CAMPUT 2024 ENERGY REGULATION COURSE – COST OF CAPITAL MODULE
Discussion Document – Isolating a market-based range of ROE and ERP

I. Introduction

The purpose of this discussion document is to illustrate how to isolate a market-based range of return on equity (ROE) and forecast equity risk premium (ERP) for a forward test year using the breadth and depth of an evidentiary record. The record from Alberta Utilities Commission (AUC) proceeding 27084 has been used for the purpose of this discussion, given its size and scope. This discussion is designed as an educational aid for consideration by participants attending the CAMPUT Energy Regulation Course and the associated cost of capital module of that program.

This discussion focuses solely on estimating an empirical ROE and ERP range and does not consider the process required to establish deemed equity. ROE and deemed equity, taken together, are generally referred to as a utility's equity cost of capital.

The ultimate determination of a regulatory panel to place a specific ROE in the empirical range is a function of how the business, financial, and regulatory risks of the jurisdictional utilities differ from the companies that comprise the portfolio of comparable equities.

It is important to note that the Recommended Approach set out in this discussion is only one of a number of possible approaches and the resulting empirical range is dependent on the evidence filed by parties, in this case, as in AUC proceeding 27084. In addition, the Recommended Approach does not necessarily reflect the findings in the AUC's Decision 27084-D02-2023. Details of the AUC's findings can be found on the AUC's website at www.auc.ab.ca.

II. Comparator Group of Representative Utilities

In order to perform the empirical analysis that informs the determination of the equity cost of capital and increase the likelihood that the cost of capital determination by a regulator meets the legal standard known as the Fair Return Standard[1], market-based data from publicly traded utilities/utility holding companies must be obtained. A comparator group of representative utilities/utility holding companies of sufficient size is required to perform the needed analysis. A significant innovation in AUC proceeding 27084 was the specification of comparator screening criteria[2] and the identification of a comparator group of 33 utilities[3] prior to the filing of evidence by parties to the proceeding. This allowed a certain degree of standardization in the empirical evidence. However, it remained open for parties to argue whether or not the comparator group was "truly comparable to the Alberta utilities"[4].

III. Return on Equity – Two Constituent Parts

The evidentiary record in AUC proceeding 27084 reflects an equity risk premium approach to determine ROE, as per the finalized issues list[5]. ROE for a future test year is expressed as the sum of two forecasts:

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1 Exhibit 27084-X0401*: Northwestern Utilities Limited v. City of Edmonton*, [1929] S.C.R. 186; Exhibit 27084-X0396: *Federal Power Commission v. Hope Natural Gas* 320 U.S. 591 (1944); Exhibit 27084-X0403*: Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia et. al.* 262 U.S. 679 (1923); and Exhibit 27084-X0402: *TransCanada PipeLines Ltd. v. National Energy Board*, 2004 FCA 149.

2 Exhibit 27084-X0256.

3 Exhibit 27084-X0257.

4 Exhibit 27084-X0268.01, PDF page 4.

5 Exhibit 27084-X0268.01, PDF page 3.

a long Canada bond yield and ERP. This approach reflects four previous AUC findings[6]. First, risk-averse investors require higher returns for bearing higher risk. Second, the forecast return or premium required by investors for bearing higher risk over the risk-free rate should be directionally consistent with forecast bond yields. Third, the cost of capital is forward looking, and fourth, there is an inverse relationship between forecast bond yields and the risk premium required by equity investors.

IV. Estimating the Forecast Long Canada Bond Yield

After identifying a comparator group of representative utilities/utility holding companies, the next step is the estimation of the forecast long Canada bond yield, needed to determine an ERP and ROE.

The positions of parties with respect to the determination of the forecast long Canada bond yield in AUC proceeding 27084 are briefly set out below. The summary of the submissions of parties and the Recommended Approach are adapted from AUC Decision 27084-D02-2023, where it is expedient to do so.

With the exception of CCA, parties uniformly submitted that yields on long-term government bonds are considered to be default free and therefore appropriate for both estimating the forecast long Canada bond yield and use in the empirical analyses required to directly and indirectly estimate the forecast ERP. There was also general agreement the 30-year Canada bond yield be used, as the 30-year term to maturity is consistent with the long-term character of the underlying utility assets.

Parties were also consistent in the view that the yield used to quantify the base forecast long Canada bond yield be a forecast, in keeping with the forward-looking nature of a cost of capital determination. However, there were differences in how the forecast 30-year Canada bond yield should be determined and the data sources used. Submissions of parties as to the forecast long Canada bond yield, term to maturity, and source of data to be used to specify the forecast long Canada bond yield are summarized below in Table 1.

Table 1. Forecast Long Canada Bond Yield Recommendations by Party

Witness (Sponsoring Party)	Recommendation	Data Source	Yield
Dr. Villadsen (ATCO/Apex/Fortis)	Use projection of the 10-year Canada bond yield plus the long-term average maturity premium between 10-year and 30-year Canadian bonds.[7]	Consensus Economics[8]	3.85% as of November 7, 2022.[9]

[6] AUC Decision 2004-052.

[7] Exhibit 27084-X0469.01, PDF page 71.

[8] Consensus Economics publishes long-term [10-year] interest rate projections twice a year, in April and in October. Transcript Volume 2, PDF page 114, lines 2 – 6.

[9] Exhibit 27084-X0469.01, PDF page 41. 3.85% represents the average of yield on a 10-year Canadian government bond in February 2023 (3.5%) and November 2023 (3.4%) as reported by Consensus Forecasts on November 7, 2022, publication, adjusted upwards by Dr. Villadsen by 40 basis points to represent a maturity premium for the 30-year over the 10-year Canadian Government bond.

Witness (Sponsoring Party)	Recommendation	Data Source	Yield
Concentric (ENMAX)	Use 10-year bond yield forecast and add the average spread between 10- and 30-year government bond yields.[10]	Consensus Economics	-[11]
Mr. D'Ascendis (AltaLink/EPCOR)	Use an average of three-month-out and 12-month-out forecasts of the 30-year Canada bond yield.[12, 13]	RBC Financial Markets Monthly and TD Economics Forecast	2.89% as of December 31, 2022.
Mr. Madsen (IPCAA)	Use current 30-year GoC bond yield as this point in time observation is consistent with a number of published forecasts of the 30-year Canada bond yield for 2023 – 2024.[14]	RBC Financial Markets Monthly, Kroll	2.95% as of January 13, 2023.
Dr. Cleary (UCA)	Use the actual prevailing 30-year government bond yield at the time the initial (or base) ROE is set.[15]	-	2.85% as of January 19, 2023[16]
Mr. Thygesen (CCA)	No submission made on the rate or approach to quantify this variable.	-	Maximum risk-free rate for 2024 be set at 3%[17]

Source: AUC Decision 27084-D02-2023, October 9, 2023, page 23.

Recommended Approach

The Recommended Approach adopts the view that the forecast long Canada bond yield reflect a 30-year term to maturity and be set at 3.00%, equal to the average 30-year Canada bond yield estimates of RBC, TD, and ScotiaBank for the forecast period Q1 2023 – Q4 2023, as per Exhibit 27084-X0610, PDF page 2. This Recommended Approach reflects the following considerations.

First, the Recommended Approach adopts the submissions of parties that the 30-year term to maturity best reflects the long-term character or useful life of the underlying utility assets and parties provided various empirical and capital markets resources that supported the rationale for matching the maturity of the asset and the term to maturity of the risk-free rate.[18]

Second, in keeping with the prospective or forward-looking nature of the determination of the cost of capital, the Recommended Approach uses a forecast of the 30-year Canada bond yield. The Recommended Approach does not rely on Dr. Cleary's submission that a naïve forecast[19], equal to the actual 30-year Canada bond yield on November 30, 2022, or any other arbitrary point in time, is a more accurate estimate of future 30-year Canada bond yields than other approaches. It is noteworthy that the use of a naïve forecast to quantify the forecast long Canada bond yield did not have broad support from

10 Exhibit 27084-X0315, PDF page 101.
11 Exhibit 27084-X0315, PDF page 61. While Concentric did not recommend a specific numerical value for the base forecast long Canada bond yield, it used an average of the Canadian (3.59%) and U.S. (3.87%) risk-free rates of 3.73% in its estimation of ROE and implied equity risk premium (forecast ERP) in its filed evidence.
12 Exhibit 27084-X0390, PDF page 24.
13 Exhibit 27084-X0610 AML_EPCOR-AUC-2023Feb21-001, PDF pages 1-3.
14 Exhibit 27084-X0292, PDF page 14.
15 Exhibit 27084-X0320, PDF pages 6-7.
16 Exhibit 27084-X0605, UCA-AUC-2023FEB21-012, PDF page 31.
17 Exhibit 27084-X0713, paragraph 44.
18 Exhibit 27084-X0390, PDF page 22-24.
19 An estimating technique wherein the actual values from the previous period are employed as the forecast for the current period, without adjusting them or identifying causal factors.

other parties in AUC proceeding 27084 and is a significant departure from the evidence filed by Dr. Cleary in other regulatory proceedings.

Third, the Recommended Approach reflects the view that a direct forecast of the 30-year Canada bond yield is simpler and more transparent than the approach recommended by Dr. Villadsen and Concentric, which uses the 10-year government of Canada bond yield and adjusts it by adding the average spread between 10- and 30-year government bonds. As noted by Concentric[20], Consensus Economics does not publish a forecast for the 30-year Long Canada Bond Yield and as such, the addition of the average spread is required to produce a 30-year forecast. The Recommended Approach adopts the view that a direct forecast eliminates the need to make additional estimates and adjustments for which there is no single, standardized approach. Accordingly, the Recommended Approach does not use the methodology recommended by Dr. Villadsen and Concentric.

Finally, the Recommended Approach reflects the view of Mr. D'Ascendis that the availability and quality of data is an important consideration in the selection of the forecast to be used. The Recommended Approach reflects the fact that the selected 30-year Canada bond yield forecasts are published by large, reputable Canadian financial institutions, are publicly available without cost, and should a forecast from one or more of the named banks be unavailable, there are three additional banks from which a forecast may be obtained.

V. Estimating ROE and Forecast ERP

Empirical models generally used in cost of capital proceedings include: the capital asset pricing model (CAPM), empirical CAPM (ECAPM), constant growth discounted cash flow model (DCF), multi-stage discounted cash flow model (M-DCF or multi-stage DCF), and risk-premium models. Each of these empirical approaches has well-known limitations.

Table 2 sets out the empirical approaches used and ROE and forecast ERP recommendations by party to AUC proceeding 27084.

Table 2. ROE and Forecast ERP Recommendations by Party

Witness (Sponsoring Party)	ROE (%)	Forecast ERP[21] (%)	Empirical Approaches Used	Comments
Dr. Villadsen (ATCO/Apex/Fortis)[22]	10.0	5.68	CAPM, DCF, M-DCF, Bond Yield Risk Premium Analysis	Recommended range for ROE is 9.2% to 10.4%.
Concentric (ENMAX)	9.50	5.67	CAPM, DCF, M-DCF, Bond Yield Risk Premium Analysis	Recommendation reflects M-DCF and CAPM using historical MERP.[23]
Mr. D'Ascendis (AltaLink/EPCOR)	10.30	6.44	CAPM/ECAM, DCF, M-DCF, Predictive Risk Premium	Recommended range for ROE is 9.80% - 10.80%.[24]

[20] Exhibit 27084-X0315, PDF page 101, lines 13-17.

[21] Includes 0.50% Flotation Allowance.

[22] Exhibit 27084-X0921, PDF page 2. Recommendation also assumes 40% deemed equity for ATCO Electric Distribution, ATCO Gas, ATOC Pipelines, with additional equity thickness for ATCO Electric Transmission (42%), Apex (44%), and FortisAlberta (43%). If deemed equity is set at 37%, then the ROE should be set 25 to 40 basis points above the recommendation for 40% equity or 10.25% to 10.40%. Recommended ROE and forecast ERP include 20 basis point risk adder.

[23] Exhibit 27084-X0315, PDF page 4.

[24] Exhibit 27084-X0390, PDF page 9.

Witness (Sponsoring Party)	ROE (%)	Forecast ERP[21] (%)	Empirical Approaches Used	Comments
			Model, Adjusted Total Market Approach	
Mr. Madsen (IPCAA)[25]	7.70	4.75	CAPM, DCF and M-DCF	Recommendation is simple average of CAPM and DCF models (7.51% and 7.90%).
Dr. Cleary (UCA)	6.75	3.90	CAPM, DCF, M-DCF and Utility Bond Risk Premium Analysis	-
Mr. Thygesen (CCA)	-	-	-	No submission made regarding the ROE or value of the forecast ERP.[26]

Source: AUC Decision 27084-D02-2023, October 9, 2023, page 25.

In order to estimate ROE and forecast ERP range using the empirical methodologies used in AUC proceeding 27084, the following approach has been used.

First, each of the empirical approaches used by parties is briefly described, including the key variables that must be specified and the associated measurement issues. The descriptions used in AUC Decision 27084-D02-2023 have been used where it is expedient to do so.

Second, the submissions of parties are set out in summary form. The summary of submissions used in AUC Decision 27084-D02-2023 have been used where it is expedient to do so.

Third, using evidence derived from the record of AUC proceeding 27084, the rationale used to appropriately quantify the key variables in each empirical approach is set out.

Fourth, using the Recommended Approach's forecast long Canada bond yield of 3% and the evidence filed by parties, the ROE and forecast ERP resulting from each of the empirical approaches are specified, as is whether the empirical approach will be used to inform the ROE and forecast ERP range.

1. The Capital Asset Pricing Model

The Capital Asset Pricing Model (the CAPM) is an asset pricing model that states the collective investment decisions of investors in capital markets will result in equilibrium prices for all risky assets, such that the returns investors expect to receive on their investments are commensurate with the risk of those assets relative to the market as a whole. The CAPM risk return relationship is known as the Security Market Line, in which the required expected return on an asset is proportional to that asset's risk relative to the market, as measured by its "beta".[27]

The CAPM can be represented by the following equation:

$$Rs = Rf + \beta[Rm-Rf]$$

where:

[25] Exhibit 27084-X0292, PDF page 6.

[26] Exhibit 27084-X0713, CCA-AUC2023FEB21-007, PDF page 13, para. 1. Mr. Thygesen recommends the ROE be no higher than 8.3%, implying a forecast ERP of 5.30%, including 0.50% Flotation Allowance, and assuming the Recommended Approach's determination of the forecast long Canada bond yield or 3.00%.

[27] Exhibit 27084-X0471, PDF page 3.

Rs is the required return on the common stock;

Rf is the risk-free rate;

Rm is the return on the market portfolio;

Rm – Rf is the market risk premium (MRP); and

βs, or beta, is the risk measure for the common stock. Beta captures the sensitivity of a common stock's returns to the market's returns and is equal to covariance of the investment returns and the returns on the market portfolio, divided by the variance of the returns on the market portfolio. Beta is a measure of systematic risk – risk that cannot be diversified away. In effect, beta measures the contribution made by an individual stock to the risk of the diversified market portfolio.

Each of the variables in the CAPM equation must be estimated and the issues associated with the quantification of each variable include:

- Risk Free Rate: long-term government yield or short-term treasury bill yield and adjusted/normalized or actual forecast;
- Beta: weekly or monthly data; duration of data sampling period; raw, Blume or Hamada adjusted betas; and recognized third-party or proprietary calculations;
- Market Risk Premium: historical, long-term, or forecast single period estimate; survey estimates; arithmetic or compound annual return; and adjusted/normalized or actual historical; and
- Market Flotation Allowance of 0.50%.

The CAPM recommendations of parties are summarized in Table 3.

Table 3. CAPM Recommendations by Party

Witness (Sponsoring Party)	Risk-free Rate (%)	MRP (%)	Beta	Flotation Allowance (%)	ROE (%)
Mr. D'Ascendis (AltaLink/EPCOR)[28]	2.88	7.64	0.61	0.50	8.38 (Canadian utility group)
	4.03	7.80	0.79	0.50	10.88 (U.S. Electric utility group)
	4.03	7.80	0.76	0.50	10.70 (U.S. Gas utility group)
Dr. Villadsen (ATCO/Apex/Fortis)[29]	3.85	5.91 – 6.56	37% Hamada: 1.21[30] 40% Hamada: 1.12	-	9.4 -11.2 (Full comparator group)
Concentric (ENMAX)[31]	3.73	7.59	0.85	0.50	10.73 (Full comparator group)
Dr. Cleary (UCA)[32]	2.85	5.00	0.45	0.50	5.7 (Canadian comparator group)

[28] Exhibit 27084-X0390, PDF pages 86, 177-179. ROE results represent an average of CAPM and ECAPM models.

[29] Exhibit 27084-X0469.01 PDF pages 6 and 46-49. Dr. Villadsen's scenario analyses use various estimates of beta: Raw, Blume Adjusted and Hamada Adjusted at 37% and 40%. Dr. Villadsen's recommended range using the CAPM reflects a Brattle analysis using Hamada betas assuming 40% leverage and three years of weekly data from Bloomberg.

[30] Exhibit 27084-X0469.01, PDF page 43, footnote 118.

[31] Exhibit 27084-X0315, PDF pages 62, 64-65, and 105. The betas used in Concentric's CAPM analyses for the entire comparator group are drawn from two sources: Value Line and Bloomberg.

[32] Exhibit 27084-X0320.02, PDF page 61. Beta of 0.45 per cent is raw/unadjusted. ROE of 5.7% includes an A-rated Canadian utility bond yield spread adjustment of 0.095 per cent.

Witness (Sponsoring Party)	Risk-free Rate (%)	MRP (%)	Beta	Flotation Allowance (%)	ROE (%)
Mr. Madsen (IPCAA)[33]	2.95	6.08	0.669	0.50	7.51 (Canadian and U.S. Electric utility group)
Mr. Thygesen (CCA)[34]	-	-	-	-	-

Source: AUC Decision 27084-D02-2023, October 9, 2023, page 26.

1.1 Risk-free rate

The Recommended Approach set out Section IV uses a forecast long Canada bond yield with a term to maturity of 30-years and a specific value of 3.00%. This metric will be used in the quantification of the forecast ERP and ROE in each of the empirical approaches discussed in this document.

1.2 Beta

A significant volume of academic and empirical evidence was filed on the record of AUC proceeding 27084 to support the position taken by parties relating to how beta should be calculated.

In general, witnesses for the utilities used betas with the following characteristics:

- Sourced from established, reputable fee for service data providers widely used by the investment community, in particular Value Line and Bloomberg;
- Reflected weekly data to more effectively capture the contribution made by each individual stock in the comparator group of equities to the risk of the diversified market portfolio over the measurement period. Selected measurement periods ranged from two[35] to five-years[36]. The use of weekly versus monthly betas was supported by each utility expert using a variety of measures, including variation[37] and statistical performance analysis[38];
- Incorporated the Blume adjustment to address the tendency of raw betas to change gradually over time, transform the historical unadjusted or raw beta into an expectational value consistent with the forward-looking nature of the cost of capital, and partially correct for the known deficiencies of the CAPM[39]; and
- In the case of the evidence filed by Dr. Villadsen, used the Hamada adjustment to reflect a 40% deemed equity component to standardize the capital structure of the comparable group of

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33 Exhibit 27084-X0292, PDF pages 28-29. Mr. Madsen used MERP in lieu of MRP in the CAPM calculations and focused his analysis on the Canadian and U.S. electric utility holding companies of the comparator group.

34 Exhibit 27084-X0305. Mr.Thygesen did not make a submission on ROE or forecast ERP using the CAPM.

35 Transcript Volume 5, page 973, PDF page 80, lines 8-11 and 15. Mr. D'Ascendis uses Bloomberg's default setting of two years to calculate beta.

36 Exhibit 27084-X0315, PDF page 62. Value Line publishes the historical Beta for each company based on five years of weekly stock returns and uses the New York Stock Exchange as the market index. Concentric has computed Bloomberg Betas using five years of weekly stock returns and using the S&P or the S&P/TSX Composite as the market index, in the case of U.S. or Canadian comparable equities, respectively.

37 Exhibit 27084-X0390, PDF pages 80-84.

38 Exhibit 27084-X0469.01, PDF page 44.

39 Exhibit 27084-X0390, PDF pages 76-84; Exhibit 27084-X0315, PDF pages 62-64; Exhibit 27084-X047, PDF pages 7-8; and Exhibit 27084-X0469.01, PDF pages 43-44.

utilities and calculate beta[40] on an equivalent basis, given the relationship between financial leverage and equity returns.

Two of the three witnesses for consumer groups prepared estimates of ROE and Forecast ERP using the CAPM. Each witness used different a different approach to calculate beta.

Dr. Cleary presented weekly and monthly raw (unadjusted) betas for both the U.S. and Canadian comparators using weekly and monthly data from Bloomberg. Dr. Cleary did not support the use of either the Blume or Hamada adjustments to calculate beta[41]. Dr. Cleary's beta recommendation of 0.45 considered the average of his weekly raw beta estimate of 0.336 and monthly raw beta estimate of 0.319, both as of December 31, 2022, and the seven-year weekly and monthly beta estimates of 0.52 and 0.246, respectively[42] adjusted upward to 0.45 based on judgment.

Mr. Madsen also used raw and adjusted betas in his analysis, however Mr. Madsen concluded that it is reasonable to use Blume adjusted betas, as they are consistent with the forward-looking nature of a cost of capital determination. Mr. Madsen therefore used five-year monthly data provided by YCharts and Yahoo Finance to determine an average adjusted beta of 0.669 for the combined Canadian and U.S. Electric Utility segments of the comparable group of utilities.[43] Mr. Madsen considered and then rejected the use of Blume adjusted, weekly Value Line betas.

1.3 Expected Market Risk Premium

Parties to AUC proceeding 27084 used a variety of approaches to quantify the MRP.

Mr. Madsen's MRP of 6.08% is an average of three MRP estimates: the implied ERP provided by Kroll of 6.0%, Damodaran implied ERP of 6% as of January 1, 2023, and implied MRP calculated by Mr. Madsen of 6.23% by applying a Gordon Growth Model to the S&P500.[44]

Dr. Cleary adopted an MRP of 5.00%, equal to the average of a commonly used historical range of 4% to 6%. Dr. Cleary relied on a series of surveys and reports from academics, investment management firms, and actuarial service providers to establish historical and forecast returns for the Canadian, U.S. and world developed markets.[45]

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40 Exhibit 27084-X0469.01, PDF pages 43-44. Dr. Villadsen used weekly data from Bloomberg over a three-year measurement period. A similar analysis was performed assuming deemed equity of 37%.

41 Exhibit 27084-X0320.02, PDF pages 49-60, Table 9 PDF page 58; and Exhibit 27084-X0333. Betas presented in Table 9 are drawn from Exhibit X0333 and are presented as annual betas, raw and Blume adjusted, for 2016 to 2022. However, the data range for each individual year appears to be two years of historical weekly data, and in the case of monthly betas, five years of historical monthly data. In addition, the results presented demonstrate that utility holding company weekly betas, both raw and Blume adjusted, can and do approach or exceed the value of 1.0, the beta for the market portfolio. In addition, Dr. Cleary's analysis demonstrates that the Blume adjusted weekly betas of the Canadian comparables demonstrate a lower range and standard deviation than similar metrics for weekly raw betas. Dr. Cleary does not perform a similar analysis on the calculated monthly raw or Blume adjusted betas. Using the empirical approach in Exhibit 27084-X0333, none of the monthly beta estimates, raw or Blume adjusted approach, are equal to 1.0, the beta for the market portfolio. Dr. Cleary's monthly beta calculations include negative raw betas and betas that are not materially different from zero.

42 Exhibit 27084-X0320.02, PDF pages 49-60, Table 9 PDF page 58.

43 Exhibit 27084-X0292, PDF pages 16-22.

44 Exhibit 27084-X0292, PDF pages 24–29.

45 Exhibit 27094-X0320.02, PDF pages 39-49.

Dr. Villadsen used the historical average premium of market returns over the income return on long-term bonds, as per Duff & Phelps, for both the Canada and the U.S. The MRP are expressed as the arithmetic average and is 5.91% for Canada (1935 – 2021) and 7.46% for the U.S. (1926 – 2021). Dr. Villadsen also calculated a forecast MRP for both Canada and the U.S. using Bloomberg estimates of total market return adjusted to be measured over a 30-year government bond. Forecast MRP using this approach are calculated to be 6.56% and 4.50% for Canada and the U.S., respectively.[46]

Mr. D'Ascendis calculated a prospective MRP for both Canada and the U.S. by applying a constant growth DCF model to the companies comprising each of the S&P/TSX and S&P500. The resulting total return for each index is then reduced by the forecast Canadian or U.S. long-term government bond yield. The resulting forecast MRPs for Canada and the U.S. are 9.92% and 7.03%, respectively. Mr. D'Ascendis estimated historical MRPs by using a regression analysis in which the MRP is expressed as a function of the long-term government bond yield. The historical MRPs for Canada and the U.S. using this approach are 5.35% and 8.57%, respectively.[47]

Concentric used the MRP ex-post historical arithmetic average based on data from Kroll of 5.74% for Canada (1919 – 2021), and 7.46% for the U.S. (1926 – 2021). Concentric calculated forecast or forward MRP by subtracting the risk-free rate for each country from the estimated total return for the overall market, as calculated using the DCF methodology for the S&P/TSX Composite Index in Canada and the S&P index in the U.S. The forecast MRP resulting from this approach is 9.22% for Canada and 7.93% for the U.S.[48]

1.4 Flotation Allowance

Regulatory tribunals typically allow the inclusion of a flotation allowance of 0.50 percent in estimates of ROE obtained from the application of the CAPM, constant growth discounted cash flow model (DCF), multi-stage discounted cash flow model (M-DCF), and risk premium models. The flotation allowance is normally included in the allowed return to account for administrative costs and equity issuance costs, any impact of underpricing a new issue, and the potential for dilution.[49]

In AUC proceeding 27084, Mr. D'Ascendis[50], Dr. Cleary[51], Mr. Madsen[52], and Concentric[53] supported the continued use of a 0.50 percent flotation allowance and have incorporated it into their estimates of ROE and forecast ERP. No party expressed a contrary view.

Recommended Approach – Flotation Allowance

The Recommended Approach uses a flotation allowance of 0.50 per cent, as it is reasonable and reflects the filed position of parties in the evidentiary record. In addition, the Recommended Approach uses this

[46] Exhibit 27084-X0469.01, PDF pages 42-43.
[47] Exhibit 27084-X0390, PDF page 85.
[48] Exhibit 27084-X0315, PDF page 64-65.
[49] AUC Decision 22570-D01-2018, PDF page 104.
[50] Exhibit 27084-X0390, PDF pages 100-101.
[51] Exhibit 27084-X0320.02, PDF page 61.
[52] Exhibit 27084-X0292, PDF page 6.
[53] Exhibit 27084-X0315, PDF page 66.

adjustment to the forecast ERP and ROE results obtained through the CAPM, DCF, M-DCF, and certain risk premium models.

Recommended Approach - Quantifying the CAPM Variables

In order to inform the quantification of the forecast ERP and ROE using the CAPM, the following Recommended Approach was used.

First, although raw betas may be reliable indicators of changes in the trending of systematic or non-diversifiable risk, the use of raw betas in the CAPM calculation does not result in forecast ERP or ROE estimates that are in a band of reasonableness. Only Dr. Cleary used raw or unadjusted betas in the CAPM analysis. Dr. Cleary's recommended ROE using the CAPM of 5.7% is 2.8% lower than the 8.50% ROE established by the AUC in prior regulatory proceedings[54], despite changed capital markets conditions[55], and is only 1.27% higher than the A-rated utility bond yield used by Dr. Cleary in his utility bond yield risk premium analysis, despite Dr. Cleary's recommendation that the appropriate premium to the A-rated utility bond yield is 2.50%.

Second, the Recommended Approach uses Blume adjusted betas to calculate the CAPM. As per the evidence in AUC proceeding 27084, Blume adjusted betas have the effect of transforming a historical measure of risk into a forward estimate, are a more reliable measure of systematic risk based on the well-known and accepted empirical work of Dr. Blume, and correct, in part, for the known weakness of the CAPM of underestimating the cost of equity capital for low risk or value stocks, such as the shares of the utility holding companies in the comparator group. Blume adjusted betas are commonly used by the investment community and result in ROE and forecast ERP estimates that are directionally consistent with prior regulatory determinations.

Third, due to the need to obtain the best measure of the contribution made by an individual stock to the risk of the diversified market portfolio in the context of current market conditions, the Recommended Approach uses weekly betas to calculate ROE using the CAPM. As the cost of capital is a prospective estimate, it is appropriate to use the more accurate forecast of non-diversifiable risk. As set out in the next section, the Recommended Approach also reflects the use of Mr. Madsen's Blume adjusted, monthly betas. The weekly Blume adjusted Value Line betas provided in Mr. Madsen's evidence are also used in Mr. Madsen's average beta calculation presented in Table 4. The use of betas from reputable, established data service providers minimizes the opportunity for arbitrary adjustments and custom calculations that do not have broad support amongst parties to a proceeding.

Fourth, the Recommended Approach does not use Hamada betas to estimate the CAPM ROE. Based on the evidentiary record of AUC proceeding 27084, the assumptions and calculations undertaken by Dr. Villadsen to derive Hamada betas were not adequately tested and the limitations of the empirical approach remain unresolved.

Fifth, based on the empirical record of AUC proceeding 27084, the Recommended Approach adopts the view that historical MRPs should reflect long-term actual realized stock market returns net of the commensurate income return (i.e., yield) on the long-term government bonds, in order to capture a

[54] AUC Decision 22570-D01-2018.
[55] Exhibit 27084-X0910.

large number of economic and monetary cycles, minimizing the risk that calculated MRPs reflect anomalous or transitory market conditions. In addition, given the additive nature of the CAPM model and the use of the CAPM to calculate a single period return, the MRP should be an arithmetic average. Finally, historical realized stock market returns should not be normalized for the impact of monetary policy intervention and other factors, unless similar adjustments are made to the risk-free rate.[56]

Sixth, the Recommended Approach does not use surveys to estimate MRP or the MRP estimates of investment management professionals and actuarial service providers. These estimates are not empirically robust, were prepared for different purposes, and cannot be analyzed and tested. Although the Recommended Approach uses Dr. Cleary's MRP of 5.00%, it is not clear the estimate is consistent with these principles. However, inclusion of this estimate, as set out below, has a non-material effect on the average MRP.[57]

Finally, the Recommended Approach does not adopt the ECAPM approach to estimate ROE or forecast ERP. Dr. Cleary raised a number of concerns with the ECAPM[58] methodology and the assumptions and variables used in the approach were not subject to adequate testing based on the evidence in AUC proceeding 27084. As such, the Recommended Approach does not use the ECAPM approach to determine ROE and forecast ERP.

Recommended Approach - ROE and Forecast ERP Using the CAPM

Using the Recommended Approach set out in the discussion above, and applied as set out in Table 4, the CAPM estimate of ROE is 8.99% and forecast ERP is 5.99%, including a 0.50% flotation allowance.

Table 4. Estimate of ROE and Forecast ERP Using the CAPM

Witness (Sponsoring Party)	Weighted[59] Average Adjusted Beta	Historical MRP		Forward MRP		Weighted Historical MRP	Weighted Forecast MRP	Average MRP
		Canada	U.S.	Canada	U.S.			
Mr. Madsen (IPCAA)	0.74	-	-	-	6.23%			
Concentric (ENMAX)	0.85	5.74%	7.46%	9.22%	7.93%			
Mr. D'Ascendis (AltaLink/EPCOR)	0.76	5.35%	8.57%	9.92%	7.03%			
Dr. Villadsen (ATCO/Apex/Fortis)	0.74	5.91%	7.46%	6.56%	4.50%			
Dr. Cleary (UCA)	-	5.00%	-	-	-			
Average	0.77	5.50%	7.83%	8.57%	6.42%	7.48%	6.75%	7.11%
					CAPM ERP:			5.49%
					Plus Forecast Long Canada Bond Yield			3.00%
					Plus Flotation Allowance:			0.50%
					CAPM ROE:			8.99%
					Forecast ERP Including Flotation Allowance:			5.99%

[56] Exhibit 27084-X0868.

[57] Removal of this estimate would increase the Average MRP by 0.01%.

[58] Exhibit 27084-X0759, PDF pages 43-45.

[59] Calculated as a weighted average using the comparable group of 33 representative utilities adopted by the AUC in proceeding 27084: five Canadian, 22 U.S. electric, and six U.S. natural gas utility comparables. Average unrounded Adjusted Beta is 0.7718 and Average MRP unrounded is 7.112%.

2. Constant Growth Discounted Cash Flow Model

The constant growth discounted cash flow model (DCF) assumes that the market price of a stock is equal to the present value of the cash flows that the owners of the shares expect to receive. In general, expected future cash flows are represented by the dividends paid per share. This pricing relationship is generally expressed as:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_\infty}{(1+k)^\infty}$$

where:

P_0 represents the current stock price;

D_1 … D_∞ represent expected future dividends; and

k (or K) is the discount rate or required ROE.[60]

The expression can be simplified and rearranged into annual and quarterly compounding DCF equations:[61]

Annual compounding DCF

$$K = \frac{D_0(1+g)}{P_0} + g$$

Quarterly compounding DCF

$$K = \left[\frac{D_0(1+g)^{1/4}}{P_0} + (1+g)^{1/4}\right]^4 - 1$$

where g is the expected growth rate of dividends, and the specifications of the remaining variables are consistent with the definitions above.

Each of the variables in the DCF approach must be estimated and the issues associated with the quantification of each variable include:

Current Stock Price: period of time, usually expressed in days, over which the "current" stock price is calculated;

Dividend: period of time over which the "current" dividend is determined, and whether it is appropriate to adjust the dividend by an estimated growth factor to account for quarterly dividend growth at different times throughout the year; and

Dividend Growth Rate: use of analyst forecast EPS growth rates as a proxy for dividend growth rate; appropriateness of the use of analyst forecasts; whether forecast nominal GDP

[60] Exhibit 27084-X0390, PDF page 40.
[61] Exhibit 27084-X0292, PDF page 29.

should be used as a proxy for EPS growth, whether EPS growth rates can exceed forecast nominal GDP, and whether it is appropriate to use simplified empirical approaches employing historical, book value-based data to calculate future dividend growth rates.

The constant growth DCF recommendations by parties are summarized in Table 5.

Table 5. Constant Growth DCF Recommendations by Party

Witness (Sponsoring Party)	Weighted[62] ROE (%)	Flotation Allowance (%)[63]	ROE including Flotation Allowance (%)
Mr. D'Ascendis (AltaLink/EPCOR)[64]	9.59	0.50	10.09
Dr. Villadsen (ATCO/Apex/Fortis)[65]	9.95	0.50	10.45
Concentric (ENMAX)[66]	9.59	0.50	10.09
Dr. Cleary (UCA)[67]	6.35	0.50	6.85
Mr. Madsen (IPCAA)[68]	7.31 – 9.14	0.50	7.81 - 9.64
Mr. Thygesen (CCA)[69]	-	-	-

2.1 Current Stock Price

Parties to AUC proceeding 27084 calculated the current stock price as follows.

Mr. D'Ascendis calculated the current stock price as the average closing price of the last 60 trading days ending December 30, 2022, for each company, in order to avoid biases that may arise from anomalous or transitory events but remain reasonably representative of expected capital markets conditions over the long term.[70]

Dr. Villadsen calculated the current stock price for each of the utility comparators as the average of the closing stock prices for the 15 trading days ending on the date of the analysis. Dr. Villadsen's averaging approach is designed to reduce the risk associated with biases that may arise on a single trading day but is consistent with using current stock prices.[71]

Concentric calculated the current stock price for each company in the respective proxy groups by using the average stock price for each company for the 90 trading days ended December 31, 2022.[72]

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62 Calculated as a weighted average using the comparable group of 33 representative utilities adopted by the AUC in proceeding 27084: five Canadian, 22 U.S. electric, and six U.S. natural gas utility comparables.

63 The Constant Growth DCF directly calculates ROE prior to the addition of the flotation allowance.

64 Exhibit 27084-X0390, PDF page 47. Average of the mean and median.

65 Exhibit 27084-X0469.01, PDF pages 54 and 55.

66 Exhibit 27084-X0315, PDF pages 53-57. Exhibit 27084-X0490, sheet JMC-3 Constant DCF.

67 Exhibit 27084-X0320.02, PDF page 61-69. Dr. Cleary uses only the Canadian utilities in his recommendations.

68 Exhibit 27084-X0292, PDF pages 29-44. Exhibit 27084-X0304, Sheet DCF. Mr. Madsen does not use the U.S. Gas utility comparable equities in his constant growth analysis and excludes Algonquin Power & Utilities Corp. from his DCF calculations.

69 Exhibit 27084-X0305. Mr.Thygesen did not make a submission on ROE or forecast ERP using the constant growth DCF.

70 Exhibit 27084-X0390, PDF page 42.

71 Exhibit 27084-X0471, PDF page 12.

72 Exhibit 27084-X0315, PDF page 54.

Dr. Cleary presented dividend yield calculations in his evidence, using trailing twelve months, 5-year and 7-year dividend yield averages.[73]

Mr. Madsen used the average of the 30-day period December 9, 2022, to January 24, 2023, to determine current stock price. Mr. Madsen's approach is designed to reduce the bias associated with the use of the current stock price arising from short-term stock price volatility.[74]

2.2 Dividend

The dividends used by parties were specified in the following manner.

Mr. D'Ascendis used the annualized dividend on December 30, 2022, for each comparator utility. In order to reflect the quarterly dividend payment cycle, that the companies in the comparator group increase their quarterly dividend at various times during the year and ensure that the dividend is representative of the next 12-month period, Mr. D'Ascendis increased the dividend by one-half of the annual dividend growth rate assumed in his calculation[75], as set out in the next section.

Dr. Villadsen calculated the dividend as the last recorded quarterly dividend payment as reported by Bloomberg prior to the date of the analysis. The dividend is increased by an amount equal to the forecasted growth rate to estimate the future dividend input, as required by the DCF model[76]. Dr. Villadsen used the quarterly compounding version of the Constant Growth DCF model.

Concentric calculated the dividend by increasing the current annualized dividend by one half year's growth rate, to account for increases in quarterly dividends at different times throughout the year. Concentric states that this adjustment ensures that the expected dividend [yield] is, on average, representative of the coming twelve-month period and does not overstate the aggregated dividends to be paid during that time.[77]

In his explanation of the variables in the constant growth DCF model, Dr. Cleary stated that D_0 represents the dividends paid over the most recent 12-month period.[78] Dr. Cleary presents a number of dividend yield calculations, including trailing twelve months from December 2022 and average 5-year and 7-year dividend yield averages.[79]

Mr. Madsen relied on the current dividend in each of his constant growth DCF models.[80] Mr. Madsen presents DCF results that reflect both the annual and quarterly compounding constant growth DCF models. Mr. Madsen does not increase the annualized current dividend to account for increases in quarterly dividends at different times throughout the year.[81]

2.3 Dividend Growth Rate

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73 Exhibit 27084-X0320.02, PDF pages 65-69; and Exhibit 27084-X0334.01.
74 Exhibit 27084-X0292, PDF page 32.
75 Exhibit 27084-X0390, PDF page 41.
76 Exhibit 27084-X0471, PDF page 12.
77 Exhibit 27084-X0315, PDF page 54.
78 Exhibit 27084-X0320.02, PDF page 62.
79 Exhibit 27084-X0320.02, PDF pages 65-69; and Exhibit 27084-X0334.01.
80 Exhibit 27084-X0292, PDF page 32.
81 Exhibit 27084-X0292, PDF page 32. Exhibit 27084-X0304, Sheet DCF.

The dividend growth rate used by parties reflected a number of approaches.

Mr. D'Ascendis used analysts' five-year forecasts of earnings per share growth [82] in his DCF analysis, on the basis that using projected earnings growth rates in a DCF analysis provides a better match between investors' market price appreciation expectations and the growth rate component of the DCF. Mr. D'Ascendis supported this assertion with a variety of empirical and academic research.[83] Mr. D'Ascendis did not support the use of forecasted GDP in the DCF analysis, nor did he accept the view that forecast utility EPS growth should considered a ceiling for the growth component in a constant growth DCF.[84]

Dr. Villadsen used investment analyst forecasts of company-specific growth rates sourced from Value Line and Thomson Reuters IBES[85], consistent with the empirical basis of the DCF model which requires that forecast growth rates reflect investor expectations about the pattern of dividend growth for the companies over a sufficiently long horizon.

Concentric used projected earnings growth rates from SNL Financial, Value Line, Zacks, and Thomson First Call for the companies in the respective proxy groups, on the basis that the most relied upon indicator of investors' expectations is analysts' estimates of future earnings growth. Concentric also presented that it is appropriate to use projected EPS growth rather than dividend growth rates: first, dividend growth is derived from and can only be sustained by earnings growth; second, in order to reduce the long-term growth rate to a single measure, as required by the constant growth DCF model, it is necessary to assume a constant payout ratio, and that EPS, dividends per share, and book value per share grow at a constant rate; third, earnings growth rates are less influenced by dividend decisions made in response to near-term changes in the business environment; and finally, analyst EPS growth forecasts are widely available, whereas dividend and book value growth rates are generally available only from Value Line.[86] Concentric also asserted that regulatory changes in Canada and the U.S. have reduced analyst forecast optimism bias and presented academic studies to support this position.[87]

Dr. Cleary defined the dividend growth rate as the expected long-term average growth rate in dividends and earnings[88] and calculated a sustainable growth rate for each company in the comparable group by multiplying the earnings retention ratio (equal to 1 – Dividend Payout Ratio) by the book return on equity.[89] Dr. Cleary used various calculations of dividend growth using historical data to estimate ROE and the forecast ERP.[90]

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82 Exhibit 27084-X0391, Sheets 2.2-2.4 CGDCF. EPS estimates were from Value Line, Zack's, and Yahoo! Finance.
83 Exhibit 27084-X0390, PDF pages 42-46.
84 Exhibit 27084-X0390, PDF page 46.
85 Exhibit 27084-X0469.01, PDF page 51.
86 Exhibit 27084-X0315, PDF page 54.
87 Exhibit 27084-X0315, PDF page 56.
88 Exhibit 27084-X0320.02, PDF page 62.
89 Exhibit 27084-X0320.02, PDF page 65.
90 Exhibit 27084-X0320.02, PDF pages 64-65. Market Nominal GDP DCF for 2020 – using a growth factor equal to nominal estimated GDP of 3.85%; Implied Growth (2022) – using a sustainable growth factor equal to the average of the average sustainable growth and median sustainable growth rates of the Canadian sample of five companies using 2022 dividend payout ratio and actual 2021 book ROE; Implied Growth (2016 – 2022) – using a sustainable growth factor equal to the average of the average sustainable growth rate and the median sustainable growth rates of the Canadian sample of five companies using 2016 – 2022 dividend payout ratios and 20216 – 2021 actual ROEs; Average of Average 2022 and 2016-2022 growth; and Average of Median 2022 and 2016-2022 Median growth.

Mr. Madsen considered a number of growth factors for each of his DCF models. Mr. Madsen reviewed growth projections from many publicly available sources, including the governments of Canada and Alberta, analysts' forecast growth projections, historical EPS growth rates, current year (2023) and prior year (2022) forecasts of EPS growth, and dividend growth. Based on this analysis, Mr. Madsen concluded the analysis supports the selection of more conservative growth estimates that are closely aligned with forecast growth in nominal GDP. Mr. Madsen stressed that absent a compelling need to support the attraction of capital and maintain the financial integrity of the utilities, Mr. Madsen would recommend growth estimates that are below the forecast growth in nominal GDP.[91] For each of his annual and quarterly compounding constant growth DCF calculations, Mr. Madsen conducted four scenarios, using combinations of forecast GDP and analysts' forecast EPS growth for each company in the Canadian and U.S. electric comparator groups. Mr. Madsen did not include Algonquin Power & Utilities Corp. in his recommended Constant Growth DCF calculations, even though the company was included in the group of comparable equities.[92]

Recommended Approach – Quantifying the Constant Growth DCF Variables

In order to inform the quantification of the forecast ERP and ROE using the constant growth DCF, the following Recommended Approach is used.

First, consistent with the empirical basis of the constant growth DCF, forecast EPS growth rates are used as a proxy for expected dividend growth. The Recommended Approach uses the minimum and mean analyst growth rates in the constant growth DCF analysis; maximum EPS growth rates have been excluded as they appear to be unreasonably high. The Recommended Approach notes that analyst EPS growth estimates are widely used by the investment community, concerns relating to analyst EPS optimism bias for large capitalization stocks like those in the comparator group may be misplaced[93], and the use of analyst EPS estimates supplied by third-party, established data service providers, such as Value Line, Zack's, Yahoo! Finance, SNL Financial, and Thomson First Call minimizes the opportunity for arbitrary adjustments and custom calculations that may introduce bias (higher or lower) into the calculation and are generally not uniformly supported in a regulatory proceeding.

Second, the Recommended Approach does not use the sustainable growth rate approach employed by Dr. Cleary to estimate the expected dividend growth rate and calculate the estimated ROE and forecast ERP. Dr. Cleary's approach relies on historical 7-year average dividend yields and payout ratios and uses accounting data, rather than readily available, market-driven forecasts. The approach produces growth estimates that are less than historical actual rates of growth[94] and less than inflation, resulting in negative real utility growth. The Recommended Approach does not support the premise of the

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91 Exhibit 27084-X0292, PDF pages 33-41.

92 Exhibit 27084-X0292, PDF pages 41-42. Scenario 1: growth equals nominal Canadian GDP of 3.77%; Scenario 2: growth is 3.91% and is equal to average forecast EPS growth for each company in the Canadian and U.S. electric comparator groups for the current year and next year (2022 and 2023, respectively); Scenario 3: growth is 5.35% and is equal to forecast EPS growth for each company in the Canadian and U.S. electric comparator groups for the next 5 years as per Yahoo! Finance; and Scenario 4: growth is 4.34% and is equal to the average of each of 3.77%, 3.91%, and 5.35%.

93 Transcript Volume 3, pages 704 – 722.

94 Exhibit 27084-X0304, Sheet DCF, column "Growth forecast past 5 years (per annum)".

approach that the only monies available for growth are retained earnings per share, as it ignores the issuance of equity to fund growth[95].

Third, the record in AUC proceeding 27084 demonstrates that the compound annual utility growth rate of 6.53% exceeded the U.S. GDP growth rate over the 1947 to 2021 period.[96] In addition, the record also alleviated arguments that using a growth rate in excess of GDP will result in the utility segment becoming larger than the whole economy. Mr. D'Ascendis demonstrated that the utility sector would not comprise over 50% of the U.S. GDP for 341 years from the 1947 starting point and would not overtake 100% of U.S. GDP for many millennia[97]. Accordingly, the Recommended Approach does not use forecast GDP as a proxy for forecast EPS growth, as the record in AUC proceeding 27084 supports the view that utility EPS growth has exceeded the long-term growth rate of the U.S. economy and can exceed nominal GDP growth for years at a time. Similarly, the Recommended Approach does not support the supposition that utility EPS growth is "capped" or limited by GDP growth.

Fourth, the Recommended Approach does not endorse the analysis and conclusions of Mr. Madsen. There is no evidence on the record of AUC proceeding 27084 that investors and other market participants use estimated nominal GDP as a proxy for utility growth for the purpose of calculating the constant growth DCF. Moreover, Mr. Madsen does not provide any evidence that his recommended ROE and forecast ERP estimates would meet the capital attraction and financial integrity components of the Fair Return Standard, as he asserts.

Finally, the Recommended Approach uses an averaging period to calculate the current stock price to mitigate the risk that a single date, point in time estimate may be biased by market conditions on the pricing date. The averaging period should not exceed 90 days, as a longer averaging period is inconsistent with the empirical basis of the constant growth DCF approach that assumes the use of current stock prices. In addition, the Recommended Approach accepts the adjustment of the current quarterly dividend by the chosen dividend growth rate, as submitted by Mr. D'Ascendis, Dr. Villadsen, and Concentric. No party provided a contrary view that the adjustment was inappropriate.

Recommended Approach – ROE and Forecast ERP Using Constant Growth DCF

Using the Recommended Approach set out above, the constant growth DCF estimate of ROE is 9.47% and forecast ERP is 6.47% (including a 0.50% flotation allowance), as set out in Table 5.

Table 5. Estimate of ROE and Forecast ERP Using Constant Growth DCF

Witness (Sponsoring Party)	Description	Weighted[98] EPS Growth Rate (%)	Flotation Allowance (%)	ROE (%)
Mr. Madsen (IPCAA)[99]	Annual Compound DCF - Scenario 2	3.91	0.50	8.22

[95] Exhibit 27084-X0761.02, PDF page 61.
[96] Exhibit 27084-X0390, PDF page 159, Schedule 3 and Exhibit 27084-X0665.
[97] Exhibit 27084-X0663, PDF page 13, D'Ascendis-UCA-2023FEB21-008(b).
[98] Calculated as a weighted average using the comparable group of 33 representative utilities adopted by the AUC in proceeding 27084: five Canadian comparables, 22 U.S. electric utility comparables, and six U.S. natural gas comparables.
[99] Exhibit 27084-X0292, PDF pages 29-44; and Exhibit 27084-X0304, Sheet DCF. Mr. Madsen does not use the U.S. Gas utility comparable equities in his constant growth analysis and excludes Algonquin Power & Utilities Corp. from his constant

Witness (Sponsoring Party)	Description	Weighted[98] EPS Growth Rate (%)	Flotation Allowance (%)	ROE (%)
	Annual Compound DCF - Scenario 3	5.35	0.50	9.65
	Quarterly Compound DCF – Scenario 2	3.91	0.50	8.40
	Quarterly Compound DCF – Scenario 3	5.35	0.50	9.92
Concentric (ENMAX)	Minimum EPS Growth	4.73	0.50	8.98
	Mean EPS Growth	5.78	0.50	10.09
Mr. D'Ascendis (AltaLink/EPCOR)	Average Projected 5-year EPS Growth	5.79	0.50	10.02
Dr. Villadsen (ATCO/APEX/Fortis)	Quarterly Compound DCF	5.67	0.50	10.45
		Average ROE - Constant Growth DCF including Flotation Allowance:		9.47
		Less: Forecast Long Canada Bond Yield		3.00
		Forecast ERP Including Flotation Allowance:		6.47

3. Multi-stage Discounted Cash Flow (Multi-stage DCF)

The multi-stage DCF model reflects the premise that investors value an investment according to the present value of its expected cash flows over time[100] and is an extension of the constant growth DCF. Unlike the constant growth DCF, the multi-stage DCF approach does not rely on the assumption of a single, constant estimate of dividend growth in perpetuity[101]. The multi-stage DCF can be expressed by a number of empirical equations. However, in general, the multi-stage DCF assumes that dividends grow at a constant rate over a short-term period, usually 5 years in length, transition to an assumed long-term constant growth rate over an interim period, also usually 5 years in length, and then grow in perpetuity at a growth rate usually equal to forecast nominal GDP.

The variables that must be estimated in a multi-stage DCF equation are the similar to those used in the constant growth DCF, with the exception of the assumed short-term and long-term dividend growth rates and the length of the short-term and transition periods, expressed in years.

The multi-stage DCF recommendations of parties to AUC proceeding 27084 are summarized in the following table.

Table 6. Multi-stage DCF Recommendations by Party

Witness (Sponsoring Party)	Weighted[102] ROE (%)	Flotation Allowance (%)	ROE Including Flotation Allowance (%)
Mr. D'Ascendis (AltaLink/EPCOR)[103]	9.41	0.50	9.91

growth DCF recommendations. Algonquin Power & Utilities Corp. has been used in Mr. Madsen's analysis to inform the Recommended Approach set out in this document.

100 Exhibit 27084-X0390, PDF page 53.

101 Ibid.

102 Calculated as a weighted average using the comparable group of 33 representative utilities adopted in AUC proceeding 27084: five Canadian comparables, 22 U.S. electric utility comparables, and six U.S. natural gas comparables.

103 Exhibit 27084-X0390, PDF page 50. Recommended M-DCF reflects average of mean and median results.

Witness (Sponsoring Party)	Weighted[102] ROE (%)	Flotation Allowance (%)	ROE Including Flotation Allowance (%)
Dr. Villadsen (ATCO/Apex/Fortis)[104]	8.43	0.50	8.93
Concentric (ENMAX)[105]	8.49	0.50	8.99
Dr. Cleary (UCA)[106]	7.01	0.50	7.51
Mr. Madsen (IPCAA)[107]	7.38-8.46	0.50	7.88-8.96
Mr. Thygesen (CCA)[108]	-	-	-

3.1 Multi-stage DCF Approach and Growth Estimates

Parties to AUC proceeding 27084 used various empirical approaches to calculate the multi-stage DCF.

Mr. D'Ascendis calculated the multi-stage DCF ROE as being equal to the rate of return that equates the current price per share of each company in the comparable group with forecast dividends over a two-hundred-year period. The share price, dividend and average projected five-year growth rates reflect the same estimates used by Mr. D'Ascendis in his constant growth DCF analysis. The growth rate is used in years one to five (Stage 1) of the calculation. To calculate dividends in years 11 – 200 (Stage 3), Mr. D'Ascendis used growth rates equal to long-term nominal GDP in Canada and the U.S., equal to 5.03% and 5.44%, respectively. Years six through ten represent a transition stage (Stage 2), in which the assumed growth rate in the first five years is adjusted in a levelized manner to equal the long-term growth rate.[109]

Dr. Villadsen calculated the multi-stage DCF ROE using a quarterly model where quarterly dividends over a 10-year period are estimated using a short-term growth rate (years one through 5), a transition growth rate (years six through ten) that equates the short-term growth rate with a long-term growth rate. The long-term growth rate is used to calculate a terminal stock price as at the end of year ten.[110] The short-term growth rates used in the multi-stage DCF analysis are the same as those used in Dr. Villadsen's constant growth DCF calculations and a long-term Canadian GDP growth forecast of 3.8% is used for all companies in the comparable group.[111]

Concentric also calculated the multi-stage DCF ROE as being equal to the rate of return that equates the current price per share of each company in the comparable group with forecast dividends over a two-hundred-year period. The share price, dividend and average projected five-year growth rates reflect the same estimates used by Concentric in its constant growth DCF analysis. The growth rate is used in years one to five (Stage 1) of the calculation. To calculate dividends in years 11 – 200 (Stage 3), Concentric used growth rates equal to long-term estimated nominal GDP in Canada and the U.S., equal to 3.84% and 4.14%, respectively. Years six through ten represent a transition stage (Stage 2), in which the

104 Exhibit 27084-X0469.01, PDF page 55-56.
105 Exhibit 27084-X0315, PDF page 59.
106 Exhibit 27084-X0320.02, PDF page 70.
107 Exhibit 27084-X0292, PDF pages 29-44; and Exhibit 27084-X0304, Sheet DCF.
108 Exhibit 27084-X0305. Mr. Thygesen did not make a submission on ROE or forecast ERP using the Multi-stage DCF.
109 Exhibit 27084-X0390, PDF pages 47-48; and Exhibit 27084-X0391, sheets 2.5-2.8.
110 Exhibit 27084-X0469.01, PDF pages 49-57; and Exhibit 27084-X0471, PDF pages 10-13.
111 Exhibit 27084-X0469.01, PDF page 51.

assumed growth rate in the first five years is adjusted in a levelized manner to equal the long-term growth rate.[112]

Dr. Cleary used a variation of the constant growth DCF called the H-Model to estimate a multi-stage DCF ROE. The approach assumed that growth in dividends moves in a linear manner from a short-term growth rate (gS) toward a long-term growth rate (gL) over a specified period of time, defined as 2H, where H is defined as the "half-life". The approach is expressed as:

$$Ke = (D_0/Price) \times [(1+gL) = H(gS - gL)] + gL$$[113]

Consistent with Dr. Cleary's constant growth DCF calculations, sustainable growth rates were calculated, such that the assumed short-term growth rate is 1.37% and the long-term growth rate is assumed to be 1.62%. Dr. Cleary considered two scenarios: Scenario 1 in which the transition period or half-life is 4 years and Scenario 2 in which the transition period or half-life is 2 years.[114] Dr. Cleary did not consider the results of the H-model analysis for the U.S. equities in his recommendations.

Mr. Madsen used two empirical approaches to calculate a range of multi-stage DCF ROE estimates. Mr. Madsen applied the approach used by the U.S. Federal Energy Regulatory Commission (FERC) in four scenarios.[115] Mr. Madsen adjusted the FERC formula to change the weights used from 80/20 short-term/long-term to 67/33 and adjusted the dividend used in the calculation by one half of the simple average of the short-term and long-term growth rates, versus the FERC approach of adjusting the dividend by only one half of the short-term growth rate.[116] Mr. Madsen also calculated a multi-stage DCF ROE using an approach similar to that used by Mr. D'Ascendis and Concentric. Mr. Madsen applied this latter approach in two scenarios.[117]

Recommended Approach – Quantifying the Multi-stage DCF Variables

The Recommended Approach to select the variables that will inform quantification of forecast ERP and ROE using the multi-stage DCF is set out below and incorporates the Recommended Approach for the variables in the constant growth DCF that are also used in the multi-stage DCF.

As per the constant growth DCF section, the Recommended Approach does not use Mr. Madsen's multi-stage DCF calculations using forecast GDP as an estimate for forecast EPS growth rates in years one to five alone or averaged with current analyst estimates, as doing so is inconsistent with the empirical basis for the multi-stage DCF approach. In addition, the Recommended Approach does not rely on Mr. Madsen's multi-stage DCF calculations that use current and one-year forecast EPS growth rates as a proxy for a five-year forecast EPS growth rate or use a one-year EPS growth estimate in year one and the

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112 Exhibit 27084-X0315, Concentric evidence, PDF page 57-58; and Exhibit 27084-X0490, Sheet JMC-4 Multi-Stage DCF.
113 Exhibit 27084-X0320.02, PDF pages 63-64.
114 Exhibit 27084-X0320.02, PDF pages 70-71.
115 Exhibit 27084-X0292, PDF pages 42-44; and Exhibit 27084-X0304.
116 Exhibit 27084-X0292, PDF page 30, footnote 25. FERC Opinion No. 569-A, May 21, 2020, PDF page 14, paragraph 20.
117 Exhibit 27084-X0292, PDF page 30; and Exhibit 27084-X0304, Sheet DCF and Multi-DCF Alt. Scenario 1: Analyst forecast next year EPS growth used in year one and analyst forecast five-year EPS growth used in years two through five. Nominal GDP of 3.77% used in years six through 300; Scenario 2: nominal GDP of 3.77% is used for years one through 300.

five-year EPS estimate in years two to five. A market-based, five-year EPS forecast is available and the appropriate metric for use in both instances.[118]

The Recommended Approach uses the FERC's two-step DCF approach used by Mr. Madsen and the multi-stage DCF approach used by Dr. Villadsen, as the latter is a reasonable adaptation of the standard formula for the present value of a cash flow stream.[119]

However, the adjustments made by Mr. Madsen to the FERC approach are arbitrary and are not used in the Recommended Approach. Dr. Villadsen and Mr. D'Ascendis further indicated that these adjustments were not appropriate.[120,121]

The Recommended Approach also does not accept the removal of Algonquin Power & Utilities Corp. from the multi-stage DCF results provided by Mr. Madsen, consistent with the inclusion of Algonquin and four additional Canadian utility holding companies in the proxy group of comparable utilities regardless of the screening criteria[122] and the determination by the AUC in the early stages of proceeding 27084 that the comparator group would be fixed for the duration of the proceeding – no additions or deletions from the comparator group would be permitted.[123] It is notable that Mr. Madsen also excluded Algonquin from his constant growth DCF analysis, but not from his other calculations.

The multi-stage DCF calculations used by Concentric and Mr. D'Ascendis that reflect analyst EPS growth forecasts in years one to five and are averaged up or down in years six to ten to equal forecast nominal GDP in years 11 to 200, are standard present value calculations of a cash flow stream and are used in the Recommended Approach.

The Recommended Approach does not use the results of Dr. Cleary's H-Model discounted cash flow approach. Experts for the utilities raised a number of empirical and qualitative issues with the model as applied by Dr. Cleary, including the use of sustainable growth rates that are less than forecast inflation[124,125] and result in negative real utility growth, sustainable growth rates that are less than historical actuals[126], and the need to consider growth arising from the issuance of equity.[127]

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118 Exhibit 27084-X0304, Sheets DCF and Multi DCF Alt. FERC Scenario 1: nominal estimated GDP of 3.77% is used for both the short-term and long-term growth rate; FERC Scenario 2: short-term growth rate is the average of the current year forecast and next year's growth rate and nominal estimated GDP of 3.77% is used as the long-term growth rate; FERC Scenario 3: short-term growth rate is equal to analyst 5-year EPS growth rates and nominal estimated GDP of 3.77% is used as the long-term growth rate; and FERC Scenario 4: the average the short-term growth rate in Scenarios one to three is used as the short-term growth rate and the long-term growth rate is nominal estimated GDP of 3.77%.

119 Exhibit 27084-X0471, PDF page 9.

120 Exhibit 27084-X0750, PDF page 32-36.

121 Exhibit 27084-X0761.01, PDF page 28.

122 Exhibit 27084-X0256, AUC Letter to Parties, PDF page 1.

123 Exhibit 27084-X0255, AUC Letter to Parties, PDF page 5.

124 Exhibit 27084-X0750, PDF page 29.

125 Ibid.

126 Exhibit 27084-X0743, PDF page 41.

127 Exhibit 27084-X0761.02, PDF page 61.

Recommended Approach – ROE and Forecast ERP Using Multi-Stage DCF

Using the Recommended Approach set out above, the multi-stage DCF estimate of ROE is 9.16% and forecast ERP is 6.16%, as set out in Table 7.

Table 7. Estimate of ROE and Forecast ERP Using Multi-Stage DCF

Witness (Sponsoring Party)	Description	EPS and Perpetual Growth Rates (%)			M-DCF ROE[128] (%)
		Years 1 – 5	Years 6 – 10	Years 11+	
Mr. Madsen (IPCAA)[129]	Scenario 3: FERC	5.35	3.77	3.77	9.44
	Scenario 2: Multi DCF Alternative	5.35	3.77	3.77	8.53
Concentric (ENMAX)	Mean	5.83	4.96	4.09	9.02
Mr. D'Ascendis (AltaLink/EPCOR)	Mean	5.84	5.58	5.38	9.90
Dr. Villadsen (ATCO/Apex/Fortis)	Mean	5.53	4.66	3.80	8.93
		Average Multi-stage DCF ROE Including Flotation Allowance:			9.16
		Less: Forecast Long Canada Bond Yield			3.00
		Forecast ERP Including Flotation Allowance			6.16

4. Risk Premium Models

Parties to AUC proceeding 27084 used three forms of risk premium models:

- Government bond yield risk premium model;
- Utility bond risk yield premium model; and
- Predictive risk premium model.

4.1 Government Bond Yield Risk Premium Model

The government bond risk premium approach recognizes that equity is riskier than debt because equity investors bear the residual risk associated with ownership. Equity investors therefore require a return that is greater (i.e., a premium) than would a bond holder. [130]

The government bond risk premium approach estimates ROE as the sum of the equity risk premium (ERP) and the yield on the 30-year U.S. Treasury yield. The ERP is not directly observable and is calculated as being equal to authorized returns from U.S. electric utility and U.S. gas distribution companies[131,132] less the then prevailing quarterly 30-year U.S. Treasury yield. The relationship

[128] Calculated as a weighted average using the comparable group of 33 representative utilities adopted in AUC proceeding 27084: five Canadian comparables, 22 U.S. electric utility comparables, and six U.S. natural gas comparables.

[129] Mr. Madsen's Scenario 3: FERC reflects an 80/20 Short-term/Long-term weighting of estimated growth, is corrected for the use of only the short-term growth estimate to adjust the dividend, and includes Algonquin Power & Utilities Corp. Scenario 2: Multi-DCF Alt reflects the forecast five-year EPS estimate in years one through five and includes Algonquin Power & Utilities Corp.

[130] Exhibit 27084-X0315, PDF page 66.

[131] Ibid, PDF page 67, lines 9-11.

[132] Exhibit 27084-X0469.01, PDF page 58, paragraph 50.

between the ERP and government bond yield is established in an ordinary, least squares regression, where the 30-year U.S. Treasury yield is the independent variable, and the ERP is the dependent variable. The approach produces empirical results that have high explanatory variables and significant coefficients of regression.[133,134]

Concentric and Dr. Villadsen both used the government bond yield risk premium model to inform their ROE and forecast ERP recommendations.[135,136]

The government bond yield risk premium regression results are set out in Table 8. ROE and forecast ERP are calculated using the forecast long Canada bond yield of 3.00% adopted by the Recommended Approach in Section IV. The addition of a flotation allowance to the ERP estimated by the regression equation is not needed, as the flotation allowance is reflected in the ROE determinations used in the analyses.

Table 8. Government Bond Yield Risk Premium Results by Party

		Regression Parameters					
Witness (Sponsoring Party)		**Intercept**	**Slope**	**Base Forecast GOC (%)**	**Flotation Allowance (%)**	**Estimated ERP (%)**	**Estimated ROE (%)**
Concentric (ENMAX)	Electric	8.43	-0.5433	3.00	-	6.80	9.80
	Gas	8.51	-0.5776	3.00	-	6.78	9.78
Dr. Villadsen (ATCO/Apex/Fortis)	Electric	8.47	-0.5390	3.00	-	6.85	9.85
	Gas	8.37	-0.5410	3.00	-	6.75	9.75

Recommended Approach – Government Bond Yield Risk Premium Model

The Recommended Approach reflects the view that it is reasonable to use estimates of ROE and forecast ERP derived using the government bond yield risk premium model to inform the empirical range of the ROE and forecast ERP. Although allowed ROEs from other jurisdictions are not, strictly speaking, wholly market-based data, the large volume of observations[137] effectively diversifies the specific regulatory issues associated with each proceeding in the data set. In addition, the regression variables are statistically significant, and the explanatory power of the approach is very high[138].

A simple average of the four, government bond yield risk premium equations in Table 8 results in an estimated forecast ERP of 6.79% and ROE estimate of 9.79%.

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133 Exhibit 27084-X0315, PDF pages 66-69; and Exhibit 27084-X0490, Sheet JMC-7.1 Risk Premium – Electric and JMC-7.2 Risk Premium Gas.

134 Exhibit 27084-X0469.01, PDF pages 58 - 61.

135 Exhibit 27084-X0315, PDF page 67; and Exhibit 27084-X0490, Sheet JMC-7.1 Risk Premium – Electric and JMC-7.2 Risk Premium Gas.

136 Exhibit 27084-X0469.01, PDF page 60-61.

137 Exhibit 27084-X0315, PDF page 67. Data regarding allowed ROEs were derived from 907 electric utility company rate cases and 751 gas distribution utility rate cases in the U.S. from January 1992 through December 31, 2022, as reported by Regulatory Research Associates.

138 Ibid. PDF pages 67 and 68; and Exhibit 27084-X0490, Sheet JMC-7.1 Risk Premium – Electric and JMC-7.2 Risk Premium Gas.

4.2 Utility Bond Yield Risk Premium Model

The utility bond risk premium approaches used by parties in AUC proceeding 27084 also recognize that equity is riskier than utility debt, as equity investors similarly bear the residual risk associated with ownership. Equity investors therefore require a return that is greater than would a utility bond holder. Dr. Cleary and Mr. D'Ascendis were the only parties in AUC proceeding 27084 to use a utility bond risk premium approach to estimate forecast ERP and ROE.

The utility bond yield risk premium recommendations by party are summarized in Table 9.

Table 9. Utility Bond Yield Risk Premium Recommendations by Party

Witness (Sponsoring Party)	Weighted[139] Average ERP (%)	Weighted Utility Bond Yield (%)	Weighted ROE (%)
Dr. Cleary (UCA)	3.0[140]	4.43	7.43
Mr. D'Ascendis (AltaLink/EPCOR)			
Beta-derived ERP[141]	4.64	6.04	10.68
S&P/TSX Capped Utilities Index and S&P Utility Index ERP[142]	3.41	6.04	9.45
BYRP Based on ROEs for U.S. Utilities	4.72	6.04	10.76
	D'Ascendis Average Utility Bond Yield (%)		4.26
	Plus: Flotation Allowance		0.50
	Plus: Weighted Utility Bond Yield		6.04
	D'Ascendis Weighted Adjusted Total Market Approach ROE:		10.80

Dr. Cleary and Mr. D'Ascendis each used different approaches to calculate forecast ERP and ROE using the utility bond yield risk premium approach.

Dr. Cleary used an approach that involves adding a risk premium to the yield on a firm's outstanding publicly traded long-term bonds, such that the return on equity is equal to the issuer's bond yield plus a company risk premium. Dr. Cleary selected the yield on long-term A-rated Canadian utility bonds of 4.43% as of January 19, 2023, and added a risk premium in the 2-5% range, using a best estimate of 2.5%. Dr. Cleary also added a 0.50% flotation allowance.[143]

Mr. D'Ascendis used an Adjusted Total Market Approach to estimate the risk premium to be added to the prospective utility bond yield. The Adjusted Total Market Approach uses three separate empirical calculations to estimate utility bond risk premiums: an ERP that is derived from a beta coefficient adjusted total market ERP, an ERP based on the S&P Utilities Index, and an ERP based on authorized

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139 Calculated as a weighted average using the comparable group of 33 representative utilities adopted by the AUC in proceeding 27084: five Canadian comparables, 22 U.S. electric utility comparables, and six U.S. natural gas comparables. Exhibit 27084-X0390, PDF page 61; and Exhibit 27084-X0320.02, PDF page 71-73. Dr. Cleary uses the Canadian comparables only.

140 Exhibit 27084-X0320.02, PDF pages 71-73. Presented ERP represents Canadian comparables only and is expressed as the sum of a utility bond risk premium of 2.50% plus 0.50% Flotation Allowance.

141 Exhibit 27084-X0390, PDF page 62.

142 Exhibit 27084-X0390, PDF page 63.

143 Exhibit 27084-X0320.02, PDF pages 71-73.

ROEs for U.S. Utilities. The ERP results are then averaged and added to a prospective public utility bond yield.

Recommended Approach – Utility Bond Yield Risk Premium Approach

The Recommended Approach considers the empirical basis of the utility bond yield methodology to be valid and adopts the use of only the utility bond risk premium approach based on U.S. utility ROEs. The Recommended Approach does not use the method filed by Dr. Cleary and the two additional methods presented by Mr. D'Ascendis to inform the empirical range of ROE and forecast ERP. The Recommended Approach reflects the following considerations.

First, Dr. Cleary's application of the utility bond yield risk premium approach, in particular the selection of the 2.50% risk premium, is not supported by empirical analysis. Dr. Cleary's approach does not resolve the fundamental issue with the utility bond yield risk premium approach - that the equity premium must be estimated. Dr. Cleary does not resolve this fundamental issue in his analysis or recommendation.

Second, while the Beta-derived ERP and S&P/TSX Capped Utilities Index and S&P Utility Index ERP presented by Mr. D'Ascendis make use of third-party data to estimate the variables in each calculation, the selection of variables and adjustments made were not subject to any material testing in AUC proceeding 27084.

Third, Mr. D'Ascendis used the difference between the authorized ROEs from litigated cases and the then-prevailing level of long-term A2-rated utility bond yields to estimate the utility bond ERP.[144,145] The utility bond yield risk premium regression results are set out in Table 10. The regression variables are statistically significant, and the explanatory power of the approach is very high.[146]

ROE and forecast ERP are calculated using the forecast long Canada bond yield of 3.00% adopted by the Recommended Approach in Section IV. The addition of a flotation allowance to the ERP estimated by the regression equation is not needed, as the flotation allowance is reflected in the ROE determinations used in the analyses.

Table 10. Utility Bond Yield Risk Premium Results

		Regression Parameters					
Witness (Sponsoring Party)		**Intercept**	**Slope**	**Utility Bond Yield (%)[147]**	**Flotation Allowance (%)**	**Estimated Utility Bond ERP (%)**	**Estimated ROE (%)**
Mr. D'Ascendis (AltaLink/EPCOR)	Electric	7.5943	-0.4811	4.57	-	5.40	9.97
	Gas	7.5670	-0.4863	4.57	-	5.34	9.91

144 Exhibit 27084-X0390, PDF page 64.

145 Ibid. PDF page 64, lines 12-21. Data was gathered for 1,207 U.S. electric rate proceedings and 818 gas rate proceedings between January 1980 and December 30, 2022, as reported by Regulatory Research Associates.

146 Exhibit 27084-X0391, sheets 4.16 and 4.17.

147 Equal to 3.0% base forecast long Canada bond yield adopted in Section IV and the average A-rated Canadian utility bond spread for the month of February 2023 of 1.57% from Exhibit 27084-X0605, PDF page 36.

A simple average of the two, utility bond yield risk premium equations in Table 10 results in an estimated ROE of 9.94% and forecast ERP of 6.94%.

5. Predictive Risk Premium Model

The predictive risk premium model (PRPM) is based on the premise that the volatility of prices and returns clusters over time and is therefore highly predictable. As a result, it can be used to predict future levels of risk and risk premiums. That is, historical volatility can be used to predict future volatility, which can then be translated to a predicted equity risk premium. The PRPM estimates the risk-return relationship directly, as the predicted equity risk premium is generated by predicting volatility or risk. The PRPM is based on the evaluation of the results of estimated investor behavior (i.e., the variance of historical equity risk premiums).[148]

Mr. D'Ascendis was the only witness in AUC proceeding 27084 to use the PRPM to inform his forecast ERP and ROE recommendations. Mr. D'Ascendis' estimates of ROE using the PRPM are set out in Table 11, including flotation allowance.

Table 11. Predictive Risk Premium Model Recommendations[149]

	Mean Results (%)	Median Results (%)	Average of Mean and Median (%)
Canadian Utilities	12.00	10.78	11.30
U.S. Electric Utilities	12.85	12.88	12.87
U.S. Gas Utilities	12.42	12.85	12.64

Recommended Approach – Predictive Risk Premium Model

The Recommended Approach does not use the results of the PRPM to estimate ROE or forecast ERP. There was little meaningful analysis of the PRPM approach on the record of AUC proceeding 27084 and resulting ROEs are higher than the results produced by the other empirical approaches considered in the process. Finally, the record of AUC proceeding 27084 indicates this approach is not widely used in regulatory proceedings and may not yet be viewed as a mainstream methodology.

VI. Recommended Approach – Range ROE and Forecast ERP

Using the Recommended Approach set out in Sections I – V, an empirically-based range for ROE and forecast ERP can be identified. Table 12 illustrates this range.

[148] Exhibit 27084-X0390, PDF pages 54-60.
[149] Ibid. PDF page 60.

Table 12. Estimated ROE and Forecast ERP Range Using Recommended Approach

Empirical Method	Return on Equity (%)	Forecast ERP (%)
CAPM (Section V.1)	8.99	5.99
Constant growth DCF (Section V.2)	9.47	6.47
Multi-stage DCF (Section V.3)	9.16	6.16
Government Bond Yield Risk Premium (Section V.4.1)	9.79	6.79
Utility Bond Yield Risk Premium (Section V.4.2)	9.94	6.94
Average	**9.47**	**6.47**
Forecast Long Canada Bond Yield (%) (Section IV)		3.00
	Low	**High**
Range: ROE	8.99	9.94
Range: Forecast ERP	5.99	6.94