OPINION

ON

RETURN ON EQUITY

FOR

GAZIFÈRE INC.

Prepared by

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I. INTRODUCTION AND SUMMARY OF CONCLUSIONS

A. INTRODUCTION

My name is Kathleen C. McShane and my business address is 4550 Montgomery Avenue, Suite 350N, Bethesda, Maryland 20814. I am President of Foster Associates, Inc., an economic consulting firm. I hold a Masters in Business Administration with a concentration in Finance from the University of Florida (1980) and am a Chartered Financial Analyst (1989). I have testified on issues related to cost of capital and various ratemaking issues on behalf of local gas distribution utilities, pipelines, electric utilities and telephone companies in more than 200 proceedings in Canada and the U.S., including the Régie de l'énergie du Québec. My professional experience is provided in Appendix F.

The purpose of my testimony is to recommend a return on equity ("ROE") for Gazifère Inc. for test year 2011, to evaluate the existing mechanism for adjusting the allowed ROE annually, and to recommend any changes to that mechanism as warranted.

B. SUMMARY OF CONCLUSIONS

My conclusions are as follows:

1. The existing automatic adjustment formula is not producing returns for Gazifère that meet the fair return standard. The fair return needs to be recalibrated and the automatic adjustment formula needs to be revised.

2. The sensitivity of the cost of equity to government bond yields is materially lower than the existing automatic adjustment mechanism implies. In addition, the cost of equity moves in the same direction as the utility cost of debt; this relationship has not been reflected in the automatic adjustment mechanism. As a result, the allowed ROEs have

decreased over time to a much greater extent than is justified and moved in the wrong direction in 2009.

3. The allowed return for Gazifère must meet all three requirements of the fair return standard, including the comparable returns standard. The fair return extends to both the capital structure and return on equity, that is, the overall return allowed must satisfy the fair return standard.

4. The capital structure and the return on equity are inextricably linked; the fair return on equity cannot be established without reference to the level of financial risk inherent in the capital structure adopted for regulatory purposes.

5. Gazifère's common equity ratio of 40.0% is reasonable in light of the Company's business risks, and the capital structures maintained by both the major Canadian gas distributors and the smaller Canadian investor-owned gas and electric distribution utilities. The common equity ratio is materially lower than that maintained by relatively low risk U.S. gas and electric distribution utilities with which Gazifère competes for capital and whose returns are a relevant consideration for satisfying the comparable returns standard.

6. The fair return for a benchmark Canadian distribution utility is estimated at 10.75%. The benchmark return reflects the following:

   a. The return on equity is based on the results of equity risk premium and discounted cash flow tests.

   b. The equity risk premium test results are based on three separate approaches. The equity risk premium tests indicate the following costs of equity before adjustment for financing flexibility:

Risk Premium Test	Cost of Equity
Risk-Adjusted Equity Market	9.25%
DCF-Based	9.4%
Historic Utility	11.0%
Average	**10.0%**

c. Constant growth and multi-stage discounted cash flow tests, applied to a sample of benchmark low risk U.S. utilities, also support a cost of equity of 10.0%.

d. The allowance for financing flexibility is estimated in a range of 0.50% to 1.0%, or a mid-point of 0.75%. The addition of a 0.75% financing flexibility adjustment to a "bare bones" cost of equity based on the market-based equity risk premium and discounted cash flow tests results in a fair return for a benchmark Canadian distribution utility of 10.75%.

8. An incremental equity risk premium relative to the ROE for a benchmark distribution utility of no less than 0.50% is warranted for Gazifère. With an incremental equity risk premium of 0.50%, my recommended ROE for Gazifère for test year 2011 is 11.25%. The recommended ROE of 11.25% represents the recalibrated fair return for Gazifère to which the proposed revised automatic adjustment formula should be applied to determine the allowed ROEs for subsequent test years.

9. The automatic adjustment formula should be revised to lower the sensitivity to changes in long-term Canada bond yields from 75% to 50% and to add a second adjustment variable, namely, 50% of the change in long-term A rated corporate bond yield spreads. It is critical to recognize that the formula adopted has to be internally consistent with assumptions made in setting the allowed ROE for Gazifère for 2011. It is perhaps obvious that it would not be reasonable to implement the proposed formula without

adopting an allowed ROE that explicitly recognizes that the 2010 allowed ROE reflects a much greater sensitivity to changes in long-term Canada bond yields than the empirical evidence supports.

II. BACKGROUND FOR REVIEW OF GAZIFÈRE'S ROE

Since Decision D-99-09, issued February 1999, the annual allowed ROEs for Gazifère have been set using an automatic adjustment formula. The defining elements of the automatic adjustment mechanism are its sole reliance on forecast long-term Canada bond yields to set allowed ROEs and the underlying premise that the cost of equity changes by 75% of the change in forecast long-term Canada bond yields. If the formula were applied based on the February 2010 Consensus Economics, *Consensus Forecasts*, the allowed ROE for Gazifère would be 9.07%.[1]

From the inception of the formula in Canada in the mid-1990s,[2] the allowed ROEs for utilities regulated by the Régie de l'énergie, as well as for utilities in other Canadian jurisdictions, have tracked the downward trend in long-term Canada bond yields. Since the automatic adjustment formula was originally adopted, the overriding factor determining the allowed ROEs for Canadian utilities was the downward trend in long-term Canada bond yields, rather than factors which directly drive equity return requirements. Between 1995 and 2009, the forecast long-term Canada bond yield fell by 475 basis points; the corresponding average allowed ROEs fell by 335 basis points.[3] With the widespread adoption of similar automatic adjustment formulas, allowed ROEs in Canada converged to a relatively narrow range, with the result that comparisons among

[1] The initial ROE adopted for Gazifère in D-99-09 was 10.0% based on a long-term Canada bond yield of 5.7%. The forecast of long-term Canada bond yields based on the February 2010 forecast of 10-year Canada bond yields of 3.9% (average of 3-month and 12-month forward forecasts of 3.7% and 4.1%) and the average January 2009 Bloomberg daily spread between 10-year and 30-year Canada bond yields of 0.56% is 4.46%. The application of the formula results in an ROE of 9.07%.

[2] The British Columbia Utilities Commission introduced the first formula (Order G-35-94, *In the Matter of Return on Common Equity BC Gas Utility, Pacific Northern Gas, West Kootenay Power,* June 1994). The National Energy Board adopted its multi-pipeline ROE formula in Reasons for Decision, RH-2-94 in March 1995.

[3] The reduction is slightly less than 75% of the decline in forecast long-term Canada bond yields largely due to the fact that the AUC did not apply its formula to the Alberta utilities for 2009.

the allowed ROEs as a reasonableness check were of limited value, as they were subject to an extensive degree of circularity.

The decline in long-term Canada bond yields experienced during the past 15 years reflects in large part a sea change in the Canadian economy characterized by a shift from huge government deficits and indebtedness to an unbroken string of government surpluses (commencing in 1997/98) and a steady reduction in the relative (to the size of the economy) amount of debt outstanding.[4] With the vast improvement in the government's finances and the reduction in government debt outstanding relative to the size of the economy came the decline in long-term Canada bond yields. The secular decline in long-term Canada bond yields reflects three factors: a reduction in the expected rate of inflation over the longer-term, the waning of investors' fear that inflation would reignite to levels experienced in the 1980s decade, and a declining supply of long-term government debt relative to demand.

Of these three factors, only the decline in the expected rate of inflation over the longer-term would directly translate into a corresponding decline in the cost of equity. The fear that inflation would reignite had taken the form of a premium that investors required to "lock in" investment in long-term bonds with fixed coupon rates. Investors in equities, in contrast, are not similarly locked in and thus equity investors did not demand the same "lock in" premium. In contrast to the fixed rates on debt, corporate earnings, which ultimately determine the returns to equity investors, are better able to keep pace with the rate of inflation. The elimination of the "lock in" premium as inflationary fears waned lowered the risk associated with investment in long-term government bond yields. In the absence of a commensurate decline in the cost of equity, the result was an increase in the market equity risk premium.

With respect to the third factor, strong demand for long-term government debt by institutions, particularly those seeking to match the duration of their assets and liabilities, creates an

[4] With the financial crisis and ensuing recession, the Federal government is now anticipating budget deficits for fiscal years 2009/10-2014/15.

imbalance in the supply of and demand for long-term government securities. The scarcity factor, in turn, leads to abnormally low long-term government bond yields. The reduction in long-term government bond yields arising from a demand/supply imbalance has no bearing on the cost of equity.

Layered over the secular decline in long-term Canada bond yields have been periodic "flights to quality" throughout the period the formulas have been in effect. A "flight to quality" occurs when investors flee from risky securities to the safe haven of the safest securities, long-term government securities. A "flight to quality" puts downward pressure on the yields of default-free securities, e.g. long-term government bond yields, and a corresponding increase in the cost of risky forms of capital. Since the introduction of automatic adjustment formulas, the capital markets have been characterized by multiple crises of varying proportions, including the "Asian Contagion" and ensuing Russian sovereign debt default in 1997-1998, the dot.com bust in 2000, the Enron bankruptcy in 2001, 9/11, the run-up to and the outbreak of the Iraq War in March 2003, and the global financial crisis dating from August 2007. The series of market crises and flights to quality during the period the formulas were in operation kept downward pressure on the level of long-term Canada bond yields, which in turn suppressed the level of allowed ROEs.

The application of the automatic adjustment formulas for 2009 clearly demonstrated that the existing formula also could produce incongruous results, that is, a decline in allowed ROEs at a time when the cost of capital was increasing. While the flight to quality had pushed both the actual and forecast yields on long-term government bonds lower during 2008, other capital market indicators were signaling a higher cost of capital.

Between October 2007 and October 2008, the yield on long-term A rated corporate bonds had jumped approximately 170 basis points, from approximately 5.6% to 7.3%. The yield on the TSX Composite rose by more than 1.5 percentage points, with the equity market falling 35% over the same 12-month period. The higher dividend yield, similar to the increase in corporate debt yields, pointed to a higher cost of capital.

In addition to the increase in the TSX Composite dividend yield, the increase in the cost of equity and a widening of the equity risk premium were reflected in the significant increase in the volatility in the equity markets, as represented by the Implied Volatility Index ("MVX") introduced by the Montréal Exchange in 2002. The Montréal Exchange states that the "MVX is a good proxy of investor sentiment for the Canadian equity market: the higher the Index, the higher the risk of market turmoil. A rising Index therefore reflects the heightened fears of investors for the coming month."[5]

During much of 2002-2007, prior to the onset of the financial crisis, the MVX was relatively stable, trading within a range of 8 to 24, and averaging 15. During 2008, the MVX rose sharply, peaking at almost 90 in November 2008, its highest level since inception, and averaging close to 60 during the 4th quarter. To put this in perspective, the MVX never exceeded 25 prior to August 2007. The increase in the MVX signaled higher risk aversion and an increase in the equity risk premium. Despite broad-based market indicators to the contrary, the application of the automatic adjustment formulas, tied to government bond yields, resulted in lower allowed ROEs for 2009 than for 2008.

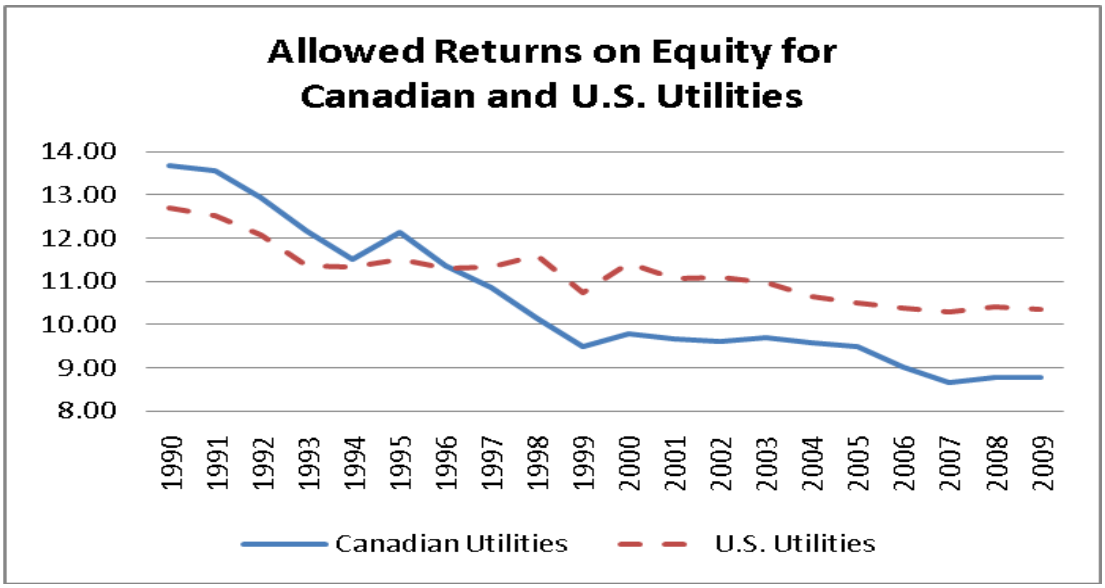
While the incongruity of the formula results during the financial crisis highlighted the problem with the formulas, it was not the onset of the financial crisis which caused the formula to go awry. It is the result of reliance on a formula governed solely by changes in the long-term Canada bond yield (with a high elasticity factor), rather than the composite of factors that bear on equity return requirements, that caused the allowed ROEs to diverge off course over time. The extent of that divergence can be assessed by a comparison of the allowed ROEs of Canadian and U.S. utilities.

[5] www.m-x.ca/indicesmx_mvx_en.php

This comparison is germane given (1) the significant integration of the Canadian and U.S. capital markets, (2) the similarity in the business (or operating environments) for distribution utilities in Canada and the U.S., and (3) the similarity in the regulatory models in the two countries.

Figure 1 below compares the allowed ROEs in Canada and the U.S. between 1990 and 2009.

Figure 1



Source: Schedule 2.

Figure 1 shows that allowed returns in the U.S. and Canada were comparable until automatic adjustment formulas tied to government bond yields became the norm (approximately 1997-1998) in Canada. With the widespread adoption of automatic adjustment formulas in Canada, a significant gap between the allowed ROEs in the two countries emerged, a gap which persisted through 2009. Between 1998 and 2009, Canadian utilities' allowed ROEs averaged 1.4 percentage points lower than those of their U.S. peers, whose allowed ROEs continued to be set using various tests and informed judgment. The average yield on long-term government bonds in the two countries over the same period differed by only nine basis points.

Since allowed ROEs in the U.S. are determined using various cost of equity tests, they can be used, retrospectively, to test the sensitivity of the utility cost of equity to changes in long-term government bond yields. When the quarterly allowed ROEs from 1995 (the year the initial automatic adjustment mechanism was applied in Canada by the BCUC) to 2009 are regressed against long-term Treasury bond yields lagged by six months,[6] the result indicates that the allowed ROEs changed by approximately 40 basis points for every one percentage point change in long-term government bond yields. By comparison, the typical automatic adjustment formula which has been relied upon in Canada, including the Régie's formula, assumes that the ROE changes by 75 basis points for every one percentage point change in long-term government bond yields and includes no other explanatory variables. The analysis strongly indicates that, with the benefit of hindsight, the cost of equity is significantly less sensitive to changes in long-term government bond yields than the automatic adjustment formulas assume.

The evidence that the formulas were producing returns that did not meet the fair return standard had been mounting for some time.

As long ago as December 2001, CIBC World Markets Report entitled "*Pipelines and Utilities: Time to Lighten Up*", stated, in reference to the then recent formulaic reduction in Newfoundland Power's allowed return (from 9.59% to 9.05% year over year):

> The magnitude of the reduction in the case of Newfoundland Power illustrates the flaw in using a brief snapshot of existing rates rather than a forecast of rates that are expected to persist during the upcoming year. More importantly, however, it shows the shortcoming of the formula approach itself. Mechanically tying allowed returns on equity to long bond yields is an approach that is simple for regulators to apply; however, in recent years, with a steady decline in bond yields, it has produced-allowed returns that are out of sync with the cost of capital, and returns that are being achieved with comparable nonregulated companies or regulated returns that are achievable in the U.S.

[6] To take account of the fact that the date of the decision lags the period covered by the market data on which the ROE decision was based.

At the time of the report, the allowed returns for Canadian utilities were approximately 9.6%, compared to just over 11% for U.S. utilities.

In its June 2006 *Canadian Hydrocarbon Transportation System* report, the National Energy Board (NEB) reported that a number of analysts felt that the ROE generated by the NEB formula and by other Canadian regulators' formulas "were a little too low" and not supportive of dividend growth or credit metrics. A number of analysts commented that where they had "Buy" recommendations on utility stocks, the recommendations tended to reflect the prospects of the unregulated operations. Analysts also commented that companies had reduced costs and taken other steps to improve profitability and dividend growth for several years, and wondered how long that could continue. The 2007 Report expressed similar views.[7] Some market participants expressed concern that the stand-alone pipelines might have difficulty attracting capital given low ROEs. Others felt the regulated entities would be able to attract capital, but that the terms under which they did so would be more costly than for the consolidated entity. In addition, the report stated:

> Many analysts expressed support for a formulaic approach to determining ROEs because of the transparency, stability and predictability that this method provides. However, a number expressed the view that the ROE resulting from the formula was too low, and contend that they are much lower than regulated ROEs in the U.S. and U.K. While views ranged widely on this issue, some felt that the typically lower ROEs in Canada were not justified by the differences in risk for Canadian companies compared to FERC-regulated pipelines. Some parties suggested it was time for the Board to revisit the ROE Formula.

In *Pipelines/Gas & Electric Utilities,* dated December 7, 2006, Karen Taylor, then equity analyst for BMO Capital Markets, concluded, "We believe on a collective basis, that the allowed returns

[7] The NEB did not consult with analysts for the purpose of their 2008 report, in light of its then ongoing cost of capital proceeding for TransQuébec and Maritimes Pipeline.

as established by the formulas highlighted above [referring to the NEB, EUB,[8] BCUC and OEB[9] formulas] are confiscatory and likely violate the Fair Return Standard."[10]

With the unambiguous divergence between the trends in long-term government bond yields on the one hand and utility bond yields and the market cost of equity on the other during 2008 led other investment analysts to the conclusion that the formula had broken. In RBC Capital Markets' January 16, 2009 *Industry Comment* entitled "Allowed ROEs: The Formula Is Broken, but Will Regulators Fix It?", analyst Robert Kwan commented:

> With higher equity risk premiums and higher long bond yields for Energy Infrastructure companies that are trading at levels close to the allowed ROEs, it appears that the formula is broken. Forgetting the magnitude of change, it appears that the formula is producing a result that is directionally incorrect (i.e., ROEs declining yet corporate bond yields and equity risk premiums are rising).

Mr. Kwan recommended from a risk/reward perspective:

> We would focus on companies with the least exposure to the formula.

A February 23, 2009 report by Macquarie Research entitled *ROE Formula May Finally Bite the Dust* concluded that government bond yields bear little resemblance to any private company's cost of capital. The report also concluded that:

> Lack of comparability between allowed utility ROEs and returns on similar investments is driving the emerging capital access problem. In support of the argument the comparability criterion is not being met, utility customers and their expert witnesses like to point out that allowed returns for U.S. utilities are considerably higher than allowed returns in Canada. No matter how we slice the data, we concur with this opinion.

[8] Alberta Energy and Utilities Board, now the Alberta Utilities Commission.
[9] Ontario Energy Board.
[10] Studies commissioned by the Canadian Gas Association and the Canadian Energy Pipeline Association published in 2008 also came to the conclusion that the ROEs produced by the automatic adjustment formulas did not meet the fair return standard.

On March 19, 2009 the National Energy Board released its cost of capital decision for TransQuébec and Maritimes Pipeline (TQM). In that decision, the NEB expressed the view that:

> there have been significant changes since 1994 in the financial markets as well as in general economic conditions. More specifically, Canadian financial markets have experienced greater globalization, the decline in the ratio of government debt to GDP has put downward pressure on Government of Canada bond yields, and the Canada/US exchange rate has appreciated and subsequently fallen. In the Board's view, one of the most significant changes since 1994 is the increased globalization of financial markets which translates into a higher level of competition for capital. When taken together, the Board is of the view that these changes cast doubt on some of the fundamentals underlying the RH-2-94 Formula as it relates to TQM.

The NEB also noted that:

> The RH-2-94 Formula relies on a single variable which is the long Canada bond yield. In the Board's view, changes that could potentially affect TQM's cost of capital may not be captured by the long Canada bond yields and hence, may not be accounted for by the results of the RH-2-94 Formula. Further, the changes discussed above regarding the new business environment are examples of changes that, since 1994, may not have been captured by the RH-2-94 Formula. Over time, these omissions have the potential to grow and raise further doubt as to the applicability of the RH-2-94 Formula result for TQM for 2007 and 2008.

Following its decision for TQM specifically, the NEB rescinded its RH-2-94 decision which adopted the automatic adjustment formula.[11]

BMO Capital Markets analyst George Lazarevski in *Pipelines and Utilities* (March 30, 2009) stated:

> We applaud the NEB for acknowledging that the RH-2-94 formula is no longer applicable given the changes in business risk, financial markets and economic conditions. In particular, the globalization of financial markets made it difficult for Canadian operators to compete for capital with such low ROE.

[11] National Energy Board, *Reasons for Decision, Multi-Client, RH-R-2-94*, October 2009. It is of note that the NEB's decision was for years 2007 and 2008 and was rendered independently of the financial crisis.

On April 24, 2009, Scotia Capital commented:

> The turmoil in financial markets over the last 18 months has had a material knock-on effect on a sector typically seen as a safe haven from adverse equity market volatility and valuations. Energy utilities across Canada have seen their regulated returns on equity squeezed by falling Government of Canada bond yields, even as the real-world cost of equity capital has risen dramatically.
>
> Beginning with the National Energy Board in early 1995, Canadian energy regulators have largely adopted formula-based annual adjustments to utilities' allowed return on equity. These formula have been based on the capital asset pricing model. A base "risk-free" rate, represented by long Canada bond yields, is augmented by an equity risk premium, chosen to represent the business and financial risk of the utilities. The NEB's formula was created in 1994 and 1995, when Canada long bond yields reached over 9% at times, due to a range of factors, including ratings downgrades, large public sector deficits, and bearish domestic and international market sentiment towards Canadian government debt.
>
> As Canada's public sector reformed its finances, long Canada yields have come down, gradually but steadily, since early 1995. This led to a gradual decline in utility allowed ROEs, which has been a challenge for equity holders, and a challenge for utility management to offset by trying to "over-earn" the regulatory target, which is used to set rates.
>
> The onset of economic and financial market turmoil in late 2007 led to a further, more rapid decline in Canada yields, mimicking the global flight to the safety of top-quality sovereign debt, and reflecting widespread investor aversion to risk of all kinds. This triggered a decrease in Canadian utility regulators' formula-driven ROEs, to unprecedented low levels. However, utility bond spreads, and their cost of equity capital, were rising.
>
> Very recently, the NEB recognized these adverse and undesirable results, in what we view as a very significant Decision in the case of Trans Québec & Maritimes Pipeline. The NEB varied from its formula, which it had applied virtually universally to utilities in its jurisdiction since 1995. The ROE relief was material, lifting TQM's ROE from the formula-set 8.46% and 8.71% in 2007 and 2008 (on the NEB's deemed equity capitalization of 30%) to roughly 11.6% to 11.8%, based on the same capital structure and the embedded cost of debt.[12]

[12] Stephen Dafoe, "Falling Canada Yields and Utility ROEs", *Capital Points*, ScotiaBank Group, April 24, 2009.

In its December 2009 decision, the BCUC eliminated its automatic adjustment mechanism.[13] In so doing the Commission found the following:

> The Commission Panel agrees that a single variable is unlikely to capture the many causes of changes in ROE and that in particular the recent flight to quality has driven down the yield on long-term Canada bonds, while the cost of risk has been priced upwards.
>
> In the Commission Panel's opinion, reliance on CAPM by Canadian regulatory agencies has also contributed to the divergence between Canadian and US allowed ROEs. In light of the limited weight given by the Commission Panel to CAPM in determining the ROE for TGI [Terasen Gas] for 2010, it would seem inconsistent to retain the adjustment mechanism.

The BCUC set the allowed ROE for Terasen Gas, the designated benchmark utility, effective July 1, 2009 at 9.50%, compared to 8.47% for the first six months of 2009. The corresponding ROEs effective July 1, 2009 for both the smaller gas utilities, Terasen Gas (Vancouver Island) and Terasen Gas (Whistler), were 10.0%, 50 basis points point higher than the ROE for the benchmark utility.

In its, *Report of the Board on the Cost of Capital for Ontario's Regulated Utilities*, EB-2009-0084, December 11, 2009, the Ontario Energy Board ("OEB"), in its assessment of the automatic adjustment formula (which was identical to the Régie's formula), concluded that:

> The existing formula approximates this relationship [between interest rates and the equity risk premium] using a linear specification. The Board is of the view that it is unreasonable to conclude that the current formula correctly specifies this relationship, based on the passage of time, changes in financial and circumstances generally, and the empirical analyses provided by participants to the consultation and the discussion at the consultation itself. However, the Board is of the view that its current formulaic approach for determining the equity cost of capital should be reset and refined, not otherwise abandoned or subject to wholesale change.

[13] British Columbia Utilities Commission, *In the Matter of Terasen Gas Inc., Terasen Gas (Vancouver Island) Inc., Terasen Gas (Whistler) Inc., and Return on Equity and Capital Structure, Decision*, December 19, 2009.

> The events that unfolded earlier this year that triggered this review effectively illustrated that the Board's approach needs to be refined to reduce the sensitivity of the formula to changes in government bond yields due to monetary and fiscal conditions that do not reflect changes in the utility cost of equity. The Board concludes that the current approach could be more robust and better guide the Board's discretion in applying the FRS [Fair Return Standard]. The Board notes that while the current formula today produces results similar to that in 2008, it does not address the observed behaviour of the formula during the financial crisis – lowering the allowed ROE when the amount and price of risk in the market was increasing.[14]

The OEB also recognized that:

> In its 1997 Draft Guidelines, the Board determined that the difference between the LCBF for the current test year and the corresponding rate for the immediately preceding year should be multiplied by a factor of 0.75 to determine the adjustment to the allowed ROE. In that same document, however, the Board noted that there was a significant difference of opinion concerning the relationship between interest rates and the ERP and that ratios contained in the evidence from generic rate of return proceedings in other Canadian jurisdictions ranged from 0.5:1 to 1:1.5. Moreover, the Board notes that the selection of the 0.75 adjustment factor is described in the 1997 Draft Guidelines as "admittedly somewhat arbitrary."

The OEB reset the benchmark allowed ROE at a forecast long-term Canada bond yield of 4.25% at 9.75%. Under the previous formula, the benchmark allowed ROE would have been 8.41%.

With this backdrop, a review of the cost of capital for Gazifère is warranted, the allowed return should be rebased at a level which satisfies the fair return standard, and the automatic adjustment formula should be revised.

[14] The OEB's refined formula is discussed further in Chapter VIII.

III. FAIR RETURN STANDARD

The standards for a fair return arise from legal precedents[15] which are echoed in numerous regulatory decisions across North America, including the Régie's *Décision: Demande de modifier les tarifs de* Société *en commandite Gaz Métro à compter du 1er octobre 2009*, D-2009-156, dated December 7, 2009.[16] A fair return gives a regulated utility the opportunity to:

1. earn a return on investment commensurate with that of comparable risk enterprises;
2. maintain its financial integrity; and,
3. attract capital on reasonable terms.

The legal precedents make it clear that the three requirements are separate and distinct. Moreover, none of the three requirements is given priority over the others. The fair return standard is met only if all three requirements are satisfied. In other words, the fair return standard is only satisfied if the utility can attract capital on reasonable terms and conditions, its financial integrity can be maintained ***and*** the return allowed is comparable to the returns of enterprises of similar risk.[17]

[15] The principal court cases in Canada and the U.S. establishing the standards include *Northwestern Utilities Ltd.* v. *Edmonton (City)*, [1929] S.C.R. 186; *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia,(262 U.S. 679, 692 (1923))*; and, *Federal Power Commission v. Hope Natural Gas Company (320 U.S. 591 (1944))*.

[16] The three requirements were summarized by the National Energy Board (RH-2-2004, Phase II) as follows:

> "The Board is of the view that the fair return standard can be articulated by having reference to three particular requirements. Specifically, a fair or reasonable return on capital should:
> - be comparable to the return available from the application of the invested capital to other enterprises of like risk (the comparable investment standard);
> - enable the financial integrity of the regulated enterprise to be maintained (the financial integrity standard); and
> - permit incremental capital to be attracted to the enterprise on reasonable terms and conditions (the capital attraction standard)."

The three requirements were reiterated in the *Reasons for Decision*, *Trans Québec and Maritimes Pipelines Inc.*, *RH-1-2008, March 2009* (pages 6-7).

[17] See Appendix A for further discussion of the distinction between the capital attraction and comparable returns standards.

A fair return on the capital provided by investors not only compensates the investors who have put up, and continue to commit, the funds necessary to deliver service, but benefits all stakeholders, including ratepayers. A fair and reasonable return on the capital invested provides the basis for attraction of capital for which investors have alternative investment opportunities. A fair return preserves the financial integrity of the utility, that is, it permits the utility to maintain its creditworthiness, as demonstrated by the level of its credit metrics and debt ratings. Fair compensation on the capital committed to the utility provides the financial means to pursue technological innovations and build the infrastructure required to support long-term growth in the underlying economy.

An inadequate return, on the other hand, undermines the ability of a utility to compete for investment capital. Moreover, inadequate returns act as a disincentive to expansion, may potentially degrade the quality of service or deprive existing customers from the benefit of lower unit costs that might be achieved from growth. In short, if the utility is not provided the opportunity to earn a fair and reasonable return, it may be prevented from making the requisite level of investments in the existing infrastructure in order to reliably provide utility services for its customers.

IV. ANALYTICAL FRAMEWORK

A. RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND ROE

The analysis starts with the proposition that the fair return (which in this context encompasses both capital structure and ROE) for Gazifère should be determined on a stand-alone basis. The stand-alone principle encompasses the notion that the cost of capital incurred by ratepayers should be equivalent to that which would be faced by the utility raising capital in the public markets on the strength of its own business and financial parameters. Respect for the stand-alone principle is intended to promote efficient allocation of capital resources and avoid cross-subsidies. The stand-alone principle has been respected by virtually every Canadian regulator, including the Régie, in setting both regulated capital structures and allowed ROEs.

The overall cost of capital to a firm depends, in the first instance, on business risk. Business risk relates largely to the assets of the firm. The business risk of a utility is the risk of not earning a compensatory return on the invested capital and of a failure to recover the capital that has been invested.

The cost of capital is also a function of financial risk. Financial risk refers to the additional risk that is borne by the equity shareholder because the firm uses debt to finance a portion of its assets. The capital structure, comprised of debt and common equity, can be viewed as a summary measure of the financial risk of the firm. The use of debt in a firm's capital structure creates a class of investors whose claims on the cash flows of the firm take precedence over those of the equity holder. Since the issuance of debt carries unavoidable servicing costs which must be paid before the equity shareholder receives any return, the potential variability of the equity shareholder's return rises as more debt is added to the capital structure. Thus, as the debt ratio rises, the cost of equity rises.

There are effectively two approaches that can be used to determine a fair rate of return on rate base. The first is to assess the "subject" utility's business risks, then establish a capital structure that (a) is compatible with its business risks; (b) would permit it to achieve a stand-alone investment grade debt rating; and (c) would approximately equate the level of the specific utility's total (business and financial) risk to that of the proxies (or benchmarks) used to estimate the cost of equity. This approach permits the application of a single "benchmark" cost of equity to the subject utility without any adjustment to the ROE.

The second approach relies on acceptance of the utility's actual or proposed deemed capital structure for regulatory purposes. The actual or deemed capital structure then becomes the key measure of the utility's financial risks. The utility's level of total risk (business plus financial) is then compared against that faced by the proxy firms used to estimate the ROE requirement. If the total risk of the benchmark sample is higher or lower than that of the subject utility, an adjustment to their cost of equity would be required when setting the subject utility's allowed ROE.

Both of these approaches have been taken by regulators in Canada. The Régie has used the second approach, that is, it has adopted both different capital structures and risk premiums for the utilities that it regulates, including Gazifère, Gaz Métro and Hydro-Québec. The British Columbia Utilities Commission (BCUC) and the Ontario Energy Board (OEB) have also taken this approach.

In summary, the various components of the cost of capital are inextricably linked; it is impossible to determine if the return on equity is fair without reference to the capital structure of the utility. Thus, the determination of a fair return must take into account all of the elements of the cost of capital, including the capital structure and the cost rates for each of the types of financing. It is the overall return on capital which must meet the requirements of the fair return standard. Both approaches used by Canadian regulators are equally valid as long as the combination of capital structure and return on equity result in an overall return which satisfies all

three fair return standards. The advantage of the second approach is that it is, in principle, compatible with the philosophy that the capital structure, within a reasonable range, is appropriately a decision for management, because management is in the best position to assess its business risks, financing requirements and access to debt and equity capital.

For Gazifère, the second approach has been adopted for the estimation of the fair return.

B. CONCEPT OF BENCHMARK UTILITY AND BENCHMARK ROE

The cost of equity, as estimated using tests applied to proxy companies, reflects the composite of those proxy companies' business, regulatory and financial risks. In principle, the cost of equity estimated by reference to a sample of companies is applicable to a specific utility without adjustment only if the magnitude of the total risks of the sample and the specific utility is comparable.

In Canada, there are only seven publicly-traded Canadian utilities, six with conventional corporate structures,[18] and Gaz Métro, which trades as a limited partnership.[19] These companies are relatively heterogeneous in terms of both operations[20] and size.[21] The relatively small and heterogenous universe of publicly-traded Canadian utilities means that it is impossible to select a sample of companies that would be considered directly comparable in total risk to any specific Canadian utility.

[18] Canadian Utilities, Emera, Enbridge, Fortis, Pacific Northern Gas and TransCanada Corporation.
[19] Gaz Métro's partnership unit prices were negatively impacted by the October 2006 announced change in the income tax treatment of income trusts with the result that its recent betas are not strictly comparable to those estimated for the conventional corporate regulated companies.
[20] Their operations span all the major utility industries, including electricity distribution, transmission and power generation, natural gas distribution and transmission, and liquids pipeline transmission, as well as unregulated activities in varying proportions of their consolidated activities.
[21] Ranging from an equity market capitalization of approximately $66 million (Pacific Northern Gas) to $24 billion (TransCanada).

As a result, an alternative is to estimate the cost of capital for a benchmark, or average risk, Canadian utility. For the benchmark cost of capital to be applicable to a specific utility, the specific utility's total risk needs to be similar to that of the proxy companies selected to estimate the benchmark cost of capital. If it is not, the solutions include: (1) changing the specific utility's capital structure; (2) making an adjustment to the proxy companies' cost of equity to reflect the relative total risk of the specific utility; or (3) some combination of (1) and (2).

While market data for the Canadian utilities provide some perspective on the fair return for a benchmark utility, a more accurate assessment can be made by reliance on a sample of U.S. utilities drawn from a much broader universe and selected using criteria that are designed to (1) identify companies that are of relatively similar risk to an average risk Canadian utility and (2) produce a large enough sample of companies to ensure reliable cost of equity test results. Since the majority of Canadian utilities, including Gazifère, are largely "pipes" and "wires" utilities, the sample of U.S. utilities which serve as a proxy for a benchmark Canadian utility was selected according to criteria designed to identify relatively low risk, distribution (gas and electric) utilities.

The ROE developed from both Canadian and U.S. proxy companies and market data is intended to represent the fair ROE for a benchmark Canadian distribution utility. For Gazifère, the applicability of the benchmark distribution utility ROE is dependent on its relative total (business plus financial) risk. To the extent that Gazifère's total risk differs materially from the benchmark (i.e., is of higher or lower risk than the average Canadian utility), the benchmark distribution utility ROE will need to be adjusted.

V. BUSINESS AND FINANCIAL RISK OF GAZIFÈRE

A. OVERVIEW

As noted above, the business risk of a utility is the risk of not earning a compensatory return on the invested capital and of a failure to recover the capital that has been invested. Business risk arises from demand, competitive, supply, operating, political and regulatory factors. While different business risk categories can be identified, they are inter-related. The regulatory framework, for example, is frequently designed around the inherent demand/competitive risks.

Business risks have both short-term and longer-term aspects. Short-term business risks relate primarily to year-to-year variability in earnings due to the combination of fundamental underlying economic factors and the existing regulatory framework. Long-term risks are important because utility assets are long-lived. Long-term business risks comprise factors that may negatively impact the long-run viability of the utility and impair the ability of the shareholders to fully recover their invested capital and a compensatory return thereon. As utilities represent capital-intensive investments with very limited alternative uses, whose committed capital is recovered over an extended period of time, it is the long-term risks that are of primary concern to the investor.

Regulatory risk relates to the framework that determines how the fundamental business risks are allocated between ratepayers and shareholders. Regulatory risk can be considered either as a component of business risk or as a separate risk category. The regulatory framework is dynamic: it is subject to change as a result of shifts in underlying fundamental risk factors including the competitive environment, energy policy, and regulatory philosophy.

Because regulated firms are generally regulated on the basis of annual revenue requirements, there has been a tendency to downplay longer-term risks, essentially on the grounds that the regulatory framework provides the regulator an opportunity to compensate the shareholder for

the longer-term risks when they are experienced. This premise may not hold. First, competitive factors and ratepayer resistance may forestall higher return awards when the risk materializes. Second, no regulator can bind his or her successors and thus guarantee that investors will be compensated for longer-term risks when they are incurred in the future.

Financial risk is the additional risk borne by the equity shareholder because the firm uses debt to finance a portion of its assets. As discussed in Chapter IV, the issuance of debt carries unavoidable servicing costs which must be paid before the equity shareholder receives any return. Thus the potential variability of the equity shareholder's return rises as more debt is added to the capital structure. Further, as the degree of financial leverage rises, so does the risk of loss of financing flexibility, the risk of bankruptcy and the risk that the equity shareholder will not recover the full equity investment. The capital structure, comprised of debt and common equity, can be viewed as a summary measure of the financial risk of the firm.

B. BUSINESS RISK OF GAZIFÈRE

Gazifère is a relatively small gas distribution utility serving the municipality of Gatineau, including the sectors of Hull, Aylmer, Gatineau, Masson-Anger and Buckingham. Table 1 below provides some perspective on its relative size compared to the major Canadian gas distributors. As the table indicates, Gazifère is less than 5% of the size of the major gas distributors on all three measures, customers, deliveries and rate base.

Table 1

Gas Distributor	Customers (Thousands)	Deliveries (10^6 m^3)	Rate Base (Millions of $)
Gazifère	35	175	69
ATCO Gas	1,260	6,200	1,035
Enbridge Gas	1,900	12,200	3,800
Gaz Métro	175	5,800	1,850
Terasen Gas	845	4,300	2,500
Union Gas	1,310	13,900	3,200

A small utility cannot diversify its risks to the same extent as larger utilities whose assets, geography and economic bases are less concentrated. Negative events are likely to have greater impact on the earnings or viability of a smaller company. The impact of smaller size for utilities with rated debt is frequently exhibited in lower debt ratings for these companies despite financial parameters that are stronger than their larger peers.[22]

To illustrate, in its June 2009 rating report for FortisBC, an electric utility, DBRS called the company's small size a "challenge" and stated,

> "FortisBC is a small utility compared with the dominant utility in the province, the Crown-owned BC Hydro, and serves a rural and low-population density region in south-central British Columbia. To some extent, the small size and franchise area limit opportunities for growth, operating efficiencies, and economies of scale as they relate to PBR."

FortisBC, which had a rate base of over $900 million in 2009, despite better credit metrics than Terasen Gas, the benchmark BC utility, due to an allowed common equity ratio of 40% and an allowed ROE that is 40 basis points higher than Terasen Gas's, is rated BBB(High) by DBRS

[22] See also discussion of small size premium in Chapter VII.

and Baa2 by Moody's. Terasen Gas, by comparison, has ratings of A by DBRS and A3 by Moody's.

Gazifère's gross margin is largely derived from the residential and commercial sectors; Rates 1 and 2 account for approximately 32% and 63% respectively of its delivery margin. The remainder of its margin is derived predominantly from three large customers operating in a single resource-based industry, the pulp and paper industry. The contribution of pulp and paper customers has declined significantly over the past decade as the industry has been hurt by a strengthening Canadian dollar, rising input costs, declining demand for pulp and paper products and the sharp downturn in the U.S. economy. With the decline in the pulp and paper industry and growth in the residential and commercial sectors, Gazifère is less dependent on the industrial sector than it had been historically. Because of its proximity to Ottawa, Gazifère's market growth is partly dependent on growth in government employment.

In the Rate 2 class (largely residential), although Gazifère has experienced significant customer growth (close to 5% per year between 2000 and 2009), its deliveries to Rate 2 customers have only increased by 1.4% annually, as average customer usage has declined. The average Rate 2 per customer usage in 2009 was only 75% of what it was at the beginning of the decade. Reduction in per customer consumption reflects a combination of factors, including construction of more energy efficient homes, installation of more energy efficient appliances, a trend toward construction of more multi-family dwellings, and Gazifère's Demand Side Management (DSM) program. While Gazifère has a deferral account which provides protection from lost volumes arising from its DSM program, over the longer-term, lost deliveries lead to higher unit delivery costs, which make natural gas less competitive.

Gazifère competes with electricity for both residential and commercial customers and load. While natural gas has a price advantage to electricity in Gazifère's service area, the price advantage is smaller than in other provinces (e.g., Alberta and Ontario) due to Québec's relatively unique abundance of low cost hydroelectric generation capacity and a fixed price for

heritage generation. The magnitude of the price advantage is dependent on the commodity price of natural gas, over which Gazifère has no control. The price of natural gas exhibits considerable volatility, with monthly "spot" prices (based on the Alberta Hub price) ranging from $2.55 per GJ to $10.80 per GJ in just the past two years. While at current commodity prices, natural gas enjoys a competitive advantage to electricity, during 2008, on average, the price differential between natural gas and electricity in Gazifère's residential sector was minimal. Gas price volatility creates uncertainty for consumers, which encourages them to take measures to permanently reduce energy consumption or to seek energy alternatives. A permanent increase in the commodity price of natural gas has the potential to erode the competitive advantage of natural gas in Gazifère's service area. Further, since electric heating is easier for developers to install in new construction, particularly in multi-unit dwellings, it has a built-in advantage in new construction.

Energy policy also favours electricity and renewable energy technologies over natural gas. Natural gas is not considered as environmentally friendly an energy option as hydroelectric generation or other renewable energy technologies. In 2006, legislation was passed to implement the provincial energy strategy. Bill 52, entitled *An Act respecting the implementation of the Québec Energy Strategy and amending various legislative provisions*, amended the Act respecting the Agence de l'efficacité énergétique, broadening the scope of the agency's mission by making it responsible for promoting the development of new energy technologies for all forms of energy and all sectors of activity. The promotion and development of renewable energy technologies as alternatives to fossil fuels, including natural gas, has the potential to negatively impact Gazifère's future operations.

The legislation also granted the Régie the power to implement an annual duty on fuel that distributors must pay into the Québec Green Fund. In 2007, Québec became the first province to levy a carbon tax, a tax to which natural gas, but not hydroelectric generated electricity, is subject. The imposition of a carbon tax on natural gas negatively impacts its competitiveness relative to electricity.

In December 2009, the provincial government announced an ambitious[23] greenhouse gas emissions reduction target (20% below 1990 levels by 2020), which will further favour renewable technologies over fossil fuels, including natural gas. In sum, the aggressive provincial climate change policy increases the business risks to which Gazifère is exposed.

With respect to Gazifère's regulatory framework, the Company benefits from a supportive regulatory framework which includes a number of deferral and variance accounts. The key deferral and variance accounts are for gas costs, weather normalization, lost gas stabilization, regulatory expense, DSM expense and volumetric variance, and Agence de l'efficacité énergétique dues. In short, the regulatory mechanisms mitigate Gazifère's short-term risks. They cannot, however, change the fundamental demand and competitive risks nor guarantee the recovery of the shareholders' equity investment in the longer term.

Gazifère has also been subject to Revenue Cap per Customer Comprehensive Performance Based Regulation (CPBR) since 2006. The plan sets the test year revenue requirement as the prior year's revenue requirement per customer multiplied by a projected inflation less productivity and stretch factors, multiplied by projected test year customers. To this sum are added or subtracted a cost of capital adjustment, pass through items, exogenous factors and the customers' share of productivity earnings. The performance-based methodology gives the utility an opportunity to earn higher returns by providing incentives to control costs and achieve efficiencies. The mechanism includes an asymmetric sharing mechanism; customers are credited with a share of earnings in excess of the allowed return, but do not bear any short-fall. In comparison to the traditional cost of service methodology, which was based on a single year budget, the five-year term performance-based methodology exposes the utility to higher risk of not achieving the allowed return.

[23] The government has acknowledged that its target is ambitious, given that close to 50% of total energy in Québec already comes from renewable sources.

In summary, Gazifère is a very small gas utility, with higher exposure to a single resource-based industry than most of the major Canadian gas distributors (ATCO Gas, Enbridge Gas, Terasen Gas, and Union Gas), and operating in an environment characterized by significant competition with alternative sources of energy, particularly electricity. With regard to the latter, only two of the five major gas distributors (Gaz Métro and Terasen Gas) face material competitive pressure with alternative energy sources in their core (residential and commercial markets). Gazifère faces higher business risks relative to the major Canadian gas distribution utilities, which translate into a higher required common equity ratio and/or a higher common equity return.

C. FINANCIAL RISK OF GAZIFÈRE

Gazifère is proposing the same common equity ratio of 40% that it has maintained and utilized for ratesetting purposes since 1998. The 40% common equity ratio compares to a median common equity ratio of 38.5% adopted for the five major Canadian gas distributors.[24] Gazifère is too small to have its debt rated by the debt rating agencies, as are a number of the smaller investor-owned gas and electric distribution utilities that would be of reasonably comparable business risk to Gazifère. For those with no stand-alone debt ratings, their capital structures have not been directly "tested" by the capital markets. Nevertheless, the allowed capital structures of other Canadian utilities that are most comparable in terms of size and business risk class to Gazifère provide a basis for assessing the reasonableness of Gazifère's 40% common equity ratio. As Table 2 below indicates, Gazifère's 40% equity ratio is in line with those adopted for smaller electric and gas distribution utilities in Canada.

[24] Four of the five major gas distributors also have some preferred shares in their regulated capital structures, which Gazifère does not.

Table 2

Company	Allowed Equity Ratio	Rate Base ($ million)	Debt Ratings
AltaGas Utilities	43%	$166	N/A
Maritime Electric [1/]	40.5%	$325 [2/]	BBB+ (S&P)
Natural Resource Gas	42%	$13	N/A
Pacific Northern Gas-West [3/]	40%	$130	BBB(low) (DBRS)
Terasen Gas (V.I.)	40%	$555	A3 (Moody's)
Terasen Gas (Whistler)	40%	$43	N/A

[1/] Based on actual forecast capital structure.
[2/] Estimated based on year-end 2008 net property, plant and equipment.
[3/] Applying for increase in common equity ratio to 47.5%.

Gazifère's common equity ratio is similar to those of smaller gas and electric utilities in Canada, but remains well below those maintained and allowed for U.S. natural gas distribution utilities. The average allowed common equity ratio for U.S. gas distribution utilities over the period 2006-2009 averaged 49%.[25] The median actual common equity ratio for the sample of benchmark U.S. distribution utilities based on the four quarters ended September 2009, rated A on average by S&P and A3 by Moody's was approximately 48% (See Schedules 5 and 15). The ratios maintained and allowed for U.S. distribution utilities, with which Canadian distribution utilities (including Gazifère) compete for capital, indicate that Gazifère's common equity ratio is relatively low.

[25] Regulatory Research Associates, *Regulatory Focus: Major Rate Case Decisions, January 2009-December 2009*, January 8, 2010.

VI. BENCHMARK DISTRIBUTION UTILITY ROE

A. CONCEPTUAL CONSIDERATIONS

The key to determining the fair return on equity (i.e., ensuring that all three requirements of the fair return standard are met) is reliance on multiple tests. There are three different types of tests that have traditionally been used to estimate the fair return on equity: equity risk premium (including, but not limited to, the Capital Asset Pricing Model), discounted cash flow and comparable earnings tests. Each of the tests is based on different premises and brings a different perspective to the fair return on equity. None of the individual tests is, on its own, a sufficient means of ensuring that all three requirements of the fair return standard are met; each of the tests has its own strengths and weaknesses. Individually, each of the tests can be characterized as a relatively inexact instrument; no single test can pinpoint the fair return.[26] Moreover, different tests may be more or less reliable depending on prevailing economic and capital market conditions.[27] These considerations not only emphasize the importance of reliance on multiple tests, but also of benchmarking, or testing the reasonableness of the test results themselves against other relevant information.

It is also important to recognize that expressing the ROE in terms of a premium above either long-term Canada bond yields or corporate bond yields for the purpose of applying an automatic adjustment formula does not mean that the initial ROE need be estimated solely using a test or tests that might be defined as equity risk premium tests. For example, an ROE estimated using a

[26] For example, Bonbright states, "No single or group test or technique is conclusive. Therefore, it is generally accepted that commissions may apply their own judgment in arriving at their decisions." (James C. Bonbright, Albert L. Danielsen, David R. Kamerschen, *Principles of Public Utility Rates*, 2nd Ed., page 317, Arlington, VA.: Public Utility Reports, Inc., March 1988).

[27] For example, see Federal Communications Commission, Report and Order 42-43, CC Docket No. 92-133 (1995).
> "Equity prices are established in highly volatile and uncertain capital markets... Different forecasting methodologies compete with each other for eminence, only to be superseded by other methodologies as conditions change... In these circumstances, we should not restrict ourselves to one methodology, or even a series of methodologies, that would be applied mechanically. Instead, we conclude that we should adopt a more accommodating and flexible position."

discounted cash flow model can be expressed or interpreted in terms of a premium above a yield or return on a lower risk fixed income security.

Each test has its own set of pros and cons. The discounted cash flow test directly measures utility return expectations but is subject to an ongoing debate around the accuracy of investment analysts' forecasts as the measure of investor expectations of growth. The comparable earnings test explicitly recognizes that the objective of regulation is to emulate competition and measures returns on the same original cost basis on which utilities are regulated, but is subject to concerns around selection criteria and whether the results are representative of economic returns. The Capital Asset Pricing Model, framed in an elegant, simple construct, and, on the surface, with only three components, easy to apply, has an intuitive appeal. Nevertheless, it has its own set of challenges, which are summarized below.

The focus on the challenges of the CAPM is not to suggest that other tests are necessarily superior, but because Canadian regulators have, in recent years, favoured CAPM to the exclusion of other tests.[28]

1. The CAPM attempts to measure, within the context of a diversified portfolio, what return an equity investor **should** require (in contrast to the return that the investor **does** require or what returns are actually available to investments of comparable risk).

2. The theoretical CAPM assumes that the risk-free rate is uncorrelated with the return on the market. In other words, the assumption is that there is no relationship between the risk-free rate and the equity market return (i.e., the risk-free rate has a zero beta). However, the application of the model typically assumes that the return on the market is highly correlated with the risk-free rate, that is, that the equity market return and the risk-free rate move in tandem. Consequently the application of the test proceeds on an

[28] Both the BCUC and the OEB recognized the limitations of the CAPM in their respective 2009 cost of capital decisions cited in Chapter II above.

assumption which is directly in conflict with an assumption underpinning the theoretical model itself.

3. The size of the market risk premium cannot be directly observed and is subject to a wide divergence of opinion. While historic risk premiums may provide a perspective on the size of the expected forward-looking market risk premium, historic results are sensitive to the country from which the data are drawn and the time period over which they are measured.

4. The market risk premium is not a fixed quantity; it changes with investor experience and expectations. It would be higher, for example, when investors perceive that the risk of the equity market has increased relative to that of the government bond market. However, the model does not readily allow estimation of changes in the size of the market risk premium as economic or capital market conditions (e.g., interest rates) change.

5. The size of the equity market risk premium at a given point in time depends in part on how risky long-term government bond yields are relative to the overall equity market. The need to capture and measure changes in the risk of the so-called risk-free security introduces a further complication in the application of the CAPM, particularly as the changes impact the measurement of the equity market risk premium.

6. The achieved equity market risk premium in Canada is significantly influenced by historic behaviour of the long-term Government of Canada bond. The radical change in Canada's fiscal performance over the past decade has contributed to a steady decline in long-term government bond yields and a corresponding increase in total returns achieved by investors in long-term government securities. As a result, the achieved equity market risk premiums in Canada have been squeezed by the performance of the government bond market. The low prevailing and forecast long-term Government of Canada bond yields relative to both the historic yields and total returns on those securities indicate that

the historic yields and returns on long-term Government of Canada bonds overstate the forward looking risk-free rate.

7. The objective of using the CAPM (as with any cost of equity model) is to estimate the returns that investors expect or require. Empirical tests of the model have shown in some cases that the model underestimates the returns for low beta stocks and overestimates them for high beta stocks and in other cases that there is no relationship between beta and return.

The challenges associated with the CAPM are of a sufficient magnitude to warrant the conclusion that it is not inherently superior to other approaches to the estimation of a fair return.

All approaches to estimating a fair return require significant judgment in their application, the extent of which depends on the prevailing state of the capital markets. Any individual cost of equity model implicitly ascribes simplicity to a cost whose determination is inherently complex. No single model is powerful enough on its own to produce "the number" that will meet the fair return standard. Only by applying a range of tests along with informed judgment can adherence to the fair return standard be ensured.[29]

[29] I am strongly of the view that the comparable earnings test is the only test which measures returns in a manner compatible with the base (original cost) to which they are applied. However, I also recognize that the comparable earnings test is the most controversial, not only in terms of its applicability to the estimation of a fair return, but in terms of its application (e.g., criteria for selection of comparables, period over which returns should be measured, need for adjustments for relative risk). Therefore, for the sole purpose of this evidence, in order to limit the issues relevant to the estimation of a fair return, I have applied risk premium and discounted cash flow tests only.

B. EQUITY RISK PREMIUM TESTS

1. Conceptual Underpinnings

An equity risk premium test is derived from the basic concept of finance that there is a direct relationship between the level of risk assumed and the return required. Since an investor in common equity takes greater risk than an investor in bonds, the former requires a premium above bond yields in compensation for the greater risk. Equity risk premium tests are a measure of the market-related cost of attracting capital, i.e., a return on the market value of the common stock, not the book value.

Equity risk premium tests, similar to the other tests used to arrive at a fair return, are forward-looking, that is, they are intended to estimate investors' future equity return requirements. The magnitude of the differential between the required/expected return on equities and the risk-free rate is a function of investors' willingness to take risks and their views of such key factors as inflation, productivity and profitability. Because equity risk premium tests are forward-looking, historic risk premium data need to be evaluated in light of prevailing economic/capital market conditions. If available, direct estimates of the forward-looking risk premium should supplement estimates of the risk premium made using historic data as the point of departure.

2. Risk-Free Rate

The application of equity risk premium tests require a forecast of the risk-free rate to which the equity risk premium is applied. Reliance on a long-term government bond yield as the risk-free rate recognizes (1) the administered nature of short-term rates; and (2) the long-term nature of the assets to which the equity return is applicable.

For the purpose of applying the equity risk premium tests, the estimated 2011 long-term Canada bond yield is 4.7%. The 4.7% long-term Canada bond yield estimate relies on the February 2010

Consensus Economics, *Consensus Forecasts*' 4.1% 10-year Canada bond yield forecast for February 2011,[30] which, with a January 2010 average spread between 10-year and 30-year Canada bond yields of 0.56%, results in a forecast yield of 4.7%. The 4.7% long-term Canada bond yield is consistent with a gradual upward trend toward the forecast yield expected to prevail over the longer-term (2011-2019) of approximately 5.25%.[31]

3. Risk-Adjusted Equity Market Risk Premium Test

3.a. Conceptual and Empirical Considerations

The risk-adjusted equity market risk premium approach to estimating the required equity risk premium for a benchmark distribution utility entails (1) estimating the equity risk premium for the equity market as a whole; (2) estimating the relative risk adjustment; and (3) applying the relative risk adjustment to the equity market risk premium, to arrive at the required equity risk premium for a benchmark distribution utility. The cost of equity is thus estimated as:

$$\text{Risk-Free Rate} + \left\{ \text{Relative Risk Adjustment} \times \text{Market Risk Premium} \right\}$$

The risk-adjusted equity market risk premium test is a variant of the Capital Asset Pricing Model (CAPM). The CAPM attempts to measure, within the context of a diversified portfolio, what return an equity investor **should** require (in contrast to what the investor **does** require). Its focus is on the minimum return that will allow a company to attract equity capital.

In the CAPM, risk is measured using the beta. Theoretically, the beta is a forward looking estimate of the contribution of a particular stock to the overall risk of a portfolio. In practice, the

[30] Consensus Economics does not provide a forecast of the 30-year Canada bond yield, nor does it provide a forecast of 10-year Canada bond yields for all of 2011.
[31] Consensus Economics, *Consensus Forecasts*, October 2009 anticipates the 10-year Canada bond yield to average approximately 5.0% from 2011 to 2019. The spread between 10- and 30-year Canada bond yields has historically averaged approximately 0.30%.

beta is a calculation of the historical correlation between the overall equity market returns, as proxied in Canada by the returns on S&P/TSX Composite, and the returns on individual stocks or portfolios of stocks.

The CAPM, framed in an elegant, simple construct, has an intuitive appeal. However, in addition to its restrictive premises, the CAPM does have disadvantages that caution against placing sole reliance on it for purposes of determining a fair return on equity. The disadvantages are summarized in Appendix B.

3.b. Equity Market Risk Premium

3.b.(1) Superiority of Arithmetic Averages

When historic risk premiums are used as a basis for estimating the expected risk premium, arithmetic averages, not geometric (compound) averages, should be used. The geometric average, which is appropriate for use in describing historic portfolio performance, represents the achieved return as if it had been a constant average annual return. Using the arithmetic average of all past returns recognizes the probability distribution of future outcomes based on past variations in annual returns. Expressed simply, the arithmetic average captures the unpredictability of future returns based on the volatility of past returns; the geometric average masks the historic volatility by smoothing over annual differences. (See Appendix B for further discussion).

3.b.(2) Income Returns versus Total Bond Returns

The application of the CAPM requires the estimation of the market return in relation to the risk-free rate. While government bonds are considered default-free, they are not risk-free; they are subject to interest rate risk. The total bond returns experienced include capital gains and losses resulting from changes in interest rates over time. The bond income return, in contrast, reflects

only the bond coupon payment portion of the total bond return; it represents the riskless component of the bond return. In principle, using the bond income return more accurately measures the historic equity risk premium above a true risk-free rate.

3.b.(3) The Post-World War II Period

The estimation of the expected/required market risk premium from achieved market risk premiums is premised on the notion that investors' return expectations and requirements are linked to their past experience. Basing calculations of achieved risk premiums on the longest periods available reflects the notion that it is necessary to reflect as broad a range of event types as possible to avoid overweighting periods that represent "unusual" circumstances. On the other hand, the objective of the analysis is to assess investor expectations in the current economic and capital market environment. Consequently, I focused on post-World War II returns, that is, 1947-2009, a period more closely aligned with what today's investors are likely to anticipate over the longer-term[32] as well as achieved returns and risk premiums over longer periods.

3.b.(4) Globalization and Relevance of U.S. Equity Market Experience

My estimate of the expected/required equity market risk premium was made by reference to an analysis of historic (experienced) market risk premiums. Analysis of historic risk premiums should not be limited to the Canadian experience, but should also take into account the U.S. equity market as a relevant benchmark for estimating the equity risk premium from the perspective of Canadian investors.

[32] Key structural economic changes have occurred since the end of World War II, including:
1. The globalization of the North American economies, which has been facilitated by the reduction in trade barriers of which GATT (1947) was a key driver;
2. Demographic changes, specifically suburbanization and the rise of the middle class, which have impacted on the patterns of consumption;
3. Transition from a resource-oriented/manufacturing economy to a service-oriented economy;
4. Technological change, particularly in the areas of telecommunications and computerization, which have facilitated both market globalization and rising productivity.

The historic Canadian equity and government bond returns each incorporate various factors that call into question whether they would be a realistic representation of expected risk premiums (e.g., capital held captive in Canada as a matter of policy, lack of equity market liquidity and diversity, and the higher risk of the Government of Canada bond market historically, which has since dissipated). These factors are set out in Appendix B.

One factor is the historic impact of the Foreign Property Rule (FPR), which capped the proportion of foreign investment that could be held by individuals (in RRSPs) and by pension funds. The combination of mediocre returns and small size of the Canadian market relative to the total global market (approximately 2%) put pressure on the government to increase and finally eliminate the cap on foreign investment that could be held in RRSPs and pension funds. This cap had been as low as 10% of the book value of assets (from 1971 to 1990) and was at 30% when it was removed entirely in 2005.[33] From this perspective, historic Canadian equity returns therefore are likely to understate investor return requirements.

Investor reaction to the increasingly less restrictive FPR supports that conclusion. Equity investment outside of Canada grew rapidly as the barriers to foreign investment (in terms of transactions and information costs as well as the foreign investment cap) declined. Foreign stock purchases by Canadians increased almost ten-fold between 1995 and 2007. Purchases of foreign stocks in 1995 were $83 billion; in 2007, they were $915 billion. Although purchases have declined from their 2007 peaks, in 2009 they were still close to $500 billion through November 2009. In mid-2009, although the total percentage of foreign assets in trusteed pension funds was less than 30%, the percentage of foreign equity to total equity was close to 50%.[34, 35]

[33] From 1957 to 1971 no more than 10% of income could come from foreign sources.
[34] Based on market value. Statistics Canada, Table 280-0003.
[35] Pension funds are increasingly investing in infrastructure assets outside of Canada. For example, in early 2009 a consortium of investors including the British Columbia Investment Management Corporation, the Alberta Investment Management Corporation and the Canada Pension Plan Investment Board completed the acquisition of Puget Energy, an electric and gas utility serving northern Washington State. The most recent allowed returns for Puget Sound Energy (both electric and gas) were 10.15% on a 46% common equity ratio, adopted in October 2008.

The relevance of the U.S. experience to the estimation of the risk premium from a Canadian perspective has increased as the relationship between Canadian and U.S. interest rates has changed. Historically, much of the difference between the achieved risk premiums in Canada and the U.S. arises from higher interest rates in Canada. With the vastly improved economic fundamentals in Canada (e.g., lower inflation, balanced budgets), the risk of investing in Canadian government bonds (relative to equities) has declined. Consequently, the differential between Canadian and U.S. government bond yields and returns that existed historically fell. Over the period 1926-1997, the difference between long-term government bond yields in Canada and the U.S. averaged close to 100 basis points. From 1998 to 2009, the difference was approximately -9 basis points. With similar government bond yields in the two countries for more than a decade, the U.S. historic equity market risk premium is a relevant benchmark for the estimation of the forward-looking equity market risk premium for Canadian investors.

On the equity side of the equation, the Canadian equity market composite is dominated by two sectors, financial services and energy. These two sectors alone accounted for close to 60% of the total market capitalization of the S&P/TSX Composite at the end of December 2009. In contrast to the S&P/TSX Composite, the historic U.S. equity returns have been generated by a more diversified and liquid market. In addition, the U.S. equity market has historically been the principal alternative for Canadian investors to domestic equity investments. Approximately 47% of Canadian portfolio investment in foreign equities at the end of 2008 was in the U.S.[36] The diversified nature of the U.S. equity market and the close relationship between the Canadian and U.S. capital markets and economies warrant giving weight to U.S. historical equity risk premiums in the estimation of the required equity risk premium for a benchmark Canadian distribution utility.

[36] Statistics Canada, *Canada's International Investment Position – Third Quarter 2009.* The U.S. portion of Canadian direct investment abroad at the end of 2008 was 49%.

3.b.(5) Historic Risk Premiums from 1947-2009

As previously indicated, in arriving at an estimation of the market risk premium, my point of departure was both Canadian and U.S. historic returns and risk premiums during the post-World War II period. The average U.S. and Canadian historic risk premiums during that period were as follows:

Table 3

Historic Risk Premiums Arithmetic Averages (1947-2009)		
	Versus Bond Total Returns	**Versus Bond Income Returns**
Canada	5.2%	4.9%
U.S.	6.3%	6.4%

Source: Schedule 6, page 1.

The achieved risk premiums reflect average equity market returns of approximately 12.0% and average income and total returns on long-term government bonds of approximately 7.0% in Canada (see Schedule 6). The latter are well in excess of the long-term Canada bond yields which are forecast to prevail going forward (4.7% for the test year and 5.25% over the longer-term).

3.b.(6) Comparison of Longer-Period Returns to Post-World War II Returns

A comparison of the longer-term equity market returns in Canada and the U.S. to the post-World War II returns demonstrates that the average nominal returns for the equity markets have not changed materially. Over the long-term, the equity market return in both countries (based on arithmetic averages) has been in the approximate range of 11.5%-12.5%.

Table 4

	Canada		U.S.	
	1924-2009	1947-2009	1926-2009	1947-2009
Equity Market Returns	11.6%	12.0%	11.8%	12.4%

Source: Schedule 6, pages 1 and 2.

3.b.(7) Historic Risk Premiums and Price/Earnings Ratios

The 1998-2002 equity market "bubble and bust" spawned a number of studies of the equity market risk premium that have speculated that the U.S. market risk premium will be lower in the future than in the past. The speculation stems in part from the hypothesis that the magnitude of the achieved risk premiums is due to an increase in price/earnings (P/E) ratios. That is, the historic U.S. equity market returns reflect appreciation in the value of stocks in excess of that supported by the underlying growth in earnings or dividends. The increase in P/E ratios, it has been argued, reflects a decline in the rate at which investors are discounting future earnings, i.e., a lower cost of capital.

I have analyzed the trends in P/E ratios, equity market returns, and bond returns.[37] That analysis demonstrates:

(1) The increase in price/earnings ratios experienced during the market bubble of the 1990s has not resulted in a higher and unsustainable level of equity market returns. The arithmetic average equity returns in both Canada and the U.S. from 1947-1988 (prior to the increase in P/E ratios commencing in 1989) are actually higher than the average returns for the full 1947-2009 period.

[37] See Appendix B for further discussion.

(2) An analysis of rolling 10-year average equity returns reveals no upward or downward trend in equity market returns in Canada or the U.S. over the post World War II period.

(3) The observed decline in the experienced risk premium over the 1947-2009 period, particularly in Canada, is due largely to an increase in bond returns, not a decline in equity returns. As noted above, the historic bond returns in Canada (both total and income returns) were significantly higher (at approximately 7.0%) than the forecast yields on long-term Canada bonds of 4.7% for 2011 and 5.25% over the longer-term.

In summary, the P/E ratio analysis suggests that historic equity market returns in both Canada and the U.S. are reasonable estimates of the forward looking equity market return. In contrast, the Canadian historic bond total and income returns are both materially higher than estimates of expected bond returns, which strongly suggest that the historic achieved equity market risk premium in Canada over the period 1947-2009 understates a reasonable estimate of the forward-looking equity market risk premium.

3.b.(8) Impact of Inflation on Equity Market Returns

Theoretically, the expected return on equity should be equal to the sum of the real risk-free cost of capital, the expected rate of inflation and an equity risk premium. The approximately one percentage point lower forecast rate of inflation in Canada and the U.S. compared to the historic rates might suggest that expected nominal equity returns would be lower than they have been historically. An analysis of nominal equity returns, rates of inflation and real returns on equity in both countries shows that real equity returns have generally been higher when inflation was lower (see Appendix B). The negative relationship between the achieved real equity returns and inflation does not suggest that the expected nominal equity rates of return should be lower than the historic nominal returns as a result of lower expected inflation.

3.b.(9) Estimate of Equity Market Risk Premium

Given the longer-term equity market returns, the absence of any material upward or downward trend in the nominal historic equity market returns during the post World War II period, the P/E ratio analysis, and the observed negative relationship between real returns and inflation, a reasonable expected value of the future equity market return is a range of 11.5%-12.0%,[38] based on Canadian equity market returns and supported by U.S. equity market returns. The expected return on long-term Canada bonds, based on both the 2011 and longer-term forecasts of the 30-year Canada bond yield, is in the range of 4.7% to 5.25% respectively. The resulting expected equity market risk premium is approximately 6.75%.

3.c. Relative Risk Adjustment

3.c.(1) Total Market Risk

The market risk premium result needs to be adjusted to recognize the relative risk of a benchmark distribution utility. My analysis of the relative risk adjustment starts with the recognition that (1) investors are not perfectly diversified and (2) they do look at the risks of individual investments and expect compensation for assuming company-specific or investment-specific risk. It also recognizes that, while investors can diversify their portfolios, the stand-alone utility to which the allowed return is applied cannot. Thus, a risk measurement that reflects those considerations is relevant for estimating the benchmark distribution utility equity risk premium. These considerations support focusing on total market risk, as well as on beta. The latter is intended to measure solely non-diversifiable risk. The drawbacks of beta as the sole

[38] Over the three-month period, October 2009-December 2009, the average dividend yield on the S&P/TSX was 2.8%. The expected long-term growth rate for the index based on available analysts' forecasts for the companies in the Composite, is 11.4%, indicating an expected return (based on a constant growth discounted cash flow approach) of approximately 14.5%.

measure of risk, as well as the absence of an observable relationship between "raw" betas[39] and the achieved market returns on equity in the Canadian market, provide further support for reliance on other measures of risk to estimate the required equity return (see Appendix B).

The standard deviation of market returns is the principal measurement of total market risk. To estimate the relative total risk of a benchmark distribution utility, I used the S&P/TSX Utilities Index as a proxy. I calculated the standard deviations of monthly total market returns for each of the 10 major Sectors of the S&P/TSX Index, including the Utilities Index, over five-year periods ending 1997 through 2009 (Schedule 8).

To translate the standard deviation of market returns into a relative risk adjustment, utility standard deviations must be related to those of the overall market. The relative market volatility of Canadian utility stocks was measured by comparing the standard deviations of the Utilities Index to the simple mean and median of the standard deviations of the 10 Sectors. Schedule 8 shows the ratios of the standard deviations of the Utilities Index to those of the 10 S&P/TSX Sectors. The ratio of the standard deviation of the Utilities Index to the mean and median standard deviations of the 10 major Sector Indices suggests a relative risk adjustment for a Canadian utility in the range of 0.55-0.85, with a central tendency of approximately 0.65-0.70.

3.c.(2) Historic Raw Betas

Since beta is the risk measure that underpins the application of the CAPM, I also took account of utility betas to estimate the relative risk adjustment. Schedule 11 summarizes the "raw"[40] betas I calculated using monthly changes in price for individual publicly-traded Canadian regulated pipeline, gas distribution and electric utility companies, the TSE Gas/Electric Index, and the

[39] The "raw" beta refers to the simple regression between the monthly percentage changes in the price of a utility or utility index and the corresponding percentage change in the price of the equity market index (the S&P/TSX Composite).
[40] The term "raw" means that the beta is simply the result of a single variable ordinary least squares regression.

S&P/TSX Utilities Sector using monthly price data calculated over five-year periods ending 1993 through 2009.[41]

As Schedule 11 indicates, there was a significant decline in the calculated "raw" five-year betas of the individual regulated Canadian companies between 1993-1998 and 1999-2005 (from approximately 0.50-0.60 to 0.0 and slightly negative). Following an increase in 2007 to 0.50, the "raw" betas for the individual regulated Canadian company betas again declined in 2008 to approximately 0.25 and remained at that level in 2009.

The observed levels and pattern of the calculated "raw" utility betas in 1999-2009 can be traced to four factors: (1) the technology sector bubble and subsequent bust; (2) the dominance in the TSE 300 of two firms during the early part of the "bubble and bust" period, Nortel Networks and BCE; (3) the financial crisis and the accompanying plunge in the equity markets; and (4) the greater sensitivity of utility stock prices than the equity market composite to rising and falling interest rates (e.g., during the equity market "bubble" of 1999 and early 2000 and during the first half of 2006). Over the longer-term (1970-2009), the "raw" beta of the Utilities Index using total returns has been approximately 0.50, as indicated in Section 3.c.(3) below.

3.c.(3) Canadian Regulated Company Returns and "Raw" Betas

The equity betas of traded regulated Canadian company shares and of the utility index explain a relatively small percentage of the actual achieved market returns over time. A regression of the monthly returns on the TSX Utilities Index against the returns on the TSX Composite, for example, over the period 1970-2009[42] shows the following:

[41] The S&P/TSX Utilities Sector was created in 2002 (with historic data calculated from year-end 1987), when the TSE 300 was revamped to create the S&P/TSX Composite. The Utilities Sector was essentially an amalgamation of the former TSE 300 Gas/Electric and Pipeline sub-indices. In May 2004, the pipelines were moved to the Energy Sector.

[42] The Monthly TSX Utilities Index Returns are comprised of the monthly returns on the TSE Gas & Electric Index for period January 1970 to April 2003 and the monthly returns on the S&P/TSX Utilities Index for the period May 2003 to December 2009.

Table 5

Monthly TSX Utilities Index Return	=	0.0055 +	0.49	{ Monthly TSE Composite Return }
t-statistic	=		14.6	
R^2	=	31%		

The relationship quantified in the above equation suggests a long-term beta of approximately 0.50. However, the R^2, which measures how much of the variability in utility stock prices is explained by volatility in the equity market as a whole, is only 31%. That means 69% of the monthly volatility in share prices remains unexplained.

Since utility shares are interest sensitive, the regression was expanded to capture the impact of movements in long-term Canada bond prices on utility returns. The addition of monthly long-term Canada bond returns to the analysis indicates the following:

Table 6

Monthly TSX Utilities Index Return	=	0.00198 + .41	{ Monthly TSE Composite Return }	+ .52	{ Monthly Long Canada Bond Return }		
t-statistics	=	13.0		9.1			
R^2	=	41%					

When government bond returns are added as a further explanatory variable, somewhat more of the observed volatility in utility stock prices is explained (41% versus 31%). The second regression equation suggests that utility shares have had approximately 40% of the volatility of the equity market and over 50% of the volatility of the bond market, the latter consistent with utility common stocks' interest sensitivity. Nevertheless, the equation still leaves more than half of the utility shares' volatility unexplained. To provide some perspective, the average actual annual return for the index from 1970-2009 was 12.25%. Of this average annual return, almost

2.5 percentage points was explained neither by volatility in the equity market nor the long-term government bond market.[43]

Using an expected annual equity market return of 11.5%, the low end of the 11.5%-12.0% range developed above, an annual long-term Canada bond return equal to the forecast longer-term 30-year Canada yield of 5.25%, and an annual "unexplained" return component equal to that achieved in the past (2.4 percentage points), the indicated utility return going forward is 10.0%. If, instead, the "unexplained" return component is assumed to be equal to the same proportion of the total return as was the case historically (approximately 20%), the expected utility return is 9.3%. When the average of the two utility returns (9.7%) is expressed as an equity risk premium above both the near-term and long-term forecast long-term Canada bond yields of 4.7% and 5.25% respectively, the indicated relative risk adjustment is approximately 0.70- 0.75.[44]

3.c.(4) Use of Adjusted Betas

From the calculated "raw" betas, the inference can readily be made that regulated companies are less risky than the equity market composite, which by construction has a beta of 1.0. The more difficult task is determining how the "raw" beta translates into a relative risk adjustment that captures utility investors' return requirements. In order to arrive at a reasonable relative risk adjustment, the normative ("what should happen") CAPM needs to be integrated with what has been empirically observed ("what does or has happened"). Empirical studies have shown that stocks with low betas (less than the equity market beta of 1.0) have achieved returns higher than predicted by the single variable (i.e., equity beta) CAPM. Conversely, stocks with betas higher than the equity market beta of 1.0 have achieved lower returns than the model predicts.

[43] The unexplained component of the achieved return is represented by the intercept in the equation.

[44] $\frac{9.7\% - 5.25\%}{11.5\% - 5.25\%} = 0.71$; $\frac{9.7\% - 4.7\%}{11.5\% - 4.7\%} = 0.74$

The use of betas that are adjusted toward the equity market beta of 1.0, rather than the calculated "raw" betas, takes account of the observed tendency of low (high) beta stocks to achieve higher (lower) returns than predicted by the simple CAPM. Adjusted betas are a standard means of estimating betas, and are widely disseminated to investors by investment research firms, including Bloomberg, *Value Line* and Merrill Lynch. All three of these firms use a similar methodology to adjust "raw" betas toward the equity market beta of 1.0. Their methodologies give approximately 2/3 weight to the calculated "raw" beta and 1/3 weight to the equity market beta of 1.0.

The following table compares the reported Bloomberg betas (calculated using three years of weekly prices) ending January 2010 for the five major Canadian utilities to calculated "raw" weekly betas for the same three-year period. The Bloomberg betas suggest that the relative risk adjustment based solely on the most recent Canadian regulated company betas would be approximately 0.61. The application of the same adjustment formula used by Bloomberg to the long-term calculated "raw" beta of approximately 0.50 for Canadian utilities shown in Table 5 above results in a relative risk adjustment of 0.67.[45]

Table 7

Company	"Raw" Beta	Bloomberg Beta
Canadian Utilities	0.38	0.58
Emera	0.39	0.59
Enbridge Inc.	0.51	0.64
Fortis	0.48	0.64
TransCanada	0.44	0.60
Average	**0.44**	**0.61**

Source: Schedule 11 and Bloomberg.com.

A comparison of the reported *Value Line* betas [46] to the "raw" calculated betas for the sample of low risk U.S. distribution utilities relied upon in the application of the discounted cash flow (DCF) and DCF-based risk premium test shows a similar relationship. While the "raw"

[45] Adjusted beta = 0.67 x "Raw" Beta + 0.33 x Market Beta of 1.0.
[46] *Value Line* uses a five-year horizon and a weekly price change interval.

calculated weekly betas for the five-year period ending December 2009 averaged 0.55[47], the 4th Quarter 2009 betas reported by the widely disseminated *Value Line* averaged 0.67 for the sample (Schedule 15).

3.c.(5) Relative Risk Adjustment

A summary of the results of the preceding analysis is set out in the table below:

Table 8

Relative Risk Indicator	**Relative Risk Factor**
Total Market Risk (Standard Deviations)	0.65-0.70
Relative Historic Returns and Betas: Canadian Utilities	0.70-0.75
Recent Adjusted Beta: Canadian Utilities	0.61
Long-term Adjusted Beta: Canadian Utilities Index	0.67

These results support a relative risk adjustment in the approximate range of 0.65-0.70.

3.d. Benchmark Distribution Utility Risk Premium and Cost Of Equity

I previously estimated the equity market risk premium at the 2011 forecast long Canada yield of 4.7% and at the longer-term yield of approximately 5.25% at approximately 6.75%. At an equity market risk premium of 6.75% and a relative risk adjustment of 0.65-0.70, the indicated equity risk premium is in the range of approximately 4.4%-4.7%. The cost of equity based on the risk-adjusted equity market risk premium test at the 2011 forecast long-term Canada bond yield of 4.7% is approximately 9.25%, before any adjustment for financing flexibility.

[47] The calculations of the sample betas are sensitive to the period over which the betas are calculated, the price interval chosen to estimate the betas (e.g., weekly versus monthly) and the market index selected (e.g., S&P 500 versus the NYSE Index). The betas calculated using monthly data are systematically lower than the betas calculated using weekly data for the low risk U.S. distribution utility sample.

4. DCF-Based Equity Risk Premium Test

The risk-adjusted equity market risk premium test discussed above estimates the required utility equity risk premium indirectly. That is, it estimates an equity risk premium for the equity market as a whole, and then adjusts it for the relative risk of the utility. The discounted cash flow based ("DCF-based") risk premium test estimates the equity risk premium directly for regulated companies by analyzing regulated company equity return data.

The DCF-based equity risk premium is a forward-looking test which uses the discounted cash flow model and long-term government bond yields to estimate expected utility returns and risk premiums over time. Monthly cost of equity estimates were constructed for the period 1995-2009[48] using the DCF model and a sample of low risk U.S. gas and electric utilities as a proxy for a benchmark Canadian distribution utility.[49] The reasons for choosing U.S. companies generally and gas and electric utilities specifically as a proxy for a benchmark Canadian distribution utility are as follows:

First, there are only six publicly-traded Canadian utilities with conventional corporate structures and with a long-term stock trading history. The nature of the operations of these companies has in several instances changed materially over time. Second, there are insufficient forward-looking estimates of long-term growth rates for these companies that would permit the creation of a consistent series of DCF costs of equity and corresponding risk premiums. A consensus estimate of growth expectations is critical to the application of the discounted cash flow model and to the ability to estimate the relationship between the cost of equity and interest rates.

Third, U.S. regulated companies are reasonable proxies for estimating the cost of equity for a benchmark Canadian gas distribution utility. The operating (or business) environments are

[48] The analysis comprises the full period over which automatic adjustment formulas for setting allowed ROEs have been in effect in Canada.
[49] The selection criteria for the proxy utilities and the construction of the DCF estimates are described in Appendix C.

similar, the regulatory model in the U.S. is similar to the Canadian model, Canadian and U.S. capital markets are significantly integrated and the cost of capital environment, as indicated by relatively similar levels of interest rates, is comparable. Only relatively pure-play U.S. distribution utilities were selected; these utilities are in the same business risk category as the typical Canadian utility[50] and are rated no lower than BBB+/Baa1 by both Standard & Poor's and Moody's. The average debt ratings of the sample are A (S&P) and A3 (Moody's), similar to those of the universe of Canadian utilities with rated debt (Schedules 3 and 15). The median *Value Line* Safety rank of the U.S. distribution utility sample is 1; the Safety ranks of both of the two Canadian regulated companies covered by *Value Line* (TransCanada Corp. and Enbridge Inc.) are higher, at 2.[51] To the extent that the business risks of the U.S. distribution utilities are viewed as of higher business risk than the typical Canadian distribution utility, the U.S. utilities have higher common equity ratios (lower financial risk). The average common equity ratio of the sample of U.S. distribution utilities (based on the average of the last four quarters ending September 2009) was approximately 48% (Schedule 5), compared to a typical common equity ratio for Canadian utilities of approximately 40% (Schedule 4). The benchmark U.S. distribution utility sample contains nine utilities, and is the same sample of companies used to perform the discounted cash flow test (see Chapter VI.C.).

The monthly DCF costs of equity were estimated as the sum of the consensus of analysts' forecasts of long-term normalized earnings growth,[52] plus the expected dividend yield. The equity risk premium is equal to the difference between the sample average DCF cost of equity and the corresponding month-end 30-year Treasury bond yield.

[50] All of the utilities in the proxy sample of U.S. utilities have an "Excellent" business profile, as do the majority of Canadian utilities whose debt is rated by S&P.

[51] The Safety rank represents Value Line's assessment of the relative total risk of the stocks. The ranks range from "1" to "5", with stocks ranked "1" and "2" most suitable for conservative investors. The most important influences on the Safety rank are the company's financial strength, as measured by balance sheet and financial ratios, and the stability of its price over the past five years.

[52] The consensus forecasts are obtained from I/B/E/S, a leading provider of earnings expectations data. The data are collected from over 7,000 analysts at over 1,000 institutions worldwide, and cover companies in more than 60 countries.

For the sample of U.S. distribution utilities, the DCF-based risk premium test indicates an average risk premium over the full 1995-2009 period of 4.3%; the corresponding average long-term government bond yield was 5.4%, approximately 70 basis points higher than the 2011 forecast long-term Canada bond yield of 4.7% (Schedule 12, page 1). From 1999-2009 (which corresponds to the period during which the Régie's ROE formula has been in effect[53]), the average risk premium was 4.6% with a corresponding average long-term government bond yield of 5.0% (Schedule 12, page 1).

For the entire 1995-2009 period, the data demonstrate that there has been an inverse relationship between the long-term government bond yield and utility equity risk premiums. A simple regression analysis between the monthly 30-year Treasury bond yields and the corresponding equity risk premiums indicates that, over the full period, the equity risk premium rose by 55 basis points when the long-term government bond yield fell by 100 basis points and, conversely, the equity risk premium fell by 55 basis points when the long-term government bond yield rose by 100 basis points (Schedule 12, page 2). Expressed in terms of cost of equity, the cost of equity rose (fell) by 45 basis points when the long-term government bond yield rose (fell) by 100 basis points.[54]

Based on this relationship, at the 2011 forecast 30-year government bond yield of 4.7%, the indicated equity risk premium is approximately 4.7%. The indicated cost of equity would be 9.4%.[55] However, this analysis reflects only the relationship between the cost of equity and government bond yields to the exclusion of other factors which impact on the cost of equity.

To capture the impact of other factors, I incorporated corporate bond yield spreads into the analysis. The magnitude of the spread between corporate bond yields and government bond

[53] Initially adopted for Gaz Métro in D-99-11 (February 1999).
[54] For the shorter period, (1999-2009), the equity risk premium increased (decreased) by 47% of the decrease (increase) in the long-term government bond yield (Schedule 12, page 3). In other words, the cost of equity as measured by the DCF test increased (decreased) by 53 basis points for every one percentage point increase (decrease) in the long-term government bond yield
[55] Based on the 1999-2009 regression, the estimated equity risk premium is also 4.7% and the cost of equity at a long-term Canada bond yield of 4.7% is 9.4% (Schedule 12, page 3).

yields is frequently used as a proxy for changes in investors' perception of risk.[56] I estimated the relationship among utility equity risk premiums[57] and the spreads between long-term utility[58] and government bond yields in conjunction with the change in the yield on long-term government bond yields. To estimate this relationship, I performed a second regression analysis using the same two time periods, 1995-2009 and 1999-2009 (Schedule 12, pages 2 and 3). The analysis indicated for both periods that, while the utility risk premium has been negatively related to the level of government bond yields, it has been positively related to the spread between utility bond yields and government bond yields.

The 1995-2009 analysis showed that the equity risk premium increased or decreased by approximately 35 basis points when the government bond yield decreased or increased by 100 basis points and increased or decreased by approximately nine basis points for every 10 basis point increase or decrease in the utility/government bond yield spread (Schedule 12, page 2). By comparison, the 1999-2009 analysis showed an increase (decrease) in the utility risk premium of approximately 50 basis points for every one percentage point decrease (increase) in the government bond yield and a increase (decrease) of 10 basis points in the utility risk premium for every 10 basis point increase (decrease) in the utility/government bond yield spread (Schedule 12, page 3). Based on both periods, the analyses which include both the long-term government bond and the utility/government bond yield spread suggest that the cost of equity has increased or decreased by approximately 50-65 basis points for every one percentage point increase or decrease in the government bond yield and has also increased or decreased by approximately 10 basis points for every 10 basis point increase or decrease in utility/government bond yield spreads.

At the end of January 2010, the spread between long-term Canadian A rated utility bond and 30-year Government of Canada bond yields was approximately 160 basis points. At a 2011 forecast long Canada yield of 4.7% and a utility/government bond yield spread of 160 basis points, the

[56] Or, alternatively, risk aversion i.e., willingness to take risks.
[57] Measured, as in the prior analysis, as the DCF cost of equity minus the long-term government bond yield.
[58] Based on Moody's long-term A-rated utility bond index.

two variable DCF-based equity risk premium model indicates a cost of equity before any adjustment for financing flexibility of 9.3% based on both the 1995-2009 and 1999-2009 two variable analysis (Schedule 12, pages 2 and 3).

The average cost of equity based on both the single and two variable DCF-based equity risk premium approaches over both periods is approximately 9.4%.

5. Historic Utility Equity Risk Premium Test

The historic experienced returns for utilities provide an additional perspective on a reasonable expectation for the forward-looking equity risk premium for a benchmark distribution utility. Similar to the DCF-based risk premium test, this test estimates the cost of equity for regulated companies directly by reference to return data for regulated companies. Reliance on achieved equity risk premiums for utilities as an indicator of what investors expect for the future is based on the proposition that over the longer term, investors' expectations and experience converge. The more stable an industry, the more likely it is that this convergence will occur.

Over the longer-term (1956-2009),[59] the average achieved utility equity risk premium was 4.5% for Canadian electric and gas utilities in relation to total bond returns and 4.3% in relation to bond income returns respectively.[60] For U.S. gas utilities, the corresponding average historic equity risk premiums over the entire post-World War II period (1947-2009) were 5.8% and 5.9% respectively. For U.S. electric utilities, the 1947-2009 average risk premiums were 4.8% and 4.9% (see Schedule 13).

Similar to the risk premiums for the market composite, the magnitude of achieved utility risk premiums is a function of both the equity returns and the bond returns, as summarized for the three utility indices in the table below.

[59] The longest period for which Canadian utility data are available from the TSE.
[60] Based on the Gas/Electric Index of the TSE 300 from 1956 to 1987 and on the S&P/TSX Utilities Index from 1988-2009.

Table 9

	Utility Equity Returns	Bond Total Returns	Bond Income Returns
Canadian Utilities	12.1%	7.6%	7.8%
U.S. Gas Utilities	11.9%	6.1%	6.0%
U.S. Electric Utilities	10.9%	6.1%	6.0%

Source: Schedule 13.

An analysis of the underlying data indicates there has been no secular upward or downward trend in the utility equity returns (Schedule 14); the utility returns in both the U.S. and Canada have clustered in the range of 11.0-12.0%, with a mid-point of approximately 11.5%. However, as noted in Section B.3.b(7) above and in Appendix B, the achieved bond returns (both total and income returns), particularly in Canada, are well above the levels forecast over the longer-term. The forecast 30-year Canada bond yield for the longer-term is approximately 5.25%. Compared to a utility return of approximately 11.5%, the indicated utility equity risk premium is approximately 6.25%. Using the forecast 2011 long-term Canada bond yield of 4.7% and a utility risk premium of 6.25%, the indicated utility cost of equity, before adjustment for financing flexibility, is approximately 11.0%.

6. Cost of Equity Based on Equity Risk Premium Tests

The estimated utility costs of equity based on the three equity risk premium methodologies are as follows:

Table 10

Risk Premium Test	Cost of Equity
Risk-Adjusted Equity Market	9.25%
DCF-Based	9.4%
Historic Utility	11.0%

The three risk premium tests indicate a benchmark utility cost of equity of approximately 10.0% before any allowance for financing flexibility.

C. DISCOUNTED CASH FLOW TEST[61]

The discounted cash flow approach proceeds from the proposition that the price of a common stock is the present value of the future expected cash flows to the investor, discounted at a rate that reflects the risk of those cash flows. If the price of the security is known (can be observed), and if the expected stream of cash flows can be estimated, it is possible to approximate the investor's required return, which is the rate that equates the price of the stock to the discounted value of future cash flows.

Although the DCF test, like the equity risk premium test, has flaws, it has one distinct advantage over risk premium estimates, particularly those made using the CAPM. It allows the analyst to directly estimate the utility cost of equity. In contrast, the CAPM indirectly estimates the cost of equity. In addition, the DCF model is a positive model; that is, it deals with "what is" as opposed to "what should be". The DCF model provides a widely used alternative to the CAPM; it is the principal model utilized by U.S. regulators.

There are multiple versions of the discounted cash flow model available to estimate the investor's required return. An analyst can employ a constant growth model or a multiple period model to estimate the cost of equity. The constant growth model rests on the assumption that investors expect cash flows to grow at a constant rate throughout the life of the stock. Similarly, a multiple period model rests on the assumption that growth rates will change over the life of the stock. To estimate the DCF cost of equity, I utilized both a constant growth and a three-stage

[61] See Appendix D for a more detailed discussion.

model. In both cases, the discounted cash flow test was applied to a sample of U.S. distribution utilities that are intended to serve as a proxy for a benchmark Canadian distribution utility.[62]

The growth component of the DCF model is an estimate of what investors expect over the longer-term. For a regulated utility, whose growth prospects are tied to allowed returns, the estimate of growth expectations is subject to circularity because the analyst is, in some measure, attempting to project what returns the regulator will allow, and the extent to which the utilities will exceed or fall short of those returns. To mitigate that circularity, it is important to rely on a sample of proxies, rather than the subject company. (When the subject company does not have traded shares, a sample of proxies is required.)

Further, to the extent feasible, one should rely on estimates of longer-term growth readily available to investors, rather than superimpose on the analysis one's own view of what growth should be. In the application of the constant growth model, I have relied on two estimates of earnings growth: the I/B/E/S consensus of investment analysts' earnings forecasts and an estimate of the sustainable growth rate.

In the application of the DCF test, the reliability of the analysts' earnings growth forecasts as a measure of investor expectations has been questioned by some Canadian regulators. The issue of reliability arises because of the documented optimism of analysts' forecasts historically. However, as long as investors have believed the forecasts, and have priced the securities accordingly, the resulting DCF costs of equity are an unbiased estimate of investors' expected returns. That proposition can be tested indirectly. For the sample of U.S. distribution utilities used in the DCF test (as well as the DCF-based equity risk premium test), the average expected long-term growth rate, as estimated using analysts' forecasts, for the entire 1995-2009 period of analysis was 4.8%. That growth rate is lower than the expected long-term nominal growth in the

[62] Reliance on U.S. utilities was explained in the discussion of the DCF-based equity risk premium test in Chapter VI.B.4.

economy as a whole has been over the same period.[63] An expected growth rate that is close to that of the economy as a whole would not be out-of-line with the level of growth investors could reasonably expect for the relatively mature utility industries over the longer-term.

As an alternative to the consensus of investment analysts' earnings forecasts, I estimated DCF costs of equity for the sample based on sustainable growth rates derived from *Value Line* forecasts of returns on equity, earnings retention rates and earnings growth from external financing. The development of the sustainable growth rates is explained in detail in Appendix D.

The two constant growth models indicate a cost of equity of approximately 10.2% (Schedules 16 and 17).

The three-stage model is based on the premise that investors expect the growth rate for the utilities to be equal to the analysts' forecasts (which are five year projections) for the first five years, but, in the longer-term to migrate to the expected long-run rate of nominal growth in the economy. The three-stage DCF model is fully described in Appendix D. The three-stage model indicates a cost of equity of approximately 9.75% (Schedule 18).

The two DCF models support a cost of equity, before adjustment for financing flexibility, in the range of 9.75-10.2% (mid-point of 10.0%).

D. ALLOWANCE FOR FINANCING FLEXIBILITY[64]

The financing flexibility allowance is an integral part of the cost of capital as well as a required element of the concept of a fair return. The allowance is intended to cover three distinct aspects: (1) flotation costs, comprising financing and market pressure costs arising at the time of the sale

[63] The average expected long-term nominal rate of growth in the U.S. economy, based on consensus forecasts (Blue Chip *Economic Indicators*, March editions, 1991-2009), has been 5.4% over the same period covered by the DCF-based equity risk premium test.
[64] See Appendix E for a more complete discussion.

of new equity; (2) a margin, or cushion, for unanticipated capital market conditions; and (3) a recognition of the "fairness" principle.

In the absence of an adjustment for financial flexibility, the application of a “bare-bones” cost of equity to the book value of equity, if earned, in theory, limits the market value of equity to its book value. The fairness principle recognizes the ability of competitive firms to maintain the real value of their assets in excess of book value and thus would not preclude utilities from achieving a degree of financial integrity that would be anticipated under competition. The market/book ratio of the S&P/TSX Composite averaged 2.2 times from 1995-2009; the corresponding average market/book ratio of the S&P 500 was 3.2 times.[65]

At a minimum, the financing flexibility allowance should be adequate to allow a regulated company to maintain its market value, notionally, at a slight premium to book value, i.e., in the range of 1.05-1.10. At this level, a utility would be able to recover actual financing costs, as well as be in a position to raise new equity (under most market conditions) without impairing its financial integrity. A financing flexibility allowance adequate to maintain a market/book in the range of 1.05-1.10 is approximately 50 basis points.[66] As this financing flexibility adjustment is minimal, it does not fully address the comparable returns standard.

The cost of capital, as determined in the capital markets, is derived from market value capital structures. The cost of equity has been estimated using samples of proxy companies with a lower level of financial risk, as reflected in their market value capital structures, than the financial risk reflected in the corresponding book value capital structure. Regulatory convention applies the allowed equity return to a book value capital structure. When the market value equity ratios of the proxy utilities are well in excess of their book value common equity ratios, the failure to recognize the higher level of financial risk in the book value capital structure relative to

[65] The market to book ratio of the S&P 500 includes the Utilities. The market to book ratio of the S&P Industrials alone has been higher.
[66] Based on the DCF model as shown in Appendix E, footnote 22.

the financial risk of the proxy samples of utilities, as recognized by equity investors, results in an underestimation of the cost of equity.

Utilities are entitled to the opportunity to earn a return that meets the fair return standard, namely one that provides the utility an opportunity to earn a return on investment commensurate with that of comparable risk enterprises, to maintain its financial integrity and to attract capital on reasonable terms. What must be fair is the overall return on capital. The recognition in the allowed return on equity of the impact of financial risk differences between the market value capital structures of the proxy companies and the ratemaking capital structure is required to ensure that the opportunity to earn a return commensurate with that of comparable risk enterprises. A full recognition of the disparity between the levels of financial risk in the market value capital structures and utility book value capital structures warrants an adjustment to the "bare bones" cost of equity of no less than 100 basis points (See Appendix E and Schedules 19-21).

A reasonable adjustment for financing flexibility to the "bare bones" cost of equity estimated solely by reference to market-based tests (that is, without reference to the comparable earnings test) would be the mid-point of the indicated range of 50 to 100 basis points, i.e., 75 basis points. The addition of an allowance for financing flexibility of 75 basis points to the "bare-bones" return on equity estimate of 10.0% for a benchmark distribution utility, derived from both the DCF and equity risk premium tests, results in an estimate of the fair return on equity of 10.75%.

VII. EQUITY RISK PREMIUM FOR GAZIFÈRE

The final step in the ROE analysis is to determine whether, at Gazifère's proposed equity ratio of 40%, an adjustment to the benchmark distribution utility ROE is warranted.

Gazifère is a very small utility for which there are no directly comparable proxy companies with capital market data from which to estimate the equity risk premium that is required for a utility of its size. In the absence of market data for proxy utilities that are directly comparable, the quantification of the incremental equity risk premium required for Gazifère requires professional judgment.

The table below provides some perspective on the incremental risk premiums that have been adopted for other relatively small Canadian gas distribution utilities in conjunction with their capital structures. The comparison of the smaller utilities to the relevant benchmarks, while admittedly circular, indicates a typical equity risk premium for the smaller utilities (at similar capital structures) of approximately 50 basis points on average.

Table 11

Company	Rate Base ($Millions)	Equity Ratio	Benchmark Utility	Benchmark Utility Equity Ratio	Risk Premium to Benchmark
AltaGas Utilities	166	43%	ATCO Gas	39%	0% [1/]
Natural Resource Gas	13	42%	Enbridge Gas	36%	0.50% [2/]
PNG-West [3/]	130	40%	Terasen Gas	40%	0.65%
Terasen Gas (Vancouver Island) [4/]	555	40%	Terasen Gas	40%	0.50%
Terasen Gas (Whistler) [4/]	43	40%	Terasen Gas	40%	0.50%

[1/] Difference in business risk reflected in capital structure. AltaGas's higher common equity ratio relative to ATCO Gas is equivalent to approximately 25-50 basis points in ROE.
[2/] Combined difference in common equity ratio and ROE with benchmark is equivalent to approximately 100 basis points in ROE.
[3/] Currently applying for increase in common equity ratio to 47.5% and increase in equity risk premium to 75 basis points. Terasen Gas's allowed common equity ratio was raised from 35% to 40% in December 2009.
[4/] Coincident with the BCUC raising Terasen Gas's equity ratio to 40%, directed to file in next revenue requirements application the equity ratio that best reflects the long-term business risks.

On a stand-alone basis, Gazifère would unlikely be able to obtain a debt rating higher than BBB.[67] In comparison, the utilities that serve as the proxies for estimating the cost of equity for a benchmark distribution utility have debt ratings in the A category. An independent estimate of the equity risk premium that is required for Gazifère was made by comparing the cost of equity for a sample of BBB rated U.S. gas and electric utilities to the cost of equity for the benchmark sample of U.S. distribution utilities.

The sample of BBB rated utilities was selected according to the following criteria:

(1) Classified as a gas or electric utility by *Value Line*;

(2) Rated BBB-/Baa3 to BBB+/Baa1 by both Standard & Poor's and Moody's;

(3) Financial Risk Profile of "Significant" or better by Standard & Poor's.[68]

The companies which met the selection criteria are shown on Schedule 22.

Table 12 below compares *Value Line* betas, DCF costs of equity (constant growth based on analysts' forecasts and sustainable growth, and three-stage) and capital structures for the benchmark sample of distribution utilities and the sample of BBB rated utilities.

[67] Gazifère's stand-alone cost of debt is estimated based on a debt rating of BBB/BBB (low).

[68] Standard & Poor's assigns both business and financial risk profile rankings to all the utilities that it rates. There are six business risk profile rankings, ranging from "Excellent" to "Vulnerable", and six financial risk profile rankings, ranging from "Minimal" to "Highly Leveraged." Utilities in the two highest financial risk categories, "Aggressive" and "Highly Leveraged" were excluded in order to minimize the differences in cost of equity between the BBB and benchmark samples due solely to differences in financial risk.

Table 12

Sample	*Value Line* Betas		DCF Cost of Equity (Median)			Common Equity Ratio (2004-2008) (Average of Annual Medians)
	(4thQ 2009) (Median	(2005-2009) (Average of Annual Medians)	Constant Growth (Analysts' Forecasts)	Constant Growth (Sustainable Growth)	Three-Stage	
Benchmark	0.65	0.75	10.0%	9.9%	9.7%	46%
BBB rated	0.75	0.82	10.8%	10.4%	10.2%	46%
Difference in Cost of Equity	0.675% [1/]	0.5%[1/]	0.8%	0.5%	0.5%	---

[1/] At estimated market risk premium of 6.75%.

Source: Schedules 16-18 and 23-27

The application of both the CAPM[69] and the DCF models indicates a difference between the cost of equity for the benchmark and BBB rated samples in a range of 0.50%-0.80%. Since the book value capital structures of the two samples are identical, the differences in the samples' cost of equity can be attributed to business risk differences, rather than financial risk differences. In other words, no adjustments to the costs of equity for the samples need to be made to account for differences in financial risk. The comparison of the costs of equity for the two samples supports an equity risk premium for Gazifère within the range estimated for the two samples.

An alternative approach to estimating the incremental ROE is by reference to the studies on small size and returns conducted by Ibbotson Associates Inc.[70] These studies have quantified the impact of a firm's small size on the required return by an analysis of the relationship between betas and historic returns for companies of different sizes. The analyses indicate that small companies tend to exhibit higher betas than larger companies. In the Ibbotson classification of stocks, if Gazifère were a stand-alone publicly traded stock, it would be a Micro-Cap stock (market value of equity of less than $450 million). By comparison, both the typical publicly-traded Canadian regulated company and benchmark U.S. distribution utility used to estimate the

[69] The differential based on the CAPM would be higher if the sample betas were calculated using monthly, rather than weekly, price changes.

[70] Morningstar, *Ibbotson SBBI 2009 Valuation Yearbook: Market Results for Stocks, Bonds, Bills and Inflation, 1926-2008*, pages 89-110.

benchmark distribution utility ROE would be a Mid-Cap stock (market value of equity in the range of approximately $1.8-$7.4 billion; see Schedule 19). Ibbotson's analysis indicates the betas of Micro-Cap stocks have been approximately 0.32 higher than those of Mid-Cap stocks. An incremental beta of 0.32, when applied to a market risk premium of 6.75%, supports an incremental equity risk premium of over 200 basis points (6.75% x 0.32) for a Micro-Cap company, e.g., Gazifère.[71]

Based on this analysis, an incremental equity risk premium relative to the ROE for a benchmark distribution utility of no less than 0.50% is warranted for Gazifère. With an incremental equity risk premium of 0.50%, my recommended ROE for Gazifère for test year 2011 is 11.25%.

VIII. AUTOMATIC ADJUSTMENT MECHANISM

The key advantages of an automatic adjustment mechanism are as follows:

1. It reduces the regulatory burden imposed by the annual determination of ROEs.
2. It results in increased predictability of the allowed returns;
3. It avoids any potential arbitrariness of the outcome.

In Decision D-2009-156 the Régie noted the first advantage of relying on an automatic adjustment formula to set allowed ROEs. I do not disagree that an automatic adjustment formula can be a useful tool, provided that the ROEs it produces meet the three requirements of the fair return standard.

[71] Ibbotson's industry-by-industry analysis shows that the conclusions regarding the firm size effect apply to regulated companies as well as unregulated companies. Based on 82 years of data, Ibbotson's analysis shows that the returns for small publicly-traded electric, gas and sanitary utilities have been approximately 1.5 and 3 percentage points higher on a compound and arithmetic average basis respectively than those of large utilities. Morningstar, Ibbotson SBBI, *2008 Valuation Yearbook: Market Results for Stocks, Bonds, Bills and Inflation, 1926-2007*, pages 154-155.

Any ROE formula should be governed by three criteria:

1. Accuracy
2. Simplicity
3. Transparency.

The criterion of accuracy relates to the ability of the formula to reasonably quantify changes in the cost of equity over time. The results of any formula, no matter how complex, will only be an approximation of the cost of equity. Thus, the importance of accuracy should be weighed against the other two criteria. While the cost of equity and its determinants are complex, simplicity, both in terms of understanding the results and the application of the formula itself, is an important consideration to stakeholders, including ratepayers. Transparency simply means that the values of any variables that are used in the implementation of the formula are clearly defined, independently produced and easily verifiable.

As discussed in Chapter II, the existing automatic adjustment formula needs to be revised. In constructing a revised formula, the long-term government bond yield remains a relevant component, as long as (a) the sliding scale factor adopted reasonably reflects the relationship between long-government bond yields and the cost of equity and (b) the government bond yield is supplemented with a variable which more directly captures movements in the cost of equity.

An obvious potential complementary explanatory variable for long-term Government of Canada bond yields in an ROE formula is the spread between government and corporate bond yields.[72] Since both debt and equity holders have financial claims on the same cash flows of a

[72] Changes in dividend yields are another alternative. The major drawbacks of using dividend yields in a formula are: (1) there is no "preset" index of comparable companies whose dividend yields could be tracked. Stakeholders would need to agree on a sample of companies which would serve as a proxy for a benchmark utility and (2) a change in dividend yield may signal a change in investor growth expectations rather than a change in the cost of equity.

corporation, all other things equal, it makes logical sense that changes in a firm's cost of equity will track changes in its cost of debt.

Corporate bond yield spreads are a widely used variable for explaining and estimating equity returns. Various empirical studies have shown that there is a positive correlation between corporate yield spreads and the equity risk premium.[73]

The relationship between the equity risk premium, long-term government bond yields and corporate bond yield spreads for regulated companies was tested two ways. First, the allowed ROEs adopted for U.S. utilities were used to test the sensitivity of the utility cost of equity to changes both in long-term government bond yields and utility bond yield spreads. The average allowed ROEs can be viewed as a measure of the utility cost of equity as they represent the outcomes of multiple rate proceedings across multiple jurisdictions, which in turn reflect the application of various cost of equity tests by parties representing both the utility and ratepayers.

Quarterly allowed ROEs from 1995 (the year the initial automatic adjustment mechanism was applied in Canada by the BCUC) through 2009 were regressed against long-term Treasury bond yields and the spread between A rated utility and Treasury bond yields.[74] The results of the analysis indicate that the allowed ROEs increased or decreased by 47 basis points for every one percentage point increase or decrease in the long-term government bond yields and increased or decreased by 27 basis points for every one percentage point increase or decrease in utility bond yield spreads.[75]

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[73] Examples include: Chen, N. F., R. Roll and S. A. Ross, 1986, "Economic Forces and the Stock Market", *Journal of Business*, 59, pages 383-403 and Harris, R.S. and F.C. Marston, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts", Summer 1992, *Financial Management*, pages 63-70.

[74] The government bond yields and the spread variables were lagged by six months behind the quarter of the ROE decisions to take account of the fact that the dates of the decisions will lag the period covered by the market data on which the ROE decisions would have been based.

As noted in Chapter II, excluding the spread as a second explanatory variable, the regression indicates that the allowed ROEs changed by approximately 40 basis points for every one percentage point change in long-term government bond yields.

[75] The regression is: 7.91 + 0.47 x 6 Months Lag of 30 Year Treasury + 0.27 x 6 Months Lag of Spread.

The relationship between the cost of equity, long-term government bond yields and corporate bond/government bond yield spreads was also tested, as discussed in Chapter VI.B.4., using the discounted cash flow approach applied consistently over time to the benchmark U.S. distribution utility sample. To summarize, over the period 1995-2009, the regression analysis indicated that the cost of equity increased (decreased) by approximately 65 basis points for every one percentage point increase (decrease) in the long-term government bond yield and increased (decreased) by approximately 90 basis points for every one percentage point increase (decrease) in the utility/government bond yield spread.[76] Over the period 1999-2009, with 1999 corresponding to the year the Régie's automatic adjustment formula was first implemented, the cost of equity increased (decreased) by 53 basis points for every one percentage point increase (decrease) in the long-term government bond yield and increased (decreased) by approximately 100 basis points for every one percentage point increase (decrease) in the utility/government bond yield spread.[77]

The greater sensitivity of the DCF-based estimates of the cost of equity to changes in the spreads than the allowed returns is understandable for at least two reasons. First, the allowed returns are likely to reflect the application of various tests, which would tend to mute the true relationship between the cost of equity and the spread. Second, the correspondence from a timing

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Incorporating utility bond yields directly into the analysis by regressing the quarterly allowed ROEs against long-term A rated utility bond yields indicates that the allowed ROEs have increased (decreased) by approximately 46 basis points for every one percentage point increase (decrease) in the A rated utility bond yield.

[76] The regression for 1995-2009 using ROEs (rather than risk premiums) as the dependent variable is: ROE = 4.75 + 0.66 X 30 Year Treasury (t-stat of 15.26) + 0.92 X Utility/Government Bond Yield Spread (t-stat of 13.64); R^2 of 63%.
Using the long-term government bond yield as the sole independent variable, the ROE increased (decreased) by 45 basis points for every one percentage increase (decrease) in the long-term government bond yield.

[77] The regression for 1999-2009 using ROEs as the dependent variable is: ROE = 5.28 + 0.53 X 30 Year Treasury (t-stat of 7.62) + 0.98 X Utility/Government Bond Yield Spread (t-stat of 12.65); R^2 of 63%. Using the long-term government bond yield as the sole independent variable, the ROE increased (decreased) by 53 basis points for every one percentage increase (decrease) in the long-term government bond yield.

perspective between the costs of equity and the utility bond yields is less precise using the allowed returns as the proxy for the cost of equity than the DCF-based costs of equity.

The two analyses together support the conclusions that:

1. The sensitivity of the ROE to changes in long-term government bond yields is materially lower than the 75% factor in the original formula;

2. Although the two analyses produce different estimates of the sensitivity, the ROE is positively related to the change in utility/government bond yield spreads.

Based on the results of the above analyses, I recommend that the Régie's automatic adjustment formula be revised as follows:

1. Reduce the relationship between the forecast long-term Government of Canada bond yields and the benchmark ROE from 75% to 50%; and

2. Add a second explanatory variable, corporate bond yield spreads, to the original formula with the same 50% sliding scale factor.

The resulting adjusted formula can be expressed as:

$$\mathbf{ROE_{New} = Initial\ ROE + 50\%\ X\ (Change\ in\ Forecast\ GOC\ Bond\ Yield) + 50\%\ X\ (Change\ in\ Corporate\ Bond\ Yield\ Spread)}$$

The proposed revised formula is analogous to the automatic adjustment formula that was adopted by the Public Utilities Commission of the State of California (CPUC) in May 2008 to set the

ROEs for the utilities under its jurisdiction.[78] The California adjustment mechanism adjusts the ROE by 50% of the change in utility bond yields.[79] It is virtually identical to the refined automatic adjustment formula adopted by the OEB in EB-2009-0084.[80]

Under the revised formula, the forecast long-term Government of Canada bond yield would be estimated in a similar way as it was under the original automatic adjustment formula. For Gazifère, the forecast long-term Canada bond yield would be estimated using the October Consensus Economics, *Consensus Forecasts* of 10-year Government of Canada bond yields plus the September actual average daily spread between 30-year and 10-year Government of Canada bond yields.[81] The relevant corporate bond yield spreads would be calculated using the actual difference between the yields on the long-term A rated Corporate Bond Index available from TSX Inc. and the yields on long-term Canada bonds prevailing at the time of the *Consensus Forecasts*.[82]

Schedule 28 shows what the National Energy Board's multi-pipeline ROEs would have been under this revised formula had it been adopted initially, compared to the ROEs produced by the formula actually adopted in *Reasons for Decision*, RH-2-94, May 1995. I used the NEB ROEs for comparative purposes, as the NEB's formula is virtually identical to the Régie's formula, was one of the first formulas adopted in Canada, remained unchanged between the issuance of RH-2-

[78] Public Utilities Commission of the State of California, *Decision Establishing a Multi-Year Cost of Capital Mechanism for the Major Energy Utilities*, May 29, 2008.
[79] Previously the CPUC had conducted annual cost of equity reviews. Under the new approach, it will conduct cost of equity reviews every three years, with the automatic adjustment mechanism used to set ROEs during the interim years. The utility bond yields to be used in the adjustment mechanism for each utility will be governed by the specific utility's debt rating, that is, if the utility's debt is rated A, its ROE will be adjusted by 50% of the change in A rated utility bond yields. The operation of the mechanism is also subject to a trigger of 100 basis points. The ROEs will not be adjusted unless the relevant long-term utility bond yields change by more than 100 basis points.
[80] The principal difference is that the proposed revised formula relies on long-term A rated corporate bond yield spreads, whereas the revised OEB formula relies on long-term A rated utility bond yield spreads which are obtained from Bloomberg. The index selected by the OEB is a reasonable alternative to the A rate Corporate Bond Index proposed here.
[81] The Régie uses yields and spreads obtained from Bloomberg. Daily yields and spreads between the benchmark long-term and 10-year Canada bonds are also available at www.bankofcanada.ca.
[82] The index, the DEX Long Term Bond Index-Corporate A, formerly published by ScotiaCapital, is available by subscription from TSX Inc.

94 and its rescission in 2009[83], and the results of which were published each year since inception.

The resulting average indicated ROE for 1996-2009 under the revised formula is 10.7%, versus 9.6% under the RH-2-94 formula. To put this in perspective, the 10.7% average adjusted ROE compares to an average ROE adopted by regulators for U.S. gas distribution and electric utilities of 10.9% over the same period. The similarity in the average ROE produced by the adjusted formula and the average allowed ROEs for U.S. utilities is a reasonable outcome, given the similarity in the cost of capital environments in the two countries. As noted above, from 1998-2009, the average long-term Government of Canada and U.S. Treasury bond yields were within 10 basis points of each other (4.98% versus 5.07%). The average yield on long-term A rated corporate bonds in the two countries was identical (6.3% in both countries).[84]

Based on the proposed revised formula, the forecast long-term Canada bond yield of 4.7% and a long-term A rated corporate bond yield spread of 172 basis points[85], the 2011 multi-pipeline ROE would be 10.48%, compared to 8.82% under the RH-2-94 formula.

It is critical to recognize that the formula adopted has to be internally consistent with assumptions made setting the initial allowed ROE. It is perhaps obvious that it would not be reasonable to implement the proposed revised formula without resetting the allowed ROE at a level that explicitly recognizes that the ROEs that have been allowed since the Régie adopted its automatic adjustment mechanism reflect a much greater sensitivity to changes in long-term Canada bond yields than the empirical evidence supports.

Given the unpredictability of capital markets, there is sufficient potential for any automatic adjustment mechanism based on relatively simplistic relationships among variables to produce

[83] The BCUC adopted an automatic adjustment formula in 1994, but changed the adjustment factor several times between 1994 and 2009, when it eliminated the automatic adjustment mechanism.
[84] Measured by the DEX Long Corporate A index and Moody's Long-term A Rated Corporate Bond Yields for Canada and the U.S. respectively.
[85] Average of month-ends December 2009 and January 2010.

ROEs that deviate from a fair return. Consequently, establishing a process for a review on a regular basis would be prudent. Establishing a process for review of the ROE and formula every five years would balance the objective of achieving regulatory efficiency with the obligation to establish a fair return.

Specifying that the ROE would be subject to review once every five years does not mean that the Régie would have to instigate a comprehensive proceeding, but that the Régie would seek comments from stakeholders on a regularly scheduled basis as to the need for a review.

In addition to the recommended process for review of the return on equity, a trigger mechanism can provide an additional safeguard to ensure that the fair return standard continues to be satisfied. As the proposed formula incorporates both changes in the forecast long-term Government of Canada bond yield and corporate bond yield spreads, I recommend that a trigger mechanism be expressed in terms of a range around the recalibrated initial ROE. While the determination of an appropriate range is largely a judgment, a range of plus or minus 200 basis points would be reasonable.

If the ROE calculated by reference to the proposed revised formula were to be more than 200 basis points above or below the initial recalibrated ROE adopted for Gazifère, the underlying economic and capital market conditions would have changed sufficiently from current and forecast conditions to justify a canvassing of stakeholders to determine whether a formal review of both the starting ROE and formula is warranted. A plus or minus 200 basis point range on the ROE with the proposed revised formula corresponds to a ceiling on the forecast long-term Canada bond yield of approximately 8.70%.

While the establishment of a trigger mechanism may mitigate the need to conduct a comprehensive review on a regularly scheduled basis, it does not eliminate the need to ascertain on a regular basis whether the automatic adjustment formula is continuing to produce ROEs that meet the fair return standard.

While both a specified schedule for review and a trigger mechanism would provide important safeguards, stakeholders should retain the right to seek earlier review should changes in economic and capital market conditions so warrant.