ONTARIO ENERGY BOARD
COST OF CAPITAL REVIEW
EB-2024-0063

VECC COMPENDIUM PANEL 3 -
M3 Nexus Economics

October 2, 2024

TAB 1

2. Nexus Economics' CAPM Results and Discussion

In a CAPM analysis, a firm or project's cost of equity is equal to the risk-free rate plus a markup that compensates the investor for exposure to systemic or market risk.[80]

The idea behind the CAPM is that in a perfect capital market, idiosyncratic or project-specific risk is diversified away and, therefore, generates no compensation. Only systemic risk (i.e., risk that is correlated with the overall volatility of the market) is compensable.

As discussed earlier, in theory, the CAPM is forward-looking, but in application, the CAPM is mechanical and relies on the analyst (such as LEI or Nexus Economics) rather than on the marketplace. While we have attempted to minimize the impact of this mechanical application in our specific CAPM approach, the reliance on analyst judgment is a nonetheless a disadvantage of the CAPM and a reason that other cost of equity approaches should be considered by the Board.

a) Market Risk Premium

Rather than using an historical average MRP (as LEI does), we compute the MRP based on contemporary data using the DCF.[81] This approach uses, so far as practicable, forward-looking data from the capital markets rather than long-term historical averages. LEI shows in its Figure 42 that the historical market risk premium has been volatile (high

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[80] The CAPM is expressed as the formula:

$$ke_i = r_f + \beta_i(MRP)$$

ke_i is the cost of equity for firm or project i, r_f i is the risk-free rate and β_i, or "beta" measures the degree of exposure of firm i to the overall market risk. Beta is defined as $\beta_i = \frac{cov(r_i, r_m)}{var(r_m)}$, or the ratio of the covariance of the returns of the firm to the market as a whole deflated by the variance of the market. See, e.g., Aswath Damodaran. INVESTMENT VALUATION: TOOLS AND TECHNIQUES FOR DETERMINING THE VALUE OF ANY ASSET (2nd ed.). (2002) (New York) John Wiley., p. 76. The Market Risk Premium (MRP)is defined as:

$$MRP = E(r_m) - r_f$$

Which is the expected return on the market minus the risk-free rate.

[81] The MRP of 8.83 percent using 2025 forecast of 30-year US Treasury bonds. (Forecast from econforecasting.com at https://econforecasting.com/forecast/t30y.) This would be 8.53 percent if rates as of 6/25/2024 were used.

TAB 2

M3-VECC 24

Reference: M3: NEXUS Report, pages 62 (Footnote #80) and 68

Preamble: The Report states:

"*Applying the CAPM using a forward-looking MRP and interest rates results in an ROE of 10.19 percent excluding the transactions cost recovery of 50 basis points*."

(a) Please provide the values for each of the parameters of the CAPM formula (per page 62) that result in an ROE of 10.19%.

Response:

For all companies, the risk-free rate is 4.06 and the MRP is 8.83%. The betas vary by company. The company-by-company results that produce the 10.19%. Accordingly, the average beta was 0.6942 (0.6942=(0.1019-0.0406)/0.0883). Data and analysis can be found in M3-NAICS 2211 (as filed).xlsx at tab [Ke Analysis].

(b) Is the 10.19% meant to reflect an appropriate ROE for 2024 or 2025?

Response:

This result is our best estimate as of 2024. This is our mean estimate (excluding equity transactions or flotation costs) of the cost of equity using the CAPM model that would apply to Ontario electric service providers.

TAB 3

Baa-rated commercial bond yields. To put the regression equation on an equal risk-adjusted footing, we *unlevered* the authorized ROEs using the unlevering equation discussed earlier. Accordingly, our training equation was:

$$Unlevered\ Authorized\ ROE = \alpha + \beta_1(30\ Year\ US\ Treasury\ Yields) + \beta_2(Moody'sBaa\ Yields)$$

And our prediction equation is:

$$ROE_u = 5.03074 + 0.46903\ DGS30 + 0.12186\ DBaa$$

Using a rate of 4.06 percent (2025 forecast for 30-year US Treasury bonds) and Moody's Baa yield of 5.790 percent produces an unlevered ROE of 7.863 percent, which we then relever to the Deemed 60:40 Debt-to-Equity ratio and a tax rate of 26.5 percent to produce an ROE of 11.59 percent, as reported in Table 2. We then *remove* 50 basis points (for transactions costs) from the risk premium result to produce 11.09 percent. We do this out of a sense of caution. We do not know which US jurisdictions add transactions costs, but we are aware that it is not uncommon to do so. Accordingly, after making our risk premium calculations we reduce the result by 50 basis points in our Table 9 results.

As we noted, our result of 11.09 percent for the risk premium method is similar to the 10.80 percent ROE that LEI's risk premium method produces (when adjusted for leverage and taxes, and also with 50 basis points removed). We also removed 50 basis points from the LEI result, extending this same line of reasoning. The similarity of the results, and the fact that the LEI result is within our 95 percent confidence interval provides additional confidence in the reasonableness of these results.

TAB 4

percent including those costs. Table 5 shows the lower and upper 95 percent confidence limits on the estimate.

3. Nexus Discounted Cash Flow Results and Discussion

The single-stage DCF is based on the fundamental equation of value:

$$Value = \sum_{t=1}^{\infty} \frac{Expected\ Cash\ to\ Investors_t}{(1+k_e)^t}$$

This equation says that the value of an economic asset equals the expected cash paid each period discounted by the relevant risk-adjusted cost of capital. Infinite-lived assets, such as equity, whose cash-to-investors is presumed to grow forever at a constant rate, *g*, can be expressed by a simplified equation as:

$$Value = \frac{Expected\ Cash\ to\ Investors}{(k-g)}$$

As noted earlier, using dividends per share as the Expected Cash to Investors, and price per share as the value metric (in a well-functioning capital market prices equilibrate to value), the Gordon model becomes:

$$k_e = \frac{d_0(1+g)}{P} + g$$

a) Dividend Yield

For the dividend yield, we use contemporary yields (i.e., May 2024, when the dataset was downloaded from CapIQ).

b) Growth Rates

We use growth rates from Yahoo Finance, Zacks, S&P's CapIQ, and Stockanalysis.com. Our goal is to cross-reference data from reputable sources to help ensure that the data

TAB 5

5. Computation of Low, Average, and High Cost-of-Equity Results in Table 9

Throughout this analysis, we have described our weighted averages as well as our "low" and "high" figures. We average the results of the various methodologies (and datasets) together because no one methodology is likely to be perfect. All methodologies suffer from limitations. It is therefore useful to determine whether and to what extent the computed numbers are coalescing around a useful average.

Table 9 –Nexus Economics Cost of Equity Results (Table 5 Reproduced for Convenience)

		Lower Confidence Limit	Average	Weight [b]	Upper Confidence Limit
1	Single Stage DCF	9.92%	10.92%	**38%**	11.93%
2	Growth Rates - Yahoo Finance	9.76%	10.69%	12%	11.63%
3	Growth Rates - Zacks	9.27%	10.11%	14%	10.95%
4	Growth Rates - CapIQ	10.37%	11.86%	5%	13.36%
5	Growth Rates - StockAnalysis	11.08%	12.22%	8%	13.37%
6	CAPM	9.73%	10.19%	**49%**	10.65%
7	Risk Premium (Authorized Returns)	10.19%	11.09%	**13%**	11.98%
8	**WEIGHTED AVERAGE [b]**	9.86%	**10.58%**	100%	11.31%
9	Transactions Costs	0.50%	0.50%	100%	0.50%
10					
11	Total	10.36%	**11.08%**		11.81%

[a] Results are relevered to a Debt-to-Equity Ratio of 1.50 and taxes of 26.5%.

[b] Weights are determined by the inverse of the standard deviation of the mean result.

Table 9 shows our results based on different methodologies and data sources.[98] Each approach examines multiple firms using multiple datasets, so we seek here to provide ranges of reasonableness. We do so by computing a 95 percent confidence interval on our computed average. In contrast to the mean (or average), which is a point estimate of the unknown parameter value (in this case, the "true" cost of equity), the confidence interval quantifies an interval estimate around that value. The 95 percent confidence interval basically states that if one were to run the experiment multiple times and compute the average in each experiment, and then computed the standard deviation of all of these

[98] Not every data provider offered information on the same firms.

TAB 6

M3-12-SEC-78

Please provide Nexus' views on the relative business and financial risk between electricity distributors, electricity transmitters, and natural gas utilities.

Response:

The Nexus Economics report specifically addressed electricity distributors. Nexus has no relevant views about electricity transmitters and natural gas utilities.

TAB 7

As a first pass, we selected all firms with NAICS codes of 2211 and SIC Codes of 4991, 4931, 4911 from the S&P CapIQ database.[79] These industry classification codes are for "Electric Power Generation Transmission and Distribution." The SIC Codes are:

- 4911. Electric Services. "Establishments engaged in the generation, transmission, and/or distribution of electric energy for sale"; and
- 4931. "Establishments primarily engaged in providing electric services in combination with other services, with electric services as the major part though less than 95 percent of the total."

We kept only those firms that traded on North American exchanges (NYSE, NASDAQ, TSX, and OTC). We then examined each of the surviving candidates for special issues that made them inappropriate for comparison. We rejected those that (1) had no operations; (2) no longer existed; (3) were REITs rather than operating companies; (4) had no distribution or transmission (were IPPs, engineering companies, developers, or marketers) (5) only renewables or biogas (too speculative); (6) had considerable negatives in the historical data such as no revenues or no history of positive earnings (too speculative).

Our filters produced 43 candidates, most of which had at least one financial data provider with a beta and an expected earnings-per-share growth rate. The financial services data providers that we examined, CapIQ, Yahoo Finance, Zacks, and StockAnalysis.com had relevant information for somewhat over half of the candidates that could be used in the DCF.

[79] NAICS (North American Industrial Classification System) is used by the US, Canadian, and Mexican agencies to collect business data. NAICS was designed to supersede the Standard Industrial Code system, though both are used. See: "What is a NAICS Code and Why do I Need One" at NAICS Association at What is a NAICS Code and Why do I Need One? | NAICS Association. Note: SIC Code 4991 does not exist but was erroneously assigned to AES Corp in the CapIQ database. For that reason, we retained the "4991" company.

TAB 8

North American Industry Classification System (NAICS) Canada 2022 Version 1.0

- 22 - Utilities
- 221 - Utilities

2211 - Electric power generation, transmission and distribution

This industry group comprises establishments primarily engaged in the generation of bulk electric power, transmission from generating facilities to distribution centres, and/or distribution to end users.

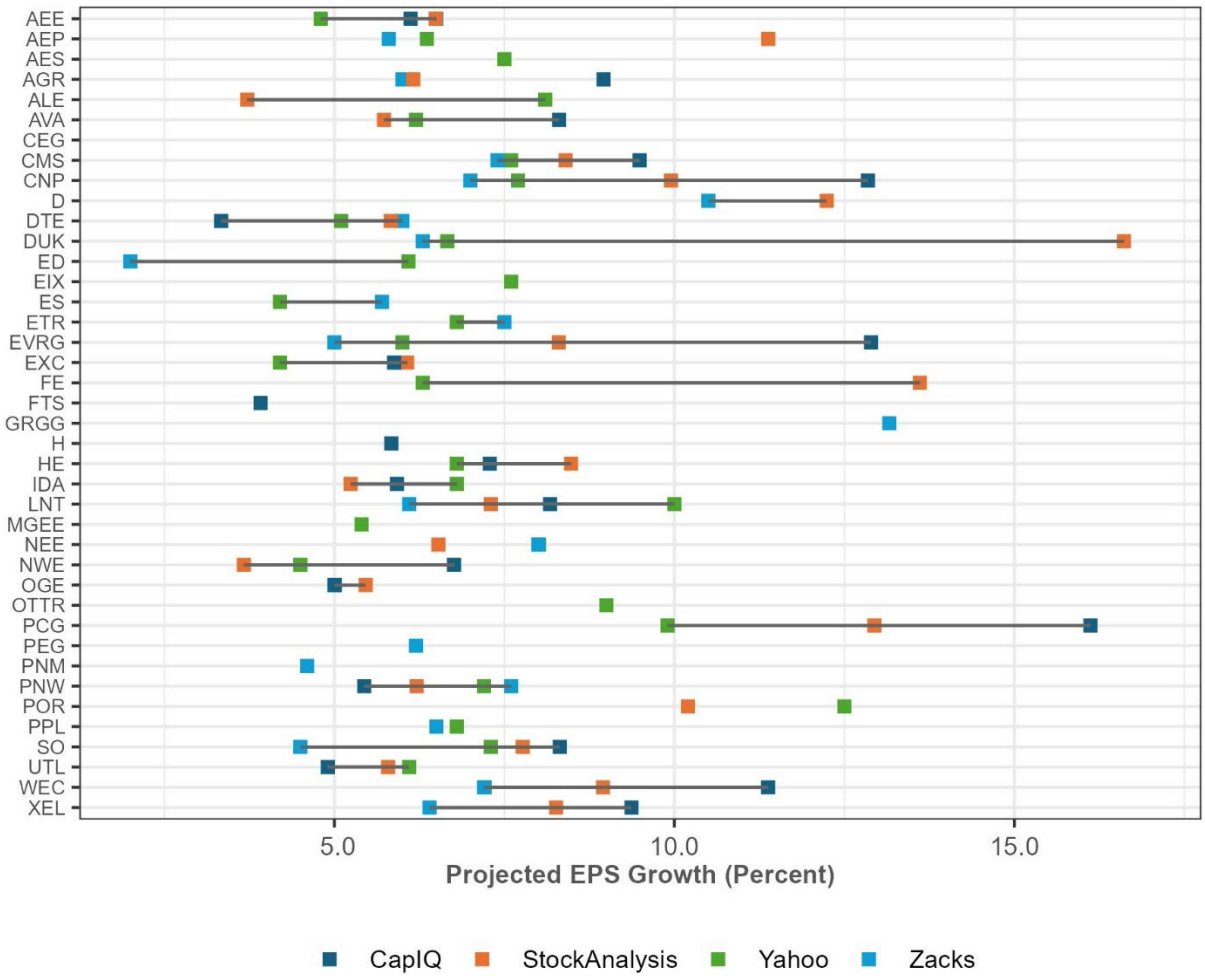
Display definitions | Display structure

Code	Industry
22111	Electric power generation
22112	Electric power transmission, control and distribution

Date modified: 2024-08-06

TAB 9

Figure 10 – Investment Analyst EPS Long-Term Expected Growth Rates Obtained from Different Sources



Since there is considerable dispersion in outlooks for earnings growth, we also filter the growth rates to only use those that are within 2 standard deviations of the overall average (95 percent confidence).[95]

Applying our DCF analysis to the data provided by Yahoo, Zacks, CapIQ, and Stock Analysis produces a weighted average DCF cost of equity result of 10.92 percent shown

[95] Standard deviation of the mean (or standard error) is computed as the overall standard deviation divided by the square root of the number of observations. This produces a screened range of growth rates of 1.54 percent to 17.33 percent.

TAB 10

M3-VECC 25

Reference: M3: NEXUS Report, pages 69-72

Preamble: The Report states:

"*As noted earlier, using dividends per share as the Expected Cash to Investors, and price per share as the value metric (in a well-functioning capital market prices equilibrate to value), the Gordon model becomes:*

$k_e = d_0(1+g)/P + g$" (page 69)

And

"*For the dividend yield, we use contemporary yields (i.e., May 2024, when the dataset was downloaded from CapIQ*)" (page 69)

And

"*Since there is considerable dispersion in outlooks for earnings growth, we also filter the growth rates to only use those that are within standard deviations of the overall average (95 percent confidence*)." (page 71)

And

"*Applying our DCF analysis to the data provided by Yahoo, Zacks, CapIQ, and Stock Analysis produces a weighted average DCF cost of equity result of 10.92 percent*." (page 71)

And

"*The lower- and upper- 95 percent confidence interval on this average also found on line 1 of Table 9 is 9.92 percent to 11.93 percent, which excluding transactions costs*." (page 72)

(a) For purposes of calculating the DCF ROEs for each company did NEXUS use a multi-stage DCF model or was a single stage DCF model used?

Response:

We used the single-stage DCF model.

(b) If a single-stage DCF model was used, please provide NEXUS' rationale for adopting this approach.

Response:

The single-stage model incorporates the fewest interventions by the analyst (e.g., Nexus). It therefore permits the data to speak for itself.

(c) If a two or three-stage DCF model was used please indicate the length of time assumed for each stage and the basis for the growth rates used in each stage.

Response:

We used the single-stage model.

(d) With respect to the second reference, please explain more fully: i) how the Dividend Yield value for each company was determined (i.e., was it based current dividend rates or average dividends over the past year – recognizing that dividend rates change) and ii) how the stock price used in the denominator was determined (e.g., over what period was it averaged and why this period was selected))?

Response:

Dividend yield was a point-in-time estimate based on then-current price and annualized dividends as provided by S&P's CapIQ.

(e) With respect to the third and fourth references, please provide a list of the companies actually used for the DCF analysis, the dividend yield for each, the growth rate used for each and the resulting DCF ROE for each, and the weighting applied to each company's results – leading to the 10.92%.

Response:

The list of companies used for the DCF analysis is provided in Table 6 of our Report. The growth rates and other data, by company, are provided in the Excel file M3-NAICS 2211 (as filed).xlsx at tab [Ke Analysis].

(f) Please also explain how the growth rate to be used for each company was determined (e.g., was it a simple average of the growth rates from available sources?).

Response:

The growth rate for each firm is a simple average as provided by the each of the data aggregators (e.g., Yahoo, Zacks, CapIQ, and StockAnalysis). The different aggregators (Yahoo, Zacks) have different projected growth rates.

(g) With respect to the fourth reference, please explain how the weighting for each company was determined and why it is appropriate to weight the results accordingly as opposed to using a simple average.

Response:

For each data aggregator (e.g., Yahoo, CapIQ), we computed the DCF results by company. We computed the simple average of the results as well as their standard deviation and the relevant confidence intervals by data aggregator.

Our Table 5 shows the average and 95% confidence intervals for the DCF results for each of the data sources.

We also computed an overall weighted average of the results across the data providers, which is shown in line 1 of Table 5. The weighed average is computed using the inverse variance weighting as described in pages 74-76 of our Report.

(h) With respect to the fifth (last) reference, was the data used to determine the confidence range the DCF ROE results for each of the individual companies.

Response:

We computed the DCF for each individual company by data provider. We computed the simple average and standard deviation of the cross-section of the companies by data provider.

TAB 11

risk factors when there is a significant change in business/financial risks is a reasonable approach and is recommended to be retained.[26]

- The current policy of considering the impact of risk factors when there is a significant change in business/financial risks is a reasonable approach, which LEI recommends be retained.

D. Nexus Economics Evaluation and Recommendation

LEI has identified business and financial risks in its report. However, given the changes in industry structure occurring due to decarbonization and electrification efforts, Nexus Economics has also identified a category of risk that LEI ignores: *strategic risk*. Strategic risk is the risk that distributors are subjected to as they face increasing uncertainty regarding the direction of the industry and the significant investments that they will be required to make despite the uncertain future. Therefore, Nexus Economics considers that LEI fails to recognize the magnitude of the changes the distributors likely will encounter now and in the coming years.

The electric power industry today is in a transition that it has not faced since the 1970s. The 1970s introduced new challenges to the industry, including:

- Increases in fuel prices (primarily petroleum): Significant petroleum price increases triggered by the oil embargoes of the early 1970s significantly increased electricity prices for end-users. The increase in fuel prices triggered the adoption of new technologies, including nuclear power;
- Load growth uncertainty: The 1970s were characterized by significant load growth uncertainty. The rate of increases in load growth significantly declined during this period as a result of increasing prices and reduced economic activity. For example, the construction of nuclear-generating units in the United States in the 1970s and 1980s was triggered by historically significant load growth. Also, load growth in the 1960s averaged 7.3 percent. Load growth tapered to 4.7 percent in the 1970s and 2.9 percent in the 1980s.[27] The declines in load growth during the construction of these nuclear plants led to a number of regulatory and policy challenges, increasing utilities' risk.

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[26] LEI Report, p. 62.

[27] U.S. Energy Information Administration, U.S. Commercial nuclear capacity comes from reactors built primarily between 1970 and 1990, June 30, 2011.https://www.eia.gov/todayinenergy/detail.php?id=2030

The electric power industry in Ontario in the 2020s and 2030s is characterized by similar challenges triggered by uncertainties related to the energy transition discussed above, including the increasing rate of adoption of electric space heating, electric vehicles, and new loads such as data centers.

The electric power industry is undergoing a significant transition which is exposing the distributors to not only the normal risk associated with utility operations, but uncertainty regarding the future of the electric distribution business model. As a result of this transition:

- A significant increase in the level of capital spending is expected to be driven by electrification policies adopted by the Province of Ontario;
- Prior policies adopted by the OEB to facilitate policy goals and reduce the risk faced by distributors have become obstacles to adopting new goals. For example, in the past several years, the OEB adopted residential fixed distribution charges (i.e., no volumetric component of the tariff) to address the declining residential average usage problem and facilitate the adoption of DERs. However, the adoption of electrification policies would presumably reverse the trend of decreasing average usage and thus limit revenue growth to distributors;
- Uncertainty regarding load growth. Table 3 provides the trajectory of load growth in peak demand projected by the IESO. Nexus Economics observes the following. First, projected peak load growth is significantly greater than historical load growth. Second, IESO projections are based on a reference scenario and a "net zero" scenario that differ significantly. Therefore, a significant amount of uncertainty exists regarding the level of loads that distributors must serve in the future;

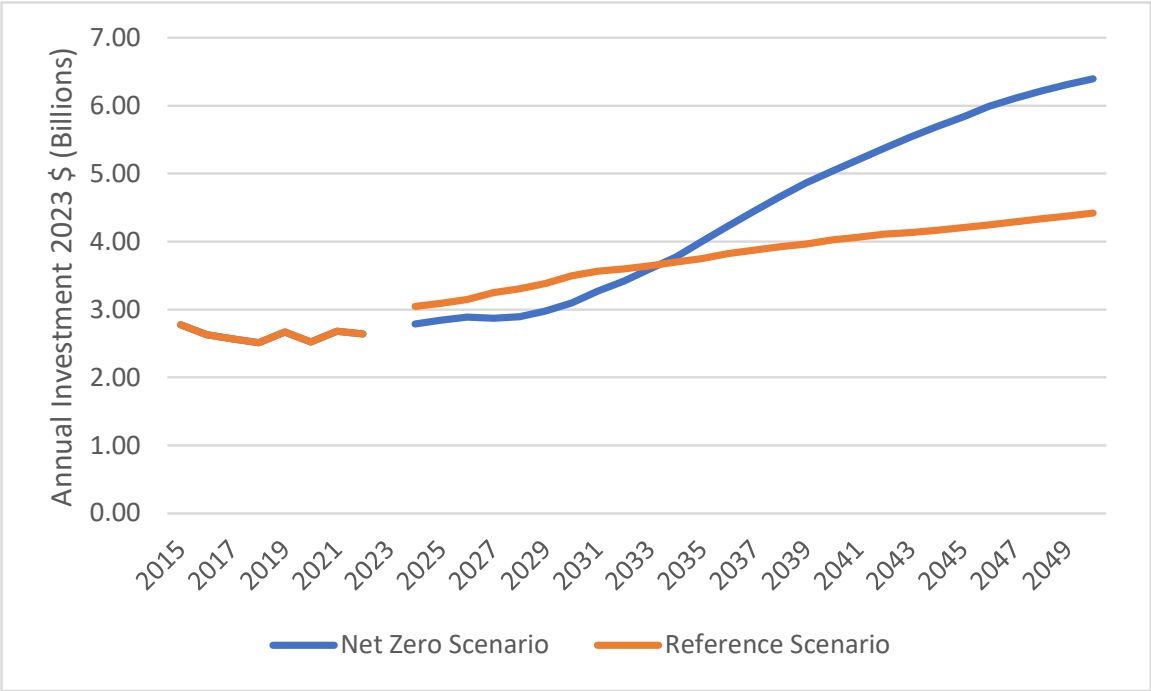
Table 3 – Historical and Projected Annual Average Growth in Non-Coincident Peak Demand

Time Period	Annual Average Peak Demand Growth Rate
2016-23	0.2%
2025-2050	3.3%

- Uncertainty regarding the quantity of capital investments. As decarbonization policies are implemented, the quantity and cost of new capital investments will be

highly uncertain for the next several decades. Figure 6 provides the projected capital requirements associated with the infrastructure that distributors must construct. An EDA commissioned report quantified average capital additions for Ontario distributors in 2015-22 of $2.632B ,stated in 2023$.[28] However, the projected average annual capital additions through 2050 are $3.81B in the Reference Scenario and $4.46B in the Net Zero Scenario. The significant growth in capital additions driven by uncertain energy policies suggests that the distributors in Ontario are being subjected to significant incremental risk.

Figure 6 – Annual Average Investments by Ontario Distributors



Source: Solving Grid-Lock: Our Vision for a Customer-Centric Energy Transition

This situation is analogous to the uncertainty of nuclear plant construction programs of the 1970s and 1980s. Whether or not the demand projections ultimately prove accurate, a risk exists that assets will need to be constructed based on policy initiatives, with uncertain outcomes. Projections of long-term load growth have historically been

[28] Electricity Distributors Association, "Solving Grid-Lock – Vision for a Customer-Centric Energy Transition", 2024.

inaccurate and, in some cases, triggered unneeded construction of assets or increased costs.

Other jurisdictions embracing carbon reduction and electrification policies have amended their regulatory mechanisms recognizing that the trajectory of capital spending may be uncertain. The absence of these policy changes in Ontario increases the risk to which distributors are exposed.

E. Conclusion

Distributors in Ontario have been facing significantly higher levels of uncertainty than ever since the industry transformation in the late 1990s. Their role in the energy industry may significantly change in the next twenty years, serving increasing load triggered by new end-uses such as EVs and increasing space heat saturation. However, the increases and associated capital investments are not associated with any historical data series; they are forecasts based upon expected changes in behavior, which are untested. Although we cannot at this point quantify the uncertainty due to the industry changes with enough precision to adjust the recommended ROE, we can nevertheless conclude that the volatility and associated increases in risk support higher ROEs than are proposed by LEI and, especially, a more frequent update of the ROE (i.e., every three years) to determined how capital costs have changed. An "autopilot adjustment", such as the annual adjustment mechanism, might be useful when the status quo is anticipated for the industry. But an autopilot is less useful when there are obvious significant changes on the horizon—even if the risk effects of these changes are at present not quantifiable with sufficient accuracy to justify an adjustment to the ROE. This uncertainty underscores our recommendation that the Board revisit the issues in this proceeding every 3 years rather than every 5 years.

TAB 12

XII. Defined Interval to Review the Cost of Capital Policy (Issue #17)

Issue 17: What should be the defined interval (for example, every three to five years) to review the cost of capital policy (including, but not limited to, a review of the ROE formula and the capital structure)? Should the OEB adopt trigger mechanism(s) for a review and if so, what would be the mechanisms?

A. Current Policy

The OEB's 2009 decision established an approach to update the cost of capital policy every five years. The first review in 2014 resulted in a staff report, but no evidence was offered by the parties.

B. LEI Recommendation

LEI recommends that the existing policy be maintained with reviews every five years including trigger mechanisms.

C. Nexus Economics Evaluation and Recommendation

The status quo has effectively resulted in no formal proceeding to review the cost of capital in fifteen years. Annual updates have been prepared based on changes in bond interest rates, which has previously been discussed. However, these changes need to capture many of the other variables critical to an accurate calculation of the cost of capital. As a result, the current ROE provided by the OEB to distributors is significantly below that of peers (as shown in Figure 1).

D. Conclusion

Nexus Economics recommends that a litigated cost of capital proceeding occurs every three years. Our recommendation for the three-year interval is consistent with the Auditor General's recommendation. The increased frequency of a litigated proceeding provides the following advantages: it (i) maintains the ROE at a rate dictated by financial markets; (ii) establishes a level of institutional knowledge; and (iii) address uncertainty about energy policy and the impact of energy policy on cost of capital issues.

TAB 13

variance). This means that the confidence interval around the mean will be high. Moreover, at best, the historical average provides an indication of what the future average might be. We are more interested in what the MRP is now than we are in some past average. The average might never be relevant in the future. There may only be episodes of higher and lower risk aversion and therefore higher or lower MRPs, but the average itself may simply be a statistical artifact that does not apply on any particular day in the capital markets. In any event, it is our conclusion that a more forward-looking MRP should at least be part of the analysis that the Board considers.

Table 7 - Market Risk Premium

Row	Item	Source		Value
1	ROE	CapIQ: Ratios	LTM	0.1782
2	DPS	CapIQ: Income Statement	LTM	69.87
3	EPS	CapIQ: Key Stats, Income Statement &	LTM	196.70
4	PE	CapIQ Ratios & Multpl.com (2024-06-25)		28.31
5	DPR	[2]/[3]		0.3552
6	g = (br)	(1-[5])*[1]		0.1149
7	Div Yield	[5]/[4]		0.0125
8	Ke	[7](1+[6])+[6]		0.1289
9	30-Year Tbonds	Forecast from econforecasting.com		0.0406
10	**MRP**	[8]-[9]		**0.0883**
Source: S&PCapIQ		CIQ Pro: S&P 500 (^SPX) | Ratios (spglobal.com)		

Because our data sources did not provide investment analyst forecasts of the expected EPS growth rate, we computed the rate using the so-called *br* formula, shown in line 6 of Table 7 above. Both methods may be used and assessed as to differences. The *br* method is fundamental growth, the idea being that a firm can grow without external financing by reinvesting cash that might otherwise be paid out as dividends and generating its average profits (ROE).[82]

[82] The growth rate *g* is computed as (1-Dividend Payout Ratio) x Return on Equity. See, Roger A. Morin, NEW REGULATORY FINANCE. (2006) (Public Utilities Reports, Inc). pp. 303-305. (Hereafter, Morin.) The *br* formula is inappropriate for regulated companies because the *br* formula relies on an equality between earned returns and cost of equity, which arguably is the case for the unregulated market in equilibrium but not for a regulated entity. (Morin, p. 304.)

TAB 14

Exhibit file M3-NAICS 2211 v04 (as filed).xlsx - Tab MRP Table 7

Computation of the Market Risk Premium for use in the CAPM

Row	Item	Source		Value	Value
1	ROE	CapIQ: Ratios	LTM	0.1782	6.2036
2	DPS	CapIQ: Income Statement	LTM	69.87	69.87
3	EPS	CapIQ: Key Stats, Income Statement &	LTM	196.70	196.70
4	PE	CapIQ Ratios & Multpl.com (2024-06-25)		28.31	28.31
5	DPR	[2]/[3]		0.3552	0.3552
6	g = (br)	(1-[5])*[1]		0.1149	4.0000
7	Div Yield	[5]/[4]		0.0125	0.0125
8	Ke	[7](1+[6])+[6]		0.1289	4.0627
9	30-Year Tbonds	Forecast from econforecasting.com		0.0406	0.0406
10	**MRP**	[8]-[9]		**0.0883**	**4.0221**

Source: S&PCapIQ — CIQ Pro: S&P 500 (^SPX) | Ratios (spglobal.com)

TABLE 7

Year	Avg Yield
2024	0.0454
2025	**0.0406**
2026	0.0392
2027	0.0423
2028	0.0437
2029	0.0433
Source:	
30-year bond yields (forecasted)	
30 Year Treasury Bond Yield | econforecasting.com	
See: Tab [30yr Tbond Forecast]	
########	**0.04360**

TAB 15

ONTARIO ENERGY BOARD

FILE NO.:	**EB-2024-0063**	**Generic Proceeding - Cost of Capital and Other Matters**

VOLUME:	**3**	
DATE:	**September 27, 2024**	
BEFORE:	**Michael Janigan**	**Presiding Commissioner**
	Lynne Anderson	**Commissioner**
	Pankaj Sardana	**Commissioner**

for investors, between vertically integrated companies that own generating assets versus electric utilities that don't own generating assets, why is that a relevant criteria in your proxy group? It doesn't matter.

MR. COYNE: My testimony isn't that it doesn't matter that they own electric generation. My testimony is that investors consider regulated utilities as a similar universe of investments. I didn't say that there aren't differences operationally or risk-wise between them. But when we do the cost of capital analysis, we start with screens that give us a group of companies that are more like -- as much like the target group that we are focusing on as possible.

And then, from there, we look as we have here at individual characteristics of those companies to see if there are adjustments that are necessary to our analysis, or that we have been careful enough in our screening to get a like sample of companies to begin the work.

I didn't at all say that there aren't differences that investors would consider in these companies. It's the universe of companies that they would consider similar; hence the Value Line approach of starting with a Value Line group of regulated utilities for the analysis.

MR. RUBENSTEIN: But here, where we are looking at essentially electricity distributors and transmitters in the electric proxy group, from our discussion about OPG being excluded, why would you have not had essentially the opposite of this: doesn't own regulated electric

TAB 16

M3-VECC 18

Reference: M3: NEXUS Report, pages 45 and 49

Preamble: The Report states:

"*The above analysis of the Canadian and US economies is indicative of a single capital market*." (page 45)

And

"*It is the third step that contains the error. Using the 2025 forecasted Canadian rate of 3.19 percent (for example, as of 6/25/2024, the Canadian yield is 3.295 percent versus the US rate of 4.39 percent) in place of the US rate accounts for the difference. It is incorrect to swap out a US dollar-based rate for a Canadian dollar-based rate when the original data series still exists*." (page 49)

(a) If the Canadian and US economies are indicative of a single capital market, why is there a significant difference between the 2025 forecast Canadian rate of 3.19% and the 2025 forecast US rate of 4.39%?

Response:

Possible causes for the difference in US and Canadian rates include different monetary policies by the respective central banks. In the US, this includes monetary tightening as the US Fed sells long-term bonds from inventory. The US Fed's balance sheet for long-term US government bonds has declined 19% from a high of $8.9 trillion in April 2022 to $7.2 trillion as of July 31, 2024 (source: St Louis Fed at data series WALCL). Selling bonds into the market pushes down bond prices (all else the same) and thereby increases yield. This can be expected to adjust until the market moves to a new equilibrium supply and demand balance for long-term US government bonds.

We note, however, that the spread between 10-year Canadian bonds and 10-year US bonds has declined from about 105 basis points (1962-1995, with Canada being higher) to about -15 basis points (1967-2024, with Canada yields being lower), with the 1996 demarcation being the passage of NAFTA and the 2020 replacement of NAFTA by the USMCA.

This decline of essentially 100% in the yield differential is consistent with the integration of Canadian and US capital markets into a single North American capital market, encouraged by economic integration of NAFTA and USMCA. Differences in monetary policies between the two countries can cause temporary differences in yields, but economic integration appears to be a force driving yields together.

FRED Graph Observations	(Monthly) IRLTLT01CAM156N - DGS10	
Federal Reserve Economic Data	Avg Difference 1962-1995	1.050
Link: https://fred.stlouisfed.org	Avg Difference 1997-2024	-0.147
Help: https://fredhelp.stlouisfed.org		
Economic Research Division		
Federal Reserve Bank of St. Louis		

(b) How are exchange rates and exchange rate risk considered/imputed into NEXUS theory that Canada and the U.S. share a unified market?

Response:

Under the CAPM model, for example, the marginal investor's portfolio of assets is widely diversified. Diversification means that the portfolio would include assets that pay out in different currencies. The increase in value of one currency over another in the diversified portfolio is canceled by the decreasing value of the other part of the portfolio, meaning that (all else the same) currency risk is idiosyncratic and therefore there is no incremental return for enduring exchange rate risk.

Speculators purposefully can tilt their portfolios to try to outguess the market regarding exchange rate changes, but this is a different exercise than that contemplated by (e.g.) equilibrium models of asset pricing such as the CAPM.

TAB 17

Table 6 – Firms Included in the Nexus ROE Analysis

			DCF					
Ticker	Name	Eligible	Yahoo	Zacks	CapIQ	Stock Analysis	CAPM	Any
TOTALS		43	29	23	20	27	43	43
AEE	Ameren Corp.	Yes	X	X	X	X	X	X
AEP	American Electric Power Co.	Yes	X	X		X	X	X
AES	The AES Corp.	Yes	X				X	X
AGR	Avangrid Inc.	Yes		X	X	X	X	X
ALE	ALLETE Inc.	Yes	X			X	X	X
APTL	Alaska Power & Telephone Co.	Yes					X	X
AQN	Algonquin Power & Utilities	Yes					X	X
AVA	Avista Corp.	Yes	X		X	X	X	X
CEG	Constellation Energy Corp.	Yes					X	X
CMS	CMS Energy Corp.	Yes	X	X	X	X	X	X
CNP	CenterPoint Energy Inc.	Yes	X	X	X	X	X	X
D	Dominion Energy	Yes		X		X	X	X
DTE	DTE Energy Co.	Yes	X	X	X	X	X	X
DUK	Duke Energy Corp	Yes	X	X		X	X	X
ED	Consolidated Edison Inc.	Yes	X	X			X	X
EIX	Edison International	Yes	X			X	X	X
EMA	Emera Inc.	Yes					X	X
ES	Eversource Energy	Yes	X	X			X	X
ETR	Entergy Corp.	Yes	X	X			X	X
EVRG	Evergy, Inc.	Yes	X	X	X	X	X	X
EXC	Exelon Corp.	Yes	X	X	X	X	X	X
FE	FirstEnergy Corp.	Yes	X			X	X	X
FTS	Fortis Inc.	Yes			X		X	X
H	Hydro One Ltd	Yes			X		X	X
HE	Hawaiian Electric Industries	Yes				X	X	X
IDA	IDACORP Inc.	Yes	X		X	X	X	X
LNT	Alliant Energy	Yes	X	X	X	X	X	X
MGEE	MGE Energy Inc	Yes	X				X	X
NEE	NextEra Energy Inc.	Yes	X	X		X	X	X
NWE	NorthWestern Energy Group	Yes	X		X	X	X	X
OGE	OGE Energy Corp.	Yes		X	X	X	X	X
OTTR	Otter Tail Corp.	Yes	X				X	X
PCG	PG&E Corp.	Yes	X		X	X	X	X
PEG	Public Svc Entpr Group Inc.	Yes		X			X	X
PNM	PNM Resources Inc.	Yes		X			X	X
PNW	Pinnacle West Capital Corp.	Yes	X	X	X	X	X	X
POR	Portland General Electric Co.	Yes	X			X	X	X
PPL	PPL Corp.	Yes	X	X			X	X
SO	The Southern Co.	Yes	X	X	X	X	X	X
TA	TransAlta Corp	Yes					X	X
UTL	Unitil Corp.	Yes	X		X	X	X	X
WEC	WEC Energy Group	Yes	X	X	X	X	X	X
XEL	Xcel Energy Inc.	Yes		X	X	X	X	X

TAB 18

Figure 3: Comparison of Interest Rates, Inflation, and Other Market Indicators

Indicator	November 2009	May 2024
Bank of Canada Overnight Rate	0.25%	4.75%
10-year Government of Canada bond	3.40%	3.64%
30-year Government of Canada bond	3.94%	3.51%
A-rated Canadian utility bond	5.41%	4.86%
GDP Growth Forecast – Consensus Economics – Canada	4.44%	3.84%
Consumer Price Inflation – Canada	1.0%	2.7%
U.S. Federal Reserve – Fed Funds Rate	0.0-0.25%	5.25-5.50%
10-year U.S. Treasury bond	3.40%	4.48%
30-year U.S. Treasury bond	4.31%	4.62%
Moody's A-rated utility bond	5.63%	5.74%
GDP Growth Forecast – Consensus Economics – U.S.	5.06%	4.04%
Consumer Price Inflation – U.S.	1.8%	3.3%
5-year Bloomberg Beta (raw)[52]	0.64	0.82
5-year Bloomberg Beta (adjusted)[53]	0.76	0.88

As shown in the above Figure, while interest rates on 30-year Canadian government and utility bonds have declined since November 2009, most other market indicators have increased. Specifically, monetary policy in both Canada and the U.S. is significantly more restrictive in May 2024 in response to higher inflation as compared to November 2009, when central banks were seeking to stimulate the global economy following the financial crisis. Importantly, utility betas (both raw and adjusted) have increased since November 2009 – a key measure of the market's view of utility risk. Overall, these market indicators support our recommendation to reset the base authorized ROE for Ontario's electric and gas utilities at 10.0 percent.

[52],[54] Concentric took an average of the 5-year raw and adjusted Bloomberg Betas for the North American Proxy Group using the two time periods observed in Figure 3.

TAB 19

CHAPTER 11 REORGANIZATION OF UTILITY COMPANIES

*Ralph R. Mabey**

*Patrick S. Malone***

I. INTRODUCTION

On April 6, 2001, Pacific Gas and Electric (PG&E), the utility unit of PG&E Corporation, filed for reorganization under Chapter 11 of the United States Bankruptcy Code after months of intense media coverage of the "California Energy Crisis." PG&E filed for Chapter 11 after spending $9 billion in excess of revenues to purchase electricity to supply its customers, exhausting its ability to borrow, while consumer rates remained frozen by the California Public Utilities Commission (CPUC) at a level far below prices at which PG&E could buy power on the wholesale market.[1] According to PG&E Chairman Robert D. Glynn, Jr., PG&E

> chose to file for Chapter 11 reorganization affirmatively because we expect the court will provide the venue needed to reach a solution, which thus far the State and the State's regulators have been unable to achieve .... The regulatory and political processes have failed us, and now we are turning to the court.[2]

Similar problems face Southern California Edison (SCE) that might drive it toward bankruptcy as well.

Although PG&E is the latest, and perhaps largest, utility to file for bankruptcy, it is only the most recent in a series of utility bankruptcies, mostly involving electric power utilities, which began in the late 1980s. As deregulation and other forces have come to bear on the natural gas and electric power industries over the last decade, several utilities have turned to Chapter 11 in an effort to save their troubled companies.

Because of the historical role of regulation in the utility sector, such

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** Mr. Malone is an associate in the Salt Lake City, Utah office of LeBoeuf, Lamb, Greene & MacRae.

1. PACIFIC GAS AND ELEC. CO., News Release, *Pacific Gas and Electric Company Files for Chapter 11 Reorganization,* (April 6, 2001), *available at* http://www.pge.com /006a_news_rel/ 01405.shtml.

2. *Id.*

bankruptcies often present legal and policy issues not found in more typical bankruptcies. This article will discuss four recent major utility bankruptcies and some of the practical lessons learned from these bankruptcies, primarily focusing on such fundamental issues facing troubled utilities as the interplay between the regulatory agencies charged with overseeing such companies and the bankruptcy courts. It will then conclude with a discussion of some of the issues which are likely to be important in the pending PG&E, and possible SCE, bankruptcy proceedings. To begin, however, this article will review the basic legal concepts applicable to any Chapter 11 reorganization.

II. OVERVIEW OF CHAPTER 11 BANKRUPCTY

Chapter 11 provides a process whereby a business may attempt to reorganize itself by restructuring its debt, business, and assets or by liquidating its assets in an orderly fashion. This process involves a number of key concepts and procedural protections that are fundamental to any Chapter 11 proceeding. The remainder of this section will briefly review a few of the most important of these concepts and protections.[3]

A. The Bankruptcy Estate

When a voluntary bankruptcy petition is filed, an estate comprised of the debtor's property and interests is created as a matter of law.[4] With a few limited exceptions, the estate consists of all legal and equitable interests of the debtor in property at the time of filing. The estates of individuals include exempt property, even though an unsecured creditor or some involuntary secured creditors may not be able to participate in the value of such exempt property.

Generally, in a Chapter 11 reorganization, the bankruptcy estate and debtor's business are operated either as the "debtor-in-possession" or by a court-appointed trustee.[5] The debtor-in-possession is ordinarily operated by the same management as was the debtor company before bankruptcy. Once a company enters bankruptcy, however, the duty of the debtor-in-possession (or trustee) is no longer to maximize profits for shareholders, but rather to maximize the value of the bankruptcy estate primarily for the benefit of the debtor's unsecured creditors. Thus, the dynamics of operating a company in bankruptcy will be substantially different from those of operating a company outside of bankruptcy.

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3. At the time of this article, both the House and Senate have passed bills amending the Bankruptcy Code. Differences between the bills have not yet been resolved in conference and, therefore, neither has been signed into law by the President. Consequently, the new amendments will not be discussed in this article. At any rate, most (but not all) of the major proposed amendments to the Bankruptcy Code in the House and Senate bills relate to Chapter 7 consumer bankruptcies, not to large Chapter 11 corporate reorganizations.

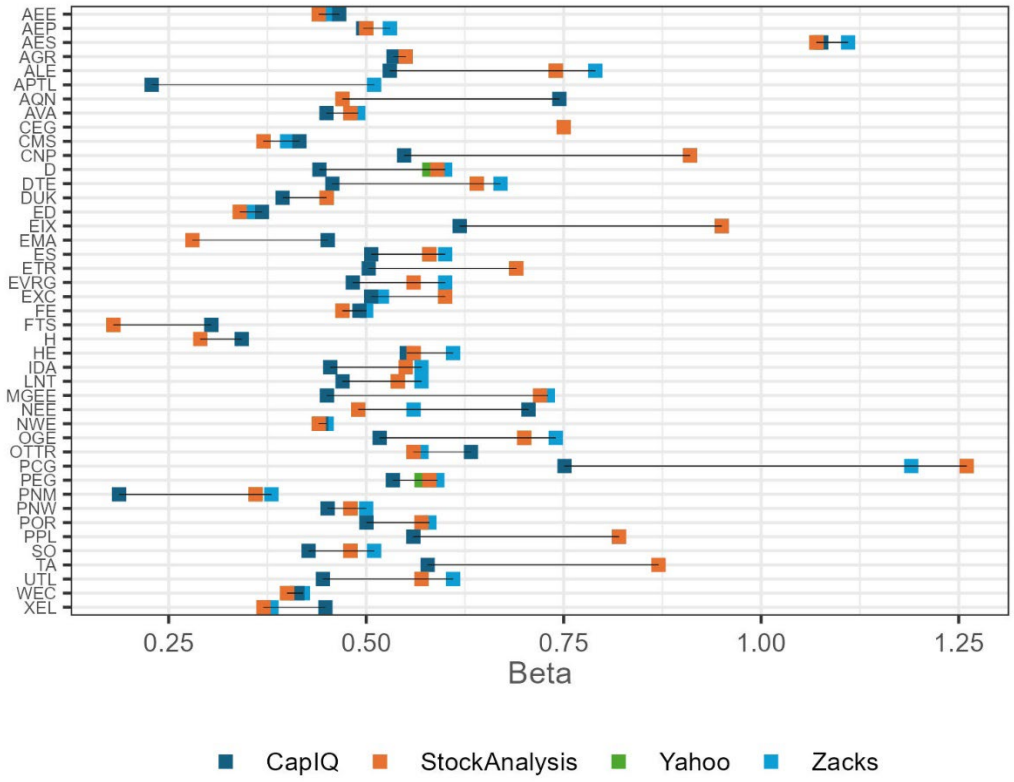
4. 11 U.S.C. § 541 (2000).

5. 11 U.S.C. §§ 1107-1108 (2000).

TAB 20

We obtained historical betas for the comparator companies identified in Table 6 from Yahoo, Zacks, S&P's CapIQ, and StockAnalysis. These betas are computed from 3 years of monthly price data using the S&P 500 as the market.[84] These are shown in Figure 10.

Figure 9 – Betas as Obtained from Different Sources



We present Figure 9 to illustrate that even historically-derived betas can differ based on underlying assumptions regarding the market that is used as the basis for the analysis (e.g., S&P 500 or the NYSE). The betas can also differ depending on the time window used in the regression, as we discussed in our review of the Dominion beta presented in Figure 8. In other instances, the betas are very similar. Table 8 shows that Yahoo,

[84] See, e.g., https://investexcel.net/how-does-yahoo-finance-calculate-beta/ for a step-by-step process for replicating a beta from the Yahoo Finance website. CapIQ betas are "beta 3-year (country)".

TAB 21

ONTARIO ENERGY BOARD

FILE NO.:	**EB-2024-0063**	**Generic Proceeding - Cost of Capital and Other Matters**

VOLUME:	**4**	
DATE:	**October 1, 2024**	
BEFORE:	**Michael Janigan**	**Presiding Commissioner**
	Lynne Anderson	**Commissioner**
	Pankaj Sardana	**Commissioner**

which are listed below the graph might have provided betas for all of the companies, but generally for each company you have two or three betas from your source data. And wherever you have had a beta for one of these companies you have graphed it here, and the rows and the lines connecting those squares are meant to illustrate variability in the historical observed betas for these proxy companies; right?

DR. PAMPUSH: Yes, sir.

MR. MONDROW: Okay. And so, I see the variability, in addition to that I see, I seem to see that most of the betas, and these are all proxies for the Ontario utilities I think you're considering in your report, they seem to cluster around kind of .4 to .6?

DR. PAMPUSH: I think I agree with that.

MR. MONDROW: Okay. And your recommended beta is -- remind me?

DR. PAMPUSH: .69.

MR. MONDROW: .69. And that's before or after the Blume adjustment?

DR. PAMPUSH: It's after Blume, and also after the Hamada adjustment for leverage. Although that's pretty small, the Blume adjustment.

MR. MONDROW: Okay, great. The risk premium approach, am I correct that that approach is not based on market data?

DR. PAMPUSH: It's market data, I heard that earlier this afternoon, I don't want to quibble. But so I think I agree with --

TAB 22

ONTARIO ENERGY BOARD

FILE NO.:	**EB-2024-0063**	**Generic Proceeding - Cost of Capital and Other Matters**

VOLUME:	**4**	
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BEFORE:	**Michael Janigan**	**Presiding Commissioner**
	Lynne Anderson	**Commissioner**
	Pankaj Sardana	**Commissioner**

going to talk about the CAPM -- I'm going to try to talk to you about the CAPM model, and when I say try it's my frailty, not yours, to be clear. I am being self-deprecating.

In the CAPM methodology the starting point is a derivation of expected market returns, that's something that we just spoke of and you were clear to make sure I understood when you talk about that, you talk about future expected market returns. And, in fact, unlike the other experts you don't rely on the historical market return data at all, rather you compute a forward-looking expected market; fair?

DR. PAMPUSH: Yes, sir.

MR. MONDROW: Okay. And I should get an exhibit number because I am going to take you to my compendium which I hope you got yesterday, and I think we are at Exhibit K4.6, if I'm not mistaken.

MR. RICHLER: That's right, K4.6 is your compendium.

MR. MONDROW: Thank you. And if we could go to, it's page PDF 13 of the compendium which is the compendium has page numbers in the top right corner, so it's page 12 of the compendium but PDF page 13. And Dr. Pampush, this is an excerpt from your report which you will recognize, and there is a Table 7 there. And this Table 7 summarizes the forward-looking expected market return computation that you did for this process; right?

DR. PAMPUSH: Yes, sir. That's what it represents, yes.

TAB 23

M3-10-OEB Staff-50

Note this interrogatory has been asked by LEI

Ref: Nexus Report, Table 7, p. 63

Nexus presented a table on “Market Risk Premium” in Table 7 on this page.

a) Please provide the backup calculations for the derivation of each of these numbers (in MS Excel worksheet).

Response:

Please see the file M3-NAICS 2211 v04 (as filed).xlsx at tab [MRP Table 7].