Diane Roy
Director, Regulatory Affairs

FortisBC Energy
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 576-7349
Fax: (604) 576-7074
www.fortisbc.com

Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Dennis Swanson
Director, Regulatory Affairs

FortisBC Inc.
Suite 100 – 1975 Springfield Road
Kelowna, BC V1Y 7V7
Tel: (250) 717-0890
Fax: 1-866-335-6295
www.fortisbc.com

Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

March 10, 2014

Via Email

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: FortisBC Energy Inc. (FEI) and FortisBC Inc. (FBC) (collectively the Companies)

Applications for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Applications)

Supplemental Rebuttal Evidence of Dr. Edwin Overcast, Black & Veatch to the Evidence of Dr. Mark Lowry, on behalf of the Commercial Energy Consumers Association of British Columbia (CEC)

Further to the British Columbia Utilities Commission letter dated March 4, 2014 (FEI Exhibit A-31, FBC Exhibit A-36), the Companies respectfully submit the attached Supplemental Rebuttal Evidence of Dr. Edwin Overcast, Black & Veatch to the Evidence of Dr. Mark Lowry, on behalf of CEC.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC. and
FORTISBC INC.

Original signed by: Diane Roy

For: Diane Roy and Dennis Swanson

Attachment

cc (email only): Registered Parties

FortisBC Energy Inc. (FEI) and FortisBC Inc. (FBC) (collectively FortisBC or the Companies)
Applications for Approval of
Multi-Year Performance Based Ratemaking Plans for
2014 through 2018

Supplemental Rebuttal Testimony of
Dr. H. Edwin Overcast, Black & Veatch

to Evidence of
Dr. Mark Lowry (CEC)

March 10, 2014

Q1. Have you reviewed the responses prepared by PEG to BCUC-CEC IR 2.12.1 and BCSEA-CEC IR 2.16.1?

A1. Yes.

Q2. Please describe the results of your review of BCUC-CEC IR 2.12.1.

A2. PEG filed electric and gas multiple regression analyses that support the conclusion that marginal cost is less than average cost for total cost, O&M cost and capital cost for both gas and electric. This is not a remarkable filing as a properly conducted marginal cost analysis would demonstrate that this conclusion is true in nearly every case for both gas and electric utilities. It has certainly been true for all of the marginal cost studies I have conducted over the years. Nevertheless, there are issues with the analyses that should be discussed.

Q3. Please comment on the measures of the variables in the analysis.

A3. PEG continues to use its index concept as the basis for regression analysis. Every PEG index number is wrong as discussed in my rebuttal testimony. The division of costs by a price term that does not correspond to the basket of inputs actually used results in meaningless index numbers. There is also a fundamental problem with the claim that the variables are significant cost drivers for the utility. As I will show, this is an incorrect assumption and correlation does not imply causation although it would be a necessary but not sufficient condition. There are also technical issues with the regressions as I discuss below.

Q4. Please explain why the data in the regression is wrong for the regression.

A4. Essentially the data being used is the index value (cost divided by the price index equals the quantity index number). Since these numbers are not valid, as explained in my rebuttal, there is no reason to conclude that the regression results have any application if this case. The price index does not reflect the actual input mix of any utility and in fact is too high for the costs and results in too few input units. This is the upward bias for TFP discussed in my rebuttal. Further, as I noted in rebuttal, the inputs used in the analyses will not actually produce the measure of outputs but instead would produce far less output than the utility requires to serve its customers for both gas and electric utilities.

Q5. Please explain why the variables are not cost drivers.

A5. Econometric analysis is not based on just adding variables to a regression but rather on postulating a theoretical model of the variables that cause the costs. PEG has not done this critical initial step. A comprehensive and thorough theoretical model would demonstrate that the variables that cause costs for gas and electric utilities are the number of customers and measures of capacity. This would then lead to the rationale for each variable in the regression. PEG has not even discussed why some variables are used and they have assumed that cost

functions are continuous in order to take a second order estimate from the model. I have explained this issue and the reason cost functions are not continuous in my rebuttal evidence.

For those who prepare cost of service studies cost causation is critical to the allocation process. There are virtually no distribution or transmission costs allocated on energy, either kWhs or GJs. For a gas utility the cost drivers are customers and design day capacity and for some local customer facilities the customer Non-Coincident Peak (NCP) (typically where the customer is a non-firm customer). For the electric utility, transmission plant is a function of installed capacity for plant laterals and some measure of coincident peak for the bulk system. For the distribution system the costs are a function of the number of customers, an NCP measure and the individual customer's NCP. Each of these variables is grounded in the planning, construction and operation of the utility.

No costs other than production costs vary with kWhs or GJs and there are sound reasons not to use a throughput measure in any study of distribution or transmission TFP. I have discussed those reasons in my rebuttal testimony, TFP reports and criticism of other studies. I will not repeat that discussion here. Suffice it to say that if costs varied with these factors (and they do not) regulators would adjust these costs in rate cases as part of the weather normalization process. They do not. Further, I have analyzed the role of throughput in detail in cost of service testimony and no regulator has concluded that volumetric measures drive the costs. It is my understanding that the same is true for the BCUC.

Q6. What does it mean when the PEG regression results find that the independent variable throughput is significant in the regression analysis?

A6. It actually means nothing in terms of cost causation since it has no theoretical foundation. It is likely that the correlation using cross section data is a measure of the size of the utility. It is not even an issue that larger utilities will have more volume than smaller utilities (with some notable exceptions) and hence require more inputs. Again, this is not a remarkable conclusion and it provides no value related to the determination of TFP that would not be reflected in a properly constructed output index of customers and capacity.

Q7. Please explain your comments related to notable exceptions related to gas or electric utility volumes for smaller utilities.

A7. There are always exceptions related to the volume of throughput that depend on customer mix that have smaller utilities in terms of customer count having larger throughput that equals much larger utilities but have minimal inputs to serve larger loads. For example, a small utility may serve a very large load or several very large loads just outside the city gate for a gas utility. This might be a load such as a refinery or a fertilizer plant that use millions of GJs each month resulting in a very large gas throughput but in very little costs. The same may be true for electric utilities that serve large customers such as aluminum plants, steel mills or plastic extrusion plants. These types of utility customers may operate at very high load factors and may not even

use the distribution system at all because they are served at high voltages off the transmission system. PEG has such utilities in its sample. In measuring distribution capital for both electric and gas utilities, the inclusion of this type of throughput measure will greatly increase the TFP of distribution simply because there are no costs for distribution associated with the output served at transmission. This is not an issue when the capacity variable reflects both distribution and transmission.

Q8. Please provide any observations you have on the regression results.

A8. I would note that PEG includes variables that have T-statistics[1] that are so low that the hypothesis that the variable is not significantly different from zero cannot be rejected. That means that the variable explains nothing in the regression. Removing those observations from the regression analysis would result in a lower R-square[2]. Consider the power distributor CAPEX model where T-statistics for 5 variables in the model are below one. For the gas total cost model three variables have T-statistics that would not allow us to reject the hypothesis that the variables are not different from zero.

Q9. Please discuss the choice of variables in the model.

A9. PEG has chosen variables that are not comprehensive in scope for driving costs, without any explanation for either included or omitted variables. For example, the gas analysis includes bare steel main and cast iron main, both of which require replacement. However, they chose not to include coated steel main or potentially defective plastic pipe that need to be replaced as well. At least one utility in the PEG sample is dealing with replacing defective plastic pipe with significant CAPEX implications. In the total cost model for gas, PEG includes the variable total electric customers without any explanation. Intuitively the number of electric customers could mean anything. It might be gas fired power plants or it might be the same as the number of gas customers since presumably all gas customers have electricity. Neither option is satisfactory for understanding the issue of total cost for gas distribution. This is particularly true for power generators that are likely served off transmission main. It is also an incomplete variable since the level of use varies for peaking, cycling or baseload generation.

It is also unclear how the number of gas customers impacts the CAPEX for electric utilities. This is particularly the case where electric utilities are summer peaking since gas homes with air conditioning look just like any other customer with air conditioning and only a larger saturation of electric heating (an unlikely event except for customers in warmer climates) would have an impact on the distribution system costs. Thus we would expect that if this is the consideration that other alternate fuels such as oil and propane customers would also impact CAPEX.

[1] After an estimation of a coefficient, the t-statistic for that coefficient is the ratio of the coefficient to its standard error. That can be tested against a t distribution to determine how probable it is that the true value of the coefficient is really zero.

[2] The portion of the change in the dependent variable explained by the independent variables.

The vintage of pipe after 1940 is another puzzling variable because we know that all pipes from 1940 to about 1961 are either steel or cast iron. Plastic pipe begin to be installed in the early 1960s but did not command significant shares until the late 1970s. In 1971, safety regulations were adopted that required steel pipe to be both coated and cathodically protected. This has an impact both on CAPEX and O&M expense not even considered in the PEG model.

Q10. Do you have any comments on the response to BCSEA-CEC IR 2.16.1.?

A10. Yes. I do not think that PEG's comments related to shortcomings do in fact constitute shortcomings. All parties have experience with these calculations and they have been successful in prior PBRs. The concern about weather is a red herring since the only costs related to weather variance are pass-through items. Finally, using a single factor for both O&M and Capital assures that incentives are balanced.

Q11. Does this complete your testimony?

A11. Yes.