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September 8, 2009

VIA RESS and COURIER

Ontario Energy Board
P.O. Box 2319, 27th Floor
2300 Yonge Street
Toronto ON M4P 1E4

Attention: Ms. Kirsten Walli, Board Secretary

Dear Ms. Walli,

Re: Consultation on Cost of Capital - Board File No. EB-2009-0084

We are counsel to Great Lakes Power Transmission LP ("GLPT"). In respect of the above-noted matter, attached are the responses of GLPT prepared in conjunction with Power Advisory LLC relating to the Board's prescribed issues in this matter. Also attached for the Board's consideration is a report prepared by Power Advisory LLC on behalf of GLPT setting out in greater depth an analysis of the application of the ERP formula and the need to change from the current approach.

GLPT has made this submission using RESS and has sent three hard copies to the Board via courier.

Yours truly,

Charles Keizer

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IN THE MATTER OF a consultation by the Ontario Energy Board on the Cost of Capital for Electricity Distribution Companies

Issues for Discussion at Stakeholder Conference

1. **What method(s)/test(s) might the Board formally consider to determine whether the return on capital meets: (i) the comparable investment standard; (ii) the financial integrity standard; and (iii) the capital attraction standard?**

a) Methods for calculating return on equity

A range of different approaches have been employed across North America to establish the appropriate return on equity ("ROE"); the National Energy Board ("NEB") has recently proposed and accepted a different methodology for calculating the cost of capital. Each of these methods has advantages and disadvantages in setting the ROE. The appropriateness and reliability of these methods will vary depending on economic and capital market conditions. We briefly review them here.

The three methods most commonly employed are

1. The Discounted Cash Flow (DCF) model
2. The Capital Asset Pricing Model (CAPM)
3. The Equity Risk Premium (ERP) model.

The National Energy Board recently accepted the After-Tax Weighted Average Cost of Capital (ATWACC) methodology in its decision (RH-1-2008) on the appropriate cost of capital for the Trans Quebec & Maritimes Pipeline, Inc. (TQM).

In addition to their ability to meet the Fair Return Standard outlined in the question, criteria often applied to models for the determination of ROE are ease and transparency of application, sensitivity to cross-entity variations like risk, and ability to respond readily to changes in financial and economic market conditions which affect the regulated entities. The National Energy Board also discussed the ability of the ATWACC to allow comparisons across different financial structures.

i) DCF

The DCF methodology sets the ROE as that discount rate which will make the expected future cash flows (dividends plus share price appreciation) equal to the current value of the equity. The ROE is therefore set at the rate of return which is already implicit in the value of the company's stock. To account for normal stock price fluctuations, the calculation is averaged over some period. The advantage of this methodology is that it is entirely market-oriented, letting the ROE reflect the market's valuation. Difficulties include potential variability in the ROE as the stock price and expectations fluctuate and, for Ontario, the fact that most electricity distribution and

transmission utilities are not publicly traded and hence have no open market valuation. This method meets the comparable investment standard by virtue of its market orientation and use of a peer group of similarly situated utilities. It meets the financial integrity standard by setting ROE at the level expected by shareholders, and the capital attraction standard similarly by setting the ROE at a rate that attracts capital.

ii) CAPM

The CAPM model's structure is similar to the ERP approach, but it relies on market valuations by looking specifically at the relationship between the subject stock and the market. It calculates the ROE as an underlying risk-free rate plus a factor that measures the degree to which changes in the value of the utility stock are correlated with changes in the overall market. The formula for the CAPM is

$$K_e = r_f + \beta(r_m - r_f),$$

where r_f is the risk-free market rate of return and r_m is the rate of return for the market. β is the covariance between the company's return and the market; that is, it measures the extent to which the company's returns are influenced by the same factors as the market as a whole. With this model, the ROE is determined by current market interest rates and the historical relationship between the company's returns and those of the market. The advantage of this methodology is that it reflects the market's historical perception of the risk of a specific company. Disadvantages for Ontario include that, like the DCF model, it relies for its value on the performance of the stock in the market, while Ontario most distributors and transmitters are not publicly traded and therefore have no readily discoverable relationship between their returns and those of the market.

iii) ERP

The ERP model assumes that equity is more risky than debt, since the equity owners share in the residual profits, not in the interest (which is paid before profit is calculated.) To compensate for this risk, they expect a higher rate of return than the interest rate the firm is paying to lenders. The ERP model therefore adds an equity risk premium to a risk-free (market-based) rate of interest. The model used by the Board is expressed as

$$K_e = K_0 + \gamma(r_{forecast} - r_f)$$

Where K_0 is the original ROE in the first year of the program, r_f is the risk-free rate (the yield on long-term government bonds) at the time the formula was established, $r_{forecast}$ is the current forecast of the long-term government bond rate. γ is a parameter that represents the responsiveness (or elasticity) of ROE to changes in the long-term government bond interest rate forecast. For Ontario electricity distributors, k_0 is 9.35%, r_f is 5.5% and γ is .75. The advantage of this method is that it is transparent and, having been in use for over a decade in Ontario, familiar and understandable to everyone. Its disadvantages include its inability to respond to changing conditions either of the market or of the relative risks of one or more of the regulated entities. In addition, changes in ROE are based solely on changes in the long-term government

bond rate. Therefore, it is insensitive to changes in other financial market conditions. It also provides the same ROE to all distribution utilities, which does not recognize their varying degrees of risk.

b) Tests for determining whether the return meets the three standards

We would suggest three sets of empirical tests to determine whether each of the standards is being met:

(i) comparisons of the ROE to those of other utilities, such as those in the United States (which the NEB recognized as a valid comparator group in its recent TQM decision);

(ii) financial market measures for financial integrity, such as times interest coverage; and

(iii) actual cost of capital to utilities, such as the credit spread relative to a benchmark debt.

A simple and simplistic measure of whether returns are fair is to observe whether new investors are seeking to invest. The Ontario transmission market should be attractive due both to the anticipation that it will need significant capital investment to expand in the near future, and the flexibility of the regulatory framework to accept new transmitters. It is instructive to compare the number of transmission investors looking to invest in Ontario with the recent experience in the regulated Texas electricity market, where in excess of a dozen investors both from within and outside Texas competed to participate in the $5 billion transmission investments mandated by the state's Competitive Renewable Energy Zone initiative.

2. **That new firms have not entered and do not appear to be seeking to enter is one indication that the market is not attracting interest, which could be due to the inability of firms to earn returns commensurate with risks, which means that it is not meeting the capital attraction part of the FRS. Is the current deemed capital structure appropriate? If not, what alternative(s) might the Board consider?**

The critical issue for this stakeholder consultation is the ERP formula. This should be the focus of this investigation. GLPTLP is not proposing to take a position on the appropriate debt/equity ratio for electric transmission or distribution companies in Ontario at this time.

3. **Should the approach to setting cost of capital parameter values differ depending on whether a distributor finances its business through the capital markets or through government lending such as Infrastructure Ontario or through bank lending? If so, what would be the implications, if any, of doing so?**

The approach to setting the cost of debt should reflect the underlying cost of the debt to which the utility has access. If the utility has access to lower cost debt from Infrastructure Ontario then the utility's cost of debt assumptions should reflect this.

However, the same approach should be used to establish the ROE for all utilities regardless of whether the utility must access equity from public markets or from a government entity. In both instances, the ROE must provide the owners of the company with returns sufficient to attract

capital, and for utilities reliant on capital markets, the return have to meet the expectations of the capital markets. Government-owned utilities should not be discriminated against (and have lower regulated ROEs) because of their public ownership and lack of need to access the capital markets.

Furthermore, there are risks associated with government-owned utilities that are not adequately recognized. With the taxpayer effectively the equity owner, taxpayers bear the risks associated with insolvency of the utility and this is at a time when provincial and municipal budgets are stressed by the financial downturn. This is the same risk faced by equity in investor-owned utilities and the compensation should be similar.

Government-owned utilities should receive the same market-based ROE as investor-owned utilities to ensure that capital is efficiently allocated. If they receive a lower ROE than investor-owned utilities then this may contribute to over investment in distribution and transmission infrastructure recognizing that the generation sector can be a "competitor for investment" and it relies on private capital which must earn a market-based return over the long run. Demand side management and conservation can also be competitors for investment. Where capital intensive transmission or distribution investment competes with less capital intensive demand side management and conservation measures, the allocation of investment between transmission and distribution assets and conservation will be based on the respective costs of these investments. Therefore, if the costs of capital for transmitters and distributors are understated by setting an ROE which is too low, there will be too much transmission and distribution investment. .

4. Does the analysis in the Concentric Report provide a reasonable foundation for satisfying the comparable investment test standard?

Yes. The Concentric Report performed significant analysis to construct a comparable group of utilities in the United States. First, they considered the criteria that bond rating services apply to determine risk.[1] Then, they considered a set of screening criteria to establish similarity. Ultimately, they concluded that the gas distributors in Ontario are largely comparable to those in the United States.[2] In addition, Concentric narrowed its sample to eight US utilities which could, by the criteria, be considered most comparable to those in Ontario. Again, they concluded that there remains a clear difference in allowed ROEs between Ontario utilities and comparable utilities in the United States. This analysis developed and considered reasonable criteria to measure comparability, gathered the available data, and applied the criteria. The study therefore forms a reasonable foundation for satisfying the comparable investment test standard.

A similar evaluation by NERA concluded "that the regulatory environments in Canada and the US are highly similar and directly comparable." (Allowed Return on Equity in Canada and the United States – An Economic, Financial and institutional Analysis, National Economic

[1] Concentric Energy Advisors, "A Comparative Analysis of Return on Equity for Natural Gas Distributors", June 14, 2007, prepared for the Ontario Energy Board, pg. 27.

[2] Concentric Energy Advisors, pg. 32.

Research Associates, Inc., Kenneth Gordon, Ph.D. and Jeff D. Makholm, Ph.D., February 2008, p. 6).

5. If not, what might the Board use as a comparator group?

Based on the Concentric and NERA analyses, US utilities can represent a reasonable comparator group. Since most regulators in Canada now use the ERP formula, comparing returns in Ontario to returns elsewhere in Canada does not allow for a test of the ERP formula itself. There is circularity in that comparison, given that the other jurisdictions in Canada employ the same basic approach for establishing ROEs.

The Concentric Report notes that returns to utilities in Canada were about equal to those in the United States before the widespread adoption by Canadian regulators of the ERP formula. Since then, as the Concentric Report also shows, ROEs in Canada have fallen relative to those in the United States.

6. Were the Board to only consider the use of Canadian utilities as a comparator group, is there an issue with circularity, given that the ROEs of these utilities are, and have been established by a mechanism similar to currently used by the Board?

Yes, there is a circularity issue with the use of Canadian utilities as a comparator group. This is supported by the high correlation coefficient (0.88) between Canadian utility ROEs and Long Canada Bond rates.

The Concentric study established that the disparity in ROEs between gas distribution utilities in Canada and the United States extends throughout Canada. They noted, for example, that the range of ROEs in Canada does not overlap at all with those in the United States.[3] Since a common factor among the Canadian utilities – the use of the ERP formula – is at issue here, it is not possible to use Canadian utilities to compare the results of the formula to those with some other approach to setting ROE.

7. Should the ERP approach be reset given that when the formula was first established the reference bond rate was 8.75%?

Yes. If the current ERP formula is retained in its present form, it must be reset in light of significant changes in Canadian and North American economies and capital markets. These changes and current financial market conditions are delineated in more detail in the Power Advisory Report filed with this response.

Briefly, financial market conditions and utility risks have changed dramatically since the ERP formula was first established. In 1997, the Government of Canada had reduced, but not yet

[3] Concentric Energy Advisors, pg. 24.

eliminated, its budget deficit. The deficit was not forecast for elimination for two more years[4]. The inflation rate had stayed below 5% for about five years. The inflationary expectations built into the markets had not yet fully been removed, but the influence began to be felt in 1997.

For the first five months of 1997, the monthly average yield on 30-year Government of Canada benchmark bonds was above 7%. It has not reached that level again. Yields began to drop from the middle of 1997 on, finishing the year just below 6% and with an annual average of the monthly averages of 6.66%. The following year, yields had dropped further to average 5.59%. So conditions in Canadian financial markets were changing in 1997 and have continued to change. As the Report pointed out, the monthly average yield on the 30-year benchmark bonds had not been below 4% until 2008, and only for one month before November of 2008. Since November of 2008, the yield has been consistently below 4%.

This low yield reflects the current monetary policy which is aimed at stimulating the economy through expanding the money supply and reducing interest rates. Government of Canada bond yields are therefore at lows not seen in more than 30 years. At the same time, the recession has worsened corporate performance and raised investors' perceptions of risk in corporate equities. Investors have therefore demanded higher risk premiums for corporate (including utility) equities.

Directionally, the yields on long-term Canadian government bonds and corporate returns on equity have diverged. Any relationship that held in 1997 no longer holds.

8. Should the ERP approach be reset on a regular basis (e.g., every 4 or 5 years) to mitigate the issues described in the 1997 Compendium?

Yes, if the ERP approach is retained, at a minimum it should be reset every 4 or 5 years. While the Power Advisory Report outlines two alternative ERP formulas that should be more robust and the ROE estimates that they generate less subject to bias and distortions from market events than the Board's current ERP formula, a regular reset of the ERP formula is appropriate given the potential for bias being compounded in the ROEs. The *Compendium to Draft Guidelines* acknowledged that "over time these parameters and adjustment factors will have a cumulative or compounding effect on the results of the formulaic ROE mechanism. The use of an inappropriate initial ROE will either inflate or understate subsequent rate determinations."[5] Therefore, with this compounding effect a small mis-specification of the formula can result in significant bias in the ROE determination over time. To a large degree using the ERP formula to establish the ROE for utilities is akin to driving using the rear view mirror. The relationship embedded in the ERP formula is based on the past performance of the financial and credit markets and in no way reflects changes in this relationship that could occur in the future. This argues for re-evaluating the appropriateness of the ERP formula on a regular basis. This potential for compounding bias

[4] Government of Canada, Department of Finance, Economic and Fiscal Update, October 1997.

[5] p. 6.

in the ERP approach is another reason for a thorough review of the Cost of Capital methodology used by the Board.

9. How might the Board address the potential issues arising from the application of the current methodology as a single, point-in-time calculation?

One strategy for reducing the weight given to current conditions which might not be representative of future conditions is to use averages for parameter values that are used in the model. Whether averaging is appropriate depends on whether it neglects current information that might better reflect anticipated future market conditions. Exponential smoothing techniques could be used to weight more heavily the historical lagged data that has proven to be the best predictor of the future. The use of consensus forecasts for the future bond yields is valuable given that it better reflects anticipated future market conditions and that consensus forecasts have been shown to be more accurate than individual forecasts.

10. How should the Board establish the initial ROE for the purposes of resetting the methodology?

To properly and fairly review such a central aspect of the regulation of electricity and gas distributors in Ontario as the initial ROE , the Board should conduct a formal proceeding with evidence from all stakeholders. The proceeding should focus on both the methodology for setting the ROE and the level of the initial ROE.

In such a proceeding, all stakeholders would be able to present evidence on such matters as the degree to which the ERP formula meets the Fair Return Standard; what alternative methodologies they would prefer to the current ERP formula, and the initial level of ROE they believe meets the criteria. The issues list for this proceeding should be broad enough to allow a thorough discussion of these various methodologies and testing of the evidence supporting or opposing them.

After hearing the evidence and the submissions of the participants in the hearing, the Board would decide on a new (or revised) methodology. It would also determine the initial level of ROEs to be set under the new methodology. As the first application, the initial ROE should be a result of the application of the methodology to the then current conditions.

Since, as we and others have argued in these responses, the current conditions of the financial markets are not typical of the immediate past and will probably change as the economic and financial situation of Canada changes, the Board will need to take particular care to ensure that the initial ROE that it sets meets the FRS criteria and that it will not set a biased level that the ongoing methodology (like the ERP methodology) will only magnify.

11. Is the government (of Canada) bond yield the appropriate base upon which to begin the return on equity calculation.

Not necessarily. Long Canada Bonds are a distinctly different financial instrument than utility equities, with different risks and different determinants of prices and value. Long Canada Bonds

are low risk. Long Canada Bond rates are driven by monetary and fiscal policy and reflect investor expectations regarding future inflation and the real cost of capital. Long Canada Bonds have little credit or return risk. Utility equities have all these risks and bear greater return and credit risk than Long Canada Bonds. Therefore, it is inappropriate to attempt to forecast utility ROEs by only considering Long Canada Bond rates.

Power Advisory proposed two alternative models in the attached report prepared for GLPTLP. The first model established utility ROEs based on BAA corporate bond yields with a 6 month lag. This model specification would be relatively easy to implement. The second model established utility ROEs based on the 30 year government bond yield with a six month lag and market expectations regarding near term volatility of a stock market index with a six month lag. Both models performed better in terms of standard econometric measures than just using the government bond yield as the sole explanatory variable.

12. What is the relationship between corporate bond yields and the corporate cost of equity? Is this relationship sustainable?

This relationship is more stable than that between Long Canada Bond and corporate cost of equity. Regression analysis results indicate that corporate bond yields are a better predictor of utility ROEs than Long Canada Bond rates. The adjusted r^2 for a regression where Long Canada Bonds is the sole explanatory variable (along with a constant) is 0.864 versus 0.889 where a BAA corporate bond is the sole explanatory variable (along with a constant).

As discussed in the attached report prepared for GLPTLP by Power Advisory, corporate bonds will better reflect the impact of changes in credit risks. Such changes aren't likely to affect the rates for Long Canada Bonds, but would affect the rates for corporate bonds and utility ROEs.

13. Does the current approach used by the Board to calculate the ERP remain appropriate? If not, how should the ERP be calculated?

The current approach used by the Board to calculate the ERP isn't appropriate. As discussed further in Power Advisory's September 8th report, the Board's ERP formula overstates the relationship between Long Canada Bond rates and utility ROEs and as a result understates the required ROE to satisfy the Fair Return Standard. In the short-term the ERP formula should be revised by replacing the "0.75" coefficient with a value of from "0.45" to "0.50". Longer term the ERP formula should be revised and based on the relationship between corporate debt rates and utility ROEs or alternatively an additional variable should be added to the ERP formula to better reflect equity risks. Power Advisory evaluated an explanatory model which in addition to long term government bonds used the VIX which measures near-term volatility of the Standard and Poor's 500 Index. This model performed considerably better than the Board's existing ERP formula in terms of goodness of fit.

14. Should the Board adopt a dead band? If so, what should the range of the dead band be?

For administrative ease, the Board could adopt a narrow dead band, say ±10 bp. The value of such a dead band depends on whether it would avoid having utilities restate rates. However, given that ROE is just one element of utility rates, even if the ROE were not to change, other elements of the ratemaking process are likely to change which would require the utility to restate rates. Therefore, it isn't clear that a dead band would result in significant savings in the costs of administering rates.

15. Should the Board adopt trigger mechanism(s)? If so, how should the Board review the methodology?

A trigger mechanism would be useful for review of the cost of capital mechanism. If the mechanism is formulaic, one set of criteria could trigger a review of the formula's parameters and more severe criteria could trigger a review of the formula or of the approach itself.

Trigger mechanisms could monitor for breaks in historical relationships among financial market variables and for other conditions such as changes in equity market volatility through market volatility indices like VIX or VMX.

16. What is the appropriate test(s) to ensure the FRS is met (e.g., corroborating results for reasonableness relative to other benchmarks or through other methods?)

See the empirical tests reviewed in the response to Question 1.

17. What information might the Board need to definitively determine that market conditions are having an effect on the variables used by the Board's cost of capital methodology?

GLPTLP believes that the critical question is whether market conditions are being adequately reflected by the variables used in the Board's cost of capital methodology. One measure of the degree to which market conditions effect on these variables is appropriate and within norms, are the values produced by the Board's cost of capital methodology. To the degree that the relationships between these values (e.g., the ROE and long-term debt rate) change significantly then the Board should evaluate the reasonableness of these changes in light of market conditions.

GLPTLP believes that there are no simple tests that can be applied to evaluate the reasonableness of the results produced by the Board's cost of capital methodology. The reasonableness of the results produced by the Board's cost of capital methodology can be assessed by applying judgment regarding whether the results produced are generally consistent with financial and credit market conditions. For example, when the ROE decreases from the previous year, it is appropriate to consider whether conditions in the financial and credit market are consistent with such a decline, i.e., do they indicate lower interest rates for a comparable credit risk and lower risks for equities in general.

18. Should the Board consider monitoring indicators like these on an on-going basis to test the reasonableness of the results of its cost of capital methodology?

Yes but from time-to-time rather than continuously. It is not necessary to monitor these indicators on an on-going basis because the Board's cost of capital methodology is only applied at specific time periods. However, when the Board's cost of capital methodology is being applied, it is important to assess financial market conditions because these conditions change constantly: the Board's FRS ROE also changes and in ways not always related to underlying market fundamentals.

19. What other key metrics used by financial market participants to determine whether financial markets conditions are or are not "normal" might the Board consider?

The key metrics that should be considered by the Board are those that will offer insights regarding the reasonableness of the relationships embedded within the Board's ERP formula and cost of capital methodology. These metrics include spreads between "risk free" bonds like Government of Canada bonds and corporate bonds, the shape of the yield curve, and investor expectations regarding volatility of stock market indices including MVX and VIX.

Evaluation of the Ontario Energy Board's Equity Risk Premium Formula

Prepared for:

Great Lakes Power Transmission LP

September 8, 2009

poweradvisoryllc.com
978 369-2465

Contents

Executive Summary

The equity risk premium (ERP) formula used by the Ontario Energy Board (OEB or Board) to set the Return on Equity (ROE) allowed for gas and electricity distributors and electricity transmitters under the Board's jurisdiction does not meet the Fair Return Standard (FRS). While current financial market conditions exacerbate its shortcomings, the formula has proven to provide inadequate returns over much of the time that it has been in use. Therefore, the Board cannot assume that the current perverse results produced by the ERP formula will be remedied when the credit markets heal. The deficiencies of the current ERP formula are more systemic. The Board should undertake a formal proceeding to review its ROE methodology and the reasonableness of the results it produces.

The fact that the Board's ERP formula is broken and doesn't meet the Fair Return Standard is demonstrated by:

1. The unrealistic ROE values that it has produced. The most recent ROE that it produced provides a mere 39 basis point premium over long-term debt and this premium must compensate investors for the considerably greater risks of equity. Furthermore, this ROE declined by 24 basis points relative to the previous ROE value at a time when equities (including utility stocks) have been subjected to unprecedented volatility.

2. The ERP formula assumes that utility ROEs can be explained solely by changes in Long Canada Bond rates which are a distinctly different financial instrument with different risks and different determinants of prices and value than utility equities. The net result is that the Board's ERP formula is missing critical variables that influence the required returns for utility equities.

3. Failing to include these critical variables in the ERP formula causes the formula to overstate the relationship between Long Canada Bond rates and utility ROEs. The net effect is that the ".75" coefficient in the ERP formula is too high. As a result, the significant declines in Long Canada Bond rates since 1997 have resulted in declines in utility ROEs produced by the ERP formula which cause these ROEs to be below the Fair Return Standard.

4. The factors that have led to declines in Long Canada Bonds do not all result in declines in the required ROEs for utilities, causing the ERP formula to understate the ROE needed to meet the Fair Return Standard.

5. The amount of risk faced by regulated utilities has increased significantly since the ERP formula was first adopted. Conservation and demand management programs and unprecedented declines in several of Ontario's major electricity consuming industries pose increased demand risks, with attendant risks to revenues. The capital and phasing required for major new transmission facilities required to implement the *Green Energy and Green Economy Act* present increased financial risks. These increased risks are not reflected in the ROEs produced by the ERP formula.

1. Introduction and Purpose

Power Advisory LLC (Power Advisory) was engaged by Great Lakes Power Transmission LP (GLPT) to provide an independent assessment of the Ontario Energy Board's (OEB's or Board's) Equity Risk Premium (ERP) formula. Specifically, Power Advisory was asked to assess whether the existing ERP formula and parameters provide a proper basis for establishing a required return on equity (ROE) for an electricity distribution or transmission company in Ontario that meets the Fair Return Standard (FRS) and, if the formula does not do so, to propose an alternative formula that would provide a reasonable estimate and satisfy the Fair Return Standard.

The OEB issued a letter on March 16, 2009 to establish a consultative process to consider whether current economic and financial market conditions warrant an adjustment to any of the Cost of Capital values identified in the Board's in its February 24, 2009 letter. On June 18, 2009, the Board issued a letter announcing a review of its policy regarding the cost of capital and a stakeholder conference to provide a discussion of issues regarding its ERP formula.

The *Issues for Discussion at Stakeholder Conference* document noted that

> "the Board has found the Equity Risk Premium ("ERP") approach to be pragmatic and efficient given the Ontario market structure and the number of utilities that the Board regulates. These factors remain unchanged and the Board has concluded that an ERP approach remains the most appropriate in the current circumstances. However, the Board will review the application and the derivation of the current ERP approach to determine if it is sufficiently robust to guide the Board's discretion in applying the FRS."[1]

This report provides Power Advisory's assessment of the ability of the ROE produced by the current ERP formula to meet the FRS and discusses alternative formulas that would provide a long-term fix.

1.1 Summary of Power Advisory's April 17th Report

On March 16, 2009, the OEB issued a letter to establish a consultative process to consider whether current economic and financial market conditions warrant an adjustment to the Cost of Capital parameter values, but not to consider the Cost of Capital methodology itself. In response to this letter, GLPT asked Power Advisory for an independent opinion on these parameters. A report from Power Advisory was filed with the Board on April 17, 2009.[2] This section summarizes that report, which was confined to the issue of whether current market conditions warrant a change in the parameters of the ERP formula.

The Report noted that the ERP formula used by the OEB assumes a fixed relationship between the equity risk premium and long-term Government debt yields. However, the OEB acknowledged that opinions differ on the relationship itself and that the relationship may change as financial market conditions

[1] Attachment B: Issues for Discussion at Stakeholder Conference, p. 1.

[2] Power Advisory LLC, "Comments on the Cost of Capital in Current Economic and Financial Market Conditions," April 17, 2009, prepared for GLPT.

change.[3] The equity risk premium must compensate investors for the additional risks associated with equity relative to debt. The Power Advisory report gave evidence that the ROE resulting from the OEB's formula does not adequately compensate investors for the additional risks associated with equity under current financial market conditions.[4]

There are three aspects of the current economic and financial markets that suggest any fixed relationship between long-term Government debt and equity risk premiums is unlikely to be maintained:

(1) Worsening economic conditions and subprime mortgage exposure resulted in a flight to quality which has reduced yields on Government Bonds and increased those for other investments, such as utility equities;

(2) The bankruptcies and forced sales of major financial intermediaries and the deleveraging and unwinding of positions led to reduced liquidity and a collapse in credit availability for corporate borrowers. This increased Corporate debt yields and required stock ROEs; and

(3) In response to these conditions and a deepening recession, central banks coordinated efforts to reduce interest rates. The net effect has been a dramatic decline in government interest rates, with increased spreads between government and corporate debt.[5]

The net effect of these developments was that any fixed relationship that had existed between changes in Long Canada Bonds and utility ROEs assumed by the ERP formula no longer held. This report expands on this analysis and extends it to the broader question of the validity of the ERP formula under the full range of economic and credit market conditions.

1.2 Contents of this Report

This report contains four chapters, the first of which is this introduction. The second provides a critical assessment of the ERP methodology focusing first on the current formula and the resulting 2009 ROE estimate in light of the current financial market conditions and then on the systemic deficiencies of the formula that apply to the full range of economic and credit market conditions. The third chapter responds to comments offered in various April 17th submissions to the OEB that suggested that the ERP formula continues to produce reasonable results. The final chapter recommends alternative ERP formulas. A long term fix for the ERP formula is proposed. These changes should be made to the ERP formula to better allow it to reflect a diverse range of economic and financial market conditions such as have recently occurred.

[3] Ibid., pp. 4-5.

[4] Ibid., pp. 8-9.

[5] Ibid., pg. 2.

2. Review of the Equity Risk Premium Formula Results

In a 2004 Decision the OEB outlined: "two reasons which would justify a review of the formula. The first justification would be significant changes in market conditions. The second justification would be significant changes in the utility risk."[6] Power Advisory believes that both of these conditions have been satisfied. We first review the changes in financial market conditions and evidence regarding how the results of the ERP formula are inconsistent with these conditions. We then review changes in utility risk since the ERP formula was implemented by the OEB in 1997.

2.1 ERP Formula Results Inconsistent with Financial Market Conditions

The clearest indication that the Board's ERP formula must be revised is the most recent ROE that it yielded. This ROE provides a mere 39 basis point premium over the equivalent long-term debt rate. This is relative to a 247 basis point spread provided by the OEB's 2008 cost of capital parameters.[7] In the OEB's words, the equity risk premium methodology "relies on the assumption that common equity is riskier than debt and that investors will demand a higher return on shares, relative to the return required on bonds, to compensate for that risk."[8] This premium must compensate investors for these greater equity risks at a time when equities have been subjected to unprecedented volatility. While there is evidence that credit spreads and relationships in the financial and credit markets are beginning to return to more normal conditions, it is likely that the recent financial crisis will have a lasting effect on investor perceptions of risk and as a consequence the price of risk.

Another indication that the ERP formula is producing results that are out of line with economic fundamentals is that the 2009 ROE declined by 24 basis points.[9] This decline in the ROE suggests a lower risk environment; whereas in fact market risks increased.

Equity markets recently have experienced unprecedented volatility. This is demonstrated by the MVX and VIX which are the volatility indices published by the Montreal Exchange and the Chicago Board of Options Exchange.[10] An increase in the MVX and VIX signals investor expectations of greater share price volatility. The VIX reached an all time high in October 2008 and remained high for several months.[11] A

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[6] RP-2002-0158 Decision and Order, para. 114

[7] Ontario Energy Board, *The Cost of Capital in Current Economic and Financial Market Conditions*, EB-2009-0084, p. 1.

[8] *Compendium to Draft Guidelines on a Formula-based Return on Common Equity for Regulated Utilities (Compendium to Draft Guidelines)*, March 1997, p. 6.

[9] The ROE produced by the ERP formula is 8.01% relative to the 8.35% ROE allowed in 2008.

[10] MVX measures the expected volatility over the next month of the Canadian Standard and Poor's/Toronto Stock Exchange 60 Index. VIX measures market expectations regarding the near-term volatility of the Standard and Poor's 500 Index, a broad-based market index.

[11] The MVX reflected a corresponding increase as investors expected increased stock market index volatility. Utility shares have also experienced increased volatility.

fundamental precept of finance is that investors require higher returns to compensate for higher risk. As the expectation of increased volatility affects investor perceptions, investors will require an increase in ROE as compensation for this increased volatility. The discounted cash flow model results presented in Power Advisory's April 17th report, which was filed with the OEB, indicated that utility ROEs increased from 11% to 12.5% from the first quarter of 2007 to the first quarter of 2009.[12] Therefore, expected utility ROEs actually increased during this period rather than declined as implied by the ERP formula.

2.2 Failure of ERP Formula to Produce Fair ROEs not Surprising

The inability of the ERP formula to provide a reasonable ROE under these economic and financial market conditions isn't surprising. The ERP formula assumes that changes in utility ROEs can be explained solely by changes in Long Canada Bond rates. This is unrealistic. Long Canada Bonds are a distinctly different financial instrument than utility equities, with different risks and different determinants of prices and value. Long Canada Bonds are low risk. Long Canada Bond rates are driven by monetary and fiscal policy and reflect investor expectations regarding future inflation and the real cost of capital. Long Canada Bonds have little credit or return risk. Utility equities have all these risks and bear greater return and credit risk than Long Canada Bonds.

Government and corporate bond yields (and by extension utility ROEs under most conditions) are likely to be highly correlated as long as credit risks don't materially change. However, this relationship would not necessarily hold under financial market conditions as extreme as have been experienced or in other situations where the factors affecting these two financial variables diverge. For example, with a change in credit risks such as occurred in 2008 with the Lehman Brothers bankruptcy this relationship will break down and the predictive power of the ERP formula with it. Similarly, expansionary monetary policy drives down the yields on government debt while not necessarily impacting corporate rates of return to the same degree. When implementing the ERP formula the OEB acknowledged this: "[a] disadvantage of using the ERP approach is that ...historical-average risk premium calculations are time sensitive and subject to considerable volatility from period to period."[13]

This is particularly relevant given the investor flight to quality and use of monetary policy to reduce interest rates to promote economic activity. In these circumstances, any historical relationship between Long Canada Bonds and equity risk premiums is unlikely to be maintained. Finally, a relationship that was appropriate in the early 1990s may no longer be appropriate in 2009 given changes in financial markets. When this formula was initially set Long Canada Bond yields were 8.75% and had recently been close to 10%.[14] That the apparent relationship between Long Canada Bond yields and utility ROEs no longer holds at these levels supports the fact that these financial variables respond to different market factors. In sum, it is unreasonable to assume that changes in Long Canada Bond rates will fully reflect required changes in utility ROEs, particularly under recent financial market conditions.

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[12] *Comments on the Cost of Capital in Current Economic and Financial Market Conditions*, prepared for Great Lakes Power Transmission LP

[13] *Compendium to Draft Guidelines*, p. 6.

[14] OEB, Issues for Discussion at Stakeholder Conference, July 30, 2009, p. 4.

Econometrics indicates that if a variable is omitted from the "correct model" specification the parameter estimates for the remaining variables will be biased if the omitted variable is correlated with these variables. To the degree that these variables (i.e., the omitted and those in the model) are positively correlated the coefficient of the remaining variables will take on the effect of the omitted variable(s).[15,16] Therefore, the coefficient(s) for the variables in the regression equation overstate the effect of changes in these variables on the dependent variable. Specifically, the coefficient for the explanatory variable will be higher than it should be. In terms of the ERP formula employed by the OEB this suggests that the .75 coefficient is too high.[17] In our April 17th report we estimated a regression coefficient for the ERP formula for changes in Long Canada Bond rates of .472.

Therefore, the significant decline in Long Canada Bond rates since 1997 has resulted in too large a decline in the utility ROEs produced by the ERP formula such that these ROEs do not satisfy the Fair Return Standard. Furthermore, the deficiencies in the ERP formula are systemic and not just a consequence or reflection of recent economic and credit market conditions.

This potential for the compounding effect of a small mis-specification of the formula which results in significant bias in the ROE determination over time was acknowledged by the OEB in its *Compendium to Draft Guidelines:* "over time these parameters and adjustment factors will have a cumulative or compounding effect on the results of the formulaic ROE mechanism. The use of an inappropriate initial ROE will either inflate or understate subsequent rate determinations."[18]

Given the prevalence of the ERP for setting utility ROEs in Canada and its limited application in the US, this compounding effect explains why Canadian ROEs are considerably below those of US utilities even though others have found that there are no appreciable differences in regulatory or financial risks, operating characteristics, or tax environment that justify the differences in ROE allowed in the US and Ontario.[19]

2.3 Changes in the Canadian Economy and Financial Markets Since the ERP was Specified

The situation of the Canadian economy and financial markets is very different now from that in 1994, when first the British Columbia Utilities Commission, then (in 1995) the National Energy Board, and the

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[15] Robert S. Pindyck and Daniel L. Rubinfeld, *Econometric Models and Econometric Forecasts*, Second Edition, 1981, p. 129.

[16] As discussed further below, one possible additional explanatory variable is corporate bond yields which are highly correlated with government bond yields.

[17] $ROE_t = 9.35\% + 0.75 \times (\text{Long Canada Bond Forecast}_t - 5.50\%)$

[18] p. 6.

[19] Concentric Energy Advisors, A Comparative Analysis of Return on Equity For Electric Utilities, June 2008.

OEB in 1997 initiated the ERP formula-based methodology for determining ROEs for regulated utilities. The formula makes the changes to allowed ROEs dependent only on changes in the rate of interest on long-term Government of Canada bonds. To be valid, therefore, the formula had to reflect a stable relationship between the interest rate on long-term Government of Canada bonds and the rate of return on equity for utility shares. This section shows how these variables have diverged because they do not respond in the same way to financial market events.

This chapter analyzes the factors that drove government bond rates over the last 20 years and the impacts on the variables which drive the ERP formula and discusses their current dynamics versus those that prevailed in the mid 1990s. As outlined below, these dynamics show that these variables now respond to much different economic drivers.

2.3.1 Long-term Government of Canada Bonds

The interest rate on sovereign lending from a stable government, such as that of Canada, is cited as a "risk-free rate". Such bonds are felt to have no risk of default or of failure of the borrower to meet all of its obligations.[20] Furthermore, if the bonds are held to maturity then the holder is guaranteed to earn the coupon rate and bears little return risk.

However, while there is no risk of default of the nominal amount of the bond and its interest, lenders do still bear risk. If there is unanticipated inflation in the currency in which the bond is denominated, then the repayments of both principal and interest will have a lower real value (that is, a lower value in terms of their ability to purchase goods and services) than was anticipated when the bond was purchased. Lenders therefore look at a nominal interest rate as a combination of a real rate of interest and compensation for expected inflation. If the actual inflation rate is higher than expected, the real return will be lower than expected once the nominal interest rate is set.

The first application of the ERP formula in Canada was made at an atypical time in Canadian economic and financial history. In the early 1980s, Canada had endured a period of very high inflation (above 8% per year from 1975 to 1983, except for a dip to about 6.5% in 1976). Canada had been running large fiscal deficits during that time. The result was that interest rates on Canadian government securities became quite high. Even though inflation had started to come down by the mid 1990s as a result of a determined effort by the central bank, the government continued to run very large fiscal deficits. These forced the government to be a very active borrower, driving up interest rates in order to attract needed capital. In addition, investors demanded a premium on these bonds given the expectation that the consequence of the continued high fiscal deficits would be increasing inflation as a way to mitigate the cost of the debt repayments. These conditions changed dramatically after the mid 1990s. Canada's fiscal deficit not only declined but turned into a large surplus, taking the Canadian government out of the business of issuing net new securities and taking pressure off the financial markets. The reduction in government borrowing left greater room for private borrowing.

[20] While governments can go bankrupt, the market expects that the circumstances under which a stable government like Canada's would go bankrupt would be so extraordinary that it is likely that no investments would be safe.

The inflation rate stayed firmly within the Bank of Canada's target range of 1-3% per year. Finally, this good performance on both the fiscal and the inflation fronts led investors to trust the performance of the Canadian government and to reduce the implicit inflation risk premium in Canadian government bonds.

An easy way to see this reduction is to look at the Canadian government's real interest rate bond. This is an indexed bond with the principal linked to the rate of inflation and a real interest rate representing the real net return. It was introduced in the 1990s to allow Canada to borrow without having to pay a large inflation risk premium. In the early 1990s the yield on these bonds was over 4%; by January of 2008 it was 1.94%[21] and the current rate is about 1.80%.[22] Since January of 2008, forces have acted to drive Canadian interest rates even lower. The economic crisis originating in the US sub-prime lending markets has resulted in a recession in Canada and most other developed countries. Monetary authorities in Canada, like those in other countries, have adopted monetary policies intended to stimulate the economy. These have meant increasing the money supply, driving Canadian government bond rates and other short term rates to unusually low levels in order to stimulate consumer and business spending.

The average rate on the Canadian government benchmark long-term bond rate for the last 10 years (1999-2008) was just over 5%. That is a significant drop from its previous 10 year average of almost 8.4%, when the rate was under pressure both from government borrowing and from investor fears of future inflation. But the rate has now fallen further. Prior to November 2008 it had been under 4% for only one month; since then, it has been under 4% for every month, but one.[23] Clearly, current conditions have reduced interest rates on Canadian government bonds. At issue is whether the factors that reduced those interest rates would also have reduced the expected ROEs for Canadian utilities.

The long-term decline in interest rates on long-term Government of Canada bonds can be attributed to three factors: the reduction in inflation, the reduction in inflation risk premiums (to cover the uncertainty regarding the rate of inflation), and the reduction in Government bond interest premiums required to induce investors to hold bonds as a result of reduced borrowing due to the improvement in the Government's fiscal position. Of these, only the reduction in inflation can be expected to influence the equity risk premium that corporate owners expect.[24] The forces driving down long-term government bonds rates would therefore not be expected to drive down investor expectations of corporate rates of

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[21] Laurence Booth and Sean Cleary, "Capital Market Developments in the Post-October 1987 Period: A Canadian Perspective", October 2008

[22] Bank of Canada.

[23] Data from the Bank of Canada.

[24] Kathleen McShane, "Capital Structure and Fair Return on Equity," prepared for Terasen Gas, May, 2009. Equity owners do not require the same inflation hedge as bondholders because they expect that corporate profits will grow with inflation.

return on equity in the same way. A closer look at the forces affecting Canadian corporate financial performance and ROEs is in the next section.

2.3.2 Recent Corporate Financial Performance

Current market conditions have put stress on corporate borrowers and investors. As the financial crisis continued, lenders reacted by a flight to quality, preferring government bonds and their lack of default risk to corporate issues, especially equity issues. The recession threatened corporate rates of return and drove stock prices down to compensate for the increased risk. This suggests that corporate equity risk is being driven by a very different dynamic from that affecting long-term government bonds.

This can also be seen in simple correlations. The correlation coefficient between long-term Government of Canada bonds and the S&P/TSX composite index from February 1998 to July 2008 was -0.02; in effect, they were statistically not related at all.[25] At the same time, the correlation between long-term Government of Canada bonds and long-term US Government bonds was .79, indicating that they are highly correlated.[26]

When the depth of the recession became more fully known in the latter part of 2008, corporate bond rates and the spreads between corporate and government bond rates rose dramatically in both the United States and Canada.[27] While government bond rates are driven down by the flight to quality, corporate bond rates are driven up because the flight is away from them.

If the equity risk premium is to represent the amount that investors require to compensate them for taking the additional risk of equity compared to the risk-free government bond rate, then the formula does not produce an adequate result. The analysis has shown that the equity risk demanded by investors can in fact move in opposite directions from the rate of interest on government bonds, or at best be wholly uncorrelated with it.

As Roland Priddle, the former chair of the NEB, observed,

> It's now hard for me to see that long-term bond yields, driven by factors as disparate as governments' efforts to get budgetary deficits in hand, central bank' concerns (or not) about inflation...are somehow going to provide a continuing, reliable proxy for returns

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[25] The correlation coefficient is a number between -1 and +1 which indicates how closely related two series are to each other. If the series are identical, the correlation coefficient is +1; if they are exactly opposite, the correlation coefficient is -1. A correlation coefficient of 0 means that the two series are not statistically related . (Thomas H. Woonnacott and Ronald J. Wonnacott, Introductory Statistics for Business and Economics, Second Edition, 1977, pg 124-125.) A correlation coefficient of -.02 is effectively zero.

[26] Booth and Cleary, op. cit., pg. 18.

[27] Concentric Energy Advisors, Inc., "Comments on the OEB Consultative Process", pg. 11 (filed by Enbridge Gas Distribution Inc.)

available in businesses presenting degrees of risk similar to gas pipelines and distribution enterprises.[28]

2.4 Changes in Utility Risks

The amount of risk faced by regulated electricity utilities in Ontario has increased significantly since the ERP formula was first adopted. For example, current economic conditions have led to greatly increased demand risk for both transmission and distribution utilities whose revenues depend on system usage (peak demand for the transmitters and both peak and energy demand for the distributors). In the current economic climate, both peak demand and energy use have both fallen for virtually all utilities. The declines in electricity demand have been deeper than in previous economic downturns and may reflect fundamental changes in the Ontario economy. The economic futures of two major electricity consuming industries in Ontario – pulp and paper and automotive manufacturing – are very uncertain. Adding to these demand risks are programs of conservation and demand management, which aim to reduce peak demand both through targeted programs, sometimes implemented by the distributors, and through such provincial programs as appliance standards. Therefore, there is increased uncertainty regarding future electricity demands and this greater uncertainty represents an increased revenue risk for Ontario distribution and transmission electric utilities.

Other government policies, particularly environmental policies, have added to risk for these utilities. The *Green Energy and Green Economy Act* places new obligations on distributors to carry out conservation programs and to expand their systems to connect renewable generation. Transmitters also will be required to expand their systems both to enable integration of planned renewable generation and to allow its transmission to markets. The construction of these facilities will place risks on the utilities due to their sheer size relative to the existing capital asset base as well as due to the need for accelerated construction schedules. For example, the Integrated Power System Supply Plan (IPSP) identified $4 billion in transmission expenditures compared to a total rate base for the licensed transmitters of approximately $6.5 billion. They also will have increased risk that the renewable generation for which the facilities were built will not itself be completed and the unused transmission cannot be charged to the network pool.

Ontario electricity distribution utilities also face significant political and associated regulatory risk. The Ontario electricity industry has been restructured three times since 1998, and each restructuring has affected the transmission, distribution and generation industries. There is little to reassure investors that the industry will not be further restructured as Ontario continues to adapt to changing economic conditions and new technologies.

As the risk to the regulated entities increases, the amount of equity risk premium that investors will demand can be expected also to increase. Clearly, utility risks have increased since the ERP formula was implemented by the OEB in 1997.

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[28]Roland Priddle, "It's Time for the Next Evolution in Regulation," in The Gas Journal of Canada (2007): A9. Cited in Canadian Gas Association, "Natural Gas Utility Return Determination in Canada: A New Approach", April 2008. Filed by Enbridge Gas Distribution, Inc.

3. Comments on Assertions that ERP Formula Results Reasonable

This chapter addresses the arguments that have been put forward by various consumer groups in their April 17th comments to the OEB. In general these parties assert that the OEB's ERP formula continues to provide reasonable results. A wide range of assertions were made. They were perhaps most clearly articulated by the Canadian Manufacturers and Exporters (CME) who asserted that: (1) there is no increase in the perceived risk of utilities and the decline in utility share prices has been 50% of the decline in the value of the market as a whole; (2) there is no evidence that the values are causing any immediate and material threat to the financial integrity of any electricity distribution utilities that the Board regulates; (3) there is no evidence to indicate that any electricity utilities the Board regulates are having any difficulty accessing capital; and (4) the capital markets do not perceive utilities to be any riskier than they were when the Board's adjustment formula was established.[29] Each of these arguments is addressed below, except for the last which was addressed in the previous chapter.

3.1 No Increase in the Perceived Risk of Utilities

Consumer groups have argued that in spite of the financial turmoil experienced in the international financial and credit markets there is no increase in the perceived risk of utilities. They assert that this is demonstrated by the fact that the decline in utility share prices have been 50% of the decline in the value of the market as a whole.[30] They note that utility shares are a safe harbor and the flight to quality also results in utility shares being a preferred investment.

This argument fails to consider the tangible evidence provided by the capital markets which indicates that risk has been repriced at a higher level by investors as a result of the financial crisis. As discussed in the previous chapter, a spread of 39 basis points between utility debt and equity doesn't provide adequate compensation to equity investors for the additional risks that they bear. Specifically, equity investors are subordinate to debt in terms of their claims on utility assets and furthermore, dividends are paid only after debt obligations have been discharged. Therefore, as the economy stalls and both electricity demand and transmission income, which is a function of demand, fall, there is an increased risk regarding the earnings for transmitters.[31] Bondholders returns are threatened if the transmitter defaults, whereas shareholders are at risk for any revenue loss. Clearly, equity investors face greater risks with respect to the returns that they earn and require additional compensation for this risk. At a time of increased business and financial risks (i.e., when these returns are more uncertain), it doesn't make sense that the compensation that equity investors demand would decline.[32,33]

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[29] Comments of the Canadian Manufacturers and Exporters, April 16, 2009, p. 9.

[30] Comments of the Canadian Manufacturers and Exporters, p. 5.

[31] While this risk can be mitigated over the long term by the utility filing rate application that contains a new revenue forecast, the utility is at risk for the period prior to which new rates are established and bears the risk regarding the reasonableness of the revenue forecast used to establish these rates.

[32] Recall that the spread was 247 basis points under the OEB's 2008 cost of capital parameters.

As earnings yields increase, the cost of equity increases. Figure 1 shows the dramatic decline in utility share prices. Declining share prices shown in Figure 1 reflect in part investor requirements for higher earnings and dividend yields. Earnings yield indicates a stock's return.

Figure 1 also contrasts the performance of the Dow Jones Utility Average (DJUA)[34] (darker, blue line) with the S&P 500 index[35] (lighter, red line) over the last twelve months. While the S&P 500 had a lower low (with a decline of about 48%) than the DJUA (decline of 39%), utility share prices have clearly be hard hit.[36] The magnitude of the drop in utility share prices challenges the assertion that there is no increase in the perceived risk of utilities. More significantly, the standard deviation of the DJUA average over the last 12 months relative to the previous 12 months increased by almost twice the rate experienced by the S&P 500, calling into question the assertion that there is no increase in the perceived risk of utilities.[37]

Figure 1: Dow Jones Utility Average vs S&P 500 over the last 12 Months

Source: Yahoo Finance

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[33] A financial analyst engaged by the Edison Electric Institute, characterized the 230 basis point spread between bond yields and allowed ROEs as "modest" and "suggests that equity investors need additional compensation to encourage their investment in utility common stocks." (J.M. Cannell, Inc., The Financial Crisis and Its Impact On the Electric Utility Industry, Prepared for: Edison Electric Institute, February 2009, p. 7)

[34] The DJUA is a price-weighted average of 15 utility stocks traded in the United States. The DJUA was started in 1929. Source:www.investopedia.com

[35] The S&P 500 index published by Standard & Poor's is widely regarded as the best single gauge of the U.S. equities market and includes 500 leading companies in leading industries of the U.S. economy. Source: Standard and Poor's

[36] Interestingly, the S&P 500 has rebounded more than the DJUA.

[37] The standard deviation of the DJUA over the most recent 12-months relative to the previous 12-months increased by 68%, whereas the SP 500 increased by 39%.

The increase in required utility ROEs was indicated by the previously discussed discounted cash flow (DCF) analysis which was a part of our April 17th filing with the OEB. Recall that this DCF analysis indicated that utility ROEs increased from 11.0% in the first quarter of 2007 to 12.5% in the first quarter of 2009. The primary contributor to this increase was the increase in dividend yield from declining share prices.

Another perspective on the increase in risk and how this has been priced into bond and equity prices is provided by a White Paper conducted for the Edison Electric Institute.[38]

> One of the most important characteristics of the current environment is a dramatic rise in risk levels. Bond yields and spreads clearly reflect that reality in terms of debt securities. Declining stock prices and attendant rising yields convey the same message relative to equities. The impact on debt and equity financing from mounting risk is that it is now more difficult and costly to access the public markets. Because the ratemaking process is intended to help foster capital attraction for utilities, this new risk paradigm needs to be incorporated accurately into regulatory deliberations.

This increase in ROE is very real when utilities are required to issue additional equity with these lower share prices. Consumer groups claim that Ontario utilities continue to have access to the equity markets. While these utilities can issue equity, the important question is at what cost. Our analysis indicates that this access is at an effectively higher required ROE.

3.2 No Evidence of an Immediate and Material Threat to Financial Integrity of Utilities

The consumer groups also argue that there is no evidence that the values (cost of capital values produced by the OEB formulas) are causing any immediate and material threat to the financial integrity of any electricity distribution utilities that the Board regulates.

While there has been clear evidence that the ERP formula has caused utility allowed ROEs to be below the true cost of capital for a number of years, it is the recent declines in allowed ROEs that have threatened their financial integrity. The impact on utility financial integrity is insidious. The resulting reduced cash flows can threaten utilities' credit ratings; the rating agencies indicate that one of their rating criteria is the severity of the regulator. Lower cash flows make utilities more susceptible to the business cycles. The signs of financial distress may become apparent only after the utility is downgraded. In the current credit environment which is characterized by wide credit spreads, the impact of a downgrade can be very significant on both the cost of debt and equity and this is at a time when the capital budgets for a number of Ontario utilities are significantly greater than available cash flow and require access to capital markets. Where downgrades are in part a response to a perception of an adverse regulatory climate, the consumer cost impacts of higher debt costs and reduced reliance on leverage can be sustained for years.

Utility capital budgets are developed for long time horizons. Planning and permitting requirements result in a lag between committing to an investment and spending the funds.[39] Therefore, the effect of an

[38] J.M. Cannell, Inc., The Financial Crisis and Its Impact On the Electric Utility Industry, Prepared for: Edison Electric Institute, February 2009, p. 9.

inadequate ROE will be felt in the future as investments are deferred. Furthermore, utilities have an obligation to ensure that the service they offer is reliable and their systems can be operated safely. These investments are unlikely to be deferred except in the direst circumstances. Other investments which might offer long term savings or service quality enhancements to customers in the form of efficiency improvements or new services are more likely to be deferred under such conditions. Another area where investments are likely to be deferred is with respect to infrastructure replacement. These investments are important for service quality and offer benefits to customers, but are not essential for system operation.

The nature and structure of the Ontario electricity sector makes the consequences of low ROE on the financial health and performance of the firm particularly difficult to identify. Most Ontario LDCs and transmission companies are not publicly traded, so there is no market in which to see the actual rates of return to their owners.

3.3 No Evidence that Utilities are Having Difficulty Accessing Capital

Utilities have been able to access the debt markets, but they have had to pay increased credit spreads in the last twelve months. There has been some evidence of easing in the last several months. Accessing the equity markets has been more difficult. While utilities have been able to access these markets the question is at what cost.

A report by the Edison Electric Institute calls into question the consumer groups' assertion regarding access to equity markets.

> Equity financing also has been difficult to secure, and utility deals have been scarce. The equity markets have been characterized by unprecedented and sustained volatility, driven in part by hedge funds being forced to undo billions of dollars worth of investments due to investor withdrawals. In the current environment, few companies have been eager to try to price a stock offering. At the same time, stock prices hovering near 52-week lows have made selling new common stock unattractive, if not unpalatable. Issuing stock at prices below book value—where some electric utilities are currently trading—is not a financially astute course of action, as it serves to undermine shareholder value.[40]

An alternative perspective on whether utilities are having difficulty accessing capital is to compare the ROEs yielded by the ERP formula with those that pipeline companies are negotiating for new pipeline investments. As discussed, above it is difficult for utilities to eliminate all investment if the allowed ROE is below their required cost of capital. Furthermore, when the allowed ROE is below the actual cost if essential, utilities can issue additional equity, but only by further diluting the returns earned.

New pipelines are one utility investment that is fully discretionary and as such a better indication regarding the required cost of equity for utilities. John C. Major (former Justice Canadian Supreme

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[39] Also these effects may not be visible for some time because the utility can use the existing infrastructure, but eventually the quality or efficiency of the utility's service will suffer.

[40] J.M. Cannell, Inc., p. 7.

Court) and Roland Priddle (former Chair of the National Energy Board) note that "in the "generic ROE era" it has become the practice for new pipelines subject to NEB jurisdiction to apply for tolls that have been the subject of prior negotiation with shippers. Typically, these tolls reflect ROEs about 300 or more basis points higher than incumbent pipelines, such as Foothills, TCPL, TQM and Westcoast, receive under the generic ROE."[41] This indicates that the NEB's ERP formula which is similar to the OEB's has yielded ROEs that are insufficient to attract capital to greenfield gas pipeline projects and suggests that the ROEs produced by these ERP formula may impair utilities ability to attract capital over the long term.[42]

3.4 Spread between Long Term Debt Rate and ROE isn't Unprecedented

The consumer groups have argued that the spread between long term debt rate and ROE produced by the ERP formula isn't unprecedented and shouldn't be viewed as evidence that the ERP Formula is broken.[43]

The preceding chapter has reviewed at length how the relationship between the Long Canada Bonds (which is reflective of the risk free rate) and utility ROEs doesn't hold and how it is unrealistic to expect an equation as simple as the ERP formula to provide reasonable results regarding the cost of utility equity in financial markets where relationships between the risk free rate and equity returns have fundamentally changed given changes in investor attitudes and perceptions of risk and fundamental changes in credit markets. In addition, current monetary and fiscal policy has influenced the rates for Long Canada Bonds and resulted in a further decoupling of the relationship with utility ROEs.

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[41] John C. Major and Roland Priddle, *The Fair Return Standard for Return on Investment by Canadian Gas Utilities: Meaning, Application, Results, Implications*, March 2008, p. 21.

[42] Major and Priddle, p. 5.

[43] The Canadian Manufacturers and Exporters asserts that the spread was even negative during the early 1980s when short and long term interest rates were very high. (CME Comments, p. 7). However, inflation during this period exceeded 10% and this along with regulatory lags caused some utility share prices to drop below book value, a clear indication of the poor financial health of the sector. As such, it isn't reasonable to reference these credit and financial market conditions as an appropriate financial benchmark.

4. Proposed Revisions to the ERP Formula

The preceding discussion suggests that the OEB's current ERP formula yields an unreliable estimate of the required ROE for an electric distribution or transmission company. The major deficiencies of the formula are that it is based solely on the relationship between changes in the rates for Long Canada Bonds and required utility ROEs and omits other critical explanatory variables. As discussed, by omitting other important explanatory variables the formula overstates the relationship between Long Canada Bonds and required utility ROEs. Specifically, the ".75" coefficient in the formula is too high. Therefore, the Board cannot assume that the deficiencies in the ERP formula will be remedied when credit markets heal.

Given the OEB's desire to continue to use the ERP approach, to address these deficiencies the ERP formula needs to be respecified and reflect additional explanatory variables that capture the determinants of required utility ROEs. Two obvious types of data series are: (1) rates for long-term utility bonds to better reflect changes in credit spreads for higher risk securities than Long Canada Bonds; and (2) investor expectations regarding stock price index volatility to better reflect changes in equity market conditions. The VIX or MVX represent possible data series to consider equity market conditions.[44]

Alternative model specifications which could replace the current ERP formula are reviewed below to provide the Board with an indication regarding what an alternative formula could look like.

4.1 Proposed Revision to the ERP Formula

Power Advisory evaluated a range of different model specifications in an effort to come up with a formula that will yield more reasonable results than the existing formula under a range of different credit and financial market conditions. The different explanatory variables that were evaluated include: Long Government Bond Rates, Corporate AAA Debt, Corporate BAA Debt, and the VIX. Different lags were considered to recognize the length of time required to conduct cost of capital proceedings causing utility ROEs to be established under earlier credit and financial market conditions.

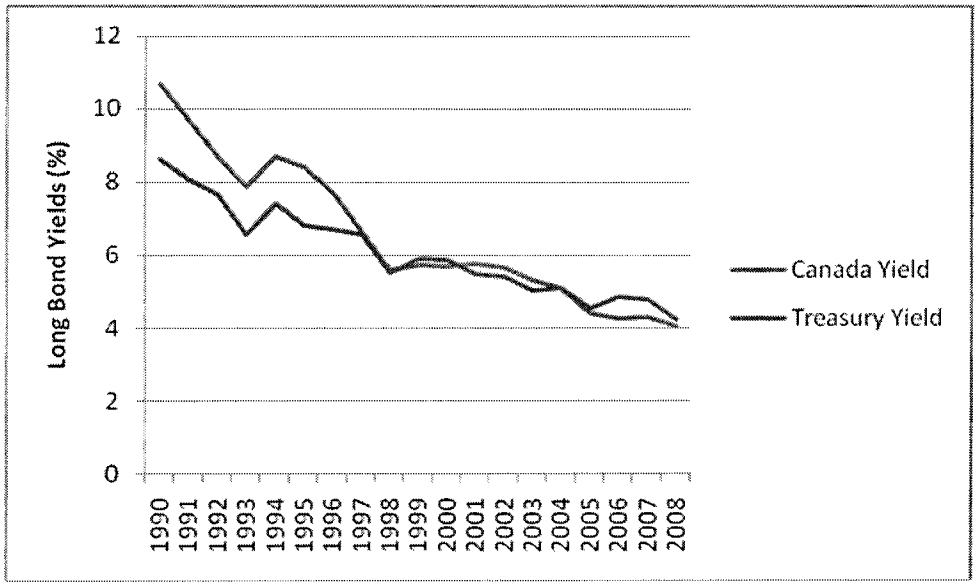
Because ERP formulas have been used to establish utility ROEs in the vast majority of Canadian jurisdictions with investor owned utilities (all except Nova Scotia – Nova Scotia Power currently receives 9.35%[45]), Canadian utility ROEs cannot be used to evaluate the reasonableness of these relationships. If these values were used then Long Canada Bonds would clearly be shown to have the strongest statistical relationship with utility ROEs because they were used to establish these ROEs. Therefore, the various models evaluated were all based on U.S. utility ROEs along with U.S. financial data. As indicated in

[44] One issue with the use of the VIX is that it measures the implied investor expectations regarding 30-day forward volatility. CBOE has developed a 3-month volatility index (VMX) which helps address this issue. Therefore, it doesn't necessarily reflect investor expectations for the term of the rate period. However, with investor expectations regarding future volatility likely to be based largely on recent volatility and few reliable tools to forecast future changes in stock market volatility while imperfect such an index might be preferred over a model specification which doesn't consider this variable.

[45] FAM Settlement Agreement, UARB Decision, NSUARB – NSPI – P-887, December 10, 2007, paragraph 13.

Figure 2 which contrasts U.S. and Canada long-term bond yields and more fully evaluated in our April 17th filing, U.S. and Canadian financial markets are highly integrated. Furthermore, others have found that there are no appreciable differences in regulatory or financial risks, operating characteristics, tax environment that justify the differences in ROE allowed in the US and Ontario.[46,47]

Figure 2: Comparison of Long Bond Yields



Two models performed the best in terms of standard econometric considerations (i.e., goodness of fit, highly significant parameter values, and plausible statistical relationships). The first was also relatively straight forward which should make it relatively easy to implement. The second was a multi-variable model which should make it more robust and better able to reflect financial and credit market conditions similar to those recently experienced. Interestingly, both models performed better than just using the Government Bond yield as the sole explanatory variable.[48]

The first model is: ROE = 7.008% + (US Corp BAA Bond yield with 6 month lag x 0.5356)[49]

[46] Such findings were made by Concentric Energy Advisors and NERA in two separate reports. Concentric Energy Advisors, A Comparative Analysis of Return on Equity For Electric Utilities, June 2008. Allowed Return on Equity in Canada and the United States – An Economic, Financial and institutional Analysis, National Economic Research Associates, Inc., Kenneth Gordon, Ph.D. and Jeff D. Makholm, Ph.D., February 2008.

[47] The National Energy Board in its recent Trans Quebec Maritimes Pipeline, Inc. Decision found that US pipelines represented an appropriate point of reference relative to Canadian pipelines. (RH-1-2008) The NEB found that although there are some differences in U.S. and Canadian regulatory frameworks, the similarities outweigh the differences. The NEB noted that both countries have similar regulatory models, similar regulatory goals and policies, and operate within a common market for commodities.

[48] The adjusted r^2, or coefficient of determination, indicating goodness of fit for this model is .864.

The second model is: = 7.451% + (US Gov 30 Year Bond yield with 6 month lag x 0.5122)
+ (VIX index value with 6 month lag x .0077)[50]

Using current values for these variables produces ROE estimates of 10.5% to 11.3%. However, when implementing these models Canadian values should be used for these variables.[51] When these are employed the ROE estimates range from 10.3% to 11.1%. These ROE estimates provide an indication regarding the magnitude of the bias in the ROE estimate produced by the OEB's current ERP formula and the importance of addressing this issue expeditiously.

[49] The t-statistics and confidence levels regarding the statistical significance of the constant are 27.899 (t-stat) and 0.00000 (confidence level) and US Gov Bond yield are for constant and 15.267 (t-stat), and 0.00000 (confidence level) for VIX 4.118 (t-stat) and 0.00080 confidence level. The adjusted r^2 indicating goodness of fit is .889.

[50] The t-statistics and confidence levels regarding the statistical significance of the constant and US Corp BAA Bond yield are 19.823 (t-stat), 0.00000 (confidence level) for constant and 12.0525 (t-stat), and 0.00000 (confidence level) for US Corp BAA Bond yield. The adjusted r^2, coefficient of determination, indicating goodness of fit is .930.

[51] For example, a comparison of current Long Canada Bond rates with those for US treasuries indicates that Canadian bonds are offering a 27 basis point discount relative to Treasuries.