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April 11, 2014

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

B.C. Sustainable Energy Association  
c/o William J. Andrews, Barrister & Solicitor  
1958 Parkside Lane  
North Vancouver, B.C. V7G 1X5

Attention: Mr. William J. Andrews

Dear Mr. Andrews:

**Re: FortisBC Energy Inc. (FEI)**

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

**Response to the B.C. Sustainable Energy Association and the Sierra Club  
British Columbia (BCSEA) Information Request (IR) No. 1 on FEI Rebuttal  
Evidence**

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On June 10, 2013, FEI filed the Application as referenced above. In accordance with Commission Order G-9-14 setting out the Amended Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCSEA IR No. 1 on FEI Rebuttal Evidence.

Sincerely,

**FORTISBC ENERGY INC.**

***Original signed:***

Diane Roy

Attachments

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

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1   **1.0   Topic:       Gas furnace DSM program cost effectiveness**

2       **Reference:   FEI Exhibit B-46, Rebuttal Evidence of FEU to Evidence of BCSEA-**  
3       **SCBC, pp. 1-2.**

4       “The FEU are unable to agree with Mr. Plunkett and Mr. Chernick’s assessment of the  
5       cost effectiveness of natural replacement of furnaces for three primary reasons:

- 6       • The FEU are unable to replicate Mr. Plunkett and Mr. Chernick’s estimate of \$401 for  
7       the incremental cost of a natural replacement. FEU’s estimate of this cost is \$977,  
8       based on the average of contractor feedback on program applications in the 2012  
9       Furnace Replacement Pilot and validated by contractors attending the January 2013  
10      Program Design workshop.
- 11      • Mr. Plunkett and Mr. Chernick do not appear to account for free ridership.
- 12      • Mr. Plunkett and Mr. Chernick do not appear to account for program administration  
13      costs of \$353,000.”

14      1.1     When determining the incremental cost and energy savings of a furnace natural  
15      replacement, what AFUE efficiency level does FEU consider to be the baseline?  
16

17      **Response:**

18      The FEU consider the baseline for a natural replacement program to be 90 – 92 AFUE based  
19      on the B.C. Energy Efficiency Act Standards – MEMPR Enforcement Bulletin 09-03<sup>1</sup>.

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23           1.1.1   Does FEU consider the baseline to be the Code AFUE efficiency level?  
24                   Or does FEU use a higher baseline assuming some customers would  
25                   have installed the efficient furnace absent the program (adjusted  
26                   baseline)?  
27

28      **Response:**

29      Yes, the FEU consider the baseline to be the Code AFUE efficiency level as this is the  
30      commonly-used treatment in all EEC programs that are “natural replacement”.

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<sup>1</sup> MEMPR Enforcement Bulletin 09-03: BC Efficiency Act Standards: Gas and Propane-Fired Furnaces  
<http://www.empr.gov.bc.ca/EEC/Strategy/EEA/Pages/RegulatedProducts.aspx>



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1.2 In FEI Exhibit B-7, Attachment 4.11 spreadsheet, the \$977 is represented as the increase over code furnace. Please confirm.

**Response:**

Confirmed.

1.3 In FEI Exhibit B-7, Attachment 4.11 spreadsheet, a high-efficiency installed furnace cost is shown as \$4,365, a code furnace cost is shown as \$3,388 and an adjusted base furnace is shown as \$3,960. Please confirm the following:

1.3.1 The incremental cost of a high-efficiency furnace compared to code is the difference between \$4,365 and \$3,388 (i.e., \$977).

**Response:**

Confirmed.

1.3.2 The incremental cost of a high-efficiency furnace compared to an adjusted baseline furnace is the difference between \$4,365 and \$3,960 (i.e., \$405).

**Response:**

This response addresses BCSEA Rebuttal IRs 1.1.3.2, 1.1.4.4, 1.1.5 and 1.1.6 concerning the cost effectiveness inputs that should be used for a natural replacement program in comparison to an early replacement program.

In natural replacement programs, the incremental cost used in TRC calculations would be \$977, which is the difference between the cost of a base code furnace and the high efficiency model being incented in the program. The energy savings would be 3.0 GJs. In a natural replacement



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1 program, there is no reason to adjust the baseline furnace costs, so an adjusted baseline  
2 calculation would not be available, nor would it be considered.

3 The following discussion explains why an adjusted base line calculation is not appropriate in a  
4 natural replacement program but rather is a component of calculating Period 2 savings in an  
5 early replacement program. As previously discussed, early replacement savings are calculated  
6 in two steps:

7 Period 1: For the period of time between when the new furnace was installed and the  
8 time it would normally have been replaced, the savings would be the difference in  
9 consumption between the existing furnace and the new high efficiency furnace.

10 Period 2: If the program induces the home owner to install **a more efficient furnace**  
11 **than they otherwise would**, then additional savings will occur into the future.

12 FEI used an adjusted base line calculation only for Period 2 savings and costs of its early  
13 replacement program as explained in the response to BCSEA IR 1.4.10:

14 “In a conventional DSM program, the incremental cost is determined by subtracting the  
15 cost of the base “code” heating system from the cost of the upgraded or program  
16 furnace. The same principle is applied in an early replacement program, except that the  
17 time difference between when the furnace is replaced in response to the program’s  
18 incentive (beginning of year 1) and when it would be replaced if waiting for the system to  
19 fail (determined to be year 4.3) must be taken into consideration. The incremental cost is  
20 therefore determined by taking the net present value (NPV) of the base “code” heating  
21 system and the NPV of the high efficiency model and then subtracting these two  
22 amounts.”

23 In a natural replacement program, there is no need to adjust the incremental cost from base  
24 code for the time value of money as described above.

25 As explained in the response to BCSEA IR 1.4.11, the baseline for the early replacement  
26 program is further adjusted as follows:

27 “The cost of the base furnace is further adjusted to account for the fact that  
28 approximately 59% of respondents stated that they would have installed a High  
29 Efficiency rather than a base furnace. The adjusted base furnace is now a blended cost  
30 of the code furnace (~41%) and the HE furnace (~59%). So this basically reduces the  
31 incremental cost of the furnace.”

32 In summary, in this early replacement program, Period 1 savings are a result of customers  
33 committing to an early upgrade. In a natural replacement program, the incremental cost is \$977  
34 and the energy savings is 3.0 GJs. There is no basis to apply FEI’s adjusted base line to the  
35 natural replacement program.



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1.4 In FEI Exhibit B-20, Attachment 1.2 spreadsheet, various furnace savings are shown depending on the furnace baseline. Please confirm the following:

1.4.1 The savings for a high-efficiency furnace (96.1 AFUE) compared to code (92 AFUE) are 3.0 GJ, based on the total of cells H5 (0.7 GJ) and H6 (2.3 GJ).

**Response:**

Confirmed.

1.4.2 The savings for a high-efficiency furnace (96.1 AFUE) compared to an adjusted baseline furnace are 1.7 GJ, as shown in cell H14.

**Response:**

Confirmed. See the response to FEI BCSEA Rebuttal IR 1.1.3.2.

1.4.3 For measure cost-effectiveness analysis of a high efficiency furnace compared to a code furnace the incremental cost is \$977 and the energy savings would be 3.0 GJ.

**Response:**

Confirmed.



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1                    1.4.4    For measure cost-effectiveness analysis of a high efficiency furnace  
2    compared to an adjusted baseline furnace the incremental cost is \$405  
3    and the energy savings is 1.7 GJ.  
4

5    **Response:**

6    As explained in the response to FEI BCSEA Rebuttal IR 1.1.3.2, the adjusted baseline furnace  
7    is only applicable to calculating Period 2 savings in an early replacement program.  
8  
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11                    1.5    What furnace incremental cost and savings does FEU recommend be used  
12    together for determining cost-effectiveness of natural replacements at the  
13    measure level, before factoring in free ridership or including other program  
14    costs?  
15

16    **Response:**

17    Please refer to the response to FEI BCSEA Rebuttal IR 1.1.3.2.  
18  
19  
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22                    1.6    When calculating the TRC or MTRC cost-effectiveness of furnaces, does FEU  
23    agree that no further free ridership needs to be included if an adjusted baseline is  
24    used that decreases the costs and savings by accounting for the participants that  
25    would have installed the high-efficiency furnace absent the program? If not, why  
26    not?  
27

28    **Response:**

29    This question appears to assume incorrectly that the adjusted baseline accounts for free  
30    ridership in a natural replacement program. Please refer to the response to FEI BCSEA  
31    Rebuttal IR 1.1.3.2 which describes the use of the adjusted baseline for calculating Period 2  
32    savings for an early replacement program. The adjusted baseline used by FEI for Period 2  
33    savings cannot be used as the incremental cost for natural replacement adjusted for free riders,  
34    The incremental cost of \$977 would still be used.

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1.7 Does FEU agree that when initially considering which measures to include in a DSM program it is good practice to first consider the measure TRC and MTRC cost-effectiveness before including program costs (excluding incentives) and free ridership? If not, why not?

**Response:**

Agreed. The FEU screen all measures that are being considered for inclusion in EEC programs through initial cost benefit scenarios and sensitivity analysis in the initial stages of business case development and program design. However, this is an initial screen only, and ultimately program costs and free riders must be included in the final program design.

1.8 Has FEU determined the TRC and MTRC cost-effectiveness of high-efficiency furnaces at the time of natural replacement at the measure level, before factoring in free ridership and program costs? If so, please provide such an analysis.

**Response:**

Yes. As stated in the response to BCSEA IR 1.4.5 (FEI Exhibit B-7):

*“As part of developing the Furnace Early Replacement Program, sensitivity analysis was conducted to assess a program targeting the general population of furnace replacements. Through this analysis, it was determined that a replacement of a furnace with “zero” years of advancement would have an MTRC of 0.76; thus, this element of a potential furnace replacement program was deemed by the Companies not to be cost-effective and therefore was not included in the pilot program.”*

The following charts provide further evidence to the response to BCSEA IR 1.4.5 as extracted from the 2012 business case:

Scenarios prior to the inclusion of program costs are as follows:

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**Figure 16: MTRC for Varying Periods of Advancement**

	0 years	5 years	12 years
Standard Furnace (AFUE 65)	0.76	2.23	2.75
Mid-efficiency Furnace (AFUE 80)	0.76	1.25	1.36
Boiler – Estimated (AFUE 70)	0.60	0.92	1.06
Boiler – Estimated (AFUE 80)	0.60	0.63	0.59

1

2 Scenarios after the inclusion of program costs are as follows:

**Figure 19: MTRC for Varying Periods of Replacement Advancement**

	Base Case	0 years	2 years	5 years	12 years
Sensitivity – varying advancement	1.64	0.61	1.05	1.43	1.82

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1.9 Does FEU agree that when applying free ridership in TRC or MTRC cost-effectiveness the free ridership affects both measure costs and savings equally (i.e., both are reduced by the same percentage)? If not, why not?

**Response:**

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Other than for screening purposes (see response to BCSEA Rebuttal IR 1.1.7) the FEU do not calculate the TRC or MTRC at the measure level. At the program and portfolio levels, costs and savings in the TRC and MTRC are not impacted equally by free ridership. Total incremental cost and energy savings are both reduced by free-ridership, while program and portfolio administration and program marketing costs are not impacted by free-ridership.



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1    **2.0    Topic:           DSM cooperation with other utilities and agencies**

2           **Reference:    FEI Exhibit B-46, Rebuttal Evidence of FEU to Evidence of BCSEA-**  
3                    **SCBC, p. 2.**

4            “Yes, the FEU have discussed in their evidence their intention to include heating  
5            systems in a Deep Retrofit Champion Bonus. The FEU are working with utility partners  
6            and the government to transition the LiveSmart platform into a more accessible model in  
7            order to provide value to customers in providing ‘improvements in building thermal  
8            integrity as part of a whole-house, comprehensive retrofit program’. The Furnace  
9            Replacement Program, and other stand-alone gas measures will reside within the ‘Home  
10           Energy Rebate Offer Program’ currently under development with phase I to launch in  
11           spring of 2014.”

12           2.1       Please explain in more detail what is envisioned for the LiveSmart transition and  
13                    how it will improve whole-house comprehensive treatment of both gas and  
14                    electric savings.

15  
16    **Response:**

17    As outlined in the responses to BCSEA IR 1.3 series (FEI Exhibit B-7) and BCSEA IR 2.3 series  
18    (FEI Exhibit B-20), the FEU, BC Hydro and FortisBC PowerSense are collaborating on the  
19    Home Energy Rebate Offer (HERO) Program with Phase I to be launched in the spring of 2014.  
20    Utility partners have invested resources in program design and implementation including a new  
21    incentive structure, a common administrative platform, and shared communications plans. As  
22    the next step, program partners are examining ways to add more value to the home energy  
23    assessment process and determine ways to claim energy savings that would justify financial  
24    contributions from utilities.

25    Over time, we believe utility collaboration through a shared administrative and marketing  
26    platform will improve the whole-house comprehensive treatment of both gas and electric  
27    savings. The collaboration is intended to increase market transformation, build relationships with  
28    industry for training, capacity development and job creation, and cost-effectively increase the  
29    reach of DSM rebate programs. Furthermore, collaboration will drive additional savings through  
30    increased energy literacy and the promotion of a culture of conservation through shared  
31    messaging in utility marketing channels.

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35           2.2       Please explain the interaction of the Deep Retrofit Champion Bonus, LiveSmart,  
36                    and the Home Energy Rebate Offer Program and how whole-house  
37                    comprehensive treatment of both gas and electric savings will be facilitated.



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2 **Response:**

3 As noted in the response to FEI BCSEA Rebuttal IR 1.2.1, the FEU, BC Hydro and FortisBC  
4 PowerSense are collaborating on a HERO Program with Phase I to be launched in the spring of  
5 2014. The HERO Program will facilitate a whole- house comprehensive treatment of both gas  
6 and electric savings. The HERO Program will be presented to customers as a seamless  
7 operation and, where possible, province-wide offers will be available. The FEU's Furnace  
8 Replacement Program, and other stand-alone gas measures will reside within the HERO  
9 Program, along with electric DSM measures offered by BC Hydro and FortisBC PowerSense.

10 The Deep Retrofit Champion Bonus will be a measure within the broader HERO Program. As  
11 outlined in the response to BCSEA IR 1.3.1 (FEI Exhibit B-7), the objective of the bonus is to  
12 promote deeper retrofits through an incentive for homeowners to conduct multiple upgrades. In  
13 order to receive this \$750 bonus, the customer must conduct Pre and Post Retrofit Home  
14 Energy Assessments, and select three or more qualifying measures including insulation, air  
15 sealing, windows, heating or water heating systems. Energy savings for the Deep Retrofit  
16 Champion Bonus will be based on a program evaluation which will demonstrate the percentage  
17 of measures taken as a direct result of the bonus offer. Additional savings will be garnered  
18 through the inclusion of windows and other measures such as heating systems that may not  
19 generally be included in the ongoing base offer.

20 Provincial funding of the LiveSmart BC Efficiency Incentive Program ended March 31, 2014,  
21 therefore there is no interaction between LiveSmart and the HERO Program or LiveSmart and  
22 the Deep Retrofit Champion Bonus. Ministry staff will, however, be available to support and  
23 promote home energy retrofit initiatives.

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1    **3.0    Topic:        DSM targeting high-users**

2        **Reference:    FEI Exhibit B-46, Rebuttal Evidence of FEU to Evidence of BCSEA-**  
3        **SCBC, pp. 2-3.**

4        “Targeting high-users as suggested would add to the administrative costs of the program  
5        and is currently not planned by the FEU. However, the Customer Engagement Tool will  
6        allow the FEU to target customers more effectively in the coming years. Refer to Exhibit  
7        B-11, response to BCUC IR 1.222.4.1 for a discussion of this issue.”

8        3.1    Has the FEU considered identifying high-users by simply looking at the customer  
9        gas bills?

10

11    **Response:**

12    This response addresses FEI BCSEA Rebuttal IRs 1.3.1 and 1.3.2 and FEI CEC Rebuttal IRs  
13    1.3.1 and 1.3.2.

14    The FEU can indeed identify high-users by looking at billing consumption history, which would  
15    require additional staff resources. However, once the high user customer segments are  
16    identified, a direct mail promotion to the selected participants is costly based on an estimate of  
17    >\$0.80 per contact. If, for example, the FEU wanted to contact 20 percent of customers based  
18    on gas consumption while targeting neighbourhoods with older vintage homes with a resultant  
19    higher probability of requiring a heating system upgrade, the promotion would cost about \$150  
20    thousand.

21    The FEU’s marketing channels of our website, bill inserts, Conserver Enewsletter and contractor  
22    outreach are a cost effective means to reach all customers. Program participation targets in this  
23    popular program have been met mostly through contractor engagement and therefore costly  
24    promotions have not been required to date.

- 25        • In the fall of 2012, a \$40 thousand marketing investment resulted in over three thousand  
26        participants in eight weeks during the heating season
- 27        • In the summer of 2013, a \$26 thousand marketing investment resulted in over two  
28        thousand participants with a ten week pre-qualification period outside the heating  
29        season

30    The FEU recognize the benefits of customer segmentation and target marketing. EEC behavior,  
31    energy literacy and rebate programs will benefit from the Customer Engagement Tool project,  
32    expected to launch in late 2014. Through this project, targeted communications will add more  
33    value per customer contact through Home Energy Reports illustrating consumption over time  
34    and neighbour comparisons, energy savings tips and promotional offers. At the time of writing, a  
35    vendor is being selected and an implementation plan is under development.



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3.2 Would the FEU consider this approach to be too administratively costly? If so, why?

**Response:**

Please refer to the response to FEI BCSEA Rebuttal IR 1.3.1.