



**Diane Roy**  
Vice President, Regulatory Affairs

**Gas Regulatory Affairs Correspondence**  
Email: [gas.regulatory.affairs@fortisbc.com](mailto:gas.regulatory.affairs@fortisbc.com)

**Electric Regulatory Affairs Correspondence**  
Email: [electricity.regulatory.affairs@fortisbc.com](mailto:electricity.regulatory.affairs@fortisbc.com)

**FortisBC**  
16705 Fraser Highway  
Surrey, B.C. V4N 0E8  
Tel: (604) 576-7349  
Cell: (604) 908-2790  
Fax: (604) 576-7074  
Email: [diane.roy@fortisbc.com](mailto:diane.roy@fortisbc.com)  
[www.fortisbc.com](http://www.fortisbc.com)

September 20, 2018

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

Attention: Mr. Christopher P. Weafer

Dear Mr. Weafer:

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

**Project No. 1598964**

**Application for Acceptance of 2019-2022 Demand Side Management (DSM)  
Expenditures Plan (the Application)**

**Response to the Commercial Energy Consumers Association of British  
Columbia (CEC) Information Request (IR) No. 1**

---

On June 22, 2018, FEI filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-138-18 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to CEC IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

**FORTISBC ENERGY INC.**

***Original signed:***

Diane Roy

Attachments

cc (email only): Commission Secretary  
Registered Parties

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 1

1     **1.     Reference:     Exhibit B-1, page 6 – 7**

The energy savings in FEI's DSM Plan are generally consistent with the 2017 LTGRP forecast Reference Case energy savings.<sup>6</sup> From 2019 until 2022, FEI's DSM Plan forecasts eight percent higher energy savings than FEI's 2017 LTGRP. FEI's DSM Plan indicates expenditures that average \$81.14 million per year (including inflation). For the same period, the 2017 LTGRP Reference Case forecasts a theoretical estimate of DSM expenditures that average \$42.80 million per year. However, energy savings and expenditure figures are not directly comparable in absolute terms. By virtue of representing a long term forecast and in contrast to FEI's DSM Plan, the 2017 LTGRP does not take into account the following factors:

- Non-incentive expenditures that support or enable DSM programs at the portfolio level, such as enabling activities and conservation education outreach;
- Operational program delivery considerations, such as changes in required DSM staffing levels, program eligibility requirements, or measure packaging and marketing; and
- Emergence of new technologies more than five years into the future or technologies which are currently unknown which may increase aggregate energy savings opportunities and thus enable greater actual DSM program expenditures.

The 2017 LTGRP provides a sensitivity analysis, sourced from the BC CPR's Bass Diffusion model, of how changes in the value of FEI's measure incentives, as a proportion of incremental measure cost, impact forecast energy savings and estimated DSM expenditures. This analysis showed that, directionally, energy savings increased at a lower rate than the estimated DSM expenditures when applying a limited set of increasing measure level incentive values. This directionally aligns with FEI's DSM Plan forecasting eight percent higher energy savings for the 2019-2022 period at 47 percent higher annual expenditures than the 2017 LTGRP.

The 2017 LTGRP projects that, as part of a long term plan for implementing DSM activities, FEI will continue to perform residential, commercial, industrial, low income, innovative technologies, conservation education and outreach as well as enabling DSM activities. FEI will implement this long-term plan via successive DSM plans which take into account the prevailing market, regulatory, and end-use technology conditions. Within this framework, FEI's proposed DSM expenditure schedule and attached DSM Plan are consistent with the 2017 LTGRP.

2

3             1.1     What are the differences between FEI's DSM Plan and the 2017 LTGRP? Please  
4                     explain and provide quantification.

5

6     **Response:**

7     Please refer to the responses to BCUC IRs 1.2.2, 1.2.4, 1.2.5.1, and BCSEA IR 1.6.1.

8

9

10

11             1.2     In what ways, if any, would FEI's LTGRP plan change if it were modified to reflect  
12                     FEI's proposed DSM plan? Please explain.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 2

**Response:**

As FEI explained in response to BCUC IR 2.57.1.2 in the 2017 LTGRP proceeding, FEI updates its LTGRP at regular intervals and considers the most recent practically available information when preparing forecasts for each iteration of the LTGRP. By virtue of having to meet specific submission dates, each iteration of the LTGRP necessarily needs to represent inputs that capture a certain snapshot in time rather than a continuously updated stream of input data.

Changing the LTGRP to reflect FEI's proposed 2019-2022 DSM Plan would require updating the entire set of numerous inputs to the LTGRP, including its DSM assumptions, whose complex interactions condition the LTGRP forecast results. FEI is unable to complete this complex exercise in the time allotted to respond to these information requests, and doing so would have limited, if any, value. As a directional and simplified indication, the LTGRP DSM measure assumptions and measure mix may change to approximate the 2019-2022 DSM Plan's expenditures and energy savings for the 2019-2022 period.

1.3 Please elaborate on the types of conditions FEI might consider under 'prevailing market,' 'regulatory', and 'end-use technology' conditions, and how these would affect the DSM plan.

**Response:**

Prevailing market conditions include, but are not limited to, macroeconomic factors, customer preferences and behavior, and energy supply trends. Regulatory conditions include, but are not limited to, policy and regulation that impacts the economy and innovation as well as the extraction, transfer and use of energy. End-use technology conditions include, but are not limited to, the characteristics of technologies that use or influence the use of energy at the final consumption point. These could be simple changes in equipment efficiencies, new features (e.g. end-use carbon capture) that influence how energy use adapts to regulation, or information technology (e.g. smart learning thermostats or home energy reporting) that influences how end-users interact with their energy end-use equipment. Given the complex interaction of these conditions, FEI is not able to predict the specific impacts each one might have on the DSM Plan. Any of these conditions may shift upwards or shift downwards measure assumptions, participation inputs, and program design parameters which may either increase or decrease DSM Plan energy savings and expenditures.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 3

1    2.    **Reference:    Exhibit B-1, page 10**

**Table 3-3: FEI Incentive Expenditures: 2016 Actuals vs. DSM Plan**

	Actual	Proposed			
	2016	2019	2020	2021	2022
Total incentive expenditures (thousands)	\$ 21,045	\$ 42,623	\$ 47,957	\$ 59,625	\$ 65,411
Increase as a percentage of 2016	0%	103%	128%	183%	211%

2

3            2.1        Please confirm that the figures in Table 3-3 are in thousands of dollars.

4

5    **Response:**

6    Confirmed.

7

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 4

1     **3.     Reference:     Exhibit B-1, page 10**

In October 2017, the BC Government introduced the Climate Solutions and Clean Growth Advisory Council to provide strategic advice to government on climate action and clean economic growth. In December 2017, the Government of Canada announced a partnership with the Government of BC for energy efficiency and climate action in the province. This includes funding toward a Building Energy Retrofit Partnership that will provide financial incentives to households and businesses to undertake retrofits that reduce greenhouse gas emissions and energy bills. FEI is currently in discussion with the Ministry of Energy, Mines, and Petroleum Resources regarding the integration of the Retrofit Partnership with the current FEI program portfolio.

2

3             3.1     Please provide further details of the Government of Canada partnership with the  
4                     Government of BC, including quantification of any financial incentives.

5

6     **Response:**

7     Please refer to the response to BCSEA IR 1.1.4.

8

9

10

11             3.2     When does FEI expect to integrate the Retrofit Partnership with the current FEI  
12                     program portfolio?

13

14     **Response:**

15     Please refer to the response to BCSEA IR 1.1.4.

16

17

18

19             3.3     How does FEI expect the Retrofit Partnership to change the current FEI program  
20                     when they are integrated, if at all?

21

22     **Response:**

23     Please refer to the response to BCUC IR 1.14.1.

24

25

26

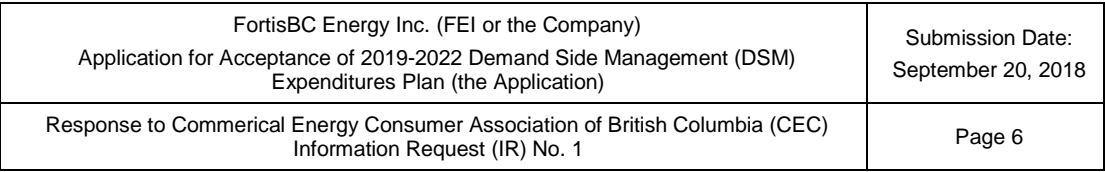
FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 5

1           3.4     Please provide an estimate of the DSM expenditures and savings that would be  
2                     expected as the Retrofit Partnership is integrated into FEI's plans.

3  
4     **Response:**

5     Please refer to the response to BCUC IR 1.14.1.

6



Please refer to the response to BCSEA IR 1.8.1.1.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 7

1     **5.     Reference:     Exhibit B-1, page 20**

FEI requests acceptance of expenditures over a four-year period in order to maintain certainty in the market that FEI will be able to offer the programs listed in the DSM Plan over an extended time. This allows external parties such as contractors, manufacturers and other program partners to better support DSM initiatives knowing that they will be established for the long term. This approach also promotes regulatory efficiency, enabling FEI to take advantage of program momentum and allows DSM staff to focus their time and attention on program development and operation.

2

3             5.1     Why is four years the appropriate time frame instead of 3 or 5 years? Please  
4                     explain.

5

6     **Response:**

7     Four years was established as the time frame for the DSM Plan to better align with the long  
8     term gas resource planning cycle and to better align with the FBC electric DSM and long term  
9     electric resource planning cycle. This alignment promotes regulatory and internal operational  
10    efficiency related to both FEI and FBC DSM Plan applications.

11   As discussed in the Application (and referenced in the above preamble), a longer DSM Plan  
12   period also maintains certainty in the market regarding program offers. In addition to allowing  
13   contractors, manufacturers and other program partners to better support DSM initiatives with the  
14   knowledge that they will be established for a longer term, a longer period also allows for building  
15   deeper program knowledge among partners through their experience. It may also allow for  
16   broader customer awareness through sustained program communications and customer word  
17   of mouth.

18

19

20

21             5.2     Would there be any value in providing a 3 or 5 year spending schedule? Please  
22                     explain why or why not, and assess value to customers assuming increased  
23                     DSM expenditures after 3 years based on new developments and continuity of a  
24                     base for 5 years.

25

26   **Response:**

27   FEI believes the most appropriate timeframe for the DSM schedule following the 2014-2018  
28   period is the four-year period included in the Application. Please refer to the response to CEC  
29   IR 1.5.1 for additional information regarding the selection of this timeframe.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 8

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22

5.3 What types of initiatives benefit most from longer-term commitments? Please explain.

**Response:**

Many initiatives across program areas demonstrate the benefits of longer term funding commitments. It takes time to build customer awareness, educate contractors/builders about program eligibility rules and ensure that suppliers have available qualifying products. Capital planning and budgeting for large projects (commercial, industrial, residential and social housing developments) may take place over a multi-year planning cycle. Stable funding ensures energy efficiency is built into the project plans and throughout the buildout. Many programs are reliant on partnerships and delivery agents that require an ongoing funding source to provide stability in the market. It takes significant resources to build infrastructure to support rebate administration and therefore it is beneficial to know that the investment will pay off over time. Initiatives to support Quality Installation and contractor/builder accreditation are long term projects requiring support from utilities and other partners. School Education programs require time to develop curriculum-connected content that aligns with the Ministry of Education requirements and to successfully promote the resource to teachers. In summary, long term stability of DSM funding benefits initiatives across the entire DSM portfolio.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 9

1     **6. Reference: Exhibit B-1, page 22**

FEI is requesting acceptance of DSM expenditures for 2019-2022 of \$324.6 million. FEI is forecasting annual DSM expenditures in each of the program areas as outlined in Table 6-1. These expenditures are stated in "as-spent" dollars, including inflation. If accepted, these are the values that FEI will report actual spending against in each year's Annual DSM Report. These are the same values shown in Exhibit 1 of the DSM Plan (Appendix A). For simplicity, all other tables in Appendix A show proposed expenditures in 2019 dollars (uninflated).

**Table 6-1: FEI DSM Expenditures - 2019-2022 Forecast, Shown in As Spent Dollars \***

Program Area	Utility Expenditures (\$000s)				
	All Spending				
	2019	2020	2021	2022	Total
Residential	23,521	25,722	28,476	31,383	109,101
Commercial	13,837	17,357	27,441	31,081	89,715
Industrial	3,103	3,152	3,644	3,708	13,607
Low Income	6,630	6,795	6,984	7,217	27,626
Conservation Education and Outreach	7,155	7,360	8,595	9,467	32,578
Innovative Technologies	2,043	2,202	2,631	3,062	9,938
Enabling Activities	8,426	8,321	9,230	8,918	34,895
Portfolio Level Activities	1,635	1,676	1,822	1,975	7,108
<b>ALL PROGRAMS</b>	<b>66,350</b>	<b>72,585</b>	<b>88,822</b>	<b>96,811</b>	<b>324,567</b>

2

3             6.1 Please provide the above Table 6-1 in 2019 dollars, uninflated, as Table 6-1(a).

4

5     **Response:**

6 Please see the table below.

**Table 6-1(a): FEI DSM Expenditures - 2019-2022 Forecast, Shown as 2019 Dollars**

Program Area	Total Utility Expenditures (\$000s)				
	2019	2020	2021	2022	Total
Residential	23,521	25,213	27,361	29,558	105,654
Commercial	13,837	17,009	26,352	29,245	86,444
Industrial	3,103	3,088	3,498	3,487	13,175
Low Income	6,630	6,659	6,707	6,791	26,787
Conservation Education and Outreach	7,155	7,203	8,233	8,868	31,459
Innovative Technologies	2,043	2,156	2,523	2,876	9,597
Enabling Activities	8,426	8,154	8,862	8,390	33,832
Portfolio Level Activities	1,635	1,635	1,735	1,835	6,840
<b>ALL PROGRAMS</b>	<b>66,350</b>	<b>71,117</b>	<b>85,272</b>	<b>91,049</b>	<b>313,787</b>

7

8

9

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 10

1

2           6.2     Please provide matching present values for savings streams associated with  
3                   each year of these expenditures in a complementary Table 6-1(b).

4

5     **Response:**

6     Please see the table below. FEI notes that a correction was made to the overall energy savings.  
7     The following analysis uses the corrected values. Please refer to the revised Appendix A,  
8     Exhibit 6 provided in the Errata filed concurrently with these IR responses.

**Table 6-1(b): Present Value (2019) of Net Lifetime Gas Savings, FEI DSM 2019-2022 Forecast**

Program Area	PV of Net Lifetime Gas Savings (GJ)				Total
	2019	2020	2021	2022	
Residential	2,714,585	2,986,234	3,079,158	3,197,489	11,977,465
Commercial	3,026,523	2,989,931	4,055,224	4,359,421	14,431,099
Industrial	1,962,834	1,859,097	2,009,838	1,903,616	7,735,384
Low Income	698,270	666,506	635,972	606,945	2,607,693
Conservation Education and Outreach	0	0	0	0	0
Innovative Technologies	0	0	0	0	0
Enabling Activities	0	0	0	0	0
Portfolio Level Activities	0	0	0	0	0
<b>ALL PROGRAMS</b>	<b>8,402,212</b>	<b>8,501,767</b>	<b>9,780,191</b>	<b>10,067,471</b>	<b>36,751,641</b>

9

10

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 11

7. Reference: Exhibit B-1, page 26

2. C&EM expenditures will have a goal of incentive costs exceeding 50 percent of the expenditures in a given year.

7.1 How did FEI arrive at the goal of incentive costs exceeding 50 percent of the expenditures in a given year?

**Response:**

The DSM Guiding Principle referenced in the above preamble is a qualitative approach to designing incentives that ensures a higher proportion of C&EM expenditures are delivered to customers as incentives to assist in offsetting the higher incremental cost of higher efficiency equipment and appliances. FEI did not undertake a quantitative analysis of different potential threshold levels in setting this DSM Guiding Principle. FEI notes that the goal of incentive costs exceeding 50 percent of expenditures in a given year has been an FEI DSM Guiding Principle for many years and during 2014-2017 actual incentive costs were more than 60 percent of total expenditures annually<sup>1</sup>.

7.2 What other levels did FEI consider, and why did it select 50% as the appropriate threshold?

**Response:**

Please refer to the response to CEC IR 1.7.1.

7.2.1 Please provide quantitative analysis supporting this decision.

**Response:**

Please refer to the response to CEC IR 1.7.1.

---

<sup>1</sup> FEI Natural Gas Demand-Side Management Programs Annual Reports, 2014-2017.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 12

1

2     **8.       Reference:   Exhibit B-1, page 26**

3                     7. FEI will seek collaboration for programs from other parties, such as governments, other  
4                     utilities, and equipment suppliers and manufacturers in recognition of the broader  
5                     societal benefits resulting from successful program development and implementation.

6

7                     8.1     Please provide examples of the types of collaboration that FEI will seek out from  
8                     other parties.

9

10                    **Response:**

11                    Collaborating partners and the types of collaborations that FEI will seek out from other parties  
12                    include the following:

13                    Utility partners – BC Hydro and FortisBC Inc. (FBC)

- 14                    • Program offers and design
- 15                    • Customer engagement
- 16                    • Trades outreach and training
- 17                    • Program evaluation in support of province-wide offers where reasonable to do so

18

19                    Government – local governments, provincial and federal (Natural Resources Canada), BC  
20                    Housing

- 21                    • Co-fund offers, studies, events, program delivery
- 22                    • Trades engagement, quality installation and accreditation
- 23                    • Energy advisor support and home labeling initiatives

24

25                    Associations – Those listed below have active member communication channels and events to  
26                    help educate the market about program requirements, provide feedback on program design and  
27                    contractor outreach.

- 28                    • Home Performance Stakeholder Council (HPSC)
- 29                    • Canadian Home Builders Association (CHBA)
- 30                    • Thermal Environmental Comfort Association (TECA)

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 13

- Heating Refrigeration and Air Conditioning Institute of Canada (HRAI)

- Hearth Patio and Barbecue Association of Canada (HPBAC)

- Canadian Institute Plumbing Heating (CIPH)

Other – Includes manufacturers, contractors, builders, trades, engineers, architects, energy advisors and other building professionals.

- Program training and feedback gained through customer interactions

- Improvement to program design through consultation

- Contributions to FEI's knowledge base of building performance

- Partnerships for upstream incentives

8.2 What are the expected benefits of establishing collaborations with other parties?  
Please explain.

**Response:**

The expected benefits of establishing collaborations with other parties include:

- Increased breadth and depth of offer when working with co-funding partners;
- Providing customers with a single province-wide offer to improve ease of access;
- Partnerships for upstream incentives;
- Cost efficiencies on incentives, administration, communications, evaluation, and trades training expenditures;
- Increased awareness through use of external marketing channels drives program participation;
- Consistent and unified messaging resulting in improved energy literacy;
- Program messaging is heard through local and trusted sources such as local government or service providers;

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 14

- Greater program uptake in the harder to reach segments such as low income, Indigenous communities and new Canadians;
- Program development improvements made through industry insights to the benefits of customers, builders and trades; and
- Work with industry and partners to work on trades training for improved equipment performance and longevity in addition to improved building performance overall.

8.3 Please provide any quantitative analysis and/or estimate validating the benefits of this outreach.

**Response:**

Collaborations are typically analyzed qualitatively, as quantitative analysis of collaboration efforts can be very time consuming and take away from program development and implementation work. Please refer to the response to CEC IR 1.8.2 for a list of the qualitative benefits of collaboration.

FEI has, however, undertaken a quantitative analysis of the cost savings benefits of collaborating with BC Hydro. Earlier this year, FEI and FBC worked with BC Hydro to update the assessment of their collective program/initiative collaboration cost savings. FEI, FBC and BC Hydro conducted a joint review of incremental cost efficiencies occurring as a direct result of the partnership over the April 1, 2013 to March 31, 2018 time period (based on BC Hydro fiscal years). This review examined the costs incurred for each program and project collaboration that was in place over this time period and determined that FEI, FBC and BC Hydro combined had total incremental cost efficiencies of approximately \$21.5 million as a result of working together.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 15

1     **9.     Reference:   Exhibit B-1, page 26**

10. Programs will support market transformation by incenting efficient measures through customers and/or trade allies (contractors, equipment manufacturers, distributors, retailers, etc.), developing trade ally capacity, and supporting codes and standards development and implementation.

2

3             9.1     Does FEI measure the amount of 'market transformation' that occurs over any  
4                     given period of time?

5

6     **Response:**

7     Yes. FEI continues to conduct market studies on a program-by-program basis and assess  
8     adoption of energy efficient equipment through end-use studies. For program level evaluation,  
9     FEI measures market effects, using a combination of interviews with market actors  
10    (manufacturers and distributors), industry stakeholders, program management and subject  
11    matter experts, and analysis of available data and information obtained from industry reports,  
12    program documents, program data, and government policy papers.

13   FEI's ability to determine metrics on market transformation depends on the availability and  
14   reliability of market data, market product mix, and up-to-date model directories to provide insight  
15   on changes to the market. Over the last five years, FEI has formally conducted three program  
16   level market transformation studies and two end-use studies through third party consultants.  
17   The list of studies and a summary of their high level results are provided below:

18   1. Furnace Replacement Pilot Program – Quality Installation Study for Furnaces, Ecolighten  
19     Energy Solutions, September 2013

20    **Results:**

- 21             • Found that issues with a lack of quality installations of furnaces have been  
22               addressed through the program requirements and awareness built by the program;  
23               and
- 24             • Acknowledgment that some elements of program compliance and performance  
25               optimization of furnaces are at a minimal level creating opportunity for the Furnace  
26               Replacement Program to bring recognition to the importance of quality installation on  
27               the performance and efficiency of the heating system.

28

29   2. EnerChoice Fireplace Program Market Effects Evaluation, Sampson Research Inc., May  
30     2016

31    **Results:**

- 32             • The EnerChoice Fireplace Program is credited with increasing the overall volume of  
33               fireplace sales by 10% over the last five years;

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 16

- Customer awareness of the EnerChoice label is high; and
- Overall market penetration of the EnerChoice eligibility has increased from 25% in 2008 to as high as 80% currently according to industry experts.

### 3. BC Fenestration Market Study, RDH Building Science Inc., October 2016

#### Results:

- Manufacturers awareness that the market is ready for the introduction of higher-performance, lower U-value products.

### 4. Commercial End-Use Study, Discovery Research, 2015

#### Results:

- Informs FEI about commercial end-use energy equipment uptake and the types of buildings they occupy.

### 5. Residential End-Use Study, Sampson Research Inc., 2017

#### Results:

- Informs FEI about residential end-use energy equipment uptake and the types of buildings they occupy.

9.1.1 If yes, how does FEI measure market transformation? Please provide the metrics and how they are calculated.

#### **Response:**

Please refer to the response to CEC IR 1.9.1.

9.1.2 If yes, please provide the results of FEI's measurements of 'market transformation' over the last five years.

#### **Response:**

Please refer to the response to CEC IR 1.9.1.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 17

1

2

3

4 9.1.3 If no, why not?

5

6 **Response:**

7 Please refer to the response to CEC IR 1.9.1.

8

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 18

1    **10.    Reference:    Exhibit B-1, page 26**

2    11. FEI will retain a DSM stakeholder group, comprised of government, industry, trades,  
3    manufacturers, non-governmental organizations, advocacy groups, other utilities and  
4    customers to provide it with strategic advice. Additionally, FEI will undertake program  
5    area specific stakeholder consultation(s) on effective program design and  
6    implementation.

7    10.1    Please provide FEI's analysis of the benefits and costs of working with this  
8    stakeholder group.

9    **Response:**

10    FEI has not conducted a complete benefit and cost analysis of the EECAG activities. The  
11    benefits of receiving input and feedback from this group are intrinsic in nature and difficult to  
12    measure. FEI believes that its programs and planning processes have been and will continue to  
13    be improved through the engagement of this stakeholder group. The costs of doing so are a  
14    small fraction of the overall portfolio costs.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 19

1     **11.     Reference: Exhibit B-1, pages 28- 29**

- The portfolio approach to measuring the cost-effectiveness of DSM expenditures has been in place for many years and remains an effective means of assessing the performance of DSM activities. The Commission first determined that assessment of cost-effectiveness be based on the portfolio as a whole in its decision on FEI's 2008 DSM Application<sup>13</sup> and, since then, has reached the same determination in each of its subsequent decisions on FEI's DSM expenditure applications. Continued use of the portfolio approach will provide more flexibility for FEI to implement programs that meet customer needs while addressing the requirements of the DSM Regulation and maintaining a cost-effective portfolio. Alternatively, implementing cost effectiveness at some level below the Portfolio, such as at the program area or individual program level, is likely to be more restrictive on programs for some customer groups (Residential customers, for example) due to more restrictive cost-effectiveness requirements. ;

2

3             11.1     Please elaborate on the 'more restrictive cost-effectiveness requirements' that  
4                     would be attributable to the residential customers and/or other customer groups.

5

6     **Response:**

7     FEI clarifies that the statement "more restrictive cost-effectiveness requirements" was intended  
8     to refer to program offerings that face greater challenges meeting cost-effectiveness tests and  
9     as such, may be reliant on the MTRC.

10    All programs are challenged in meeting cost-effectiveness in the current low cost natural gas  
11    market as the avoided cost of natural gas is the primary benefit. In addition, as Minimum Energy  
12    Performance Standards (MEPS) become more stringent over time, there are fewer savings that  
13    can be allocated to DSM programs. MEPS are most prevalent in residential HVAC equipment  
14    and therefore these programs face the greatest challenges. As another example, commercial  
15    programs are able to capture larger energy savings per dollar of incremental cost than  
16    residential programs and are therefore more cost-effective. Residential and Commercial New  
17    Construction are also programs that are challenged from a cost-effectiveness perspective.  
18    However, the benefits of educating builders and trades for high performance buildings with a  
19    potential 100-year lifespan adds significant societal value.

20    These programs with their broad reach, or in the case of low income programs, hard to reach  
21    segments, have high societal benefits in terms of non-energy benefits associated with building  
22    performance, comfort and health. In addition, they are important programs from a GHG  
23    emissions reduction and community energy planning perspective for local governments.

24

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 20

1    **12.    Reference: Exhibit B-1, page 31**

2                    ***7.1.3.2 Inclusion of Non-Energy Benefits***

Section 4(1.1)(c) of the DSM Regulation requires the Commission to allow the inclusion of NEBs, the amount of which may be determined either by the Commission based on evidence from the utility or by using a deemed 15 percent adder to the benefits side of the MTRC calculation. FEI has chosen to use the 15 percent NEB adder in its MTRC calculations for the DSM Plan.

2

3                    12.1    Did FEI undertake to make an assessment of any other appropriate amount for  
4                    attribution as NEBs for which it could request Commission approval?

5

6                    **Response:**

7                    FEI examines its DSM activities on an ongoing basis for opportunities to quantify and claim  
8                    additional NEBs. To date, FEI has not identified any opportunities to do so that perform better  
9                    than the deemed 15 percent adder method in terms of both increasing benefits and maintaining  
10                   a balanced portfolio of DSM offerings across customer groups. This is not surprising given that  
11                   many NEBs are typically difficult to quantify. If FEI does identify an opportunity to claim  
12                   additional NEBs over the plan period, FEI will bring those values forward in its DSM Annual  
13                   Report.

14

15

16

17                    12.1.1    If yes, please provide the amounts that FEI determined could be an  
18                   appropriate assessment of NEBs.

19

20                    **Response:**

21                    Please refer to the response to CEC IR 1.12.1.

22

23

24

25                    12.1.2    If yes, please explain why FEI used the 15% adder instead.

26

27                    **Response:**

28                    Please refer to the response to CEC IR 1.12.1.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 21

1  
2  
3  
4  
5  
6  
7  
8  
9

12.1.3 If no, why not?

**Response:**

Please refer to the response to CEC IR 1.12.1.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 22

# 13. Reference: Exhibit B-1, pages 31 and 32 and Appendix A page 14

## 7.2.1 Net-to-Gross (NTG) Ratio: Spillover and Free Riders

In the majority of cases to date, FEI has calculated NTG by only adjusting the benefits downward for the presumed presence of “free riders”, i.e. individuals who participate in an incentive program who would have upgraded their equipment even in the absence of an incentive. FEI believes that the NTG should also account for the benefit of customers that adopt efficiency measures because they are influenced by program-related information and marketing efforts, though they do not actually participate in the incentive program. Accounting for this effect, known as “spillover”, in the NTG is a recognized approach that is used by many utilities

In its decision on the 2014–2018 EEC funding approval as part of the 2014–2019 PBR approval<sup>20</sup> the Commission recognized both the difficult challenge of measuring spillover and the negative impact of not including spillover effects in the NTG calculation. The Commission Panel approved the Company’s request for endorsement of the recognition of spillover effects on a case-by-case basis where evaluation shows that spillover is occurring<sup>21</sup>. FEI consistently includes the assessment of spillover in its evaluations. Due to the difficulty in confirming and quantifying spillover, FEI has so far only been able to quantify spillover for inclusion in the cost effectiveness for one of its DSM programs – that being the Residential EnerChoice Fireplace Program<sup>22</sup>. FEI will continue to include spillover identification and quantification on a program-by-program basis in its program evaluations. Where spillover can be quantified FEI will include it in program and portfolio cost-effectiveness calculations.

Measure	Measure Details							Free Rider Rate (%)	Spillover Rate (%)
	Incremental Cost (\$)	Incentive (\$)	Contractor Incentive (\$)	Annual Gas Savings (GJ)	Annual Elec. Savings (kWh)	Measure Lifetime (yrs)			
Space Heating									
Furnace	\$1,737	\$500	\$100	6.2	280	18	- <sup>9</sup>	0%	
Boiler	\$3,200	\$500	\$100	8.7	0	18	- <sup>9</sup>	0%	
Combination System	\$5,486	\$1,200	\$50	17.7	0	18	20%	0%	
Secondary Heating									
EnerChoice Fireplace	\$132	\$300	\$50	9.5	0	15	28%	0%	
Direct Vent Wall Furnace	\$1,245	\$300	\$0	4.6	0	20	1%	0%	
Water Heating									
0.67 EF Storage Tank Water Heater	\$246	\$200	\$50	3.0	0	13	26%	0%	
Condensing Tankless Water Heater	\$2,561	\$1,000	\$50	9.5	0	20	31%	0%	
Condensing Storage Tank Water Heater	\$2,273	\$1,000	\$50	6.9	0	13	11%	0%	
Building Envelope									
Attic Insulation	\$1,326	\$550	\$0	8.5	0	30	20%	0%	
Wall Insulation	\$2,714	\$625	\$0	28.9	0	30	20%	0%	
Crawlspace and Basement Insulation	\$838	\$543	\$0	6.6	0	30	20%	0%	
Other Insulation	\$1,167	\$350	\$0	5.7	0	30	20%	0%	
Bonus Offers	\$0	\$1,000	\$0	0.0	0	-	-	-	
Water Conservation									
Aerators & Showerheads	\$3	\$3	\$0	1.0	0	10	0%	0%	
ENERGY STAR Washer	\$77	\$75	\$0	1.0	69	14	20%	0%	
ENERGY STAR Dryer	\$50	\$100	\$0	0.7	0	12	0%	0%	
Other									
Drain Water Heat Recovery	\$738	\$250	\$0	4.3	0	25	3%	0%	
Communicating Thermostat	\$250	\$100	\$0	6.5	0	15	0%	0%	
HVAC Zone Controls	\$896	\$500	\$0	5.5	0	16	0%	0%	
Appliance Maintenance	\$0	\$25	\$0	0.0	0	-	-	-	
<b>Weighted Average per Participant</b>	<b>\$380</b>	<b>\$175</b>	<b>\$18</b>	<b>2.8</b>	<b>26</b>	<b>17</b>	<b>19%</b>	<b>0%</b>	

13.1 Please explain how FEI determines the impact of ‘free riders’.

## Response:

Free riders refer to a program participant who would implement the program measure or practice in the absence of the program. Spillover refers to individuals who implement energy efficiency measures or efficiency actions due to program influences, but without any financial or technical assistance from the program. Free riders and spillover rates are components that make up the Net-to-Gross (NTG) ratio equation:

$$NTG = 1 - \text{Free Rider} + \text{Spillover}$$

For programs where free rider rates are determined and applied to the equation, the impact of free riders is a reduction to the energy savings. Spillover, where applicable will increase the energy savings when included in the equation. The significance of the impact to the energy savings is dependent on the values assigned to the free rider and spillover rates.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 23

13.2 What types of metrics are used in determining that spillover is occurring?

**Response:**

FEI includes spillover identification and quantification on a program-by-program basis in its program evaluations. For programs where spillover is quantifiable, a survey-based (self-reported) approach is typically used to estimate participant spillover. This approach includes a series of questions tailored to confirm that additional non-incented energy efficiency improvements made by the participants are attributable, in whole or in part, to their participation in the program. The survey may identify a proportion of participants that take additional energy saving actions and thus result in either a percentage increase to the energy savings or an additional GJ savings, on average for each participant, as a result of the program. Spillover from non-participants, also known as market effects, can be ascertained through surveys of non-participants and/or of trade allies (equipment wholesalers, installers, etc.). However, there are challenges to this approach. There is no record of the equipment purchase, and identifying a group of non-participants that installed energy-efficient equipment on their own can be time consuming and costly. FEI has not included any non-participant spillover in its cost-effectiveness calculations to date but will continue to review and explore opportunities to report non-participant spillover as part of FEI's program evaluation activities.

13.3 Please explain how FEI calculates 'spillover' for the Residential EnerChoice Fireplace Program.

**Response:**

Please refer to the response to BCUC IR 1.8.1.1

13.4 Are there industry standards, such as a deemed adder or detractors, available that are used in other jurisdictions to account for spillovers and free riders?

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 24

1    **Response:**

2    Yes, there is evidence indicating the use of deemed adder or detractors used in some  
3    jurisdictions to account for spillovers and free riders.

4    FEI recently completed a study “Review of Net-to-Gross (NTG) Assumptions FEI and FBC  
5    Energy Efficiency Programs” (refer to the response to CEC IR 1.13.8) that indicated a trend in  
6    the industry towards using simplified approaches to estimate net savings (e.g. use of deemed  
7    NTG values). Some jurisdictions (e.g., California, Massachusetts, and Ontario) have  
8    commissioned third party reviews of methodologies to calculate free ridership. In some cases,  
9    these reviews contributed to the adoption or formalization of methods used to determine free  
10   ridership in program evaluations. The simplified approaches include two different methods,  
11   simplified self-reporting methodology, i.e. survey, and deemed NTG values.

12   A recent study conducted by Evergreen Economics for the Energy Trust of Oregon<sup>2</sup>, states the  
13   following:

14           For some types of programs (e.g., low income, hard-to-reach small business,  
15           new programs), stipulated NTG values of 1.0 or close to 1.0 are viewed as  
16           appropriate by the literature and by market experts. For other types of programs,  
17           stipulated values drawn from research in other states/service territories are  
18           generally considered acceptable as placeholder values until a program or region-  
19           specific value can be calculated. All the experts interviewed, however, say that  
20           generally this should be only a short-term solution, and that spending on  
21           research to calculate NTG is a legitimate evaluation activity that should be built  
22           into overall evaluation costs.

23   The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific  
24   Measures Chapter 21: Estimating Net Savings – Common Practices<sup>3</sup> provides evidence of  
25   jurisdictions in North America that use deemed or stipulated NTG ratios, but emphasizes the  
26   disadvantages of using such deemed values, stating:

27           Although using deemed or stipulated values is a relatively simple and low-cost  
28           approach, there are several disadvantages. NTG values are variable across time  
29           and space, and strongly linked to program design and implementation. This  
30           makes deemed values or assumptions potentially unreliable when transferred  
31           from a program in one jurisdiction to a similar program in another jurisdiction.

---

<sup>2</sup> Current Methods in Free Ridership and Spillover Policy and Estimation, Evergreen Economics, February 2017.

<sup>3</sup> The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures Chapter 21: Estimating Net Savings – Common Practices (2017), issued by National Renewable Energy Laboratory (NREL) at [www.nrel.gov/publications](http://www.nrel.gov/publications).

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 25

Generally speaking, FEI does not use deemed adders or detractors to account for spillover and free riders as FEI has not found sufficient industry data to support usage of such standards by FEI. Firstly, as noted by the Evergreen Economics study above, the use of deemed values is typically a short-term solution and used as a placeholder until program specific values can be calculated. Secondly, FEI has not found sufficient evidence to support the use of deemed values from other jurisdictions in BC over a longer term. FEI continues to assess and quantify free rider and spillover on a program-by-program basis and applies program specific values, when available.

13.4.1 If yes, please provide the standards that are used in other jurisdictions and explain why FEI does not employ these standards.

**Response:**

Please refer to the response to CEC IR 1.13.4.

13.5 What are FEI's views as to the likely impact of spillovers from its DSM programs in general? I.e., do they materially impact the effects of FEI's programs or not?

**Response:**

FEI believes that spillover can materially impact the energy savings for FEI's programs. In general, if the inclusion of the spillover rate in the Net-To-Gross (NTG) ratio is not fully offset by the free rider rate, the impact of the spillover will result in an increase to the energy savings that FEI can claim for the program. Spillover and free rider rates are components of the NTG ratio:

$$\text{NTG} = 1 - \text{Free Rider} + \text{Spillover}$$

These components are interrelated in their impact on the NTG. The relative size of the free rider and spillover rates, and the extent to which these components offset one another, will determine how much impact they have on the NTG. The extent of the impact will vary from program to program.

FEI has been required to estimate and include free rider rates in its cost effectiveness analysis, and considers that including free riders but not spillover has resulted in conservative program design and evaluation. Under the current circumstance where FEI is required to include the

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 26

subjective effects of free riders, FEI will also include the development of spillover rates, where it can be supported with evidence, for use in cost effectiveness analysis in program design and performance reporting on a program-by-program basis, and to continue monitoring the industry for examples and best practices in doing so.

However, it remains FEI's position that both free riders and spillover effects are very subjective and tend to cancel each other out. FEI's preferred approach would be to use gross energy savings as the benefit in cost effectiveness analysis, instead of using any spillover or free rider effects.

Due to the difficulty measuring and proving spillover, FEI cannot quantify the spillover values or confirm the impact of the spillover as it may apply to program delivery during the 2019-2022 DSM Plan. Where it is possible to quantify (or if quantification was not necessary), it would directionally result in improved cost effectiveness results for those programs where it is applied.

13.6 If FEI believes that the impacts of spillovers are material, could FEI provide a general assessment of what that impact might be? Please explain and provide a quantitative assessment if possible.

**Response:**

Please refer to the response to CEC IR 1.13.5.

13.7 The CEC notes that although FEI has stated that it has identified and accounted for Spillover in the EnerChoice Fireplace Program, no spillover rate is identified in the Home Renovation Program profiles. Please explain.

**Response:**

There was an error in reporting the spillover value for the EnerChoice Fireplace measure in the Home Renovation Program. A spillover rate of 10 percent should have been shown in the table for Section 3.4.1 of Appendix A in Exhibit B-1. This spillover rate applies only to the Home Renovation Program.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 27

This error caused an under-reporting of energy savings for the portfolio of approximately 2 percent. Please refer to the Errata filed concurrently with these IR responses for the corrected values.

13.8 Please provide FEI's assessment of DSM spillover literature and its applicability to FEI's DSM programs and provide any particularly relevant articles and/or reports.

**Response:**

FEI's assessment of spillover literature includes the review and documentation of industry reports from similar jurisdictions. Internal review of the methodology and analysis is conducted to confirm reasonableness and applicability. In addition, FEI recently commissioned a third party consultant to conduct a study to review the methods, data sources, and assumptions used by FEI to estimate free ridership and spillover for its energy efficiency programs. The study, "Review of Net-to-Gross Assumptions FEI and FBC Energy Efficiency Programs" (see Attachment 13.8) was commissioned to ensure that the Net-to-Gross (NTG) adjustments are reasonable, defensible, and calculated using industry best practices. The study confirmed that FEI's approach to assessing free rider and spillover is consistent with industry best practices. Recommendations were also included as a guidance for FEI to consider when assessing free rider and spillover.

FEI's EM&V Framework was developed as a general guideline for EM&V activities that are consistent with industry standards and practices. The Framework indicates the type of EM&V activities that can be included as part of a program evaluation such as free rider, spillover, surveys, billing analysis, and engineering analysis. The following two examples of industry reports are consistent with the FEI's EM&V Framework and industry best practice:

1. The California Evaluation Framework (2004) prepared for the California Public Utilities Commission and the Project Advisory Group<sup>4</sup>.
2. The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures Chapter 21: Estimating Net Savings – Common Practices (2017), issued by National Renewable Energy Laboratory (NREL)<sup>5</sup>.

<sup>4</sup> Available online at the following link:  
[http://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Public\\_Website/Content/Utilities\\_and\\_Industries/Energy/Energy\\_Programs/Demand\\_Side\\_Management/EE\\_and\\_Energy\\_Savings\\_Assist/CAEvaluationFramework.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/EE_and_Energy_Savings_Assist/CAEvaluationFramework.pdf).

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 28

1 **14. Reference: Exhibit B-1, page 33 and Appendix G – FEI C&EM 4 Year Evaluation**  
2 **Plan (Labelled Appendix D) pages 3 and 4 and Appendix A page 1**

In preparing the Application, FEI examined the results of more recent industry surveys on evaluation expenditures. Survey results obtained from E Source, an energy efficiency consultancy serving gas and electric utilities throughout North America, indicate that for utilities with DSM expenditures of between US\$20 and US\$55 million, DSM budgets are between 2 percent and 3 percent, and that the proportion of DSM expenditures on evaluation decreases as the size of the portfolio increases.<sup>23</sup> Utilities with expenditures greater than US\$55 million tend to spend just under 2 percent on evaluation. The Consortium for Energy Efficiency (CEE) found that in 2014 US and Canadian natural gas utilities spent about 2 percent of their overall DSM budgets on evaluation and in 2015 this value dropped to 1 percent for Canadian Utilities.<sup>24</sup> According to these CEE Reports, the proportion of total DSM expenditures appears to be declining in recent years for Canadian natural gas utilities.

Table D-1: FEU Evaluation Plan for 2019-2022

Program	Program Area	Service Region	Type of Evaluation or Activities	Program Partners	Proposed 4 Year Budget (000's)
Home Renovation Rebate Program	Residential	FEU	Evaluation studies, Market studies, Process & Impact	BCH Hydro, Fortis BC Inc., Municipal, Provincial and Federal Government	\$1,635
New Home Program	Residential	FEU	Market studies, Process & Impact	BC Hydro, FortisBC Inc., NRCan, MEMPR, Municipal Government	\$205
Rental Apartment Efficiency Program	Residential/Commercial	FEU	Process & Impact	Fortis BC Inc.	\$180
Prescriptive Program	Commercial	FEU	Market studies, Process & Impact	Fortis BC Inc.	\$550
Performance Program - Existing Buildings	Commercial	FEU	Market studies, Process & Impact	Fortis BC Inc.	\$150
Performance Program - New Buildings	Commercial	FEU	Process & Impact	Fortis BC Inc.	\$260
Performance Program	Industrial	FEU	Measurement & Verification	Fortis BC Inc.	\$180
Prescriptive Program	Industrial	FEU	Measurement & Verification	Fortis BC Inc.	\$60
Strategic Energy Management Program	Industrial	FEU	Measurement & Verification	BC Hydro	\$180
Direct Install Program	Low Income	FEU	Process & Impact	BC Hydro, FortisBC Inc.	\$480
Self Install Program	Low Income	FEU	Process & Impact	BC Hydro, FortisBC Inc.	\$21

PAGE 3

<sup>5</sup> Available online at the following link: <https://www.nrel.gov/docs/fy17osti/68578.pdf>.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 29

Table D-1: FEU Evaluation Plan for 2019-2022 (continued)

Program Name	Program Area	Service Region	Type of Evaluation or Activities	Program Partners	Proposed 4 Year Budget (000's)
Prescriptive Program	Low Income	FEU	Process & Impact	None	\$52
Support Program	Low Income	FEU	Process	None	\$260
General Residential Education Program	Customer Education and Outreach	FEU	Process	FortisBC Inc., Community Power, Municipalities	\$419
Residential Customer Engagement Tool	Customer Education and Outreach	FEU	Process	FortisBC Inc.	\$153
Commercial Education Program	Customer Education and Outreach	FEU	Process	BC Hydro, FortisBC Inc., Community Power, Municipal	\$216
School Education Program	Customer Education and Outreach	FEU	Process	FortisBC Inc.	\$201
Pilot Program	Innovative Technology	FEU	Measurement & Verification	None	\$600
Customer Research	Enabling Activities	FEU	Communications	None	\$80
Commercial Energy Specialist	Enabling Activities	FEU	Process & Impact	FortisBC Inc.	\$175
Community Energy Specialist	Enabling Activities	FEU	Process & Impact	FortisBC Inc.	\$110
Codes & Standards	Enabling Activities	FEU	Process	none	\$610
Trade Ally Network	Enabling Activities	FEU	Process	none	\$2,400

PAGE 4

This DSM Plan covers all of FEI's natural gas service territory. In addition, this plan provides program details and planned cost-effectiveness results for FEI's proposed portfolio of DSM program area activity.

14.1 How does the 'FEU service region' differ from the FEI service territory, if at all?

**Response:**

In the case of the above tables, "FEU service region" is the same as "FEI service territory".

14.2 Please provide the percentage of overall DSM budget that FEI is planning to spend on evaluation.

**Response:**

FEI's total proposed evaluation expenditure for 2019 to 2022 is approximately 2.9 percent of FEI's overall planned portfolio expenditures.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 30

1           14.3   What percentage of its DSM budget has FEI spent on evaluation over the last  
2                   five years?

3  
4   **Response:**

5   The table below summarizes the percentage of FEI's evaluation expenditures over the last five  
6   years.

	Utility Evaluation Expenditures				
	2013	2014	2015	2016	2017
Total Evaluation Expenditure (\$000s)	548	449	459	518	703
Overall Portfolio Expenditure (\$000s)	27,591	27,551	31,865	32,165	34,039
Percent of Evaluation Expenditure (%)	1.99%	1.63%	1.44%	1.61%	2.07%

7  
8

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 31

1     **15.     Reference:    Exhibit B-1, page 35**

**9.1    *FUNDING TRANSFERS***

It should be noted that as with all plans, the DSM Plan is subject to change in response to changes in market conditions, customer responses to programs, input from stakeholders including program partners, and changes in government policy. Due to the length of the period the DSM Plan covers, FEI requires the flexibility to be able to adjust to new information, program results and opportunities through the test period without the need for a full Commission review.

FEI proposes that program funding transfer rules follow the same process as was directed by the Commission for the 2012-2013 test period and retained for the 2014-2018 test period. The existing program funding transfer rules are as follows:

- Funding transfers under 25 percent from one approved Program Area to another approved Program Area would be permitted without prior approval of the Commission;
- In cases where a proposed transfer out of an approved Program Area is greater than 25 percent of that approved Program Area, prior Commission approval would be required.
- In cases where a proposed transfer into an approved Program Area is greater than 25 percent of that approved Program Area, prior Commission approval would be required.
- The transfer of any amount of funds from an approved Program Area to Innovative Technologies would require prior Commission approval.

FEI's understanding of these rules is that, in effect, the Commission is accepting DSM expenditures that vary from forecast as being in the public interest if they reflect funding transfers under 25 percent of the Program Area being increased.

2

3            15.1    Given that the proposal is for a four-year term, is FEI proposing that 25% of a  
4                    program expenditures could be transferred each year, or does FEI propose a  
5                    25% cap over the four-year period? Please explain.

6

7     **Response:**

8     As was the case for its 2014-18 DSM Plan, the 25 percent program transfer rule would apply to  
9     each year of the 2019-2022 DSM Plan. Therefore, if FEI determined that a transfer of more  
10    than 25 percent of the annual expenditures of an approved Program Area in a given year is  
11    required, such a transfer would require Commission approval.

12

13

14

15            15.2    What criteria does FEI use to determine whether or not a funding transfer should  
16                    occur? Please explain.

17

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 32

1    **Response:**

2    The following two criteria must be met in order for a funding transfer to occur in a given year  
3    within the allowed transfer amounts:

4       1. A program area is expected to realize actual expenditures greater than the approved  
5       amount for that program area; and

6       2. Another program area is expected to realize expenditures less than the approved  
7       amount for that program area.

8    Both conditions must be met in order to allow room to transfer funds from one program area to  
9    the other.

10

11

12

13       15.3 Does FEI's interpretation of the rules contemplate the % of funding transfer  
14       based on single transfers, or does it also consider the effects of multiple  
15       transfers? For example, if program A transferred 10% of its funding to program C  
16       increasing the program C budget by 20%, and Program B also transferred 10%  
17       of its funding to program C for an additional increase in program C's budget of  
18       10% resulting in a cumulative increase of 30% of program C's budget, would FEI  
19       require Commission approval? Please explain why or why not.

20

21    **Response:**

22    FEI interprets the rules to allow for more than one program area to contribute funding space to  
23    another program area where there is a need to do so and available funding in the contributing  
24    program areas. FEI also interprets the rules to allow for any single program area to be able to  
25    contribute funding to multiple other program areas where it has funding available and there is a  
26    need to do so, up to a maximum of 25 percent of the approved expenditure of those program  
27    areas. However, FEI views the above example, where the receiving program area's expenditure  
28    increases by 30 percent, to exceed the transfer rules. FEI would expect that such a transfer  
29    amount would require Commission approval.

30

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 33

1     **16.     Reference:     Exhibit B-1, page 35**

In addition, FEI proposes that starting with 2019 it be permitted to transfer or “rollover” unspent expenditures in a Program Area to the same Program Area in the following year. As noted above, FEI’s DSM Plan is subject to change in response to various external factors. These factors may require FEI to respond by adjusting the timing of its planned expenditures. The flexibility to rollover unspent amounts would allow FEI to adjust to external factors and allow FEI to carry out its DSM Plan over the course of the four years, even if the timing of the expenditures varies from plan. In effect, FEI is requesting that the Commission accept the total expenditures per Program Area over the time period of the expenditure schedule. As the exact timing of the expenditure within the four-year period should not change the public interest in making the expenditures, FEI believes this is an appropriate approach.

2

3             16.1     Please provide examples and a brief discussion of the types of external factors  
4                     that have influenced FEI’s ability to spend its DSM dollars in the past.

5

6     **Response:**

7     A number of external factors have influenced FEI’s ability to spend its DSM dollars in the past:

8             •     Program funding partners in and out of the market have impacted program expenditures  
9                     – for example, when the provincial government ended funding for LiveSmart BC and  
10                     utility partners relaunched the program in 2014;

11            •     Timing of BCUC approval of FEI’s 2014-2018 Performance Based Ratemaking (PBR)  
12                     Application resulted in spending on new initiatives being delayed, particularly in the  
13                     Industrial program area where a longer lead time to market is required;

14            •     Timing of the introduction of equipment regulations / Minimum Efficiency Performance  
15                     standards is difficult to predict and causes program redesign to align with the new  
16                     baselines;

17            •     Capital planning and budgeting for large customer projects (commercial, industrial,  
18                     residential and social housing developments) may take place over a multi-year planning  
19                     cycle and therefore influence program expenditures;

20            •     Customer timelines, budgets and operational needs may not be congruent with the  
21                     program terms and conditions resulting in lost opportunities especially in commercial and  
22                     industrial projects; and

23            •     Seasonal offers are impacted by customer demand for contractors - for example  
24                     summer furnace program uptake was impacted in more recent years due to increased  
25                     demand for air conditioning.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 34

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31

16.2 Does FEI propose any limitations on the amount of funding it is permitted to 'rollover' during any given year?

**Response:**

FEI has not proposed any limitations on the amount of unspent funding in a Program Area in a given year to rollover to the same Program Area in the following year. As discussed in the response to BCUC IR 1.23.5.1, FEI intends to follow and roll out the DSM Plan that it has worked hard to develop. FEI has proposed the ability to rollover unspent expenditures as a mechanism to provide flexibility to adjust the timing of planned expenditures in response to external factors if required.

16.3 How does FEI propose to deal with unspent dollars at the end of the 4-year period, if any occur?

**Response:**

While FEI intends to follow and roll out the 2019-2022 DSM Plan it has developed, forecast amounts that are not expended by the end of the 4-year period would not be rolled over into FEI's next DSM application or affect FEI's ratepayers. FEI has proposed to forecast \$30 million in the rate base DSM Deferral account each forecast year and the difference between the \$30 million forecast and actuals for a given year, up to the approved amount including any prior year rollover, would be accounted for in the non-rate base DSM Deferral account, attracting AFUDC, in the year it is expended. The ending balance of the non-rate base DSM deferral account each year is transferred to FEI's rate base DSM deferral account the following year.<sup>6</sup> Any forecast amounts that are not spent have no impact on FEI's ratepayers because only amounts expended are ultimately included in rate base.

---

<sup>6</sup> Exhibit B-1, Section 9.2, page 36.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 35

1    **17.    Reference: Exhibit B-1, page 36**

**9.2    ACCOUNTING TREATMENT**

Further to Section 5 and consistent with the spirit of Order G-44-12, FEI is proposing to forecast rate base additions to the Energy Efficiency and Conservation deferral account (historically referred to as the EEC deferral account but hereinafter DSM deferral account) of \$30 million, on a net-of-tax basis, for each of the years 2019 through 2022.

Under the current approved treatment, \$15 million of expenditures are forecast in the rate base DSM Deferral account each forecast year and the difference between the \$15 million forecast and actual expenditure levels, up to the approved amount, are accounted for in FEI's non-rate base DSM Deferral account, attracting a weighted average cost of capital (WACC) return, in the year they are expended. The closing balance of the non-rate base DSM Deferral account is then transferred to FEI's rate base DSM Deferral account at the beginning of the following forecast year.

FEI proposes that the \$15 million limit be increased to \$30 million per year as expenditures have been consistently greater than \$30 million per year under the DSM portfolio over the past three years (2015 to 2017) as illustrated in Table 5-1. With the significant increase in expenditures proposed in Section 6, FEI submits that at least \$30 million annually will continue to be spent over the 2019 to 2022 period proposed in the DSM Plan. Aligning the amount forecast in the rate base DSM Deferral account each year with the actual expenditures reduces the financing costs added to the deferral account, and overall costs to rate payers on the non-rate base portion of the DSM Plan expenditures. FEI will account for the balance of spending, up to the approved FEI funding amount, greater than \$30 million in FEI's non-rate base DSM deferral account. Consistent with approved practice the ending balance of the non-rate base DSM deferral account will be transferred to FEI's rate base DSM deferral account at the beginning of the following year. FEI's rate base DSM deferral account will continue to be amortized in rates over the approved amortization period.

2

3            17.1    How is spending above 'Approved' accounted for?

4

5    **Response:**

6    FEI has not proposed any treatment for spending above approved levels as FEI has not  
7    historically spent over approved amounts and cannot foresee a scenario where it would  
8    overspend without prior Commission acceptance of the expenditures.

9

10

11

12            17.2    Under FEI's DSM proposal, FEI has the authority to 'rollover' DSM spending to  
13            the next year. Does FEI commit to spending at least \$30 million each year?

14

15    **Response:**

16    While not anticipated, unforeseen external factors, for example a broad equipment issue  
17    impacting customer participation or a shortage of certified trades to complete installations, could

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 36

1 potentially impact the 2019-2022 DSM Plan's execution. As a result, FEI is unable to commit to  
2 a specific annual expenditure level as requested above.

3 However, as discussed in response to CEC IR 1.16.2 and BCUC IR 1.21.3.1, FEI intends to  
4 follow and roll out the DSM Plan that it has worked hard to develop. FEI DSM expenditures  
5 were greater than \$30 million per year for 2015-2017 and are projected to exceed \$38 million in  
6 2018 based on expenditures as of the end of July. While subject to change, indications from this  
7 projection are that expenditures for 2018 will be above the approved plan and FEI intends to  
8 seek Commission approval for the potential overage in advance of year-end. FEI expects that  
9 expenditures will continue to be at least \$30 million annually over the 2019-2022 period and will  
10 work to achieve the forecast total amounts in the 2019-2022 DSM Plan.

11  
12  
13  
14 17.2.1 If no, please explain why not.

15  
16 **Response:**

17 Please refer to the response to CEC IR 1.17.2.

18  
19  
20  
21 17.3 What is FEI's proposition if it does not spend \$30 million in a given year?

22  
23 **Response:**

24 As discussed in the response to CEC IR 1.17.2, FEI expects that at least \$30 million annually  
25 will continue to be spent over the 2019-2022 DSM Plan period.

26 Please refer to BCUC IR 1.22.6 and BCUC IR 1.22.8.1 for a discussion of the impacts if FEI  
27 spends less than the \$30 million in a given year.

28  
29  
30  
31 17.4 Please confirm or otherwise explain that DSM spending is not included in PBR  
32 formulaic spending.

33  
34 **Response:**

35 Confirmed.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 37

1 **18. Reference: Exhibit B-1, page 37 and Appendix J**

Further to the Commission directive referenced above, FEI has also provided the analysis for an amortization period (see Appendix I) that is in line with the average weighted measure life of all the measures in the DSM Plan, which is more appropriate from a cost/benefit matching perspective. FEI has determined the average weighted measure life to be 16 years (see Appendix J for how this was calculated), meaning that customers benefit from FEI's DSM measures for an average time period of 16 years. It is therefore appropriate that the costs be amortized over this same period.

FEI provides the incremental rate change from switching to a 16 year amortization period as scenario 3 in the above table. A 16 year amortization period results in lower rate impacts for customers.

2

Program Area and Program	Total Cost (non-inflated) 2019-2022 (\$1000s)	Measure Lifetime (yrs)	Weighted Life by Expenditures (yrs)
<b>Residential</b>			
Home Renovation Rebate Program	71,942	17.1	
New Home Program	31,819	19.4	
Rental Apartment Efficiency Program	1,726	10.0	
<b>SUB-TOTAL</b>	<b>105,488</b>	<b>N/A</b>	<b>17.7</b>
<b>Commercial</b>			
Prescriptive Program	52,900	17.3	
Performance Program - Existing Buildings	10,550	5.7	
Performance Program - New Buildings	17,301	19.2	
Rental Apartment Efficiency Program	5,025	8.7	
<b>SUB-TOTAL</b>	<b>85,777</b>	<b>N/A</b>	<b>15.8</b>
<b>Industrial</b>			
Performance Program	8,028	10.0	
Prescriptive Program	2,225	12.7	
Strategic Energy Management Program	2,540	5.0	
<b>SUB-TOTAL</b>	<b>12,793</b>	<b>N/A</b>	<b>9.5</b>
<b>Low Income</b>			
Direct Install Program	9,090	12.0	
Self Install Program	1,986	10.0	
Prescriptive Program	12,311	17.5	
<b>SUB-TOTAL</b>	<b>23,387</b>	<b>N/A</b>	<b>14.7</b>
<b>ALL PROGRAMS WITH DIRECT SAVINGS</b>	<b>227,445</b>	<b>N/A</b>	<b>16.2</b>
Non-Program Specific Expenses (Residential)	3,244		
Non-Program Specific Expenses (Commercial)	3,119		
Non-Program Specific Expenses (Industrial)	690		
Support Program (Low Income)	3,200		
Non-Program Specific Expenses (Low Income)	805		
<b>Innovative Technologies</b>	<b>9,762</b>		
Conservation Education and Outreach	31,459		
Enabling Activities	34,252		
Portfolio Level Activities	6,840		
<b>ENTIRE PORTFOLIO</b>	<b>320,816</b>		

3

4 18.1 How does FEI determine the 'Measure Lifetime' in each case above?

5

6

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 38

**Response:**

Measure life of individual measures is typically determined through the following process:

- Measure life reference values from similar utility programs are sourced through online research. These are typically found in Technical Resource Manuals (TRMs) and Measure Life studies such as Focus on Energy Evaluation, Business Programs: Measure Life Study, PA Consulting Group Inc., Aug 25 2009<sup>7</sup>;
- Industry standards are sourced for equipment life such as ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) resources:
  - ASHRAE Equipment Life Expectancy Charts
  - ASHRAE Owning and Operating Cost Database – Equipment Life & Maintenance Cost Survey; and
- All reference values are tabulated, ranked and sorted by applicability.

Measure life for a specific measure is then determined following an examination of the tabulated findings. In some cases, data collected through program delivery, such as contractor feedback, will help in confirming or adjusting measure life assumptions.

A measure life value for a program can be determined as a weighted average of the measure life of the individual measures based on participation for each measure as weighting.

18.2 Please identify, in each of the programs, any elements that are helpful to the government in establishing regulatory codes and standards in the future.

**Response:**

This response also addresses CEC IRs 1.18.3 and 1.18.5.

Enabling activities that FEI engages in to assist government in establishing codes and standards include supporting research, analysis, development, training, and education and increasing market capacity for new codes and standards adoption.

---

<sup>7</sup> [https://focusonenergy.com/sites/default/files/bpmeasurelifestudyfinal\\_evaluationreport.pdf](https://focusonenergy.com/sites/default/files/bpmeasurelifestudyfinal_evaluationreport.pdf).

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 39

1 The enabling activities area includes initiatives that support and supplement FEI's DSM program  
2 development and delivery. These programs, activities and projects provide resources common  
3 to the support and delivery of all program area activities.

4 FEI's portfolio of DSM programs provides incentives to encourage adoption of energy efficient  
5 equipment that exceeds code baseline, thus increasing market saturation of higher efficiency  
6 equipment. This increased market saturation ultimately enables the adoption of higher  
7 performance requirements in codes and standards.

8 FEI's discussions regarding future code development and adoption with various levels of  
9 government are ongoing. For example, FEI has played a large role in the introduction of the BC  
10 Energy Step Code, both through its development and with the introduction of FEI's incentive  
11 program to align with the steps of the BC Energy Step Code.

12 FEI confirms that learnings from DSM programs support market transformation by encouraging  
13 higher market saturation of improved energy efficiency measures in equipment and/or improved  
14 building practices, thereby allowing the applicable standards or regulatory body to propose and  
15 enact future regulation.

16  
17  
18  
19 18.3 Please identify any connections between learnings on these programs and  
20 specific codes and standards regulations under discussion with any level of  
21 government.  
22

23 **Response:**

24 Please refer to the response to CEC IR 1.18.2.  
25  
26  
27

28 18.4 Please confirm that where there is a new code and/or standard established, is  
29 that one element which may be determinative in establishing a measure's  
30 lifetime? Please explain.  
31

32 **Response:**

33 This is not confirmed; the determination of a specific measure's life is independent of future  
34 changes to codes or standards. Factors that determine the persistence in terms of years of  
35 future expected savings from implementing an energy efficient measure (i.e. measure life)

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 40

1 include user behavior, expected building use change, equipment operation time and continued  
2 mechanical service. The establishment of new codes and standards would impact the relevant  
3 code baseline of the energy efficient measure, which is used for the purposes of calculating  
4 energy savings and not the measure life.

5  
6  
7  
8 18.5 Please confirm that learnings from DSM expenditure plans are instrumentally  
9 helpful in establishing appropriate regulatory codes and standards for the  
10 transformation of the market.

11  
12 **Response:**

13 Please refer to the response to CEC IR 1.18.2.  
14

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 41

1     **19.     Reference:     Exhibit B-1, Appendix A, page 1**

Many of the programs in this DSM Plan are continuations of programs that FEI is currently operating, and has reported on in their 2017 DSM Annual Report. However, the DSM Plan also includes some new initiatives within the approved program areas; these new initiatives reflect FEI's on-going efforts to respond to changing market conditions and to integrate operational lessons learned from current implementation activities.

As with all long-term plans, it should be noted that this DSM Plan is subject to changes in market conditions, customer responses to programs, consultation input from stakeholders, including program partners, and changes in government direction and policy. Therefore, information and forecasts listed in the Program Profiles represent best estimates as of the filing of this DSM Plan and are subject to adjustments, as required.

2

3             19.1     Please provide an itemized list of the new initiatives and the change in market  
4                     conditions or operational lessons that instigated the change.

5

6     **Response:**

7     To clarify, new initiatives referenced on page 1 of Appendix A of the Application (Exhibit B-1)  
8     are considered to be a combination of new programs, program design elements, operational  
9     improvements and general customer and stakeholder engagement. The table below describes  
10    those initiatives and breaks out the reasons and market drivers that instigated the change.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 42

Program Area	Initiative Description	Appendix A Reference	Market Driver
Residential	Revise the New Home Program to include support for BC Energy Step Code.	Page 9	DSM Regulatory Amendments and industry requests to simplify the existing ENERGY STAR for new homes program.
Residential / Trade Ally Network	Increased emphasis on Quality Installation on all program measures, trades training and support for contractor accreditation.	Page 9	Furnace program QI initiatives from 2015- 2018 requested by associations and trades. FEI recognizes the importance of equipment performance on realized energy savings and home comfort.
Residential	Offer the furnace and boiler rebates year round rather than on a seasonal basis.	Page 10	Contractor and customer demand for a full year program combined with policy that encouraged FEI to increase incentive expenditures.
Residential	Appliance Maintenance Program expanded to include services for new water heater technologies such as tankless water heaters.	Page 10	Contractor and customer demand for program expansion. Industry request for support in tankless water heater rebates to increase demand and educate consumers about the importance of maintenance.
Residential	Increased incentives for Condensing tankless water heaters.	Page 10	To encourage the uptake of the technology, and to support upcoming federal minimum efficiency regulations in 2020.
Residential	Expand the Home Renovation and New Home programs to include new measures.	Page 10	Contractor and customer demand for new technologies and pilot results demonstrating cost effectiveness.
Commercial	Expanding the Prescriptive Program to include new measures.	Page 19	Operational lesson that prescriptive type rebates allow for easier access to rebates for some customer groups and building types.
Commercial	Revising Performance Program – New Buildings to align with BC Energy Step Code.	Page 22	Support the adoption of the BC Energy Step Code and stakeholder input.
Industrial	Expanding the Prescriptive program to include new measures.	Page 27	Operational lesson that prescriptive type rebates allow for easier access to rebates for some customer groups and building types.
Industrial	Adding a new Industrial program called the Strategic Energy Management program.	Page 33	Opportunity identified to deepen customer engagement and provide industrial facilities with a program initiative to embark on energy management and a starting point to tackle operational type energy savings.
Low Income	Expanding the Direct Install program to include measures for manufactured homes	Page 34	FEI's market research indicates that manufactured homes are an underserved market and many are old and have rarely received energy efficiency retrofits. The Direct Install program will seek to develop opportunities to perform additional retrofits in manufactured homes and will provide duct sealing and repair, high efficiency furnace retrofits, and other measures as appropriate.
Low Income	Incentives for top-up rebates in the Residential program area.	Page 34	FEI gained operational lessons from the development of Space Heat Top Ups and Water Heater Top Ups for social housing providers. These rebates have proven to be of benefit to many participants. Based on this experience, FEI believes there is a similar opportunity to develop Top Ups for Low Income Residential customers for furnaces and water heaters.
Innovative Technologies	Supporting of pre-commercial technologies.	Page 48	Stakeholder feedback indicated a need for support in this area.
Enabling Activities	Adding a new program called the Community Energy Specialist Program.	Page 53	To support the development of energy plans including BC Energy Step Code support and raise awareness of and participate in FEI's C&EM programs within municipalities and regional districts.
Enabling Activities	Trade Ally Network expansion to include other industry representatives.	Page 54	FEI recognizes that other industry representatives such as commercial service contractors, equipment manufacturers, distributors and retailers also play a role in influencing natural gas end-use and energy efficiency decisions and as such incremental funding to support the expansion of this program is planned.
Enabling Activities	Launching the new Reporting Tool & Customer Application Portal.	Page 55	Customer requests for online forms and decreased rebate processing times.
Enabling Activities	Codes & Standards expansion of contributions to the advancement of codes and standards.	Page 55	Compliance with the 2017 DSM Regulation amendment stating that the utility must put forward investment equivalent to or more than 1% of the entire DSM portfolio expenditures to be provided to a standards-making body, a regulator body and/or government to assist with the development of energy conservation standards or the efficient use of energy.
Enabling Activities	Codes & Standards expanded support of BC Energy Step Code.	Page 55	With introduction of the BC Energy Step Code in 2016, FEI will support the education and awareness of this new voluntary building standard.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 43

Program Area	Initiative Description	Appendix A Reference	Market Driver
Residential	Revise the New Home Program to include support for BC Energy Step Code.	Page 9	DSM Regulatory Amendments and industry requests to simplify the existing ENERGY STAR for new homes program.
Residential / Trade Ally Network	Increased emphasis on Quality Installation on all program measures, trades training and support for contractor accreditation.	Page 9	Furnace program QI initiatives from 2015- 2018 requested by associations and trades. FEI recognizes the importance of equipment performance on realized energy savings and home comfort.
Residential	Offer the furnace and boiler rebates year round rather than on a seasonal basis.	Page 10	Contractor and customer demand for a full year program combined with policy that encouraged FEI to increase incentive expenditures.
Residential	Appliance Maintenance Program expanded to include services for new water heater technologies such as tankless water heaters.	Page 10	Contractor and customer demand for program expansion. Industry request for support in tankless water heater rebates to increase demand and educate consumers about the importance of maintenance.
Residential	Increased incentives for Condensing tankless water heaters.	Page 10	To encourage the uptake of the technology, and to support upcoming federal minimum efficiency regulations in 2020.
Residential	Expand the Home Renovation and New Home programs to include new measures.	Page 10	Contractor and customer demand for new technologies and pilot results demonstrating cost effectiveness.
Commercial	Expanding the Prescriptive Program to include new measures.	Page 19	Operational lesson that prescriptive type rebates allow for easier access to rebates for some customer groups and building types.
Commercial	Revising Performance Program – New Buildings to align with BC Energy Step Code.	Page 22	Support the adoption of the BC Energy Step Code and stakeholder input.
Industrial	Expanding the Prescriptive program to include new measures.	Page 27	Operational lesson that prescriptive type rebates allow for easier access to rebates for some customer groups and building types.
Industrial	Adding a new Industrial program called the Strategic Energy Management program.	Page 33	Opportunity identified to deepen customer engagement and provide industrial facilities with a program initiative to embark on energy management and a starting point to tackle operational type energy savings.
Low Income	Expanding the Direct Install program to include measures for manufactured homes	Page 34	FEI's market research indicates that manufactured homes are an underserved market and many are old and have rarely received energy efficiency retrofits. The Direct Install program will seek to develop opportunities to perform additional retrofits in manufactured homes and will provide duct sealing and repair, high efficiency furnace retrofits, and other measures as appropriate.
Low Income	Incentives for top-up rebates in the Residential program area.	Page 34	FEI gained operational lessons from the development of Space Heat Top Ups and Water Heater Top Ups for social housing providers. These rebates have proven to be of benefit to many participants. Based on this experience, FEI believes there is a similar opportunity to develop Top Ups for Low Income Residential customers for furnaces and water heaters.
CEO	Launch of the Residential Customer Engagement Tool.	Page 45	To increase the reach and energy literacy of residential customers across the province as well as driving participation into DSM program offerings.
Innovative Technologies	Supporting of pre-commercial technologies.	Page 48	Stakeholder feedback indicated a need for support in this area.
Enabling Activities	Adding a new program called the Community Energy Specialist Program.	Page 53	To support the development of energy plans including BC Energy Step Code support and raise awareness of and participate in FEI's C&EM programs within municipalities and regional districts.
Enabling Activities	Trade Ally Network expansion to include other industry representatives.	Page 54	FEI recognizes that other industry representatives such as commercial service contractors, equipment manufacturers, distributors and retailers also play a role in influencing natural gas end-use and energy efficiency decisions and as such incremental funding to support the expansion of this program is planned.
Enabling Activities	Launching the new Reporting Tool & Customer Application Portal.	Page 55	Customer requests for online forms and decreased rebate processing times.
Enabling Activities	Codes & Standards expansion of contributions to the advancement of codes and standards.	Page 55	Compliance with the 2017 DSM Regulation amendment stating that the utility must put forward investment equivalent to or more than 1% of the entire DSM portfolio expenditures to be provided to a standards-making body, a regulator body and/or government to assist with the development of energy conservation standards or the efficient use of energy.
Enabling Activities	Codes & Standards expanded support of BC Energy Step Code.	Page 55	With introduction of the BC Energy Step Code in 2016, FEI will support the education and awareness of this new voluntary building standard.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 44

19.2 Please provide a brief discussion of how FEI will monitor the market and/or other conditions and respond to changes as they occur.

**Response:**

FEI will monitor market conditions and consult with stakeholders through the following activities:

- Continue to develop relationships with contractors, distributors and manufacturers, through the Trade Ally Network and other means, to understand barriers and opportunities with respect to energy efficient products and program uptake;
- Conduct ongoing surveys and broader evaluation of program participants and key stakeholders;
- Hold regular meetings with program partners to identify areas for program improvement;
- Continue to meet with and gather feedback from the Energy Efficiency and Conservation Advisory Group (EECAG); and
- Align with associations, such as the Home Performance Stakeholder Council in its efforts to develop industry roadmaps and address industry concerns for the residential renovation market.

In response to the feedback received from the activities outlined above, FEI may:

- Amend program incentives, update application processes, and review qualifying product criteria;
- Create customer education materials, and provide marketing and program assistance to support customer adoption; and
- Support trades training, accreditation and quality installation activities.

FEI will also monitor government policy and direction to ensure programs meet updates to DSM Regulation amendments, ongoing updates to codes and standards and climate action policy where feasible and appropriate. In response to these changing policy decisions, FEI may:

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 45

- 1      • Review its programs and spending to determine compliance with changing DSM
- 2      Regulations and adapt DSM activity if feasible and appropriate while keeping within the
- 3      approved funding envelope;
- 4      • Adjust program eligibility, as necessary, to account for changes in codes and standards;
- 5      and
- 6      • Monitor local government adoption of BC Energy Step Codes and lend support to help
- 7      drive the transition to high performance homes and buildings.
- 8

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 46

1     **20.     Reference:     Exhibit B-1, Appendix A page 5**

Exhibit 1 - Summary of Annual Expenditures Including Inflation

Program Area	Total Utility Expenditures (\$000s)				
	2019	2020	2021	2022	Total
Residential	23,521	25,722	28,476	31,383	109,101
Commercial	13,837	17,357	27,441	31,081	89,715
Industrial	3,103	3,152	3,644	3,708	13,607
Low Income	6,630	6,795	6,984	7,217	27,626
Conservation Education and Outreach	7,155	7,360	8,595	9,467	32,578
Innovative Technologies	2,043	2,202	2,631	3,062	9,938
Enabling Activities	8,426	8,321	9,230	8,918	34,895
*Portfolio Level Activities	1,635	1,676	1,822	1,975	7,108
<b>ALL PROGRAMS</b>	<b>66,350</b>	<b>72,585</b>	<b>88,822</b>	<b>96,811</b>	<b>324,567</b>

\*Portfolio Level Activities are those activities for which the costs cannot be assigned to individual DSM programs. It should be noted that these activities are distinct from Enabling Activities. These distinct Portfolio Level Activities include expenditures such as DSM support and portfolio level staff labour, some staff training and conferences, facilities and equipment, some industry association memberships, regulatory work, and EECAG<sup>2</sup> activities.

2

3             20.1     Please provide Exhibit 1 dating back 3 years.

4

5     **Response:**

6     Exhibit 1 has been expanded to include 2016 actual results, 2017 actual results, and the  
7     projected 2018 expenditures. Please note that 2018 projected expenditures are as of July 2018  
8     and are subject to change. Indications from this projection are that expenditures for 2018 will be  
9     above the approved plan and FEI intends to seek Commission approval for the potential  
10    overage in advance of year-end.

11    FEI notes that due to an error in the background spreadsheet, the inflation portion of the DSM  
12    expenditures for 2020-2022 was incorrectly calculated. The correction results in a small  
13    reduction to the total requested DSM expenditures. Please refer to the Errata filed concurrently  
14    with these IR responses.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 47

Program Area	Total Utility Expenditures (\$000s)						
	2016 Actual	2017 Actual	2018 Projected	2019 DSM Plan	2020 DSM Plan	2021 DSM Plan	2022 DSM Plan
Residential	12,531	12,203	13,968	23,521	25,722	28,476	31,383
Commercial	10,637	10,834	11,361	13,837	17,355	27,437	31,074
Industrial	1,003	2,099	1,624	3,103	3,152	3,644	3,708
Low Income	2,277	2,644	2,878	6,630	6,795	6,984	7,217
Conservation Education and Outreach	2,415	2,590	2,729	7,155	7,353	8,578	9,433
Innovative Technologies	757	928	1,280	2,043	2,202	2,631	3,062
Enabling Activities	1,378	1,181	3,238	8,426	8,322	9,231	8,921
Portfolio Level Activities	1,167	1,559	1,529	1,635	1,676	1,822	1,979
<b>ALL PROGRAMS</b>	<b>32,165</b>	<b>34,039</b>	<b>38,607</b>	<b>66,350</b>	<b>72,577</b>	<b>88,803</b>	<b>96,775</b>

1

2

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 48

1     **21.     Reference:     Exhibit B-1, Appendix A page 5**

Exhibit 2 - Summary of Applied Inflation Rates

Inflation Category	Annual Inflation Rate (%)			
	2019	2020	2021	2022
Consumer Price Index (Non-Labour)	2.1%	2.0%	2.0%	2.0%
Average Weekly Earnings (Labour)	2.4%	2.6%	2.6%	2.8%

2

3             21.1     Please provide the sources of the CPI and AWE that FEI is using for their annual  
4                     inflation.

5

6     **Response:**

7     FEI's forecast BC CPI rate has been obtained from a variety of Canadian Financial Institution's  
8     economic forecasts, including, TD, CIBC, and BMO, as well as the BC Ministry of Finance and  
9     Conference Board of Canada forecasts. For Average Weekly Earnings (AWE), FEI used  
10    forecasts available from the Conference Board of Canada.

11

12

13

14             21.2     How does FEI apply the CPI and the AWE? Please explain.

15

16     **Response:**

17     FEI received input from ICF Canada for this response.

18     When developing the inputs for the 2019-2022 DSM Plan, non-incentive expenditures (i.e.  
19     administration, communications, evaluation, and labour) were estimated in 2019 dollars.  
20     Therefore, the inflation rates shown in the table above were applied to determine the "as-spent"  
21     dollars in any given year beyond 2019.

22     For example, if \$1,000,000 (2019 dollars) was to be spent on labour in 2020, then the "as-spent"  
23     expenditures were calculated as  $\$1,000,000 * (1.026) = \$1,026,000$ . Likewise, if \$1,000,000  
24     (2019 dollars) was to be spent on labour in 2021, then the "as-spent" expenditures were  
25     calculated as  $\$1,000,000 * (1.026) * (1.026) = \$1,052,676$ .

26     A separate inflation rate was used for all other non-incentive expenditures. For example, if  
27     \$1,000,000 (2019 dollars) was to be spent on admin in 2020, then the "as-spent" expenditures  
28     were calculated as  $\$1,000,000 * (1.020) = \$1,020,000$ .

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 49

1 It should also be noted that no inflation rates were applied to incentive expenditures since  
2 incentives already represent “as-spent” dollars.

3 FEI notes that due to an error in the background spreadsheet, the inflation portion of the DSM  
4 expenditures for 2020-2022 was incorrectly calculated in Appendix A, Exhibit 1. The correction  
5 results in a small reduction to the total requested DSM expenditures. Please refer to the Errata  
6 filed concurrently with these IR responses.

7

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 50

1    **22.    Reference:    Exhibit B-1, Appendix A page 6**

	TRC	1.0
	Portfolio**	1.8
Benefit/Cost Ratios	Utility	0.9
	Participant	1.7
	RIM	0.4

\*Only includes gas savings persisting until 2022, and therefore may be less than the sum of net incremental annual gas savings from individual program years

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

2

3            22.1    Please provide a brief description of each of the Benefit/Cost Ratios and how  
4                            they are calculated, or advise where these are included in the Application.

5

6    **Response:**

7    The three tables below briefly describe North American industry practice for each Benefit/Cost  
8    ratio and how they are calculated.<sup>8</sup>

9    In British Columbia, the Program Administrator Cost test (PACT) is referred to as the Utility Cost  
10   test (UCT), and the Modified Total Resource Cost (MTRC) test represents a modified version of  
11   the Total Resource Cost (TRC) test and could be likened to a Societal Cost test (SCT). In the  
12   MTRC, the DSM Regulation stipulates an alternative avoided cost of energy and non-energy  
13   benefits adder to be used on the benefits side of the ratio. The DSM Regulation also stipulates  
14   a low income benefits adder to be added to the benefits side of the TRC and MTRC ratios for all  
15   low income programs.

<sup>8</sup> The tables are FEI's excerpts from U.S. Environmental Protection Agency (2008). Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 51

**Table 2-2. The Five Principal Cost-Effectiveness Tests Used in Energy Efficiency**

Test	Acronym	Key Question Answered	Summary Approach
Participant cost test	PCT	Will the participants benefit over the measure life?	Comparison of costs and benefits of the customer installing the measure
Program administrator cost test	PACT	Will utility bills increase?	Comparison of program administrator costs to supply-side resource costs
Ratepayer impact measure	RIM	Will utility rates increase?	Comparison of administrator costs and utility bill reductions to supply-side resource costs
Total resource cost test	TRC	Will the total costs of energy in the utility service territory decrease?	Comparison of program administrator and customer costs to utility resource savings
Societal cost test	SCT	Is the utility, state, or nation better off as a whole?	Comparison of society's costs of energy efficiency to resource savings and non-cash costs and benefits

Source: Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects.

**Table 2-1. Basic Approach for Calculating and Representing Cost-Effectiveness Tests**

Net Benefits (Difference)	$\text{Net Benefits}_a$ (dollars)	=	$\text{NPV } \sum \text{benefits}_a \text{ (dollars)} - \text{NPV } \sum \text{costs}_a \text{ (dollars)}$
Benefit-Cost Ratio	$\text{Benefit-Cost Ratio}_a$	=	$\frac{\text{NPV } \sum \text{benefits}_a \text{ (dollars)}}{\text{NPV } \sum \text{costs}_a \text{ (dollars)}}$

Source: Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects.

Note: "NPV" refers to the net present value of benefits and costs. See Section 4.6.

**Table 3-2. Summary of Benefits and Costs Included in Each Cost-Effectiveness Test**

Component	PCT	PACT	RIM	TRC	SCT
Energy- and capacity-related avoided costs		Benefit	Benefit	Benefit	Benefit
Additional resource savings				Benefit	Benefit
Non-monetized benefits					Benefit
Incremental equipment and installation costs	Cost			Cost	
Program overhead costs		Cost	Cost	Cost	Cost
Incentive payments	Benefit	Cost	Cost		
Bill savings	Benefit		Cost		

Source: Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects.

Note: Incentive payments include any equipment and installation costs paid by the program administrator.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 52

1

2           22.2   Please confirm or otherwise explain that a Portfolio Measure of 1.8 implies that  
3                   benefits of the portfolio of DSM measures significantly exceeds the cost of the  
4                   DSM measures.

5

6   **Response:**

7   FEI notes that corrections were made to the background spreadsheet for the 2019-2022 DSM  
8   Plan resulting in a small reduction to the total requested DSM expenditures and an increase in  
9   the total energy savings. The corrections result in an increase to the Portfolio Benefit/Cost rate  
10   of 1.8 to 1.9. Please refer to the revised Application, Table 7-1, and Appendix A, Exhibit 3,  
11   provided in the Errata filed concurrently with these IR responses.

12   FEI confirms that a Portfolio Benefit/Cost Ratio of 1.9 means that the benefits of the DSM  
13   measures in the portfolio exceed the cost of the portfolio when including the additional benefits  
14   of the MTRC (as set out by the DSM Regulation) for all those programs that fail the TRC but  
15   pass the MTRC.

16

17

18

19           22.3   Please provide a brief overview of FEI's views as to the appropriate range for  
20                   each of the Benefit/Cost Ratios.

21

22   **Response:**

23   The benefit/cost ratios referenced above are an outcome of the overall 2019-2022 DSM Plan as  
24   summarized in Exhibit B-1, Appendix A, page 6, Exhibit 3 – Results for the Total DSM Program  
25   Portfolio.

26   Rather than targeting specific ranges for each of the various benefit/cost ratios, FEI's guiding  
27   principle related to cost-effectiveness is that "the combined Total Resource Benefit/Cost,  
28   including the Modified Total Resource Cost Benefit/Cost where applicable, of the Portfolio will  
29   have a ratio of 1 or higher".<sup>9</sup> Please also refer to the responses to BCUC IRs 1.5.2, 1.5.3 and  
30   1.5.3.1 for discussion regarding the Utility Cost Test.

31

---

<sup>9</sup> Application, Section 6.3, page 26.

<p style="text-align: center;">FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)</p>	<p>Submission Date: September 20, 2018</p>
<p>Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1</p>	<p>Page 53</p>

1     **23.     Reference:     Exhibit B-1, Appendix A page 8**

Exhibit 5 - Expenditures for Each of the Program Areas and the Total DSM Portfolio

Program Area	Utility Expenditures (\$000s)											
	Incentives					Non-Incentives					Total Expenditures	
	2019	2020	2021	2022	Total	2019	2020	2021	2022	Total	2019	2020
Residential	20,563	23,002	25,631	26,286	95,502	2,938	2,862	2,726	2,904	11,229	23,521	25,864
Commercial	10,194	13,193	21,123	23,803	68,312	3,643	4,075	6,050	6,815	20,583	13,837	17,268
Industrial	2,261	2,261	2,732	2,732	9,985	842	872	872	912	3,498	3,103	3,133
Low Income	4,966	5,071	5,180	5,292	20,509	1,664	1,666	1,726	1,804	6,860	6,630	6,759
Conservation Education and Outreach	0	0	0	0	0	7,155	7,203	8,233	8,860	31,450	7,155	7,203
Innovative Technologies	756	886	1,286	1,986	4,814	1,267	1,267	1,267	1,267	5,148	2,043	2,173
Enabling Activities	3,863	3,544	3,673	3,612	14,692	4,563	4,679	5,332	4,986	19,560	8,426	8,223
Portfolio Level Activities	0	0	0	0	0	1,635	1,635	1,735	1,835	6,840	1,635	1,635
<b>ALL PROGRAMS</b>	<b>42,823</b>	<b>47,957</b>	<b>56,625</b>	<b>65,411</b>	<b>215,615</b>	<b>23,727</b>	<b>24,101</b>	<b>27,962</b>	<b>29,411</b>	<b>105,201</b>	<b>66,356</b>	<b>72,057</b>

Exhibit 6 - Gas Savings and Cost-Effectiveness Results for Each of the Program Areas and the Total DSM Portfolio

Program Area	Incremental Annual Gas Savings, Net (GJ)				Cumulative Annual Gas Savings, Net (GJ)*	NPV Gas Savings, Net (GJ)	Benefit/Cost Ratios				
	2019	2020	2021	2022			TRC	Portfolio**	Utility	Participant	IDM
	2019	2020	2021	2022			TRC	Portfolio**	Utility	Participant	IDM
Residential	233,529	271,677	294,328	322,297	1,121,831	11,740,131	0.6	2.2	0.9	1.3	0.4
Commercial	280,314	295,064	418,482	478,288	1,418,592	14,431,099	1.0	1.5	1.4	1.8	0.5
Industrial	269,863	269,863	303,470	303,470	1,146,666	7,382,117	3.3	3.3	4.3	4.7	0.8
Low Income	76,022	76,590	77,141	77,707	307,459	2,607,693	4.5***	4.5	0.8	2.6	0.4
Conservation Education and Outreach	Savings Not Estimated				Savings Not Estimated		Savings Not Estimated				
Innovative Technologies	Savings Not Estimated				Savings Not Estimated		Savings Not Estimated				
Enabling Activities	Savings Not Estimated				Savings Not Estimated		Savings Not Estimated				
Portfolio Level Activities	Savings Not Estimated				Savings Not Estimated		Savings Not Estimated				
<b>ALL PROGRAMS</b>	<b>859,729</b>	<b>913,134</b>	<b>1,093,421</b>	<b>1,181,761</b>	<b>3,994,549</b>	<b>36,168,900</b>	<b>1.0</b>	<b>1.8</b>	<b>0.9</b>	<b>1.7</b>	<b>0.4</b>

\*Only includes gas savings persisting until 2022, and therefore may be less than the sum of net incremental annual gas savings from individual program years

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

\*\*\*Section 4 of the BC Demand-Side Measures Regulation, as amended in March 2017, requires the use of the Zero Emission Energy Alternative and a 40 percent benefit adder in calculating the TRC for Low Income programs.

2

3     23.1     Please provide Exhibit 5 dating back 3 years.

4

5     **Response:**

6     Exhibit 5 has been expanded to include 2016 and 2017 actuals as well as the 2018 projected

7     expenditures (as of July 2018).

8

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 54

Program Area	Utility Expenditures (\$000s)																				
	Incentives							Non-Incentives							Total Expenditures						
	2016 Actual	2017 Actual	2018 * Projected	2019	2020	2021	2022	2016 Actual	2017 Actual	2018 * Projected	2019	2020	2021	2022	2016 Actual	2017 Actual	2018 * Projected	2019 Plan	2020 Plan	2021 Plan	2022 Plan
Residential	10,291	9,688	10,041	20,583	23,002	25,631	28,286	2,240	2,515	3,927	2,938	2,662	2,726	2,904	12,531	12,203	13,968	23,521	25,664	28,357	31,190
Commercial	8,560	8,847	8,919	10,194	13,193	21,123	23,803	2,077	1,987	2,442	3,643	4,075	6,050	6,815	10,637	10,834	11,361	13,837	17,268	27,173	30,618
Industrial	529	1,614	1,071	2,261	2,261	2,732	2,732	474	485	553	842	872	872	912	1,003	2,099	1,624	3,103	3,133	3,604	3,644
Low Income	1,597	1,592	1,880	4,966	5,071	5,180	5,292	679	1,052	998	1,664	1,688	1,728	1,804	2,277	2,644	2,878	6,630	6,759	6,908	7,096
Conservation Education and Outreach	0	0	0	0	0	0	0	2,415	2,590	2,729	7,155	7,203	8,233	8,868	2,415	2,590	2,729	7,155	7,203	8,233	8,868
Innovative Technologies	67	95	0	756	886	1,286	1,686	690	833	1,280	1,287	1,287	1,287	1,287	757	928	1,280	2,043	2,173	2,573	2,973
Enabling Activities	0	0	0	3,863	3,544	3,673	3,612	1,378	1,181	3,238	4,563	4,679	5,332	4,986	1,378	1,181	3,238	8,426	8,223	9,005	8,598
Portfolio Level Activities	0	0	0	0	0	0	0	1,167	1,559	1,529	1,635	1,635	1,735	1,835	1,167	1,559	1,529	1,635	1,635	1,735	1,835
ALL PROGRAMS	21,045	21,836	21,910	42,623	47,957	59,625	65,411	11,120	12,203	16,697	23,727	24,101	27,962	29,411	32,165	34,039	38,607	66,350	72,057	87,587	94,821

\* 2018 Projected values are as of July 2018

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 55

## 1 24. Reference: Exhibit B-1, Appendix A pages 13 and 14

### 3.4 Program Profiles

The following pages provide profiles for each of the programs shown above in Exhibit 7 and Exhibit 8.

#### 3.4.1 Home Renovation Program

<b>Program Description</b>	The program will promote energy-efficiency home retrofits in collaboration with Utility Partners, as well as federal, provincial, and municipal governments. In addition to rebates, initiatives include capacity building for trades, ensuring high quality installations and providing opportunities to promote home labeling through EnerGuide home evaluations.
<b>Target Sub-Market</b>	Residential
<b>New vs. Retrofit</b>	Retrofit
<b>Partners</b>	BC Hydro, FortisBC Inc., Municipal, Provincial and Federal Government
<b>Sources</b>	Sources for measure assumptions included in Appendix A-1

Measure	Forecasted Measure Participation				
	2019	2020	2021	2022	2019-2022
<b>Space Heating</b>					
Furnace	7,000	7,000	7,000	8,000	29,000
Boiler	500	500	500	500	2,000
Combination System	500	540	610	650	2,300
<b>Secondary Heating</b>					
EnerChoice Fireplace	6,760	7,440	8,190	8,410	30,800
Direct Vent Wall Furnace	180	200	220	240	840
<b>Water Heating</b>					
0.67 EF Storage Tank Water Heater	3,680	4,050	4,450	4,900	17,080
Condensing Tankless Water Heater	1,700	1,870	2,060	2,260	7,890
Condensing Storage Tank Water Heater	530	580	640	700	2,450
<b>Building Envelope</b>					
Attic Insulation	2,250	2,475	2,720	3,000	10,445
Wall Insulation	240	265	290	320	1,115
Crawlspace and Basement Insulation	265	290	320	350	1,225
Other Insulation	110	120	130	150	510
Bonus Offers	600	650	700	750	2,700
<b>Water Conservation</b>					
Aerators & Showerheads	650	650	650	650	2,600
ENERGY STAR Washer	2,250	2,500	2,750	3,025	10,525
ENERGY STAR Dryer	100	100	100	100	400
<b>Other</b>					
Drain Water Heat Recovery	100	200	300	400	1,000
Communicating Thermostat	2,800	5,600	5,600	6,400	20,400
HVAC Zone Controls	0	100	560	640	1,300
Appliance Maintenance	50,000	50,000	50,000	50,000	200,000
<b>TOTAL</b>	<b>80,215</b>	<b>85,130</b>	<b>87,790</b>	<b>91,445</b>	<b>344,581</b>

#### Home Renovation Program (cont'd...)

Expenditure Type	Expenditures (\$000's)				
	2019	2020	2021	2022	2019-2022
Incentives	\$14,713	\$15,911	\$17,123	\$18,653	\$66,399
Admin	\$574	\$334	\$334	\$334	\$1,576
Communication	\$100	\$100	\$100	\$100	\$400
Evaluation	\$430	\$365	\$380	\$460	\$1,635
Labour <sup>a</sup>	\$483	\$483	\$483	\$483	\$1,932
<b>TOTAL</b>	<b>\$16,300</b>	<b>\$17,193</b>	<b>\$18,420</b>	<b>\$20,030</b>	<b>\$71,942</b>

Measure	Measure Details							
	Incremental Cost (\$)	Incentive (\$)	Contractor Incentive (\$)	Annual Gas Savings (GJ)	Annual Elec. Savings (kWh)	Measure Lifetime (yrs)	Free Rider Rate (%)	Spillover Rate (%)
<b>Space Heating</b>								
Furnace	\$1,737	\$500	\$100	6.2	280	18	- <sup>a</sup>	0%
Boiler	\$3,200	\$500	\$100	8.7	0	18	- <sup>a</sup>	0%
Combination System	\$5,486	\$1,200	\$50	17.7	0	18	20%	0%
<b>Secondary Heating</b>								
EnerChoice Fireplace	\$132	\$300	\$50	9.5	0	15	28%	0%
Direct Vent Wall Furnace	\$1,245	\$300	\$0	4.6	0	20	1%	0%
<b>Water Heating</b>								
0.67 EF Storage Tank Water Heater	\$246	\$200	\$50	3.0	0	13	26%	0%
Condensing Tankless Water Heater	\$2,561	\$1,000	\$50	9.5	0	20	31%	0%
Condensing Storage Tank Water Heater	\$2,273	\$1,000	\$50	6.9	0	13	11%	0%
<b>Building Envelope</b>								
Attic Insulation	\$1,326	\$550	\$0	8.5	0	30	20%	0%
Wall Insulation	\$2,714	\$625	\$0	28.9	0	30	20%	0%
Crawlspace and Basement Insulation	\$838	\$543	\$0	6.6	0	30	20%	0%
Other Insulation	\$1,167	\$350	\$0	5.7	0	30	20%	0%
Bonus Offers	\$0	\$1,000	\$0	0.0	0	-	-	-
<b>Water Conservation</b>								
Aerators & Showerheads	\$3	\$3	\$0	1.0	0	10	0%	0%
ENERGY STAR Washer	\$77	\$75	\$0	1.0	69	14	20%	0%
ENERGY STAR Dryer	\$50	\$100	\$0	0.7	0	12	0%	0%
<b>Other</b>								
Drain Water Heat Recovery	\$738	\$250	\$0	4.3	0	25	3%	0%
Communicating Thermostat	\$250	\$100	\$0	6.5	0	15	0%	0%
HVAC Zone Controls	\$896	\$500	\$0	5.5	0	16	0%	0%
Appliance Maintenance	\$0	\$25	\$0	0.0	0	-	-	-
<b>Weighted Average per Participant</b>	<b>\$380</b>	<b>\$175</b>	<b>\$18</b>	<b>2.8</b>	<b>26</b>	<b>17</b>	<b>19%</b>	<b>0%</b>

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 56

24.1 FEI partners with BC Hydro, FortisBC, and various governments for the Home Renovation Project and the New Home Program, and electricity savings are also identified. How are the electricity savings accounted for by FEI, if at all? Please explain.

**Response:**

FEI captures electricity savings for a few individual measures in specific programs. An example is natural gas furnaces where qualifying products must be ENERGY STAR rated. To earn this rating, gas furnaces must be equipped with a high efficiency electronically commutated fan motor (ECM) which contributes electric savings and FEI adds these savings within the cost effectiveness calculations. In terms of electricity savings for whole home measures (i.e. insulation) please refer to response to BCSEA IR1.11.1, which explains that savings from electric cooling are not significant in BC and therefore at this time not accounted for in insulation savings estimates. In summary, electricity savings are used by FEI for the cost effectiveness calculations and only applied where FEI can confirm that those savings are a direct result of the gas measure being installed.

In the cases of utility partner programs, FEI captures the savings for new builds or upgrades to homes whose primary heating is natural gas while the electric utilities capture the savings for new builds or upgrades to homes whose primary heating is electricity.

24.2 Why does FEI anticipate such significant increases in the communicating thermostat over the 2019-2022 period relative to some of the other measures?

**Response:**

For the Home Renovation Program, FEI's intention is for communicating thermostats rebates to be promoted in conjunction with furnace rebates to encourage the installation of compatible thermostats for system optimization. As such, the ramping rate of communicating thermostats is correlated to furnaces. The uptake in 2019 is expected to be 40 percent of furnace participants, lower than the 80 percent expected for the remainder of the Plan, to account for a mid-2019 launch that would allow time for development and integration into the Home Renovation Program.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 57

1    **25.    Reference:    Exhibit B-1, Appendix A page 20**

**Codes and Standards**

The 2019-2022 forecasts do not include baseline adjustments for potential future announcements of updates on minimum efficiency standards for regulated items. FortisBC will continue to monitor evolving codes and standards regulation and incorporate impacts to minimum efficiencies of regulated items once proposed codes and standards regulation becomes effective. This approach is due to the uncertain nature of when an effective date of proposed codes and standards regulation will come into force, and quantifying its impact within the BC market before public consultation has taken place. Additionally the approach of claiming savings after the effective date of regulation change provides a greater level of accuracy on claiming attribution savings from codes and standards.

Attributed savings will be estimated from the date of the proposed regulation change to the effective date of the regulation, as per the Demand-Side Measures Regulation (DSM Regulation). Attributed savings will then be claimed and reported on within the year of the effective date of the proposed codes and standards regulation. An assumed delay period will be applied to the effective date to account for market transition to the new regulation and existing non-compliance product stock.

When effective dates and the impact of new standards are known with certainty, FEI will make the appropriate adjustments to program design and note changes to the cost-effectiveness inputs. The approach to reporting code and standards attribution savings, similar to reporting DSM program savings will be done through the annual DSM report.

2

3            25.1    Please provide a brief discussion on how 'Codes and Standards' result in  
4                   attribution savings and how the savings are determined and calculated.

5

6    **Response:**

7    FEI's DSM programs assist in the development, adoption and implementation of new codes and  
8    standards, and help achieve energy savings as a result. Energy efficiency improvements in  
9    building codes and appliance standards can be advanced by supporting research, analysis,  
10   development, training, education and increasing market capacity for new code adoption.

11   To quantify the influence of FEI's programs on new code and standards adoption, FEI follows  
12   the approach outlined in the DSM Regulation and calculates a proportion of the total expected  
13   measure savings (i.e. attribution of savings) associated with the adoption of the energy efficient  
14   regulated item after the standard has been proposed by the regulatory body. An estimate of the  
15   realized savings is determined by estimating the increase in energy efficiency of the new  
16   proposed regulation from the current code baseline and by the market adoption of the new  
17   regulation. FEI then attributes a portion of these savings to its program(s), accounting for  
18   savings lost due to non-compliance, as a means to quantify FEI's role in accelerating the code  
19   or standard regulation change. FEI claims these savings in its DSM Annual Report once the  
20   regulation has come into force.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 58

A past example of savings attribution was presented in the 2014 EEC Program Annual Report<sup>10</sup>. Savings were attributed for codes and standards in the New Home Program as a result of the 2014 updates to the BC Building Code and the 2014 Vancouver Building By-law. The New Home Program activities in preceding years enabled code adoption and market compliance earlier than would have been done in the absence of a program by preparing the market for the higher performance standards and supporting increased market uptake of higher efficiency equipment. As a result, FortisBC was able to capture a portion of projected energy savings upon the introduction of the code.

25.2 Please explain how the attribution savings can be expected to impact the Benefit/Cost ratios.

**Response:**

Where there is evidence to support the attribution of savings from the introduction of a code or standard to FEI's DSM activities, such attribution will increase the benefits side of the cost/benefit calculation with less or no change to the cost side of the equation. This will tend to improve the cost/benefit results for that program in the year(s) that the attribution of savings occurs. This improvement in savings will thus also accrue to the portfolio. The extent to which such attribution will be measurable at the portfolio level will depend on the scale of the savings that are attributed in any given year.

---

<sup>10</sup> FortisBC Energy Utilities, Energy Efficiency and Conservation Program 2014 Annual Report, March 30, 2015, pages 34-35.

## Prescriptive Program (cont'd...)

Expenditures (\$000's)					
Expenditure Type	2019	2020	2021	2022	2019-2022
Incentives	\$6,459	\$9,385	\$11,913	\$14,182	\$41,939
Admin	\$851	\$1,055	\$1,393	\$1,638	\$4,938
Communication	\$351	\$436	\$575	\$677	\$2,039
Evaluation	\$165	\$110	\$75	\$200	\$550
Labour	\$592	\$734	\$969	\$1,140	\$3,435
<b>TOTAL</b>	<b>\$8,418</b>	<b>\$11,720</b>	<b>\$14,926</b>	<b>\$17,837</b>	<b>\$52,900</b>

Measure	Measure Details						Free Rider Rate (%)	Spillover Rate (%)
	Incremental Cost (\$)	Incentive (\$)	Contractor Incentive (\$)	Annual Gas Savings (GJ)	Annual Elec. Savings (kWh)	Measure Lifetime (yrs)		
Condensing Boiler	\$19,283	\$12,486	\$100	396	0	20	18%	0%
Mid Efficiency Boiler	\$25,922	\$10,528	\$100	894	0	20	18%	0%
Condensing Storage Water Heater	\$3,705	\$2,161	\$100	93	0	15	38%	9%
Condensing Volume Boiler	\$22,230	\$4,033	\$100	183	0	20	38%	9%
Condensing Tankless Water Heater	\$2,966	\$924	\$100	85	0	20	38%	9%
Deep Fryer	\$3,715	\$2,064	\$300	140	0	12	20%	0%
Large Vat Deep Fryer	\$6,434	\$3,467	\$300	196	0	12	20%	0%
Griddle	\$8,533	\$2,024	\$300	66	0	12	20%	0%
Combination Oven	\$8,303	\$4,014	\$300	74	0	12	20%	0%
Convection Oven	\$2,657	\$2,354	\$300	53	0	12	20%	0%
Rack Oven	\$9,705	\$5,353	\$300	327	0	12	20%	0%
Conveyor Oven	\$6,750	\$2,797	\$300	231	0	12	20%	0%
Steam Cooker	\$2,000	\$1,000	\$300	220	0	12	20%	0%
Low Flow Spray Valve	\$115	\$115	\$0	16	0	5	20%	0%
Condensing Make Up Air Unit	\$3,900	\$1,500	\$100	80	3,720	18	5%	0%
Furnace Replacement (Baseline: Std.)	\$1,840	\$800	\$100	7	280	18	0%	0%
Furnace Replacement (Baseline: Mid)	\$1,840	\$800	\$100	5	280	18	0%	0%
Roof Insulation	\$20,175	\$15,131	\$100	84	67	20	10%	0%
HVAC Controls	\$22,885	\$7,500	\$0	293	33,393	8	0%	0%
Condensing Unit Heaters	\$1,548	\$900	\$100	15	-223	18	0%	0%
Vortex Desalers	\$35,080	\$10,000	\$0	330	22,500	25	0%	0%
Gas Underfired Broilers	\$1,900	\$1,200	\$300	128	0	12	20%	0%
Weighted Average per Participant	\$4,987	\$2,612	\$114	67	703	17	7.8%	0.7%

2

3        26.1    How are the spillover rates for Condensing Storage Water Heater, Condensing  
4                Volume Boiler, and Condensing Tankless Water Heater determined and  
5                calculated?

7 **Response:**

8 The spillover rates for Condensing Storage Water Heater, Condensing Volume Boiler, and  
9 Condensing Tankless Water Heater were determined during the 2016 Commercial Water  
0 Heating Program evaluation.

1 The approach taken for determining and calculating spillover rates included:

- 2 • Survey with program participants which consisted of a series of questions associated  
3 with identifying the energy efficiency upgrades or efficiency actions undertaken since  
4 participating in the program, and the factors that influenced their decision to implement  
5 those upgrades; and
- 6 • Results were tabulated based on the percentage of those who responded to  
7 implementing the efficiency upgrades and attributing those upgrades to the program.

8 This approach is referred to as a survey-based (self-reported) approach which is consistent with  
9 industry best practice.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35

26.2 The Free Rider rates are significant for several of the measures in the Prescriptive Program. Please discuss the possibility/likelihood that the Free Rider rates are over- or underestimated, and provide a range of confidence if possible.

**Response:**

FEI determines free rider rates in accordance with the methods outlined in the California Evaluation Framework and submits that, for this reason, the free rider rates presented in the preamble for the Prescriptive Program are within a reasonable range and in alignment with industry best practices. FEI's methods for determining free rider rates do not include statistical determinations of confidence but do include the following procedures for validating findings:

- FEI retains third-party consultants with industry expertise to quantify free rider rates. Typically, consultants conduct this assessment via program participant surveys. These surveys validate the consistency of free rider information by asking multiple questions regarding the participant's energy efficiency upgrade decision in absence of the DSM program, the timing of their decision to upgrade, and their efficiency choices. Each response in the series of questions is assigned a probability scale to identify the degree of free ridership (full or partial free rider) and the results are taken into account for analyzing and determining the free rider rates.
- In addition, FEI's evaluation team hosts periodic internal meetings to review and, if applicable, initiate further research or updates to free rider rates based on recent and updated evaluation reports and/or external sources. The broader evaluation team consists of contributors from FEI's DSM engineering and program specific subject matter experts from groups such as Energy Solutions who participate in the process.
- For new programs or measures, FEI reviews reference data from similar jurisdictions and studies of similar technologies to determine free rider rates at the outset of deploying the new measure or program. FEI uses such information until it is able to conduct its own evaluation to either validate or update such free rider rates.

Given FEI's methods for determining free rider rates and procedures for validating its findings, FEI is confident that the determined free rider rates are the best available gauges for free ridership for FEI's DSM programs.

FortisBC Energy Inc. (FEI or the Company) Application for Acceptance of 2019-2022 Demand Side Management (DSM) Expenditures Plan (the Application)	Submission Date: September 20, 2018
Response to Commercial Energy Consumer Association of British Columbia (CEC) Information Request (IR) No. 1	Page 61

1

2

3

4           26.3   Please discuss how the Free Rider rates are determined and calculated.

5

6    **Response:**

7    Please refer to the response to CEC IR 1.26.2.

8

**Attachment 13.8**

---

# **Review of Net-to-Gross Assumptions**

## **FEI and FBC Energy Efficiency Programs**

### **Executive Summary**

**Prepared for:**

Cindy Wong  
Evaluation, Measurement and Verification  
FortisBC Energy Inc.  
Surrey, BC

**Submitted by:**

Sampson Research Inc.

**December 31, 2017**



**SAMPSON RESEARCH INC.**

1543 Park Avenue  
Roberts Creek, British Columbia  
V0N 2W2  
1. 604.740.0254  
[www.sampsonresearch.com](http://www.sampsonresearch.com)



### **Disclaimer**

The opinions expressed in this report are the responsibility of the author, Sampson Research, and do not necessarily represent the views of FortisBC.

### **Acknowledgements**

The author is grateful for the generous assistance received from the following FEI and FBC staff in the preparation of this report:

Cindy Wong  
Ken Ross  
Beth Ringdahl  
Ned Georgy  
Ramsay Cook  
Andrew Luke  
Jennifer Shum  
Keith Veerman  
Ann Wilson



# TABLE OF CONTENTS

	Page
<b>1 EXECUTIVE SUMMARY.....</b>	<b>1</b>
1.1 Findings.....	1
1.1.1 Industry Scan .....	1
1.1.2 NTG Methods and Assumptions Used by FEI and FBC.....	1
1.2 Recommendations.....	2
<b>2 INTRODUCTION.....</b>	<b>5</b>
2.1 Study Objectives .....	5
2.2 Methods.....	5
2.3 Report Organization .....	5
<b>3 NTG DEFINITIONS &amp; METHODS.....</b>	<b>7</b>
3.1 Key Definitions.....	7
3.2 Overview of Methods to Estimate NTG .....	8
3.3 Strengths and Weakness of NTG Methods .....	10
<b>4 INDUSTRY NTG PRACTICES .....</b>	<b>13</b>
4.1 Findings.....	13
4.1.1 Application of NTG Adjustments .....	13
4.1.2 Prospective vs. Retrospective Application of NTG Adjustments .....	14
4.1.3 Methods Used to Estimate Free Ridership .....	14
4.1.4 Methods Used to Estimate Spillover .....	15
4.1.5 Best Practices in Applying Self-Reporting Methodologies (Tetra Tech 2011) .....	17
4.1.6 Trends in the Application of NTG Methodologies .....	17
4.1.7 Factors Influencing Free Ridership .....	20
4.2 Summary Comments .....	22
<b>5 FORTISBC NTG METHODS AND ASSUMPTIONS.....</b>	<b>25</b>
5.1 Summary of Findings .....	25
5.1.1 Sources of NTG Information .....	25
5.1.2 NTG Components Addressed .....	25
5.1.3 Free Ridership Methods .....	26
5.1.4 Spillover Methods.....	27
5.1.5 Currency of NTG Assumptions.....	28
5.1.6 Documentation & Transparency.....	29
5.1.7 Reasonableness of Free Rider and Spillover Estimates .....	29
5.2 Summary Comments .....	34
<b>6 RECOMMENDATIONS .....</b>	<b>37</b>
<b>REFERENCES .....</b>	<b>39</b>
<b>APPENDIX A: FEI &amp; FBC PROGRAMS .....</b>	<b>43</b>
<b>APPENDIX B: INDUSTRY SCAN OF NTG VALUES .....</b>	<b>45</b>

# LIST OF TABLES

Page

Table 1: Summary of NTG Methods by Applicability (Source: DOE UMP, 2014) .....	10
Table 2: Free Ridership Comparisons – Residential Programs .....	31
Table 3: Free Ridership Comparisons – Commercial Programs .....	32
Table 4: Participant Spillover Comparisons – Residential Programs .....	33
Table 5: Non-Participant Spillover Comparisons – Residential Programs .....	34
Table 6: Participant Spillover Comparisons – Commercial Programs .....	34
Table 7: Non-Participant Spillover Comparisons – Commercial Programs .....	34

# LIST OF FIGURES

Page

Figure 1: Free Ridership (%) Comparisons - Residential Programs .....	31
Figure 2: Free Ridership (%) Comparisons - Commercial Programs .....	32

# ABBREVIATIONS AND ACRONYMS

<b>BCUC</b>	British Columbia Utilities Commission
<b>DID</b>	Difference in differences
<b>DOE</b>	United States Department of Energy
<b>ECAP</b>	Energy Conservation Assistance Program
<b>ESK</b>	Energy Savings Kit
<b>ETO</b>	Energy Trust of Oregon
<b>FBC</b>	FortisBC Inc.
<b>FEI</b>	FortisBC Energy Inc.
<b>FR</b>	Free riders
<b>FRR</b>	Free rider rate
<b>GS</b>	Gross savings
<b>HERO</b>	Home Energy Rebate Offer
<b>ME</b>	Market effects
<b>NPSO</b>	Non-participant spillover
<b>NS</b>	Net savings
<b>NTG</b>	Net-to-gross
<b>PSO</b>	Participant spillover
<b>QED</b>	Quasi-experimental design
<b>RCT</b>	Randomized control trials
<b>SO</b>	Spillover
<b>UMP</b>	Uniform Methods Project



# 1 EXECUTIVE SUMMARY

This study reviewed net-to-gross (NTG) methods, data sources, and assumptions used by FortisBC Energy Inc. (FEI) and FortisBC Inc. (FBC). NTG is defined to include free riders and spillover. FortisBC commissioned this study to ensure that its NTG estimates are reasonable, defensible, and derived using industry best practices.

Data and information reviewed for this study came from interviews with FEI and FBC program managers and evaluation specialists, FEI and FBC program evaluations and market research, other internal documents, and a scan of industry best practices in the estimation of free riders and spillover. Comparisons were made between FEI and FBC NTG estimates and assumptions with those from evaluations of comparable energy efficiency programs published by the industry during the last 10 years.

## 1.1 Findings

### 1.1.1 Industry Scan

- There are a variety of methods used to estimate free riders. While all methods have strengths and weaknesses, self-reporting methods dominate the industry. The volume of literature addressing the strengths and weaknesses of self-reporting methodologies is substantial. A number of compendiums and guides addressing best practices have been written.
- Despite their popularity, there is considerable diversity in how self-reporting methods are applied. Some jurisdictions (e.g., California, New York, Oregon) have developed guidelines for their utilities to minimize the arbitrariness of free rider methodologies used in program evaluations.
- Among jurisdictions allowing adjustments for spillover, its inclusion in the calculation of net savings is becoming more common. Energy savings from spillover serve to offset some or all of the savings lost to free riders. Spillover estimates based on self-reporting methodologies dominate. Compared to free riders, there has been considerably less critical review of spillover methodologies.
- While the methods and data used to estimate free rider and spillover were typically well documented, very few evaluations discussed or sought to understand the factors that contributed to their NTG findings.

### 1.1.2 NTG Methods and Assumptions Used by FEI and FBC

- For free riders, the majority of evaluations commissioned by FEI and FBC used a self-reporting methodology chosen by the evaluation contractor. Methods and procedures used to estimate free riders in FEI and FBC residential program evaluations are consistent with industry best practices.
- Commercial program evaluations conducted for FBC used self-reporting methods and are following industry best practices. Self-reporting methodologies used in FEI's commercial program evaluations varied significantly in their sophistication and rigor. None of FEI's commercial evaluations explored spillover.
- Methods used by FEI and FBC to estimate free riders differ. FBC's most recent residential and commercial evaluations used a variant of Energy Trust of Oregon's simplified NTG methodology whereas recent a number of FEI evaluations have used the more elaborate method discussed by

the Uniform Methods Project (DOE UMP 2014). Both methods have their merits but are significantly different.

- Documentation of the methods, findings, and factors contributing to NTG results varied by program. The level of documentation provided in some evaluations was insufficient to assess the rigor behind the estimates.
- Impact evaluations typically deliver results one or two years following program participation. In this context, most FEI and FBC estimates of free ridership based on formal evaluations are current.
- FEI is following industry best practices by attempting to assess free ridership at the program application stage. Several programs use only one question on the application form while others use multiple questions. While a single question is not overly robust, it can provide early feedback about free ridership to program managers and can be useful if tracked over time. Free ridership and the factors driving free ridership should continue to be addressed in impact evaluations.
- Free ridership values for residential FEI programs tend to be at or below the low end of the range of comparable industry values. However, relatively few evaluations of DSM programs addressing gas measures were found in the industry scan. Free rider rates for FBC's residential programs were well within the range of comparable industry values.
- Free ridership values for FEI and FBC commercial programs, with the odd exception, were within the range of comparable industry values.
- Relatively few of FortisBC residential and commercial programs currently claim participant spillover. BCUC's position on spillover places the burden of proof for any claims to spillover on the utility. This is appropriate and reinforces the need to use best practices in the choice of method, application rigor, and documentation.

### 1.2 Recommendations

Recommendations for FortisBC include:

1. Consider standardizing the self-reporting method used to estimate free riders and spillover for the two utilities. Barring this, consultants should be required to specify the method they will use to assess free riders and spillover at the Request for Proposal (RFP) stage. The rigor and soundness of their proposed methodologies should be included in proposal evaluation criteria.
2. Evaluations should fully document the methods, data sources, assumptions, and rules for addressing inconsistency and uncertainty in the determination of free riders. Similar documentation requirements should be required for any calculations of spillover.
3. Continue to assess free ridership early in the customer participation process, using either questions on the application form (where space permits) or a quick-feedback survey administered shortly after a customer's decision to participate (e.g., upon receipt of their rebate). If implemented, quick-feedback surveys should be administered by an independent third party to minimize response bias.
4. Use industry best practices in determining placeholder values for free ridership in new programs. Sources for this information include technical feasibility studies, pre-launch market research, industry representative round-tables or industry scans of evaluations for similar programs.

5. Where sample sizes permit, impact evaluations should explore factors influencing program participation and free ridership, including the timing of the technology and program awareness relative to the purchase / implementation decision, incentive structures (rebates versus financing, etc.), socioeconomic factors, and other program or non-program influences.
6. Evaluations addressing free ridership in large commercial and industrial projects should use a preponderance-of-evidence approach, recognizing that multiple influencers / influences may have impacted the decision to proceed with the investment / project.
7. Rationales, methods and savings assumptions used to determine energy savings due to spillover (any type) should be fully documented, consistently applied, and supported by the program's logic model. Erring to the conservative on both attribution and coverage is recommended.
8. FortisBC should continue to build its internal evaluation capacity and expertise to be able to independently assess the merits and validity of free ridership and spillover methods and estimated values.

\* \* \* \* \*





**Sampson Research Inc.**

Economic research that matters to communities and business

☎ 604.740.0254

✉ [jsampson@sampsonresearch.com](mailto:jsampson@sampsonresearch.com)

[www.sampsonresearch.com](http://www.sampsonresearch.com)