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October 30, 2018

Industrial Customers Group
c/o #301 – 2298 McBain Avenue
Vancouver, BC V6L 3B1

Attention: Mr. Robert Hobbs

Dear Mr. Hobbs:

Re: FortisBC Inc. (FBC)

Project No. 1598973

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

Response to the Industrial Customers Group (ICG) 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 review of the Application, FBC respectfully submits the attached response to ICG 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

1.0 Reference: 2017 COSA and Rate Design Proceeding, Project No. 1598939, Exhibit B-15, ICG IR 2.1

"FBC provides examples of its commitment to the Climate Leadership Plan (CLP). Does FBC consider its proposal to offer "customized" (reduced incentives) DSM programs to its self-generating customers to be in alignment with the CLP's stated objectives of increasing efficiency through expansion of DSM programs?

Response: FBC notes that this question falls into the category of, "…interrogatories or requests for information of this nature that are not directly related to either the COSA or FBC's Rate Design Application", that the Commission indicated should be avoided in the Decision attached to Order G-62-18 in this process.

In addition, pursuant to Commission Order G-72-18, the customer program is being discussed in a separate Commission process at this time."

1.1 Please file the relevant record and respond to the above noted information request filed in the 2017 Cost of Service Analysis and Rate Design proceeding.

Response:

Section 3.2.3 of FBC's 2017 Cost of Service Analysis and Rate Design Application discusses FBC activities that support the B.C. government's 2016 Climate Leadership Plan (CLP) objective related to efficient electrification, including its proposed Community Solar project, investments in electric vehicle (EV) charging stations and its EV Charging Application.

FBC supports government policy related to reducing greenhouse gas emissions through these electrification initiatives. The customized approach to offering DSM incentives to self-generation customers ensures that the energy savings resulting from the incentives contribute to reducing the demand for FBC's energy supply.

The CLP's objective of increasing efficiency through expansion of FortisBC incentives[1] is not an objective for FBC, it is specific to gas equipment and FEI. If an FBC self-generating customer is also an FEI customer, it has the potential to participate in FEI's energy efficiency programs that include incentives to implement higher efficiency gas equipment.

It is unclear to FBC what constitutes the "relevant record" with respect to this information request. The requested information is provided in this response, and the subject matter only pertains to the current regulatory process.

[1] British Columbia Climate Leadership Plan, August 2017, page 32

2.0 Reference: Exhibit B-1, page 13

"EECAG is FEI's long-standing advisory group. As part of ongoing C&EM integration efforts, the November 2017 EECAG meeting was "joint" with both gas and electric stakeholders present to discuss FEI and FBC's 2019-22 DSM Plans."

2.1 Please identify the participants at the November 2017 EECAG meeting.

Response:

Table 1 below lists EECAG Members who received an invitation to the November 27 EECAG Meeting as well as those who attended.

Table 1: November 27, 2017 EECAG – List of Invitations Sent and Meeting Attendees

ORGANIZATION	Invited	2017 Attendance Nov 28/17
Aboriginal Housing Management Association	Yes	
Alliance Marketing	Yes	
AO Smith and CIPH	Yes	
Avia Employment (Residential Representative)	Yes	
BC Housing	Yes	Yes
BC Hydro	Yes	Yes
BC Mechnical Contractors Assoc	Yes	
BC Ministry of Energy and Mines	Yes	Yes
BC Non Profit Housing Assoc.	Yes	Yes
BC Public Interest Advocacy Centre	Yes	
BC Sustainable Energy Association	Yes	Yes
BC Utilities Commission	Yes	Yes
BCIT	Yes	Yes
Canfor Pulp Ltd.	Yes	
Catalyst Paper	Yes	
Commercial Energy Consumers Association of BC (CEC)	Yes	Yes
Consumers Council of Canada	Yes	Yes
FNEMC	Yes	
Fraser Basin Council	Yes	Yes
Greater Vancouver Home Builders' Association	Yes	Yes
Heating, Refrigeration and Air Conditioning Institute of Canada	Yes	
IBC Technologies Inc.	Yes	
JSA Sales Inc.	Yes	Yes
LandlordBC	Yes	
Love Energy Consultants Inc.	Yes	Yes
Ministry of Natural Gas Development and Minister Responsible for Housing	Yes	Yes
National Energy Equipment	Yes	
Office of Energy Efficiency Natural Resources Canada	Yes	Yes
Pembina Institute	Yes	Yes
Teck Resources	Yes	
Tenants.BC.CA	Yes	
Tseshaht First Nation	Yes	
UBCM - Union of BC Municipalities	Yes	
University of British Columbia Okanagan	Yes	Yes
Urban Development Institute	Yes	

3.0 Reference: Exhibit B-1, page 14

"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."

3.1 Please comment on whether FortisBC intends to apply the "sliding scale" mechanism identified in Section 5.2 of the 2016 LTERP and LT DSM Plan Application during the period of this Application from 2019 to 2022?

Response:

Confirmed, FBC intends to apply the "sliding scale mechanism" (as it is referred to in this IR) for self-generating industrial customers accessing DSM incentives under the Industrial Custom Program. Please also refer to the response to BCUC IR 1.2.3.

3.2 If so, please identify Commission approvals relevant to the "sliding scale" mechanism?

Response:

FBC does not consider that any specific or express BCUC approval is necessary for it to adopt what is referred to in this IR as the "sliding scale mechanism" with respect to DSM incentives for self-generation customers in its service area. Quantification of the appropriate DSM incentives under particular DSM programs or measures is a business practice involving managerial decision making on the part of the utility. The UCA does not require pre-approval of the BCUC for such business practices to be implemented. If a self-generation customer (or any customer) wishes to challenge FBC's decision-making with respect to the quantification of DSM incentives, then the appropriate recourse for the matter to be reviewed by the BCUC is a complaint pursuant to section 72 of the UCA.

In any event, FBC notes that it described the approach it intended to adopt in respect of DSM incentives for self-generation customers at Section 5.2 of the Long Term DSM Plan (LT DSM Plan), filed as part of FBC's 2016 Long Term Electric Resource Plan (2016 LTERP). FBC also answered numerous IRs in the 2016 LTERP proceeding regarding the "sliding scale mechanism". The BCUC accepted the LT DSM Plan, in full, as being in the public interest pursuant to Order G-117-18. If the BCUC had objections to or concerns with FBC's intended approach to this issue, then it would not have accepted the LT DSM Plan, without limitation, as being in the public interest.

Furthermore, in dismissing a complaint by Zellstoff Celgar Limited Partnership (Celgar) in Order L-14-18, the BCUC accepted the underlying premise of FBC's approach to DSM incentives for self-generation customers: that in order for conservation projects or initiatives to qualify for DSM incentives, the end-use efficiency has to contribute to reducing the demand for the utility's energy services.

FBC considers that these BCUC orders are supportive of its implementation of what is referred to here as the "sliding scale mechanism".

3.3 If the "sliding scale" mechanism was not approved by the Commission, does FortisBC believe it does not require Commission approval to apply the sliding scale mechanism?

Response:

Please refer to the response to ICG IR 1.3.2.

3.4 Please explain the methodology for forecasting DSM Plan expenditures for self-generation customers?

Response:

FBC does not explicitly forecast DSM Plan expenditures for self-generation customers. Insofar as such customers qualify for FBC's DSM programs, they will be able to access pro-rated (so-called sliding scale) incentives under the applicable program budget, likely the Custom Program.

3.5 Please discuss how FortisBC intends to calculate the amount of DSM incentive to a cannabis grower that installs self-generation.

Response:

FBC will evaluate any DSM measures and/or projects undertaken by cannabis self-generators on a case-by-case basis and the appropriate processes, for example Measurement &

Verification, will be undertaken to confirm the realized energy savings. The DSM incentive will be pro-rated according to the energy savings attributed to (i.e. utility sales reduction realized by) FBC.

3.6 If a cannabis grower installs self-generation immediately after receiving a DSM incentive, would there be a claw-back mechanism to recoup any portion of the DSM incentive?

Response:

The Terms & Conditions of FBC's Custom Business Efficiency Program (CBEP) include provisions to "claw-back" the pro-rated unamortized balance of DSM incentives if a customer significantly reduces or replaces its demand for electricity. Customers are required to sign-off on the CBEP Terms & Conditions as part of the program application process.

3.7 Has the recent rescindment of FBC's Rate Schedule 90 changed in any way FBC's view of the eligibility of self-generators to undiscounted access to DSM programs or incentives?

Response:

No.

As stated in Section 5.3 of the LT DSM Plan, the Terms and Conditions (T&Cs) contained in RS 90 are already set out in the individual program-specific terms and conditions. Rescindment of RS 90 does not change the overall objective of FBC's DSM Programs as stated in BCUC Letter L-14-18, that "the end use efficiency [of a DSM project] has to contribute to reducing the demand for the utility's energy services". Further, FBC expressly sought a BCUC order rescinding RS 90 in the 2016 LTERP process on the basis that, among other things, the Terms & Conditions presented in RS 90 were redundant in light of the Terms & Conditions applicable to specific DSM programs. FBC would not have sought such an order if rescinding RS 90 had the effect of changing the substantive basis of its DSM programs.

4.0 Reference: Exhibit B-1, page 16

"Navigant uses DSMSim™ a proprietary bottom-up technology diffusion and stock tracking model implemented using a System Dynamics framework."

4.1 Please provide additional details of the DSMSim modelling tool, including a list of both input parameters and resultant outputs.

Response:

DSMSim™ is a bottom-up technology diffusion and stock tracking model implemented using a System Dynamics[2] framework. The model explicitly accounts for different types of efficient measures such as retrofit (RET), replace-on-burnout (ROB), and new construction (NEW) and the impacts these measures have on savings potential. The inputs for each measure are listed below. The model then reports the technical, economic, and market potential savings in aggregate by service territory, sector, customer segment, end-use category, and highest-impact measures.

Measure Level Inputs
Unique Measure Name
Common Measure Name
Measure Description
Baseline Assumption
End Use Category
Customer Segment
Sector
Scaling Basis
Unit Basis
Competition Group
Base Measure Lifetime
Efficient Measure Lifetime
Base Measure Cost
Efficient Measure Cost
Incremental Cost
Incremental Cost Proration Factor
Base Electric Energy Consumption
Efficient Electric Energy Consumption
Incremental Electric Energy Savings

[2] See Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill. 2000 for detail on System Dynamics modelling. Also see http://en.wikipedia.org/wiki/System_dynamics for a high-level overview.

Measure Level Inputs
Base Electric Coincident Peak Demand
Efficient Electric Coincident Peak Demand
Incremental Electric Demand Savings
Base Gas Consumption
Efficient Gas Consumption
Incremental Gas Energy Savings
O&M Savings

There are many input parameters to the DSMSim model discussed in the BC Conservation Potential Review. Table 1-1 from the BC Conservation Potential Review: Market Potential (page 5) report provides an overview of the parameters used to develop the market potential. The Calculation of the Approach to Equilibrium Market Share section provides a description of the inputs used for the calculation of equilibrium market share (page 7).

Results Outputs
Savings Potential
Benefit-Cost Ratios
Levelized Costs
Natural Change
Cost Tests
Incremental Market Potential by Sector (GWh/year)
Total Electric Energy Potential by Potential Type (GWh/year)
Electric Energy Market Potential by End Use (GWh/year)
Electric Energy Market Potential by Customer Segment (GWh/year)
Top Measures Ranked by Electric Energy Market Potential in 2025 (GWh/year)
Electric Energy Market Potential LCOE Supply Curve 2025
Electric Energy Market Potential TRC Supply Curve in 2025

5.0 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."

5.1 Please provide the values market potential electric savings in the kraft pulp and paper customer segment in tabular form.

Response:

Please refer to Attachment 5.1 for the electric market potential savings (kWh/yr) identified in the kraft pulp and paper customer segment.

5.2 Please identify the specific measures, initiatives and programs and the energy savings attributable to each that make up the market potential electric savings in the kraft pulp and paper customer segment for each of the next five years.

Response:

Please refer to Attachment 5.1 provided in the response to ICG IR 1.5.1 for the specific measures and energy savings attributable to the kraft pulp and paper customer segment that make up the market potential electric savings.

In order for conservation projects or initiatives to qualify for DSM incentives, the end-use efficiency has to contribute to reducing the demand for the utility's energy services. Please refer to the response to ICG IR 1.3.4 for a discussion on DSM Plan expenditures for self-generation customers.

5.3 Please explain how FBC expects the kraft pulp and paper customer segment market potential electric savings to be realized if a "sliding scale" mechanism is applied to the DSM incentives.

Response:

FBC notes the scope of the BC CPR potential study included self-generated loads to ensure the provincial report, provided as a deliverable by the participating BC utilities, was comprehensive. However, including these loads in FBC's market potential study does not obligate FBC to incent any or all energy savings that do not result in reduced utility sales to self-generating customers.

Furthermore, FBC considers that its commercial and industrial customers make decisions based on the attributes of the project under consideration including the DSM incentives and/or other external funding as available, their utility bill savings and other – often significant – non energy benefits such as productivity improvements.

6.0 Reference: Exhibit B-1, page 23

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

i. the measure's energy savings, valued at the LRMC; and

ii. the measure's demand savings, valued at the DCE.

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

6.1 Please explain whether the concept of a "sliding scale" mechanism applied to DSM incentives for self-generators is suggested anywhere in the provincial DSM Regulation or has received any form of Commission approval for projects or initiatives that pass the TRC test?

Response:

FBC considers that the scheme of the Demand-Side Measures Regulation, B.C. Reg. 326/2008 (DSM Regulation) is consistent with the approach to DSM incentives for self-generation customers the Company described in the LT DSM Plan (referred to by ICG in its IRs as the "sliding scale mechanism"). In particular, the governing TRC test, as set out in section 4 of the DSM Regulation, uses the present value of the "avoided electricity cost" from a measure – i.e. the utility's energy savings from a measure valued using LRMC, plus avoided costs using the DCE – to determine cost effectiveness. Paying DSM incentives to self-generation customers in proportion to FBC's avoided costs that result from a measure is therefore supported by the governing legislation because FBC does not avoid any electricity costs to the extent a conservation measure implemented by a self-generation customer does not reduce load served by FBC. Further, the cost effectiveness test in section 4 of the DSM Regulation only applies to the BCUC's review of a public utility's long term resource plan (see UCA, s. 44.1(8)(c)) or a DSM expenditure schedule filed by a public utility (see UCA, s. 44.2(5)(d)). This reflects that the avoided electricity costs in the TRC calculation under the DSM Regulation are the utility's avoided costs from a measure not a customer's avoided electricity costs.

Please refer to the response to ICG IR 1.3.2 regarding BCUC orders that are applicable to FBC's approach to this issue.

6.2 Please explain whether the TRC test considers only the utility costs and energy savings associated with a specific measure, initiative and program, or portfolio?

Response:

The TRC (Total Resource Cost) test considers the customers' portion of measure costs in addition to utility costs (measure incentives plus program administration), energy and demand savings associated with a specific measure, initiative, program, or portfolio.

6.3 Please reconcile the 8 percent gross-up for losses against the loss values of 2.86 percent for transmission connected service and 4.26 percent for distribution connected service as referenced on page 105 of Exhibit B-1 in FBC's 2017 COSA and Rate Design Proceeding (Project No. 1598939).

Response:

The total system loss value used in FBC's 2017 Cost of Service Analysis (COSA) and Rate Design Application (RDA) was 8.3 percent, based on the differential between the 2016 actual kWh sold to customers and the 2016 actual kWh generated and/or purchased for the system as a whole. This figure is reasonably close to the 8 percent value used in the DSM measure calculation.

For the purpose of the 2017 COSA, the values for transmission and distribution losses were derived from engineering estimates independent from the overall system loss calculation and the remaining losses were assumed to be at the secondary level.

7.0 Reference: Exhibit B-1, page 29

"For the above reasons, FBC is requesting approval to move to a 15-year amortization period for its DSM expenditures."

7.1 Please provide any analysis or studies relevant to the average weighted measure life of all measures in the DSM Plan?

Response:

Please refer to the responses to BCUC IRs 1.8.2 and 1.8.3 for a discussion on the amortization period and supporting analysis. Please refer to the response to BCUC IR 1.8.6 for a comparison to the amortization periods of other utilities in North America. FBC conducted an internal analysis to estimate the 15-year amortization period for its DSM expenditures.

Measure life reference values from similar utility programs are sourced through online research. These are typically found in Technical Resource Manuals (TRMs), Measure Life studies, Conservation Potential Reviews, and Industry standards are sourced for equipment life such as ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers). In some cases, data collected through program delivery, such as contractor feedback, help in confirming or adjusting measure life assumptions. A measure life value for a program can be determined as a weighted average of the measure life of the individual measures based on participation for each measure as weighting.

7.2 Please explain how FBC uses the persistence of energy savings in program design? If so, please comment on whether FBC proposes to change the persistence of energy savings to match the average weighted measure life of the DSM Plan?

Response:

Please refer to the response to BCUC IR 1.8.5.

8.0 Reference: Exhibit B-1, Appendix A, 2019 to 2022 DSM Plan, page 10

"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."

Alternatively, for select qualifying measures such as lighting and irrigation equipment, industrial customers can receive their incentive as a point-of-sale from participating trade allies."

8.1 If FBC proposes to apply the "sliding scale" mechanism to the Prescriptive Program, please explain how the "sliding scale" mechanism would be applied to point-of-sale rebates from participating trade allies?

Response:

The terms and conditions of the Prescriptive Program require that self-generators seek pre-approval from FBC prior to submitting an application. If FBC's review of the customer account suggests that some of the project savings may not be realized by FBC, then the self-generating customer may not be eligible for the Prescriptive Program, but may be able to receive incentives through the Custom Program.

8.2 If FortisBC intends to apply the "sliding scale" mechanism to just one of these two programs, please explain the rationale for such different treatment?

Response:

Please refer to the response to ICG IR 1.8.1.

8.3 Please provide a full description of the two core programs, including nominal incentives for energy savings and feasibility studies and persistence?

Response:

Descriptions of the Industrial Prescriptive Program and Custom Program are contained in the 2019-2022 DSM Plan (Appendix A to the Application, pages 8-9). The current list of measures, incentives, and measure lives for the Industrial Prescriptive Program and Custom Program are provided in the following tables.

Table 1: Prescriptive Program Measure Life

Measure Category	Measure	Incentive	Unit of Incentive	Annual kWh Savings	Measure Life
LED Lamps	LED T8 lamp, 4ft (up to 13W)	$5.00	per lamp	49.09	13
LED Lamps	LED T8 lamp, 4ft (14W to 22W)	$5.00	per lamp	37.9	13
LED Lamps	LED T5HO lamp, 4ft (up to 30W)	$8.00	per lamp	72.81	13
LED Lamps	LED 2 or 4 pin downlights (up to 14W)	$7.00	per lamp	26.11	13
LED Lamps	LED 2 or 4 pin downlights (15W to 20W)	$10.00	per lamp	18.65	13
LED Lamps	LED PAR style lamp (up to 12W)	$8.00	per lamp	106.68	7
LED Lamps	LED PAR style lamp (13W to 24W)	$10.00	per lamp	134.65	7
LED Lamps	LED BR style lamp (up to 18W)	$7.00	per lamp	127.19	7
LED Lamps	LED MR16 style lamp (up to 7W)	$8.00	per lamp	43.27	7
LED Lamps	LED HID screw-In replacement (up to 100W)	$20.00	per lamp	324.51	13
LED Lamps	LED HID screw-In replacement (100W to 250W)	$30.00	per lamp	876.55	13
LED Interior Luminaires	LED interior troffer (up to 40W)	$35.00	per fixture	79.52	13
LED Interior Luminaires	LED interior troffer (41W to 80W)	$40.00	per fixture	196.35	13
LED Interior Luminaires	LED ENERGY STAR fixture (up to 40W)	$10.00	per fixture	199.24	13
LED Interior Luminaires	LED linear ambient luminaire (up to 50W)	$40.00	per fixture	79.52	13
LED Interior Luminaires	LED linear ambient luminaire (51W to 100W)	$50.00	per fixture	177.7	13
LED Interior Luminaires	LED low-bay luminaire (50W to 100W)	$60.00	per fixture	140.4	13
LED Interior Luminaires	LED low-bay luminaire (101W to 150W)	$70.00	per fixture	335.7	13
LED Interior Luminaires	LED high-bay luminaire (up to 200W)	$90.00	per fixture	540.85	13
LED Interior Luminaires	LED high-bay luminaire (201W to 250W)	$120.00	per fixture	820.6	13
LED Interior Luminaires	LED high-bay luminaire (251W to 300W)	$150.00	per fixture	1,049.06	13
LED Exterior and Parking Garage Luminaires	LED wall pack luminaire (up to 30W)	$30.00	per fixture	164.62	12

Measure Category	Measure	Incentive	Unit of Incentive	Annual kWh Savings	Measure Life
LED Exterior and Parking Garage Luminaires	LED wall pack luminaire (31W to 60W)	$60.00	per fixture	260.98	12
LED Exterior and Parking Garage Luminaires	LED wall pack luminaire (61W to 120W)	$70.00	per fixture	397.49	12
LED Street Lights and Exterior Pole / Arm Mounted Luminaires	LED area and roadway luminaires (up to 60W)	$60.00	per fixture	273.02	12
LED Street Lights and Exterior Pole / Arm Mounted Luminaires	LED area and roadway luminaires (61W to 90W)	$70.00	per fixture	401.5	12
LED Street Lights and Exterior Pole / Arm Mounted Luminaires	LED area and roadway luminaires (91W to 120W)	$90.00	per fixture	465.74	12
LED Street Lights and Exterior Pole / Arm Mounted Luminaires	LED area and roadway luminaires (121W to 200W)	$120.00	per fixture	1,035.87	12
LED Street Lights and Exterior Pole / Arm Mounted Luminaires	LED area and roadway luminaires (201W to 300W)	$150.00	per fixture	993.71	12
LED Street Lights and Exterior Pole / Arm Mounted Luminaires	LED area and roadway luminaires (301W to 530W)	$150.00	per fixture	2,188.18	12
LED Exterior and Parking Garage Luminaires	LED parking garage luminaire (up to 70W)	$60.00	per fixture	569.4	6
LED Exterior and Parking Garage Luminaires	LED parking garage luminaire (71W to 120W)	$70.00	per fixture	1,007.40	6
LED Exterior and	LED fuel canopy luminaire (up to 100W)	$60.00	per fixture	487.82	12

Measure Category	Measure	Incentive	Unit of Incentive	Annual kWh Savings	Measure Life
Parking Garage Luminaires					
LED Exterior and Parking Garage Luminaires	LED fuel canopy luminaire (101W to 250W)	$90.00	per fixture	1,003.75	12
LED Exterior and Parking Garage Luminaires	LED flood light up (251W to 350W)	$150.00	per fixture	1,653.45	23
Lighting Controls	Occupancy sensor (switch-plate or fixture-mounted)	$25.00	per control	272.5	19
Lighting Controls	Occupancy sensor (ceiling or wall-mounted)	$25.00	per control	545	19
Lighting Controls	Photocell sensor	$10.00	per control	157.68	23
LED Backlit Signage	LED backlit signage	$5.00	per foot	23.6	12
HVAC - Heat Pumps	Cold Climate Heat Pump	$500.00	per ton	5,313.35	15
HVAC - Heat Pumps	Variable Refrigerant Flow Heat Pump	$600.00	per ton	4,790.89	20
HVAC - Heat Pumps	Packaged Terminal Heat Pump	$80.00	per PTHP	1,719.81	15
Compressed Air - Dyers	Cycling Refrigerated Dryer	$5.00	per dryer CFM	13.69	15
Compressed Air - Zero-Loss Drains	Zero-Loss Condensate Drain	$200.00	per drain	1,200.00	13
Compressed Air - Low Pressure Drop Filter	Low Pressure Drop Filter	$2.00	per compressor hp	59.68	4
Compressed Air - VSD Compressors	High Efficiency Compressor-1 shift	$100.00	per compressor hp	371.34	15
Compressed Air - VSD Compressors	High Efficiency Compressor-2 shift	$125.00	per compressor hp	742.68	15
Compressed Air - VSD Compressors	High Efficiency Compressor-3 shift	$150.00	per compressor hp	1,114.03	15
Irrigation - Drip Irrigation	Sprinkler to Drip Irrigation System	$150.00	per acre	453	20
Irrigation - Pump	Centrifugal Booster Pump System Overhaul	$400.00	per pump	546.19	13

Measure Category	Measure	Incentive	Unit of Incentive	Annual kWh Savings	Measure Life
System Overhaul					
Irrigation - Pump System Overhaul	Submersible Booster Pump System Overhaul	$400.00	per pump	308.78	13
Irrigation - Pump System Overhaul	Turbine Booster Pump System Overhaul	$400.00	per pump	308.84	13
Irrigation - Pump System Overhaul	Submersible Well Pump System Overhaul	$400.00	per pump	385.33	13
Irrigation - Pump System Overhaul	Turbine Well Pump System Overhaul	$400.00	per pump	328.63	13
Irrigation - Variable Speed Drives	Variable Speed Drives on Well Pump (Less than or Equal to 300 hp)	$100.00	per pump hp	168.36	10
Irrigation - Variable Speed Drives	Variable Speed Drive on Booster Pump (Less than 150 hp)	$100.00	per pump hp	186.83	10
Variable Speed Drives	Variable Speed Drive (Less than 20hp)	$100.00	per motor hp	665.08	13
Variable Speed Drives	Variable Speed Drive (Between 20hp and 75hp)	$80.00	per motor hp	643.62	13

Table 2: Custom Program Measure Life

Measure Category	Measure	Incentive	Unit of Incentive	Annual kWh Savings	Measure Life
Energy Study	Plant Wide Audit	Up to 50% of energy study cost, up to $10,000	per study	N/A	N/A
Energy Study	Feasibility Study	Up to 75% of energy study cost	per study	N/A	N/A
Custom Measure	Custom Lighting Measure	Lesser of: • 50% of total measure cost • 100% of incremental measure cost • Incentive sufficient to bring the project down to a two-	per measure	Varies by project	Varies by project

Measure Category	Measure	Incentive	Unit of Incentive	Annual kWh Savings	Measure Life
		year payback • $0.15/kWh for one year of savings multiplied by percent savings realized by FBC			
Custom Measure	Custom Non-Lighting Measure	Lesser of: • 50% of total measure cost • 100% of incremental measure cost • Incentive sufficient to bring the project down to a two-year payback • $0.25/kWh for one year of savings multiplied by percent savings realized by FBC	per measure	Varies by project	Varies by project

1

2

9.0 Reference: Exhibit B-1, Appendix A, 2019 to 2022 DSM Plan, Table 5-1, page 10
Exhibit B-1, Appendix E, FBC DSM 2017 Annual Report, Table 5-1, page 15

"The Industrial Efficiency program achieved savings of 0.9 GWh, or 56 percent of the 1.6 GWh Plan for 2017 and a decrease over 2016 savings of 2.1 GWh."

9.1 Please explain the changes FBC intends to make to the Industrial Program Area to achieve 10 GWh of savings in 2019, when only 0.9 GWh of savings were realized in 2017?

Response:

Savings and incentive expenditures in the Industrial Program Area are highly variable due to the relatively low number of industrial customers in the FBC service territory. In addition, participation in the Industrial Program area tends to reflect a small number of large projects with highly variable completion dates. The increase in the Industrial Program area savings forecast is primarily due to the anticipated increase in program participation from prospective cannabis production customers. However, FBC currently has an increased number of Industrial Custom program commitments that are forecast to increase 2018 and 2019 plan year savings (and expenditures) over the 2017 plan year, irrespective of participation from new cannabis production facilities.

9.2 Please identify the amount of industrial program area energy savings that were not realized in 2017 and/or 2018 because of projects that were not implemented due to FBC's proposed application of the "sliding scale" mechanism to the DSM incentives for self-generators.

Response:

FBC is not able to speculate on the extent of savings that were not realized in 2017 and/or 2018 from self-generators due to FBC's intended application of the "sliding scale" mechanism to DSM incentives. As self-generators typically do not access FBC industrial DSM programs, energy efficiency opportunities pursued by self-generators outside of FBC DSM programs are not shared with FBC.

10.0 Reference: Exhibit B-1, Appendix A, 2019 to 2022 DSM Plan, Section 7.1, page 14

"The Commercial Energy Specialist Program is a joint initiative between FBC and FEI that co-fund Energy Specialist positions in large commercial organizations. FBC provides up to $30,000 per year in an annual contract with the remaining $30,000 provided by FEI. Energy Specialists' key priority is to identify and implement opportunities for their organization to participate in FBC and FEI's DSM programs, while also identifying and implementing non-program specific opportunities to use electricity and natural gas more efficiently."

10.1 Will the Commercial Energy Specialist Program be accessible by industrial customers, and if so, will a "sliding scale" mechanism be applied to the incentives available to self-generators?

Response:

No, FBC has no plans to offer the Commercial Energy Specialist Program to industrial customers.

11.0 Reference: Exhibit B-1, Appendix A-1, Kelowna Demand Response Assessment

11.1 Please discuss whether there has been any study performed to examine the correlation of the Kelowna peak summer daily loads being offset by distributed generation such as solar photovoltaic? Has FortisBC examined providing incentives for solar photovoltaic net metering installations to offset the peak summer daily loads?

Response:

FBC has not performed a study correlating Kelowna peak summer daily load profiles to distributed generation such as solar photovoltaics (PV), nor has FBC examined providing incentives, other than the net metering rate itself. FBC's CPR study excluded solar PV as a measure because it failed pre-screening of the governing TRC cost test.

11.2 Was examining summer daily peak load offset by solar PV net metering installations part of the Enbala study scope, and if not, why not?

Response:

The Enbala DR potential study focused on curtailment of existing customer loads in response to projected DR events and as such did not consider adding measures such as solar PV, whether through net metering or otherwise. The study did consider distributed generation, in the form of customer standby or backup generators, as a potential DR measure that FBC has initially rejected due to the increased GHG emissions.

Attachment 5.1

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)