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January 22, 2016

Commercial Energy Consumers Association of British Columbia
c/o Owen Bird Law Corporation
P.O. Box 49130
Three Bentall Centre
2900 – 595 Burrard Street
Vancouver, BC V7X 1J5

Attention: Mr. Christopher P. Weafer

Dear Mr. Weafer:

Re: Project No. 3698852

FortisBC Energy Inc. (FEI)

Application for its Common Equity Component and Return on Equity (ROE) for 2016 (the Application)

Response to the Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 2

On October 2, 2015, FEI filed the Application referenced above. In accordance with Commission Order G-177-15 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to CEC IR No. 2.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc: Commission Secretary
Registered Parties (e-mail only)

FortisBC Energy Inc. (FEI or the Company) Application for Common Equity Component and Return on Equity for 2016 (the Application)	Submission Date: January 22, 2016
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1 **46. Reference: Exhibit B-1, Appendix B, Pages 49 and 50; Exhibit B-4, CEC 1.1.2**

I have tested my market risk premium estimates by conducting a regression analysis on long Canada bond yields and annual market risk premiums calculated by Morningstar Ibbotson through 2011; and by Duff & Phelps thereafter. As can be seen in Exhibit JMC-6, I have isolated the effects of the global financial crisis in 2008 as an anomalous event that did not align with the normal relationship between treasury yields and market risk premiums. I have set this period aside by assigning a dummy variable to it. My analysis yielded a statistically significant value at the 85 percent confidence level, and in my opinion is informative of the relationship between bond yields and market risk premiums. Note that the coefficient for 30-year bond yields is negative 1.11, such that a negative change in the bond yield results in an almost equal increase in the market risk premium - evidence

2

that the market risk premium and bond yields are indeed inversely related. Using my 30-year Canadian bond yield forecast of 3.68 percent, the regression formula produced by my analysis yielded a market risk premium of 10.09 percent when the long Canada bond yield is 3.68 percent.

$$(MRP = 14.18\% + (-1.11 \times 3.68\%) + (-45.18 \times 0) = 10.09\%)$$

Accordingly, my estimate of the market risk premium of 7.6 percent is reasonable and appropriate and is more reflective of the current low interest rate environment than the long term average. Applying this MRP to the full expression of the CAPM formula, using the Canadian proxy group average beta of 0.65, would yield an ROE of 10.19 percent, when the Canada long bond is 3.68 percent; and 9.78 percent, when the Canada long bond yield is equal to the August 31, 2015 value of 2.23 percent.⁷⁸

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1.2 Please provide the results for the regression analysis if the 2008 period was not set aside.

Response:

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	10.2085509	6.738042772	1.515061753	0.138254	-3.44402	23.86112
Canada Long Bond	-0.745785974	0.799968377	-0.932269318	0.357241	-2.38668	0.875104

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46.1 Please provide an interpretation of the co-efficient results.

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1 **Response:**

2 This series of questions (CEC IRs 2.46.1 through 2.46.8.3) is based on a regression analysis
3 posed by the CEC in CEC IR 1.1.2 where Concentric was asked to remove the dummy variable
4 that isolated the effects of the 2008 market collapse. The resulting regression results, shown
5 above, have weakened from Concentric's original analysis which included the dummy variable,
6 such that t-stats and p-values for the independent variable were lower. Further, the F-value
7 (which summarizes the overall strength of the regression and the ability of the variables to
8 explain the variance in the market risk premium) weakened significantly in the new regression
9 from 4.4623 to 0.8691, a level that provides only 64% confidence that the specification of the
10 model captures the relationship of long Canada bond yields and the market risk premium.
11 Concentric finds the requested model, upon which these questions are based, to be inferior to
12 its original analysis, but provides the following responses on how to interpret the results of the
13 requested model.

14 The regression coefficients provide the inputs for the linear formula $y = mx + b$, for a set of
15 variables (x_n, y_n), where "b" is the intercept or the point on the y axis where x is 0, and "x" is the
16 slope coefficient. The intercept is the level of market risk premium that would occur if Canada
17 long bond yields were 0. The slope coefficient for the x variable (or independent variable), in
18 this case the long Canada bond yield, represents the steepness of the line, it is "m" in the linear
19 formula. The slope coefficient can be interpreted as the degree of co-variance that the bond
20 yield has with the observed market risk premium, such that as X increases, the market risk
21 premium will change by the product of the X variable and its associated coefficient. Since the
22 slope coefficient is negative, as the X variable decreases, the market risk premium will increase.
23 This inverse relationship was also evident in Mr. Coyne's original regression model¹ and is
24 evident in forward-looking risk premium estimates as Mr. Coyne discusses on pp. 47-48 of his
25 testimony.

26 According to the results of the requested regression, the resulting linear formula is as follows:

27 Market Risk Premium = $10.2085509 + (-0.745785974 \times \text{Long Canada bond yield})$

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31 46.2 Please provide an interpretation of the standard error results.

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¹ See Coyne Direct p. 49, line 23 through p. 50, line 1.

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Response:

The standard error for each coefficient is the standard deviation or the measure of the spread between the observed statistics and the mean of the sample. It is calculated by taking the square root of the variance around the mean. The standard error for each regression coefficient in the requested regression has increased slightly (from 6.35 vs. 6.74 for the intercept, and from 0.75 to 0.80 for the Canada long bond variable) over those of the original regression. This indicates the inclusion of the 2008 period has introduced a higher degree of error into the regression equation.

46.3 Please provide an interpretation of the T-stat results.

Response:

The t-tests determine whether each slope coefficient is useful in estimating the market risk premium. The t-statistics are calculated by dividing the regression coefficient by its associated standard error. A t-statistic indicates the statistical significance of the coefficient and is used to assess whether there is a relationship between the coefficient and the dependent variable (in this case the market risk premium), or if that relationship is actually zero. If the absolute value of the t-statistic is sufficiently high, we can conclude that the slope coefficient is useful in explaining the relationship between bond yields and market risk premium. If you consult a t-stat table in a statistics textbook, you would find that with a sample size of 38, a t-stat of approximately 2.0 would provide a 95% probability that the coefficient helped explain the variation in market risk premium. 95% is the typical level of significance sought for a two-tailed test. Though depending on the level of certainty desired, lower levels of significance are acceptable, especially when the overall regression is stronger when the variable is included (as measured by the F-statistic). There is nothing sacrosanct about the 95% significance level, we must evaluate the consequences of being wrong in determining what level of significance is acceptable.

In this case, the t-stat for the intercept is 1.51, which indicates 86% probability (as measured by taking $1 - p\text{-value}$) that the coefficient actually does help explain the variation in the market risk premium. The coefficient for the x variable, however, is weak as indicated by a t-stat of roughly 0.93, providing only a 64% probability that bond yields help to explain the market risk premium. As indicated in Mr. Coyne's response to BCUC IR 2.46.1, these t-statistics are significantly lower than those of Mr. Coyne's original regression, where the intercept t-statistic was 2.24 (indicating 97% probability that the intercept contributes to our understanding of the market risk premium and the two independent variables), the Canada long bond t-statistic was -1.49 (indicating an 85% probability that the variable helps explain the variance in the market risk

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premium), and the dummy variable t-statistic was -2.81 (providing a 99% probability that the dummy variable contributes to understanding changes in the market risk premium). The t-statistics of the coefficients in Mr. Coyne's original regression reflect a stronger relationship between the variables and the market risk premium as specified in Mr. Coyne's original model.

46.4 Please provide an interpretation of the P-value results.

Response:

The P value is referred to as the probability value and represents the exact significance level of the t-statistic. This provides the probable percent of the time that independent variable (bond yields) may have no significance in explaining the variation in the market risk premium. Please also see Mr. Coyne's response to CEC IR 2.46.3 above.

46.5 Please provide an interpretation of the lower 95% results.

Response:

This is the lower bound of the confidence interval at 95% confidence that the sample mean, "x", lies above the lower bound. It is calculated by finding the t-statistic in a table in a text book for the desired confidence level and sample size, and then multiplying that t-statistic by the standard error. This result is subtracted from the coefficient to find the lower bound and is added to the coefficient to find the upper bound. The result is the lower end of the range in which we would expect to find the value of "x" with 95% confidence.

46.6 Please provide an interpretation of the upper 95% results.

Response:

This is the upper bound of the confidence interval. The interpretation is that one could be 95% confident that the sample mean of x or the y intercept lies below the stated value. In this case, we can be 95% certain that the y intercept falls below 23.86, and the coefficient for x falls below

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0.875. The result is the upper end of the range in which we would expect to find the value of “x” with 95% confidence. Please refer to the response to CEC IR 2.46.5 above for the calculation.

46.7 Please provide the market risk premium using the regression formula with all the information included and not excluding the 2008 data.

Response:

Below are the calculations based on the regression formulas, assuming a forecast interest rate of 3.68 percent:

- 2008 Excluded: $MRP = 14.17709 + (-1.1105949 \times 3.68) + (0 \times -45.184734) = 10.09$ percent
- 2008 Included: $MRP = 10.208551 + (-0.745786 \times 3.68) = 7.46$ percent

Mr. Coyne notes that the first regression (the regression provided in his testimony) is considerably stronger with an F-statistic of 4.4623 at a significance of 0.0186 (implying 98.14% confidence that model is appropriately inferring the relationship between the bond yields, the market crash of 2008, and the market risk premium) compared to an F-statistic for the second equation (the CEC-requested regression model) of 0.8691 at a significance level of 0.3572 or at 64.28% confidence that the model is correctly inferring the relationship between the dependent and independent variables. The variables of the first model contribute to the overall understanding of the relationship at a higher significance level (nearly 99%) and the exclusion of either independent variable, would undermine the ability of the model to describe the relationship between bond yields and the market risk premium.

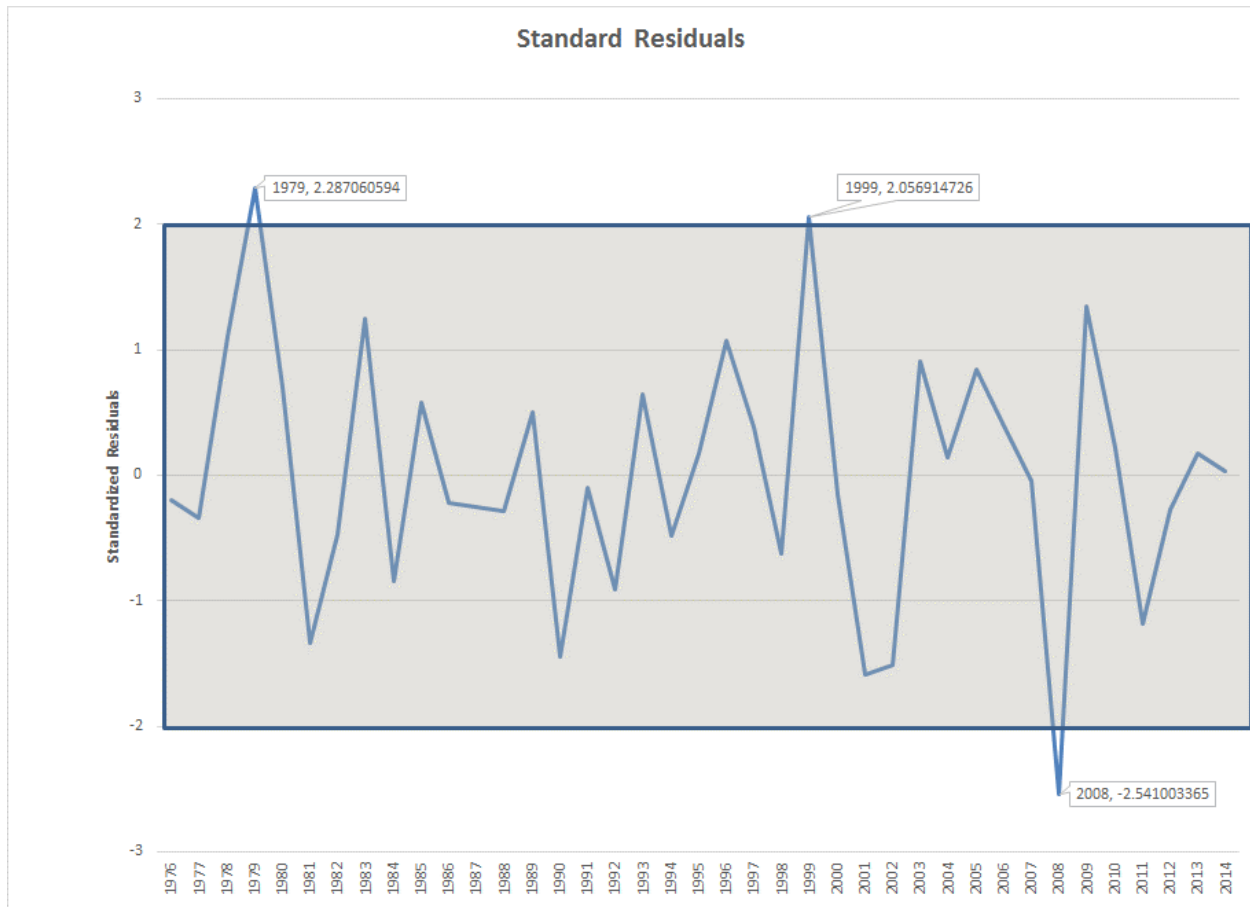
46.8 Were there any other ‘anomalous’ events such as sky-high interest rates in the early 80s which did not align with the normal relationship between treasury yields and market premiums that would have been incorporated into the data and not set aside?

Response:

In reviewing the graph of standardized residuals where all available data is included, it appears there are 3 periods where the standardized residuals exceeds 2, a level that by review of the

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1 data has occurred in only 3 periods over the past four decades. The standardized residual
2 could be interpreted as the number of standard deviations the residual represents from the
3 predicted MRP. Mr. Coyne considers two standard deviations sufficiently large to be
4 considered an 'anomalous' event.



46.8.1 If yes, please provide a list of the anomalous events that did not align
with the normal relationship between treasury yields and market risk
premiums.

Response:

The periods were: 1979, 1999 and 2008. The 1979 period just proceeded a recession and the
1999 period marked a peak which preceded a significant decline, similar to that of 1979.
Removing the three periods above further strengthens the regression results such that all

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1 variables are statistically significant at the 95th percentile. The results are shown below. The
2 below regression equation results in a market risk premium of 8.473 percent, which is greater
3 than the 7.6% used in Mr. Coyne's CAPM analysis.

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.665199118					
R Square	0.442489867					
Adjusted R Square	0.376900439					
Standard Error	13.41714775					
Observations	39					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	4	4857.914714	1214.478678	6.746359653	0.000413862	
Residual	34	6120.67503	180.0198538			
Total	38	10978.58974				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	12.87812382	5.521703842	2.33227355	0.025744231	1.656671506	24.09957613
Canada Long Bond	-1.196995868	0.64881216	-1.844903566	0.073777439	-2.515540818	0.121549082
1979 Recession	40.49532028	13.71646039	2.952315621	0.005682627	12.62011896	68.3705216
1999 Boom	34.47068754	13.6677071	2.522053428	0.016516606	6.694564831	62.24681025
2008 Recession	-43.53627553	13.81655079	-3.151023449	0.003386043	-71.61488502	-15.45766605

46.8.2 If yes, please explain why all the anomalous events were not set aside.

Response:

According to the chart shown in CEC IR 2.46.8 above, the above noted events were of a lesser magnitude.

46.8.3 If yes, please provide the criteria that were used to determine which anomalous events should be set aside.

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1 **Response:**

2 Mr. Coyne selected only the 2008 recession since it was singularly important and already known
3 to him to have resulted in anomalous market activity. However, Mr. Coyne finds the criteria he
4 used in CEC IR 2.46.8.1 provides a reasonable approach to identifying anomalous events.

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1 **47. Reference: Exhibit B-1, Appendix B, Page 23; Exhibit B-4, CEC 1.2.1**

Table 3: TSX Market Indicators

	June 2012 [1]	August 2015
<u>S&P/ TSX Composite</u>		
Price Index	11,597	13,859
Earnings	\$789.00	\$802.38
Dividends	\$365.80	\$433.98
Trailing P/E	14.70X	20.28X
Dividend Yield	3.20%	3.13%
Long Term Growth Rate	3.36%	13.82%
D/Y Ratio	1.9X	2.1X
<u>S&P/ TSX 60</u>		
Price Index	664	815
Earnings	\$48.00	\$50.38
Dividends	\$20.90	\$25.46
Trailing P/E	13.80X	18.81X
Dividend Yield	3.10%	3.12%
Long Term Growth Rate	3.01%	14.47%
Forward P/E [2]	12.60X	15.94X
Forward Earnings Yield (E/P) [3]	7.94%	6.27%
D/Y Ratio	1.8X	2.1X
10-year Canada Bond Yield	1.70%	1.49%
Notes:		
[1] Per Direct Evidence of Kathy McShane in BC GCOC Proceeding (August 2012) at 32.		
[2] Forward P/E ratio is 12/31/2015 Bloomberg Estimate.		
[3] Forward Earnings Yield is calculated by dividing 1 by the Forward P/E		
Source: Data from Bloomberg		

The substantial increases in the Trailing P/E between 2012 and 2015 indicate that investors see greater growth opportunities both in the market overall and in utility shares than was the case in 2012. After several years of post-recession expansion, values for equities have been driven to higher levels, although we have seen some retrenchment over the course of 2015. The increase in growth rates reflects greater optimism across the economic spectrum in terms of future earnings growth, both for the broader index and utilities.

47.1 Please explain how greater optimism might be reflected in market risk premiums.

Response:

The referenced excerpt pertains to growth rates and not the market risk premium. Increased optimism means greater earnings opportunities, increased stock valuations and accordingly capital appreciation returns, but not less or more risk in relation to the risk free return (i.e. the market risk premium).

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1 47.2 Please provide approximate quantification as to how the market risk premium
2 would be affected by the changes seen in the trailing P/E.
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4 **Response:**

5 As Mr. Coyne has discussed in CEC IR 2.47.1 above, it is not possible to infer a direct
6 relationship between the trailing P/E and the market risk premium.
7

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48. Reference: Exhibit B-1, Page 32; Exhibit B-1, Appendix B, Page 45; Exhibit B-4, CEC 3.1; Exhibit B-1, Appendix B, Page 17, Table 2

Consistent with previous proceedings, FEI believes that a formula cannot capture all the changes facing a utility's cost of capital and can yield a return that does not meet the Fair Return Standard. Therefore, FEI respectfully submits that the Commission should suspend the application of the AAM in BC, instead reviewing the cost of capital for the benchmark utility in a three to five year time frame. Nevertheless, if the Commission continues to believe that an AAM

i. Risk Free Rate

My CAPM analysis relies on the 2016 through 2018 average Consensus Economics forecast of the Canadian 10-year government bond (shown previously in Table 2, and repeated below in Table 4) and adds the historical spread between 10-year and 30-year government debt.⁴¹ This period has been chosen to match the period when FEI's rates are most likely to be in effect.

Mr. Coyne has observed that the Commission precedent is to set the ROE and capital structure of the regulated companies for a three-five year period. Though Mr. Coyne acknowledges that this practice is not set in stone, judging by past BCUC decisions, Mr. Coyne presumes that rates established as a result of this Application will most likely be in effect for a number of years. As Table 2, in Mr. Coyne's testimony demonstrates, bond yields are expected to increase substantially over the next several years. As such, the very low interest rates prevalent today are not expected to be sustained through the rate period. Since cost of capital determinations are sometimes dependent on the level of bond yields, (i.e., CAPM, risk premium approach), it is appropriate to consider both the period for which rates will be in effect, and to also reflect the longer term outlook of typical utility investors.

Table 2: Long Term Forecast for 10-Year Government Bond Yields³⁴

	2015	2016	2017	2018	2019	2020	2021-2025
Canada	1.6	2.1	3.2	3.6	3.7	3.9	4.0
U.S.	2.2	2.8	3.9	4.1	4.2	4.3	4.3

³⁴ Consensus Forecasts by Consensus Economics Inc., Survey Date April 13, 2015.

48.1 Is Mr. Coyne presuming that ROE will be in effect for three to five years?

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1 **Response:**

2 As noted in the above referenced response to CEC IR 1.3.1, Mr. Coyne assumes rates will be in
3 effect for a number of years; although he made no specific assumption as to the precise number
4 of years, he recognizes 3-5 years has been the norm. As he describes in his evidence on this
5 topic:

6 Use of the 2016 through 2018 forecast, as opposed to the current risk free rate, reflects
7 the current market reality that near-term bond yields remain near all-time lows, and that
8 investors factor higher interest rate levels in their forward-looking return expectations.
9 Otherwise, the results produced by the CAPM would not reflect forward-looking
10 circumstances. (Coyne Direct Evidence, p. 41)

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14 48.1.1 If not, please explain why not and provide further details as to the
15 ‘number of years’ that Mr. Coyne presumes the ROE will be in effect.

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17 **Response:**

18 Please refer to the response to CEC IR 2.48.1.

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22 48.2 What would be the appropriate term for assessing risk and other considerations
23 when determining an appropriate ROE if an annual automatic adjustment
24 mechanism was included? Please provide reasons for the response.

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26 **Response:**

27 Mr. Coyne has in his prior submission to this Commission recommended a periodic review
28 every 3-5 years if an automatic adjustment mechanism is adopted.

29 Specified Timetable for Periodic Review and/or Rebasing of the Formula - Any formulaic
30 methodology should be accompanied by defined conditions that would trigger a review.
31 It is necessary to routinely benchmark the formulaic result to other measures of ROE.
32 Concentric recommends an established framework for rebasing the formula, i.e., every
33 three to five years, unless there is substantial agreement among stakeholders that the
34 formula is providing reasonable results. The periodic review, at a minimum, should
35 incorporate tests beyond those upon which the formula is based. There is also value in

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1 allowing parties to seek a review of the formula when and if they believe it is providing
2 unreasonable results.²

3
4 Mr. Coyne's view is that future rates would likely be adjusted according to the AAM adopted by
5 the BCUC in the GCOC, and he assumes the BCUC's floor for the AAM would continue, based
6 on the logic adopted by the Commission in the GCOC proceeding that 3.8% is the lowest rate
7 which is consistent with a normal cyclical low.³

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11 48.3 Is Mr. Coyne aware of any long term forecasts for 10 year Government Bond
12 Yields prepared by other firms?

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14 **Response:**

15 Based on the number of firms surveyed in the Consensus Forecast, Mr. Coyne is aware that a
16 number of firms make projections of bond yields, but he is not aware of their general availability
17 in either the public domain or by subscription, other than through the Consensus Forecasts. He
18 relies upon the Consensus Forecast for Canada because it provides a survey of these firms and
19 has been regularly relied upon by the BCUC and other Canadian regulators as a reliable source
20 of economic data for Canada and major international countries, including the U.S. Mr. Coyne
21 also relies on the Blue Chip forecast, but it does not include a long term bond yield forecast for
22 Canada.

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26 48.3.1 If yes, please provide these forecasts and their sources.

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28 **Response:**

29 Please refer to Mr. Coyne's response to CEC IR 2.48.3 above. Mr. Coyne does not subscribe
30 or otherwise have access to other long term forecasts for Canadian bond yields.

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² A Review of Automatic Adjustment Mechanisms for Cost of Capital, Update and Recommendations,
August 3, 2012, p. 8.

³ GCOC Stage 1 Decision, pp. 90-91.

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48.3.2 Has Consensus updated their forecast since April, 2015?

Response:

Yes.

48.3.3 If yes, please provide.

Response:

Consensus Economics updates its long term forecasts in April and October. The October 2015 forecast is provided in Confidential Attachment 48.3.3, provided to the Commission only as it is proprietary and only available to subscribers who, under the terms of the license, are not to reproduce, redistribute or store in a public retrieval system without prior written consent, which has not been obtained.

48.4 Does the 'Long term forecast for 10 Year Government Bond Yields' developed by Consensus include consideration for any periods of recession?

Response:

According to the updated Consensus Economics forecast provided in Confidential Attachment 48.3.3 in response to CEC IR 2.48.3.3, Canada's economy is projected to remain in expansion over the entire forecast (see p. 28). The narrative recognizes the recessionary quarters in 2015 (see p.17), but no recessionary quarters or years are forecast.

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48.4.1 If yes, please identify when the forecasted periods of recession are expected to occur and elaborate on the conditions that were forecast in the recession(s).

Response:

Please refer to the response to CEC IR 2.48.4 above.

48.4.2 If not, please explain why not.

Response:

Consensus Economics publishes the results of surveys as it explains: "Every month, Consensus Economics surveys over 250 prominent financial, and economic forecasters for their estimates of a range of variables including future growth, inflation, interest rates and exchange rates." (Confidential Attachment 48.3.3, p. 1). Some forecasters may be projecting periods of recession, but the published consensus does not.

48.4.3 If not, does the author believe that a period of recession is likely to occur over the next 10 years?

Response:

Assuming the question refers to the author of the Consensus Forecast, please refer to the response to CEC IR 2.48.4.2.

48.4.4 If yes, please explain why the period of recession was not included in developing the long term forecast.

Response:

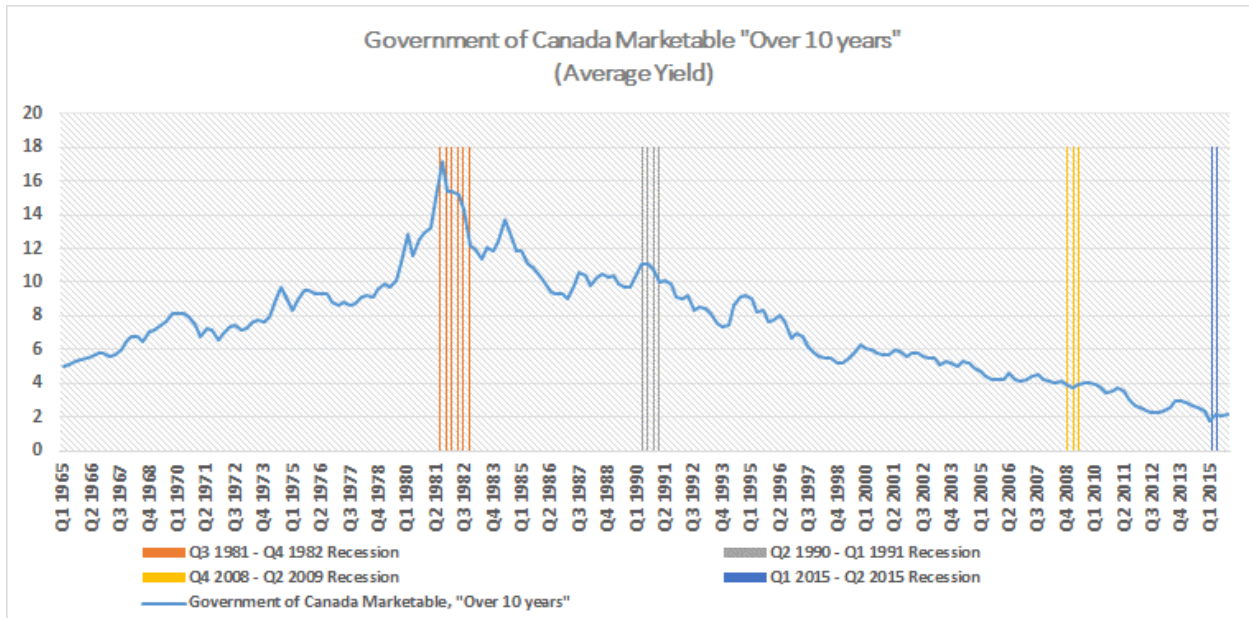
Please refer to the response to CEC IR 2.48.4.2.

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48.5 Please provide a graph of Canadian interest rates over the last 50 years.

Response:

This graph shown below provides a view of the general trend in interest rates from Q1 1965 to Q4 2015. Mr. Coyne has selected the long-term (over 10-years) Government of Canada Marketable bonds for this response since there is 50-years of bond history to respond to the question. However, the general trend interest rates would also be reflected by other bonds or notes. Further Mr. Coyne has indicated periods of recession with vertical lines comprising the months of recession.



Sources: "Over 10 Year Data": Statistics Canada, Government of Canada Marketable Bonds, Average Yield, Over 10 years - CANISM Table V122487; and Recession: Organization for Economic Co-Operation and Development, GDP Growth rate compared to previous quarter, seasonally adjusted, OECD.Stat,

48.6 Please provide a brief discussion of the typical relationship between recessions and interest rates.

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Response:

Interest rates are impacted by both the level of economic activity and actions of the central bank. During a period of recession, businesses and consumers are typically spending less, which lowers the demand for credit. The central bank may also lower its target rate to stimulate the economy if it believes inflation is under control. One would therefore typically expect interest rates to soften or fall during periods of recession. As evident in the chart provided in response to CEC IR 2.58.5, the relationship between long term interest rates and recessions in Canada has not been a consistent one. Long term interest rates, as evidenced by Government of Canada marketable bond yields, fell following the recession in 1981-1982 and 1990-1991, but these were also part of a long term secular decline in bond yields that began in 1981. A corresponding lowering of long term interest rates did not occur during the recessions in 2008-2009 and 2015.

48.7 Does Dr. Coyne and/or FEI agree it is likely that a period of recession will occur within the next 10 years.

Response:

Mr. Coyne believes, based on typical economic cycles that a period of recession is likely in the next 10 years, although he does not have a view on its timing, duration or depth. He notes that the period from 1991–2008 and 1965–1981 did not have a period of recession, so a 10-year period without recession is not unprecedented. Mr. Coyne believes Consensus Survey analysts would build reasonable expectations of recession into their forecasts.

48.7.1 If no, please explain why not.

Response:

Please refer to Mr. Coyne's response to CEC IR 2.48.7.

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1 **49. Reference: Government of Canada Bond Yields**

2

3 49.1 Please file the long-term Government of Canada benchmark bond yields over the

4 last 10 years found at [http://www.bankofcanada.ca/rates/interest-rates/lookup-](http://www.bankofcanada.ca/rates/interest-rates/lookup-bond-yields/)

5 [bond-yields/](http://www.bankofcanada.ca/rates/interest-rates/lookup-bond-yields/).

6

7 **Response:**

8 Monthly series long term Government of Canada benchmark yields over the last 10 years are

9 included in the table below.

Monthly Series - GoC Benchmark Bond Yields - Long Term	
Date	Rate
2015-12	2.16
2015-11	2.29
2015-10	2.26
2015-09	2.21
2015-08	2.2
2015-07	2.2
2015-06	2.38
2015-05	2.25
2015-04	2.19
2015-03	1.97
2015-02	1.95
2015-01	1.93
2014-12	2.33
2014-11	2.48
2014-10	2.59
2014-09	2.73
2014-08	2.57
2014-07	2.7
2014-06	2.82
2014-05	2.76
2014-04	2.93
2014-03	2.96
2014-02	2.96
2014-01	2.94

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Monthly Series - GoC Benchmark Bond Yields - Long Term	
Date	Rate
2013-12	3.2
2013-11	3.14
2013-10	3.01
2013-09	3.09
2013-08	3.09
2013-07	2.97
2013-06	2.96
2013-05	2.65
2013-04	2.38
2013-03	2.49
2013-02	2.53
2013-01	2.57
2012-12	2.37
2012-11	2.3
2012-10	2.38
2012-09	2.33
2012-08	2.37
2012-07	2.22
2012-06	2.32
2012-05	2.33
2012-04	2.65
2012-03	2.67
2012-02	2.6
2012-01	2.64
2011-12	2.5
2011-11	2.69
2011-10	3.02
2011-09	2.83
2011-08	3.1
2011-07	3.35
2011-06	3.53
2011-05	3.5
2011-04	3.74

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Monthly Series - GoC Benchmark Bond Yields - Long Term	
Date	Rate
2011-03	3.72
2011-02	3.75
2011-01	3.75
2010-12	3.54
2010-11	3.65
2010-10	3.5
2010-09	3.33
2010-08	3.47
2010-07	3.77
2010-06	3.65
2010-05	3.68
2010-04	4.04
2010-03	4.07
2010-02	4.05
2010-01	3.96
2009-12	4.07
2009-11	3.85
2009-10	3.96
2009-09	3.84
2009-08	3.9
2009-07	4.05
2009-06	3.91
2009-05	4.19
2009-04	3.82
2009-03	3.74
2009-02	3.69
2009-01	3.72
2008-12	3.45
2008-11	3.94
2008-10	4.27
2008-09	4.13
2008-08	4.01
2008-07	4.16

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Monthly Series - GoC Benchmark Bond Yields - Long Term	
Date	Rate
2008-06	4.05
2008-05	4.12
2008-04	4.08
2008-03	3.96
2008-02	4.18
2008-01	4.19
2007-12	4.18
2007-11	4.23
2007-10	4.38
2007-09	4.5
2007-08	4.44
2007-07	4.49
2007-06	4.56
2007-05	4.39
2007-04	4.2
2007-03	4.21
2007-02	4.09
2007-01	4.22
2006-12	4.1
2006-11	4.02
2006-10	4.24
2006-09	4.07
2006-08	4.2
2006-07	4.45
2006-06	4.67
2006-05	4.5
2006-04	4.57
2006-03	4.23
2006-02	4.15
2006-01	4.2

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1 **50. Reference: Exhibit B-1, Appendix B, Pages 62 and 63; Exhibit B-4, CEC 1.7.1**

1. Operating Risks

It should also be noted that BC recognizes 285 different aboriginal First Nations, Bands and Tribal Councils in the province, which may lead to additional regulatory processes to allow proper recognition of these groups' rights in regulatory proceedings. This impacts the Company's business risk profile by adding the potential for protracted regulatory and political proceedings which could stymie or delay project plans and adds a layer of regulatory and administrative burden to utility operations.

previous periods, the 2014 PBR Decision included some additional regulatory uncertainty and risk, although the broader regulatory constructs that supported FEI's characterization of regulatory risk in 2012 remain in place. FEI has thus assessed its overall regulatory risk as being similar to what it was in 2012, with the potential to be higher over the term of PBR.

FEI notes that Mr. Coyne was not referring to uncertainty regarding the recovery of regulatory proceeding costs in his statement on page 63 of Appendix B, but rather to the extent of proceedings, associated delays to projects and the associated regulatory and administrative burden to the utility.

FEI's third party costs for the Commission's regulatory proceedings, and third party political costs associated with CPCN projects (such as public consultation and First Nations engagement), are generally recovered through deferral accounts from ratepayers, once approved by the Commission. Other regulatory and political costs, including internal staff resources and any third party costs associated with regular capital projects, are included in formula O&M or capital during the term of the PBR, with variances from the formula amount subject to earnings sharing with ratepayers.

50.1 Please provide a more detailed explanation as to how the business risk profile is affected by regulatory and administrative burden if the regulatory proceeding costs are typically passed on to ratepayers.

Response:

An increase in regulatory and administrative burden caused by protracted regulatory and political proceedings can lead to increased delays in project approvals and increased regulatory lag. For instances, increased delays in project approval may lead to lost business opportunities or at least to delayed final investment decisions and/or cost over-runs.

Another aspect of regulatory and administrative burden is related to the resources required to address the complexities and the potential delays to projects that result. For example, bringing incremental resources on board and to a level of knowledge required to address the complexities of the regulatory or political process will take time, and resources with the kind of

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skills required are in high demand and may not be available. FEI needs to balance using internal resources whenever possible with the costs of hiring external consultants and legal counsel. This is a consideration regardless of whether costs are passed on to ratepayers.

50.2 Is the 'regulatory risk' affected by whether or not the company is operating under PBR? Please explain.

Response:

Regulatory risk is a function of rate constructs because they can impact the utility's opportunity to earn a return on and of capital.

The extent of the risk associated with PBR, and the risk it presents relative to COS regulation, depends on the integral effects of the elements of the approved PBR plan. The approved productivity factor, the determination of base capital and operating costs used in the formula, the inclusion of symmetrical earning sharing mechanism and financial off-ramps or lack of these mechanisms, the use of forecast or historic data in PBR formula, the service quality indicators and their treatment, the criteria used for definition of exogenous factors, the capital tracker options, and other elements of the plan can all affect the risk that is attributed to a particular PBR plan. As stated in response to CEC IR 1.17.8.1, credit rating agencies consider that FEI's shift to PBR plan may increase risk due to the potential for increased cash flow volatility compared to cost of service regulation, however this risk is considered to be marginal.

In this Application, FEI concluded that although the PBR decision has introduced some additional risk, the overall regulatory risk is currently similar to what it was in 2012 when cost of service regulation was in place. However, the full impact of some new elements of the 2014 PBR design may only be known after the PBR term (these new elements are detailed on page 74 of FEI's business risk, Appendix C) and therefore there is a potential for regulatory risk to be higher over the term of the PBR.

50.2.1 If yes, does operating under PBR enhance or diminish the regulatory risk that is faced by the company? Please explain.

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1 **Response:**

2 Please refer to the response to CEC IR 2.50.2.

3

4

5

6 50.2.1.1 If 'enhanced', is the regulatory risk a burden that the company
7 bears under PBR and also an opportunity for the company to
8 improve its financial position? Please explain.

9

10 **Response:**

11 Please refer to the responses to CEC IRs 1.17.10 and 2.50.2.

12

13

14

15 50.2.1.2 If 'enhanced', would a return to cost of service in 2019 mitigate
16 the regulatory risk? Please explain why or why not.

17

18 **Response:**

19 FEI cannot speculate on the nature of a cost of service approach in the abstract and how it
20 would differ from the current PBR in terms of permitting FEI to earn a return on and of capital.
21 In the past, the Commission has assessed regulatory risk with reference to factors such as
22 deferral account coverage and other matters that have yet to be established for the period
23 following 2019. As stated on page 73 of FEI's business risk, Appendix C, the unpredictability of
24 future decisions of the regulator is a source of regulatory uncertainty and regulatory risk. Please
25 refer to the response to CEC IR 2.50.2, in which FEI notes that credit rating agencies have not
26 attributed a significant increase in regulatory risk to PBR.

27

28

29

30 50.2.1.3 If 'diminished' please explain how the regulatory risk is
31 diminished under PBR.

32

33 **Response:**

34 Please refer to the response to CEC IR 2.50.2.

35

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1 **51. Reference: Exhibit B-4, CEC 1.7.2**

2 The treatment of these costs is the same as described in the response to CEC IR 1.7.1 under
3 PBR or Cost of Service, with the exception that any amounts that are included in formula O&M
4 or capital under PBR, are instead forecast in O&M or capital under Cost of Service. To the
5 extent the amounts are included in the forecast for the test year(s) under Cost of Service, they
6 are recovered from customers in O&M or capital.

7 51.1 Please discuss how operating under PBR influences the risk faced by the
8 company and provide quantification/estimates of how the risk is affected by
9 operating under PBR.

10 **Response:**

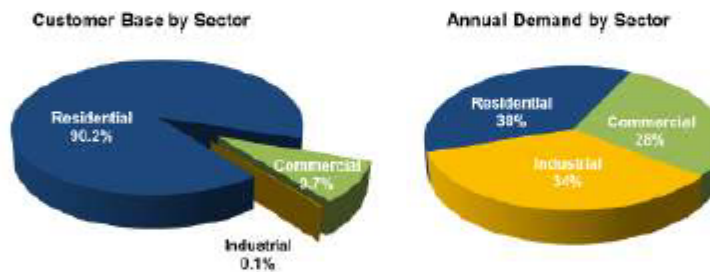
11 It is the specifics of any cost of service or PBR plan that influences the regulatory risk faced by
12 the Company. FEI has provided a discussion in its Application and in the response to CEC IR
13 2.50.2 of the regulatory risk of the current PBR plan, but it is not possible to quantify this risk.

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1 **52. Reference: Exhibit B-4, CEC 1.10.1**

The following response addresses CEC IRs 1.10.1.1 through 1.10.2.1.

Natural gas competes with electricity for certain types of end-uses in homes and businesses. As discussed in the Company's most recent Long Term Resource Plan filed on March 25, 2014², the FEI customer base includes over 945,000 customers, consisting predominantly of residential customers that account for approximately 90% of the overall customer base (see Figure below). However, on an annual demand basis, there is a more even split between the residential, commercial, and industrial groups.



There are numerous end use applications for natural gas so it is difficult to provide an exhaustive list of the customers and end-uses where gas competes with electricity. Typically, the competition between the two energy forms in residential settings relates to the production of heating, cooling or hot water as well as cooking, drying and/or decorative uses. In general, the

main forms of competition in the commercial sector are similar to residential, namely heating, water heating, cooling and cooking.

Industrial applications requiring heating, cooling, and cooking may compete with electricity. Industrial applications where natural gas typically wouldn't compete with electricity include waste treatment and incineration, drying and dehumidification, food processing, and industrial boilers. Applications where natural gas is used as a feedstock for the manufacturing of chemicals and products wouldn't compete with electricity.

52.1 Does FEI anticipate that natural gas prices will rise as significantly as electricity prices over the next five years and over the next ten years? Please explain why or why not.

Response:

Due to the number of supply and demand factors and the very dynamic nature of the market place it is difficult to predict what the level of absolute or relative changes in market prices for natural gas or electricity will be over the next five years or ten years. A good illustration of the possible range of natural gas prices under different scenarios and assumptions was provided in the response to CEC IR 1.10.9, sourced from the US Energy Information Administration. In addition to the response to overall North American commodity prices, pricing in the smaller and less liquid BC markets exhibits greater volatility due to such factors as infrastructure constraints

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1 and limited markets. At this point in time, however, FEI believes that natural gas market prices
2 in BC are at or below the average cost of production and therefore are not sustainable. In other
3 words, FEI anticipates there will be continued volatility and upward pressure on natural gas
4 market prices in British Columbia in response to either flattening production (impacting supply)
5 or increased market access (resulting in higher loads) over the next 5 to 10 years.

6 Increases in natural gas commodity prices will also influence market prices for electricity due to
7 the increasing level of gas fired generation in the overall resource mix across North America
8 including the Pacific Northwest. In British Columbia, however, retail electricity prices are cost
9 based rather than market based, and in any case natural gas generation is a very small portion
10 of BC Hydro's overall resource portfolio. Please refer to FEI's response to CEC IR 1.10.7 for a
11 discussion on the current expectations for future BC Hydro electricity rates based on available
12 information.

13
14
15
16
17 Exhibit B-4, CEC 10.3 and <http://www.nrel.gov/docs/fy06osti/39512.pdf>, page 6 and
18 [http://www.sustainableprosperity.ca/sites/default/files/publications/files/The%20Likely%20](http://www.sustainableprosperity.ca/sites/default/files/publications/files/The%20Likely%20Effect%20of%20Carbon%20Pricing%20on%20Energy%20Consumption%20in%20Canada.pdf)
19 [Effect%20of%20Carbon%20Pricing%20on%20Energy%20Consumption%20in%20Can](http://www.sustainableprosperity.ca/sites/default/files/publications/files/The%20Likely%20Effect%20of%20Carbon%20Pricing%20on%20Energy%20Consumption%20in%20Canada.pdf)
20 [ada.pdf](http://www.sustainableprosperity.ca/sites/default/files/publications/files/The%20Likely%20Effect%20of%20Carbon%20Pricing%20on%20Energy%20Consumption%20in%20Canada.pdf), page 4

This response addresses CEC IRs 1.10.3 through 1.10.5. FEI does not have data on cross-price elasticity between natural gas and electricity. FEI's 2014 LTRP identified that own-price elasticity for natural gas is low and suggested values of -0.2 for residential and -0.5 for commercial and industrial customers³. The following source references are cited in the 2014 LTRP:

Residential price elasticity data is from <http://www.nrel.gov/docs/fy06osti/39512.pdf>, although <http://www.eia.gov/oiaf/analysispaper/elasticity/pdf/tbl.pdf> suggests that the long term price elasticity is higher.⁴

The following document contains additional information on natural gas and electricity price elasticity and suggests that the values may have increased somewhat:

<http://www.sustainableprosperity.ca/sites/default/files/publications/files/The%20Likely%20Effect%20of%20Carbon%20Pricing%20on%20Energy%20Consumption%20in%20Canada.pdf>.

Please note that the elasticity estimate presented for commercial and industrial customers has a high level of aggregation. In these markets, the responsiveness of demand to price may vary greatly depending on factors such as the ability to hedge against price volatility by industrial customers, degree of fuel substitution possibilities, reduction in production levels, etc.

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1 'Based on this analysis, consumer demand for electricity and natural gas should be
2 relatively unresponsive to price changes in the short term and more responsive to price
3 changes in the long term but could differ substantially by region. Demand for these
4 goods is generally inelastic in the short term, because a consumer's main options when
5 energy prices change are to vary how he or she uses energy-consuming appliances
6 (e.g., adjust a thermostat or turn on fewer lights) or reduce expenditures on other goods.
7 Over the longer term, consumers can buy appliances that use a different energy source
8 and/or purchase more-efficient appliances. Therefore, price elasticities tend more toward
9 the elastic range than the inelastic range in the long term.'

Price elasticities are impacted by various factors, including the availability and price of substitutes, consumer knowledge and responsiveness of demand to changes in income levels. For these reasons, the price elasticity of demand can vary over time and geography. Moreover, there is a difference between short-run and long-run price elasticities. For example, it could take years for demand to fully respond to an increase in electricity prices as consumers gradually shift towards using more energy efficient appliances. This is an important consideration when interpreting short-run elasticity measures (like the ones presented in this paper) – it usually requires significant capital investment to switch between energy sources. Therefore, the quantity demanded of energy products is more likely to respond in the long-term to price changes as consumers change their behaviour and invest in substitutes.

10
11 52.2 Please confirm that the information contained in the Long Term Resource Plan
12 would represent a long term price elasticity.

13
14 **Response:**

15 Confirmed.

16
17
18
19 52.2.1 If not confirmed, please explain why not.

20
21 **Response:**

22 Please refer to the response to CEC IR 2.52.2.
23
24
25

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52.3 Please provide FEI's views as to what length of time would be considered 'long term' and what may be considered 'short term' in the context of price elasticity. Please distinguish between rate classes if appropriate.

Response:

The long term examination of the impact of gas prices on demand in the LTRP recognized that the concept of longer term price elasticity would apply to the demand outlook to a greater extent between 5 and 20 years into the future. The concept of short term price elasticity could be expected to apply more in the 1 to 5 year time frame. FEI is not aware of any differences between rate classes in what is considered long-term vs. short-term price elasticity.

52.4 When does FEI anticipate revisiting its ROE?

Response:

As explained on page 33 of FEI's Application, FEI believes that its allowed ROE and capital structure should be set through a traditional regulatory proceeding and reviewed in a three to five year time frame. However, the resulting ROE and capital structure for utilities must always meet the Fair Return Standard. FEI, or an interested party, should remain at liberty to seek an adjustment if the cost of capital no longer meets the Fair Return Standard as a result of emerging circumstances during the period between anticipated proceedings.

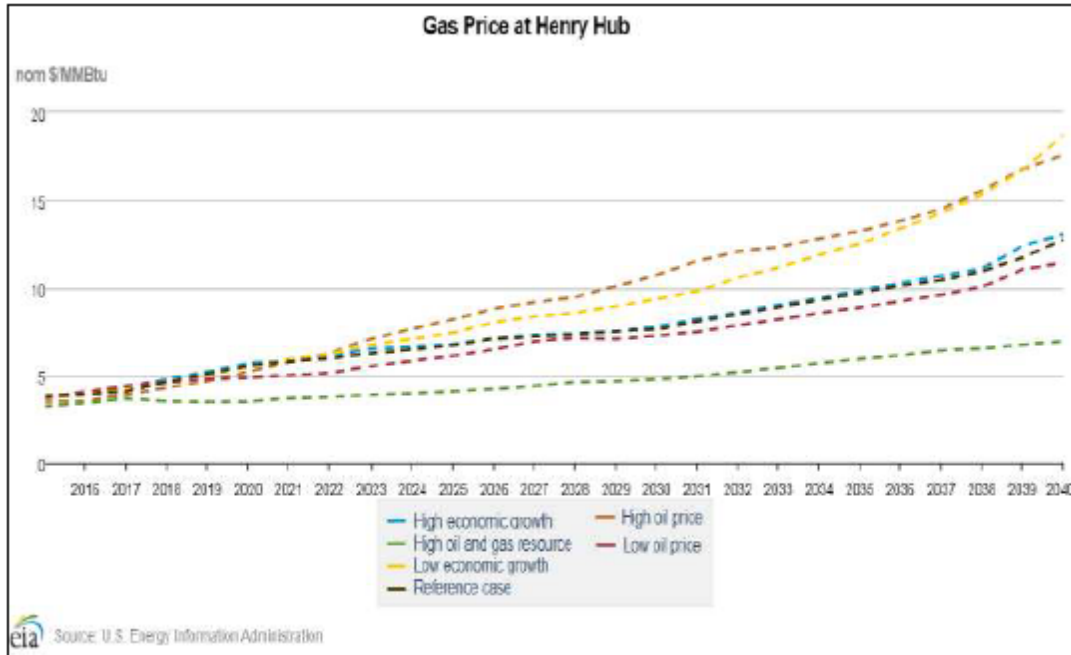
52.4.1 Please discuss the criteria that FEI uses to determine when it should apply for a review of its ROE.

Response:

The allowed ROE and capital structure must always meet the Fair Return Standard (FRS) and therefore FEI will apply for a review of its ROE and capital structure in any year if the FRS criteria stated on page one of its Application are not met. Please also refer to the response to BCUC IR 2.52.4.

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1 **53. Reference: Exhibit B-4, CEC 1.10.9**



2

3 53.1 Please provide further definition/interpretation for the legend identifying the

4 conditions that may be considered 'high economic growth', 'high oil and gas

5 resource', low economic growth, 'high oil price' and 'low oil price'.

6

7 **Response:**

8 As shown, the referenced figure is sourced from the Energy Information Administration (EIA).

9 The EIA's report titled "Assumptions to AO2015" provides a table summarizing the major

10 assumptions and the different scenarios embedded in their 2015 Annual Energy Outlook (see

11 below).

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Table 1.1. Summary of AEO2015 cases

Case name	Description
Reference	Real GDP grows at an average annual rate of 2.4% from 2013 to 2040. Crude oil price rises to about \$140/barrel (Brent 2013 dollars) in 2040.
Low Economic Growth	Real GDP grows at an average annual rate of 1.8% from 2013 to 2040. Other energy market assumptions are the same as in the Reference case.
High Economic Growth	Real GDP grows at an average annual rate of 2.9% from 2013 to 2040. Other energy market assumptions are the same as in the Reference case.
Low Oil Price	Low prices result from a combination of low demand for petroleum and other liquids in the non-Organization for Economic Cooperation and Development (non-OECD) nations and higher global supply. Lower demand is measured by lower economic growth compared with the Reference case. On the supply side, the Organization of the Petroleum Exporting Countries (OPEC) increases its liquids market share to 51%, and the costs of other liquids production technologies are lower than in the Reference case. Light, sweet crude oil prices remain around \$52/b (2013 dollars) through 2017, then begin to rise slowly to almost \$66/bbl in 2026, and to \$76/b in 2040.
High Oil Price	High prices result from a combination of higher demand for liquid fuels in non-OECD nations and lower global supply. Higher demand is measured by higher economic growth compared with the Reference case. OPEC market share averages 32% throughout the projection. Non-OPEC petroleum production expands more slowly in the short to middle term compared to the Reference case. Crude oil prices rise to \$252/barrel (2013 dollars) in 2040.
Oil and Gas: High Oil and Gas Resource	Estimated ultimate recovery (EUR) per shale gas, tight gas, and tight oil well is 50% higher, well spacing is 50% closer (i.e., the number of wells left to be drilled is 100% higher) than in the Reference case. In addition, tight oil resources are added to reflect new plays or the expansion of known tight oil plays, and the EUR for tight and shale wells increases by 1%/year beyond the Reference case annual increase to reflect additional technology improvements. This case also includes kerogen development, as well as undiscovered resources in the offshore lower 48 states, Alaska, and shale gas and coalbed resources in Canada that are 50% higher than in the Reference case.

For further details on the scenarios/assumptions, please take a look at the full report:
<http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554%282015%29.pdf>

53.2 Please confirm or otherwise explain that the relevant price considerations are those for the next three to five years.

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1 **Response:**

2 The price forecast was provided by the EIA and is updated on an annual basis. This particular
3 forecast was published/released on April 14, 2015. The explanations for the price
4 considerations are detailed in the response to CEC IR 2.53.1. The EIA indicates that it believes
5 that those price considerations are relevant for the next three to five years.
6

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1 **54. Reference: Exhibit B-4, CEC 1.18.1**

18.1 Is it the author's opinion that the risk has increased, decreased or remained the same from the 2013 Decision?

Response:

The scope of Mr. Coyne's testimony in the GCOC proceeding was limited to matters pertaining to the Automatic Adjustment Mechanism, and did not relate to a review of FEI's business risk. In this proceeding, Mr. Coyne was not engaged by FEI to provide an in-depth comparison of FEI's business risk, relative to the risks that existed at the time of the 2012 GCOC application, but rather FEI's current risk profile and how it compares to the proxy group companies. However, Mr. Coyne has conducted a high-level comparative review of FEI's risk profile relative to 2012. Mr. Coyne generally finds that the business risks that the Commission identified as long term risks in its 2013 GCOC Decision continue to present as long term business risks to FEI today. Mr. Coyne is aware that municipalities are increasingly adopting policies and practices to combat climate change in the energy, building construction, and HVAC industries among others; and that consumer behavior is increasingly influenced by these policies. Mr. Coyne has not assessed whether this expansion of policies and the increasing change in customer behavior was already factored into the last ROE assessment, or whether these developments changed FEI's risk trajectory. But, Mr. Coyne has observed that these risks continue to be significant and do not appear to have diminished.

2

3 54.1 What variables should be addressed in an annual automatic adjustment
4 mechanism? Please provide details with a rationale, and quantification where
5 applicable.

6

7 **Response:**

8 Below are excerpts from Mr. Coyne's 2010 Study⁴ on this topic that identifies the variables and
9 the attributes that should be considered for use in an annual automatic adjustment mechanism.
10 First Mr. Coyne provides a listing of considerations when selecting variables for use in
11 automatic adjustment mechanisms, then he provides a listing of commonly used variables,
12 followed by a table detailing the advantages and disadvantages of each of the variables listed.
13 He has also included an excerpt from his 2012 study, which provided an update of the 2010
14 study.

15 Though Mr. Coyne promoted a model that incorporated a variable that tracked changes in utility
16 authorized returns, he finds the incorporation of the utility corporate bond spread as a second
17 factor in the former one-factor model (which was based solely on government bond yields), and
18 the lessening of the sensitivity to changes in interest rates from 0.75 to 0.50, to have
19 significantly improved the reliability of the AAM. He notes that this model is currently operating
20 in Ontario with reasonable results. However, as described on page 103 of Mr. Coyne's direct

⁴ Concentric Energy Advisors, Inc., *A Review of Automatic Adjustment Mechanisms for Cost of Capital*, prepared for the Terasen Utilities (November 29, 2010) at 8-12, and Appendix A.

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evidence, he finds that an evidentiary review of a given utility's cost of capital is most likely to provide the most accurate estimate of a utility's cost of equity.

- **Desirable Formula Attributes**

Two perceived benefits of a formulaic adjustment mechanism are regulatory expediency and greater certainty for both the utility and regulator. As noted above, formulas generally update annually, without special proceedings or contentious battles between stakeholders. However, the tendency to set and forget the formula is also a primary drawback to the formulaic approach. When equity returns are generated on autopilot, there is a tendency to ignore or discount changing market conditions that may render the formulaic result unfair. There must be a balance that recognizes the need to periodically benchmark against traditional measures of required returns for regulated utilities. A functional ROE formula must be able to approximate the results that would have been produced in a rate-setting hearing process.

Establishing the starting point of the formula is the first step in the process. Great care must be exercised in establishing the initial ROE as the effects of any understatements or overstatements will be felt with each succeeding application of the formula. Concentric is of the view that the initial ROE should be set in accordance with traditional ROE setting methodologies, utilizing multiple approaches, based on a proxy group of companies with similar risk profiles, in a process where the regulatory Board hears evidence from the company and its stakeholders. Most jurisdictions go through this process each time ROE is set. A fully litigated regulatory process where stakeholder evidence is presented and heard by the commission generally provides a sound basis for a fair determination of ROE. As noted earlier, several jurisdictions have turned to the use of formulas to provide interim adjustments to ROE for estimated movements in equity markets between rate proceedings. The same regulatory objectives could be met without a formula by scheduling regular cost of capital proceedings within reasonable time frames. Periodic rate hearings encompass most of the desired attributes we consider in establishing a formulaic methodology. When utilizing an AAM, it is also important that the parameters of the formula are carefully selected. Otherwise, errors will have a compounding influence on the formulaic result as they accumulate over time.

If a formula is adopted, Concentric is of the opinion that any formulaic approach selected should give adequate consideration to the following criteria:

1. Tracks required utility equity returns
2. Ease of administration
3. Based on commercially accessible inputs
4. Promotes regulatory transparency
5. Forward-looking
6. Stability
7. Insulated from the effects of anomalous and transitory market conditions

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8. Specified timetable for periodic review and/or rebasing of the formula
9. Reflects the capital market conditions faced by the utility.

Tracks Required Utility Equity Returns

The formulaic approach must accurately reflect investor-required equity returns amid varied economic and financial market conditions. A formula that relies exclusively on government bond yields, for example, may lose sight of influences in the bond market that do not affect the equities market and vice-versa. Bond yields and equity returns do not always move in tandem. For example, the sustained decline in interest rates in Canada over the last decade as a result of the monetary policy from the Federal Reserve Board and the Bank of Canada has resulted in increasingly lower formula-produced returns on equity, while litigated evidentiary proceedings in Canada and the U.S. were producing higher equity returns than those produced by the formula. Indeed, in the recent financial crisis and economic recession, credit spreads widened significantly and equity market volatility rose to unprecedented levels, ultimately causing government bond yields and corporate capital costs to move opposite to one another despite a historical positive relationship. Neither bond yield (government or corporate) provides a complete picture of required equity returns. Incorporating factors that estimate required utility equity returns or incorporating returns allowed in other jurisdictions into the formulaic adjustment mechanism might alleviate this problem. Such factors might include:

- An index of North American allowed equity returns for utilities
- DCF Calculation
- Equity Risk Premium or CAPM⁵ Calculation
- Investor analyst sector or utility specific projections for ROE.

Ease of Administration

Regulators seeking to adopt formulas are generally looking for an ROE adjustment mechanism that can be updated annually without the need for a hearing process or supporting expert testimony. The process of hiring experts to provide opinions and supporting evidence on ROE issues is costly and time consuming. It is important that if an automatic adjustment mechanism is reintroduced, it should be readily administered by regulatory staff without the assistance of outside experts.

Based on Commercially Accessible Inputs

Formulas should utilize data that is commercially available and populated for both U.S. and Canadian companies. Often, subscription charges apply to data services (e.g., Bloomberg,

⁵ The CAPM methodology is an extension of the basic equity risk premium model. It is a theoretical model based on the investor objective of optimizing portfolio returns by minimizing systematic market risk. The CAPM model is often criticized for the subjectivity and controversy around its input parameters such as beta, the means to adjust beta, the appropriate risk free rate and the appropriate risk premium.

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DEX Universe Bond Indices), but these costs may be more than offset by the value of the data to the process.

Promotes Regulatory Transparency

Regulatory transparency refers to the openness of the process and predictability of outcomes by all stakeholders, i.e. the utility, creditors, investors, and ratepayers. A formulaic ROE that can be readily estimated by stakeholders promotes regulatory transparency, enabling investors to make forward projections based on widely understood data inputs. A formula with inputs that are not available to the stakeholders or that requires regulatory discretion in its application would not satisfy the objective of regulatory transparency as there is still uncertainty around the ultimate regulatory decision.

Forward-Looking

A formulaic ROE should provide an informed estimate of what investors will require in returns over the course of the applicable rate-setting period. For this reason, the use of yield projections and share price data are beneficial in providing a forward looking view of what is to come on the investment horizon. Both projected yield data and stock value per share data provide meaningful information as to what investors see for the future of a given credit issue or company valuation at the present time. Near-term historical data may be a reasonable proxy for projected data unless significant growth or anomalous market activity render recent history an inappropriate indicator for the projection period.

Stability

The formula should be responsive to changing market conditions but not overly sensitive to normal market volatility. It should have the stability to moderate the effects of temporary market movements so that regulators and utilities alike are not constantly making nominal changes to rates that would otherwise reverse themselves in the next period. Deadbands are used in several jurisdictions to avoid the recalculation of ROE and rates for minor changes in market conditions. If used, deadbands should strike a reasonable balance between triggering too often and not triggering often enough. A formula that is too sensitive to market volatility introduces unnecessary volatility to utility revenues and rates and results in inefficient rate revisions.

Insulated from the Effects of Anomalous and Transitory Market Conditions

Some formulaic approaches employ ceilings and floors to limit the movement of ROE from starting levels and/or trigger a review. The recent market collapse and recession of 2008 illustrated that a formula may produce inappropriate results under certain market conditions. Monitoring and setting limits based upon established thresholds such as: returns in other jurisdictions, credit spreads, changes in bond yields, changes in earnings growth, changes in stock prices, or substantial changes in ROE results may all provide valuable information to assist in the determination that the formula should be tested for appropriate results. Once such a condition is identified, there must be an assessment and resolution process where the regulator and stakeholders arrive at an equitable solution for ensuring the fair return on equity for the upcoming period.

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Specified Timetable for Periodic Review and/or Rebasing of the Formula

Any formulaic methodology should be accompanied by defined conditions that would trigger a review. A formula that remains on autopilot too long may yield inappropriate results. It is therefore necessary to routinely benchmark the formulaic result to other measures of ROE. We have observed that conditions may arise that would warrant a review, but without an established process the decision to re-evaluate the formula could be delayed by stakeholder deliberations on whether the formula is providing reasonable results. For that reason, Concentric recommends an established framework for rebasing the formula, i.e. every 3 to 5 years, unless there is substantial agreement among stakeholders that the formula is providing reasonable results. The periodic review, at a minimum, should incorporate tests beyond those upon which the formula is based. There is also value in allowing parties to petition for a review of the formula when and if they believe it is providing unreasonable results.

Reflects the Capital Market Conditions Faced by the Utility

When setting the ROE for a regulated utility, it is ideal to obtain data inputs reflecting capital market conditions faced by the utility. The integration of North American capital markets and the similarity of the legislative and regulatory processes have created a more homogenous market for utility capital. Formulas should strive to choose proxies carefully, so that risks borne by the proxy companies are representative of those to which the utility under consideration is subjected. Though no proxy is perfect, risk adjustments may be made for marked differences in risk profiles between the utility and its set of proxy companies.

• **Alternative Formulaic Approaches**

A Study of Formulaic Inputs

The components of a cost of capital or ROE adjustment formula can be broken down into two fundamental functions. First, the inputs to approximate the movement of equity returns based upon an estimated relationship between the formula input factor and the returns utility equity investors require. Through our research, we have identified the following inputs and coefficients that are present in ROE automatic adjustment mechanisms:

- Forecast Government Bond Yield
- Historical Government Bond Yield
- Corporate Bond Yield
- Utility Bond Yield
- DCF, Risk Premium and CAPM Inputs
- Formula Coefficient.

Second, some formulas incorporate protective mechanisms that mitigate the impact of the formula under certain conditions. Examples of these are trigger mechanisms that prompt a

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review if a predetermined threshold is met, and predetermined periods for rebasing ROE. Some formulas employ ceilings and floors that are either fixed or tied to a variable, which provide a figurative rail to keep the formula returns on track. Other mechanisms may specify a materiality threshold for adjustment and employ a deadband in which no adjustment is made. Below is a list of measures that we have identified that moderate or rebase the results of the formula in certain conditions:

- Deadband
- Ceilings and Floors
- Trigger Mechanisms
- Review Period.

INPUTS	ADVANTAGES	DISADVANTAGES
Forecast 10-Year Government Bond Yield	<ul style="list-style-type: none"> • Widely available • Historical relationship between government bond yields and utility equity returns • Forward looking 	<ul style="list-style-type: none"> • May significantly depart from corporate equity returns - no equity market input • Significantly influenced by national monetary policy and broad macroeconomic trends. • 10-year horizon is not sufficiently long to parallel corporate asset investment horizon (requires a increment to bring the life to 20 to 30 years – could result in mismatching of forecast and historical data) • Not specific to utilities
Historical Avg. 10-Year Government Bond Yield	<ul style="list-style-type: none"> • Widely available • Historical relationship between government bond yields and utility equity returns 	<ul style="list-style-type: none"> • May significantly depart from corporate equity returns - no equity market input • Significantly influenced by national monetary policy and broad macroeconomic trends. • 10-year horizon is not sufficiently long to parallel corporate asset investment horizon (requires a increment to bring the life to 20 to 30 years – could result in mismatching of forecast and historical data) • Historical performance may not be indicative of future – i.e. not forward looking • Not specific to utilities

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INPUTS	ADVANTAGES	DISADVANTAGES
Bloomberg historical 30-Year A-rated Utility Bond Yield	<ul style="list-style-type: none"> Historical relationship between corporate utility bond yields and utility authorized equity returns. Less subject to governmental monetary policy and broad macroeconomic trends. Appropriate investment horizon of 30 years Data available for both U.S. and Canadian Bond Yields Derived from frequently updated fair value curve Specific to utilities 	<ul style="list-style-type: none"> Requires a Bloomberg subscription Stringent data protection requirements Not forward looking Utility bond yields are not always a good predictor of utility equity returns – no equity market input
Moody's 30-year Baa or A-rated utility bond yield	<ul style="list-style-type: none"> Historical relationship between corporate utility bond yields and utility authorized equity returns Less subject to governmental monetary policy and broad macroeconomic trends. Appropriate investment horizon of 30 years Specific to utilities Widely available for nominal cost – does not require an expensive subscription 	<ul style="list-style-type: none"> Not forward looking Utility bond yields are not always a good predictor of utility equity returns – no equity market input Heavily weighted towards U.S. utilities
Coefficient for Change in Bond Yields of 0.75	<ul style="list-style-type: none"> Easily administered Regulatory transparency 	<ul style="list-style-type: none"> Overstates impact of historic interest rate fluctuations on utility equity returns, and may change over time Not supported by regression of utility allowed equity returns and government or corporate bond yields
Coefficient for Change in Bond Yields of 0.50	<ul style="list-style-type: none"> Easily administered Regulatory transparency Supported by regression of utility allowed equity returns and government or corporate bond yields 	<ul style="list-style-type: none"> Bond yields, alone, cannot fully explain movements in equity markets
Prescriptive and equal weighting of DCF, CAPM and Risk Premium Approach	<ul style="list-style-type: none"> Provides a prescriptive approach to recalculating ROE each year Specific to utilities and equities Based on actual equity calculation using commonly applied methods and inputs Eliminates the controversy around ROE inputs (i.e. risk premium, beta, growth rates) 	<ul style="list-style-type: none"> More difficult to administer Inputs can be viewed as subjective and require subscriptions to data services Data limited to publicly-traded, investor-owned utilities followed by analysts
Weighting of U.S. RRA Index and Canadian Litigated Returns	<ul style="list-style-type: none"> Moderately easy to administer Provides some regulatory transparency Specific to utilities and incorporates measures of allowed returns on equity (i.e. equity market inputs) When weighted with Utility bond yields, provides assurance that divergence in equity market from bond market will be at least partially accounted for in the formula result. 	<ul style="list-style-type: none"> Commissions reluctant to use decisions from other commission in their ROE determinations Requires reliance on U.S. data Requires subscription to SNL to develop index, i.e. data is not widely available Requires Canadian ROE Decision research

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INPUTS	ADVANTAGES	DISADVANTAGES
Deadband	<ul style="list-style-type: none"> • If set properly will avoid frequent and temporary adjustments to ROE - reduces volatility in earnings and rates • Facilitates regulatory expediency by less frequent changes to ROE. 	<ul style="list-style-type: none"> • If not set appropriately may be too sensitive to changes in inputs requiring frequent ROE updates; or conversely be too unresponsive to market inputs
Ceiling and Floors	<ul style="list-style-type: none"> • Provides certainty that the formula returns will not result in unusually high or low ROE estimates. 	<ul style="list-style-type: none"> • Transfers a portion of market risk from ratepayer to shareholder
Trigger Mechanism	<ul style="list-style-type: none"> • Provides certainty that significant movements in ROE will be reviewed and the formula's ability to adequately track returns will be reassessed. 	<ul style="list-style-type: none"> • May not adequately address the period for which the formula should be reviewed, i.e. may require review when not needed and not trigger a review when it is needed. • Trigger mechanisms are often set improperly, i.e. changes in ROE do not necessarily translate to ROEs that are inappropriately low or high.
Specified Review Period	<ul style="list-style-type: none"> • Provides certainty that ROE will be reviewed/ rebased if necessary, and the formula's ability to adequately track returns will be reassessed. 	<ul style="list-style-type: none"> • May not adequately address the period for which the formula should be reviewed, i.e. may require review when not needed and not trigger a review when it is needed.

As we observed during the 2008-2009 financial crisis, a formula that is heavily weighted on a single factor may be unduly influenced by market events. During the financial crisis and economic recession, credit spreads widened significantly and equity market volatility rose to unprecedented levels, ultimately causing government bond yields and corporate capital costs to move opposite to one another despite a historical positive relationship. Neither bond yield (government or corporate) provides a complete picture of required equity returns. Common equity holders are exposed to higher risk than bond holders, and both classes of investment are subject to market circumstances (e.g., the flight to safety lowering government bond yields) that may impact that security but not the other. However, incorporating the corporate credit spread into the AAM does mitigate the impact of changes in the relationship between corporate and government bond yields. Further, incorporating factors that estimate required utility equity returns or incorporating returns allowed in other jurisdictions into the formulaic adjustment mechanism adds additional assurance that one factor, subject to influences unrelated to utility cost of capital, would not be able to hijack the formulaic allowed return. An AAM should be sufficiently robust to function in varied and extreme market conditions.⁶

⁶ Concentric Energy Advisors, Inc., A Review of Automatic Adjustment Mechanisms for Cost of Capital; Update and Recommendations, prepared for the FortisBC Utilities (August 3, 2012)

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54.2 What is an appropriate term for an automatic adjustment mechanism to be in effect? Please explain.

Response:

Below is an excerpt from Mr. Coyne's 2012 Study that is responsive to this question:

Specified Timetable for Periodic Review and/or Rebasing of the Formula - Any formulaic methodology should be accompanied by defined conditions that would trigger a review. It is necessary to routinely benchmark the formulaic result to other measures of ROE. Concentric recommends an established framework for rebasing the formula, i.e., every three to five years, unless there is substantial agreement among stakeholders that the formula is providing reasonable results. The periodic review, at a minimum, should incorporate tests beyond those upon which the formula is based. There is also value in allowing parties to seek a review of the formula when and if they believe it is providing unreasonable results.⁷

54.3 How many proxy utilities incorporate annual or other adjustment mechanisms in their ROEs?

Response:

Mr. Coyne notes that the OEB Staff recently conducted a review of the OEB's formula following a five year period, and the OEB concluded its policy was working as intended.⁸

54.4 Please provide an overview of any annual or other adjustment mechanisms that are included in any of the utilities being used as proxies in this proceeding.

⁷ Ibid at 8.

⁸ OEB Decision, EB-2009-0084, Cost of Capital Review and the OEB Staff Report, January 14, 2016, p. 11/

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1 **Response:**

2 Enbridge Gas and Union Gas's ROEs are set by the OEB Formula. In December 2009, the
3 Ontario Energy Board rebased and modified its AAM from a simple reliance on 75% of the
4 change in the Canada Long Bond to 50% of the change in forecast long-term Canada bond
5 yields and 50% of the change in observed A-rated utility bond index over the 30-year Canada
6 Bond yield. The OEB continues to rely on its modified formula.⁹

$$ROE_t = ROE_{t-1} + \left[0.50 \times (LCBF_t - LCBF_{t-1}) + 0.50 \times \sum_i \frac{30_CUtA_B_{i,1} - 30_CB_{i,1}}{i_t} \right]$$

7
8 In this formula, the long Canada Bond Forecast is combined in equal weighting with the
9 Average daily Spread for the most recent three months, between A-rated Canadian Utility
10 Bonds and 30-year Government of Canada Bonds. The Long Canada Bond forecast is given by
11 the following equation:

$$LCBF_t = \left[\frac{10_CBF_{3,t} + 10_CBF_{12,t}}{2} \right] + \sum_i \frac{30_CB_{i,1} - 10_CB_{i,1}}{i_t}^{10}$$

12
13 Gaz Metro in Quebec, had previously adopted a slightly modified version of the Ontario formula
14 to incorporate 50% of the change in utility bond spreads and 75% of the change in government
15 bond yields.¹¹ However, the formula has been suspended since 2012 and ROE has been
16 established through a cost of capital proceeding.

17 Southwest Gas – California is subject to a triennial cost of capital application, where an AAM is
18 employed for the interim years. The formula is tied to the variation of corporate bond yields,
19 based on each company's corporate credit rating. During the intervening years, when the
20 difference between the current 12-month October through September average utility bond rate
21 and their respective interest rate benchmark exceeds a trigger of 100 basis points, the utilities'
22 return on equity for the following calendar year is automatically adjusted by one-half the
23 difference between the current average utility bond rates and their benchmarks.¹²

24 *if (Moody's_Ut_Bnd_t – Moody's_UT_Bnd_{benchmark}) > 100 basis points, then*

25

26 $ROE_t = ROE_{t-1} + 0.50 \times (Moody's_Ut_Bnd_t - Moody's_UT_Bnd_{benchmark})$

27

⁹ Ibid at 3.

¹⁰ A Review of Automatic Adjustment Mechanisms for Cost of Capital, prepared for the Terasen Utilities (November 29, 2010) at 15.

¹¹ Concentric Energy Advisors, Inc., *A Review of Automatic Adjustment Mechanisms for Cost of Capital; Update and Recommendations*, prepared for the FortisBC Utilities (August 3, 2012) at 3.

¹² Ibid at 6.

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and

$$Moody's_{Ut_Bnd_{new\ benchmark}} = Moody's_{UT_Bnd_t}$$

Or

$$if (Moody's_{Ut_Bnd_t} - Moody's_{UT_Bnd_{benchmark}}) < 100 \text{ basis points, then}$$

$$ROE_t = ROE_{t-1}^{13}$$

Atmos Mississippi operates under a rate plan that utilizes a weighting of a series of ROE analyses, i.e. DCF, risk premium and CAPM, developed in accordance with prescribed parameters, to develop their adjustment mechanism. This methodology most closely emulates the evidence typically provided in a litigated rate process. In simple terms, a benchmark ROE is calculated each year based upon the prescribed methodologies and inputs. The benchmark ROE is further adjusted by a performance factor, to arrive at the annual performance-adjusted benchmark. If the resulting performance-adjusted benchmark ROE yields an authorized return that differs from the calculation of the expected return by greater than a specified deadband, revenues are either increased or decreased to make up for the shortfall or overage in expected returns. The authorized revenue increase for annual rate increases is subject to a 4% revenue cap. For some utilities, the revenue cap acts as a hard cap (or ceiling) and for others it may signal the need for an ROE proceeding (a trigger mechanism).¹⁴

¹³ A Review of Automatic Adjustment Mechanisms for Cost of Capital, prepared for the Terasen Utilities (November 29, 2010) at 19.

¹⁴ Ibid at 20-22.

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1 **55. Reference: Exhibit B-4, CEC 1.21.1 and 1.21.2**

21. **Reference: Exhibit B-1, Appendix B, Page 81**

Company	Credit Rating	Total Assets (billions)	Percent Regulated	Short-term Risks		Long-term Risks					Business Risk Determination in Relation to FEI
				Revenue Stabilization	Cost Recovery	Operating Risk	Supply and Infrastructure Risk	Price and Volatility Risk	Volume Demand Risk	Political and Regulatory Risk	
FEI	A3 or A-	\$6.9	100%	Excellent	Excellent	Good	Good	Fair	Challenging	Challenging	
Alamos Energy	A-	\$7.6	86%	Good	Excellent	Good	Excellent	Good	Good	Good	Lower Risk
New Jersey Resources	A	\$2.8	72%	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Lower Risk
Southeast Natural Gas Company	A+	\$3.1	89%	Excellent	Good	Good	Good	Excellent	Good	Excellent	Lower Risk
Piedmont Natural Gas Co.	A	\$3.6	87%	Good	Excellent	Good	Excellent	Excellent	Good	Excellent	Lower Risk
South Jersey Industries	BBB+	\$1.8	88%	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Comparable
Southeast Gas Corporation	A-	\$4.4	94%	Excellent	Excellent	Good	Excellent	Good	Challenging	Fair	Comparable
WGL Holdings Inc.	A+	\$4.1	88%	Excellent	Excellent	Excellent	Excellent	Good	Good	Good	Lower Risk
U.S. Peay Group Average	A/A-	\$9.2	88%	Excellent	Excellent	Excellent/Good	Excellent	Excellent/Good	Good	Good	Lower Risk

21.1 Please provide the time frame for 'short term risk' and 'long term risk' that is used in this table.

Response:

By 'Short-term' risks, Mr. Coyne is referring to the regulatory protection the company enjoys in minimizing the potential for loss or significant lag between the incurrence of costs and their ultimate recovery; or for losses due to weather or declines in customer use. We would expect all costs to be recovered within a year or two. Rankings relate to the measure of regulatory protection against losses and the minimization of regulatory lag.

21.2 Please confirm that the most significant long term risks facing FEI relate to Volume Demand Risk and Political and Regulatory risk.

55.1 In that FEI categorizes Operating Risk, Supply and Infrastructure Risk, Price Volatility Risk, Volume Demand Risk and Political Regulatory Risk as "Long Term Risk", are all these risks categorized for the impact they could have beyond 5 years? Please explain.

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1 **Response:**

2 The table presented in the preamble relates to Mr. Coyne's risk categories, not FEI's risk
3 categories. Long-term risk relates to the risk factors that impair the ability of shareholders to
4 fully recover their invested capital over time. These factors present risks today that investors
5 will consider in making investment decisions, but they are considered long term risks because
6 they are most likely to materialize after the passage of some time.

7 For instance, a major shift in a utility's service territory demographics (a factor in the operating
8 risk category as defined by Mr. Coyne) can have long-term impacts on energy consumption
9 patterns that go beyond five years. Similarly, the impacts of provincial and local governments'
10 policies and regulation are long-term and often tend to demonstrate impacts years after the
11 related policies and regulations are in place. Gas supply and price volatility risks are also long-
12 term. Any potential capacity constraint would increase volatility and natural gas prices. This can
13 be mitigated by pipeline expansion projects; however, these require several years to complete.
14 The volume demand risk can also be categorized as long-term. The impact of a decline in use
15 per customer, capture rates in multi-family dwellings, and loss of market share in water heating
16 and space heating applications, will have impacts well beyond a 5 year time frame as
17 consumers often use their equipment to the end of its useful life. All of these considerations
18 represent current risks for an investor making a long term investment, and the significance of
19 the risks for cost of capital will evolve over time as the prospects of realization evolve and the
20 magnitude of the risk becomes clearer.

21

22

23

24 55.2 When would FEI anticipate the effects of risk arising from Volume Demand Risk
25 to be any greater than the risk over the next five years?

26

27 **Response:**

28 FEI interprets this question as asking whether the volume/demand risk will be greater in the
29 period beyond the next five years than it will be within the next five years. The response to that
30 question is provided below.

31 As defined by Mr. Coyne, demand/volume risk relates to shifts in FEI's key indicators such as
32 use per customer (UPC), throughput, capture rates and market share in different sectors and
33 applications.

34 According to FEI's 2014 long-term resource plan (LTRP), over the next 20 years, FEI's
35 residential UPC will continue to decline at a relatively constant rate. This is accompanied by a
36 long-term declining trend in residential throughput (although as demonstrated in Figure C-6 of

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FEI's business risk Appendix, the rate of decline within the next five years is forecast to be greater than the period beyond the next five years).

FEI does not have any forecasts for capture rates or market share percentages as these are ordinarily calculated based on actual data and past performance. Nevertheless, FEI anticipates that its market share in space and water heating applications as well as its capture rate in multi-family dwellings will continue to be challenged both within and beyond the next five years. The impacts of provincial and local policies set in the last 5 years become more pronounced with time. For instance, side wall venting is no longer allowed in Vancouver for single family detached homes and it continues to be prohibited in new high rise condominiums. For detached homes there is an increase in cost to pipe to the rear of the house which may cause the home owner to select a different heating technology. In high rises it is not practical to vent all units vertically as the cost is too great. This results in very little gas in new high rises in Vancouver. The impact of this relatively new change in City of Vancouver building bylaws is already a hindrance to FEI's ability to attract new customers or retain existing customers, but as time goes by, more retrofit projects may be forced to transition from natural gas to electricity, increasing the impact of this change in building code over time.

As explained in the response to CEC IR 2.55.3, the new Climate Leadership Plan will be finalized in the spring of 2016. If the BC government decides to adopt the recommendations of the climate leadership team, FEI's volume/demand risk will become substantially higher than today.

As such, it is expected that with the passage of time, volume demand risk will continue with its upward trend, possibly with a steeper slope beyond the next five years than within the next five years.

55.3 When would FEI anticipate the effects of risk arising from political and regulatory risk to be any greater than the risk over the next five years?

Response:

FEI interprets this question as asking whether the political and regulatory risk will be greater in the period beyond the next five years than it will be within the next five years. The response to that question is provided below.

As explained in responses to BCUC IR 1.4.3 and BCUC IR 2.51.1, FEI may face a significant incremental (i.e. steeper) upward trend to its political risk category due to the recent developments related to the provincial government's Climate Leadership Plan. The BC

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government will release its final plan in the spring of 2016. Adoption of any of the recommendations provided by the climate leadership team to the BC government will increase the political risk, and demand risk, beyond the next five years. Further, FEI anticipates that municipal governments will ramp up their activities to implement their GHG emission reduction policies, introduce new initiatives that curb the use of fossil fuels and sanction renewable and/or alternative energy solutions (including expanding the areas served by district energy systems) in order to meet their 2020 emission reduction targets. As these municipalities implement and realize their objectives, the magnitude of these risks may directionally increase.

In addition, as explained on pages 71 and 72 of FEI's business risk, Appendix C, the area of Aboriginal law is evolving and has potential implications for anyone proposing activities that may impact asserted Aboriginal rights or title. The recent developments such as the SCC Decision in *Tsilhqot'in Nation V. British Columbia*, 2014 SCC 44, created some uncertainty through several passages. The intent of these passages will likely be the subject of future litigation and interpretation.

The regulatory risk is primarily caused by the regulatory uncertainty. The same uncertainty makes it impossible to say with certainty if the regulatory risk will be greater in the period beyond the next five years than it will be within the next five years. As explained in Section 10 of FEI's business risk, Appendix C, regulatory risk may increase over the term of the PBR due to the potential non-recovery of prudently incurred costs for exogenous events (due to the materiality threshold for Z-factor) and/or if the PBR formula cannot appropriately compensate FEI for its capital expenditures (for instance due to the 50 percent reduction in growth factors or the use of backward looking rate-setting elements in PBR formula). The regulatory framework after the current PBR period is not yet known.

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1 **56. Reference: Exhibit B-4, CEC 1.22.2 and CEC 1.22.3**

The following table shows the case and date of the last award for each company:

Company	Year and Case Where Award was Last Determined
FortisBC Energy Inc.	British Columbia Utilities Commission, Letter L-1-14, Return on Equity for the Benchmark Utility for the Year 2014, January 10, 2014
ATCO Gas	Alberta Utilities Commission, Decision 2191-D01-2015, 2013 Generic Cost of Capital, March 23, 2015
Enbridge Gas Distribution Inc.	Ontario Energy Board, Cost of Capital Parameter Updates for 2015 Cost of Service Applications, November 20, 2014
Union Gas	Ontario Energy Board, Decision and Rate Order, EB-2011-0210, January 17, 2013, at 23.
Gaz Metro	Regie de l'energie, Decision D-2015-076, R-3879-2014 Phase 3 Interlocutory Decision, May 26, 2015

2

Response:

The following table shows the awarded ROEs for each company for the last 10 years:

Authorized Rate of Return on Common Equity										
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fortis BC Energy Inc.	8.80	8.37	8.62	8.99	9.50	9.50	9.50	8.75	8.75	8.75
ATCO Gas	8.93	8.51	8.75	9.00	9.00	8.75	8.75	8.30	8.30	8.30
Enbridge Gas Distribution Inc.	8.74	8.39	8.39	8.39	8.39	8.39	8.39	8.93	9.36	9.30
Union Gas	9.63	8.54	8.54	8.54	8.54	8.54	8.54	8.93	8.93	8.93
Gaz Metro	8.95	8.73	9.05	8.76	9.20	9.09	8.90	8.90	8.90	8.90

Source: Data gathered by Concentric

3

4 56.1 What factors caused the Enbridge Gas Distribution Inc. ROE to decline from
5 2014 to 2015?

6

7 **Response:**

8 The OEB adjusts its parameters to its formula for ROE each year, previously twice per year (up
9 until May 2014). The formula-determined ROE declined from 9.36% in January 2014 to 9.30%
10 in January 2015.

11

12

13

14 56.2 Do any of the companies have automatic adjustment mechanisms?

15

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1 **Response:**

2 Yes.

3

4

5

6

56.2.1 If so, which companies have automatic adjustment mechanisms in
place?

7

8

9 **Response:**

10 FEI operates under the automatic adjustment mechanism approved by the BCUC in 2013.
11 However, because the 3.8% government bond yield floor has not been reached since its
12 adoption, the formula has not resulted in changes to allowed ROEs in BC. Enbridge is the only
13 other company from those listed in the table that currently operates under an automatic
14 adjustment mechanism for ROE. Mr. Coyne notes that Union Gas' ROE has been set
15 according to settlements in its multi-year rate plans; Alberta previously employed an AAM but its
16 use was suspended in 2009; and similarly, use of the formula for Gaz Metro's ROE has been
17 suspended in its most recent rate determinations before the Régie.

18

19

20

21

56.3 Please show the comparative use of deferral accounts for each of the companies
listed.

22

23

24 **Response:**

25 Mr. Coyne has provided an overview of major deferral and variance accounts for each of the
26 proxy group companies in the risk templates of his risk appendix, on pages from A-16 through
27 A-87, under the headings, "Gas Supply Risk Mitigation and Incentives", "Volume/Demand Risk
28 Mitigation", "Capital Cost Recovery Risk Mitigation", and "Other Significant Deferral and
29 Variance Accounts".

30

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1 **57. Reference: Exhibit B-4, CEC 1.30.2**

30.2 Please confirm that the reason low oil prices may hinder FEI's efforts to expand the NGT demand in its service territory is because oil competes with natural gas in the transportation sector on price.

Response:

The primary markets that FEI is targeting for natural gas use all use diesel fuel as the incumbent fuel today (i.e., mine haul trucks, on road trucks, marine vessels in the Emission Control Areas). Diesel prices and oil prices are strongly correlated, thus the reference to 'current low oil prices'.

2

3 57.1 Which other companies have NGT demand? Please quantify.

4

5 **Response:**

6 To FEI's knowledge, there are no other natural gas utilities in the Province of BC that currently
7 serve NGT demand.

8 Gaz Metro and Enbridge, the primary natural gas utilities in Quebec and Ontario respectively,
9 are the other two major regulated utilities in Canada that offer a similar NGT service as FEI's to
10 both light and heavy duty transportation applications.

11 Emterra, which is a refuse collection company, also has CNG operations in Manitoba.

12

13

14

15 57.2 Do other gas utilities face similar issues with their ability to expand their NGT
16 demand? Please explain.

17

18 **Response:**

19 The price of diesel, which is closely correlated with crude oil prices, is a variable that is
20 encountered by all companies that are supporting the growth in natural gas for transportation
21 applications. This would include natural gas engine manufacturers, fuel suppliers (i.e. natural
22 gas utilities), natural gas fueling station providers and other companies that are helping support
23 the NGT industry.

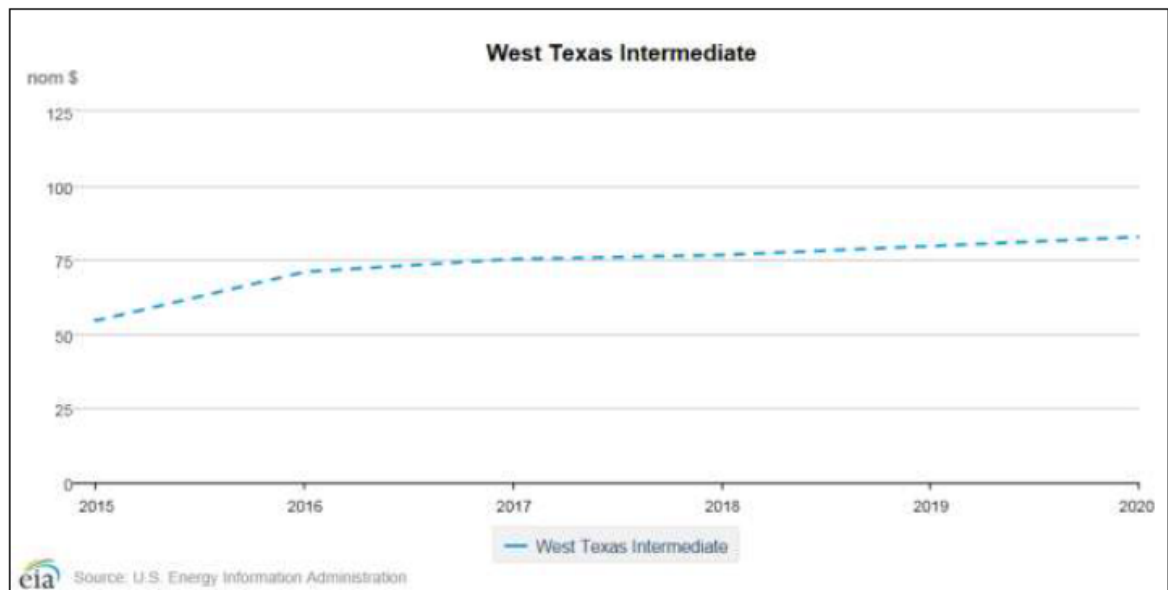
24

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1 **58. Reference: Exhibit B-4, CEC 1.30.3**

Response:

FEI does not produce its own oil price forecast but relies on third party forecasts. The following figure illustrates the West Texas Intermediate (WTI) crude oil price forecast from the U.S. Energy Information Administration (EIA)'s Annual Energy Outlook 2015 report⁹.



The following figure illustrates the WTI crude oil price forecast from GLJ Petroleum Consultants for the next five years.

2

3 58.1 Please confirm or otherwise explain that the average price of diesel relative to
4 the WTI is highest in Alberta and BC compared to the other Petroleum
5 Administration for Defense Districts (PADDs) in North America.

6

7 **Response:**

8 To clarify, PADDs in North America are limited to geographic regions in the United States of
9 America and are not applicable to regions in Canada. Further, due to different taxation
10 structures on fuel between Canada and the US and refining capacities of petroleum refineries in
11 the US and Canada, comparing fuel prices in BC and Alberta to all PADD regions does not
12 provide a meaningful comparison.

13 The PADD V region, which includes the states of Alaska, Washington, Oregon, California,
14 Hawaii, Nevada and Arizona, although not directly comparable, would provide the closest
15 comparator to BC and Alberta.

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Using Seattle, WA as a comparator region for PADD V, the current price of diesel in Seattle is approximately \$2.29 US per gallon. Using the current exchange rate of approximately 1.45 Cdn per 1 USD, this converts to \$0.88 Cdn per litre. This compares the current prices in Vancouver, BC of approximately \$1.06 Cdn per litre, and with Calgary of approximately \$0.80 Cdn per litre.

As the price of WTI crude oil is a single price that is applicable for all regions in the table, and since the price of diesel is highest in Vancouver of the three PADD regions discussed, then the relative price of diesel is higher in Vancouver but lower in Calgary.

58.2 Please provide the average price of diesel relative to the WTI for BC, Alberta, and PADDs I, II, III, IV and V.

Response:

The table below provides the average price of diesel for the requested regions. For each PADD region, FEI selected the largest city to provide a representative example of all regions. The price of WTI crude oil is a single price that is applicable for all regions in the table.

Region	Price (\$US per gallon)	Price (\$Cdn per litre) ¹⁵
PADD I (New York)	\$2.49	\$0.95
PADD II (Chicago)	\$2.09	\$0.80
PADD III (Houston)	\$1.79	\$0.69
PADD IV (Denver)	\$1.89	\$0.72
PADD V (Los Angeles)	\$2.29	\$0.88
BC (Vancouver)	N/A	\$1.06
Alberta (Calgary)	N/A	\$0.80

** Converted using an exchange rate of 1.45 Cdn per 1 USD and 3.785 litres per US gallon*

The price of WTI crude oil for the prompt month (February 2016) settled at \$29.42 US per barrel as of January 15, 2016, which is a price that is applicable to all the cities shown above.

¹⁵ Source: <http://www.gasbuddy.com/> was used for each identified region for consistency.

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FEI did not convert the WTI crude oil price from dollars per barrel to dollars per litre on a diesel equivalent basis as the conversion would need to be based on relative energy content between crude oil and diesel and this information is not readily available to FEI.

58.3 Please confirm that WTI is currently below \$35 US/bbl and that toward the end of the year in 2015 was similarly low and below \$40 US/bbl.

Response:

FEI can confirm that the prompt month WTI contract has traded below \$40 US/bbl since December 2015, and as of January 11, 2016, the prompt month contract (February 2016) has traded below \$35 US/bbl. However, there are futures contracts, beyond the prompt month contract, above \$35 US/bbl and \$40 US/bbl in 2016.

58.3.1 Please comment on the validity of the EIA forecast.

Response:

The EIA pricing forecast is prepared by the statistical and analytical agency within the US Department of Energy. It is generated using a market-based approach focusing on various factors including energy supply/demand fundamentals. It is widely used by analysts in the energy industries and planners in governmental and non-governmental organizations.

This EIA forecast was published in April 2015, when WTI was trading between \$50-\$60 US/bbl. The market has experienced significant volatility since the forecast and prices have decreased due to an oversupplied global market. Therefore, at the current time, the forecast is higher than the WTI futures curve representing the prices transacted in the marketplace. However, given the volatility and uncertainty of crude oil prices in the future, FEI cannot comment on whether or not the EIA forecast is valid compared to actual settled prices over the long run.

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1 **59. Reference: Exhibit B-4, CEC 1.30.5**

2 Please refer to the response to CEC IR 1.30.2 regarding the reference to the oil prices in the preamble. The advantages of natural gas in FEI's target transportation market (mine haul

trucks, on road trucks, marine vessels in the Emission Control zones) should be compared with its substitute fuel which is mainly diesel fuel. In addition to the relative annual fuel cost savings, natural gas can reduce the GHG emissions of the vehicles on a lifecycle basis by 15 to 25 percentage points compared to gasoline or diesel. Further, natural gas vehicles emit less noise on a decibel basis than comparable diesel trucks, hence generate less noise pollution.

Alternatively, where natural gas vehicles are at a disadvantage to diesel vehicles is the higher initial capital costs of natural gas vehicles compared to comparable diesel powered vehicles. Further, the fueling infrastructure is still in the nascent stages of development, which is required to provide fueling to fleets that operate along strategic transportation corridors. The build out of CNG and LNG fueling infrastructure is required to permit further penetration and adoption of natural gas vehicles.

A limitation regarding development of the NGT market is the availability of suitable OEM supplied NG engines for target applications. FEI's initial success in penetrating the heavy duty truck market was dependent on the availability of a 15 litre engine developed by Westport Innovations and made available through OEM offerings from Peterbilt and Kenworth. This engine was withdrawn from the market in late 2013 and no suitable replacement engine has been introduced. As a result, market penetration in the heavy duty truck segment has been limited.

59.1 Does FEI have plans to build out the CNG and LNG infrastructure?

Response:

Yes. As filed in FEI's Annual Review for 2016 Rates, Table B-9 of Appendix B provided the total number of fueling stations that FEI has constructed to date and forecasts for 2016. The table is provided below for reference.

Table B-9: Forecast Total FEI Fueling Stations

	2015A	2015P	2016F
CNG Stations	7	7	9
LNG Stations	5	5	5
Total	12	12	14

FEI forecasts to construct two (2) more CNG stations in 2016 in addition to the seven (7) it currently owns and operates. To date FEI owns and operates five (5) LNG stations.

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With regard to the timing of CNG / LNG infrastructure investment beyond 2016, the progress of development is uncertain and will depend on the pace of natural gas adoption by the transportation industry and the needs of customers for fueling infrastructure. FEI will be constrained by the types of expenditures, spending limits and program duration set out in the GGRR, which will expire on March 31, 2018; however, it will continue to look for ways to promote the adoption of NGT in local and regional markets.

59.1.1 If yes, please discuss and provide timelines for expected development.

Response:

Please refer to the response to CEC IR 2.59.1.

59.2 Could CNG and LNG be produced from RNG to reduce GHG emissions further? Please explain.

Response:

There are already tariff options that provide customers the ability to purchase RNG LNG and CNG. However, the RNG molecules are generally not directly compressed or liquefied. The RNG purchased by an NGT customer is called "notional" RNG as the sources of RNG production such as waste water treatment plants, landfills and farm waste operations are generally not convenient for the location of a CNG station or a small scale LNG facility. Also the quantities of RNG produced at a specific site are generally too small to develop a viable NGT facility.

In FEI's RNG program, the biomethane is injected into the pipeline grid and becomes commingled with the conventional natural gas moving through the system. Customers participate in the RNG program by electing to take a certain percentage of their gas as RNG rather than conventional natural gas. The RNG option is open to both CNG and LNG customers. For example, FEI's Rate Schedule 46 LNG Service tariff provides the option for customers to elect to receive a portion of their LNG from FEI's Biomethane program. For CNG customers, RNG is available under Rate Schedule 11B. When a customer elects to take a quantity of their gas as RNG they are displacing a GHG-emitting source of fuel with a carbon-neutral fuel. It is apparent for NGT customers that are displacing diesel fuel or gasoline with

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- 1 conventional natural gas or RNG, that the carbon neutral RNG will produce larger GHG
- 2 reductions than displacing these fuels with conventional natural gas.

3

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1 **60. Reference: Exhibit B-4, CEC 1.31.1; Exhibit B-4, CEC 1.31.2; Exhibit B-4, CEC**
2 **1.31.3**

FEI has used the following data sources to provide the requested throughput tables in CEC IRs 1.31.1 through 1.31.3.

- 2014 Approved throughput as provided in the Compliance Filing for BCUC Order G-106-15.
- 2015 Approved throughput as provided in the Compliance Filing for BCUC Order G-106-15.
- 2016 Approved throughput as provided in the Compliance Filing for BCUC Order G-193-15.
- 2017 Forecast throughput as provided in the data tables used to produce Figure 3-7 through Figure 3-9 in the 2014 Long-term Resource Plan Application.

Since the 2016 and 2017 Forecasts were prepared using different methodologies, they cannot be directly compared.

	2014	2015	2016	2017
FEI	Approved	Approved	Approved	Forecast
Residential (TJs)	74,029	73,068	72,466	72,485
Annual Change (TJs)		(961)	(602)	19

	2014	2015	2016	2017
FEI	Approved	Approved	Approved	Forecast
Commercial (TJs)	55,920	55,573	55,102	57,407
Annual Change (TJs)		(347)	(471)	2,305

	2014	2015	2016	2017
FEI	Approved	Approved	Approved	Forecast
Industrial (TJs)	87,001	80,797	78,091	70,456
Annual Change (TJs)		(6,204)	(2,706)	(7,635)

60.1 Please explain why FEI did not provide information using a consistent methodology so that the data can be properly compared.

Response:

Approved forecasts using the short term methodology exist for the years 2014 through 2016 as identified in the IR response and preamble to this question. However a short term methodology

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forecast for 2017, that will be used in FEI's Annual Review for 2017 Rates, will not be available until the fall of 2016. As a result, FEI could only use the most recent long term forecast for 2017 because the short term methodology forecast does not exist yet.

60.2 Is the difference in the methodologies such that FEI is actually anticipating continued decline in the throughput for residential and commercial customers through 2017 if a similar methodology was used throughout?

Response:

The information presented in the tables in the preamble indicate relatively flat throughput for residential customers, increasing throughput for commercial customers and a significant decline in industrial throughput in 2017, but due to the timing of when the forecasts were prepared and the differences in methodology, FEI cannot conclude that these scenarios will necessarily materialize. FEI is experiencing a continued decrease in use per customer for the residential class. Other factors are more difficult to predict, and without a detailed short-term forecast (as discussed in the response to CEC IR 2.60.1), FEI cannot speculate further on 2017.

60.2.1 If no, please indicate if FEI would likely see an increase or stable throughput in 2017 for each rate class if a consistent methodology were used.

Response:

Please refer to the response to CEC IR 2.60.2.

60.3 Would the forecast decline in Industrial throughput likely be even larger in 2017 if a consistent methodology were used? Please explain.

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1 **Response:**

2 The short term methodology for the industrial throughput will be determined from the Industrial
3 Survey to be run in the second quarter of 2016. Until those results have been gathered and
4 tabulated, FEI cannot comment on whether or not a decline will exist and, should a decline in
5 throughput exist, whether or not it will be larger or smaller than the amount provided in response
6 to CEC IR 1.31.3.

7

Attachment 48.3.3

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