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October 11, 2018

Sent via email/eFile

**FBC 2019-2022 DSM EXPENDITURES APPLICATION
EXHIBIT A-3**

Ms. Diane Roy
Vice President, Regulatory Affairs
FortisBC Inc.
16705 Fraser Highway
Surrey, BC V4N 0E8
electricity.regulatory.affairs@fortisbc.com

**Re: FortisBC Inc. – Application for Approval of 2019-2022 Demand Side Management Expenditures Plan –
Project No. 1598973 – Information Request No. 1**

Dear Ms. Roy:

Further to your August 2, 2018 filing regarding the FortisBC Inc. 2019 – 2022 Demand Side Management Expenditures Application, enclosed please find the BCUC Information Request No. 1. Please file your responses by October 30, 2018.

Sincerely,

Original Signed by:

Patrick Wruck

/aci
Enclosure



FortisBC Inc.
Application for Acceptance of Demand Side Management Expenditures
Plan for the Period Covering 2019 to 2022

INFORMATION REQUEST NO. 1 TO FBC

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A. PORTFOLIO LEVEL ISSUES

**1.0 Reference: PORTFOLIO LEVEL ISSUES
Exhibit B-1, pp. 1, 5, 14, 22; Appendix A, p. 2
Consistency with Long Term Electricity Resource Plan (LTERP)**

On page 1 of Exhibit B-1, FortisBC Inc. (FBC) states:

The LT DSM Plan [Long Term Demand Side Management Plan] was premised on a ramp up in DSM spending and savings, beginning in 2021, that would offset an average of 77 percent of FBC’s forecast load growth annually over the LTERP’s planning horizon.

Table 1-1 shows that the proposed budget for the DSM Plan is \$7.7 million more, in total, than the pro-forma budget contemplated in the LT DSM Plan (inflation adjusted) and is expected to achieve an additional 18.7 GWh of electricity savings for this period.

On page 5 of Exhibit B-1, FBC states:

The DSM measures included in the 2019-2022 DSM Plan are consistent with the measures assessed and the benefit/cost methodology used in the 2016 LTERP and LT DSM Plan.

On page 14 of Exhibit B-1, FBC states:

Overall, the DSM Plan expenditures are 21 percent higher (at \$44.0 million) than the pro-forma budgets provided in the 2016 LTERP (\$35.7 million inflation adjusted). Over half (\$4.0 million) of the \$7.7 million increase is allocated to lighting measures in the Industrial sector, largely to address agriculture process lighting in the emergent cannabis industry. Other large increases are from the Residential Customer Engagement Tool (\$1.1 million), the Demand Response pilot (\$1.0 million), and the DSM tracking tool (\$0.6 million) under Supporting Initiatives.

On page 22 of Exhibit B-1, FBC states:

FBC’s proposed DSM portfolio for 2019 to 2022 is cost-effective, with a TRC of 1.5, based on the methodology set out in section 4 of the DSM Regulation.

Table 1-1 of Appendix A to Exhibit B-1 indicates a portfolio level Total Resource Cost (TRC) benefit/cost ratio of 1.5 for the 2019-2022 DSM Plan and a portfolio level TRC benefit/cost ratio for the LT DSM Plan of 1.9.

- 1.1 Please provide the annual percentage of FBC's forecast load growth that is expected to be offset by the 2019-2022 DSM Plan.
 - 1.1.1 Please also provide a calculation that excludes load growth and energy savings from the cannabis industry that were not contemplated at the time of the LTERP.
 - 1.1.2 Please discuss any differences with the forecasted load growth offset contained in the LTERP.
- 1.2 Please confirm that all measures that were included in the LT DSM Plan are included in the 2019-2022 DSM Plan.
 - 1.2.1 If not confirmed, please explain.
- 1.3 Please discuss if FBC was contemplating expenditures on Residential Customer Engagement Tool, the Demand Response (DR) pilot and the DSM tracking tool at the time of preparing the 2016 LTERP. Please explain why these costs were not included in the 2016 LTERP forecast.
- 1.4 Please explain the main reasons for the differing TRC ratios in the 2019-2022 DSM Plan and the LT DSM Plan.

**2.0 Reference: PORTFOLIO LEVEL ISSUES
Exhibit B-1, pp. 2, 19 to 21; Appendix B, pp. 14, 19, 20, 27;
2016 LTERP and LT DSM Plan proceeding, Exhibit B-11, Response to BCUC IR 79.1
Conservation Potential Review (CPR)**

On page 2 of Exhibit B-1, FBC states:

FBC uses the market potential estimated in its CPR as an input to the planning process. The market potential is an estimate of energy savings for a list of technologies that could be achieved over time. Broad assumptions about customer acceptance and adoption rates are made to estimate the potential. Market potential differs from program potential in that it does not account for the various mechanisms that can be used to deliver DSM programs for a specific measure and/or customer segment. FBC evaluates the potential identified for each energy end use, compares it to program activity, and calibrates programs where appropriate.

Figure 5-2 on page 19 of Exhibit B-1 shows the electric energy market savings potential by end-use, aggregated across all sectors. FBC states the dominant end-uses are lighting and whole facility.

Figure 5-3 on page 20 illustrates the amount of electric savings in the market potential included in consumer electronics, the kraft pulp and paper customer segment and from codes and standards which, historically, have not contributed to FBC's DSM program savings.

Figure 5-4 on page 21 illustrates the 2019-2022 DSM Plan compared to remaining market potential.

In the 2016 LTERP and LT DSM Plan proceeding, in response to British Columbia Utilities Commission (BCUC) IR 79.1, FBC states:

A CPR is an important planning tool that is used to:

- provide input into DSM Planning and long term energy conservation goals;

- develop new energy efficiency and conservation programs or initiatives, including behavior programs, and modify existing ones; ...
- 2.1 Please confirm whether “lighting” and “whole facility” are the dominant end-uses targeted by the 2019-2022 DSM Plan, in alignment with the CPR market potential analysis.
 - 2.2 Please provide further details on FBC’s kraft pulp and paper customer segment, including the number of customers, and whether such customers are also self-generating.
 - 2.3 Please explain why consumer electronics and the kraft pulp and paper customer segment have not historically contributed to FBC’s DSM program savings.
 - 2.3.1 Please discuss what factors could contribute to FBC considering programs to target these areas in the future.
 - 2.3.2 Please discuss what actions FBC is planning to overcome barriers in the consumer electronics and the kraft pulp and paper sectors.
 - 2.4 Please explain the main reasons for the “remaining market potential” shown in Figure 5-4. Please include in the response a discussion of the extent to which customer acceptance of DSM programs, incentive levels, and the exclusion of cost-effective measures contribute to the remaining market potential.
 - 2.5 Please explain whether FBC considers that a DSM portfolio that approaches the market potential is theoretically achievable.
 - 2.5.1 Please discuss the likely magnitude of costs required to meet this theoretical scenario.
 - 2.6 Please outline any new measures or programs that have been introduced in the 2019-2022 DSM Plan as a result of the CPR.
 - 2.6.1 Please provide specific examples of how programs in the 2019-2022 DSM Plan have been modified as a result of the CPR.

On page 14 of Appendix B to Exhibit B-1, Navigant states with respect to market potential results:

This section provides the market potential results calculated by the model at varying levels of aggregation, using the TRC benefit-cost test as a screen (which is consistent with the representation of economic potential in Section 4).

- 2.7 Please confirm and explain if the TRC benefit-cost screen included the 10% of expenditures that are permitted to use the modified Total Resource Cost (mTRC) to be considered cost-effective.

Pages 19 and 20 of Appendix B to Exhibit B-1 states:

Navigant found the greatest potential exists in the commercial sector in terms of GWh/year and as a percentage of consumption. The commercial sector captured almost 41% of market potential by 2035, while the residential sector captured 37% of the market potential.

...

When viewed as a percentage of consumption, similar sector-level trends in the market potential are evident, as shown in Figure 1-10 and Table B-5. The commercial sector’s market potential reaches 14% of commercial consumption by 2035, and the industrial sector reaches just under 13% of industrial consumption.

- 2.8 Please explain whether FBC considers the sector level trends identified in the CPR to be relevant in guiding the relative levels of DSM expenditure allocated to each sector in the 2019-2022 DSM Plan.

Section 1.2.6 of Appendix B to Exhibit B-1 describes adjustments for natural change in the CPR market potential study.

2.9 Please discuss whether FBC undertakes adjustments for “natural change” in its DSM forecasting.

**3.0 Reference: PORTFOLIO LEVEL ISSUES
Exhibit B-1, p. 5
BC Energy Objectives**

Table 3-1 of Exhibit B-1 outlines “BC’s Energy Objectives Met by FBC DSM Plan”. With respect to *Clean Energy Act* Part 1, Section 2(h), FBC states:

FBC pursues electrification (fuel switching) measures pursuant to s. 18 of the CEA and s. 4 of the Greenhouse Gas Reduction (Clean Energy) Regulation. For example: FBC undertook construction of the Kootenay Electric Vehicle (EV) charging network and plans to pursue the construction of further EV charging facilities.

3.1 Please confirm if any fuel switching measures are included in the 2019-2022 DSM Plan.

3.2 Please clarify the relevance of EV charging facilities to the 2019-2022 DSM Plan.

**4.0 Reference: PORTFOLIO LEVEL ISSUES
Exhibit B-1, pp. 11, 14
2019-2022 DSM Plan Portfolio Expenditures**

On page 11 of Exhibit B-1, FBC states:

The DSM Plan continues many of the cost-effective programs previously accepted in the 2018 DSM Plan, with some additions and modifications to simplify offers for customers, align programs with provincial partners, and comply with changes to applicable legislation.

Table 5-1 on page 14 shows the proposed expenditures, inflation adjusted, for the 2019-2022 DSM Plan.

4.1 Please provide a consolidated list of additional programs/ measures that have been included in the 2019-2022 DSM Plan, compared to the 2018 DSM Plan.

4.1.1 Please briefly discuss whether these measures have been included as a result of the CPR Market Potential, changes in legislation, or other reasons.

4.2 Please identify any programs or measures included in the approved 2018 DSM Plan that have been discontinued for the 2019-2022 DSM Plan.

4.2.1 Please explain the reasons these programs have been discontinued.

4.3 Please provide a table that shows the total expenditures by customer class in the 2019-2022 DSM Plan as a percentage of forecasted customer revenue.

4.3.1 Please explain the extent to which FBC has considered the balance of expenditures between customer classes in the development of the 2019-2022 DSM Plan.

4.4 Please calculate, for each year of the 2019-2022 DSM Plan, (i) DSM spending as a percentage of FBC revenues, and (ii) DSM energy savings as a percentage of energy sold.

4.4.1 Please provide a comparison of these results to other electric utilities in North American jurisdictions. Please provide commentary to explain this comparison.

**5.0 Reference: PORTFOLIO LEVEL ISSUES
Exhibit B-1, p. 11
DSM Plan Guiding Principles**

On page 11 of Exhibit B-1, FBC states:

Programs will have a goal of being universal, offering access to energy efficiency and conservation for all residential, commercial and industrial customers, including low income customers.

...

C&EM [Conservation and Energy Management] expenditures will have a goal of incentive costs exceeding 50 percent of the expenditures in a given year.

- 5.1 Please discuss whether FBC considers that there are any customer segments, including potential future customers, where there are remaining barriers to accessing FBC's DSM programs.
 - 5.1.1 If yes, please discuss the actions FBC is taking or proposes to take to remove those barriers and ensure all customers have reasonable access to FBC's DSM programs.
- 5.2 Please provide a table that illustrates incentive costs as a percentage of expenditures for each program area at the portfolio level and for the duration of the 2019-2022 DSM Plan. Please also provide data for 2018 as a comparison.
 - 5.2.1 Please provide an explanation for any program areas where incentive levels in the 2019-2022 DSM Plan have increased or decreased by more than 10% compared to the 2018 DSM Plan.

**6.0 Reference: PORTFOLIO LEVEL ISSUES
Exhibit B-1, p. 13
Consultation**

On page 13 of Exhibit B-1, FBC states:

FBC engaged in and documented over 50 interactions and consultations related to the DSM Plan. The range of entities consulted with included: communities, customers, contractors, manufacturers, government, First Nations, vendors, interest groups, and the Energy Efficiency and Conservation Advisory Group (EECAG).

On page 13, FBC also states that consultation feedback included expanded alignment with industry influencers, consideration of upstream incentives and support for pre-commercial technologies.

- 6.1 Does FBC consider that there were any gaps or hard-to-reach entities with respect to its consultation activities? Please explain.
- 6.2 Please explain further what is meant by industry influencers and whether FBC considers that the 2019-2022 DSM Plan works towards achieving alignment.
- 6.3 Please define upstream incentives in the context of FBC's DSM activities.
 - 6.3.1 Please outline the programs, if any, where upstream incentives have been included in the 2019-2022 DSM Plan.

- 7.0 Reference: PORTFOLIO LEVEL ISSUES**
Exhibit B-1, pp. 23, 24, 26, 27
FBC 2016 LTERP and LT DSM Plan proceeding, Exhibit B-2, Response to BCUC IR 35.1;
Response to BCUC IR 82.2
FBC 2017 DSM Expenditures proceeding, Exhibit B-1, Appendix C, p. 23
Cost Effectiveness Testing

On page 23 of Exhibit B-1, FBC states:

The governing TRC test is often expressed as a ratio of the benefits of a DSM measure divided by the measure's cost, including the utility's program costs. The benefits are the "avoided costs", calculated as the present value over the effective measure life of:

- i. the measure's energy savings, valued at the LRM [Long Run Marginal Cost]; and
- ii. the measure's demand savings, valued at the DCE [Deferred Capital Expenditure].

The measures' energy and demand savings are grossed-up by the avoided transmission and distribution energy losses ("line losses") of 8 percent before the benefits are calculated. In its DSM Plan, FBC uses the LRM of \$100 per MWh (\$2015) accepted in the 2016 LTERP for cost effectiveness testing under the DSM Regulation. The DCE value of \$79.85 per kW-yr (\$2015), accepted in the Commission's 2017 DSM Plan Decision, is again used for this Application.

In the FBC 2016 LTERP and LT DSM Plan proceeding, in response to BCUC IR 35.1, FBC states with respect to the LRM for avoided DSM energy costs:

The LRM includes line losses, therefore includes delivery to the customer. If a generation resource were to be located in the FBC system at the distribution level, it can be expected that transmission losses would be reduced by 2 to 3 percent. Distribution losses would remain unless the generation source was located right at the load source.

In response to BCUC IR 82.2, FBC states:

FBC has not evaluated this potential and considers DSM savings to be a reliable but non-firm resource. Thus, DSM savings cannot be counted on to defer network system reinforcements that are predicated on peak load requirements.

In the FBC 2017 DSM Expenditures proceeding, Appendix C of Exhibit B-1 contains the Deferred Capital Expenditure (DCE) Study prepared by EES Consulting. On page 23, EES Consulting states:

FortisBC needs to consider if the avoided T&D costs need to be de-rated. Specifically, T&D costs will only be reduced if a significant amount of load reduction is attained in an area where the utility expansion plans can be altered. Using a deration approach helps mitigate the risk of overvaluing DSM program peak reduction potential.

- 7.1 Please confirm the present value of the benefits of the 2019-2022 DSM Plan with respect to energy savings (in \$ and MWh) and demand savings (in \$ and kW-year).
- 7.2 Please clarify if the energy savings figures presented in the 2019-2022 DSM Plan represent grossed up savings accounting for line losses.
 - 7.2.1 Please clarify if grossing up energy savings to account for losses results in double counting, given that the LRM includes line losses.

- 7.3 Please confirm that FBC considers DSM savings in the 2019-2022 DSM Plan to be a reliable but non-firm resource.
 - 7.3.1 If confirmed, please explain why FBC considers that DSM savings should be attributed benefits for avoided demand savings, as valued by the DCE.
- 7.4 Please summarize any analysis undertaken by FBC with regards to whether the DCE value should be de-rated based upon the characteristics of the load reduction resulting from FBC's DSM programs.
 - 7.4.1 Please explain why FBC has not de-rated the DCE value in this application or previous DSM expenditure schedule applications.
- 7.5 Please discuss if FBC will revisit the calculation of the DCE in the next LTERP filing.

On page 24 of Exhibit B-1, FBC states:

The measures contained in the DSM Plan all passed the standard TRC test, without resorting to use of the 15 percent NEB [non-energy benefit] adder, hence there are no expenditures falling into the 10 percent mTRC [modified Total Resource Cost] cap.

- 7.6 Please provide a list of measures that were not included in the 2019-2022 DSM Plan that would be cost effective under the TRC test and the mTRC test (within the 10% cap).
 - 7.6.1 Please explain why FBC did not include additional measures in the 2019-2022 DSM Plan that could have been cost-effective under the TRC and mTRC.

On page 26 of Exhibit B-1, FBC states:

Historically, FBC calculated the net-to-gross (NTG) ratio by adjusting the benefits downward for the presumed presence of free riders. Additionally, FBC has included known spill-over effects in the NTG ratio, which is a recognized approach used by other utilities including BC Hydro. Spill-over is the conceptual opposite of free riders, thus including both effects presents a more complete and balanced view of program impacts.

Table 7-1 shows free-rider and spill-over rates for FBC's programs.

- 7.7 Please discuss, in the view of FBC, the extent to which savings attributable to spill-over effects could be considered similar to a behavioural DSM measure.
 - 7.7.1 Please explain why FBC makes adjustments for savings from spill-over effects but does not forecast energy savings from its Conservation Education and Outreach (CEO) programs.
- 7.8 Please explain the high spill-over rates for residential lighting.
 - 7.8.1 Please explain why there is not a similar spill-over assumption for commercial lighting.
- 7.9 Please explain whether FBC adjusts its incentive levels for programs with high free-ridership.

B. ADDITIONAL APPROVALS SOUGHT

8.0 Reference: **ADDITIONAL APPROVALS SOUGHT** **Exhibit B-1, pp. 28, 29** **Amortization Period**

On page 28 of Exhibit B-1, FBC states:

FBC currently uses a ten-year straight-line amortization of its DSM expenditures. FBC has undertaken the analysis for an amortization period 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/benefits matching perspective. The Company has determined the average weighted measure life to be 15.6 years, meaning that customers benefit from FBC's DSM measures for an average time period of approximately fifteen years. It is therefore appropriate that the costs also be amortized over this same period.

Table 8-1 on page 28 shows the average measure life weighted by incentives for the 2019-2022 DSM Plan.

FBC provides the incremental rate change from switching from the current 10-year to a 15-year amortization period in Table 8-2. On page 28, FBC states that at spending levels consistent with 2018, the proposed change in amortization results in a rate impact lower by 0.51 percent in 2019 than under the existing 10-year amortization.

- 8.1 Please reproduce Table 8-1 to include analysis of average measure life weighted by savings.
 - 8.1.1 Please discuss any differences between the respective weighted averages.
 - 8.1.2 Please reproduce Table 8-2 if the resulting weighted average does not round to 15 years.
- 8.2 Please explain why FBC weighted measure life by incentives instead of savings. Please discuss the pros and cons of each approach.
 - 8.2.1 Please discuss whether, in the view of FBC, expenditures or savings are a more appropriate measure of "customer benefits".
 - 8.2.1.1 Please discuss the pros and cons of an approach that would take the middle point of weighted measure life by incentives and the weighted measure life by savings.
- 8.3 As an addition to Table 8-2, please provide a calculation that illustrates the cumulative rate impact of amortizing over 10 years and 15 years and the difference between the two amortization periods.
 - 8.3.1 Please discuss FBC's position on whether overall costs to ratepayers should be a factor in determining the appropriate amortization period for DSM measures.
- 8.4 Does FBC consider that the amortization period should be reviewed for each future DSM expenditure application, based upon the portfolio of planned measures?
- 8.5 Please briefly summarize the assumptions underpinning the estimated life of a DSM measure.
 - 8.5.1 Please discuss if FBC undertakes any analysis of actual persistence of measures.
 - 8.5.1.1 Please discuss the uncertainties associated with estimating DSM measure life, including the potential factors that could lead to actual measure life of DSM measures being shorter or longer than the estimated measure life. Please specifically comment on the risks of redundancy presented by new technologies.

8.6 Is FBC aware of other utilities in North America that amortize DSM Expenditures over a period of 15 years or greater? If so, please provide the details, such as the utility's name, amortization period, and information on the amounts that are deferred, capitalized or expensed, if any.

9.0 **Reference: ADDITIONAL APPROVALS SOUGHT**
Exhibit B-1, p. 29
2012-2013 Revenue Requirements and Review of 2012 Integrated System Plan
proceeding Decision with Order G-110-12, p. 140
Funding Transfers

On page 29 of Exhibit B-1, FBC states:

FBC 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, FBC's DSM Plan is subject to change in response to various external factors. These factors may require FBC to respond by adjusting the timing of its planned expenditures. The flexibility to rollover unspent amounts would allow FBC to adjust to external factors and allow FBC 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, FBC is requesting that the Commission accept the total expenditures per Program Area over the time period of the expenditure schedule.

On page 140 of the 2012-13 Decision, the BCUC determination states:

The Commission Panel is of the view that a more formal policy regarding fund transfers among sectors/ program areas is appropriate at this time, given the substantial increase in the budget for DSM programs. The Commission Panel is also of the view that a threshold of percent is most appropriate. **The Commission Panel therefore approves FortisBC' s transfer of a maximum of 25 percent of the budget amount from one existing program area or sector to another existing program area or sector without prior approval of the Commission.** In cases where a proposed transfer into or out of an approved Sector is greater than 25 percent of that sector, prior Commission approval is required. The Commission Panel recommends that funding transfers of 25 percent or more requiring prior Commission approval, should, where feasible, be presented to FortisBC' s DSM Advisory Committee for feedback before the approval request is made to the Commission.

9.1 Please confirm whether, under FBC's proposal regarding "rollover" of unspent amounts from year to year, this would be cumulative or restricted to the following year.

9.1.1 Please explain under this proposal whether FBC considers that there should be any upper limits to the amount of expenditure that could be rolled over in any given year or cumulatively over the four year period.

9.1.1.1 If yes, please provide FBC's view as to the percentage of program expenditures that would provide an appropriate rollover over in any given year or cumulatively over the four year period, with respect to balancing BCUC's regulatory oversight and FBC's flexibility to adapt its DSM Plan.

9.1.2 Please explain under this proposal how FBC intends to provide information or explanation in its annual DSM reports to the BCUC regarding the amounts of expenditure rolled over to the following year.

9.2 Please comment on whether this proposal incurs a greater risk of FBC underspending its overall approved DSM expenditures.

- 9.2.1 Please comment on whether this proposal incentivizes FBC to backload spending to the end of the plan.
- 9.3 Please discuss FBC’s interpretation of the current funding transfer rules with respect to moving funds from one program area to another.
- 9.3.1 Please discuss if FBC believes it is appropriate for FBC to require BCUC approval for funding transfers into or out of an approved program area.
- 9.3.1.1 If yes, please provide FBC’s view as to the percentage of program expenditures that would provide an appropriate funding transfer threshold, with respect to balancing BCUC’s regulatory oversight and FBC’s flexibility to adapt its DSM Plan.
- 9.3.1.2 In the absence of such a policy, please provide FBC’s position on how customers can be assured that FBC is working towards meeting approved expenditure levels in a given sector.
- 9.3.2 Please explain how FBC intends to provide information or explanation in its annual DSM reports to the BCUC regarding the amounts of expenditure transferred into or out of an approved program area.
- 9.4 Does FBC believe that it could be appropriate for there to be a mechanism for reviewing the levels of approved expenditures if there was a material change to the DSM Regulation in the period covered by the 2019-2022 DSM Plan, for example, with respect to cost-effectiveness criteria?
- 9.4.1 If yes, please discuss how such a mechanism could operate.

C. PROGRAM LEVEL ISSUES

**10.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, pp. 3 to 5
FBC 2018 DSM Expenditures Proceeding (2018 DSM Proceeding),
Exhibit B-2, Appendix A2, p. A6
Residential Program Area**

Table 2-1 of Appendix A to Exhibit B-1 shows Residential Program Area expenditures and savings for 2019-2022.

On page 5 of Appendix A to Exhibit B-1, FBC states:

The key changes, compared to the previously approved programs in the 2018 FBC DSM Plan, are:

- Aligning new home rebates with the BC Energy Step Code. By broadening rebates and adding tiers, FBC will be able to encourage and capture additional savings from Step 4 and 5 homes; and
- Accounting for the upcoming changes to lighting standards. Program energy savings from light bulbs, fixtures, and controls peak in 2019 prior to the code change and taper down in the following years.

10.1 Please provide a table that, for each program in the residential area, shows the estimated program expenditures in 2019, the approved expenditures in the 2018 DSM Plan and the percentage variance.

- 10.1.1 Please provide an explanation for any programs with a change in expenditures greater than +/- 25%.
- 10.1.2 Please confirm and explain that FBC expects to require lower annual expenditures on labour and expenses for the duration of the 2019-2022 DSM Plan, compared to the 2018 DSM Plan.
- 10.2 Please clarify if the residential lighting program is cost-effective on a TRC basis if expenditures and savings from activities in 2020 to 2022 only are taken into account.
- 10.3 Please explain the significant ramp up of expenditures in the new home program from 2019 to 2022.
 - 10.3.1 Please briefly explain the barriers to adoption of Step 4 and 5 homes in the absence of a supporting DSM program.

On page 4 of Appendix A to Exhibit B-1, FBC states:

With its temperate winters and hot summers, the FBC service area is an ideal climate for air source heat pumps (ASHP).

In the 2018 DSM Proceeding, Exhibit B-2, Appendix A2, on page A6, FBC states:

The incentive value for a forced air central ASHP was doubled in the 2017 DSM Plan (and continues in 2018) and both central and ductless ASHP configurations are eligible for the HRR bonus offer to attract more comprehensive retrofits. In spite of FBC's increased rebate values, participation numbers continued to decline throughout 2017. An insight report was conducted in summer 2017 that identified customers' knowledge (or lack thereof) and interest in heat pump technology. It also uncovered barriers for adoption, such as the preference to switch to a lower cost fuel i.e. natural gas and customer aversion to Tier 2 of the Residential Conservation Rate. In response to declining participation, the 2018 budget was reduced to ensure participation numbers could be met in the interim while tools to increase the number of customers participating in the program are developed. In 2018, a communications campaign targeting customers with electricity as their primary heating source will leverage perceived strengths of heat pump technology. This is intended to set the stage for increased participation in subsequent years.

- 10.4 Please provide a comparison of the expected expenditure on ASHP in 2018, and the annual expenditures for the 2019-2022 DSM Plan.
- 10.5 Please explain whether FBC considers that its communication activities in 2018 will lead to increased uptake of ASHP over the duration of the 2019-2022 DSM Plan.
 - 10.5.1 Please discuss if further activities are planned in the 2019-2022 DSM Plan to increase customer awareness and interest in ASHP.

**11.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, pp. 6, 7
2018 DSM Proceeding, Exhibit B-2, Appendix A2, p. A8; Exhibit B-4, Response to
BCOAPO IR 1.3.5
Low Income Program Area**

On page 6 of Appendix A to Exhibit B-1, FBC states:

Table 3-1 outlines the Low Income programs planned expenditures, energy savings and the Benefit/Cost ratio on a Total Resource Cost (TRC) basis. Overall, the Low Income Program Area continues to grow throughout the plan period.

11.1 Please reproduce Table 3-1 with the Benefit/Cost ratio on a TRC basis included.

11.2 Please confirm that FBC's forecasted expenditure in the Low Income Program Area is higher in 2019 than the approved expenditures in the 2018 DSM Plan.

On page 7 of Appendix A to Exhibit B-1, FBC states:

Some work that has either already begun or will begin shortly includes:

...

- Strengthening awareness and engagement among low income individuals through attending relevant venues (e.g. Food banks), direct mail, program collateral at MLA offices, partnerships (e.g. Ministry of Social Development), attending social housing events (e.g. Cooperative Housing Federation of BC, BC Non-Profit Housing Association), digital campaigns, and other opportunities that arise.

In the 2018 DSM Proceeding, on page A8 of Exhibit B2, FBC states:

While outreach has been and will continue to be strengthened throughout FBC's service region, the budget allocated to ECAP in 2018 is reflective of the lower participation rates seen in 2017.

In the 2018 DSM Proceeding, in response to BCOAPO IR 1.3.5, FBC states:

FBC has a number of initiatives planned to further strengthen its outreach efforts regarding low income programs, including:

- Expansion of its community social service organizations (CSSOs) honoraria pilot project to provide CSSOs an honorarium to complete the ECAP application on behalf of any clients that face challenges in completing the application independently. The project financially supports CSSOs to market ECAP through their existing marketing channels.
- Collaborated efforts with local governments to promote ECAP:
 - Marketing through their existing communication channels;
 - ECAP program presentations to Affordable Housing and Poverty Prevention committees; and
 - Introductions to local CSSOs.
- ECAP and low-income program presentations to additional CSSOs.
- More and sustained personalized (face-to-face) outreach with First Nations communities to promote low-income programs, as well as new customizable,

culturally appropriate collateral to enhance promotional outreach, including videos, for First Nation audiences.

- 11.3 Please discuss whether FBC considers that its outreach efforts regarding low income programs in 2018 have been successful in terms of promoting increased uptake.
- 11.4 Please confirm that the outreach activities summarized in the 2019-2022 DSM Plan are expected to be sustained throughout the duration of the 2019-2022 DSM Plan.
- 11.4.1 Please confirm that additional outreach efforts have been included in the 2019-2022 DSM Plan compared to the 2018 DSM Plan.

**12.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, pp. 8, 9
Commercial Program Area**

Table 4-1 of Appendix A to Exhibit B-1 shows the Commercial Program Area expenditures and savings for 2019 to 2022.

On page 8 of Appendix A to Exhibit B-1, FBC states:

For the 2019-2022 DSM plan, energy conservation measures for commercial customers are grouped into the following two core program areas, which encompass measures that are similar in terms of what they offer customers and how they are delivered to the market:

- Prescriptive Program; and
- Custom Program

Customers in the commercial market have diverse business types, wants, needs, and degrees of sophistication. The proposed groupings enable a non-measure specific approach that FBC will employ to deliver its energy efficiency offers to the commercial market. This approach allows FBC to adapt the market-facing aspects of each program to suit the needs of the various target customer segments.

On page 9 of Appendix A to Exhibit B-1, FBC states with respect to the Custom Program:

The Custom Program provides offers to encourage commercial customers to identify, assess, and implement custom building energy-efficiency projects for existing and new buildings. The program is administered jointly with FEI, providing customers with a one-stop program in the FBC service territory to evaluate and implement building-scale energy efficiency projects.

...

FBC and FEI are currently developing a retrocommissioning offer. Retrocommissioning refers to the identification and implementation of low- and no-cost measures to improve building energy performance. FBC and FEI had a joint retrocommissioning offer in market (the Building Optimization Program) from 2014-2017. While the incentive levels and program offers for the re-launch have not been finalized, FBC is considering support for retrocommissioning investigation studies, completion studies, coaching and/or performance incentives.

- 12.1 Please confirm that FBC's forecasted expenditure in the Commercial Program Area in 2019 has reduced compared to the levels approved in the 2018 DSM Plan.

- 12.1.1 If confirmed, please explain the reason for the decreased expenditures.
- 12.2 Please provide the expected magnitude of load growth gross of DSM for commercial customers from 2019 to 2022.
- 12.3 Please explain why annual expenditures in the Commercial Prescriptive Program decline over the course of the 2019-2022 DSM Plan.
- 12.4 Please discuss whether FBC is planning activities to seek further opportunities in the commercial sector to maintain or increase its DSM offerings to commercial customers in future years.
- 12.5 Please explain whether FBC believes that the new groupings for the 2019-2022 DSM Plan will have an impact on the deliverability of FBC's forecasted energy savings.
- 12.6 Please discuss whether the Custom Program includes fuel switching, given the joint administration with FortisBC Energy Inc. (FEI).
- 12.7 Please explain why the retrocommissioning offer was discontinued following the 2014 to 2017 period.
 - 12.7.1 Please discuss why FBC has determined that the retrocommissioning offer should be relaunched.
- 12.8 Please clarify if the forecasted expenditures in the Table 4-1 for the Custom Program include estimated expenditures for retrocommissioning.
 - 12.8.1 If not included, please explain how FBC expects these offers to be funded.

**13.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, pp. 6, 23
FBC 2016 LTERP and LT DSM Plan proceeding, Exhibit B-1, Appendix E, p. 16
New Industrial Customers**

On page 6 of Exhibit B-1, FBC states:

The 2016 LTERP contemplated a number of load drivers, including #6 "Large Load Sector Transformation: unanticipated growth of large load customers not associated with traditional energy intensive industries". Such unanticipated load growth at the time of the 2016 LTERP is now materializing as FBC is aware of 14 cannabis production facilities that are proposed in its service area. The LT DSM Plan called for a ramp up in DSM spending and savings to a target of 32 GWh/yr in 2023. However in response to the DSM opportunities presented by the proposed cannabis facilities, FBC has advanced the 32 GWh/yr DSM savings target to 2019. Similarly the LT DSM Plan pro-forma expenditures have been advanced.

On page 11 of Appendix A to Exhibit B-1, FBC states:

To date, fourteen new industrial cannabis operations are in the planning or construction stage in the Southern Interior. FBC has received a number of requests to provide incentives for LED grow lights compared to baseline high intensity discharge grow lights. Cannabis producers have also expressed interest in investigating other electric energy efficiency opportunities, including ventilation and air conditioning.

On page 23 of Exhibit B-1, FBC states:

The measures' energy and demand savings are grossed-up by the avoided transmission and distribution energy losses ("line losses") of 8 percent before the benefits are calculated.

On page 16 of Appendix E to Exhibit B-1 in the 2016 LTERP proceeding, FBC states:

System losses consist of the following: Losses in the transmission and distribution system; Losses due to wheeling through the BC Hydro system; Company use, and Unaccounted-for energy (meter inaccuracies and theft). Consistent with past practice FBC assumed a loss rate of eight percent of gross load, before the AMI [Advanced Metering Infrastructure] impact. AMI loss reduction is expected to further reduce the losses in the future by reducing theft from the system from illegal marijuana grow operations.

- 13.1 Please provide an estimate of the annual load growth expected from the new cannabis production facilities, gross of any planned DSM programs, for 2019 to 2022.
 - 13.1.1 Please provide an estimate of the annual electricity savings expected from DSM programs targeting cannabis production facilities.
- 13.2 Please discuss whether FBC anticipates a reduction in theft from illegal cannabis facilities due to the growth of legal cannabis production facilities.
 - 13.2.1 If so, please discuss whether FBC intends to update its assumptions for line losses.
 - 13.2.2 Please discuss the extent to which FBC believes the new, legal, cannabis production facilities are additional to or a replacement of the illegal facilities in FBC's service area.
- 13.3 Please discuss whether FBC considers that any programs targeting new cannabis production facilities on a retrofit basis will be less effective than programs that incentivize uptake at the construction phase.
 - 13.3.1 Please discuss whether FBC considers that it has sufficient lead time to target DSM programs that will be in place for the beginning of the facilities' operation.
 - 13.3.2 Please discuss whether there is any potential benefit to front-loading expenditures targeting new cannabis production facilities to ensure that programs are implemented at the construction phase.
- 13.4 Please discuss any evidence to indicate whether new cannabis production facilities in the FBC service area could not implement energy efficient grow lighting, ventilation and air conditioning in the absence of FBC incentives.
 - 13.4.1 Please discuss what assumptions that FBC has made with respect to free-ridership of programs targeting new cannabis production facilities in the FBC service area.
- 13.5 Please explain what assumptions FBC has made with regards to additional cannabis facilities in the FBC service area in the 2019 to 2022 period, beyond the 14 planned facilities.
 - 13.5.1 Please explain if FBC has made any assumptions with respect to other new large industrial customers, for example bitcoin mining facilities, in its service area for this test period.
 - 13.5.1.1 Please discuss whether the industrial program area expenditures contemplated in the 2019-2022 DSM Plan would be sufficient to provide DSM program access to additional cannabis facilities, bitcoin mining or other large new industrial load coming online in the test period.

**14.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, pp. 10, 11
Industrial Program Area**

Table 5-1 of Appendix A to Exhibit B-1 shows Industrial Program Area expenditures and savings for 2019 to 2022.

On page 10 to 11 of Appendix A to Exhibit B-1, FBC states:

The Custom Program provides offers to encourage customers to identify, assess and implement measures that use energy for process-related activities. The program is administered jointly with FEI, providing customers with a one-stop program in the FBC service territory to evaluate and implement industrial energy efficiency projects.

14.1 Please provide the estimated total annual expenditures and energy savings in the industrial program area, excluding estimated expenditures due to the additional cannabis production facilities in the FBC service area.

14.1.1 Please compare these figures to the approved levels in the 2018 DSM Plan, and provide an explanation of any differences.

14.1.2 Please discuss whether FBC is planning activities to seek further opportunities to maintain or increase its DSM offerings to existing industrial customers.

14.2 Please discuss whether the Custom Program includes fuel switching, given the joint administration with FEI.

**15.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, p. 13
2018 DSM Proceeding, Exhibit B-2, Appendix A, pp. A5, A14
Conservation Education and Outreach**

On page 13 of Appendix A to Exhibit B-1, FBC states with respect to the Residential Customer Engagement Tool:

Industry research on similar tools indicate electric savings for this type of initiative are approximately 2% of total participant electric consumption. However, since these savings are based on behavior changes and there is uncertainty on their relative magnitude, they cannot be effectively forecast at this time and have not been included in this DSM Plan. Once savings are realized, they will be reported in FBC's annual DSM reports to the British Columbia Utilities Commission.

Table 6-1 of Appendix A to Exhibit B-1 shows forecasted Conservation Education and Outreach expenditures for 2019 to 2022.

Table A2-1 of Exhibit B-2 in the 2018 DSM Proceeding indicated forecasted energy savings of 240 MWh and expenditures of \$165,000 for the Residential Customer Engagement Tool.

Table A5-1 of Exhibit B-2 in the 2018 DSM Proceeding shows supporting initiative expenditures, including a line item for "Conservation, Education and Outreach" of \$200,000.

15.1 Please clarify whether the expenditures in the 2018 DSM Plan classified under the line item "Conservation Education and Outreach" have been reallocated to individual programs in the 2019-2022 DSM Plan.

15.1.1 If not confirmed, please explain the increase in expenditure on the Residential Customer

Engagement Tool and education programs for the 2019-2022 DSM Plan.

- 15.1.1.1 Please explain the reason for the pattern of annual expenditures in the Residential Customer Engagement Tool between 2019 and 2022.
- 15.2 Please provide details of the lower and upper bound of savings from similar tools based upon FBC's review of industry research.
 - 15.2.1 Please discuss if FBC believes that using a conservative low estimate of savings from the Residential Customer Engagement Tool could be appropriate for DSM plans.
- 15.3 Please explain why FBC provided an estimate of savings from the Residential Customer Engagement Tool in 2018 but has forecasted no savings for the 2019-2022 DSM Plan.
 - 15.3.1 Please provide an estimate of savings from FBC's customer engagement tools that will be realized in 2018, and the estimated TRC benefit/cost ratio.
 - 15.3.1.1 Please discuss whether FBC believes that once savings are realized from customer engagement tools, that these can be used as a proxy savings for future years.

**16.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, pp. 14 to 16
Supporting Initiatives**

Table 4-1 of Appendix A to Exhibit B-1 shows expenditures on Supporting Initiatives for 2019 to 2022.

On page 14 of Appendix A to Exhibit B-1, FBC describes the Commercial Energy Specialist and Community Energy Specialist programs.

On pages 15 and 16 of Appendix A to Exhibit B-1, FBC describes the DSM Tracking System.

- 16.1 Please explain the reasons for funding positions within commercial/ community organizations, versus funding in-house FBC positions to support the same activities.
 - 16.1.1 Please confirm if the positions funded are fixed term to align with the period covered by the 2019-2022 DSM Plan.
 - 16.1.2 Please discuss how FBC will monitor the effectiveness and review the funding requirements of this program.
- 16.2 Please explain the reason for the ramp up in expenditures in the Trade Ally Network program in the 2019-2022 DSM Plan.
- 16.3 Please describe how FBC intends to attribute savings from codes and standards in its annual DSM reports. Please specifically address how savings related to the BC Energy Step Code are distinguished with savings in FBC's New Home Program.
- 16.4 Please discuss whether FBC believes that the implementation of the DSM Tracking System will result in cost savings or increased energy savings from its DSM programs.

**17.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, p. 26; Appendix A, pp. 18, 19; Appendix D, p. 15
Portfolio Expenditures**

On page 26 of Exhibit B-1, FBC states:

The total proposed expenditure for EM&V [Evaluation, Monitoring and Verification]

activities to be conducted over the 2019-2022 DSM Plan period is approximately \$1.7 million, or four percent of the DSM expenditure portfolio.

On page 15 of Appendix D to Exhibit B-1, FBC states:

Industry practice for budget spending on EM&V activities appears to range from just below 2 percent to 3 percent of spending on overall energy efficiency and conservation program budgets. The Companies examined the results of 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 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. 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.

- 17.1 Please explain why FBC's expenditure on EM&V activities is higher than the "industry practice" described in Appendix D.
 - 17.1.1 Please discuss whether FBC expects to realize other benefits as a result of higher spending on EM&V activities.
- 17.2 Please discuss what actions FBC plans to take to improve the efficiency of its EM&V spending, as measured by the percentage of EM&V expenditures compared to the DSM portfolio expenditures.

With respect to the Innovative Technologies Program, on pages 18 to 19 of Appendix A, FBC states:

FBC supports feasibility studies, field studies, and pilots to validate customer acceptance and energy savings of innovative equipment and systems. Technologies that have potential are incorporated into DSM programs.

- 17.3 Please discuss how FBC determined the appropriate level of expenditures on the Innovative Technologies Program.
- 17.4 Please provide a summary of any technologies that have been incorporated into FBC's DSM programs in the last 5 years as a result of FBC's work on innovative technologies.

**18.0 Reference: PROGRAM LEVEL ISSUES
Exhibit B-1, Appendix A, p. 15; Appendix A-1, pp. 3, 5, 6, 17
Demand Response Pilot (DR pilot)**

On page 15 of Appendix A to Exhibit B-1, FBC states:

Appendix A-1 contains the Kelowna area DR [Demand Response] potential assessment report. The second phase of work will simulate the customers' DR potential against a backdrop of the past 3-year system load profile for the Kelowna area. The final phase of work, subject to RFP, would be to proceed with a Kelowna area DR pilot project to validate proof of concept. Table 9-1 outlines FBC planned pilot study over 2019-2022 to assess the ability of DR to defer capital infrastructure investment in the electric system. The DR pilot anticipates testing both summer and winter potential over 2019-20. The initial expenditures to implement the Kelowna area DR pilot project include customer

recruitment, demand control apparatus, licensing and configuration costs. The additional costs (\$125 thousand per year) are FBC's estimate to sustain the DR capacity.

Page 3 of Appendix A-1 to Exhibit B-1 states:

Enbala estimates that a demand response program would provide a combined utility benefit of \$172/kW-year from Avoided Transmission, Distribution and Generation costs.

...

Enbala recommends that FortisBC proceed with an ICI Demand Response Pilot targeting 1.75 MW of capacity per year, and, at a minimum, maintain this level of DR capacity for a period of 3 years.

Page 5 of Appendix A-1 to Exhibit B-1 states:

The forecast shown here is based on historical load drivers expected in the Kelowna area and does not include proposals for cannabis facilities or block-chain which may increase the load growth significantly.

Page 17 of Appendix A-1 to Exhibit B-1 states:

FortisBC is experiencing large potential uncertainty in load growth in the Kelowna region due to emergent cannabis production facilities and cryptocurrency miners. Given this uncertainty, it is difficult for FBC to be certain that even 11 MVA of DR as identified in this study will be sufficient to avoid a capital upgrade. That said, the Kelowna area constraint can still serve as a specific example of how to quantify the benefit of deferring a capital upgrade.

FBC projects that the Kelowna area will require an additional transformer to be operational by Jan 1, 2023 to secure reliable service for the Kelowna area and meet N-1 contingency criterion. Under a modest loadgrowth scenario FBC could achieve the same outcome by aggregating large institutional, commercial and industrial (ICI) customers in the Kelowna area to provide a sufficient load relief to defer the costly upgrade at Lee Terminal or DG Bell.

A new terminal transformer (and related balance-of-plant expenditures) is anticipated to cost \$17 million and take 3 years to plan and build. Therefore, anticipating the load to exceed the reliability limit in summer 2023, FBC is planning to begin the substation upgrade project in 2020.

- 18.1 Please confirm that FBC does not expect to defer upgrades at Lee Terminal or DG Bell as a result the DR pilot.
 - 18.1.1 If confirmed, please explain why FBC did not select a location for the DR pilot where there could have been sufficient lead time for the potential deferral of capacity upgrades, if successful.
- 18.2 Please discuss the criteria that FBC will be using to measure the success of the DR pilot.
 - 18.2.1 Please outline the potential next steps if the DR pilot Phase II and the proof of concept phase are considered successful by FBC.
 - 18.2.1.1 Please explain if the results of the DR pilot could potentially inform the resource options considered as part of the next LTERP.
- 18.3 Please outline other future capacity upgrades on the FBC system that, if the DR pilot is

successful, there is sufficient lead time for DR to be considered as an option to defer upgrades.

18.3.1 Please discuss the extent to which the quantified benefits from the DR pilot can be used to extrapolate the benefits of deferring other capacity upgrades.

18.4 Please discuss whether FBC considers that the utility benefits calculated in the DR pilot could be used to provide a more accurate representation of avoided capacity costs for DSM cost-effectiveness testing.

18.5 Please explain why the DR capacity needs to be sustained for 3 years.

18.6 Please discuss the implications of the forecast not including proposals for cannabis facilities or block-chain, with respect the outcomes of the DR pilot.

18.6.1 Please discuss FBC's understanding of the feasibility of cannabis production facilities participating in future DR programs.

18.6.1.1 Please discuss if new cannabis production facilities in FBC's service area will be considered for inclusion in Phase II of the DR pilot.

Page 6 of Appendix A-1 to Exhibit B-1 states:

Enbala views Demand Response as the beginning of a continuum towards implementing a Virtual Power Plant (VPP) product that can use distributed energy resources to meet multiple utility goals. Load flexibility can be harnessed in a VPP for fast bi-directional control to balance energy flows in real time, which can further be expanded to grid ancillary services such as frequency regulation. Finally, voltage and reactive power flows can be managed to mitigate the localized impact to distribution networks from resources such as roof-top solar PV.

18.7 Please discuss whether FBC intends to test the potential feasibility of any aspects of the "Virtual Power Plant" as part of the DR pilot.

Page 9 of Appendix A-1 to Exhibit B-1 states:

The Kelowna area is a dual peaking system, however the winter reliability load limit (400 MW) is significantly larger than the summer reliability limit as shown in Figure 5. This is due to the higher capacity of the transformers at lower temperatures.

18.8 Please discuss whether in theory, the summer reliability load limit could be lower than the levels modelled in Appendix A-1 due to extreme high temperatures.