPI - X + Z$  .

21  
22 Finally, we note that the  $X$  factor is based on broader industry indices without reference  
23 to efficiency improvements in electricity distribution in Ontario. It is common across  
24 utilities without any attempt to differentiate productivity.

---

<sup>3</sup> Discussion Paper, page 21.

1        **B. Retention of Productivity Savings**

2  
3        The theoretical literature on incentive regulation provides a simple and clear argument on  
4        the role of productivity savings in creating incentives for cost minimization. The  
5        regulated firm and its beneficiaries must be able to derive benefit for a sufficient period  
6        of time in order for incentives to be effective. Early “claw-back” through rebasing  
7        dilutes the incentive effects. Moreover, there is now significant empirical support for this  
8        proposition. Productivity savings are seen to decline as the date of rebasing approaches  
9        and firms postpone efficiency improvements until the next cycle begins.

10  
11       One of the remedies for this problem is to extend time-spans between rebasings to five  
12       years or more. Furthermore, an argument can be made that retention of productivity  
13       savings for longer periods of time is especially important for publicly owned utilities  
14       which, for a variety of reasons, are less amenable to spontaneous incentive creation than  
15       private sector companies. However, extending time periods between rebasings also  
16       creates risks for utilities if they are precluded from incorporating legitimate and  
17       unexpected cost increases in rates.

18  
19       A more recent resolution involves permitting utilities to retain productivity savings for a  
20       period of say five years regardless of the timing of rebasings. For example, suppose a  
21       price-cap regime is in place for a five year period with a prescribed productivity  
22       improvement of 1% per year. Suppose further that efficiency improvements during year  
23       five yield savings of 1.25%. The utility is then permitted to retain some or all of these  
24       savings for a full five years even though a rebasing has been scheduled for the upcoming  
25       year.

26  
27       The price-cap regime which is being proposed in the Discussion Paper is to be followed  
28       within three years by an incentive regulation mechanism which is yet to be developed and  
29       which may depend on future rebasing. The interim nature of the proposed regime may  
30       jeopardize new productivity gains. Distribution utilities, acting in the interests of their  
31       shareholders, may have a disincentive to achieve further efficiency improvements at this

1 time if the resulting cost savings could be “clawed back” in the near future. In addition,  
2 these same disincentives may discourage shareholders and utilities from pursuing  
3 mergers, particularly in view of the significant transition and transactions costs that  
4 would certainly be incurred. A mechanism which ensures that utilities continue to benefit  
5 from cost savings for a substantially longer period of time should therefore be considered.  
6  
7  
8

### 9 C. Incentive Creation in Publicly Owned Firms

10  
11 Can we expect a price-cap regulatory mechanism to have a positive impact on the  
12 distribution industry in Ontario? Such regulatory devices have clear advantages. They  
13 are simple, transparent and have an impressive pedigree. They enjoy widespread use in  
14 other jurisdictions which, one would expect, signify efficacy. And, there is growing  
15 evidence that price-caps are indeed effective, but most of the evidence is based on private  
16 sector data.  
17

18 In Ontario, it could be argued that rate freezes, moratoria and other constraints over the  
19 past decade and longer have acted as a surrogate price-cap mechanism. In addition,  
20 during this time period, distributors have faced expanding obligations and mandates.  
21 They have become legal corporate entities operating in electricity markets with new and  
22 significant prudential duties, retail settlement functions and regulatory requirements.  
23 They have acquired growing responsibilities in the areas of conservation, demand  
24 management and the smart meter program. Combined with the presence of informal  
25 yardstick competition, these factors are likely to have driven efficiency improvements,  
26 though a rigorous analysis which would calibrate industry-wide gains has not been  
27 performed.<sup>4</sup> Such an analysis could inform the discussion about the efficacy of price-cap  
28 rules in the Ontario setting.  
29

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<sup>4</sup> Preliminary calculations for several large distributors suggest that real unit OM&A costs have declined, perhaps significantly since 1994.



1 However, given that the distribution industry in Ontario is largely in the public sector, the  
2 Discussion Paper does not elaborate on how incentives are likely to be created to achieve  
3 further cost reductions and efficient capital expenditures. For an industry dominated by  
4 private sector companies, such an investigation would be of lesser interest. In the present  
5 context, it acquires much greater importance.

6  
7 If incentive regulation is to have the desired effect, employees at all levels of the utility  
8 should benefit when corporate performance improves. Public sector corporations – partly  
9 as a reflection of employee preferences and partly as a result of public policy -- often  
10 structure their remuneration packages with relatively less emphasis on performance pay.  
11 In addition, political and public pressure often constrains the absolute level of  
12 remuneration for senior management and executives at public corporations. Thus, if one  
13 wants to promote the efficacy of *incentive based regulation* in a public firm, one would  
14 also want to strengthen the role of *incentive base remuneration*. Moreover, remuneration  
15 packages at senior levels should be sufficient to attract suitable talent originating in both  
16 the private and public sectors. In short, if performance-based regulation is to be  
17 effective, performance-based compensation needs to play a prominent role.

18  
19 Broader public and political acceptance of performance pay at utilities would facilitate a  
20 move in this direction and the regulator could assist by recognizing its importance and  
21 not discouraging greater reliance on performance pay.

22  
23 Employee remuneration is – for unionized staff – the outcome of a complex bargaining  
24 process. Management and executive remuneration, on the other hand, is a corporate  
25 process often involving the participation of the board of directors. An assessment  
26 process conducted by utilities to determine whether remuneration packages in the  
27 industry are best suited to promoting incentive regulation would be useful. It may be that  
28 stronger performance incentives are desirable. Such an approach may lead to greater  
29 benefits to management and employees but also increased risks.

30

1 In the private sector, shareholders exert pressure on corporations because they stand to  
2 benefit directly from improved performance. For publicly owned corporations, one  
3 would anticipate that “the shareholder” could also exert such pressure, as long as there  
4 are benefits to be realized.

5  
6 In Ontario, most distributors are “owned” by municipalities.<sup>5</sup> If municipalities, as  
7 shareholders, are to exert pressure on their distributors to sustain or improve  
8 performance, they need to have the incentive to do so. In some respects, that incentive  
9 has always been there: reliability of electricity service is a highly charged political issue  
10 and failures receive little public tolerance.<sup>6</sup> On the other hand, rate moratoria which  
11 constrain distributors from earning reasonable rates of return, diminish the incentive for  
12 municipalities, as shareholders, to exert discipline with respect to costs. Conversely, a  
13 reliable pecuniary benefit flowing from utility ownership which may be retained in the  
14 local utility or used to the benefit of the local community, strengthens the incentive chain  
15 that is an essential feature of effective incentive regulation.

16  
17 Thus far, in this section, we have outlined two areas that merit consideration – employee  
18 incentives and shareholder incentives. In our view, a more careful examination of  
19 mechanisms for enhancing the potential for incentive creation under price-cap regulation  
20 of government owned utilities is warranted. Given present information, what measures  
21 can the regulator take during the interim period of proposed price-cap regulation? Three  
22 recommendations flow from the discussion thus far.

23  
24 First, productivity improvements achieved during the interim period should be protected  
25 from “rebasing” for a well-defined period, say five years. In this context, an assessment  
26 of the benefits of longer periods of retention of productivity savings by public  
27 corporations would also be appropriate.

28

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<sup>5</sup> The most prominent exception is Hydro One Networks Inc., which is owned by the Province.

<sup>6</sup> Consider, for example, the public outrage at Consolidated Edison as a result of outages in New York during the recent heat waves.

1 Second, an examination by distributing utilities of the extent and role of performance-  
2 based remuneration in promoting the objectives of performance-based regulation in  
3 public utilities would be desirable. It may be appropriate for the regulator to encourage  
4 greater reliance on performance pay.

5  
6 Third, there may be a place for the regulator to mitigate the impacts of political “claw-  
7 backs” such as rate moratoria, thus strengthening the pecuniary incentives of municipal  
8 shareholders and improving the effectiveness of incentive regulation. This is a delicate  
9 area which we will consider in the next section.

10

11

12

#### 13 D. Regulatory and Political Risk

14

15 Ontario distributors will continue to face considerable regulatory uncertainty in the  
16 upcoming years even if the proposals put forth in the Board Staff Discussion Paper were  
17 implemented. First, the proposed interim regulatory rule is to be superseded by incentive  
18 regulation that is yet to be determined. Second, there has been increasing emphasis on  
19 conservation and demand management programs and the installation of “smart meters”,  
20 both of which require significant investments and ongoing development by distributors.

21

22 These regulatory risks may be dominated by an even greater degree of political risk.  
23 From 1994 to 2000, most Ontario distributors froze rates, in part as a result of political  
24 pressure to do so. Distribution costs were subsequently revisited and in 2001 distribution  
25 companies were authorized to earn a 9.88% rate of return on equity. However, as a result  
26 of concerns about rate impacts, the government decided that the allowed rate of return  
27 would be phased in over three years. For a utility beginning with a zero rate of return on  
28 equity, a return of 3.29% was permitted in 2001, followed by an increase to 6.59% in  
29 2002. In November 2002, Bill 210 froze rates. Finally, in 2005, distributors were  
30 permitted to include the third tranche, ostensibly raising the return to the originally

1 targeted 9.88%. However, they were directed to spend the moneys on conservation and  
2 demand management programs.

3

4 The Discussion Paper prepared by Board staff as well as its predecessor contains an  
5 extensive discussion and recommendations for the determination of the cost of capital for  
6 distributing utilities. That discussion is supported by technical analyses. The proposals  
7 for cost of capital calibration are largely based on the capital asset pricing model  
8 (CAPM). The issues arising out of these analyses and proposals are beyond the scope of  
9 the present paper. Suffice it to say that strengths and weaknesses have been identified  
10 which merit fuller consideration. However, a brief commentary relating to regulatory and  
11 political risks may be useful to the discussion of incentive regulation.

12

13 If the objective of the process by which rates of return are set is to approximate the  
14 expected rates of return that would be provided in the market-place, then political risk  
15 needs to be incorporated. Consider a choice between investing in a privately owned gas  
16 distributor with a Board-approved rate of return on equity of say 8% and an Ontario  
17 publicly owned distributor with a rate of say 9%. Based on recent patterns of political  
18 claw-back from publicly owned distributors in Ontario, the expected return of 8% may be  
19 more attractive, perhaps even much more attractive. Moreover, empirical analyses<sup>7</sup> of  
20 data on privately owned utilities or other firms which do not face similar political risk  
21 will not capture this important source of risk faced by Ontario distributors, and are  
22 therefore to be interpreted accordingly.

23

24 It is not our intent here to judge the correctness of public policy decisions which re-  
25 appropriate returns that should reasonably be earned by public sector corporations.  
26 Rather, we would make two observations. First, political risk is an important source of  
27 risk for Ontario distributors in their efforts to earn reasonable rates of return on equity.  
28 Second, if incentive regulation is to have the desired effects on productivity, shareholders  
29 should be in a position to benefit from cost savings. These incentive effects are

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<sup>7</sup> Such as the estimation of utility “beta” for insertion in CAPM-type calculations.

1 significantly degraded if distributors are deprived of the opportunity to earn and retain  
2 reasonable rates of return.

3

4 In this context, the regulator is in a difficult position having to operate within the  
5 boundaries of policies promulgated by the Province. However, government policy may  
6 be influenced if it is informed by the recognition of inconsistencies between short term  
7 customer benefits arising out of rate freezes and long term benefits for all parties flowing  
8 from efficiency gains which in turn require properly functioning incentive regulation.

9

10 Moreover, there may be mechanisms by which the regulator can mitigate such dilution or  
11 destruction of incentives. For example, if the Provincial government constrains recovery  
12 of a fair rate of return during one period, the regulator may suggest a compensatory  
13 mechanism that is acceptable to all parties. One approach would involve revising the  
14 price-cap rule at that point in time so that greater recovery by utilities and their  
15 shareholders is possible in a future period to compensate for current period shortcomings.  
16 An important element is regulatory commitment and attentiveness to incentives at all  
17 links within the incentive chain. This commitment, in turn, cannot be realized without  
18 strong political support for incentive regulation.

19

20 Finally, it is worth underscoring that regulatory uncertainty and political risks also have  
21 important implications for continued industry restructuring and consolidation. If utilities  
22 and their shareholders are uncertain about the potential for receiving benefits from  
23 mergers, they are unlikely to consider them, particularly in view of the significant  
24 transition and transactions costs that will certainly be incurred. As with efficiency gains  
25 arising from improvements in operating efficiency, utilities would need to benefit for a  
26 significant period of time from cost savings arising out of mergers if they are to be  
27 undertaken.

## 1 **4 Conclusions**

2  
3 Evolution towards a suitable incentive regulation regime for distributors in Ontario will  
4 take time, and the Board has made it clear that a number of important processes need to  
5 be completed prior to the institution of a more durable structure. That evolutionary  
6 process will require further adaptation on the part of distribution utilities if they are to  
7 successfully absorb the additional risks and uncertainties that incentive regulation entails  
8 relative to a cost-of-service approach. Given the history of informal yardstick competition  
9 and pressures on utility costs through rate freezes in recent years, many Ontario  
10 distributors are likely well-positioned – from the point of view their of corporate culture -  
11 - for proceeding along this path. At the same time, many of the easily attained efficiency  
12 improvements may have already been extracted over the course of the last decade.

13  
14 Board Staff have provided a thoughtful proposal. Keeping in mind the comments  
15 expressed earlier, the Discussion Paper contains a practical and rational interim approach  
16 to regulation of the distribution sector. The presence of a multiplicity of utilities should  
17 be viewed not as a regulatory burden, but as an opportunity to promote greater efficiency  
18 than would be possible if there were only a very small number of distributors.

19  
20 Most importantly, the role of incentives in incentive regulation cannot be  
21 overemphasized. The net income of *private* companies, regulated or otherwise, cannot be  
22 appropriated easily. If Ontario distribution utilities are to function under the  
23 “corporatized” model with incentives resembling their private sector counterparts, then  
24 the role of incentives needs to be clearly understood so that they are not undermined.  
25 Provincial governments cannot expect the regulator to promote efficiency through state-  
26 of-the-art mechanisms such as incentive regulation, and at the same time harvest the  
27 rewards for their own purposes.

## Appendix A

### CURRICULUM VITAE -- ADONIS JOHN YATCHEW

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**CURRENT EMPLOYMENT STATUS:** Professor of Economics and Associate Chair for Graduate Studies, University of Toronto

#### **OTHER PROFESSIONAL ACTIVITIES:**

Editor-in-Chief, The Energy Journal (2006-present)

Editor, The Energy Journal, (2006)

Joint Editor (with G. Campbell Watkins) The Energy Journal (1997-2005)

Joint Editor (with Len Waverman) The Energy Journal (1995-1996)

Member, Editorial Board, Foundations and Trends in Econometrics

Editor (with Yves Smeers) 1997, Distributed Generation, special issue of the Energy Journal

Advisory Editor, Economics Letters (1985-1997)

Member, Advisory Board, *Eurasia Foundation*

#### **AWARDS AND DISTINCTIONS:**

Teaching award: 1987 SAC APUS Teaching Award, University of Toronto

Top grade in Ontario, Royal Conservatory of Music, Toronto, Grade X Piano exam, 1969.

#### **DEGREES:**

Ph.D. Harvard University, Economics - 1980

M.A., University of Toronto, Economics - 1975

B.A., University of Toronto, Mathematics and Economics - 1974

Completed all practical exams for an A.R.C.T. in performance, piano, Royal Conservatory of Music, Toronto – 1972.

#### **ACADEMIC EXPERIENCE:**

2005 Visiting Fellow, ARC Center of Excellence for Mathematics and Statistics of Complex Systems, Mathematical Sciences Institute, Australian National University

2004-present Professor of Economics, University of Toronto

2001 Visiting Fellow, School of Mathematical Sciences, Australian National University

1986 to 2004	Associate Professor, Economics, University of Toronto
1989, 1990, 1991	Visiting Research Associate, Harvard University
1986	Visiting Fellow Commoner, Trinity College, Cambridge U.K.
1980 to 1986	Assistant Professor, Economics, University of Toronto
1984	Visiting Research Associate, National Bureau of Economic Research, Cambridge, Massachusetts
1982 to 1984	Visiting Assistant Professor, University of Chicago
1976	Lecturer, University of Toronto, Scarborough College

## **REFEREED PUBLICATIONS:**

Pesando, J., and Yatchew, A., 1977, "Real vs. Nominal Interest Rates and the Demand for Consumer Durables in Canada", Journal of Money, Credit, and Banking, 428-436.

Yatchew, A., 1981, "Further Evidence on 'Estimation of a Disequilibrium Aggregate Labor Market'", Review of Economics and Statistics, 142-144.

Griliches, Z. and A. Yatchew, 1981, "Sample Selection Bias and Endogeneity in the Estimation of the Wage Equation: An Alternative Specification, Annales de l'Insee, 43, 35-46.

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Bird, R., Bucovetsky, M., and Yatchew, A., 1985, "Tax Incentives for Film Production: The Canadian Experience", Public Finance Quarterly, Vol. 13, 396-421.

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Yatchew, A. and L. Bos 1997, "Nonparametric Regression and Testing in Economic Models", Journal of Quantitative Economics, 13, 81-131, [www.chass.utoronto.ca/~yatchew](http://www.chass.utoronto.ca/~yatchew).

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Ricciuto, L., V. Tarasuk and A. Yatchew 2005: "Socio-demographic Influences on Food Purchasing Among Canadian Households", forthcoming, European Journal of Clinical Nutrition.

Hall, Peter and A. Yatchew 2005: "Nonparametric Estimation When Data on Derivatives are Available", forthcoming, Annals of Statistics.

## **BOOK**

Yatchew, A., 2003, Semiparametric Regression for the Applied Econometrician, 213 pages, Themes in Modern Econometrics, Cambridge University Press.

## **OTHER PAPERS / STUDIES**

Yatchew, A. 1995, "The Distribution of Electricity on Ontario: Restructuring Issues, Costs and Regulation", Ontario Hydro at the Millenium, University of Toronto Press, 327-342,353-354.

Yatchew, A. 1995, "Comments on The Regulation of Trade in Electricity: A Canadian Perspective", Ontario Hydro at the Millenium, University of Toronto Press, 165-7.

Yatchew, A. 2001: "Incentive Regulation of Distributing Utilities Using Yardstick Competition", Electricity Journal, Jan/Feb, 56-60.

Littlechild, S. and A. Yatchew, 2002: "Hydro One Transmission and Distribution: Should They Remain Combined or be Separated", [www.chass.utoronto.ca/~yatchew](http://www.chass.utoronto.ca/~yatchew) .

## **WORKING PAPERS**

McCaig, B. and A. Yatchew 2005: "International Welfare Comparisons and Nonparametric Testing of Multivariate Stochastic Dominance", under submission.

Yatchew, A., 1999, "Differencing Methods in Nonparametric Regression: Simple Techniques for the Applied Econometrician, 86 manuscript pages.

## **RECENT RESEARCH GRANTS**

2004-2006 SSHRC grant "Semiparametric demand modeling and testing".

2003-2004: Grant to develop interactive web-based teaching software for undergraduate statistics at the University of Toronto.

2001-2004: SSHRC grant, "Efficient Estimation of Semiparametric Equivalence Scales"

## **SUPERVISION OF GRADUATE STUDENTS DURING THE LAST FIVE YEARS**

1. Brian McCaig -- Ph.D. student, Economics Department. I am a member of thesis committee. Brian co-authored a paper with me which he delivered at conferences in Germany and the United Kingdom. That paper is under submission.
2. Laurie Ricciuto – Ph.D. student in the Department of Nutritional Sciences, Faculty of Medicine, University of Toronto. I am currently a member of her thesis committee. She is using semiparametric regression techniques to analyze household food expenditure data.
3. Angela No – Ph.D. student, Economics Department. I was a member of her thesis committee. Angela co-authored a paper with me which appeared in Econometrica. She has just begun teaching at Carnegie-Mellon. She defended her thesis in 2004.
4. Christopher Bataille – Ph.D. candidate at Simon Fraser University. I served as external examiner at his thesis defense (2004).
5. Chander Shahi – Ph.D. student, University of Toronto, Forestry. I served as a member of his comprehensive committee (2005). (Chander took my Ph.D. course in econometrics and is specializing in the application of economic and econometric modeling to forestry.)
6. Yiguo Sun – I supervised her Ph.D. thesis which she completed in 2002. Yiguo Sun co-authored a paper with me and Catherine Deri on estimation of equivalence scales which appeared in the Journal of Business and Economic Statistics in 2003. She is currently teaching at the University of Guelph.
7. Catherine Deri – co-authored a paper with me and Yiguo Sun on estimation of equivalence scales which appeared in the Journal of Business and Economic Statistics in 2003. She has just begun teaching at the University of Ottawa.
8. Toby Daghish, Ph.D. student in finance. I suggested a topic and then supervised a paper which he wrote for one of my graduate econometrics courses. The paper has recently been published in the Journal of Financial Econometrics.
9. Marie Rekkas, Ph.D. student, Economics Department. I was a member of her Ph.D. thesis committee. She has just begun teaching at Simon Fraser University.
10. Each year I supervise 20-25 papers Ph.D. research papers (pre-thesis stage).

## **COURSES TAUGHT DURING THE LAST FIVE YEARS**

ECO 100 (Undergraduate): Introduction to Economics

ECO 220 (Undergraduate): Quantitative Methods / Statistics in Economics

ECO 2400F(Ph.D): Econometrics I.  
ECO 2401S(Ph.D): Econometrics II  
ECO 2403S (Ph.D): Special Topics in Econometrics  
ECO 2404S (Ph.D): Empirical Applications of Economic Theory

I have been developing on a web-based statistics course for economists jointly with Wolfgang Haerdle of Humboldt University in Berlin.

### **OTHER PROFESSIONAL EXPERIENCE:**

Member, Board of Directors, *EnerConnect*, 1998-2006

#### **Electrical Utilities:**

(2006) Filed evidence before the New Brunswick Board of Commissioners of Public Utilities on cost-sharing of joint-use power poles.

(2005) Prepared analysis on cost-sharing of power poles by cable companies. The analysis was part of the basis for a settlement proceeding in Ontario.

(2004) Prepared analysis on cost-sharing of power poles by cable companies. The document was filed before the Ontario Energy Board.

(2003) Testified before the Ontario Energy Board on distributor service area amendments.

(2003) Testified before the New Brunswick Board of Commissioners of Public Utilities on performance based regulation, benchmarking and rate of return issues

(1993-1998) Prepared major studies for the Municipal Electric Association on restructuring of the electric utility industry in Ontario

(1991-1992) Research Director for the Municipal Electric Association in their intervention before the Environmental Assessment Board in connection with Ontario Hydro's 25 year Demand/Supply Plan

(1992) Prepared testimony on forecasts of electricity demand for Ontario -- Environmental Assessment Board Hearing

(1982-1995) consultant to the Municipal Electric Association at the Ontario Hydro Rate Hearings before the Ontario Energy Board

**Airlines:** (1989) prepared technical analysis of the effects of booking system biases in a major U.S. litigation.

**Banking Industry:** (1997) Prepared analysis of securities lending for Canada Trust

**Bell Mobility:** (1991- 1994) prepared short term market assessment and forecasts for cellular telephone sales

**Competition / Antitrust:** (1990) prepared statistical analysis in connection with a legal proceeding on anti-competitive behavior relating to the supply of paper forms; (1989) prepared analysis in connection with the Imperial Oil/Texaco merger deliberations before the Federal Competition Tribunal

**Film Industry:** (1981), one of three co-investigators in study for Federal Government of tax incentives to the Canadian film industry

**Information Technology:** (1994) prepared cost allocation analyses.

**Probability Analysis:** (2004, 2005, 2006) prepared odds of winning prizes in promotions by international fast-food chain.

**Minerals:** (1985), performed econometric analysis of zinc, copper, potash markets as part of a larger study for Cominco

**Natural Gas:** (1985), coauthored a major background study for the Federal Government/Province of Alberta energy price negotiations; (2005), prepared statistical and economic analyses in litigation proceeding.

**Oil Pipelines:** (1987, 1992) coauthored studies on pipeline cost allocation.

**Parking Authority of Toronto:** (1985), designed data sampling scheme for Parking Authority of Toronto - to be used for monitoring flows into parking lots and as a broad audit check

**Toronto Transit Commission:** (1988, 1989, 1991), various studies on subjects such as subway reliability measures, evaluation criteria for resource allocation, statistical procedures in relation to count data