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March 3, 2014

**Via Email**  
**Original via Mail**

British Columbia Utilities Commission  
6<sup>th</sup> Floor, 900 Howe Street  
Vancouver, BC V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

**Re: FortisBC Energy Inc. (FEI) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)**  
**Energy Efficiency and Conservation (EEC) Evidentiary Amendment –**  
**Modified Total Resource Cost (MTRC) Results for Low-Income EEC Programs**

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Through internal investigation and discussions with Government with respect to interpretation of the Demand Side Measure Regulation<sup>1</sup> (DSM Regulation), the FEU have determined that its cost-effectiveness analysis of Low Income Programs under section 4 of the DSM Regulation was incorrect as presented in the FEU's 2014-2018 EEC Plan filed in the Application.<sup>2</sup> The purpose of this amendment is to correct the cost-benefit treatment of the Low Income Programs, and show the impact that this correction has on the FEU's 2014-2018 EEC Plan and the FEU's responses to information requests. The sole impact of this change is that the cost-effectiveness test result of the Energy Conservation Assistance Program (ECAP), and thus the combined TRC/MTRC of the EEC portfolio as a whole, are both higher than previously presented. This amendment does not change the FEU's proposed EEC expenditure levels or any other aspect of the Application. The remainder of this update:

- Explains how the correct interpretation of the DSM Regulation differs from the interpretation the FEU used to prepare the 2014-2018 EEC Plan originally,

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<sup>1</sup> B.C. Reg. 326/2008, as amended.

<sup>2</sup> Exhibit B-1, Appendix I.

- Applies the correct interpretation of the DSM Reg, and
- Presents the corrected information for each of the impacted references in FEU submissions filed within the FEI 2014-2018 PBR proceeding.

In the 2014-2018 EEC Plan, the FEU calculated the Total Resource Cost Test (TRC) of the Low Income Programs with the benefit of the 30% adder required in section 4(2)(b) of the DSM Regulation. However, the FEU incorrectly did not apply the modified TRC (MTRC) test as set out in section 4(1.1)(a) and (b) of the DSM Regulation to the Low Income Programs. As explained below, under the DSM Regulation Low Income Programs are eligible for the MTRC.

Section 4(2) of the DSM Regulation states that in determining whether a Low Income Program<sup>3</sup> is cost-effective, the Commission must use the TRC. Section 4(1.1) of the DSM Regulation, in turn, specifies how the Commission is to apply the TRC. Accordingly, pursuant to Section 4(1.1)(a) of the DSM Regulation, the total resource cost effectiveness of a Low Income Program that does not pass the TRC when using the 30% benefit adder, can be determined by using the long-run marginal cost of acquiring electricity generated from clean or renewable resources, multiplied by 0.5 (known as “the Zero Emission Energy Alternative”, or “ZEEA”). Further, pursuant to DSM Regulation section 4(2)(b), low income programs are also to consider the benefit of the demand side measure to be 130% of the value that would normally be recognized in a non-low income program. In summary, section 4(2) and 4(1.1) read together indicate that Low Income Programs are eligible for the MTRC treatment utilizing the 30% benefit adder for low income programs instead of the 15% adder that is used when applying the MTRC to non-Low Income programs. The FEU recognize that use of the MTRC remains limited to 33% of the EEC portfolio, including Low Income Programs.

Table 1 below provides a summary of the aspects of the 2014-2018 EEC Plan and information requests that are impacted by the Amendment.

**Table 1: Areas impacted by Amendment**

<b>Item to be Modified</b>	<b>Original statements/sentiments</b>	<b>Revision/Impact</b>
EEC Plan: Exhibit 2 - Results for the Total EEC Program Portfolio	Exhibit 2 displayed Benefit/Cost Ratios for the portfolio using the TRC test for ECAP	The TRC for the portfolio is now slightly higher. See Appendix A for revised EEC Plan Exhibit 2.
EEC Plan: Exhibit 3 - A Summary of the Expenditures for Programs that Require the MTRC Adder.	Exhibit 3 displayed a summary of expenditures for programs that require the MTRC treatment.	The ECAP program should be included in the programs that require the MTRC treatment. Even after including ECAP the MTRC expenditures are below 1/3 of entire portfolio expenditures. See Appendix A for revised EEC Plan Exhibit 3.

<sup>3</sup> Referred to in the DSM Regulation as “a demand-side measure referred to in section 3 (a)”.

Item to be Modified	Original statements/sentiments	Revision/Impact
EEC Plan: Exhibit 5 - Gas Savings and Cost-Effectiveness Results for Each of the Program Areas and the Total EEC Portfolio.	Exhibit 5 displayed the cost-effectiveness results for each of the program areas and the portfolio.	The Low Income program area TRC and the portfolio TRC are now slightly higher. See Appendix A for revised EEC Plan Exhibit 5.
EEC Plan: Exhibit 14 - Summary of Savings and Cost Effectiveness Results for the Low Income Sector Program Portfolio	Exhibit 14 displayed the cost-effectiveness results for the Low Income Programs.	The ECAP Low Income program should display an MTRC result which will improve the Low Income Portfolio TRC result. See Appendix A for revised EEC Plan Exhibit 14.
BCUC IR 1.207.1	FEU's response to this IR stated a "combined Portfolio TRC/MTRC ratio of 1.30"	The combined portfolio TRC/MTRC is now 1.35.
BCUC IR 1.217.4	FEU's response to this IR identified ECAP as a program that does not pass TRC/MTRC.	This response now shows that ECAP does pass MTRC.
BCUC IR 1.218.3.1.1	FEU's response to this IR illustrated the impacts of changes to BC Hydro's LRMC on the MTRC programs.	This response now shows impacts of changes to BC Hydro's LRMC on the MTRC programs including ECAP.
BCUC IR 1.219.6	FEU's response to this IR included a table listing TRC and MTRC for all FEU EEC 2014-2018 programs.	This response now shows an updated table showing the MTRC for all Low Income programs.
BCUC IR 1.219.7	FEU's response to this IR stated a TRC of 0.43 for ECAP.	FEU's response to this IR now states an MTRC of 1.06
BCUC IR 1.229.2	FEU's response to this IR stated that Low Income programs use the TRC with a 30% bonus applied to the benefits.	FEU's revised response adds that Low Income programs use the TRC, or MTRC, with a 30% bonus applied to the benefits.
BCUC IR 1.239.1	FEU's response to this IR displayed on TRC results for Low Income Programs.	FEU's revised response shows both the TRC and the MTRC for the ECAP program.
BCUC IR 2.366.6	FEU's response to this IR stated the percentage of the portfolio that qualifies as cost-effective using the MTRC is 24% over the plan period.	The percentage of the portfolio that qualifies as cost-effective using the MTRC is now 30% over the plan period.

Item to be Modified	Original statements/sentiments	Revision/Impact
BCUC IR 2.367.3.1	FEU's response to this IR displayed "n/a" for the MTRC for ECAP in "Table 1: Revised Benefit Cost Test Results for Programs with Original UCT<1.0"	Revised IR response displays 1.06 for ECAP MTRC.
BCUC IR 2.370.1.1	FEU's response to this IR stated the programs that would be affected by applying \$100/MWh and \$80/MWh as an input in to the ZEEA and what the impacts on budget would be.	FEU's revised response shows that ECAP is an additional program that would fail the MTRC if ZEEA was lowered.
BCUC IR 2.374.4.1	In response to this IR, FEU incorrectly stated that the MTRC does not apply to low income program cost effectiveness analysis	The revised response applies MTRC.
BCUC IR 2.384.11.3	FEU's response to this IR did not include MTRC results for Low Income programs.	The revised response includes MTRC results for Low Income programs.
BCSEA IR 1.1.1	This IR requested the full working copy of the model used to produce the FEU EEC 2014-2018 Plan.	The revised working copy of the model will be filed as Amended Confidential Attachment 1.1.

Accompanying this amendment are the following attachments containing the blacklined pages which required revision.

Attachment	Exhibit No.	Description
A	B-1-1 Appendix I, Attachment I-1	FEU's 2014-2018 EEC Plan revised to show the MTRC results for ECAP and the modified combined TRC/MTRC results for the portfolio as a whole.
B	B-7	BCSEA IR1 revisions including a confidential filing of the working files related to this request.
C	B-11	BCUC IR1 revisions
D	B-24	BCUC IR2 revisions

Within the updates provided throughout the attachments, all data that has been amended as a result of correcting the Application of the MTRC to the ECAP program has been highlighted in yellow. It should be noted that cost effectiveness results provided in this amendment include the use of the updated discount rate noted in the FEU's response to BCUC IRs 1.218.6 and 1.220.2. In these two IR responses, the FEU acknowledged that there was a slight error in the discount rate used to conduct the cost effectiveness analysis for programs in the 2014-2018 EEC Plan, and provided the correct discount rate. The FEU reran the cost effectiveness calculations using the correct discount rate at that time and determined that the

impact of the error was negligible, causing a very slight improvement to the cost effectiveness, and did not require an evidentiary update. Slight differences between the results provided in this amendment and the original 2014-2018 EEC Plan as a result of correcting the discount rate have not been highlighted.

If further information is required, please contact the undersigned.

Sincerely,

**FORTISBC ENERGY INC.**

***Original signed:***

Diane Roy

Attachments

cc (email only): Registered Parties

**Attachment A**

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**Exhibit 2 - Results for the Total EEC Program Portfolio<sup>3</sup>**

Indicator		Service Territory		Total
		FEI	FEVI	
Utility Expenditures, Incentives (\$1000s)	2014	17,212	2,331	<b>19,543</b>
	2015	18,539	2,547	<b>21,086</b>
	2016	18,383	2,638	<b>21,020</b>
	2017	17,898	2,557	<b>20,455</b>
	2018	18,062	2,494	<b>20,556</b>
	<b>Total</b>	<b>90,093</b>	<b>12,567</b>	<b>102,660</b>
Utility Expenditures, Non-Incentives (\$1000s)	2014	13,294	1,516	<b>14,810</b>
	2015	13,915	1,537	<b>15,452</b>
	2016	13,351	1,468	<b>14,818</b>
	2017	13,410	1,523	<b>14,933</b>
	2018	13,806	1,512	<b>15,318</b>
	<b>Total</b>	<b>67,774</b>	<b>7,556</b>	<b>75,331</b>
Utility Expenditures, Total (\$1000s)	2014	30,505	3,848	<b>34,353</b>
	2015	32,453	4,084	<b>36,537</b>
	2016	31,733	4,105	<b>35,839</b>
	2017	31,308	4,080	<b>35,388</b>
	2018	31,868	4,006	<b>35,874</b>
	<b>Total</b>	<b>157,867</b>	<b>20,124</b>	<b>177,991</b>
Annual Gas Savings, Net (GJ/yr.)	2014	637,255	66,693	<b>703,948</b>
	2015	1,255,547	136,195	<b>1,391,743</b>
	2016	1,733,589	204,155	<b>1,937,743</b>
	2017	2,265,196	270,295	<b>2,535,491</b>
	2018	2,787,418	336,344	<b>3,123,762</b>
	<b>NPV of Gas Savings, Net (GJ)</b>	<b>21,247,479</b>	<b>2,798,187</b>	<b>24,045,666</b>
Benefit/Cost Ratios	TRC	0.94	1.04	<b>0.95</b>
	Portfolio*	<b>1.36</b>	<b>1.31</b>	<b>1.35</b>
	Utility	1.32	1.39	<b>1.33</b>
	Participant	2.15	3.74	<b>2.33</b>
	RIM	0.52	0.36	<b>0.49</b>

\* Includes the MTRC adder for programs that require it (i.e. TRC/MTRC hybrid)

<sup>3</sup> Inflation is not included in the expenditures noted in this exhibit or in those included in any other exhibits from this point forward. Rather, all expenditures other than those in Exhibit 1 are presented in 2014 dollars.

**Exhibit 3 - A Summary of the Expenditures for Programs that Require the MTRC Adder**

Program and Service Territory	All Spending					
	2014	2015	2016	2017	2018	Total
<b>* Furnace Replacement Program (Residential)</b>						
FEI	3,053	3,040	3,040	3,040	3,030	15,202
FEVI	302	301	301	301	300	1,503
<b>Total</b>	<b>3,355</b>	<b>3,340</b>	<b>3,340</b>	<b>3,340</b>	<b>3,330</b>	<b>16,705</b>
<b>* ENERGY STAR® Water Heater Program (Residential)</b>						
FEI	998	1,340	1,105	1,019	1,249	5,711
FEVI	99	133	109	101	124	565
<b>Total</b>	<b>1,096</b>	<b>1,472</b>	<b>1,215</b>	<b>1,120</b>	<b>1,372</b>	<b>6,275</b>
<b>* New Home Program (Residential)</b>						
FEI	943	943	943	714	714	4,256
FEVI	93	93	93	71	71	421
<b>Total</b>	<b>1,036</b>	<b>1,036</b>	<b>1,036</b>	<b>784</b>	<b>784</b>	<b>4,677</b>
<b>* New Technologies Program (Residential)</b>						
FEI	239	262	282	305	329	1,416
FEVI	24	26	28	30	32	140
<b>Total</b>	<b>262</b>	<b>287</b>	<b>310</b>	<b>335</b>	<b>361</b>	<b>1,556</b>
<b>* Customer Engagement Tool for Conservation Behaviours (Residential)</b>						
FEI	520	635	763	905	1,161	3,984
FEVI	58	71	85	101	129	444
<b>Total</b>	<b>578</b>	<b>706</b>	<b>848</b>	<b>1,006</b>	<b>1,290</b>	<b>4,428</b>
<b>* Continuous Optimization Program (Commercial)</b>						
FEI	2,655	2,085	1,645	1,322	1,081	8,789
FEVI	124	100	80	66	56	426
<b>Total</b>	<b>2,779</b>	<b>2,185</b>	<b>1,724</b>	<b>1,389</b>	<b>1,137</b>	<b>9,214</b>
<b>* Energy Conservation Assistance Program (Low Income)</b>						
FEI	1,507	1,659	1,829	2,010	2,210	9,216
FEVI	167	184	203	223	246	1,024
<b>Total</b>	<b>1,675</b>	<b>1,844</b>	<b>2,033</b>	<b>2,234</b>	<b>2,456</b>	<b>10,240</b>
<b>ALL MTRC PROGRAMS</b>						
FEI	9,915	9,963	9,607	9,315	9,774	48,574
FEVI	867	908	899	893	957	4,523
<b>Total</b>	<b>10,781</b>	<b>10,871</b>	<b>10,506</b>	<b>10,208</b>	<b>10,731</b>	<b>53,097</b>
<b>ENTIRE PORTFOLIO</b>						
FEI	30,505	32,453	31,733	31,308	31,868	157,867
FEVI	3,848	4,084	4,105	4,080	4,006	20,124
<b>Total</b>	<b>34,353</b>	<b>36,537</b>	<b>35,839</b>	<b>35,388</b>	<b>35,874</b>	<b>177,991</b>
<b>MTRC VS. PORTFOLIO (%)</b>						
FEI	33%	31%	30%	30%	31%	31%
FEVI	23%	22%	22%	22%	24%	22%
<b>Total</b>	<b>31%</b>	<b>30%</b>	<b>29%</b>	<b>29%</b>	<b>30%</b>	<b>30%</b>

\* Program requires the MTRC in order to pass the economic screen

**Exhibit 5 - Gas Savings and Cost-Effectiveness Results for Each of the Program Areas and the Total EEC Portfolio**

Program Area and Service Territory	Annual Gas Savings, Net (GJ/yr.)					NPV Gas Savings, Net (GJ)	Benefit/Cost Ratios				
	2014	2015	2016	2017	2018		TRC	Portfolio*	Utility	Participant	RIM
Residential											
FEI	170,789	297,895	421,760	545,011	687,510	5,832,253	0.72	N/A	1.18	1.75	0.44
FEVI	19,465	33,895	47,914	61,335	76,726	640,262	0.77	N/A	1.16	2.85	0.31
Total	190,255	331,790	469,674	606,346	764,236	6,472,515	0.73	N/A	1.18	1.86	0.43
Commercial											
FEI	335,875	610,092	769,587	976,340	1,130,560	8,172,914	1.05	N/A	1.72	1.93	0.59
FEVI	31,919	62,488	96,253	127,165	156,203	1,407,656	1.20	N/A	1.75	3.63	0.38
Total	367,794	672,580	865,840	1,103,505	1,286,763	9,580,570	1.07	N/A	1.72	2.18	0.56
Industrial											
FEI	99,531	228,686	381,217	553,712	725,455	4,988,404	3.07	N/A	4.14	4.49	0.81
FEVI	10,134	23,327	38,969	56,774	74,496	509,169	3.10	N/A	4.21	7.65	0.49
Total	109,664	252,013	420,186	610,486	799,951	5,497,573	3.08	N/A	4.15	4.78	0.78
Low Income											
FEI	22,170	45,000	68,715	92,574	116,921	971,552	0.94	N/A	0.72	2.76	0.38
FEVI	4,188	8,277	12,308	16,218	20,062	147,912	1.14	N/A	0.86	5.27	0.29
Total	26,357	53,277	81,024	108,792	136,982	1,119,464	0.96	N/A	0.73	3.06	0.37
Conservation Education and Outreach											
FEI	0	0	0	0	0	0	0.00	N/A	0.00	N/A	0.00
FEVI	0	0	0	0	0	0	0.00	N/A	0.00	N/A	0.00
Total	0	0	0	0	0	0	0.00	N/A	0.00	N/A	0.00
Innovative Technologies											
FEI	8,891	73,874	92,309	97,560	126,973	1,282,356	1.75	N/A	2.29	4.24	0.65
FEVI	988	8,208	8,710	8,802	8,857	93,189	1.81	N/A	2.34	7.71	0.40
Total	9,878	82,082	101,019	106,362	135,830	1,375,544	1.75	N/A	2.29	4.45	0.64
Enabling Activities											
FEI	No Direct Savings						No Direct Savings				
FEVI											
Total											
ALL PROGRAMS											
FEI	637,255	1,255,547	1,733,589	2,265,196	2,787,418	21,247,479	0.94	1.36	1.32	2.15	0.52
FEVI	66,693	136,195	204,155	270,295	336,344	2,798,187	1.04	1.31	1.39	3.74	0.36
Total	703,948	1,391,743	1,937,743	2,535,491	3,123,762	24,045,666	0.95	1.35	1.33	2.33	0.49

\* Includes the MTRC adder for programs that require it (i.e. TRC/MTRC hybrid)

### Exhibit 14 - Summary of Savings and Cost Effectiveness Results for the Low Income Sector Program Portfolio

Program and Service Territory	Annual Gas Savings, Net (GJ/yr.)					NPV Gas Savings, Net (GJ)	Benefit/Cost Ratios				
	2014	2015	2016	2017	2018		TRC	MTRC	Utility	Participant	RIM
Energy Savings Kit											
FEI	7,760	14,745	21,030	26,695	31,817	185,517	5.20	N/A	3.37	12.46	0.58
FEVI	2,587	4,915	7,010	8,898	10,606	61,475	5.90	N/A	3.73	20.08	0.37
Total	10,347	19,659	28,040	35,594	42,423	246,991	5.37	N/A	3.46	14.37	0.53
Energy Conservation Assistance Program											
FEI	6,195	13,007	20,499	28,744	37,814	304,133	0.43	1.06	0.33	1.82	0.22
FEVI	688	1,445	2,278	3,194	4,202	33,497	0.43	1.06	0.32	2.37	0.18
Total	6,883	14,452	22,776	31,937	42,016	337,630	0.43	1.06	0.33	1.88	0.22
REnEW											
FEI	0	0	0	0	0	0	0.00	N/A	0.00	N/A	0.00
FEVI	0	0	0	0	0	0	0.00	N/A	0.00	N/A	0.00
Total	0	0	0	0	0	0	0.00	N/A	0.00	N/A	0.00
Low Income Space Heat Top-Ups											
FEI	2,102	4,414	6,958	8,994	10,622	111,446	2.99	N/A	3.18	3.62	0.71
FEVI	234	490	773	999	1,180	12,245	2.96	N/A	3.14	6.19	0.42
Total	2,335	4,905	7,732	9,993	11,802	123,691	2.99	N/A	3.17	3.88	0.68
Low Income Water Heating Top-Ups											
FEI	614	1,290	2,033	2,628	3,103	24,121	1.42	N/A	3.35	1.62	0.71
FEVI	68	143	226	292	345	2,659	1.41	N/A	3.32	2.79	0.42
Total	682	1,433	2,259	2,920	3,448	26,780	1.42	N/A	3.34	1.73	0.68
Non-Profit Custom Program											
FEI	5,499	11,545	18,195	25,513	33,564	346,335	2.79	N/A	2.07	4.43	0.64
FEVI	611	1,283	2,022	2,835	3,729	38,037	2.76	N/A	2.05	7.40	0.40
Total	6,110	12,828	20,217	28,348	37,294	384,372	2.79	N/A	2.07	4.72	0.61
Non-Program Specific Expenses											
FEI	No Direct Savings						No Direct Savings				
FEVI											
Total											
ALL PROGRAMS											
FEI	22,170	45,000	68,715	92,574	116,921	971,552	0.94	N/A	0.72	2.76	0.38
FEVI	4,188	8,277	12,308	16,218	20,062	147,912	1.14	N/A	0.86	5.27	0.29
Total	26,357	53,277	81,024	108,792	136,982	1,119,464	0.96	N/A	0.73	3.06	0.37

**Note:** Whistler (FEW) is included in the FEI service territory

**Attachment B**

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to B.C. Sustainable Energy Association and Sierra Club of British Columbia (BCSEA) Information Request (IR) No. 1	Page 1

**1.0 Topic: Demand side management**

**Reference: Exhibit B-1-1, Appendix I, FortisBC Energy Efficiency and Conservation & Demand Side Management, May 2013; Attachment I-1, FEU EEC 2014-2018 Plan, Program Description and Cost-Effectiveness Results, Final Report, ICF Marbek, May 2, 2013; Section 3.3, Overview of Results, Exhibit 7: Summary of Savings and Cost-Effectiveness Results for the Residential Sector Program Portfolio, p. 15 (pdf p.1138 of 1444)**

1.1 Please provide functioning Excel spreadsheet files containing all details of the cost-effectiveness analysis reported, including inputs, computations, and intermediate outputs that to allow anyone to trace, test, and replicate the calculations under assumed and alternative input variables. The response should include cost-effectiveness analysis done for the individual measures or measure packages per program participant as well as that done at the program level.

**Response:**

Please refer to Confidential Attachment 1.1 for the full working model used to produce the FEU EEC 2014-2018 Plan.

Confidential Attachment 1.1 has been updated in accordance with the details provided in the cover letter to include the MTRC for Low Income programs.

There are 8 other files included with the model package (labeled "Program Files..."). Users do not need to open these files as they will be accessed directly by the Cost Effectiveness Tool, provided they are saved together in one central location.

Note that the FEU are providing these fully functioning spreadsheets/models confidentially due to the considerable time, effort and expense of both internal resources and external contract resources which have been invested in the development of these spreadsheets/models on behalf of all rate-paying customers. The models were developed for the FEU and are proprietary to the Companies on behalf of all customers. The Companies are concerned that public disclosure and availability could allow others to use or adapt these spreadsheets/models freely, and at the expense of the FEU's customers.

Please follow these steps in order to open and view the full working model:

1. Save all files in one central location.
2. Open the file named "Cost effective Tool, Current.xlsm".
3. Enter the user name "MARBEC" and the password "MARBEC" to log in.
4. Select the Active Program Database named "Cost Effectiveness Tool, Database, Current.xlsm"
5. Click "done".

## **Amended Attachment 1.1**

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### **REFER TO LIVE SPREADSHEET MODELS**

Provided in electronic format only

**FILED CONFIDENTIALLY**

(accessible by opening the Attachments Tab in Adobe)

**Attachment C**

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 516

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2 As can be seen on page 6 of Exhibit B-1-1, Appendix I, Attachment I1, the proposed portfolio  
3 has a combined Portfolio TRC/MTRC ratio of 1.35, and a Utility Cost Test ratio of 1.33. As is  
4 the case with all DSM activity, perspectives on participants and non-participants in the FEU's  
5 EEC initiative are provided by the Participant Cost Test and Ratepayer Impact Measure  
6 respectively. For the portfolio of activity proposed for the test period, the Participant Cost Test  
7 ratio is 2.33 and the Ratepayer Impact Measure ratio is 0.49. This indicates generally that  
8 participants will see a net benefit from EEC activity, while non-participants will see a net  
9 increase in utility bills. The DSM Regulation states the following: "The commission may not  
10 determine that a proposed demand-side measure is not cost effective on the basis of the result  
11 obtained by using a ratepayer impact measure test to assess the demand-side measure." Thus,  
12 based upon the guidelines established by Regulation for British Columbia, the proposed  
13 portfolio of activity is cost-effective.

14 With respect to the quote from the Application in the preamble to the IR, please refer to the  
15 response to COPE IR 1.8.2.

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20 207.1.1 Does FEU consider it would be reasonable or not reasonable to  
21 place limits on the amount of EEC activities FEU undertakes which  
22 both decreases emissions and decreases total customer bills,  
23 provided that FEU strives to provide equitable access to EEC  
24 programs for all its customer classes? Please explain why/why  
25 not.  
26

27 **Response:**

28 The portfolio of EEC activity proposed for the test period decreases emissions in British  
29 Columbia and as such, is consistent with BC's Energy Objectives, as detailed in Section 2.2 of  
30 Exhibit B-1-1, Appendix I. A discussion of the genesis of the proposed overall expenditure level  
31 can be found in the response to BCUC IR 1.224.1. The approach taken by the Companies in  
32 requesting funding approval places an annual limit on EEC expenditures. The portfolio of  
33 activity that is the subject of this proceeding is cost-effective as defined by British Columbia's  
34 Demand Side Management Regulation, both decreases emissions and at a portfolio level, has a  
35 positive Utility Cost Test result, and provides equitable access to EEC programs for all customer  
36 classes.  
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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 582

1 **Response:**

2 This response addresses both this IR and BCUC IR 1.217.4.1.

3 Aside from programs where identifying annual gas savings is too difficult, there are no programs  
4 which the FEU has been unable to demonstrate will pass the TRC/mTRC.

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7 217.4.1 For programs identified above, please provide an explanation as to  
8 why FEU considers that undertaking this measure should provide a  
9 net benefit to BC

10  
11 **Response:**

12 Please refer to the response to BCUC IR 1.217.4

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**Deleted:** There is only one program within the 2014-2018 EEC Plan that the FEU have not been able to show passes the TRC (or the MTRC in cases where the program does not pass the TRC), and where the reason is not related to a difficulty in identifying annual gas savings:¶

<#>Low Income ECAP¶

¶  
The ECAP program is designed to be very similar to best-in-class programs offered in other jurisdictions to low income customers. Since the FEU have partnered with BC Hydro on the ECAP program, it is being offered in a cost efficient way while maintaining adequate assurances for safety and customer satisfaction. The benefits of enabling cost savings through energy efficiency to this customer segment are many and a portion of these benefits, including some benefits that serve the broader Province of BC, are not recognized by TRC even with the 30% benefit added to the TRC calculation. It should be noted that the BCUC approved the Low Income ECAP program as part of the FEU's EEC portfolio in the 2012-2013 Revenue Requirements Proceeding.<sup>1</sup> Further, while the Low Income ECAP program individually fails the TRC, overall, the FEU's portfolio of EEC Programs does pass the TRC and MTRC. As discussed in Section 6.1.1, pages 23-24, of Appendix I of Exhibit B-1-1, the portfolio-level analysis of cost-effectiveness testing has been consistently approved by the Commission and there are good reasons to continue with this approach. ¶

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 594

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### Programs affected by varying levels of LRMC

Program and Service Territory	Benefit/Cost Ratios					
	TRC	MTRC (\$190/MWh)	MTRC (\$160/MWh)	MTRC (Std.)	MTRC (\$100/MWh)	MTRC (\$70/MWh)
<b>* Furnace Replacement Program (Residential)</b>						
FEI	0.51	2.09	1.76	1.45	1.10	0.77
FEVI	0.51	2.07	1.74	1.44	1.09	0.76
Total	0.51	2.09	1.76	1.45	1.10	0.77
<b>* ENERGY STAR® Water Heater Program (Residential)</b>						
FEI	0.64	2.61	2.19	1.81	1.37	0.96
FEVI	0.63	2.58	2.17	1.79	1.36	0.95
Total	0.64	2.60	2.19	1.81	1.37	0.96
<b>* New Home Program (Residential)</b>						
FEI	0.41	1.67	1.41	1.16	0.88	0.62
FEVI	0.41	1.65	1.39	1.15	0.87	0.61
Total	0.41	1.67	1.41	1.16	0.88	0.61
<b>* New Technologies Program (Residential)</b>						
FEI	0.37	1.52	1.28	1.05	0.80	0.56
FEVI	0.37	1.51	1.27	1.05	0.79	0.56
Total	0.37	1.52	1.28	1.05	0.80	0.56
<b>* Customer Engagement Tool for Conservation Behaviours (Residential)</b>						
FEI	0.86	3.69	3.11	2.56	1.94	1.36
FEVI	0.85	3.68	3.10	2.55	1.94	1.35
Total	0.86	3.69	3.11	2.56	1.94	1.36
<b>* Continuous Optimization Program (Commercial)</b>						
FEI	0.82	3.43	2.89	2.38	1.81	1.26
FEVI	0.77	3.21	2.70	2.23	1.69	1.18
Total	0.82	3.42	2.88	2.38	1.80	1.26
<b>* Energy Conservation Assistance Program (Low Income)</b>						
FEI	0.43	1.53	1.29	1.06	0.81	0.56
FEVI	0.43	1.52	1.28	1.06	0.80	0.56
Total	0.43	1.53	1.29	1.06	0.81	0.56

\* Program requires the MTRC in order to pass the economic screen

**Note:** Whistler (FEW) is included in the FEI service territory

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It can be seen in the table above that lowering the ZEEA value affects Residential customers. A ZEEA value using \$100/MWh as the LRMC for clean renewable power causes the New Home, New Technologies, and ECAP program to drop out of the portfolio of activity, and a ZEEA value that uses \$70/MWh as the LRMC for clean renewable power causes two more Residential programs, the Furnace Replacement and Energy Star® Water Heater programs, to drop out of the portfolio of activity.

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 604

Program and Service Territory	Utility Expenditures (\$1000s)		Gas Savings, Net (GJ)		Benefit Cost Tests			
	2014-2018	% of Total	2014-2018	% of Total	TRC (Ratio)	MTRC (Ratio)	Utility (Ratio)	Utility (\$/GJ)
<b>RESIDENTIAL (ALL PROGRAMS)</b>	<b>54,902</b>	<b>30.8%</b>	<b>2,362,301</b>	<b>24.4%</b>	<b>0.73</b>	<b>2.05</b>	<b>1.18</b>	<b>7.50</b>
Energy Efficient Home Performance Program	7,901	4.4%	618,980	6.4%	1.09	3.08	2.96	3.07
* Furnace Replacement Program	16,705	9.4%	468,527	4.8%	0.51	1.45	0.93	9.64
Enerchoice Fireplace Program	5,823	3.3%	215,973	2.2%	1.57	4.45	0.98	8.88
Appliance Service Program	2,281	1.3%	0	0.0%	0.00	0.00	0.00	n/a
* ENERGY STAR® Water Heater Program	6,275	3.5%	207,105	2.1%	0.64	1.81	1.12	8.00
Low-Flow Fixtures	1,450	0.8%	192,375	2.0%	3.04	8.61	2.84	2.95
* New Home Program	4,677	2.6%	122,125	1.3%	0.41	1.16	1.01	9.19
* New Technologies Program	1,556	0.9%	24,216	0.2%	0.37	1.05	0.36	23.49
* Customer Engagement Tool for Conservation Behaviours	4,428	2.5%	513,000	5.3%	0.86	2.56	0.86	8.60
Financing Pilot	1,105	0.6%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	2,700	1.5%	0	0.0%	0.00	0.00	0.00	n/a
<b>COMMERCIAL (ALL PROGRAMS)</b>	<b>54,144</b>	<b>30.4%</b>	<b>4,296,483</b>	<b>44.3%</b>	<b>1.07</b>	<b>3.05</b>	<b>1.72</b>	<b>5.03</b>
Space Heat Program	10,066	5.7%	848,671	8.8%	2.55	7.20	3.09	2.94
Water Heating Program	1,442	0.8%	215,798	2.2%	1.15	3.26	3.94	2.18
Commercial Food Service Program	2,448	1.4%	215,842	2.2%	1.81	5.11	2.42	3.56
Customized Equipment Upgrade Program	12,272	6.9%	771,502	8.0%	1.09	3.08	2.36	3.88
EnerTracker Program	964	0.5%	218,078	2.2%	1.57	5.04	1.51	4.42
* Continuous Optimization Program	9,214	5.2%	1,780,325	18.4%	0.81	2.35	1.95	3.92
Commercial Energy Assessment Program	2,339	1.3%	231,267	2.4%	1.00	3.02	0.72	10.11
Energy Specialist Program	9,882	5.6%	0	0.0%	0.00	0.00	0.00	n/a
Mechanical Insulation Pilot	16	0.0%	15,000	0.2%	5.76	16.25	30.45	0.30
Non-Program Specific Expenses	5,500	3.1%	0	0.0%	0.00	0.00	0.00	n/a
<b>INDUSTRIAL (ALL PROGRAMS)</b>	<b>12,896</b>	<b>7.2%</b>	<b>2,192,299</b>	<b>22.6%</b>	<b>3.08</b>	<b>8.67</b>	<b>4.15</b>	<b>2.05</b>
Industrial Optimization Program	9,148	5.1%	1,552,971	16.0%	2.90	8.18	3.89	2.17
Specialized Industrial Process Technology Program	2,438	1.4%	639,328	6.6%	4.66	13.12	7.29	1.19
Non-Program Specific Expenses	1,310	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>LOW INCOME (ALL PROGRAMS)</b>	<b>15,223</b>	<b>8.6%</b>	<b>406,432</b>	<b>4.2%</b>	<b>0.96</b>	<b>2.36</b>	<b>0.73</b>	<b>11.97</b>
Energy Savings Kit	651	0.4%	136,063	1.4%	5.37	13.31	3.46	2.36
Energy Conservation Assistance Program	10,240	5.8%	118,065	1.2%	0.43	1.06	0.33	26.55
REnEW	405	0.2%	0	0.0%	0.00	0.00	0.00	n/a
Low Income Space Heat Top-Ups	394	0.2%	36,766	0.4%	2.99	7.34	3.17	2.84
Low Income Water Heating Top-Ups	77	0.0%	10,742	0.1%	1.42	3.48	3.34	2.54
Non-Profit Custom Program	1,931	1.1%	104,796	1.1%	2.79	6.83	2.07	4.40
Non-Program Specific Expenses	1,525	0.9%	0	0.0%	0.00	0.00	0.00	n/a
<b>CONSERVATION EDUCATION AND OUTREACH (ALL PROGRAMS)</b>	<b>12,000</b>	<b>6.7%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
Residential Education Program	4,950	2.8%	0	0.0%	0.00	0.00	0.00	n/a
Commercial Education Program	2,250	1.3%	0	0.0%	0.00	0.00	0.00	n/a
School Education Program	3,600	2.0%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	1,200	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>INNOVATIVE TECHNOLOGIES (ALL PILOTS)</b>	<b>6,086</b>	<b>3.4%</b>	<b>435,173</b>	<b>4.5%</b>	<b>1.75</b>	<b>4.93</b>	<b>2.29</b>	<b>3.92</b>
<b>ENABLING ACTIVITIES (ALL ACTIVITIES)</b>	<b>22,740</b>	<b>12.8%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
<b>ENTIRE PORTFOLIO</b>	<b>177,991</b>	<b>100.0%</b>	<b>9,692,688</b>	<b>100.0%</b>	<b>0.95</b>	<b>2.68</b>	<b>1.33</b>	<b>6.55</b>

Note: Whistler (FEW) is included in the FEI service territory

\* Program requires the MTRC in order to pass the economic screen

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 605

219.7 For each measure which FEU has been unable to demonstrate will pass the UCT, and which is not the result of difficulty quantifying annual gas savings, please provide an explanation as to why FEU considers that undertaking this measure should provide a net benefit to its ratepayers.

**Response:**

As stated in the response to BCUC IR 1.219.2.1, the perspective on the benefit or cost to FEU ratepayers overall, as British Columbians, is more optimally provided by the TRC/MTRC.

Please see listed below each of the programs presented in the FEU's 2014-2018 EEC Plan which have a UCT under 1.0 and an explanation as to why FEU considers that undertaking this program should provide a net benefit to British Columbians. The MTRC ratio is listed for each program where required/applicable. The TRC ratio is listed for the programs that do not require or are not applicable to the MTRC.

**Furnace Replacement Program (UCT = 0.93, MTRC = 1.45)**

This program provides the following net benefits to British Columbians:

- Reduces GHG emission by educating customers about an early rather than emergency replacement decision.
- Enables the FEU to further strengthen relationships with contractors, distributors, retailers and trade associations.
- Enables the FEU to monitor the quality of installations and the opportunity to support government and industry in training and certification of HVAC contractors.
- As heating systems tend to be the "gateway" to other savings opportunities as evidenced in the LiveSmart program, this provides an opportunity for further energy savings in deeper retrofits.
- Participation in any rebate program may lead to awareness of energy bills and therefore behavioural changes as a by-product of participation.

Note that the marginal UCT for this program may be able to be improved through reduced program administration costs in future years such as through transition to online application forms, review of contractor incentives, and reduced marketing costs once the program is further established.

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 606

1 | **Enerchoice Fireplace Program (UCT = 0.98, TRC = 1.57)**

2 | This program provides the following net benefits to British Columbians:

- 3       • Fireplace manufacturing in BC creates jobs and benefits the BC economy.
- 4       • BC households have more natural gas fireplaces than any province in Canada.
- 5       • The program provides the opportunity to educate customers about the benefits of energy
- 6       efficient zone heating and messaging regarding choosing warmth with ambience.
- 7       • Enables the FEU to further strengthen relationships with contractors, distributors,
- 8       retailers and trade associations.
- 9       • Enables the FEU to be involved in codes and standards, testing procedures and market
- 10      transformation of energy efficient fireplaces.
- 11      • In new construction, the program encourages builders to install higher quality appliances
- 12      that are energy efficient rather than low cost base models.

13 | Note that the marginal UCT for this program may be able to be improved through reduced

14 | program administration costs in future years such as through transition to online application

15 | forms, review of dealer incentives, and reduced marketing costs once the program is further

16 | established.

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**Deleted: New Home Program (UCT = 0.98, MTRC = 1.12)**

This program provides the following net benefits to British Columbians:

<#>Enables the FEU to further educate builders, developers, architects and engineers on the benefits of using natural gas efficiently and building higher quality, energy efficient homes that will benefit occupants for many decades.

<#>Enables the FEU to be involved in building codes and how natural gas fits into the goal of Near Net Zero housing by 2020.

<#>The program encourages builders to install higher quality appliances that are energy efficient rather than low cost base models.

<#>Energy labeling requirement (EnerGuide Rating) provides an opportunity for builders to work with Certified Energy Advisors and through the blower door test educate builders / onsite trades people about basic practices such as air sealing and draft proofing.

Note that the marginal UCT of this program may be able to be managed through reduced program administration costs in future years.

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 607

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#### **New Technologies Program (UCT = 0.36, MTRC = 1.05)**

This program provides the following net benefits to British Columbians:

- Introduction of new innovative technologies that are high cost but provide energy saving opportunities, where costs will come down as the market is transformed.
- Further relationships with manufacturers and distributors such that FEU is able to identify new product introductions for energy efficiency.
- In collaboration with trade associations, provide training to trades as new products are introduced to ensure customers receive quality installation so savings potential is realized.

Note that the cost benefit inputs for this program were provided as placeholders for Residential New Technologies that may be introduced over the next five years. Since it is expected that these will be innovative with low market adoption, their costs may be such that they fail traditional cost benefit tests. However, once program parameters are more defined over time, the UCT may be able to be managed through reduced program administration costs in future years.

Note also that pursuant to Section 4(1.8) of the DSM Regulation, the Commission may not use the UCT to determine that a specified demand-side measure, including a technology innovation program, is not cost-effective.

#### **Customer Engagement Tool for Conservation Behaviours (UCT = 0.86, MTRC = 2.56)**

This program provides the following net benefits to British Columbians:

- An energy visualization tool that will allow customers to understand their natural gas consumption in relation to their neighbours.
- An additional marketing platform to introduce rebate offers and energy savings tips.
- Enable the FEU to gather customer intelligence about homes, appliances and provide opportunities to target relevant marketing messages more effectively.

Note that as the Customer Engagement Tool project has yet to be delivered, the exact costs have yet to be determined.

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 608

1  
2 **Commercial Energy Assessment Program (UCT = 0.72, TRC = 1.00)**  
3 By providing participants with an energy assessment of their buildings this program makes it  
4 easier for participants to subsequently take action to reduce consumption, as well as participate  
5 in one or more of FEU's other incentive programs. The benefits which may be attributed directly  
6 to this program are limited, however, by customers who do in fact participate in another EEC  
7 program. In such a case, for example a customer who receives an assessment and then  
8 participates in the Efficient Boiler Program, the resultant natural gas savings are recorded only  
9 under the Efficient Boiler Program. The benefits which are attributed to the Commercial Energy  
10 Assessment Program represent only savings resulting from the implementation of measures  
11 with no subsequent follow up in another EEC program. This necessarily impacts the cost  
12 effectiveness of the program. Regardless, the Commercial Energy Assessment program  
13 provides value to participants and serves as a funnel to participation in other more cost effective  
14 incentive programs. As such, it occupies a well deserved place within the context of a cost  
15 effective portfolio of programs.

16  
17 **ECAP (UCT = 0.33, MTRC = 1.06)**

18 ECAP is the FEU's flagship Low Income Program in terms of having the potential to create  
19 significant and lasting savings for FEU's low income customers. By creating savings for low  
20 income customers, there are many non-energy benefits that impact the broader society and rate  
21 payers but that are difficult to quantify. One example benefit is improved health. The energy  
22 efficiency retrofit work implemented through the ECAP program can improve air quality which  
23 can lead to improved health of the occupants and therefore reduce the burden on health care  
24 systems which all FEU ratepayers help support through their tax dollars.

25 The ECAP program is very similar to, and leverages best practices from, programs offered to  
26 low income customers in many other Provinces and States and is the best example of meeting  
27 FEU's EEC portfolio adequacy requirement of offering programs to Low Income customers.  
28 Because of the programs important role in FEU's EEC portfolio and because of the many non-  
29 energy benefits that arise from the program, it is believed the UCT is an insufficient gauge of the  
30 program's merits.

31 Pursuant to Section 4(1.8) of the DSM Regulation, the Commission may not use the UCT to  
32 determine that a demand-side measure intended specifically to assist residents of low-income  
33 households to reduce their energy consumption is not cost effective.

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 680

1 **Response:**

2 A “UCT threshold” does not exist for EEC programs targeted at low-income customers. The  
3 Demand Side Measures Regulation provides for the use of the Total Resource Cost test, or the  
4 Modified Total Resource Cost test, with a 30% bonus applied to the benefits considered in the  
5 test for EEC programs targeted at low-income customers and states at Section 4(1.8)(c) that the  
6 Commission may not apply the Utility Cost Test to programs for low-income customers in  
7 determining whether the programs are cost-effective.

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 763

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Program Area	Program/Category	Service Territory	TRC	MTRC	UTC	Projected Expenditure* (\$000s)					Total
						2,014	2,015	2,016	2,017	2,018	
	Energy Conservation Assistance Program	FEI	0.4	1.1	0.3	1507	1659	1829	2010	2210	9216
		FEVI	0.4	1.1	0.3	167	184	203	223	246	1024
		Total	0.4	1.1	0.3	1675	1844	2033	2234	2456	10240
	Low Income Space Heat Top-Ups	FEI	3.0	n/a	3.2	70	77	85	68	54	355
		FEVI	3.0	n/a	3.1	8	9	9	8	6	39
		Total	3.0	n/a	3.2	78	86	94	78	60	394
	Low Income Water Heating Top-Ups	FEI	1.4	n/a	3.4	14	15	16	3	12	69
		FEVI	1.4	n/a	3.3	2	2	2	1	1	8
		Total	1.4	n/a	3.3	15	16	17	15	13	77
	Non-Profit Custom Program	FEI	2.8	n/a	2.1	285	313	344	379	417	1738
		FEVI	2.8	n/a	2.1	32	35	38	42	46	193
		Total	2.8	n/a	2.1	316	348	383	421	463	1931
	Non-Program Specific Expenses	FEI	n/a	n/a	n/a	268	268	268	268	268	1342
		FEVI	n/a	n/a	n/a	37	37	37	37	37	183
		Total	n/a	n/a	n/a	305	305	305	305	305	1525
	All Low Income Programs	FEI	0.9	n/a	0.7	2,307	2,524	2,723	2,869	3,123	13,545
		FEVI	1.1	n/a	0.9	322	299	319	378	360	1,678
		Total	1.0	2.4	0.7	2,629	2,822	3,042	3,247	3,483	15,223
* Does not include inflation											

Table 2 outlines the FEU's demand-side measures intended specifically to improve the energy efficiency of rental accommodations. These include all of the programs in the FEU's Residential Program Area, as well as several programs in the Commercial Program Area that target rental accommodations.

**Table 2: 2014-2018 demand-side measures intended specifically to improve the energy efficiency of rental accommodations**

Program Area	Program/Category	Service Territory	TRC	MTRC	UTC	Projected Expenditure* (\$000s)					Total
						2,014	2,015	2,016	2,017	2,018	
Residential	Energy Efficient	FEI	1.1	n/a	3.0	1,279.0	1,354.0	1,403.0	1,503.0	1,652.0	7,190.0
	Home Performance Program	FEVI	1.1	n/a	2.9	126.0	134.0	139.0	149.0	163.0	711.0
		Total	1.1	n/a	3.0	1,405.0	1,488.0	1,542.0	1,651.0	1,815.0	7,901.0
	Furnace	FEI	0.6	1.5	0.9	3,053.0	3,040.0	3,040.0	3,040.0	3,030.0	15,202.0

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 764

Program Area	Program/Category	Service Territory	TRC	MTRC	UTC	Projected Expenditure* (\$000s)					Total
						2,014	2,015	2,016	2,017	2,018	
	Replacement Program	FEVI	0.6	1.4	0.9	302.0	301.0	301.0	301.0	300.0	1,503.0
	Total		0.6	1.5	0.9	3,355.0	3,340.0	3,340.0	3,340.0	3,330.0	16,705.0
	Enerchoice Fireplace Program	FEI	1.5	n/a	1.0	1,156.0	1,103.0	1,051.0	730.0	677.0	4,716.0
	Total		1.6	n/a	1.0	1,427.0	1,361.0	1,298.0	901.0	835.0	5,823.0
	Appliance Service Program	FEI	0.0	n/a	0.0	415.0	415.0	415.0	415.0	415.0	2,076.0
	Total		0.0	n/a	0.0	41.0	41.0	41.0	41.0	41.0	205.0
	ENERGY STAR Water Heater Program	FEI	0.6	1.8	1.1	998.0	1,340.0	1,105.0	1,019.0	1,249.0	5,711.0
	Total		0.6	1.8	1.1	1,096.0	1,472.0	1,215.0	1,120.0	1,372.0	6,275.0
	Low-Flow Fixtures	FEI	3.0	n/a	2.8	264.0	264.0	264.0	264.0	264.0	1,320.0
	Total		3.0	n/a	2.8	26.0	26.0	26.0	26.0	26.0	131.0
	New Home Program	FEI	0.4	1.2	1.0	943.0	943.0	943.0	714.0	714.0	4,256.0
	Total		0.4	1.2	1.0	1,036.0	1,036.0	1,036.0	784.0	784.0	4,677.0
	New Technologies Program	FEI	0.4	1.1	0.4	239.0	262.0	282.0	305.0	329.0	1,416.0
	Total		0.4	1.1	0.4	24.0	26.0	28.0	30.0	32.0	140.0
	Customer Engagement Tool for Conservation	FEI	0.9	2.6	0.9	520.0	635.0	763.0	905.0	1,161.0	3,984.0
	Total		0.9	2.6	0.9	578.0	706.0	848.0	1,006.0	1,290.0	4,428.0
	Financing Pilot	FEI	0.0	n/a	0.0	112.0	174.0	235.0	276.0	309.0	1,105.0
	Total		0.0	n/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non-Program Specific Expenses	FEI	n/a	n/a	n/a	491.0	491.0	491.0	491.0	491.0	2,457.0
	Total		n/a	n/a	n/a	49.0	49.0	49.0	49.0	49.0	243.0
	Commercial Space Heat Program	FEI	2.5	n/a	3.0	1,347.0	1,381.0	1,606.0	1,606.0	1,653.0	7,592.0
	Total		2.6	n/a	3.1	1,786.0	1,831.0	2,128.0	2,128.0	2,191.0	10,066.0

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2014
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 765

Program Area	Program/ Category	Service Territory	TRC	MTRC	UTC	Projected Expenditure* (\$000s)					Total
						2,014	2,015	2,016	2,017	2,018	
	Water Heating Program	FEI	1.1	n/a	3.9	206.0	241.0	244.0	265.0	288.0	1,245.0
		FEVI	1.2	n/a	4.0	33.0	38.0	39.0	42.0	46.0	198.0
		Total	1.2	n/a	3.9	239.0	279.0	283.0	307.0	334.0	1,442.0
	Commercial Energy Assessment Program	FEI	1.0	n/a	0.7	414.0	419.0	438.0	414.0	419.0	2,105.0
		FEVI	1.0	n/a	0.7	46.0	47.0	49.0	46.0	47.0	234.0
		Total	1.0	n/a	0.7	460.0	466.0	487.0	460.0	466.0	2,339.0
	All Rental Accomodation Programs	FEI	n/a	n/a	n/a	11,437.0	12,062.0	12,280.0	11,947.0	12,651.0	60,375.0
		FEVI	n/a	n/a	n/a	1,607.0	1,668.0	1,729.0	1,651.0	1,725.0	8,374.0
		Total	n/a	n/a	n/a	13,042.0	13,726.0	14,008.0	13,594.0	14,373.0	68,748.0
* Does not include inflation											

Table 3 outlines the FEU's EEC education program for students enrolled in schools in their service areas. These include both K-12 and post-secondary in class programs and presentations.

**Table 3: 2014-2018 education programs for students enrolled in schools/post-secondary institutions in the FEU's service area**

Program Area	Program/Category	Service Territory	TRC	MTRC	UTC	Projected Expenditure* (\$000s)					Total
						2,014	2,015	2,016	2,017	2,018	
Conservation, Education & Outreach (CEO)	School Education Program	FEI	0.0	n/a	0.0	648.0	648.0	648.0	648.0	648.0	3,240.0
		FEVI	0.0	n/a	0.0	72.0	72.0	72.0	72.0	72.0	360.0
		Total	0.0	n/a	0.0	720.0	720.0	720.0	720.0	720.0	3,600.0
	All Education Programs	FEI	0.0	n/a	0.0	648.0	648.0	648.0	648.0	648.0	3,240.0
		FEVI	0.0	n/a	0.0	72.0	72.0	72.0	72.0	72.0	360.0
		Total	0.0	n/a	0.0	720.0	720.0	720.0	720.0	720.0	3,600.0

**Attachment D**

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<u>Amended</u> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 462

1 EEACG has not expressed any concerns with those results. Thus, the FEU have not specifically  
2 posed the question of the extent to which EEC programs should be required to pass the UCT.

3  
4  
5  
6 366.6 Please demonstrate that FEU has complied with section 4 (1.5) of the DSM  
7 Regulations.  
8

9 **Response:**

10 The Companies interpret this question to mean, "Please demonstrate the FEU's slate of proposed  
11 EEC activity that is the subject of this proceeding, namely the 2014-2018 EEC Plan, qualify as cost-  
12 effective under the MTRC does not exceed 33% of the proposed portfolio of activity." This can be  
13 seen in Exhibit 3 of Appendix I-1 to Exhibit B-1, where the percentage of activity that the  
14 Companies are bringing forward in the 2014-2018 EEC Plan that qualifies as cost-effective using  
15 the MTRC is 30% over the plan period.

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16

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 467

Table 1: Revised Benefit Cost Test Results for Programs with Original UCT <1.0

Program and Service Territory	Benefit Cost Tests		
	TRC	MTRC	Utility
Furnace Replacement Program	0.71	1.45	1.29
Enerchoice Fireplace Program	2.21	4.45	1.37
New Technologies Program	0.53	1.05	0.51
Customer Engagement Tool for Conservation Behaviours	1.26	2.56	1.26
Commercial Energy Assessment Program	1.48	3.02	1.06
Energy Conservation Assistance Program	0.61	1.06	0.46

Table 2 below summarizes the updated impact on the EEC budget over the PBR period and the overall reduction in FEU forecast CO<sub>2</sub> emissions if both programs that have a UCT under 1.0 (with the revised UCT emissions adder) were to be removed from FEU's portfolio. The budgets for these programs represent about 6.5% of the total EEC budget and approximately 1.5% of the CO<sub>2</sub> emissions savings over the PBR period. If these programs were to be removed, the EEC budget over the PBR period would be cut from approximately \$178 million to \$166 million and CO<sub>2</sub> savings would be reduced from 494 kt to 487 kt.

Table 2: Impact of Removing Programs with UCT <1.0 (Revised UCT Emissions Adder)

Program and Service Territory	Utility Expenditures (\$1000s)		CO <sub>2</sub> Emission Savings, Net (tonnes)	
	2014-2018	% of Total	2014-2018	% of Total
<b>ENTIRE PORTFOLIO</b>	<b>177,991</b>	<b>100.00%</b>	<b>494,327</b>	<b>100.00%</b>
New Technologies Program	1,556	0.90%	1,235	0.20%
Energy Conservation Assistance Program	10,240	5.80%	6,021	1.20%
<b>ALL MEASURES WITH UCT &lt;1.0</b>	<b>11,797</b>	<b>6.60%</b>	<b>7,256</b>	<b>1.50%</b>
<b>ENTIRE PORTFOLIO (COST EFFECTIVE PROGRAMS)</b>	<b>166,194</b>	<b>93.40%</b>	<b>487,071</b>	<b>98.50%</b>

367.3.2 What is the effective environmental premium for biomethane in \$/GJ (i.e., Long Run Marginal Cost (LRMC) of biomethane less the LRMC of gas)? Please provide the details of the estimation and describe all assumptions used.



FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 496

1   **370.0 Reference: ENERGY EFFICIENCY AND CONSERVATION**

2                   **Exhibit B-11, BCUC 1.218.3**

3                   **Evaluation Framework – Key Inputs**

4           370.1   Do FEU consider the EEC PBR budget request should be updated for BC Hydro's  
5                   changes to its estimated long-run marginal cost of clean or renewable power (refer  
6                   BCUC 1.218.3)? Please explain why/why not.

7  
8   **Response:**

9   The Companies are not aware that BC Hydro has arrived at a final determination of its long-run  
10   marginal cost of clean or renewable power at the time of writing; thus the FEU are not proposing  
11   any changes to the EEC budget proposed at this time. Should BC Hydro finalize a revision to their  
12   long-run marginal cost for clean power over the PBR period, the ZEEA used by the Companies  
13   would be adjusted accordingly, and the benefit-cost analysis for those programs requiring the use of  
14   the MTRC would be re-run. Programs not found to be cost-effective under a changed ZEEA would  
15   not run.

16  
17  
18  
19           370.1.1 Please identify any changes to the EEC budget for each year of the PBR  
20                   period that would result from is FEU was required to use (i) \$100/MWh  
21                   and (ii) \$85/MWh as an input into the zero-emission energy supply  
22                   alternative (ZEEA).

23  
24   **Response:**

25   In order to assess whether there would be any changes to the EEC budget if FEU was required to  
26   use either \$100/MWh or \$85/MWh as an input into the ZEEA, it was only necessary to focus on the  
27   ~~seven~~ programs that currently require the MTRC in order to pass the economic screen. As shown  
28   in Table 1 below, modifying the input into the ZEEA to \$100/MWh causes ~~the New Home Program,~~  
29   ~~the New Technologies Program, and the Energy Conservation Assistance Program~~ to fail the  
30   MTRC. Modifying the input into the ZEEA to \$85/MWh causes the Furnace Replacement program  
31   to fail the MTRC, in addition to the same ~~three~~ programs.

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FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 497

Table 1: Benefit Cost Test Results and Expenditures for Programs that Require MTRC

Program and Service Territory	Benefit Cost Tests				Utility Expenditures (\$1000s)	
	TRC	MTRC, Original	MTRC, ZEEA100	MTRC, ZEEA85	2014-2018	% of Total
Furnace Replacement Program	0.51	1.45	1.10	0.93	16,705	9.4%
ENERGY STAR® Water Heater Program	0.64	1.81	1.37	1.16	6,275	3.5%
New Home Program	0.41	1.16	0.88	0.75	4,677	2.6%
New Technologies Program	0.37	1.05	0.80	0.68	1,556	0.9%
Customer Engagement Tool for Conservation Behaviours	0.86	2.56	1.94	1.65	4,428	2.5%
Continuous Optimization Program	0.82	2.38	1.80	1.53	9,214	5.2%
Energy Conservation Assistance Program	0.43	1.06	0.81	0.68	10,240	5.8%

Table 2 below summarizes the annual spending, total spending, and portion of the total spending for each of the seven programs that require the MTRC in order to pass the economic screen.

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Table 2: Annual Spending for Programs that Require MTRC

Program and Service Territory	Utility Expenditures (\$1000s)						
	2014	2015	2016	2017	2018	Total	% of Total
Furnace Replacement Program	3,355	3,340	3,340	3,340	3,330	16,705	9.40%
ENERGY STAR® Water Heater Program	1,096	1,472	1,215	1,120	1,372	6,275	3.50%
New Home Program	1,036	1,036	1,036	784	784	4,677	2.60%
New Technologies Program	262	287	310	335	361	1,556	0.90%
Customer Engagement Tool for Conservation Behaviours	578	706	848	1,006	1,290	4,428	2.50%
Continuous Optimization Program	2,779	2,185	1,724	1,389	1,137	9,214	5.20%
Energy Conservation Assistance Program	1,675	1,844	2,033	2,234	2,456	10,240	5.75%

Table 3 below summarizes the impact on EEC expenditures if the programs noted above were to be removed from the portfolio of programs. The \$100/MWh scenario would result in a 3.5 percent reduction in overall spending, while the \$85/MWh scenario would see the overall spending cut by about 13 percent. It should be noted that this analysis assumes that the removal of these programs would cause no changes to any spending for non-program specific or enabling activities.

If the ECAP failed the MTRC, the FEU would propose to continue expenditures on the program as planned consistent with FEU's past EEC plans and for the reasons expressed in BCUC IR 2.374.4 and 2.374.4.1.

Table 3: Impact on Expenditures for ZEEA Scenarios

ZEEA Scenario	Impact on Expenditures (\$1000s)						
	2014	2015	2016	2017	2018	Total	% of Total
(i) \$100/MWh	1,298	1,324	1,346	1,120	1,145	6,233	3.5%
(ii) \$85/MWh	4,654	4,664	4,687	4,460	4,475	22,939	12.9%

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 530

1 **Response:**

2 The EEC plan did not take a year by year approach. The plan pools all of the benefits for an overall  
3 cost-benefit equation for the entire PBR period. The overall mTRC for the PBR period for ECAP is  
4 1.06. Although the mTRC is 1.06 and the TRC is 0.4, the FEU are not alone in reporting a TRC  
5 less than 1 for comprehensive direct-install low income programs. In a Research Brief published by  
6 E-Source in March 2012<sup>1</sup>, only 5 of 11 utilities were required to use a cost-effectiveness test for  
7 their low income programs. In an additional E-Source research brief published in 2010<sup>2</sup>, of all the  
8 low income programs in the study, only one electric utility (of 8 utilities) had a TRC greater than 1,  
9 and only one gas program was deemed "cost-effective"; however, the TRC was not published.  
10 TRC ranged from 0.37 for Pacific Gas and Electric's Energy Partners Program to 1.7 for United  
11 Illuminating's "UI Helps" program (the later being an electric-only program).

12 The societal benefits of offering energy efficiency programs to low income customers are  
13 substantial. The ECAP program, which is the program that affords low income customers the  
14 biggest opportunities for saving energy also affords the greatest benefits to society (relative to other  
15 low income programs). The societal benefits of weatherization programs in low income homes can  
16 be broken in to three categories:<sup>3</sup> environmental, social and economic:

- 17 • Environmental - reduction in air pollutants, reduced water usage (and subsequently, less  
18 sewage).
- 19 • Social – social equity, improvement in community pride through improvement in the local  
20 (low income) housing stock, and in some cases avoided unemployment benefits where low  
21 income individuals are employed in the course of the weatherization program (which does  
22 occur in the ECAP program from time to time).
- 23 • Economic – expenditures resulting in new jobs and increases in personal income which  
24 translates to increased income tax collections.

25  
26 These are just a few examples of the societal benefits to BC of low income programs. There are a  
27 host of other non-energy benefits that also result from low income programs. Some of these  
28 include:

- 29 • Enhanced health and safety – energy efficiency enabling activities in such as ventilation,  
30 moisture assessment, and the installation of CO detectors enhance the health and safety of  
31 low income homes which lowers provincial health costs;

**Deleted:** FEU do expect the cost effectiveness to improve over the five year period; however the ECAP program is not expected to reach a TRC of 1.0.¶  
The Low Income cost-effectiveness test that is applied in the EEC Plan is the TRC with a 30% benefits adder as set out in the DSM regulation. Low Income programs are excluded from mTRC. So, relative to other gas DSM programs, the benefits of Low Income programs are enhanced by the 30% adder; however, the benefits are calculated using the market price of the gas commodity. ¶  
The ECAP TRC for the PBR period is 0.43. If the Low Income programs were evaluated using the MTRC (ZEEA plus 15% adder), the mTRC would be 0.92. If Low Income programs were able to use the ZEEA in the MTRC and maintain the 30% benefits adder, the result would be a cost-effectiveness ratio of 1.04.¶  
The

<sup>1</sup> Source: E Source Research Brief, "Making Low-Income Programs Cost-Effective." March 2012.

<sup>2</sup> Spalding, Stephanie. E Source Research Brief, "Utility Low-Income Weatherization Programs." 2010.

<sup>3</sup> Martin Schweitzer, Bruce Tonn, "Non-Energy Benefits From The Weatherization Assistance Program: A Summary of Findings From the Recent Literature." April 2002. Prepared for the U.S. Department of Energy by Oak Ridge National Laboratory.



FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 531

- Enhanced comfort – increasing the efficiency of the home reduces the likelihood that homes are kept at an unsafe temperature;
- Decreased bills from enhanced energy efficiency leads to less evictions, less foreclosures on mortgages, fewer people moving in to shelters or becoming homeless, less family separation, less likely to not buy food, less usage of pay day loans, less allergies and sickness, lower mental illness;
- Utilities and ratepayers benefit from reduced costs associated with arrears and disconnections.

374.4.2 Please explain why FEU are increasing the funding for ECAP by 46 percent over the PBR period (Attachment I-1 p. 75, 79, 81), while funding for low-income top-up programs declines.

**Response:**

The FEU have proposed increasing ECAP funding from \$1.675 million in 2014 to \$2.456 million in 2018 because the FEU believe that the ECAP program will take longer to reach the peak demand for this program due to this program having longer engagement cycles with participants. The engagement cycle in this program is quite long. The time between participant approval and the final quality assurance check of the installations can take several months and even longer for engagements with non-profit societies and First Nations communities.

Similarly, the low-income top-up programs' funding request was based on projected participation in the program. However, because these are single measure programs, it's expected that participant engagement cycles will be shorter and it's estimated that this will lead to a peak program

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 618

**Table A: Program Cost Effectiveness Results Using an Avoided Cost of Gas with a 1% Escalation of the Midstream Component**

Program and Service Territory	Utility Expenditures (\$1000s)		Gas Savings, Net (GJ)		Benefit Cost Tests			
	2014-2018	% of Total	2014-2018	% of Total	TRC (Ratio)	MTRC (Ratio)	Utility (Ratio)	Utility (\$/GJ)
<b>RESIDENTIAL (ALL PROGRAMS)</b>	<b>54,902</b>	<b>30.8%</b>	<b>2,362,301</b>	<b>24.4%</b>	<b>0.64</b>	<b>2.05</b>	<b>1.05</b>	<b>7.50</b>
Energy Efficient Home Performance Program	7,901	4.4%	618,980	6.4%	0.96	3.08	2.61	3.07
* Furnace Replacement Program	16,705	9.4%	468,527	4.8%	0.45	1.45	0.82	9.64
Enerchoice Fireplace Program	5,823	3.3%	215,973	2.2%	1.40	4.45	0.87	8.88
Appliance Service Program	2,281	1.3%	0	0.0%	0.00	0.00	0.00	n/a
* ENERGY STAR® Water Heater Program	6,275	3.5%	207,105	2.1%	0.57	1.81	0.99	8.00
Low-Flow Fixtures	1,450	0.8%	192,375	2.0%	2.73	8.61	2.55	2.95
* New Home Program	4,677	2.6%	122,125	1.3%	0.36	1.16	0.89	9.19
* New Technologies Program	1,556	0.9%	24,216	0.2%	0.33	1.05	0.32	23.49
* Customer Engagement Tool for Conservation Behaviours	4,428	2.5%	513,000	5.3%	0.80	2.56	0.80	8.60
Financing Pilot	1,105	0.6%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	2,700	1.5%	0	0.0%	0.00	0.00	0.00	n/a
<b>COMMERCIAL (ALL PROGRAMS)</b>	<b>54,144</b>	<b>30.4%</b>	<b>4,296,483</b>	<b>44.3%</b>	<b>0.96</b>	<b>3.05</b>	<b>1.54</b>	<b>5.03</b>
Space Heat Program	10,066	5.7%	848,671	8.8%	2.25	7.20	2.72	2.94
Water Heating Program	1,442	0.8%	215,798	2.2%	1.03	3.26	3.51	2.18
Commercial Food Service Program	2,448	1.4%	215,842	2.2%	1.62	5.11	2.16	3.56
Customized Equipment Upgrade Program	12,272	6.9%	771,502	8.0%	0.96	3.08	2.08	3.88
EnerTracker Program	964	0.5%	218,078	2.2%	1.48	5.04	1.42	4.42
* Continuous Optimization Program	9,214	5.2%	1,780,325	18.4%	0.75	2.35	1.79	3.92
Commercial Energy Assessment Program	2,339	1.3%	231,267	2.4%	0.93	3.02	0.67	10.11
Energy Specialist Program	9,882	5.6%	0	0.0%	0.00	0.00	0.00	n/a
Mechanical Insulation Pilot	16	0.0%	15,000	0.2%	5.09	16.25	26.87	0.30
Non-Program Specific Expenses	5,500	3.1%	0	0.0%	0.00	0.00	0.00	n/a
<b>INDUSTRIAL (ALL PROGRAMS)</b>	<b>12,896</b>	<b>7.2%</b>	<b>2,192,299</b>	<b>22.6%</b>	<b>2.75</b>	<b>8.67</b>	<b>3.71</b>	<b>2.05</b>
Industrial Optimization Program	9,148	5.1%	1,552,971	16.0%	2.60	8.18	3.49	2.17
Specialized Industrial Process Technology Program	2,438	1.4%	639,328	6.6%	4.15	13.12	6.50	1.19
Non-Program Specific Expenses	1,310	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>LOW INCOME (ALL PROGRAMS)</b>	<b>15,223</b>	<b>8.6%</b>	<b>406,432</b>	<b>4.2%</b>	<b>0.85</b>	<b>2.36</b>	<b>0.65</b>	<b>11.97</b>
Energy Savings Kit	651	0.4%	136,063	1.4%	4.86	13.31	3.12	2.36
Energy Conservation Assistance Program	10,240	5.8%	118,065	1.2%	0.39	1.06	0.29	26.55
REnEW	405	0.2%	0	0.0%	0.00	0.00	0.00	n/a
Low Income Space Heat Top-Ups	394	0.2%	36,766	0.4%	2.64	7.34	2.80	2.84
Low Income Water Heating Top-Ups	77	0.0%	10,742	0.1%	1.27	3.48	2.99	2.54
Non-Profit Custom Program	1,931	1.1%	104,796	1.1%	2.46	6.83	1.82	4.40
Non-Program Specific Expenses	1,525	0.9%	0	0.0%	0.00	0.00	0.00	n/a
<b>CONSERVATION EDUCATION AND OUTREACH (ALL PROGRAMS)</b>	<b>12,000</b>	<b>6.7%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
Residential Education Program	4,950	2.8%	0	0.0%	0.00	0.00	0.00	n/a
Commercial Education Program	2,250	1.3%	0	0.0%	0.00	0.00	0.00	n/a
School Education Program	3,600	2.0%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	1,200	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>INNOVATIVE TECHNOLOGIES (ALL PILOTS)</b>	<b>6,086</b>	<b>3.4%</b>	<b>435,173</b>	<b>4.5%</b>	<b>1.55</b>	<b>4.93</b>	<b>2.03</b>	<b>3.92</b>
<b>ENABLING ACTIVITIES (ALL ACTIVITIES)</b>	<b>22,740</b>	<b>12.8%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
<b>ENTIRE PORTFOLIO</b>	<b>177,991</b>	<b>100.0%</b>	<b>9,692,688</b>	<b>100.0%</b>	<b>0.85</b>	<b>2.68</b>	<b>1.18</b>	<b>6.55</b>

Note: Whistler (FEW) is included in the FEI service territory

\* Program requires the MTRC in order to pass the economic screen

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	<b>Amended</b> Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 619

**Table B: Program Cost Effectiveness Results Using an Avoided Cost of Gas with a 2% Escalation of the Midstream Component**

Program and Service Territory	Utility Expenditures (\$1000s)		Gas Savings, Net (GJ)		Benefit Cost Tests			
	2014-2018	% of Total	2014-2018	% of Total	TRC (Ratio)	MTRC (Ratio)	Utility (Ratio)	Utility (\$/GJ)
<b>RESIDENTIAL (ALL PROGRAMS)</b>	<b>54,902</b>	<b>30.8%</b>	<b>2,362,301</b>	<b>24.4%</b>	<b>0.65</b>	<b>2.05</b>	<b>1.06</b>	<b>7.50</b>
Energy Efficient Home Performance Program	7,901	4.4%	618,980	6.4%	0.98	3.08	2.65	3.07
* Furnace Replacement Program	16,705	9.4%	468,527	4.8%	0.46	1.45	0.83	9.64
Enerchoice Fireplace Program	5,823	3.3%	215,973	2.2%	1.42	4.45	0.88	8.88
Appliance Service Program	2,281	1.3%	0	0.0%	0.00	0.00	0.00	n/a
* ENERGY STAR® Water Heater Program	6,275	3.5%	207,105	2.1%	0.57	1.80	1.01	8.00
Low-Flow Fixtures	1,450	0.8%	192,375	2.0%	2.76	8.61	2.58	2.95
* New Home Program	4,677	2.6%	122,125	1.3%	0.37	1.16	0.90	9.19
* New Technologies Program	1,556	0.9%	24,216	0.2%	0.34	1.05	0.33	23.49
* Customer Engagement Tool for Conservation Behaviours	4,428	2.5%	513,000	5.3%	0.80	2.56	0.80	8.60
Financing Pilot	1,105	0.6%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	2,700	1.5%	0	0.0%	0.00	0.00	0.00	n/a
<b>COMMERCIAL (ALL PROGRAMS)</b>	<b>54,144</b>	<b>30.4%</b>	<b>4,296,483</b>	<b>44.3%</b>	<b>0.97</b>	<b>3.05</b>	<b>1.56</b>	<b>5.03</b>
Space Heat Program	10,066	5.7%	848,671	8.8%	2.29	7.20	2.77	2.94
Water Heating Program	1,442	0.8%	215,798	2.2%	1.04	3.26	3.55	2.18
Commercial Food Service Program	2,448	1.4%	215,842	2.2%	1.64	5.11	2.19	3.56
Customized Equipment Upgrade Program	12,272	6.9%	771,502	8.0%	0.98	3.08	2.11	3.88
EnerTracker Program	964	0.5%	218,078	2.2%	1.48	5.04	1.42	4.42
* Continuous Optimization Program	9,214	5.2%	1,780,325	18.4%	0.75	2.35	1.80	3.92
Commercial Energy Assessment Program	2,339	1.3%	231,267	2.4%	0.93	3.02	0.67	10.11
Energy Specialist Program	9,882	5.6%	0	0.0%	0.00	0.00	0.00	n/a
Mechanical Insulation Pilot	16	0.0%	15,000	0.2%	5.17	16.25	27.29	0.30
Non-Program Specific Expenses	5,500	3.1%	0	0.0%	0.00	0.00	0.00	n/a
<b>INDUSTRIAL (ALL PROGRAMS)</b>	<b>12,896</b>	<b>7.2%</b>	<b>2,192,299</b>	<b>22.6%</b>	<b>2.78</b>	<b>8.67</b>	<b>3.75</b>	<b>2.05</b>
Industrial Optimization Program	9,148	5.1%	1,552,971	16.0%	2.62	8.18	3.53	2.17
Specialized Industrial Process Technology Program	2,438	1.4%	639,328	6.6%	4.20	13.12	6.58	1.19
Non-Program Specific Expenses	1,310	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>LOW INCOME (ALL PROGRAMS)</b>	<b>15,223</b>	<b>8.6%</b>	<b>406,432</b>	<b>4.2%</b>	<b>0.86</b>	<b>2.36</b>	<b>0.66</b>	<b>11.97</b>
Energy Savings Kit	651	0.4%	136,063	1.4%	4.90	13.31	3.15	2.36
Energy Conservation Assistance Program	10,240	5.8%	118,065	1.2%	0.39	1.06	0.29	26.55
REnEW	405	0.2%	0	0.0%	0.00	0.00	0.00	n/a
Low Income Space Heat Top-Ups	394	0.2%	36,766	0.4%	2.64	7.34	2.81	2.84
Low Income Water Heating Top-Ups	77	0.0%	10,742	0.1%	1.28	3.48	3.03	2.54
Non-Profit Custom Program	1,931	1.1%	104,796	1.1%	2.50	6.83	1.85	4.40
Non-Program Specific Expenses	1,525	0.9%	0	0.0%	0.00	0.00	0.00	n/a
<b>CONSERVATION EDUCATION AND OUTREACH (ALL PROGRAMS)</b>	<b>12,000</b>	<b>6.7%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
Residential Education Program	4,950	2.8%	0	0.0%	0.00	0.00	0.00	n/a
Commercial Education Program	2,250	1.3%	0	0.0%	0.00	0.00	0.00	n/a
School Education Program	3,600	2.0%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	1,200	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>INNOVATIVE TECHNOLOGIES (ALL PILOTS)</b>	<b>6,086</b>	<b>3.4%</b>	<b>435,173</b>	<b>4.5%</b>	<b>1.58</b>	<b>4.93</b>	<b>2.06</b>	<b>3.92</b>
<b>ENABLING ACTIVITIES (ALL ACTIVITIES)</b>	<b>22,740</b>	<b>12.8%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
<b>ENTIRE PORTFOLIO</b>	<b>177,991</b>	<b>100.0%</b>	<b>9,692,688</b>	<b>100.0%</b>	<b>0.86</b>	<b>2.68</b>	<b>1.20</b>	<b>6.55</b>

Note: Whistler (FEW) is included in the FEI service territory

\* Program requires the MTRC in order to pass the economic screen

FortisBC Energy Inc. (FEI or the Company) Application for Approval of a Multi-Year Performance Based Ratemaking Plan for 2014 through 2018 (the Application)	Amended Date: March 3, 2013
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2	Page 620

**Table C: Program Cost Effectiveness Results Using an Avoided Cost of Gas with a 3% Escalation of the Midstream Component**

Program and Service Territory	Utility Expenditures (\$1000s)		Gas Savings, Net (GJ)		Benefit Cost Tests			
	2014-2018	% of Total	2014-2018	% of Total	TRC (Ratio)	MTRC (Ratio)	Utility (Ratio)	Utility (\$/GJ)
<b>RESIDENTIAL (ALL PROGRAMS)</b>	<b>54,902</b>	<b>30.8%</b>	<b>2,362,301</b>	<b>24.4%</b>	<b>0.66</b>	<b>2.05</b>	<b>1.08</b>	<b>7.50</b>
Energy Efficient Home Performance Program	7,901	4.4%	618,980	6.4%	1.00	3.08	2.69	3.07
* Furnace Replacement Program	16,705	9.4%	468,527	4.8%	0.47	1.45	0.84	9.64
Enerchoice Fireplace Program	5,823	3.3%	215,973	2.2%	1.44	4.45	0.89	8.88
Appliance Service Program	2,281	1.3%	0	0.0%	0.00	0.00	0.00	n/a
* ENERGY STAR® Water Heater Program	6,275	3.5%	207,105	2.1%	0.58	1.81	1.03	8.00
Low-Flow Fixtures	1,450	0.8%	192,375	2.0%	2.79	8.61	2.61	2.95
* New Home Program	4,677	2.6%	122,125	1.3%	0.37	1.16	0.92	9.19
* New Technologies Program	1,556	0.9%	24,216	0.2%	0.34	1.05	0.33	23.49
* Customer Engagement Tool for Conservation Behaviours	4,428	2.5%	513,000	5.3%	0.80	2.56	0.80	8.60
Financing Pilot	1,105	0.6%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	2,700	1.5%	0	0.0%	0.00	0.00	0.00	n/a
<b>COMMERCIAL (ALL PROGRAMS)</b>	<b>54,144</b>	<b>30.4%</b>	<b>4,296,483</b>	<b>44.3%</b>	<b>0.98</b>	<b>3.05</b>	<b>1.58</b>	<b>5.03</b>
Space Heat Program	10,066	5.7%	848,671	8.8%	2.33	7.20	2.82	2.94
Water Heating Program	1,442	0.8%	215,798	2.2%	1.06	3.26	3.60	2.18
Commercial Food Service Program	2,448	1.4%	215,842	2.2%	1.66	5.11	2.21	3.56
Customized Equipment Upgrade Program	12,272	6.9%	771,502	8.0%	1.00	3.08	2.15	3.88
EnerTracker Program	964	0.5%	218,078	2.2%	1.49	5.04	1.42	4.42
* Continuous Optimization Program	9,214	5.2%	1,780,325	18.4%	0.76	2.35	1.81	3.92
Commercial Energy Assessment Program	2,339	1.3%	231,267	2.4%	0.94	3.02	0.67	10.11
Energy Specialist Program	9,882	5.6%	0	0.0%	0.00	0.00	0.00	n/a
Mechanical Insulation Pilot	16	0.0%	15,000	0.2%	5.26	16.25	27.78	0.30
Non-Program Specific Expenses	5,500	3.1%	0	0.0%	0.00	0.00	0.00	n/a
<b>INDUSTRIAL (ALL PROGRAMS)</b>	<b>12,896</b>	<b>7.2%</b>	<b>2,192,299</b>	<b>22.6%</b>	<b>2.82</b>	<b>8.67</b>	<b>3.80</b>	<b>2.05</b>
Industrial Optimization Program	9,148	5.1%	1,552,971	16.0%	2.65	8.18	3.57	2.17
Specialized Industrial Process Technology Program	2,438	1.4%	639,328	6.6%	4.26	13.12	6.67	1.19
Non-Program Specific Expenses	1,310	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>LOW INCOME (ALL PROGRAMS)</b>	<b>15,223</b>	<b>8.6%</b>	<b>406,432</b>	<b>4.2%</b>	<b>0.88</b>	<b>2.36</b>	<b>0.67</b>	<b>11.97</b>
Energy Savings Kit	651	0.4%	136,063	1.4%	4.94	13.31	3.18	2.36
Energy Conservation Assistance Program	10,240	5.8%	118,065	1.2%	0.40	1.06	0.30	26.55
REnEW	405	0.2%	0	0.0%	0.00	0.00	0.00	n/a
Low Income Space Heat Top-Ups	394	0.2%	36,766	0.4%	2.73	7.34	2.90	2.84
Low Income Water Heating Top-Ups	77	0.0%	10,742	0.1%	1.30	3.48	3.06	2.54
Non-Profit Custom Program	1,931	1.1%	104,796	1.1%	2.54	6.83	1.89	4.40
Non-Program Specific Expenses	1,525	0.9%	0	0.0%	0.00	0.00	0.00	n/a
<b>CONSERVATION EDUCATION AND OUTREACH (ALL PROGRAMS)</b>	<b>12,000</b>	<b>6.7%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
Residential Education Program	4,950	2.8%	0	0.0%	0.00	0.00	0.00	n/a
Commercial Education Program	2,250	1.3%	0	0.0%	0.00	0.00	0.00	n/a
School Education Program	3,600	2.0%	0	0.0%	0.00	0.00	0.00	n/a
Non-Program Specific Expenses	1,200	0.7%	0	0.0%	0.00	0.00	0.00	n/a
<b>INNOVATIVE TECHNOLOGIES (ALL PILOTS)</b>	<b>6,086</b>	<b>3.4%</b>	<b>435,173</b>	<b>4.5%</b>	<b>1.57</b>	<b>4.83</b>	<b>2.04</b>	<b>4.04</b>
<b>ENABLING ACTIVITIES (ALL ACTIVITIES)</b>	<b>22,740</b>	<b>12.8%</b>	<b>0</b>	<b>0.0%</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>n/a</b>
<b>ENTIRE PORTFOLIO</b>	<b>177,991</b>	<b>100.0%</b>	<b>9,692,688</b>	<b>100.0%</b>	<b>0.87</b>	<b>2.68</b>	<b>1.22</b>	<b>6.55</b>

Note: Whistler (FEW) is included in the FEI service territory

\* Program requires the MTRC in order to pass the economic screen