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October 30, 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 Inc. (FBC)

Project No. 1598973

2019-2022 Demand-Side Management (DSM) Expenditures Application (the Application)

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

On August 2, 2018, FBC filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-179-18 setting out the Regulatory Timetable for the review of the Application, FBC respectfully submits the attached response to CEC IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary Registered Parties



FortisBC Inc. (FBC or the Company) 2019-2022 Demand Side Management (DSM) Expenditures Application (the Application) Response to Commercial Energy Consumers Association of British Columbia (CEC)

Information Request (IR) No. 1

Page 1

1 1. Reference: Exhibit B-1, page 1

On November 30, 2016, FBC filed its 2016 Long Term Electric Resource Plan (LTERP) and Long Term DSM Plan (LT DSM Plan). The LT DSM Plan was accepted by the BCUC on June 28, 2018 in Decision and Order G-117-18. The 2016 LTERP and LT DSM Plan included Conservation Potential Review (CPR) results for the FBC service territory (FBC CPR)¹. The LT DSM Plan included an assessment of the appropriate level of cost-effective DSM resource acquisition to match FBC's resource needs over the LTERP's 20-year planning horizon. The High DSM scenario FBC selected for its LT DSM Plan contemplated annual DSM expenditures for 2019 and 2020 of \$7.9 million (\$2016) and annual DSM savings of 26.4 GWh².

The LT DSM 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. In response to emerging customer activities, the DSM Plan builds on and is an escalation of the target savings contemplated in the LT DSM Plan. Table 1-1, below, 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. Section 3.3 provides an overview of the customer activities that prompted the plan escalation and additional detail is provided in the DSM Plan (Appendix A).

Table 1-1:	2019-2022 DSM Plan	compared with	the LT DSM Plan
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Plan	2019	2020	2021	2022	Total
Expenditures (\$000s)					
2019-2022 DSM Plan	\$10,900	\$10,600	\$11,100	\$11,400	\$44,000
LT DSM Plan	\$8,100	\$8,200	\$9,400	\$10,600	\$36,300
Difference	\$2,800	\$2,400	\$1,700	\$800	\$7,700
Energy savings (GWh)					
2019-2022 DSM Plan	32.6	32.1	32.4	33.1	130.3
LT DSM Plan	26.4	26.4	28.4	30.4	111.6
Difference	6.2	5.7	4.0	2.7	18.7

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¹ FBC's CPR Technical and Economic report can be found in Appendix A of the LT DSM Plan.

² 2016 LTERP and LT DSM Plan, Volume 2, Section 3.3, Table 3-2: Pro-forma DSM Savings Targets, pg. 16.

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- 1.1 Please confirm or otherwise explain that the Commission is not precluded from accepting and/or approving higher DSM levels than was proposed in the LT DSM Plan or this plan.
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9 Response:

10 FBC has filed its 2019-22 DSM expenditure schedules pursuant to subsections 44.2(3) and (4)

11 of the Utilities Commission Act (UCA). Pursuant to subsections 44.2(3) of the UCA, the BCUC

12 must accept the expenditure schedules if it considers that making the expenditures referred to in

13 the schedules would be in the public interest.



FortisBC Inc. (FBC or the Company) 2019-2022 Demand Side Management (DSM) Expenditures Application (the Application)	Submission Date: October 30, 2018
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1 In making its determination whether to accept a DSM expenditure schedule under section 2 44.2(3) the BCUC must consider several factors as set out in section 44.2(5). These include the 3 most recent long term resource plan filed by the public utility (s. 44.2(3)). FBC's LT DSM Plan 4 was filed as part of the 2016 LTERP pursuant to section 44.1(2)(b) of the UCA. The BCUC 5 found the LT DSM Plan to be in the public interest pursuant to Order G-117-18. Accordingly, 6 the BCUC must consider the LT DSM Plan as one of the factors in determining whether to 7 accept the 2019-2022 DSM Plan. The BCUC's general practice in reviewing DSM expenditure 8 schedules is to consider their consistency with the most recent long term resource plan and long 9 term DSM plan. While FBC agrees that nothing in the UCA precludes the BCUC from 10 approving higher levels of DSM than set out in the LT DSM Plan as being in the public interest, it does not confirm that the BCUC can accept or approve higher expenditure levels than are 11 12 included in a public utility's filed DSM expenditure schedule. Specifically, subsections 44.2(3) of 13 the UCA provides that after reviewing an expenditure schedule, the BCUC must either accept 14 the schedule (s. 44.2(3)(b) or reject the expenditure schedule (s. 44.2(3)(b)). 15 16 17 18 1.2 Are the 'emerging customer activities' that resulted in an escalation of the target 19 savings contemplate d in the LT DSM plan the same as the cannabis production 20 facilities discussed on page 6? 21 22 Response: 23 Yes, they are the same. 24 25 26 27 1.2.1 If not, please discuss the emerging customer facilities that resulted in 28 an escalation of the target savings. 29 30 **Response:** Please refer to the response to CEC IR 1.1.2. 31



1 2. Reference: Exhibit B-1, pages 1-2

FBC has created a DSM Plan that is compatible with the LT DSM Plan using a number of inputs: Conservation and Energy Management (C&EM) guiding principles; review of historical

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and forecasting of future program activity levels; consultation with stakeholders; and calibration to the FBC CPR Market Potential Report that was received in January 2018 (Appendix B).

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- 5 2.1 Please provide an overview of how FBC's escalation of its DSM plan will impact 6 FBC's implementation of the LT DSM Plan, if at all. (ie. Does FBC expect to limit 7 its spending in the future to maintain the end points of the LT DSM plan, or does 8 FBC expect to exceed the LT DSM plan to increase overall?) Please discuss 9 and provide yearly quantification of expected spending and anticipated savings 10 out to the end of the LT DSM plan.
- 11

12 **Response:**

FBC does not expect to limit its DSM expenditures to conform to the LT DSM Plan. FBC believes that the 2019-2022 DSM Plan is compatible with the LT DSM Plan. The LT DSM Plan presents a pro-forma DSM budget that reflected a high-level estimate of annual DSM budgets over the course of the 2016 LTERP's 20-year planning horizon, which have now been refined and updated in the 2019-2022 DSM Plan.

18 FBC has not prepared yearly quantification of expected spending and anticipated savings out to

19 the end of the LT DSM Plan's planning horizon, beyond what was provided in the 2016 LTERP.

20 An updated long term DSM forecast, beyond the 2019-2022 period, will be prepared for FBC's

21 next long term electric resource plan.



1 3. Reference: Exhibit B-1, page 5 and 6

The 2016 LTERP indicated that FBC's long run marginal cost (LRMC) of acquiring electricity from BC "clean or renewable" resources is \$100.45/MWh (nominally \$100/MWh).⁸

In the DSM Plan, FBC continues to use the previously accepted \$100/MWh⁹ as the LRMC, and the DCE factor of \$79.85 per kW-yr¹⁰ as its avoided costs for the purposes of DSM benefits

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calculations. The DSM Plan achieves a TRC Benefit/Cost ratio of 1.5 on a portfolio basis using the same LRMC and DCE factor.

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".¹¹ 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.

- ⁶ Greenhouse Gas Reduction (Clean Energy) Regulation, B.C. Reg. 102/2012, as amended ⁷ The TRC test is the ratio of the benefits of a DSM measure divided by the DSM measure's cost, including the utility's program costs. The TRC is further described in Section 5.1.2. 2016 LTERP and LT DSM Plan, Volume 1, Section 9.3.1, pg. 119 ⁹ Order G-113-18 (FBC's 2018 DSM Expenditure Application) ¹⁰ Order G-19-17 (FBC's 2017 DSM Expenditure Application) 4 5 3.1 When does FBC expect to next review its LRMC? 6 7 Response: 8 Please refer to the response to CEC IR 1.3.2. 9 10 11 3.2 12 Does FBC consider that approximately \$100/MWh continues to represent the 13 most appropriate figure for FBC's LRMC? 14 15 Response: 16 FBC considers that \$100/MWh continues to be the most appropriate value for its LRMC of 17 acquiring clean or renewable BC resources. FBC notes that this value was recently accepted in the BCUC's June 2018 Decision on FBC's 2016 LTERP and LT DSM Plan and that its LRMC is 18
- 19 a long-run avoided cost that will be updated as part of its next long term resource plan filing.



1 2			
3 4 5 6 7 8	<u>Response:</u>	3.2.1	If no, please explain why not and provide any evidence that the LRMC has shifted either upward or downward since the LRMC was determined.
9	Please refer t	o the resp	conse to CEC IR 1.3.2.
10 11			
12			
13 14 15		3.2.2	Please provide quantification for any changes in FBC's LRMC since the 2016 LTERP.
16	Response:		
17	Please refer t	o the resp	ponse to CEC IR 1.3.2.
18 19			
20 21 22 23	3.3	Please o provide	confirm that DCE stands for Deferred Capital Expenditures, or otherwise the full name.
24	<u>Response:</u>		
25	Confirmed.		
26 27			
28 29 30	3.4	Please	describe how the DCE of \$79.85 per KW-year was calculated.



1 Response:

2 The DCE factor is the marginal cost of FBC's anticipated system infrastructure capital additions

expressed as present value, over a 20-year planning horizon, divided by the incrementalcapacity gains.

5 FBC notes that the EES report that determined FBC's DCE factor was filed as Appendix C to
6 FBC's 2017 DSM Plan application (Exhibit B-1 in BCUC Project No. 3698889), and accepted by
7 the BCUC pursuant to Order G-19-17.

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10 11 12 13 14	3.5	Please and DC total co	confirm that a TRC of 1.5 on a portfolio basis, using the accepted LRMC E means that, as a portfolio, the savings are more than recovering their sts by a factor of approximately 50%.
15	Response:		
16 17 18 19	FBC confirms This TRC ind energy saving DSM portfolio	s that the icates tha gs using o.	e TRC of 1.5 is on a portfolio basis using the accepted LRMC and DCE. at the estimated benefits (calculated as the present value of the portfolio's the aforementioned LRMC and DCE factors) are 1.5 times the cost of the
20 21			
22 23 24 25		3.5.1	If not confirmed, please explain why not and provide any calculations and quantifications necessary to correct the analysis.
26	Response:		
27	Please refer t	o the res	ponse to CEC IR 1.3.5.
28 29			
30 31 32	3.6	Please	provide the 2016 LTERP/LT DSM Plan or reference link to the same.



FortisBC Inc. (FBC or the Company) 2019-2022 Demand Side Management (DSM) Expenditures Application (the Application)	Submission Date: October 30, 2018	
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1 Response:

- 2 The 2016 LTERP can be found on FBC's website at the following link:
- 3 https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/ElectricBCUCsubmissions/Resourc
- 4 ePlans/Pages/2016-Long-Term-Electric-Resource-Plan--Long-Term-Demand-Side-
- 5 <u>Management-Plan.aspx</u>
- 6
- 7
- 8
- 9 3.7 Please elaborate on why and how the 14 cannabis production facilities in the 10 service area impacts the appropriate levels of DSM spending.
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12 **Response:**

During development of the 2019-2012 DSM Plan, FBC was aware of 14 cannabis production facilities proposed in the FBC service territory. DSM spending proposed in the 2019-2022 DSM Plan was based on early engagement with prospective cannabis customers to discuss what levels of support and incentive may be necessary to encourage energy efficient production in the prospective facilities. The additional incentives to support the cannabis industry were incremental to the proposed DSM spending to target industrial DSM market potential identified in the 2016 Conservation Potential Review.

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- 3.8 Please provide quantification of the energy, capacity and percentage load
 changes that the 14 cannabis production facilities are likely to create in FBC
 service territory; individually and collectively.
- 27 **Response:**
- 28 Please refer to the response to BCUC IR 1.13.1.
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- 323.9Does FBC expect to be able to offset all of the cannabis production facilities load33growth with increased DSM, or only a portion? Please discuss and provide34quantification.



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2 Response:

No, FBC does not expect to be able to offset all of the cannabis production facilities load growth with increased DSM in the 2019-2022 DSM Plan. FBC's proposed support for cannabis facilities in the 2019-2022 DSM Plan is expected to realize 6.0 GWh per year in savings (approximately 1.4 MW) for both new construction and retrofit projects. Assuming that cannabis production achieves a 325 GWh load by 2022, FBC expects that approximately 40 percent of the incremental load growth from cannabis production facilities will be offset with savings in the 2019-2022 DSM Plan (131.0/325 GWh).

- 10 Please note that due to a correction to the estimated savings in the Low Income program area,
- 11 the total 2019-22 DSM Plan savings have increased. For further information, please refer to the
- 12 errata filed concurrently with FBC's IR responses.
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- 3.10 Could FBC cost effectively displace all the increased load from the cannabis facilities with DSM? Please explain why or why not and provide quantification.
- 19 **Response:**

In the response to BCUC IR 1.13.1, FBC estimates the addition of a total 325 GWh of electricity load from cannabis facilities by 2022. The Conservation Potential Review Market Potential Report (filed as Appendix B to the Application) indicates that the remaining market potential is approximately 425 GWh, not including energy savings potential from cannabis production facilities.

Although it is theoretically possible that over time FBC could invest in enough cost effective DSM to offset the increased load growth from cannabis facilities, it seems unlikely given the relative magnitude of the increased load compared to the estimated market potential that can be accessed with DSM programs.

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- 323.11Are there other significant changes (ie. Other than the 14 cannabis facilities) that33are now occurring and would have relevance to any of the determinations made34in the LTERP?
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quantification and a short discussion of the expected impacts.

1 Response:

2 The 2019-2022 DSM Plan factors in the anticipated DSM opportunities arising from the known cannabis facilities that have materialized since the 2016 LTERP was filed. FBC has also seen 3 4 an increase in requests for electricity service from block-chain mining operations in its service 5 area since the 2016 LTERP was filed. One such facility has begun service near Christina Lake, 6 but the majority of its load will be taken through a wheeling tariff, and thus will be ineligible for 7 DSM programs. Additionally, FBC has not determined any DSM opportunities for these types of 8 customers at this time. 9 FBC expects it will further assess the impacts of these, and other load drivers, on its load 10 forecast and/or scenarios and subsequent portfolio analysis in its next long term electric resource plan, which it plans to submit to the BCUC by December 1, 2021. 11 12 13 14 15 3.11.1 If yes, please provide an overview of any such changes with

- 18 Response:
- 19 Please refer to the response to CEC IR 1.3.11.
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- 3.11.2 If yes, please discuss how FBC expects to address such changes.
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- 25 **Response:**
- 26 Please refer to the response to CEC IR 1.3.11.
- 27
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 - 3.11.3 If yes, please discuss how any of these changes might affect the
- 30 3.11.3 If yes, please discuss how any of these chang
 31 appropriate levels of DSM spending.
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FortisBC Inc. (FBC or the Company) 2019-2022 Demand Side Management (DSM) Expenditures Application (the Application)	Submission Date: October 30, 2018	
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1 Response:

FBC believes its 2019-2022 DSM Plan expenditure schedule provides the appropriate level of DSM spending by incorporating the anticipated changes in regards to the emerging cannabis production facilities and possessing the necessary flexibility to respond to other changing market conditions. If there were changes in the period covered by the 2019-2022 DSM Plan, FBC would review its level of expenditures in light of the changes and determine whether there was any need to file an amended expenditure schedule with the BCUC.

8 9 10 11 Does FBC expect that 14 is the total for cannabis production facilities that it will 3.12 12 experience in the next five years, or does FBC expect that more production 13 facilities will continue to proliferate? Please discuss and provide quantification 14 where possible. 15 16 Response: 17 As of October 15, 2018, FBC is aware of 17 prospective cannabis production facilities in the FBC service territory that are proposed to complete in 2019 and 2020. The 2019-2022 DSM 18 19 Plan forecast assumes that two additional cannabis facilities will be proposed annually, to 20 complete a year after. FBC's forecast is for four years. 21 Please also refer to the response to BCUC IR 1.13.1.



1 4. Reference: Exhibit B-1, page 11

5.1 GUIDING PRINCIPLES

FBC's DSM guiding principles have been updated from those presented in previous DSM applications to reflect the FEI and FBC (collectively FortisBC) C&EM department's¹⁴ common guiding principles. FortisBC's DSM guiding principles are the following:

- Programs will have a goal of being universal, offering access to energy efficiency and conservation for all residential, commercial and industrial customers, including lowincome customers.
- C&EM expenditures will have a goal of incentive costs exceeding 50 percent of the expenditures in a given year.
- C&EM expenditure schedule plans and results will be analyzed on a program, sector and portfolio level basis, with acceptance based at the portfolio level.
- The combined Total Resource Benefit/Cost, including the Modified Total Resource Benefit/Cost where applicable, of the Portfolio will have a ratio of 1.0 (unity) or higher.
- FortisBC will submit its annual DSM Reports to the BCUC, by the end of the first quarter of each year that details the results of the previous year's activity.
- 6. The DSM Plan will be compliant with the applicable sections of the UCA and the *Clean Energy Act*, and with the DSM Regulation as amended from time to time.

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- 4.1 Please provide the rationale for Guiding Principle #2.
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5 Response:

6 DSM Guiding Principle #2 is a qualitative approach to designing incentives that ensures a 7 higher proportion of Conservation & Energy Management (C&EM) expenditures are delivered to 8 customers as incentives to assist in offsetting the higher incremental cost of higher efficiency

9 equipment and appliances.



1 5. Reference: Exhibit B-1, page 13

FortisBC also received directional feedback from the consultations. This feedback included the following:

- Expand alignment with industry influencers;
- Support BC Energy Step Code for new construction;
- Support deeper retrofits;
- Provide building envelope support;
- Consider upstream incentives;
- Support pre-commercial technologies;
- Do more in the Industrial program area;
- Pursue attribution for Codes and Standards; and
- Support Energy Advisors.

The aforementioned feedback was taken into account in the development of the DSM Plan. Given this consultation process, FBC believes that the DSM Plan includes a fair representation of stakeholder and customer interests and is well positioned to achieve the energy savings forecast within.

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- _____
- 3 5.1 Please provide a table with each recommendation, a brief description of how it 4 could be accomplished, and what FBC has done or will do to pursue each of 5 those options.
- 6

7 **Response:**

8 The following table provides a list of directional feedback from consultations and a brief

9 description on how the recommendations will be accomplished through activities that FBC has10 done or will continue to pursue over the funding period.

FBC DSM activity as a result of recommendations arising from consultation
Expand alignment with industry influencers
1. FBC considers industry influencers to be all stakeholders who impact the program uptake of energy efficiency programs and measures by customer groups. Throughout the supply chain, industry influencers impact the purchase decision of customers and installation quality, and educate end users about proper equipment and building operation and maintenance;
2. Expand the Trade Ally Network for residential, commercial and industrial customer groups. Expand communications, events and training opportunities;
3. Host workshops and webinars with trades, manufacturers, energy advisors, and commercial and industrial energy consultants to elicit ongoing feedback on programs;
4. Collaborate with industry associations; and

5. Collaborate with program partners such as BC Hydro, BC's Ministry of Energy, Mines & Petroleum



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FBC DSM activity as a result of recommendations arising from consultation

Resources, Natural Resources Canada, local governments, BC Non-Profit Housing Association, and BC Housing to expand the depth and reach of program offerings and builders/trades education and engagement.

Support BC Energy Step Code for new construction

- 6. Provide incentives for Step 1 to Step 5 homes and energy advisor support for Part 9 buildings;
- 7. Provide training to builders and trades on airtightness and mechanicals; and
- 8. Provide incentives for commercial and institutional Part 3 buildings to include both a BC Energy Step Code and Non-BC Energy Step Code path.

In addition, please refer to points 3,4,5 above.

Support deeper retrofits

9. Residential–Bonus offers are in place to support two or more upgrades.

Provide building envelope support

10. Home Renovation Rebate program:

- o Increased insulation incentives through increasing the caps;
- o Developing Program Registered Contractor directories; and

11. Developing insulation training materials for existing homes and air tightness in new homes.

Consider more upstream incentives

- 12. The Commercial Prescriptive and Industrial Prescriptive Programs intend to expand upstream incentives for certain measures as follows:
 - Lighting: Currently delivered as upstream program, but expand to include more wholesale distributors; and
 - Non-lighting (i.e. heat pumps, electric food service, refrigeration, irrigation): Currently limited to heat pumps, but expand to include more partners and end-uses.

Re-launch a commercial retrocommissioning offer

13. Develop a successor retrocommissioning offer to FBC's Building Optimization Program (BOP) under the Commercial Custom Program jointly with FEI. Design new offer to be more customer centric and simpler than previous BOP program.

Do more in Industrial program area

- 14. Expand engagement with energy consultants to increase participation in the Feasibility Study and Plant Wide Audit offers in the Industrial Custom Program and increase the pipeline of custom energy efficiency projects; and
- 15. Target new cannabis production facilities for DSM opportunities prior to construction and support post-construction participation in FBC programs and offers.

Pursue attribution for Codes and Standards

- Increased Codes and Standards budget for 2019-2022 to one percent of proposed portfolio expenditures. Please refer to Section 7.4, of the 2019-22 DSM Plan (Appendix A to the Application, page 15) for more information; and
- 17. Please refer to the response to BCUC IR 1.16.3 for a discussion on claiming savings from codes and standards.

Support Energy Advisors

18. Home Renovation Rebate Program:

• Drive participation through Efficiency BC's EnerGuide Home Evaluation rebate and FBC's



Page 14

FBC DSM activity as a result of recommendations arising from consultation Home Energy Improvement Bonus; Support energy advisor training and maintain Program Qualified Energy Advisor directory; 0 19. New Home Program: Drive builders to participate in the BC Energy Step Code performance path through energy 0 advisor support fees; and Provide energy advisor training and maintain Program Qualified Energy Advisor directory. 0 Support pre-commercial technologies 20. Support feasibility studies, field studies and pilots to validate customer acceptance and energy savings of innovative equipment and systems prior to incorporation into DSM programs. Please refer to Section 8.3 of the 2012-22 DSM Plan (Appendix A to the Application, page 18) for more information.



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1 6. Reference: Exhibit B-1, page 14

5.3 DSM EXPENDITURE FORECAST BY PROGRAM AREA

Table 5-1 summarizes the DSM Plan forecast energy savings and expenditures (inflation adjusted) by program area (sector), non-program areas and portfolio level totals. The table also presents TRC Benefit/Cost ratios by program area and at the portfolio level. FBC used an inflation rate of two percent (2% annually) for program expenses and two and a half percent (2.5% annually) for program labour. Inflation is only accounted for in Table 5-1 for the plan years 2019 to 2022 and not the approved 2018 Plan figures.

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.

Program Area (Sector)	2018 Plan	Expenditures (\$000s)				Energy savings (GWh)				TRC 2019- 2022		
	Approved	2019	2020	2021	2022	Total	2019	2020	2021	2022	Total	Ratio
Residential	\$1,591	\$2,086	\$2,304	\$2,519	\$2,795	\$9,703	6.0	5.6	6.0	6.5	24.1	1.8
Low Income	\$731	\$843	\$873	\$899	\$930	\$3,545	1.0	1.0	1.0	11	4.1	1.5
Commercial	\$3,592	\$3,178	\$3,031	\$3,052	\$3,047	\$12,308	15.5	15.5	15.3	15.5	61.8	1.7
Industrial	\$377	\$1,762	\$1,788	\$1,813	\$1,815	\$7,178	10.0	10.0	10.1	10.1	40.2	1.7
Program sub-total	\$6,291	\$7,870	\$7,995	\$8,284	\$8,587	\$32,735	32.6	32.1	32.4	33.1	130.3	1.7
Education and Outreach	\$165	\$366	\$497	\$595	\$666	\$2,324						
Supporting Initiatives	\$742	\$1,218	\$838	\$1,024	\$1,044	\$4,124						
Portfolio	\$743	\$776	\$913	\$1,019	\$956	\$3,663						
Demand Response		\$477	\$324	\$130	\$133	\$1,064						
Total	\$7,940	\$10,900	\$10,600	\$11,100	\$11,400	\$44,000	32.6	32.1	32.4	33.1	130.3	1.5
LT DSM Plan	\$7,900	\$8 100	\$8,200	\$9.400	\$10,600	\$36,300	26.4	26.4	28.4	30.4	111.6	19

Table 5-1:	2019-2022	OSM Plan	Proposed	Expenditures	(inflation	adiusted)
				- A Charten Co	(

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6.1 Please provide FBC's historic DSM spending and energy savings by Program Area for the last five years.

- 6 **Response:**
- 7 The following table provides FBC's actual historical DSM spending and energy savings by
- 8 Program Area for the last five years.

Program Area (Sector)	Expenditures (\$000s)						Energ	y Savings	(MWh)	
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Residential Total	3,168	1,694	1,050	2,518	1,891	16,200	8,686	5,639	12,538	10,847
Commercial Total	1,909	1,184	1,324	2,339	4,023	10,900	5,279	5,882	8,128	16,115



	Program Area (Sector)		Exper	nditures (\$	000s)		Energy Savings (MWh)				
	Industrial Total	324	188	226	300	206	2,500	614	1,087	2,099	876
	Programs Total	5,401	3,066	2,600	5,158	6,120					
	Total	6,855	3,473	3,531	6,533	7,309	29,600	14,580	12,608	22,766	27,838
1 2											
3 4 5 6 7	6.2 Please provide FBC's source for the 2% inflation assumption and the 2.5% program labour increase assumption.										
1	<u>Response:</u>										
8 9 10	The assumed DSM Plan. This comparable	inflation ra ne program to that use	te is con Iabour i d in the l	sistent w ncrease FEI 2019	/ith the in assumpt -2022 DS	iflation ra ion is ba SM Plan.	ate foreca sed on in	ast includ Iternal FE	ed in the 3C opera	2016 LT tions and	
11 12											
13 14 15 16 17	6.3 Please provide the rationales supporting the increases in the 'Residential Customer Engagement Tool;' the 'Demand Response Pilot' and the 'DSM Tracking.'										
18	Response:										
19 20 21 22	FBC interprets "increases" to mean "budgets" for the items requested. Since filing the 2016 LTERP, FBC has developed plans for a new Residential Customer Engagement Tool (CET), Demand Response (DR) Pilot, and the DSM Tracking initiative resulting in the addition of those expenditures.										
23 24 25	Please refer to the response to BCSEA IR1 1.3.5 for the Residential Customer Engagement Tool rationale, see response to BCUC IR 1.18.2 for the DR Pilot rationale, and the response to BCUC IR 1.16.4 for the DSM tracking system rationale.										
26 27											
28 29 30	6.4	Why do Demand F	the Edu Response	cation a e not hav	nd Outro	each, Si ergy or c	upporting apacity s	Initiativ avings a	es, Portf ssociated	olio and with the	



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- 1
- 2 3

expenditures? Are they unmeasurable or are they included in the other Program Areas, or is there another reason?

4 <u>Response:</u>

5 Energy savings are not usually achieved by, and therefore not attributed to, Conservation,

6 Education and Outreach, Supporting Initiatives, and Portfolio expenditures. DR is a pilot

7 initiative so the capacity savings potential is uncertain and as a result was not included.



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1 7. Reference: Exhibit B-1, page 1 and page 14

Table 1-1:	2019-2022	DSM Plan	compared	with the	LT DSM Plan
------------	-----------	----------	----------	----------	-------------

Plan	2019	2020	2021	2022	Total
Expenditures (\$000s)					
2019-2022 DSM Plan	\$10,900	\$10,600	\$11,100	\$11,400	\$44,000
LT DSM Plan	\$8,100	\$8,200	\$9,400	\$10,600	\$36,300
Difference	\$2,800	\$2,400	\$1,700	\$800	\$7,700
Energy savings (GWh)					
2019-2022 DSM Plan	32.6	32.1	32.4	33.1	130.3
LT DSM Plan	26.4	26.4	28.4	30.4	111.6
Difference	6.2	5.7	4.0	2.7	18.7

Table 5-1: 2019-2022 DSM Plan Proposed Expenditures (inflation adjusted)

Program Area (Sector)	2018 Plan			Expenditure (\$000s)	5			E	nergy savi (GWh)	ings		TRC 201 9- 2022
	Approved	2019	2020	2021	2022	Total	2019	2020	2021	2022	Total	Ratio
Residential	\$1,591	\$2,086	\$2,304	\$2,519	\$2,795	\$9,703	6.0	5.6	6.0	6.5	24.1	1.8
Low Income	\$731	\$843	\$873	\$899	\$930	\$3,545	1.0	1.0	1.0	11	4.1	1.5
Commercial	\$3,592	\$3,178	\$3,031	\$3,052	\$3,047	\$12,308	15.5	15.5	15.3	15.5	61.8	1.7
Industrial	\$377	\$1,762	\$1,788	\$1,813	\$1,815	\$7,178	10.0	10.0	10.1	10.1	40.2	1.7
Program sub-total	\$6,291	\$7,870	\$7,995	\$8,284	\$8,587	\$32,735	32.6	32.1	32.4	33.1	130.3	1.7
Education and Outreach	\$165	\$566	\$497	\$595	\$666	\$2,324						
Supporting Initiatives	\$742	\$1,218	\$838	\$1,024	\$1,044	\$4,124						
Portfolio	\$743	\$776	\$913	\$1,019	\$956	\$3,663						
Demand Response		\$477	\$324	\$130	\$133	\$1,064						
Total	\$7,940	\$10,900	\$10,600	\$11,100	\$11,400	\$44,000	32.6	32.1	32.4	33.1	130.3	1.5
LT DSM Plan	\$7,900	\$8,100	\$8,200	\$9,400	\$10,600	\$36,300	26.4	26.4	28.4	30.4	111.6	1.9

 7.1 Please confirm that the figures in Table 1-1 are inflation adjusted for both the DSM Plan and the LT DSM Plan.

7 Response:

8 Confirmed.

- 127.2Please provide an explanation for why commercial spending is proposed to13decline each year between 2018 and 2022 in the proposed DSM Plan.



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1 Response:

- 2 Please refer to the responses to BCUC IRs 1.12.1.1 and 1.12.3.
- 3
- 4
- 5

9

7.3 Please provide an estimate of the impact on the energy savings and commercial
 7 TRC if commercial spending were to be held stable, increase by 10% per year,
 8 15% per year and 20% per year. Please adjust for inflation.

10 **Response:**

Energy savings for the commercial DSM programs are a function of more than program
 spending. As such, FBC is unable to provide a reliable estimate of the energy savings and TRC
 benefit/cost ratio for commercial programs if spending were increased.

14 Furthermore, customer response to increased funding is based on a number of factors including 15 program awareness, capacity (internal and trade allies to supply and install measures) and 16 propensity to invest. FBC did a first order estimate of the impact by using the payback 17 acceptance curves presented in the BC Conservation Potential Review. FBC estimates that 18 increasing incentives in the commercial program area by 10 percent per year, 15 percent per 19 year, and 20 percent per year (all other assumptions held equal) would yield an increase in 20 savings of approximately 1.4 percent, 2.1 percent, and 2.7 percent respectively. Because this 21 analysis is conducted using simple payback. FBC is unable to provide the exact impact on TRC. 22 however FBC considers the TRC benefit/cost ratio could increase slightly.



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8. Reference: Exhibit B-1, page 17 and 18

5.4.1 Market Potential Results

Figure 5-1 shows that the cumulative market potential increases steadily throughout the CPR period, reaching 596 GWh/year in 2035. By 2035, market potential reaches nearly 48 percent of the economic potential. Incremental annual market potential added year-over-year to the cumulative potential averages 30 GWh/year over the study horizon.²⁰

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Source: Navigant

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8.1 Please provide a brief discussion describing why the market potential is so significantly lower than the Technical and Economic potential.

7 Response:

8 Technical and Economic potential includes the potential for all energy saving measures as if 9 they could all be implemented instantaneously. Market potential is a subset of economic 10 potential that estimates the likely rate of efficient measure implementation, given factors like the 11 rate of equipment turnover (a function of a measure's lifetime), simulated incentive levels, 12 consumer willingness to adopt efficient technologies, and the likely rate at which marketing 13 activities can facilitate technology adoption.

14 Market potential represents a high-level assessment of savings that could be achieved over 15 time, factoring in broader assumptions about customer acceptance and adoption rates that are 16 not dependent on DSM program design. Additional effort is typically undertaken by program 17 designers, using the directional guidance from a market potential study, to develop detailed



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- 1 plans for delivering conservation programs. As a result, Market Potential has lower levels of
- 2 energy savings than Technical or Economic Potential.



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1 9. Reference: Exhibit B-1, page 20

Figure 5-3 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. Savings from those areas represent 168 GWh or nearly 28 percent of the total cumulative market potential by 2035. The remaining 425 GWh of market potential comes from measures typically included in FBC's DSM programs.



Figure 5-3: Annual Electric Energy Savings Market Potential by Source (GWh/year)

- 2 Source: Navigant
- 3 4
- 9.1 Why have 'codes and standards' not historically contributed to FBC's DSM program savings?

5

6 **Response:**

- 7 Please refer to the response to BCUC IR 1.16.3.
- 8
- 9
- 0
- 10
- 119.2Please confirm that the introduction of 'codes and standards' are an inexpensive12and effective means of generating DSM savings.
- 13

14 **Response:**

- 15 Confirmed. Where there is evidence to support the attribution of savings from the introduction of
- 16 a code or standard, the savings from the code or standard 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.

4 5	
6	
7	9.2.1 If no, please explain why not.
8	
9	Response:
10	Please refer to the response to CEC IR 1.9.2.
11	
12	
13	

9.3 Could FBC create increasing levels of savings which it can count towards its
programs by actively promoting the advanced implementation of codes and
standards? Please explain why or why not.

18 **Response:**

19 Please refer to the response to BCUC IR 1.16.3 for a discussion of how FBC could attribute 20 savings from codes and standards.

FBC's portfolio of DSM programs provides incentives to encourage adoption of energy efficient equipment that exceeds code baseline, thus increasing market saturation of higher efficiency equipment. The increasing market saturation ultimately enables the adoption of higher performance requirements in codes and standards. FBC believes that DSM programs support market transformation by encouraging higher market saturation of improved energy efficiency measures in equipment and/or improved building practices, thereby allowing the applicable standards or regulatory body to propose and enact future regulation.

28



1 10. **Reference:** Exhibit B-1, page 20 and 21

Figure 5-4 below compares the remaining market potential (that excludes savings from electronics, kraft pulp and paper, and codes and standards) to the DSM Plan program savings. The DSM Plan savings forecast exceeds the market potential due largely to newly anticipated activity in cannabis production facilities in FBC's service area.

2





Source: FortisBC

3 4

5 6 10.1 The above figure shows that DSM plan savings are largely stable, or increasing, while the CPR remaining potential is declining. Please explain why there appears to be a decline in the differential between the two metrics and provide quantification if possible.

7 8

9 **Response:**

10 FBC notes there is an increase, not decline, in the differential between the two metrics over 11 time.

12 Market potential represents a high-level assessment of savings that could be achieved over time, factoring in broader assumptions about customer acceptance and adoption rates that are 13 14 not dependent on DSM program design. The decline in the market potential is largely driven by 15 the adoption of new codes and standards (including commercial lighting and the BC Energy 16 Step Code) that reduce baseline energy consumption and therefore reduce energy savings 17 potential.

18 Additional effort is undertaken by program designers, using the directional guidance from a 19 market potential study, to develop detailed plans for delivering conservation programs. The



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- 1 differential between the two forecasts is due largely to estimated savings from emergent
- 2 cannabis production facilities that were additional to FBC's CPR market potential.



1 11. Reference: Exhibit B-1, page 23

 Section 4 of the DSM Regulation requires that DSM cost effectiveness be evaluation occur governing TRC test and, as necessary, the modified TRC (mTRC) test for up the expenditure portfolio (per section 4(1.5)(b)(iv)). Where the evaluation occur level, the total costs of the portfolio are compared to the total value of the programs contained in the portfolio. ²⁰ FBC Application for Acceptance of Demand Side Management Expenditures for 2017, Applicatial Expenditure Study, July 2016. Table 4 (p. 23). 11.1 Please confirm or otherwise explain that 8% represents Fortist losses on an annual basis. Response: Confirmed. FBC forecasts line losses at 8 percent of the before savings grost changed with the introduction of the Smart Metering? Please of changed with the introduction of the Smart Metering? Please of losses. The 8 percent loss rate is based on a loss study that was of losses. The 8 percent loss rate is based on a loss study that was of losses. The 8 percent loss rate is based on a loss study that was of losses. 	by the avoided transmission and he benefits are calculated. In its epted in the 2016 LTERP for cost ie of \$79.85 ²³ per kW-yr (\$2015), again used for this Application. the current filing.
 ³ FBC Application for Acceptance of Demand Side Management Expenditures for 2017, Application Expenditure Study, July 2016, Table 4 (p. 23). 11.1 Please confirm or otherwise explain that 8% represents Fortist losses on an annual basis. Response: Confirmed. FBC forecasts line losses at 8 percent of the before savings grost changed with the introduction of the Smart Metering? Please of the set of the savings of the set of the savings grost set. Response: FBC currently assumes an 8 percent losses estimate of before savings grost losses. The 8 percent loss rate is based on a loss study that was or locses. The 8 percent loss rate is based on a loss study that was or loce the set of the losses forecast to or location. 	ctiveness be evaluated using the FRC) test for up to 10 percent of evaluation occurs at the portfolio otal value of the benefits of the
 Capital Expenditure Study, July 2016. Table 4 (p. 23). 11.1 Please confirm or otherwise explain that 8% represents Fortis losses on an annual basis. Response: Confirmed. FBC forecasts line losses at 8 percent of the before savings gros 11 12 11.2 Does this line loss figure typically remain steady over a period changed with the introduction of the Smart Metering? Please of hanged with the introduction of the Smart Metering? Please of FBC currently assumes an 8 percent losses estimate of before savings gros FBC currently assumes an 8 percent losses estimate of before savings gros losses. The 8 percent loss rate is based on a loss study that was constructed and the losses forecast to be 	itures for 2017, Appendix C, Deferred
 11.1 Please confirm or otherwise explain that 8% represents Fortis losses on an annual basis. Response: Confirmed. FBC forecasts line losses at 8 percent of the before savings gros 11.2 Does this line loss figure typically remain steady over a period changed with the introduction of the Smart Metering? Please of Response: FBC currently assumes an 8 percent losses estimate of before savings gros losses. The 8 percent loss rate is based on a loss study that was constructed and the losses forecast to end to the losses forecast to the loss of the loss of the loss of the losses forecast to the loss of the	
 Response: Confirmed. FBC forecasts line losses at 8 percent of the before savings gros 11 12 11.2 Does this line loss figure typically remain steady over a period changed with the introduction of the Smart Metering? Please of Response: FBC currently assumes an 8 percent losses estimate of before savings gros losses. The 8 percent loss rate is based on a loss study that was of locses. The 8 percent loss rate is based on a loss study that was of locses. 	resents FortisBC's expected line
 9 Confirmed. FBC forecasts line losses at 8 percent of the before savings gross 10 11 12 11.2 Does this line loss figure typically remain steady over a period changed with the introduction of the Smart Metering? Please of the second structure of the	
 10 11 12 13. 11.2 Does this line loss figure typically remain steady over a period changed with the introduction of the Smart Metering? Please of the Smart Metering? 15 16 <u>Response:</u> 17 FBC currently assumes an 8 percent losses estimate of before savings group losses. The 8 percent loss rate is based on a loss study that was continued into the losses forecast to end to the losses forecast to the los	e savings gross load.
 12 13. 11.2 Does this line loss figure typically remain steady over a period changed with the introduction of the Smart Metering? Please of Response: 16 Response: 17 FBC currently assumes an 8 percent losses estimate of before savings group losses. The 8 percent loss rate is based on a loss study that was concernental AMI impacts are then incorporated into the losses forecast to end to the losses forecast to the losses fo	
FBC currently assumes an 8 percent losses estimate of before savings gro losses. The 8 percent loss rate is based on a loss study that was c Incremental AMI impacts are then incorporated into the losses forecast to operate the losses forecast to be losses forec	v over a period of years, or has it ring? Please explain.
 savings losses for the purposes of determining the annual revenue req currently developing an updated losses study using AMI data to confirm or before savings gross load losses estimate of 8 percent. 	e savings gross load to forecast y that was conducted in 2012. s forecast to determine the after revenue requirement. FBC is to confirm or update the current

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- 11.3 Ple
 - 11.3 Please provide a breakdown of the various DSM measures and their individual TRCs, identifying which programs are utilizing the mTRC to be cost effective.

4 Response:

5 The DSM measures and their individual TRCs are provided as Attachment 11.3.

6 No programs in FBC's 2019-2022 DSM Plan use the mTRC to be cost effective. Although some

7 measures, e.g., Steps 2 and 5 (referring to the BC Energy Step Code) fail the TRC test

8 individually, the bundled new home program passes as a whole without using the mTRC.

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1 12. **Reference:** Exhibit B-1, page 23 and 24 and Appendix A, page 12 and 14

The DSM Regulation also includes special treatment for specified measures (section 4(4)) and low income programs (section 4(2)). Specifically, section 4(4) of the DSM Regulation states that the cost-effectiveness of a "specified demand-side measure" must be determined by the cost effectiveness of the portfolio as a whole. Under section 1 of the DSM Regulation, specified demand-side measures include: education programs; energy efficiency training; community engagement programs; technology innovation programs; and resources supporting the development of energy conservation or efficiency standards. FBC has included specified demand-side measures within its Conservation Education and Outreach and Supporting Initiatives program areas, including increasing its Codes and Standards support to comply with the March 2017 Amendment to the DSM Regulation.

For a DSM measure(s) intended specifically to assist residents of low-income households to reduce their energy consumption (which would include the activities within FBC's Low Income Program), the Commission must, per section 4(2) of the DSM Regulation, in addition to any other analysis the Commission considers appropriate, use the TRC test and, in so doing,

increase the value of the benefit of the DSM measure by 40 percent. FBC has applied this approach in the cost-effectiveness analysis of the Low Income programs presented in the DSM Plan.

Table 6-1: Conservation Education and Outreach Expenditures, 2019-2022

Program	Expenditures 2019 dollars (000s)				
	2019	2020	2021	2022	Total
Residential Education Program	\$217	\$217	\$220	\$220	\$875
Residential Customer Engagement Tool	\$281	\$203	\$254	\$321	\$1,059
Commercial Education Program	\$21	\$21	\$28	\$28	\$99
School Education Program	\$46	\$47	\$69	\$58	\$219
Total	\$566	\$488	\$572	\$627	\$2,252

Supporting Initiatives 7

Supporting Initiatives complement the incentive-based programs discussed in the 2019-2022 DSM Plan because they provide program support, build trade ally capacity, and promote market transformation to more energy efficient options. Supporting initiatives are included in portfolio level spending because they do not result in direct DSM savings. Table 7-1 lists the proposed Supporting Initiatives.

Table 7-1: Supporting Initiative Expenditures, 2019 to 20.
--

Program		Expenditures 2019 dollars (000s)							
	2019	2020	2021	2022	Total				
Commercial Energy Specialist Program	\$60	\$60	\$60	\$60	\$240				
Community Energy Specialist Program	\$150	\$200	\$250	\$250	\$850				
Trade Ally Network	\$152	\$148	\$200	\$200	\$700				
Codes and Standards	\$97	\$105	\$117	\$116	\$435				
Reporting Tool & Customer Application Portal	\$466	\$14	\$61	\$61	\$602				
Labour and expenses	\$293	\$293	\$293	\$293	\$1,173				
Total	\$1,218	\$820	\$981	\$980	\$4,000				

The following sections outline the role for each supporting initiative.



12.1 Please identify all the measures in the Conservation Education and Outreach Expenditures that are subject to the 40% increase in the value of benefit.

4 <u>Response:</u>

5 The DSM Regulation specifies an increase of 40 percent to the value of the total resource cost 6 test benefits for low income programs. This increase in the value of the benefit does not apply 7 to Conservation Education and Outreach and Supporting Initiative expenditures as they are 8 specified DSM programs.

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- 12 12.2 Please identify all the measure in the Supporting Initiatives that are subject to the40% increase in the value of benefit.
- 14
- 15 **Response:**
- 16 Please refer to the response to CEC IR 1.12.1.



Page 30

1 13. **Reference:** Exhibit B-1, page 24

6.1.3 Avoided Cost Sensitivity

As stated in the previous section, the DSM Plan uses the accepted LRMC of \$100 per MWh for clean or renewable BC resources from the 2016 LTERP to determine the avoided energy cost benefits of DSM program measures. This LRMC value is considered "firm" energy, i.e. inclusive of generation capacity benefits. The Company also includes a DCE value of \$79.85 per kW per year to represent the incremental capacity savings of deferred infrastructure. The estimated Benefit/Cost ratios, using the two factors, are shown at the sector and portfolio levels in Table 5-1 above.

By comparison, based on a regulatory filing in 2016.²⁴ BC Hydro's LRMC is approximately \$106 per MWh, including energy and capacity, which approximates the \$100 per MWh value that FBC uses to value DSM savings as a reliable resource that can defer the need to acquire additional generation capacity. As a result, no sensitivity runs were undertaken.

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- 13.1 Please confirm that FortisBC does not have the self-sufficiency requirements that BC Hydro is required to adhere to.
- 4 5

6 **Response:**

7 Confirmed. Section 44.1(8)(b) of the Utilities Commission Act states that the BCUC must consider "the extent to which the [LTERP] is consistent with the applicable requirements under 8 9 sections 6 and 19 of the Clean Energy Act". Section 6(4) of the CEA provides that:

- 10 (4) A public utility, in planning in accordance with section 44.1 of the Utilities 11 Commission Act for
- 12 (a) the construction or extension of generation facilities, and
- (b) energy purchases, 13
- 14 must consider British Columbia's energy objective to achieve electricity self-15 sufficiency. [Emphasis added]
- 16 Section 6(2) of the CEA sets out the self-sufficiency obligations of BC Hydro as follows:
- 17 (2) The authority must achieve electricity self-sufficiency by holding, by the year 18 2016 and each year after that, the rights to an amount of electricity that meets 19 the electricity supply obligations solely from electricity generating facilities within 20 the Province,
- 21



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13.2 What would FortisBC expect its LRMC to be if it were to consider clean and renewable non-BC resources in its avoided energy cost. Please quantify.

5 Response:

6 FBC does not know at this time what its LRMC would be if it were to consider clean and 7 renewable non-BC resources in its avoided energy cost. To determine a LRMC value for such a 8 portfolio, FBC would need to conduct further portfolio analysis, which includes determining 9 future load-resource balance gaps and assessment of resource options and their costs. FBC 10 expects to conduct such analysis as part of its next LTERP, due to be submitted to the BCUC

11 by December 1, 2021.



Page 32

1 14. **Reference:** Exhibit B-1, page 24-25

6.2 OTHER STANDARD COST BENEFIT TESTS

While the TRC and mTRC continue to be the governing tests that FBC used to determine the cost-effectiveness of its DSM Plan on a portfolio basis, the Company has also historically reported and considered a range of other industry standard cost-effectiveness tests, including the Ratepayer Impact Measure (RIM)²⁵, the Utility Cost Test (UCT)²⁶ and the Participant Cost

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Test (PCT)²⁷ applied at the program, program area (or sector) and portfolio levels. These costeffectiveness tests are from the California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects (California Manual). Table 6-1 shows the standard test results at the portfolio level.

Program Area (Sector)	TRC	TRC mTRC		РСТ	PCT RIM		Utility Cost
	Ratio	Ratio	Ratio	Ratio	Ratio	\$/MWh	\$/MWh
Total	1.5	1.7	2.8	3.1	0.8	84.5	45.1

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- 14.1 Please provide a brief discussion of the Utility Cost Test, the Participant Cost Test, the Rate Impact Measure Test ratios and how they are developed and how they might be appropriately interpreted, such as what might be considered as 'passing', 'failing' or other relevant factors.
- 7 8

9 **Response:**

10 FBC uses the Total Resource Cost (TRC) test as the primary determinant of measure, program,

11 sector and portfolio cost-effectiveness, as required by the DSM Regulation. FBC considers the

12 Utility Cost Test (UCT), Participant Cost Test (PCT) and Rate Impact Measure (RIM) Test to be

13 secondary tests.

14 The UCT is the utility-centric version of the benefit cost analysis, presenting the B/C ratio from the utility perspective by omitting the Customer Portion of Cost (CPC). The UCT B/C ratio is 15 16 decreased, all else equal, by increasing the utility's measure incentive. The UCT levelized cost 17 (\$/kWh) can be used to rank the relative attractiveness of measures, and can be used to 18 compare the DSM plan sector/portfolio costs to supply-side alternatives. The UCT figure is 19 generally a figure that is approximately double that of the TRC, thus provides little or no 20 additional assessment in determining whether or not the DSM portfolio, or its constituents, are 21 cost-effective or not.

22 The PCT is the customer-centric version of the benefit cost analysis, indicating the value of the 23 participant's bill savings divided by the CPC, i.e. measure cost less utility incentive. It presents 24 the measure economics from the customer's perspective and helps balance equity since the

25 increase/decrease of measure incentive can shift the PCT ratio.



1 The RIM test shows the relative impact of various measures and programs on the utility's 2 ratepayers. It incorporates the utility's lost revenue stream (aka participant bill savings) in the 3 denominator. A positive figure (>1.0) means the avoided cost benefits exceed the measure's 4 total costs and vice versa.

- 5
- 6
- 7 8
- 14.2 Can the Utility Cost of \$45.1/MWh be appropriately described as the overall cost of DSM energy for FortisBC?
- 9 10

11 **Response:**

- Due to a correction to the estimated savings in the Low Income program area, the Utility Cost of \$45.1/MWh has decreased to \$44.7/MWh. For further information, please refer to the errata filed concurrently with FBC's IR responses.
- 15 The Utility Cost of \$44.7/MWh shows the cost per MWh, from the FBC perspective, for 16 delivering DSM energy savings for the 2019-2022 DSM Plan.
- FBC notes that the total overall cost, including Customer Portion of Cost, is better reflected inthe TRC i.e. \$83.8/MWh.
- 19 20 21 22 14.2.1 If no, please explain why not. 23 24 **Response:** 25 Please refer to the response to CEC IR 1.14.2. 26 27 28 29 14.2.2
 - 14.2.2 If yes, please confirm or otherwise explain that DSM represents the lowest utility cost of energy that FortisBC has at its disposal.
- 30 31



1 Response:

- 2 FBC does not consider a discussion on the cost of DSM, relative to other sources of energy,
- 3 within the scope of the 2019-2022 DSM Plan proceeding. For a discussion on long term
- 4 planning and the relative cost of DSM please refer to the proceedings in respect of FBC's 2016
- 5 LTERP.



1 15. Reference: Exhibit B-1, page 28

Table 7-1:	FBC	Program	Free-Rider	and	Spill-Over	Rates
100101-11	100	riogram	1 TOC-INIGOI	anta	Spin-Over	rucoa

Program Area	Free-rider	Spill-over	Source of Justification			
Residential						
Home Improvement Program	20%		LiveSmart, BC Hydro, 2012			
Heat Pumps - rebates	44%	20%	Research Into Action, 2018			
Heat Pumps - Ioans	15%	20%	Research Into Action, 2018			
Heat Pump Water Heaters	18%		Evergreen Economics, 2014			
Lighting	36%	77%	Evergreen Economics, 2014			
Appliances	57%	39%	Evergreen Economics, 2014			
New Home Program	20%		per BC Hydro (Cooper and Habart, 2014)			
Rental (in-suite)	0%		Dunsky Consulting, 2016			
Commercial						
Commercial Lighting	34%		Evergreen Economics, 2013			
Custom Building Improvement	24%		Evergreen Economics, 2018			
Building & Process Improvement	30%	12%	Sampson Research, 2012			
Custom Lighting	41%	9%	Evergreen Economics, 2018 & Sampson 2009			
Building Improvement New	25%		Sampson Research, 2011			
Industrial						
Industrial Efficiency	12%		Sampson Research, 2013			
Low Income Housing						
Energy Savings Kit	0%		as per BC Hydro			
Energy Conservation Assistance Program	0%		as per BC Hydro			

Are the 'Research Into Action,' 'Evergreen Economics' 'Dunsky' and 'Sampson

Research' studies Canadian and specifically BC studies? Please explain and

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7 Response:

15.1

8 The sources mentioned are all third-party consultants that specialize in Evaluation studies. 9 Each program report was specifically centred on FBC's customers, except in the few cases 10 where it was either a co-funded study in collaboration with FEI or a BC Hydro "internal" 11 evaluation report on their customer base, which FBC assumes approximates its own customer 12 base in terms of free-ridership and spillover factors.

provide a copy or reference link to each study.

13 The requested reports contain customer-specific information that should not be disclosed to the 14 public and the methodology and processes used in the reports are proprietary to the consultants 15 bired by EBC, and are therefore confidential. The publicly available Executive Summaries of the

15 hired by FBC, and are therefore confidential. The publicly available Executive Summaries of the



1 2	Evaluation R Hydro reports	eports are provided in the appendices to FBC's annual DSM reports ¹ . The BC were also shared with FBC on a confidential basis.
3 4		
5 6 7 8	15.2	If no, does FBC expect that FBC's Free-rider and spillover rates may be different than those studies? Please explain why or why not.
9	<u>Response:</u>	
10	Please refer t	to the response to CEC IR 1.15.1.
11 12		
13		
14 15 16	15.3	Does FBC conduct any of its own Free Rider and Spillover Rates studies? Please explain why or why not.
17	<u>Response:</u>	
18	Please refer t	to the response to CEC IR 1.15.1.
19		

https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/ElectricBCUCsubmissions/DemandSideM anagement/Pages/DSM-Reports.aspx



1 16. Reference: Exhibit B-1, page 29

8.2 FUNDING TRANSFERS

It should be noted that, as with all such 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, FBC 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.

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. As the exact timing of the expenditure, FBC believes this is an appropriate approach.

2

3

- 16.1 Please describe the current process that occurs if FBC has unspent dollars in a program area.
- 4 5

6 **Response:**

FBC reports to the BCUC on an annual basis the final results of its DSM programs, including the
actual costs and savings compared to plan. If the DSM Plan is underspent, the actuals reported
in its DSM annual reports compared to plan will show the amount of unspent dollars in each
program area. However, those unspent expenditures, either on a program or portfolio level, are
not rolled over into the next year's plan.

- 12
 13
 14
 15
 16.2 How often has FBC been unable to spend its DSM budget in a given year? Please provide a brief discussion of the circumstances that have resulted in FBC not being able to spend its DSM budget in the past.
 19
 20 Response:
- The following table shows FBC's approved and actual DSM expenditures (\$000s) over the past five years; indicating four underspent years and one overspent year. FBC notes that the gross



- 1 2017 DSM expenditure was \$7,709 thousand, approximately \$100 thousand over the approved
- 2 plan, but after adjustment for co-funding the net expenditure was \$7,309 thousand.

	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
Actual	6,855	3,473	3,531	6,533	7,309
Approved	7,878	3,001	7,292	7,532	7,610
Percent	87%	116%	48%	87%	96%

4 FBC notes that the 2013 underspend was primarily related to a reduced LiveSmartBC program,

and higher baselines for lighting products, major household appliances and prescriptive newhome construction.

The 2015-17 period of increasing expenditures, and corresponding reduction in underspend,
illustrates the ramp-up required to re-engage the market (customers, trade allies etc.) after

- 9 substantive DSM funding was restored in 2015.
- 10

3

- 11
- ...
- 12

15

1316.3Please discuss any pros or cons that FBC considers results from the current14process.

16 **Response:**

FBC considers that in the case of one year DSM plans, the current process is appropriate. However, in the case of multi-year DSM plans, the current process might result in underspend in any year being locked in for the duration of the plan period, and FBC would fall short of meeting its (overall) approved DSM expenditures. If, however, FBC is able to roll over unspent expenditures, then if there is an underspend in a given year the Company would have the opportunity to catch up in the following years, therefore increasing the likelihood that FBC would not fall short of spending its overall 2019-2022 DSM Plan expenditures.

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- 27 28
- 16.4 Would FBC be amenable to a % restriction for 'roll-overs'? Please explain why or why not.
- 29
- 30 Response:
- 31 Please refer to the response to BCUC IR 1.9.1.1.



1 2		
3 4 5 6 7	16.5 <u>Response:</u>	Would 'rolling over' spending likely result in FBC having increased difficulty spending the next year's budget? Please explain why or why not.
8	Please refer	to the responses to BCUC IRs 1.9.2 and 1.9.2.1.
9 10		
11 12 13 14 15	16.6	What would be the outcome if FBC 'rolled over' significant spending and was not able to spend the entire budget by the end of the term? Please explain.
15	<u>Response:</u>	
16 17 18	FBC expects schedule by the sc	the outcome, if FBC is not able to spend the entire 2019-2022 DSM expenditure the end of the term, would be similar to what is currently the case and is described o CEC IR 1.16.1.
19 20 21	FBC notes, h and achievat hard to devel	nowever, that it has developed the 2019-2022 DSM Plan that forecasts reasonable ole expenditures for each year and it intends to implement the plan it has worked op.
22	Please also r	efer to the response to BCUC IR 1.9.1.1.
23 24		
25 26 27 28	16.7 Response:	Please confirm or otherwise discuss that DSM spending is entirely outside the PBR process and is neither affects, nor is affected by PBR ratemaking.
20		
29 30	Confirmed. is not affected	The approval of DSM expenditures is separate from FBC's PBR process and DSM d by the formulas or sharing mechanisms in the PBR Plan.
31		



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

4 Commercial Program Area

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

The change in program organization, compared with the 2018 DSM Plan (where incentives were grouped by end-use), streamlines reporting and aligns with the FEI commercial programs. 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. The scope of Commercial DSM programs includes landlords and low income housing providers upgrading common areas of rental buildings. The proposed commercial programs are described in the following sub-sections.

Program	Expenditures 2019 dollars (000s)				Energy savings (GWh)					TRC 2019- 2022	
	2019	2020	2021	2022	Total	2019	2020	2021	2022	Total	Ratio
Commercial Custom	\$980	\$963	\$1,005	\$1,095	\$4,043	4.4	5.3	6.0	6.8	22.6	1.3
Commercial Prescriptive	\$1,371	\$1,218	\$1,174	\$1,057	\$4,819	11.1	10.1	9.2	8.7	39.1	2.8
Labour and expenses	\$828	\$828	\$828	\$828	\$3,312						
Total	\$3,178	\$3,008	\$3,006	\$2,980	\$12,173	15.5	15.5	15.3	15.5	61.8	2.0

Table 4-1: Commercial Expenditures and Savings, 2019-2022

2

3 4 17.1 How did FBC determine what proportion of the Commercial Programs should be Prescriptive versus Custom?

5

6 **Response:**

FBC develops both Prescriptive and Custom Program offers to meet the market potential
identified in the 2016 Conservation Potential Review. The decision to meet market potential
through a Prescriptive or Custom program offer depends on the measure and is not based on a
pre-determined split between programs.

Prescriptive Program offers are developed for energy efficiency opportunities where the
baseline and measure parameters (e.g., measure cost, energy savings, demand savings,
measure life) are well understood and predictable (e.g., LED lighting and appliances).

14 Custom Program offers are available for measures that are more complex and where each 15 project needs to be evaluated individually (e.g., building mechanical upgrades and advanced

16 building controls).



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7

Are there significant differences in the types, or numbers of businesses that are
likely to access custom programs than are likely to access prescriptive
programs? Please explain.

8 <u>Response:</u>

9 There is a minimum energy savings threshold for the Custom Program of 50,000 kWh per year,

10 therefore participants typically have larger buildings that consume more energy. Frequent

11 participants in the Custom Program include universities, colleges, health care facilities, schools,

12 and large retail facilities.

13 A wide variety of both large and small business and institutional buildings regularly access the

14 Prescriptive Program offers. There are significantly more participants in the Prescriptive

15 Program, as compared to the Custom Program; however, the size of individual projects in the

16 Prescriptive Program is typically much smaller.



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

Program	Expenditures 2019 dollars (000s)					Energy savings (GWh)					TRC 2019- 2022
	2019	2020	2021	2022	Total	2019	2020	2021	2022	Total	Ratio
Commercial Custom	\$980	\$963	\$1,005	\$1,095	\$4,043	4.4	5.3	6.0	6.8	22.6	1.3
Commercial Prescriptive	\$1,371	\$1,218	\$1,174	\$1,057	\$4,819	11.1	10.1	9.2	8.7	39.1	2.8
Labour and expenses	\$828	\$828	\$828	\$828	\$3,312						
Total	\$3,178	\$3,008	\$3,006	\$2,980	\$12,173	15.5	15.5	15.3	15.5	61.8	2.0

2 3

4.1 Prescriptive Program

The Prescriptive Program has two market delivery channels. Commercial customers are able to purchase qualifying measures at the vendor of their choice and apply for rebate directly from FBC. Alternatively, for select qualifying measures (such as lighting and kitchen equipment), commercial customers can receive a rebate as a point-of-sale rebate from participating trade allies. Trade allies then apply for reimbursement of the point-of-sale rebates from FBC.

4

- LED lighting and lighting controls;
- Commercial refrigeration;
- Commercial food service;
- Variable speed drives; and
- Heat pumps and heat pump water heaters.
- 5
- 6 18.1 Please provide a breakdown of the costs and savings of the various 7 programs/offers included in the Prescriptive Programs.

8 9 **Response:**

- 10 Please refer to the response to ICG IR 1.8.3.
- 11
- 12
- -
- 13
- 1418.2How many commercial customers does FBC have participating in its Prescribed15programs?Please provide over the last 5 years and over the forecast test16period.
- 17

18 **Response:**

FBC began tracking unique participants in the Prescriptive Program beginning in 2016. The
table below presents the number of unique past participants in the Prescriptive Program from
2016 to 2017, a projection of 2018 unique participants, and forecast of unique participants for



- 1 each of the years in the DSM Plan period. The downward trend reflects fewer lighting
- 2 participants, despite the anticipated increase in non-lighting measure participants.

Year	Number of Unique Participants in Prescriptive Program
2016	494
2017	844
2018 Projected	788
2019 Forecast	700
2020 Forecast	650
2021 Forecast	600
2022 Forecast	550

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- 18.3 Does the presence of trade allies and point-of-sale rebates result in a significant difference in participation rates?

9 Response:

10 Yes, the presence of contractors in the Trade Ally Network and point-of-sale Commercial 11 Partners results in a significant increase in program participation. Members of the Trade Ally 12 Network and Commercial Partners serve as a main pillar of FBC's marketing strategy and, in the case of Commercial Partners, a fundamental partner in delivering FBC's Prescriptive 13 14 Program incentives. In 2018, point-of-sale incentives through Commercial Partners are forecast 15 to be the source of at least 80 percent of individual Prescriptive Program applications. Members 16 of the Trade Ally Network are also responsible for the majority of energy efficiency product 17 installations from the Prescriptive Program.

18 Without FBC engaging with the Trade Ally Network and Commercial Partners, FBC expects19 participation numbers would be significantly lower.

- 20
- 21
- 22
- 23 24

18.3.1 If yes, please provide and discuss whether or not FBC pursues additional trade allies as a means to increase participation.



1 Response:

2 FBC has an active contactor marketing program and program staff routinely reach out to new

3 contractors to enlist them in the Trade Ally Network. FBC supports this effort by hosting

4 workshops and attending trade shows.

5 FBC's program team also actively engages with key local suppliers of energy efficiency 6 products (e.g., lighting, heat pump or irrigation distributors) to enlist them as Commercial 7 Partners, allowing them to supply eligible customers with FBC point-of-sale incentives through 8 the Prescriptive Program.



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1 **19.** Reference: Exhibit B-1, Appendix A page 9

4.2 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 Technical Advisors provide customer outreach and engagement for the Custom Program.

The commercial retrofit offer in the Custom Program provides incentives for customers to engage a qualified energy consultant to study potential building-scale electrical and natural gas energy efficiency and retrocommissioning opportunities. DSM incentives are also available to encourage the implementation of cost-effective electric energy efficiency measures.

The commercial new construction offer in the Custom Program encourages the design of high performance commercial buildings. Capital incentives are available for customers that design new buildings that exceed BC Building Code.

2 3

4

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19.1 How many commercial customers does FBC have participating in its custom commercial programs? Please provide over the last five years and over the forecast test period.

7 Response:

8 The table below shows the actual number of participants in the custom commercial programs for

9 2014 to 2017, projected number of participants for 2018, and forecast number of participants for

10 each year of the DSM Plan period. Custom projects typically take up to three years to

11 complete, therefore the table reflects when customers received their final incentive.

Plan Year	Custom Program Participants
2014	24
2015	22
2016	21
2017	22
2018 Projected	14
2019 Forecast	12
2020 Forecast	12
2021 Forecast	12
2022 Forecast	12

- 13 The lower participant numbers, beginning in 2018, reflect the majority of custom lighting projects
- 14 that were moved from the Custom Program and into the Prescriptive Program. However FBC



1 2	makes an exception for LED grow lights, where the custom approach is still required due to the lack of experience in this segment and magnitude of the anticipated incentives.
3 4	
5 6 7 8 9 10	 19.2 Are the custom 'commercial retrofit' and 'commercial new construction' offers the only two elements of the Custom program, or are there others? Please explain and identify any other programs included in the Custom Program. Response:
11	The elements of the Custom Program are as follows:
12 13	 Commercial Custom Retrofit Energy Studies: Incentives to cover a portion of the cost of an energy study to identify retrofit energy conservation measures;
14 15	 Commercial Custom Retrofit Capital Incentives: Incentives to cover a portion of measure cost of a commercial retrofit energy conservation measure;
16 17	 Commercial Retrocommissioning Studies: Incentives to cover a portion of the cost of an energy study to identify retrocommissioning opportunities;
18 19	Commercial Retrocommissioning Incentives: Incentives to encourage implementation of retrocommissioning opportunities; and
20 21	 Commercial New Construction Capital Incentives: Incentives to encourage implementation of high-performance new construction.
22 23	
24 25 26 27	19.3 Please provide a breakdown of the costs and energy savings for each offer/program included in the Custom Program.
28	Response:

The forecast non-labour costs and energy savings for each offer in the Custom Program over the DSM Plan period is provided in the table below. Please note that labour expenses are

31 developed at the commercial portfolio level, not at the program or offer level.



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Offer	Non-Labour Costs (\$millions)	Energy Savings (GWh/year)
Commercial Custom Retrofit Energy Studies	\$0.2	0.0
Commercial Custom Retrofit Capital Incentives	\$1.6	9.0
Commercial Retrocommissioning Studies	\$0.1	0.0
Commercial Retrocommissioning Incentives	\$0.1	1.2
Commercial New Construction Capital Incentives	\$1.8	12.4



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1 20. Reference: Exhibit B-1, Appendix A page 9

4.3 Selected Highlights

Below is a list of highlights for the Commercial Program Area:

- Updated measures in the Prescriptive Program. In the 2018 FBC DSM Plan, FBC introduced
 additional non-lighting energy efficiency measures in the suite of offerings of the Prescriptive
 Program. The Company will continue to review and revise its list bi-annually to ensure measures
 are meeting customer demand and technological trends in energy efficiency. Future measures
 may include LED grow lighting for agricultural products and commercial computer and server
 energy efficiency measures.
- BC Step Code adoption in Custom Program. FBC's support for high efficiency Commercial New Construction will be revised to support the adoption of the BC Energy Step Code based on input from industry stakeholders. The joint FBC and FEI program aims to provide incentives to encourage the efficient use of both electricity and natural gas in new construction. The program incentives will align with the BC Energy Step Code levels (and equivalent improvement percentages over building code for non-BC Energy Step Code buildings).
- Re-launch of retrocommissioning offers in Custom Program. 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.

2

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20.1 Please provide a brief discussion of the costs and savings results of FBC's
former Building Optimization Program.

6 **Response**:

- 7 The costs for the Building Optimization Program (BOP) supported the following activities:
- 8 Investigation studies;
- 9 Hand-off reports;
- Coaching studies; and
- Energy management information system implementation and maintenance.
- 12

The non-labour costs of the BOP program were shared equally by FBC and FEI. The total cost of the BOP program over the 2013-2015 program period was \$464,373, of which FBC's portion was \$232,186.

- 16 The total annual savings of the BOP program over the 2013-2015 program duration was 1.7
- 17 GWh/year in electricity savings and 5,626 GJ/year in gas savings.



1 21. **Reference:** Exhibit B-1, page 10 and 11

Industrial Program Area 5

Table 5-1 provides a summary of the estimated savings, program expenditures and cost-effectiveness results for each of the programs noted above.

Program		E) 2019	xpenditur) dollars (0	es 000s)		Energy Savings (GWh)			TRC 2019- 2022		
	2019	2020	2021	2022	Total	2019	2020	2021	2022	Total	Ratio
Industrial Custom	\$1,288	\$1,308	\$1,308	\$1,308	\$5,210	8.2	8.2	8.2	8.2	32.9	1.8
Industrial Prescriptive	\$290	\$290	\$311	\$308	\$1,199	1.8	1.8	1.9	1.9	7.3	1.4
Labour and expenses	\$185	\$185	\$185	\$185	\$742						
Total	\$1,762	\$1,783	\$1,804	\$1,801	\$7,151	10.0	10.0	10.1	10.1	40.2	1.7

Table 5-1: Industrial Expenditures and Savings, 2019-2022

For the 2019-2022 DSM plan, energy conservation measures for industrial customers are grouped into the following program, 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

The Industrial Program Area has changed from the 2018 DSM Plan (with its single Industrial Efficiency program) to providing two core programs, Prescriptive and Custom, per the Commercial Program Area.

5.3 Selected Highlights

Below is a list of highlights for the Industrial Program Area:

Cannabis industry growth. With the upcoming legalization of recreational cannabis, the ٠ Okanagan has seen an influx of new cannabis greenhouses and growing facilities. 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.

FBC estimates than an additional \$1 million in incentives may be required annually to support the energy efficient construction and retrofit of new cannabis facilities for the 2019-2022 DSM Plan period. This increase in incentives due to growth in the cannabis industry results in a large overall increase in the Industrial Program Area budget and savings over previous years.

3

4

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7

Is the additional \$1 million in incentives that may be required already included in 21.1 the \$7 million in program expenditures shown in Table 5-1, or would this likely be additional?



1 Response:

- Yes, the \$1 million in forecast annual incentives to support cannabis production facilities isincluded in the program expenditures.
- 4
- 5
- _
- 6 7 8
- 21.2 Please provide the expected energy savings that would likely accrue from the potential \$1 million in incentives from the cannabis industry.
- 9

10 Response:

11 Please refer to the response to BCUC IR 1.13.1.1.



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

rable 0-1, conservation Education and outreach Expenditures, 2013-202

Program	Expenditures 2019 dollars (000s)				
	2019 2020 2021 2022 Tot				
Residential Education Program	\$217	\$217	\$220	\$220	\$875
Residential Customer Engagement Tool	\$281	\$203	\$254	\$321	\$1,059
Commercial Education Program	\$21	\$21	\$28	\$28	\$99
School Education Program	\$46	\$47	\$69	\$58	\$219
Total	\$566	\$488	\$572	\$627	\$2,252

2

- 3 4
- Please explain why the Commercial Education program spending is less than 22.1 \$100,000 of the \$2,252,000 total expenditures.
- 5

6 Response:

7 The Commercial Education Program forecast is based on the proportion of commercial 8 customers to residential customers, which is approximately 10 percent. The primary purpose of 9 these two program areas is to foster a culture of conservation within the province by providing 10 communication and education about energy conservation initiatives as well as encouraging 11 behavioural changes within each customer base.

12 The Residential CET may also be made available to small commercial customers following 13 successful implementation to FBC's residential customer base. That expenditure, if realized is 14 captured under the CET expenditures.

15 16 17 18 22.2 Please provide the savings attributed to the education programs. 19 Response:

- 20
- 21 Please refer to the response to CEC IR 1.6.4.
- 22



1 23. Reference: Exhibit B-1, Appendix A page 15

7.4 Codes and Standards

FBC has increased its Codes and Standards budget for 2019 to 2022 to one percent of its proposed portfolio expenditures. FBC supports codes and standards policy development and research, through inkind and financial co-funding arrangements.

A portion of the codes and standards funding is allocated to advancing the BC Energy Step Code as FBC will support the education and awareness of this new voluntary building standard. The budget includes support for high performance builder training, quality installation manuals, as well as energy modelling and blower door testing by certified energy advisors.

FBC also works with and supports a number of international, national, and provincial entities such as:

- CEATI International Inc.;
- Consortium for Energy Efficiency;
- Canadian Standards Association;
- Design Lighting Consortium;
- Natural Resources Canada; and
- BC Ministry of Energy, Mines, and Petroleum Resources

to set new efficiency standards for buildings, HVAC equipment, appliances, and lighting products. Funding for codes and standards research is provided on a case-by-case basis.

- 23.1 What was the previous budget for Codes and Standards?
- 3 4

2

- 5 **Response:**
- 6 The 2018 DSM Plan included \$80 thousand in accepted expenditures for Codes and Standards.
- 7
- 8
- 9

11

10 23.2 How did FBC select 1% as the appropriate budget for Codes and Standards?

12 **Response:**

13 The adequacy requirement in respect of codes and standards set out in the DSM Regulation 14 specifies that no less than:

- (i) an average of 1% of the public utility's plan portfolio's expenditures per year
 over the portfolio's period of expenditures, or
- 17 (ii) an average of \$2 million per year over the portfolio's period of expenditures



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is to be allocated to support the development of standards or compliance with a specified
 standard or a measure respecting energy conservation or the efficient use of energy in the
 Province.

4 FBC has allocated one percent of the 2019-2022 DSM Plan to codes and standard development

5 over the plan period. FBC believes this amount is the most appropriate for the size of its 2019-

6 2022 DSM Plan and a sufficient level of funding to support the codes and standards initiatives

7 laid out in the plan that also achieves adequacy under the DSM Regulation.

Attachment 11.3

Program	Measure Variables	Benefit/Cost Ratios
Commercial prescriptive	LED T8 lamp, 4ft (up to 13W)	7.3
Commercial prescriptive	LED T5HO lamp, 4ft (up to 30W)	7.1
Commercial prescriptive	LED 2 or 4 pin downlights (up to 14W)	3.5
Commercial prescriptive	LED 2 or 4 pin downlights (15W to 20W)	1.2
Commercial prescriptive	LED PAR style lamp (up to 12W)	7.1
Commercial prescriptive	LED PAR style lamp (13W to 24W)	5.3
Commercial prescriptive	LED BR style lamp (up to 18W)	6.9
Commercial prescriptive	LED MR16 style lamp (up to 7W)	2.1
Commercial prescriptive	LED HID screw-In replacement (up to 100W)	6.7
Commercial prescriptive	LED HID screw-In replacement (100W to 250W)	12.7
Commercial prescriptive	LED interior troffer (up to 40W)	1.0
Commercial prescriptive	LED interior troffer (41W to 80W)	2.1
Commercial prescriptive	Low temperature refrigerated display case LED lighting	4.6
Commercial prescriptive	Medium temperature refrigerated display case LED lighting	3.8
Commercial prescriptive	LED linear ambient luminaire (up to 50W)	0.4
Commercial prescriptive	LED linear ambient luminaire (51W to 100W)	0.9
Commercial prescriptive	LED low-bay luminaire (50W to 100W)	0.7
Commercial prescriptive	LED low-bay luminaire (101W to 150W)	1.7
Commercial prescriptive	LED high-bay luminaire (251W to 300W)	4.2
Commercial prescriptive	LED wall pack luminaire (up to 30W)	1.1
Commercial prescriptive	LED wall pack luminaire (31W to 60W)	2.2
Commercial prescriptive	LED wall pack luminaire (61W to 120W)	1.8
Commercial prescriptive	LED area and roadway luminaires (up to 60W)	1.2
Commercial prescriptive	LED area and roadway luminaires (61W to 90W)	1.8
Commercial prescriptive	LED area and roadway luminaires (301W to 530W)	2.8
Commercial prescriptive	LED parking garage luminaires (softwise soott)	2.0
Commercial prescriptive	LED fuel canopy luminaire (up to 100W)	3 5
Commercial prescriptive	LED flood light up (251W to 350W)	3.6
Commercial prescriptive	Occupancy sensor (switch-plate or fixture-mounted)	5.0
Commercial prescriptive	Occupancy sensor (ceiling or wall-mounted)	10.2
	Photocell sensor	67
Commercial prescriptive	I ED hacklit signage	1 9
		1.5
Commercial prescriptive	ENERGY STAR Electrically-Heated Commercial Clothes Washer	18 5
	ENERGY STAR Gas-Heated Commercial Clothes Washer	3 7
	ENERGY STAR Glass Door Refrigerator Less than 4251 (Less than 15	5.7
Commercial prescriptive		27 0
		27.0
Commercial prescriptive	ENERGY STAR Glass Door Refrigerator 425 to 850 L (15 to 30 ft3)	13.8
		15.0
Commercial prescriptive	ENERGY STAR Glass Door Refrigerator 850 to 1/161 (30 to 50 ft3)	12.6
	ENERGY STAR Glass Door Refrigerator, Greater than 1/16 L (Greater	12.0
Commercial prescriptive	than 50 ft2)	12 7
	ENERGY STAR Solid Door Refrigerator Less than 1251 (Less than 15	12.7
Commercial proscriptivo	fr2)	0 0
		8.0
Commercial prescriptive	ENERGY STAR Solid Door Pofrigorator 425 to 850 L (15 to 20 ft2)	7 6
	LIVENUT STAN SUNU DUUL NEHIBERALUL, 425 LU 850 L (15 LU 30 L(3)	/.5
Commercial prescriptive	ENERGY STAR Solid Door Pofrigorator SEO to 1416 L (20 to 50 ft2)	76
	ראבועבויטד ארא שטווע שטטו הפוווצפומנטו, 200 נט 1410 ב (30 נט 50 ונא)	7.6

Ducation		Depetit (Cost Dation
Program	ENERGY STAR Solid Door Refrigerator, Greater than 1/16 L (Greater	Benefit/Cost Ratios
Commercial procerintive	then 50 ft2)	0.5
		9.5
Commercial proscriptive	ENERGY STAR Class Door Freezer Loss than 425 L (Loss than 15 ft2)	21 5
	ENERGY STAR Glass Door Freezer, Less than 425 L (Less than 15 htts)	21.5
	ENERGY STAR Glass Door Freezer, 425 to 650 L (15 to 50 lts)	22.0
	ENERGY STAR Glass Door Freezer, 850 to 1410 L (50 to 50 its)	25.0
Commercial procerintive	then 50 ft2)	<u>ээ</u> г
		23.5
	ENERCY STAR Commercial Ico Machine, Continuus Solf Contained	
Commercial proscriptive	Liver of STAR commerciance machine, continuous sen-contained, $loss than 70 kg/day (loss than 175 lb/day) los Harvost$	2.2
	Less than 79 kg/uay (Less than 175 b) uay) ice Harvest	2.5
	ENERCY STAR Commercial too Machine, Continuus Solf Contained	
Commercial proscriptive	Energy STAR commercial ice Machine, continuous sen-containeu,	20
	Greater than 79 kg/day Greater than 175 b/day) ite Harvest	2.8
	ENERCY STAR Commercial too Machine, Continuus too Making Uood	
	ENERGY STAR Commercial ICe Machine, Continuous ICe Making Head,	22.4
Commercial prescriptive	Less than 204 kg/day (Less than 450 lb/day) ice Harvest	23.4
	ENERCY STAR Commencial los Mashing, Cantingua los Making Llasd	
	ENERGY STAR Commercial ICe Machine, Continous ICe Making Head,	0.5
Commercial prescriptive	Greater than 204 kg/day Greater than 450 lb/day) Ice Harvest	8.5
	ENERGY STAR Commercial Ice Machine, Continous Remote	
	Condensing Unit, Less than 454 kg/day (Less than 1000 lb/day) Ice	
Commercial prescriptive	Harvest	14.5
	ENERGY STAR Commercial Ice Machine, Continous Remote	
	Condensing Unit, Greater than 454 kg/day (Greater than 1000	
Commercial prescriptive	Ib/day) Ice Harvest	15.1
Commercial prescriptive	Vending Machine Controller	5.5
	ENERGY STAR Electrically-Heated Dishwasher, Under Counter (High	
Commercial prescriptive	Temperature)	4.0
	ENERGY STAR Electrically-Heated Dishwasher (Single Tank Door,	
Commercial prescriptive	Low Temperature)	63.3
	ENERGY STAR Electrically-Heated Dishwasher (Single Tank Door,	
Commercial prescriptive	High Temperature)	39.0
Commercial prescriptive	ENERGY STAR Electric Convection Oven (Full)	5.4
	ENERGY STAR Electric Hot Food Holding Cabinet, 368 to 793 L (13 to	
Commercial prescriptive		7.0
Commercial prescriptive	ENERGY STAR Electric Steam Cooker - 4 pan	7.5
Commercial prescriptive	Floating Head Pressure Control - Low Temperature Condensing Unit	3.4
Commercial prescriptive	Auto-Closers for Walk-in Cooler Doors	2.0
Commercial prescriptive	Auto-Closers for Walk-in Freezer Doors	10.5
Commercial prescriptive	Anti-Sweat Heater Humidistat Control	2.0
Commercial prescriptive	Retrigerated Display Case Night Cover	0.2
	Retrigerated Display Case Occupancy Sensors (Medium	_
Commercial prescriptive	Temperature)	0.1
Commercial prescriptive	Cold Climate Heat Pump	15.9
Commercial prescriptive	Packaged Terminal Heat Pump	10.3
Commercial prescriptive	Hotel Guest Room Occupancy Sensor	0.5

Program	Measure Variables	Benefit/Cost Ratios
	DCV for kitchen exhaust - 5,001-10,000 CFM (natural gas space	
Commercial prescriptive	heating)	8.4
Commercial prescriptive	Cycling Refrigerated Dryer	0.1
Commercial prescriptive	Variable Speed Drive (Less than 20hp)	1.1
Commercial prescriptive	Variable Speed Drive (Greater than or Equal to 20hp)	0.9
Commercial prescriptive	Heat Pump Water Heater	1.6
Industrial prescriptive	LED T8 lamp, 4ft (up to 13W)	7.3
Industrial prescriptive	LED low-bay luminaire (101W to 150W)	1.7
Industrial prescriptive	LED high-bay luminaire (251W to 300W)	4.2
Industrial prescriptive	LED backlit signage	1.9
Industrial prescriptive	Cycling Refrigerated Dryer	0.1
Industrial prescriptive	Low Pressure Drop Filter	0.1
Industrial prescriptive	High Efficiency Compressor-1 shift	1.7
Industrial prescriptive	High Efficiency Compressor-2 shift	2.1
Industrial prescriptive	High Efficiency Compressor-3 shift	2.8
Industrial prescriptive	Sprinkler to Drip Irrigation System	2.1
Industrial prescriptive	Variable Speed Drives on Well Pump (Less than or Equal to 300 hp)	0.2
Industrial prescriptive	Variable Speed Drive (Less than 20hp)	1.1
Industrial prescriptive	Variable Speed Drive (Greater than or Equal to 20hp)	0.9
Commercial lighting	Other custom lighting	1.4
Commercial new	Whole building	1.3
Commercial new	Lighting	1.3
Commercial retrofit	Refrigeration	1.1
Commercial retrofit	Whole building	1.2
Commercial retrofit	Continuous optimization	2.9
Industrial retrofit	Lighting	1.8
Industrial retrofit	Compressors	3.0
Industrial retrofit	Pumps and fans	2.3
Industrial retrofit	Motors	2.4
Home renovation	Attic Insulation	2.1
Home renovation	Basement Insulation	1.5
Home renovation	Wall Insulation	1.2
Home renovation	Other Insulation	1.2
Home renovation	Ductless HeatPump	1.1
Home renovation	Central Variable Capacity_Heat Pump	2.3
Home renovation	Heat Pump Tune Up	1.3
Home renovation	Loans - Ductless	1.2
Home renovation	Loans - Central systems	4.8
Home renovation	Windows	1.7
Home renovation	НРШН	1.7
Home renovation	Refrigerators, 10% better than Federal standard	0.8
Home renovation	Refrigerators, 15% better than Federal standard	0.5
Home renovation	Clothes Washer, up to 2.5 cu. ft., CEE Tier 2 - NG hot water	4.9
Home renovation	Clothes Washer, over 2.5 cu. ft., CEE Tier 2 - Electric hot water	7.6
Home renovation	Clothes Washer, up to 2.5 cu. ft., CEE Tier 2 - Electric hot water	2.7

Program		Benefit/Cost Ratios
	Clothes Electric Dryers, CEE Tier 1 / ENERGY STAR (CEF of 3.93 up to	2.4
Home renovation	4.3)	3.1
Home renovation	Clothes Electric Dryers, CEE Tier 2, CEF 4.3	2.4
	Clather Floatnic Dayser, CFF Advanced Tion, CFF F 2 on higher	1 5
Home renovation	Clothes Electric Dryers, CEE Advanced Tier, CEF 5.2 or higher	1.5
Home reportion	ciolities electric Dryers, ENERGY STAR Compact (less than 4.4 cu-it	2.4
Home repovation	Pathroom Fan	2.4
Home renovation	Communicating Thermostats	0.7
Home renovation		4.0
New home	Sten 2 - SED	1.7
New home	Step 2 - St D	0.8
New home	Step 3 - SED	1.2
New home	Step 3 - MED	1.2
New home	Step 4 - SED	1.0
New home	Step 4 - St D	1.4
New home	Step 5 - SED	0.8
New home	Step 5 - MED	0.0
New home	нрумн	23
New home	Refrigerators 10% better than Federal standard	0.8
New home	Refrigerators, 15% better than Federal standard	0.5
New home	Clothes Washer over 2.5 cu. ft. CEE Tier 2 - NG hot water	31.5
New home	Clothes Washer, up to 2.5 cu, ft, CEE Tier 2 - NG hot water	49
New home	Clothes Washer, over 2.5 cu. ft., CEE Tier 2 - Electric hot water	7.6
New home	Clothes Washer, up to 2.5 cu. ft., CEE Tier 2 - Electric hot water	2.7
	Clothes Electric Dryers, CEE Tier 1 / ENERGY STAR (CEF of 3.93 up to	
New home	4.3)	3.1
New home	Clothes Electric Dryers, CEE Tier 2, CEF 4.3	2.4
New home	Clothes Electric Dryers, CEE Advanced Tier, CEF 5.2 or higher	1.5
	Clothes Electric Dryers, ENERGY STAR Compact (less than 4.4 cu-ft	
New home	capacity)	2.4
New home	Communicating Thermostats	4.6
New home	DWHR	1.7
Lighting	Bulbs	3.3
Lighting	Controls	1.0
Lighting	Fixtures	0.9
Rental apartment	Bathroom Aerators within SST only	28.4
Rental apartment	Kitchen Aerators within SST only	28.4
Rental apartment	Showerheads (fixed) within SST only	19.2
Rental apartment	Showerheads (handheld) within SST only	19.2
Rental apartment	Bathroom Aerators within SST only	28.4
Rental apartment	Kitchen Aerators within SST only	28.4
Rental apartment	Showerheads (fixed) SST only	19.2
Rental apartment	Showerheads (handheld) SST only	19.2
Rental apartment	CFL PAR 38, 23W	10.0
Rental apartment	LED A19, 16W	4.9

Program	Measure Variables	Benefit/Cost Ratios
Rental apartment	LED A19, 9.5W	2.9
Rental apartment	CFL PAR 38, 23W	4.0
Rental apartment	LED A19, 16W	1.1
Rental apartment	LED A19, 9.5W	1.2
Low Income - Self install	EA19O95D2 9.5 watt LED A19 2700K dimmable	5.1
Low Income - Self install	N9277 LED Nightlight	10.1
Low Income - Self install	N2915CH 1.5gpm Earth Massage Chrome Showerhead	10.2
Low Income - Self install	N3115P 1.5gpm Kitchen Swivel Aerator	12.6
Low Income - Self install	N3104 1.5gpm Dual Basin Aerator	26.2
Low Income - Self install	N9189 Refrigerator/Freezer Temperature cards	0.8
Low Income - Self install	N4014V Outlet/Switch Foam Gaskets (8/4)	2.9
Low Income - Self install	N8011N Weather Stripping (10m per kit)	0.6
Low Income - Self install	N3030 Storm Window kits	0.6
Low Income - Self install	N8001 Foam Tape for Door Insulation	1.9
Low Income - Direct install	LED nightlight lamps	6.4
Low Income - Direct install	LED lamps	8.3
Low Income - Direct install	fixed head faucet aerators	73.0
Low Income - Direct install	swivel head faucet aerators	30.8
Low Income - Direct install	standard showerheads	30.9
Low Income - Direct install	handheld showerheads	10.0
Low Income - Direct install	fridge thermometers	3.4
Low Income - Direct install	door draftproofings	3.4
Low Income - Direct install	door sweeps	2.8
Low Income - Direct install	door thresholds	3.8
Low Income - Direct install	9W LED globe lamps	4.6
Low Income - Direct install	LED nightlight lamps	6.4
Low Income - Direct install	LED lamps	8.3
Low Income - Direct install	fixed head faucet aerators	73.0
Low Income - Direct install	swivel head faucet aerators	30.8
Low Income - Direct install	standard showerheads	30.9
Low Income - Direct install	handheld showerheads	10.0
Low Income - Direct install	fridge thermometers	3.4
Low Income - Direct install	WH pipe wraps	9.6
Low Income - Direct install	window films	1.6
Low Income - Direct install	door draftproofings	3.4
Low Income - Direct install	door sweeps	2.8
Low Income - Direct install	door thresholds	3.8
Low Income - Direct install	fridge 15 replacements	0.7
Low Income - Direct install	fridge 18 replacements	0.6
Low Income - Direct install	fridge 21 replacements	0.5
Low Income - Direct install	Advanced ECAP - Insulation	1.4
Low Income - Direct install	Advanced ECAP - Heat pumps	0.8
Social housing	Incentives	1.5