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October 5, 2016

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

Attention: Mr. William J. Andrews

Dear Mr. Andrews:

Re: FortisBC Inc. (FBC)

Project No. 3698889

Application for Acceptance of Demand Side Management (DSM) Expenditures for 2017 (the Application)

Response to the B.C. Sustainable Energy Association and Sierra Club of British Columbia (BCSEA) Information Request (IR) No. 1

On August 8, 2016, FBC filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-135-16 setting out the Regulatory Timetable for the review of the Application, FBC respectfully submits the attached response to BCSEA IR No. 1.

If further information is required, please contact Joyce Martin, Manager Regulatory Affairs at (250) 368-0319.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

1.0 Topic: 2016 Projected Figures at the Program Level

Reference: Exhibit B-1, Table 4-1; Exhibit B-1, Appendix A, Tables A1-1, A2-1, A3-1, A4-1

Table 4-1 shows Projected as well as Approved figures for 2016 at the Program Area level but not at the Program level. Tables A1-1, A2-1, A3-1, A4-1 show figures at the Program level but do not show 2016 Projected.

1.1 Please provide versions of Tables A1-1, A2-1, A3-1, A4-1 showing 2016 Projected figures.

Response:

The requested tables updated with 2016 projections are provided below.

Projected savings and expenditures in the Residential sector are disaggregated as shown below.

Projected savings and expenditures in the Commercial sector are presented in aggregate due to uncertainties in the projects that will be completed in 2016. The majority of the energy savings in the Commercial and Industrial sectors are achieved from relatively few, larger custom projects compared to energy savings in the Residential sector that are achieved through many, small prescriptive incentives. Uncertainty in the type and scale of projects that Commercial customers will actually complete in 2016 limits FBC's ability to disaggregate the projection in the Commercial sector.

There is only a single Industrial Efficiency program, so industrial projections are not further disaggregated.

Table A1-1: Residential Program

Program Area		2016				2017		
		Approved		Projected		Plan		
		Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	TRC B/C ratio
1	Home Improvement	3,106	884	436	328	364	348	1.7
2	Heat Pumps	1,618	302	1,087	311	781	298	1.5
3	New Home	1,179	390	46	49	126	151	1.4
4	Lighting	1,547	189	3,600	279	2,735	190	2.2
5	Appliances	288	96	101	122	126	133	1.3
6	Water Heating	948	430	12	26	17	30	1.5
7	Low Income & Rentals	3,175	952	1,401	1,387	3,247	1,367	3.4

	Program Area	2016				2017		
		Approved		Projected		Plan		
		Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	TRC B/C ratio
8	Behavioural	1,048	106	417	106	3,097	200	3.7
9	**Total**	**12,909**	**3,349**	**7,098**	**2,607**	**10,493**	**2,718**	**2.5**

Table A2-1: Commercial Program

	Program Area	2016				2017		
		Approved		Projected		Plan		
		Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	TRC B/C ratio
1	Com Lighting	7,616	1,519	-	-	10,592	2,322	2.2
2	Building Improvement	4,589	976	-	-	2,931	784	2.3
3	Irrigation	490	69	-	-	144	25	3.6
4	**Total**	**12,695**	**2,564**	**11,734**	**2,547**	**13,666**	**3,131**	**2.2**

Table A3-1: Industrial Program

	Program Area	2016				2017		
		Approved		Projected		Plan		
		Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	Savings MWh	Cost ($000s)	TRC B/C ratio
1	Industrial	1,585	209	2,327	330	1,556	309	1.9
2	**Total**	**1,585**	**209**	**2,327**	**330**	**1,556**	**309**	**1.9**

Table A4-1 Supporting Initiatives – Projected 2016 Costs has been presented in response to BCOAPO IR 1.4.1.

2.0 Topic: Response to Directions

Reference: Decision and Order G-186-14 regarding FBC's 2015-2016 DSM expenditure schedule; Exhibit B-1, Appendix B, p. 4 (pdf p.54)

FBC states that in its 2014 DSM Annual Report it addressed Directions 7, 15 and 17 of Decision and Order G-186-14. These directives state:

> 7. FBC is directed to include in its next DSM Annual Report an update on its efforts to increase DSM expenditures and plan savings back to the levels included in the 2012 LTRP ($9 million and 34 GWh/year).
>
> 15. Commission Panel directs FBC to include in its next DSM Annual Report a review and discussion of whether opportunities exist in expanding DSM funding to 2013 approved levels for industrial customers while continuing to obtain cost-effective energy savings.
>
> 17. Commission Panel directs FBC to include in its next DSM Annual Report an update on FBC's efforts to identify and mitigate (though DSM programs) market barriers to energy efficiency investment and consumption decisions of its industrial customers. FBC is also required to include in its next DSM Annual Report an update on its proposal to increase the funding available for energy efficiency studies.

2.1 Please provide FBC's 2014 DSM Annual Report.

Response:

FBC's 2014 DSM Annual Report is provided as Attachment 2.1. FBC DSM Annual Reports dating back to 2007 are also publically available on its website.

2.2 Please provide responses to Directives 7, 15 and 17 of Decision and Order G-185-14 based on current information.

Response:

Please refer to the responses to BCUC IR 1.1.2 and 1.1.4 with respect to Directive 7. Please refer to the responses to ICG IR 1.2.9 and 1.2.16 with respect to Directives 15 and 17.

3.0 Topic: Response to G-186-14

Reference: Decision and Order G-186-14 regarding FBC's 2015-2016 DSM expenditure schedule

In the Commission's Decision and Order G-186-14 regarding FBC's 2015-2016 DSM expenditure schedule the panel accepted the 2015-2016 DSM expenditure schedule but also stated that:

> "[The Panel] is concerned about the adequacy of expenditures especially given that FBC's proposed DSM expenditures are less than those accepted in 2013 and those proposed in the 2012 LTRP (in particular for industrial customers). The Panel encourages FBC to file supplemental DSM expenditure schedules to bring DSM spending levels back up to previously accepted levels." [p.11, underline added]

3.1 Did FBC file supplemental DSM expenditure schedules to bring DSM spending levels back up to previously accepted levels? If so, please provide the details. If not, why not?

Response:

No. Please refer to the response to BCUC IR 1.1.2.

4.0 Topic: Savings, Spending and Budgets

References:

Exhibit B-1, Appendix A, Table A-1, 2016 Approved and 2017 DSM Plan Expenditures & Savings, p.A2, pdf p.29;

Table 4-1 FBC DSM Expenditures & Savings – 2016 Approved/Projected and 2017 Plan, p.9, pdf p.14;

Table 1-1 FortisBC Inc. DSM Portfolio Results for 2015, Appendix B, p.2, pdf p.52

4.1 If FBC has updated figures for 2016 please provide them and use them for the responses to these information requests.

Response:

Please refer to the response to BCSEA IR 1.1.1 for the 2017 DSM Plan tables updated to include the 2016 projected values.

4.2 For 2016, Savings Approved are 27,189 MWh and Savings Projected are and 21,160 MWh. Please confirm, or otherwise explain, that this represents a shortfall of approximately 20% between Approved and Projected Savings for 2016.

Response:

Confirmed.

4.3 Please fully explain the causes of the 2016 Projected Savings being approximately 20% below 2016 Approved Savings. Please explain by customer class and overall.

Response:

The Residential sector had a 45% decline in savings between the 2016 Approved Savings and the 2016 Projected Savings. The reasons for this are the same as the reasons for the lower

savings in 2017 Plan as compared to the 2016 Approved Plan, and are described in the Application (Exhibit B-1) on page 10:

- declining opportunities for energy savings as provincial and/or federal regulations phase out less efficient baseline products such as incandescent light bulbs, and mandate higher ENERGY STAR performance levels for major household appliances and electronics;
- BC Building Code (BCBC) amendments[10] that raised the baseline prescriptive requirements for new home construction; and
- lower home retrofit activity reflecting the end of multi-layer "stacked" offers, such as the LiveSmartBC program.

An 8% decline in Commercial programs was due to the late March launch of the Business Direct Install (BDI) program.

2016 Projected Savings increased in the Industrial sector on the basis of projecting the completion dates for specific projects that were in the process of being approved or completed at the time the projections were made.

4.4 For 2016, DSM Expenditures are Approved at $7,534,000 and Projected at $6,838,000. Please confirm, or otherwise explain, that this represents a shortfall of approximately 10% between Approved and Projected Expenditures for 2016.

Response:

Confirmed.

4.5 Please fully explain the causes of the 2016 Projected Expenditures being approximately 10% below 2016 Approved Expenditures. Please explain by customer class and overall.

[10] Effective December 19, 2014; see https://news.gov.bc.ca/stories/updates-to-bc-building-code-take-effect-in-december.

Response:

Please refer to the response to BCSEA IR 1.4.3.

Expenditures are closely related to program savings since incentive costs are the largest cost component in a program and the explanations for reductions in projected savings also apply to the reduced expenditure projections.

In the 2015 DSM Annual Report dated March 31, 2016, FBC states: "Given that 2015 was a transition year from 2014's scaled-back programs and considerable development work was undertaken for new and relaunched programs, the Company believes it now has the necessary resources and a fulsome complement of programs in place going forward to achieve budget and target performance in 2016." [Exhibit B-1, Appendix B, p.3, underline added, pdf p.53]

4.6 Are the projected results for savings and spending in 2016 consistent with the March 31, 2016 expectation to achieve budget and target performance in 2016?

Response:

The extract from the 2015 DSM Annual Report reflected FBC projections for 2016 performance as of the first quarter of 2016. The 2016 projections as filed in the Application reflected projections as of the third quarter based on 2016 year to date activity levels across all programs. Although not fully in line with first quarter expectations, the 2016 projections as filed are a significant improvement over 2015 results and FBC expects to achieve its 2017 DSM Plan.

4.7 To what extent, and why, can the Commission expect that the proposed 2017 budget and target performance will be achieved if the expenditure schedule is accepted?

Response:

The program ramp-up, market awareness and resource issues that impacted 2015 results have largely been overcome, as is demonstrated in FBC's projected 2016 results. Also the spending trajectory (2015 actual expenditures were 48% of plan and 2016 projection is 90% of plan)

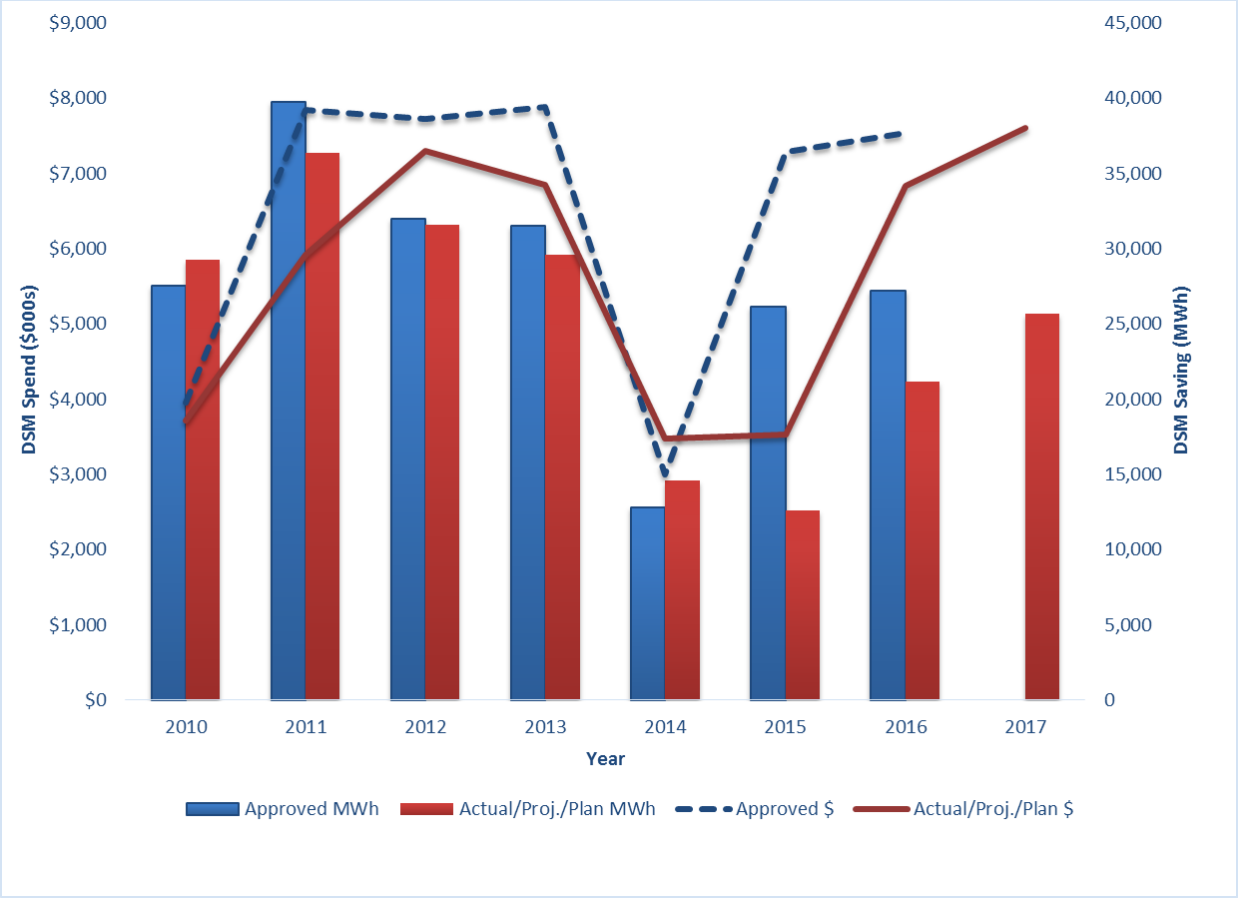
demonstrates FBC is on track to achieve its 2017 DSM Plan.

"The Company has a long record of successfully meeting or exceeding its savings targets, while keeping expenditures within approved plans and 2015 results were not in line with past performance." [Exhibit B-1, Appendix A, p.3, pdf p.53]

4.8 Please provide a graph and accompanying table showing for 2017 (Plan), 2016 (Approved and Projected), and 2015 to 2010 (Approved and Actual), DSM Spending Approved and DSM Spending Actual/Projected/Plan as lines, and DSM Savings Approved and DSM Savings Actual/Projected/Plan as bars.

Response:

The requested graph and table are provided below.



Year	Savings and spend source	Energy Savings		Spend	
	Actual/Projected/Plan	Approved MWh	Actual/Proj./Plan MWh	Approved ($000s)	Actual/Proj./Plan ($000s)
2010	Actual	27,510	29,261	$3,951	$3,712
2011	Actual	39,722	36,349	$7,842	$5,918
2012	Actual	31,961	31,587	$7,731	$7,300
2013	Actual	31,506	29,600	$7,878	$6,855
2014	Actual	12,800	14,580	$3,001	$3,473
2015	Actual	26,159	12,608	$7,292	$3,531
2016	Projected	27,189	21,160	$7,534	$6,838
2017	Plan		25,715		$7,610

4.8.1 In the requested table, please provide the portfolio TRC and the avoided cost estimate for each year.

Response:

The requested information is provided in the table below.

Year	TRC	TRC Source	Avoided Capacity Charge $/kW/yr	Avoided Energy Charge $/kWh	Blended Avoided cost $/MWh	(firm energy) Source of Avoided Cost	Deferred Capital Expenditure $/kW-yr
2010	2.0	Actual	56.69	0.0333		BCH RS 3808 including RS 1901 Rider	35.60
2011	1.6	Actual	59.44	0.0349			
2012	1.6	Actual			84.94	Long-term avoided power purchase cost	35.60
2013	1.6	Actual			84.94		35.60
2014	1.6	Actual			84.94		35.60
2015	2.0	Actual			111.96	Long-run marginal cost for BC “clean resources”	35.60
2016	2.0	Plan			111.96		35.60
2017	2.0	Plan			111.96		79.85

5.0 Topic: 2015 DSM Savings and Spending

Reference: Exhibit B-1, Appendix B, pp.2-3, pdf pp.52-53

For 2015, FBC acknowledges that DSM savings were 48% of the target approved in Decision and Order G-186-14 and spending was 48% of the approved level [p.2, pdf p.52]. FBC lists several factors it says contributed to the 2015 outcome [p.3, pdf p.53]

5.1 Please provide an analysis of the extent to which the shortfall in electricity savings in 2015 consists of missed opportunities (e.g., to have long-lasting efficiency and conservation measures included in new construction or retrofits) as distinct from potential savings that remain available.

Response:

Generally, FBC believes there were a limited amount of missed opportunities and the majority of the cost-effective potential remains. FBC's analysis of the extent to which the shortfall in electricity savings in 2015 consists of missed opportunities or not, is set out below:

Home Improvement	Limited missed opportunity	Accessible areas, e.g. unfinished basements and attics, have potential savings that remain available. However home renovation projects in inaccessible areas that could have included more energy upgrades, had energy savings that were missed.
New Home	Limited missed opportunity	The 2014 BCBC raised the standard for new homes built in 2015. FBC's New Home program is based on ENERGY STAR for New Home, which is more stringent than BCBC. The savings shortfall in 2015 was only a partially missed opportunity because new homes built in 2015 were built to the new BCBC standard, but FBC did not get the incremental savings to bring those homes to the ENERGY STAR performance level.
Appliances	Missed opportunity	This was a missed opportunity to capture savings from customers who purchased appliances in 2015. The Appliance Program relaunched in 2015 and building customer awareness takes time. With the continued emphasis on only promoting the most efficient appliances available in the market, coupled with the introduction of ENERGY STAR dryers, this program area continues to see growth and savings.
Water heating	Potential savings remain available	This was not a missed opportunity because the shortfall was due to the heat pump water heater equipment not being available in the BC marketplace yet. FBC is continuing to promote this measure, attract trade allies and work with wholesalers to stock these products.
Commercial Lighting and Building Improvement	Limited missed opportunity	The savings shortfalls in this category were due to lack of market awareness after the program was increased in 2015. This was a missed opportunity to influence customers to choose more efficient products for their commercial new construction and renovation projects completed in 2015. However, the potential to capture savings in this sector in the future remains strong.

Please also refer to the response to BCUC IR 1.5.3.

5.2 FBC says that one of the factors contributing to the 2015 results was the timing of the Commission's decision to accept the 2015-2016 DSM expenditure schedule (December 3, 2014). Does FBC anticipate that the timing of the Commission's decision regarding the current 2017 DSM expenditure schedule will impact the likelihood of achievement of the 2017 savings and spending targets? If so, by what date would a decision be required in order to eliminate the timing of the decision being a factor in the likelihood of meeting 2017 savings and spending targets?

Response:

The 2015-16 DSM Plan filing represented a marked step increase in DSM expenditures, from $3 million to $7.3 million, compared to the previous plan expenditure level. FBC required certainty of Commission acceptance of the new expenditure level before proceeding with its new and re-launched DSM programs, and adding capacity, which began in early 2015.

The 2017 DSM Plan expenditure schedule filing is fundamentally an extension of the approved 2015-16 DSM Plan, with no step change in expenditure levels, and therefore the timing of the decision is less likely to impact the 2017 savings and spending targets.

5.3 FBC says that one of the factors contributing to the 2015 results is that "Collaboration with other public utilities resulted in harmonized rebates at lower levels than those offered on a stand-alone basis in the past, which resulted in diminished returns on certain maturing programs (e.g., top tier Energy Star appliances)." Is this a factor that applied in 2016 as well? Will this factor apply in 2017, i.e., to contribute to spending and savings being below target levels?

Response:

Yes, this will also be a factor in 2016. However, it is not anticipated to be a factor in 2017 as the 2017 DSM Plan is representative of actual 2015 and projected 2016 results.

5.4 FBC says that one of the factors contributing to the 2015 results is that "The withdrawal of partners in the LiveSmartBC and ecoEnergy programs left the Company offering stand-alone programs with lower customer rebates, the consequence of which was reduced participation in the Home Improvement program." Is this a factor that applied in 2016 as well? Will this factor apply in 2017, i.e., to contribute to spending and savings being below target levels?

Response:

Please refer to the response to BCSEA IR 1.15.2 and in particular the Dunsky Energy Consulting figure that illustrates the effect of provincial and federal programs on participation. The absence of the LiveSmartBC and ecoENERGY programs is a factor in the reduced levels of home retrofit energy savings in 2016, and is expected to be in 2017 as well. The 2017 Home Improvement program spending and savings goals have been adjusted to reflect current market realities.

6.0 Topic: Carbon reduction fuel switching

Reference: Exhibit B-1 ; Decision and Order G-186-14, pp.13-14

6.1 Does FBC acknowledge that pursuant to the definition of DSM in the *Clean Energy Act* FBC's DSM portfolio can include conservation and efficiency measures regarding natural gas energy? Alternatively, please explain.

Response:

Please refer to the response to BCUC IR 1.4.1.

6.2 In the 2015-2016 FBC DSM Decision, the Commission Panel noted on page 13: "FBC's heat pump programs require electricity to be the primary energy source. Likewise, building envelope measures (insulation, draft-proofing, windows and doors) all have a prerequisite of electric heating." Is that still the case and is it a prerequisite FBC proposes to continue in 2017? Alternatively, please explain.

Response:

Please refer to the response to BCUC IR 1.4.1.

In the 2015-2016 FBC DSM Decision, the Commission Panel said on page 14 that it "is concerned that FBC excludes customers from eligibility for FBC DSM incentives where they are switching from gas to electricity." And: "The Panel considers that this approach acts contrary to BC's energy objective to encourage the switching from one kind of energy source or use to another that decreases GHG emissions in BC." As a result, the Panel issued Direction 9.

In response to Direction 9, FBC states "The BC CPR will examine the fuel switching potential and its cost-effectiveness. FBC does not have a fuel switching program at this time." [Exhibit B-1, Table 2-1, underline added]

6.3 Please provide documents or excerpts of documents from the ongoing BC Conservation Potential Review (CPR) that set out how the Review is examining fuel switching potential and its cost-effectiveness. (The focus is on

methodologies, not results.) If there is no documentation of how the CPR will examine carbon-reduction fuel switching opportunities, please explain why not.

Response:

There is no documentation available at this time because the BC Conservation Potential Review (CPR) Additional Services, which includes the Fuel Switching component, has not yet been contracted for and the consultant's proposal remains confidential in the interim.

6.4 What steps if any has FBC taken to develop programs to address carbon-reduction fuel switching opportunities?

Response:

Please refer to the responses to BCUC IR 1.4.1 and 1.4.2.

6.4.1 Does FBC intend to wait until the final BC CPR Report to decide whether to develop carbon-reduction fuel switching opportunities?

Response:

As noted in response to BCUC IR 1.4.1, fuel switching is a load building activity as opposed to DSM. FBC plans to conduct further investigation into fuel switching when the results of the BC CPR additional scope services become available later in 2016.

6.4.2 If the BC CPR Report finds achievable carbon-reduction fuel switching opportunities, and FBC decides to develop programs to address them, how long will it take for such programs to be put into operation?

Response:

In absence of the BC CPR results on fuel switching economics, FBC has not made any decisions on if or how any such opportunities may be pursued, and therefore cannot provide a timeline.

6.5 FBC is integrating its DSM department with FortisBC Energy Inc.'s Conservation and Energy Management Program. [Exhibit B-1, Appendix A, p.A15, pdf p.42] Is FBC's decision-making regarding adopting carbon-reduction fuel switching programs influenced in any way by the potential impact of such programs on FEI? If so, please describe how FBC addresses or intends to address these factors.

Response:

Please refer to the response to BCUC IR 1.4.1.

In addition to Direction 9, the Panel in G-186-14 "encourages FBC to file supplemental DSM expenditure schedules to address" the fact that FBC's 2015-2016 DSM proposal did not support BC's energy objective to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in B.C. [underline added]

6.6 Did FBC file supplemental DSM expenditure schedules to address BC's energy objective "to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia"? If so, please provide details. If not, why not?

Response:

No. Please refer to the response to BCSEA IR 1.6.4.1.

7.0 Topic: DSM expenditure amortization, intra-budget transfer rules

Reference: BCUC Project No.3698797, FBC 2015-2016 DSM Application, Exhibit B-7, BCSEA IR 1.1

"On September 15, 2014, the Commission issued its Decision and Order G-139-14 on FBC's Application for approval of a Multi-Year PBR Plan for 2014-2018. The Commission denied FBC's request to change the DSM expenditure amortization period from 10 to 15 years, approved FBC's request to move to annual DSM reporting effective January 1, 2014 and declined to rule on FBC's proposed funding transfer rules."

7.1 Please confirm FBC's current amortization period for DSM expenditures.

Response:

FBC's current amortization period for DSM expenditures is 10 years.

7.2 Please confirm the intra-budget transfer rules currently applicable to FBC's DSM expenditures.

Response:

In the Commission's Decision and Order G-139-14 on FBC's Application for approval of a Multi-Year PBR Plan for 2014-2018 (2014-18 PBR Application), the Commission declined to rule on FBC's proposed intra-budget funding transfer rules, therefore there are no intra-budget transfer rules applicable to FBC's DSM programs at this time.

7.3 Please confirm, or otherwise explain, that in the current proceeding FBC is not seeking approval of any changes to the DSM amortization period or intra-budget transfer rules.

Response:

Confirmed.

8.0 Topic: Conservation Potential Review

Reference: Exhibit B-1, p.1

"The Company intends to include a new Long Term DSM Plan (2016 LT DSM Plan) as part of the 2016 Long Term Electric Resource Plan (LTERP) which will be filed on or before November 30, 2016. The provincial dual-fuel Conservation Potential Review (BC CPR) is currently underway jointly by FortisBC Energy Inc. (FEI), British Columbia Hydro and Power Authority (BC Hydro) and FBC, and will inform the new Long-Term DSM Plan. Since the BC CPR report is not final, and FBC is seeking acceptance of the DSM expenditure schedule for 2017 only as suggested by the Commission, no BC CPR results have been incorporated in this filing." [underline added]

8.1 FBC says that the BC CPR report is not final and that it will inform FBC's new 2016 Long Term DSM Plan to be filed on or before November 30, 2016. Does this mean that the BC CPR report will be finalized before FBC files the 2016 LT DSM Plan on or before November 30, 2016? Or will FBC's 2016 LT DSM Plan be informed by work-in-progress results from the BC CPR?

Response:

FBC will use the BC CPR results to inform its Long Term DSM Plan (LT DSM Plan), to be filed as part of the Long Term Electric Resource Plan (LTERP) on or before November 30, 2016, and file the final FBC CPR report as supporting evidence.

8.2 When will the BC CPR Report be finalized? How will the BC CPR Report be made available to the Commission and stakeholders?

Response:

Please refer to the response to BCSEA IR 1.8.1.

8.3 Please summarize the interim results of the BC CPR as they relate to FBC's DSM planning.

Response:

The interim results of the BC CPR indicate there is increased overall potential compared to FBC's 2013 CPR Update. The final results may change and will be provided in the final FBC CPR report to be filed with the LTERP.

8.3.1 Directionally, does FBC anticipate that the BC CPR results will support upward, or downward, adjustment of the amount of FBC's intended DSM savings?

Response:

The BC CPR results are not finalized and FBC is not in a position to comment on the direction of future DSM savings levels until after the results are incorporated into the LT DSM Plan.

8.4 Although FBC refers to it as a 2016 Long Term DSM Plan, is the intention that the plan would apply to DSM beginning in 2018?

Response:

The LT DSM Plan, is long-term as the name implies, directional in nature and its timeframe is 2016-2035 to match the LTERP planning horizon. The upcoming LT DSM Plan and LTERP will be submitted under s. 44.1 of the UCA. The current filing is a short-term (one year) expenditure filing for 2017 under s. 44.2 of the UCA.

8.5 Will the 2016 Long Term DSM Plan filing include a DSM expenditure schedule? If so, for what test year(s)?

Response:

No. The Company anticipates receiving a decision on the LTERP, including the LT DSM Plan, before filing its next DSM expenditure schedule.

8.6 If the BC CPR Report provides results that support increased DSM savings and spending by FBC, will FBC file a supplemental expenditure schedule during 2017 in order to begin capturing such savings? Or to ramp up in order to be in a position to implement new initiatives at the start of 2018?

Response:

Although the BC CPR report is a key input to DSM planning by providing the remaining Economic potential results for the FBC service area, it does not drive FBC's DSM targets. The DSM targets are determined in the LT DSM Plan in conjunction with the Company's long term resource needs, and will be filed pursuant to the LTERP.

If the LTERP indicates a ramp-up of DSM savings and expenditures is required, then following a Commission decision on the LTERP, the Company will file a DSM expenditure plan for future years, and will at that time determine whether a supplemental expenditure request is necessary for 2017.

9.0 Topic: Average cost of DSM savings

Reference: Exhibit B-1

9.1 What is the average cost of FBC's proposed 2017 DSM electricity savings in $/MWh?

Response:

The average levelized cost of FBC's proposed 2017 DSM electricity savings, as shown in Table A6-1 of Appendix A to the Application (Exhibit B-1), is $43.8 per MWh.

10.0 Topic: Consistency with Long Term Resource Plan

Reference: Decision and Order G-110-12 regarding FBC's 2012-2013 RRA, Integrated System Plan and 2012 Long Term Resource Plan; Exhibit B-1, s.2.3 Consistency with Long Term Resource Plan

"Under section 44.2 of the UCA, the Commission, in considering whether to accept an expenditure schedule by a utility, must consider the utility's most recent long-term resource plan filed under section 44.1 of the Act. For FBC, the current 2012 LTRP was accepted by the Commission in August 2012.[4] The measures in the 2017 DSM Plan are consistent with the measures assessed and the benefit/cost methodology used in the 2012 LTRP, and the Commission's directives[5] regarding that Plan. More specifically, the number and breadth of DSM measures and programs that pass the Total Resource Cost (TRC) test[6], is similar to that projected in the 2012 LTRP (and approved for the 2015-16 DSM Plan)." [Exhibit B-1, p.4, underline added]

In the G-110-12 Reasons for Decision, the Panel states:

"FortisBC's Long-Term DSM Plan includes the years 2012-2030. The Plan sets out the expected DSM programming, energy savings and spending for 2012-2016 as an extension of the spending and savings levels from the 2011 DSM Plan previously approved by the Commission. For the years 2017-2030, FortisBC has included a constant proxy figure of 28 GWh/year in energy savings. Overall, the Plan was designed to achieve electricity savings to offset 50 percent of FortisBC's load growth until 2030." [G-110-12, Reasons for Decision, p.126, underline added]

10.1 FBC's proposed 2017 DSM electricity savings is what percentage of FBC's forecast 2017 pre-DSM load growth over 2016?

Response:

FBC's proposed 2017 DSM electricity savings is 48% as a percentage of load growth as provided in Exhibit B-2, Appendix A2, Section 2.1 of the FBC Annual Review for 2017 Rates process and as shown in the below table.

Year	Load Growth		DSM Savings		% of Load Growth
	MWh	Status	MWh	Status	
2017	53,886	Forecast	25,715	Plan	48%

"As shown in Figure 3-1 below, the total load, net of losses, is forecast to be 3,282 GWh in 2017, up 29 GWh from 2016S." [FBC 2017 Rates, Exhibit B-2, p.16, underline added]

10.2 Please confirm that the table in section 2.1 titled "Gross Load (MWh)" of Appendix A2 of Exhibit B-2 of the 2017 Rates proceeding [pdf p.133] shows Before-Savings 2016S (Seed) and Before Savings 2017F (Forecast) of 3,550,870 MWh and 3,604,756 MWh, respectively.

Response:

Confirmed.

10.2.1 Please confirm that the difference between the two figures is 53,886 MWh.

Response:

Confirmed. The difference between the before-savings gross load for 2016S and 2017F in the FBC Annual Review for 2017 Rates, Exhibit B-2, Appendix A2, Section 2.1 is 53,886 MWh. Please note that the Figure 3-1 in the Annual Review for 2017 Rates, Exhibit B-2, p.16, shows the after-savings net load.

10.2.2 Is 53,886 MWh the forecast Pre-DSM Load Growth between 2016 and 2017? If not please explain why not and provide the forecast Pre-DSM Load Growth between 2016 and 2017.

Response:

53,886 MWh is the forecast gross load growth before DSM and Other savings between 2016 and 2017.

10.2.3 Please file the table in section 2.1 titled "Gross Load (MWh)" of Appendix A2 of Exhibit B-2 of the 2017 Rates proceeding [pdf p.133].

Response

The requested table is provided below.

Gross Load (MWh)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Historical Normalized Actuals													
2006	370,078	309,284	305,670	255,581	240,065	237,225	274,816	260,925	231,742	267,853	310,004	366,727	3,429,970
2007	362,696	318,187	300,725	251,383	254,740	238,900	280,425	261,986	228,445	261,607	298,971	356,106	3,414,170
2008	351,478	312,547	288,943	248,550	243,211	235,861	276,961	258,486	223,859	260,879	300,150	349,985	3,350,908
2009	357,560	302,739	305,539	244,978	242,249	242,735	276,801	262,866	234,668	269,945	315,009	360,679	3,415,766
2010	358,574	304,251	288,022	253,247	237,451	232,285	274,190	265,937	227,770	258,133	303,172	365,668	3,368,701
2011	374,096	313,764	312,059	254,039	235,722	242,276	268,421	273,732	242,593	260,877	307,093	362,607	3,447,280
2012	354,376	315,497	304,411	253,594	237,899	233,308	272,143	275,122	236,457	262,538	313,757	362,555	3,421,657
2013	372,939	327,919	300,296	255,888	249,987	235,093	291,183	274,786	241,239	266,317	303,923	380,406	3,499,975
2014	363,245	306,420	303,949	253,146	241,945	242,396	285,626	270,799	229,532	256,624	301,612	380,684	3,435,977
2015	364,636	317,325	299,476	250,366	249,815	247,921	287,307	276,774	233,611	256,959	300,534	361,093	3,445,816
Before-Savings													
2016S	377,141	324,121	312,283	263,268	250,376	246,844	291,612	286,127	240,639	266,119	309,609	382,732	3,550,870
2017F	382,209	328,858	316,866	267,569	254,571	250,910	296,023	290,541	244,674	270,408	314,164	387,962	3,604,756
After-Savings													
2016S	376,306	323,247	311,274	262,228	249,246	245,572	290,057	284,433	238,888	264,134	307,365	380,169	3,532,919
2017F	378,989	325,685	313,575	264,367	251,347	247,524	292,202	286,560	240,688	266,063	309,421	382,729	3,559,150

10.3 In the G-186-14 Reasons for Decision, Table 1 is a Comparison of FBC Planned GWh Savings in DSM Plan [2015 and 2016] and 2012 LTRP. Please provide an extended version of this table showing the figures for 2017.

Response:

The requested table is provided below.

GWh Savings	2015			2016			2017		
	LTRP	DSM Plan	% change	LTRP	DSM Plan	% change	LTRP	DSM Plan	% change
Residential	21.1	12.1	-43%	22.6	12.9	-43%	-	10.5	
Commercial	11.9	12.6	6%	9.9	12.7	28%	-	13.7	
Industrial	1.8	1.5	-17%	1.9	1.6	-16%	-	1.6	
Total	**34.8**	**26.2**	**-25%**	**34.4**	**27.2**	**-21%**	**28**	**25.7**	**-8%**

In Decision and Order G-186-14, the Commission panel found that FBC's DSM expenditure request for 2015-2016 is reasonably consistent with the 2012 LTRP. In partial explanation, the panel states

> "FBC's 2012 LTRP included DSM objectives related to: (i) achieving 50 percent reduction in load growth, and (ii) achieving approximately 34 GWh/year reductions in energy demand for each of 2015 and 2016." [p.11, underline added]

10.4 Please confirm that for 2015 and 2016 FBC's forecast DSM savings were approximately 26 GWh and 27 GWh, respectively, but actual/projected DSM savings are only approximately 12.6 GWh and 21 GWh, respectively. If not confirmed, please provide the correct figures.

Response:

Confirmed.

10.5 Given that in the Commission-approved 2012 LTRP the forecast 2015 and 2016 DSM savings were 34.8 GWh and 34.4 GWh, respectively, does FBC agree with the characterization that its actual/projected 2015 and 2016 DSM savings of 12.6 GWh and 21 GWh, respectively, have turned out to be inconsistent with the 2012 LTRP? If not, why not?

Response:

The 2015 actual/2016 projected savings are below the 2012 Long Term Resource Plan (LTRP) target savings for those two years, however the Company believes its DSM program meets or exceeds the 2012 LTRP long run target of offsetting 50% of load growth by 2020.

Specifically, the DSM target savings in the 2012 LTRP for the years 2012-16 and the 28 GWh/yr proxy for 2017 onwards were set to achieve a 51% load growth offset by 2020. As the table below illustrates, FBC is on track to achieve a 90% load growth offset with DSM program savings since the 2012 LTRP.

Year	Gross Load	Load Growth		DSM Savings		DSM as per cent of load growth
	(MWh)	(MWh)	Status	(MWh)	Status	
2012	3,421,657	-25,623	Actual	31,587	Actual	-123%
2013	3,499,975	78,318	Actual	29,600	Actual	38%
2014	3,435,977	-63,998	Actual	14,580	Actual	-23%
2015	3,445,816	9,839	Actual	12,608	Actual	128%
2016	3,550,870	105,054	Forecast	27,190	Approved	26%
2017	3,604,756	53,886	Forecast	25,715	Plan	48%
Totals		**157,476**		**141,280**		**90%**

10.6 Given that FBC's 2017 DSM Plan is substantially the same as its 2016 DSM Plan in terms of proposed savings and spending, is the 2017 DSM Plan inconsistent with the 2012 LTRP? If not, why not?

Response:

Please refer to the response to BCSEA IR 1.10.5.

11.0 Topic: 2017 DSM Savings Estimate

Reference: BCUC Project No. 3698887, Exhibit B-2, p.16, Table 3-1; Exhibit B-1, Table 4-1

In its 2017 Rates and 2016 Annual Review filing [BCUC Project No. 3698887, Exhibit B-2, p.16], FBC indicates in Table 3-1, reproduced below, Forecast 2017 DSM Savings of approximately 32 GWh and 34 GWh including losses.

Table 3-1: Forecast 2017 DSM and Other Savings (GWh)

Line No.	Description	DSM	AMI	CIP	RCR	Rate-Driven	Total
1	Residential	(10)	12	(2)	(10)	(1)	(11)
2	Commercial	(15)				(1)	(16)
3	Wholesale	(2)				(1)	(3)
4	Industrial	(4)					(4)
5	Lighting	(1)					(1)
6	Irrigation						
7	Net	(32)	12	(2)	(10)	(3)	(35)
8	Losses	(3)	(6)				(9)
9	Gross Load	(34)	6	(2)	(10)	(3)	(43)

However, in the 2017 DSM Plan, FBC indicates in Table 4-1, reproduced below, 2017 forecast DSM savings of 25,715 MWh or approximately 26 GWh.

Table 4-1: FBC DSM Expenditures & Savings – 2016 Approved/Projected and 2017 Plan

	Program Area	2016 Approved Savings MWh	2016 Approved Cost ($000s)	2016 Projected Savings MWh	2016 Projected Cost ($000s)	2017 Plan Savings MWh	2017 Plan Cost ($000s)	2017 Plan TRC B/C ratio
1	**Programs by Sector**							
2	Residential	12,909	3,349	7,098	2,607	10,493	2,718	2.5
3	Commercial	12,695	2,564	11,734	2,547	13,666	3,131	2.2
4	Industrial	1,585	209	2,327	330	1,556	309	1.9
5	**Subtotal Programs**	27,189	6,122	21,160	5,484	25,715	6,158	2.3
6	Supporting Initiatives		675		678		674	
7	Planning & Evaluation		737		675		777	
8	**Total (including Portfolio spend)**		7,534		6,838		7,610	2.0

11.1 Please reconcile the 2017 forecast DSM savings figures in the two tables.

Response:

FBC provided a discussion of why the DSM Expenditure Schedule is not directly comparable to the forecast of DSM savings in response to BCUC IR 1.5.4 (Exhibit B-2) in the Annual Review

for 2016 Rates. FBC has copied that discussion below, with updates to reflect the response for the current year.

The savings values are not directly comparable between the 2017 DSM Expenditure Schedule (DSM Plan) Application and the Forecast 2017 DSM savings values shown in Table 3-1. The difference occurs as a result of the way that the 2017 DSM Plan savings are presented, attributed, and disaggregated in the load forecast.

The main reason for the difference is that the 2017 Forecast presents the DSM savings numbers as cumulative starting in 2016 (DSM savings are embedded in historical data) whereas the DSM Plan shows the savings as incremental (the savings for each plan year are shown separately).

The 2017 DSM Plan figure of 25,715 MWh represents annualized energy savings for the DSM projects, by major customer sector, planned to be undertaken in that calendar year only. The forecast presented in FBC's Annual Review factors in the timing of DSM projects: some of the DSM project savings are attributed to the year following the project. For example, if a project with 12,000 kWh of savings was planned to be completed in December 2015, the DSM Plan shows all of those savings in 2015. The forecast numbers, however, reflect 1/12 of the savings in 2015 (1,000 kWh of savings in December 2015) and the remaining 11/12 of the project's savings are reflected in 2016 (11,000 kWh of savings from January to November 2016).

Furthermore, FBC disaggregates a number of sub-categories of DSM that are not shown in the DSM Plan savings for forecasting purposes. For example, "Residential" in the plan savings includes the residential portion of the "Wholesale" savings (for the City of Penticton and the other municipal utilities) presented in the load forecast. Similarly the "Commercial" plan savings contain the "[Street] Lighting" and "Irrigation" values shown separately in the load forecast. The forecast also isolates the (line) "Losses" associated with the DSM program savings.

11.1.1 Please include a discussion of the treatment of Wholesale, Lighting, and Losses.

Response:

Please refer to the response to BCSEA IR 1.11.1.

11.1.2 Please explain if one table supersedes the other or if the two tables stand alone for different purposes.

Response:

Please refer to the response to BCSEA IR 1.11.1.

11.2 Please file Table 3-1 of Exhibit B-2 in FBC's 2017 Rates and 2016 Annual Review filing [BCUC Project No. 3698887].

Response:

A revised Table 3-1 of Exhibit B-2, as corrected in FBC's response to BCUC IR 1.6.1 in FBC's Annual Review for 2017 Rates is reproduced below.

Revised Table 3-1: Forecast 2017 DSM and Other Savings (GWh)

Line No.	Description	DSM	AMI	CIP	RCR	Rate-Driven	Total
1	Residential	(10)	9	(2)	(7)	(1)	(11)
2	Commercial	(15)				(1)	(16)
3	Wholesale	(2)				(1)	(3)
4	Industrial	(4)					(4)
5	Lighting	(1)					(1)
6	Irrigation						
7	Net	(32)	9	(2)	(7)	(3)	(35)
8	Losses	(3)	(7)				(9)
9	Gross Load	(34)	2	(2)	(7)	(3)	(44)

12.0 Topic: Ductless heat pumps

Reference: Exhibit B-1, Appendix A, s.A1-2 Heat Pumps, p.A3, pdf p.30; Appendix B, s.2.2.1 Home Improvement Program and Heat Pump Program, pp.7-8, pdf pp.57-58 Decision and Order G-186-14, Appendix A, p.5

In Decision and Order G-186-14, the Panel noted that FBC expressed particular support for its ductless heat pump program because "they are an energy-efficient solution for FBC customers that use electric baseboard heating." [Decision and Order G-186-14, Appendix A, p.5]

12.1 Does FBC consider that the ductless heat pump component of the Heat Pump Program continues to be an energy-efficient solution for FBC customers that use electric baseboard heating?

Response:

Yes, FBC believes ductless heat pumps (DHP) are a cost-effective solution for FBC customers with electric baseboard heating.

12.2 Has FBC considered expanding the ductless heat pump component of the Heat Pump Program in particular to help meet the needs of residential customers without access to natural gas? Will FBC address this in the upcoming Long Term DSM Plan? Will FBC address this in the Commission's RIB Rate Report proceeding?

Response:

The Home Renovation Rebate Program offers an $800 rebate for a ductless heat pump (DHP), or qualifying participants can choose a low-interest (currently 1.9% on a pilot basis) loan.

The LT DSM Plan will consider DHP products as an energy-efficient solution for customers with electric baseboard heating.

DHPs were addressed in FBC's submission on the Commission's RIB Rate Report proceedings, including illustrative savings (4,180 kWh and $627/yr) for a prototypical DHP installation.

13.0 Topic: Innovative technologies

Reference: Exhibit B-1,

In G-186-14, the Commission Panel states that it "encourages FBC to continue to support pilot projects of new DSM technologies, and to include in the next DSM expenditure request a description of the actions FBC has and plans to take to support innovative technologies." [p.13]

In Exhibit B-1, Table 2-1, quotes the B.C. energy objective "(d) to use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources, " and states: "FBC supports pilot projects of new DSM technologies, and the DSM Plan allows new measures to be incented if B/C ratio is positive. See Appendix A, section A1.5."

In Appendix A, section A1.5, FBC states:

> "Approximately 50 percent of FBC customers' water heaters are heated with electricity. To encourage efficient water heating, FBC will continue to offer rebates for the installation of heat pump water heaters (HPWH) for customers with electrically heated hot water.

To improve product availability, FBC will continue discussions with manufacturers and retailers to increase availability and awareness for customers. A pilot project, in collaboration with BC Hydro and NRCan, is testing the suitability of ducted integrated HPWH and non-integrated HPWH (condenser and compressor are located outside the homes) in the BC climate. [p.A4, pdf p.31]

13.1 Is the pilot project in collaboration with BC Hydro and NRCan regarding the suitability of ducted integrated HPWH and non-integrated HPWH the full extent of FBC's plan to support innovative DSM technologies?

Response:

No. Subsequent to the filing of the Application, FEI approached FBC to collaborate on a pilot (field trial) for Smart Learning Thermostats (SLT). The SLT business case is currently undergoing internal review and approval steps.

In addition, FBC has traditionally supported pilot projects with customers who wish to adopt a new innovative DSM technology in their home or business. FBC's support may include in-kind (i.e. staff) review of the proponent's proposal, providing incentive funding, and measurement and verification of the project savings.

14.0 Topic: Freeridership and Spill-over Effects

Reference: Exhibit B-1, s.6.2 Net-To-Gross Ratio; Table 6-1: FBC Program Free-Rider and Spill-Over Rates; Exhibit B1, Appendix A, 2017 DSM Plan, Tables A1, A1-1, A2-1, A3-1

In section 6.2, FBC says it calculates a Net-To-Gross ratio using estimates of freeridership and spill-over effects. FBC says it will continue to evaluate and quantify free-rider and spill-over effects on a program by program basis. [p.16]

14.1 Do the program and portfolio DSM savings results and TRCs in Tables A1, A1-1, A2-1, A3-1 include estimates of freeridership and spill-over effects? If not, please provide versions of these tables taking into account FBC's estimates of freeridership and spill-over effects.

Response:

The Total Resource Cost (TRC) values shown in Tables A1, A1-1, A2-1, and A3-1 include estimates of free-ridership and spill-over effects. The following table shows the program, sector and portfolio level DSM savings results before (gross) and after (net) applying the estimates of free-ridership and spill-over effects.

Sector	Program	2017 Energy savings (MWh)	
		Gross	Net
Residential	Home Improvement	364	291
	Heat Pumps	781	469
	New Home	126	101
	Lighting	2,735	3,857
	Appliances	126	103
	Water Heating	17	17
	Low Income & Rentals	3,247	3,247
	Behavioural	3,097	3,097
Residential Total		**10,493**	**11,182**
Commercial	Com Lighting	10,592	7,202
	Building Improvement	2,931	2,067
	Irrigation	144	101
Commercial Total		**13,666**	**9,370**
Industrial	Industrial	1,556	1,369
Industrial Total		**1,556**	**1,369**
Total Portfolio		**25,715**	**21,921**

14.1.1 Please comment on whether inclusion, or exclusion, of free-rider and spill-over effects makes a material difference to the 2017 DSM spending proposal.

Response:

Theoretically speaking the exclusion of free-rider and spillover effects could enable a larger DSM spending proposal as FBC could continue to incent measures (e.g. Ground-source heat pumps) long after the free-rider rate indicated market transformation had occurred.

Please refer to the response to BCUC IR 1.14.6 for a discussion on how free-ridership rates and spill-over effects were considered in the 2017 DSM Plan.

14.2 FBC states that Table 6-1: FBC Program Free-Rider and Spill-Over Rates "lists the free-ridership and spill-over rates currently deployed by FBC [p.16]. Is the NTG that FBC uses based on a simple subtraction of the Spill-Over percentage from the Free-Rider percentage? If not, please explain how the NTG is calculated and applied.

Response:

The Spillover rate is additive. The formula for Net to Gross (NTG) Ratio is:

NTG Ratio = 1 – Free Ridership + Spillover.

14.3 Regarding Table 6-1, five programs have a Free-Rider rate but not a Spill-Over rate. Why is that? Did the source documentation estimate a 0% Spill-Over rate, or did it not address the Spill-Over rate?

Response:

The evaluation studies that were undertaken to assess the assumptions used for free-ridership and spillover did analyze spillover effects; however, they found that there was insufficient evidence to support a spillover estimate other than 0% for programs other than Residential Lighting.

14.4 When does FBC anticipate updating its estimates of freeridership and spill-over effects?

Response:

Consistent with industry best practices, FBC typically conducts impact evaluations of its DSM programs on a three year cycle, adjusted as necessary in the case of a new or significantly modified program.

In 2016, the Residential Heat Pump and the Custom Business Efficiency programs will be evaluated and estimates of free-ridership and spill-over are forthcoming.

In 2017, the M&E Plan includes three evaluation studies that will update the estimates of free-ridership and spill-over: Low Income ECAP, Commercial New Construction, and Business Direct Install (see Table A5-2 on page A-14 of Appendix A to the Application (Exhibit B-1)).

14.5 For the programs in Table 6-1 that do not have estimates of spill-over effects, does FBC intend to make or acquire estimates of spill-over effects in the future?

Response:

Yes, estimates of spill-over will be included in the future impact evaluations, where sufficient evidence is available to make such an estimate.

Please refer to the response to BCSEA IR 1.14.4 for the list of planned evaluations.

14.6 Has FBC modified the design or incentive levels of any of its 2017 DSM programs based on the free rider and spillover rates given in Table 6-1?

Response:

FBC does modify the design and incentive levels of its DSM programs based on the free-rider and spill-over rates given in Table 6-1. For example, the Ground Source Heat Pump (GSHP) offer was discontinued due to the 65% free-rider rate. In the 2017 DSM Plan, the Air Source Heat Pump (ASHP) loan rate was lowered from 4.9% to 1.9% in response to the lower free-rider rate of 27% (not shown in Table 6.1 of the Application (Exhibit B-1)) for the sub-set of ASHP loan participants.

Generally, the 2017 DSM programs were designed using available market and customer intelligence in order to maximize participation for qualified products and services, and considering delivery processes that make the programs operationally effective and efficient. For many of its programs, FBC partners with other service providers and implementers. FBC also factors the opportunities and constraints of these partners into its program design. For example, FBC continues to provide incentives for top tier ENERGY STAR rated major household appliances, despite the relatively high free-ridership rate, in order to further market transformation of these products.

It should be noted that all of the 2017 DSM programs pass the cost-effectiveness tests using the free-rider and spill-over rates given in Table 6-1 of the Application (Exhibit B-1).

15.0 Topic: Home Improvement Program

Reference:

Exhibit B-1, Appendix B, Sub-Appendix B, Table B-1: Historical FBC Costs and Energy Savings 2010-2014;

Exhibit B-1, Appendix B, Table 1-1: FortisBC Inc. DSM Portfolio Results for 2015 [pdf p.52];

Exhibit B-1, Appendix A, Table A1-1: Residential Program Expenditures & Savings;

Exhibit B-1, Appendix B, Sub-Appendix C, "Evaluation of the FortisBC Home Improvement Program," December 14, 2015, by Evergreen Economics

15.1 Since 2010, FBC's Home Improvement Program has achieved energy savings ranging from an annual low of 231.2 MWh in 2015 to a high of 5,222 MWh in 2013. There has frequently been a large variance between the approved savings plan and actual savings for a particular year. Would FBC agree that an examination of approved spending, actual/projected/planned spending, planned savings and actual/projected/planned savings for the Home Improvement Program annually for 2010 to 2017 indicates (a) substantial fluctuation in savings and spending from year to year, and (b) frequent instances of substantial differences between approved and actual results for both savings and spending?

Response:

Yes, FBC agrees that a review of the Home Improvement Program from 2010 to 2017 indicates (a) substantial fluctuation in savings and spending from year to year, and (b) frequent instances of substantial differences between approved and actual results for both savings and spending.

Please refer to the response to BCSEA IR 1.15.2 regarding the effects of provincial and federal offers entering and leaving the residential energy efficiency retrofit market, which is reflected in FBC's actual/projected and plan fluctuations.

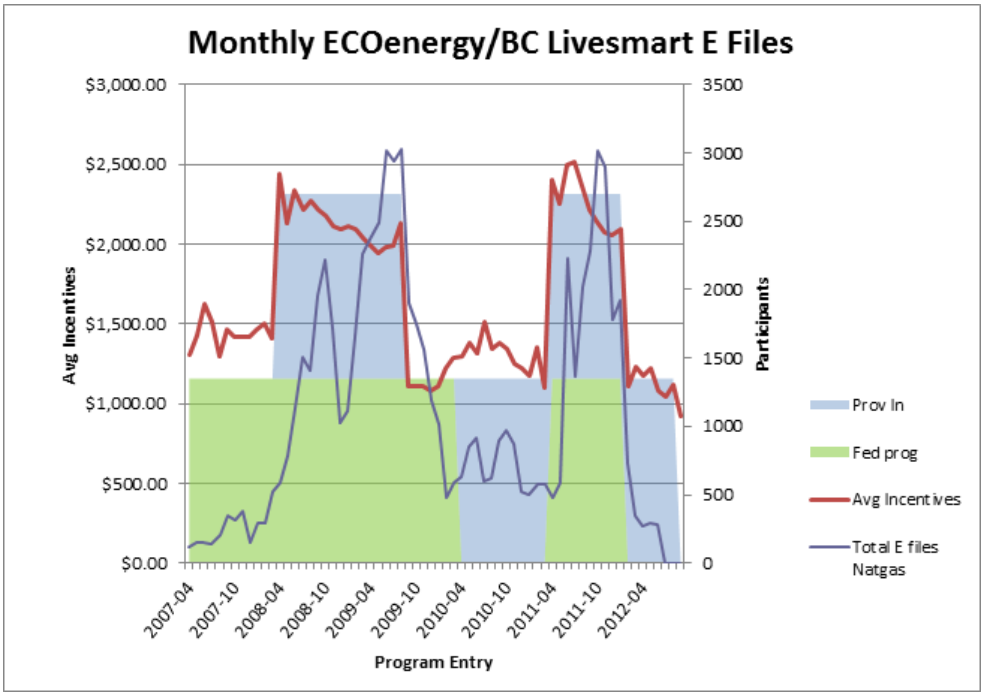
15.2 Please provide a narrative explaining on a year by year basis the changes in the approved and actual results for the Home Improvement Program from 2010 to 2017 (using Projected for 2016 and Plan for 2017).

Response:

The following table provides explanations on a year by year basis of the changes in the approved and actual results for the Home Improvement Program from 2010 to 2017. The largest driver of Home Improvement program participation and results are multiple offers, or "stacked"[2] rebates from concurrent federal and provincial programs, as is illustrated by the Dunsky Energy Consulting figure below. The federal ecoENERGY and provincial LiveSmartBC programs ended March 31 of 2012 and 2014 respectively.

Year	Plan Savings (MWh)	Actual Savings (MWh)	Explanatory narrative
2010	953	4948	• Partnered with ecoENERGY and LiveSmart BC in 2009. Delayed application processing caused surge in participation and results in 2010;
2011	8960	3692	• Increased budget to meet new regulatory requirements (*Clean Energy Act*, *Utilities Commission Act*); • Developed new programs: time required to design and launch programs and build market awareness and interest before savings are realized

[2] Program participation levels are highly sensitive to incentive levels (Comprehensive Bonus Analysis, Dunsky Energy Consulting., 2013). Dunsky Energy Consulting was contracted by FBC, FEI and BC Hydro to analyze LiveSmart BC and utility partners' rebate program participation and recommend approaches to reduce free ridership and drive deeper retrofit. The resulting Comprehensive Bonus Analysis report found that program participation levels are highly sensitive to incentive levels offered.



Year	Plan Savings (MWh)	Actual Savings (MWh)	Explanatory narrative
2012	7620	4656	• Federal ecoENERGY program ended March 31st, reducing "stacked" rebates and program participation
2013	8689	5222	• ecoENERGY out of marketplace and LiveSmartBC reduced incentive offers, further reducing "stacked" rebates and program participation
2014	1881	1299	• LiveSmart BC program offering reduced rebates and not marketed to reduce participation and costs to Ministry Energy and Mines (MEM); • LiveSmart BC program ended March 31st; • Collaborated with BC Hydro and FortisBC Energy to offer new province-wide Home Energy Rebate Offer (HERO) that was launched mid-year; • More stringent participation requirements were introduced to reduce free ridership • Bonus offer added to drive deeper retrofits (minimum of three measures);
2015	3106	231	• HERO's first full year in market; time required to build market awareness and interest before savings are realized; • ecoENERGY and LiveSmart BC continued to be out of marketplace
2016	3106	436 *(Projected)*	• More stringent participation requirements still in place; • Bonus offer requirement dropped to two measures to encourage more participation • ecoENERGY and LiveSmart BC continue to be out of marketplace; • revised NRCan Home Energy Rating system introduced
2017	364		• The reduced 2016 projected and 2017 plan savings are representative of actual 2015 results of the Home Energy Rebate Offer program

15.3 Table A1-1 [pdf p.29] indicates that FBC's 2017 Plan for the Home Improvement Program is Savings of 364 MWh, Cost of $348,000. Savings and Cost are down from 2016 Approved figures of Savings of 3,106 MWh and Cost of $884,000. If not addressed in the response to the previous IR, please explain why FBC proposes this apparently substantial reduction between 2016 Approved and 2017 Plan.

Response:

Please refer to the response to BCSEA IR 1.15.2. The reduction in 2016 projected and 2017 plan savings are representative of actual 2015 and projected 2016 results of the Home Energy Rebate Offer program.

Evergreen Economics' December 14, 2015 report "Evaluation of the FortisBC Home Improvement Program provides Recommendation #7, which states:

> "Recommendation #7: Consider revising the qualifying measures for the Home Improvement Program to increase the net-to-gross ratio. Measures such as windows, insulation, thermostats, and bathroom fans are well established in the market, relatively inexpensive in certain cases, and are commonly purchased as part of a scheduled household upgrade or retrofit, regardless of available rebates or incentives in the market. As a result, these measures dramatically increase free ridership and consequently decrease the program's net-to-gross ratio."[page 6, pdf p.87]

15.4 Please describe whether and how FBC has changed the Home Improvement Program for 2017 in response to Evergreen Economics' Recommendation #7.

Response:

The Home Renovation Rebate program (formerly HERO) was created and implemented in partnership with FortisBC Energy and BC Hydro. Free-ridership and the promotion of deeper and more retrofits were addressed in the design of the program. For example:

- rebates are not provided for windows, but they can be included as an eligible measure to qualify for the bonus rebate;
- rebates for individual insulation measures are minimal, but multiple insulation measures can be combined to qualify for the bonus rebate; and
- bathroom fans continue to be offered to help address customer health and safety (i.e. the need for adequate air exchange).

Thermostat rebates are now only offered as part of point-of-purchase seasonal promotions at retail stores.

15.5 The Evergreen Economics report has a different estimate of net-to-gross ratio for the Home Improvement Program than does the LiveSmart, BC Hydro, April 2012 figure shown in Table 6-1. Why does FBC use the LiveSmart figure?

Response:

The Evergreen Economics study contained contradictory results for the survey questions that were designed to gauge the program's influence. This indicated that the results may not be accurate. Evergreen Economics wondered whether the respondents might have misinterpreted one of the survey questions, and whether respondents were unable to distinguish between the influences of the Company's Home Improvement program and the LiveSmartBC program that ran in parallel. In light of this, the Company believes that BC Hydro's free-ridership ratio for LiveSmart is a more reliable estimate for its Home Improvement program.

16.0 Topic: Low income DSM programs

Reference: Exhibit B-1, Appendix B, pages 10 & 11 [pdf pp.60-61]; Exhibit B-1, Appendix A, page A16 [pdf p.43]

"[For 2015] Savings were 281.8 MWh for the Low Income programs. No savings were attributed to the Basic ECAP, as the program was launched in November and only energy evaluations were completed by the end of the year." [pdf p.60, underline added]

"For eligible low-income single or multi-family dwellings, the Company designed and launched ECAP for the FortisBC shared service area, in collaboration with BC Hydro and in partnership with FEI. The ECAP program provides energy evaluations, advice, and the direct installation of energy efficiency measures like LED and CFL lighting, low-flow showerheads and faucet aerators at no cost to eligible households. Some single-family homes may also qualify for new Energy Star refrigerators, high-efficiency furnaces, and draft-proofing and insulation at the "advanced" program level. The program met its 2015 participation objectives within the first six weeks of launching." [pdf p.61, underline added]

16.1 Given that the ECAP program met its 2015 participation objectives within the first six weeks of launching in November 2015, why were no savings attributed to the Basic ECAP for 2015? Is it because it is expected that actual savings would not occur until sometime after enrolment?

Response:

The Company exceeded the first year projections for ECAP Basic customer applications by the end of 2015, but savings were not attributed to the program in 2015 because installations did not begin until February 2016.

16.1.1 Please explain the difference in this respect between "Basic ECAP" and "ECAP."

Response:

ECAP refers to the combined program that encompasses the two levels of the ECAP program referred to internally as: Basic and Advanced. The Basic component includes an in-home visit from a qualified evaluator who works with customers to find simple ways to improve efficiency in their homes. This includes installing measures such as LED lighting, high efficiency showerheads, faucet aerators and door weather-stripping. For qualified customers, Advanced

ECAP offers direct installation of advanced draft proofing and insulation, heat pumps, and furnaces.

16.2 Please provide an interim assessment of the success of the ECAP program in 2016 to date. Are projected spending and energy savings in line with planned spending and savings?

Response:

Projected spending is within 10% of planned spending. Projected savings are lower than planned savings; however, more Advanced ECAP projects (insulation) are now being completed which are expected to increase savings before year end.

16.3 Table A-6 projects 3,247 MWh of savings for low income and rental programs in 2017, at a cost of $1,367,000. How much of the costs and savings are attributed to Energy Savings Kits, and how much to ECAP?

Response:

The following table shows the planned costs and savings for the Energy Savings Kit (ESK), Energy Conservation Assistance and Rental Apartment programs:

Program	Plan Expenditure	Plan Savings
Energy Savings Kits	$53,400	667 MWh
Energy Conservation Assistance Program	$986,000	2,021 MWh
Rental Apartment Program	$327,000	559 MWh

16.4 Approximately how many homes does FBC plan will participate in its ECAP program in 2017, and how many homes does FBC plan will receive ESKs?

Response:

FBC estimates 1,900 participants in the ECAP program and the distribution of 750 ESKs to customers in 2017.

16.5 Approximately how many homes in FBC's service area would be eligible to participate in the low income program?

Response:

There are approximately 25,000 households within FBC's service area that qualify for low income DSM programs[3]: 19,000 from FBC's customer base and 6,000 who receive service from FBC's Wholesale customers: the District of Summerland, the cities of Grand Forks and Penticton and Nelson Hydro.

16.6 Approximately how much energy will be saved on average by each ECAP participant?

Response:

An ECAP participant that has efficient lighting products, low flow fixtures, outlet gaskets, basic draft-proofing and window film measures installed will save 1,182 kWh per year on average, assuming electricity is used for space heating and hot water.

16.7 Approximately how many homes does FBC plan will participate in the rentals program in 2017?

[3] Source: http://www.bcstats.gov.bc.ca/StatisticsBySubject/SocialStatistics/SocioEconomicProfilesIndices/Profiles.aspx

Response:

FBC plans to have 1,200 rental units (homes) participate in the rental apartment program in 2017, based on a target of 40 buildings with an average of 30 units per building.

16.8 Approximately how many homes in FBC's service area would be eligible to participate in the rental program?

Response:

The rental program is for rental apartment buildings. There are approximately 900 rental apartment buildings in the FBC service area.

The ECAP program is available for single-family rental homes, as well as social housing and First Nations organizations' rental apartments. It is estimated that 200+ multi-family social housing apartment buildings are eligible for ECAP.

16.9 Approximately how much energy will be saved on average each rental program participant?

Response:

A rental apartment program participant that receives efficient lighting and low flow fixtures will save 675 kWh per year on average. This figure assumes that the participant uses electricity for hot water.

Attachment 2.1

Diane Roy
Director, Regulatory Services

Gas Regulatory Affairs Correspondence
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March 31, 2015

Via Email
Original via Mail

British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

Re: FortisBC Inc. (FBC)

Annual Demand Side Management (DSM) Report for the Year Ended December 31, 2014 (the 2014 DSM Report)

Please find enclosed for filing FBC's 2014 DSM Report.

The Executive Summary of completed monitoring and evaluation reports are provided in Appendix C. The full evaluation reports are filed separately as Confidential Appendix C and FBC requests that the Commission hold these reports in confidence. These reports contain customer-specific information that should not be disclosed to the public. In addition, the methodology and processes used in the reports is proprietary to the consultants hired by FBC.

If further information is required, please contact Sarah Wagner at 250-469-6081.

Sincerely,

FORTISBC INC.

Original signed by: Joyce Martin

For: Diane Roy

Attachment

FORTISBC INC.

Annual DSM Report

Year Ended December 31, 2014

March 31, 2015

Table of Contents

List of Appendices

Index of Tables and Figures

1. REPORT OVERVIEW

This report provides highlights of FortisBC Inc.'s (FBC or the Company) Demand-Side Management (DSM) programs for the year ended December 31, 2014. The report reviews the progress of FBC's PowerSense program in meeting the approved 2014 DSM Plan by educating and incenting FBC's customers to conserve energy and improve the energy efficiency of their homes and businesses. The report also provides information regarding integration and collaboration of the DSM programs with other BC utilities. Summaries of how PowerSense met the DSM Regulation requirements in 2014 and FBC's response to BCUC Directives from Order G-186-14 are included. An overview of PowerSense program activities in 2014 is presented, with a comparison of actual energy savings and costs to Plan, and a statement of financial results including benefit/cost ratios is provided. A summary of historical FBC DSM costs and energy savings for the past five years is included in Appendix B. Finally, the executive summary of completed monitoring and evaluation reports are provided in Appendix C. The full evaluation reports are filed separately and FBC requests that the Commission hold these reports in confidence. These reports contain customer-specific information that should not be disclosed to the public. In addition, the methodology and processes used in the reports are proprietary to the consultants hired by FBC.

This will be the last year that FBC and FortisBC Energy Inc. (FEI) file Annual Reports that have different formats. The Annual Reports for both companies for 2015 onward will have the same format.

1.1 *OVERVIEW OF RESULTS FOR THE YEAR ENDED DECEMBER 31, 2014*

Energy efficiency savings for the year ended December 31, 2014 were 14.6 GWh, or 114 percent of the 12.8 GWh Plan. Company costs incurred were $3,473,000 or 116 percent of the $3,001,000 filed Plan. Adding customer costs to the Company's program costs yields a total resource cost (TRC) of $5,996,000 with an overall TRC benefit/cost ratio of 1.7. The method used to determine benefits is provided in the Financial Results section.

1.2 *ADEQUACY UNDER THE DSM REGULATION*

A public utility's plan portfolio is adequate for the purposes of Section 44.1 (8) (c) of the UCA regarding long-term resource plans, only if the plan portfolio includes all of the following, as set out in section 3 of the DSM Regulation:

a) a demand-side measure intended specifically to assist residents of low income households to reduce their energy consumption;

b) a demand-side measure intended specifically to improve the energy efficiency of rental accommodations;

c) an education program for students enrolled in schools in the public utility's service area; and

d) an education program for students enrolled in post-secondary institutions in the public utility's service area.

PowerSense addressed each of these adequacy requirements in 2014. The low income and rental requirements were met though the Low Income and Rental programs, including Energy Savings Kits, refrigerator upgrades in low income rental units, and a project to provide upgrades to First Nation homes. The education requirements were addressed through programs like Energy is Awesome, Beyond Recycling and sponsorship of BC Post-Secondary Co-op Energy Conservation. More details on these initiatives are provided in the Overview of PowerSense Activities in the Residential Sector and Supporting Initiatives sections.

1.3 *RESPONSE TO BCUC DIRECTIVES*

There were no specific PowerSense DSM Directives in the PBR 2014-18 Decision. The BCUC approval for the 2015-16 DSM Plan was issued Dec 3rd 2014 (Order G-186-14) and the Directives related to the Annual Report are summarized in Table 1-1:

Table 1-1: FBC Response to BCUC Directives (Order G-186-14)

Directive Reference	BCUC Directive to FBC	FBC Response
Directive 7	FBC is directed to include in its next DSM Annual Report an update on its efforts to increase DSM expenditures and plan savings back to the levels included in the 2012 LTRP ($9 million and 34 GWh/year).	The 2015 approved DSM Plan expenditure and savings are $7.3 million and 26.2 GWh, which moves towards the 2012 LTRP goals. The next long-term DSM Plan, in the Company's LTERP due to be filed June 2016, will inform the DSM expenditure filings for 2017 and subsequent years
Directive 13	Commission Panel directs FBC to include in its next DSM Annual Report a review and discussion of whether opportunities exist in expanding DSM funding to 2013 actual levels for residential heat pumps, lighting and new home programs while continuing to obtain cost-effective energy savings.	PowerSense will address this directive in the 2015 and 2016 Annual Reports, once the 2015-16 DSM Plan for residential heat pumps, lighting and new home programs has been implemented.
Directive 14	Commission Panel directs FBC to include in its next DSM Annual Report a review and discussion of whether opportunities exist in expanding DSM funding to 2013 approved levels for municipal water while continuing to obtain cost-effective energy savings.	PowerSense will address this directive in the 2015 and 2016 Annual Reports, once the 2015-16 DSM Plan for municipal water handling has been implemented.
Directive 15	Commission Panel directs FBC to include in its next DSM Annual Report a review and discussion of whether opportunities exist in expanding DSM funding to 2013 approved levels for industrial customers while continuing to obtain cost-effective energy savings.	See FBC Response to Directive 7. The current Industrial Efficiency program offering, in the approved 2015-16 DSM Plan, is generic enough to accommodate a wide range of customer projects, and the spending rules include the ability to increase up to 25 percent of sector budget (or more with Commission approval), thus not limiting participation.
Directive 17	Commission Panel directs FBC to include in its next DSM Annual Report an update on FBC's efforts to identify and mitigate (through DSM programs) market barriers to energy efficiency investment and consumption decisions of its industrial customers. FBC is also required to include in its next DSM Annual Report an update on its proposal to increase the funding available for energy efficiency studies.	FBC is undertaking a number of activities, including hosting and facilitating an Industrial program design workshop on March 5, 2015, to better understand its industrial customers' requirements including their investment criteria. In 2015 the Company will undertake further research into other program models and best practices, including how to increase energy efficiency studies uptake.
Directive 21	FBC is directed to file, confidentially if appropriate, the full versions of EM&V reports with its DSM Annual Report.	FBC is compliant with this directive in the current DSM Annual Report and will follow it in subsequent DSM Annual Reports.

2. OVERVIEW OF POWERSENSE ACTIVITIES

In 2014 PowerSense offered programs and achieved budget and energy savings consistent with its 2014 DSM Plan filing. There were significant budget and energy savings reductions and PowerSense focussed its efforts to meet those reduced targets. PowerSense reduced the value of many rebates, cancelled a number of programs and minimized its marketing efforts. It also reduced staffing levels and other administrative costs.

With less marketing and outreach activities, PowerSense concentrated resources on improving productivity and customer service. Most significantly, an on-line, "cloud-based" application process and fully automated data reporting program was introduced (Demand Side Management Central (DSMC)). PowerSense also worked to strengthen partnerships with BC Hydro and FortisBC Energy Inc. (FEI) (collectively with FortisBC, the BC Utilities, or utility partners) and stakeholders to provide more consistent and comprehensive energy efficiency offers to residential customers.

To provide a more seamless customer experience, marketing and program collaboration with FEI continued from 2013; however, greater integration was not pursued until late 2014.

Triggered by the July provincial DSM Regulation amendments that modified low income program requirements and specified that the Long Run Marginal Cost (LRMC) be based on BC clean or renewable energy, a new DSM plan filing for 2015-16 was submitted in August, 2014.

The following overview outlines the programs PowerSense offered in 2014 as well as portfolio level Supporting Initiatives and Planning and Evaluation activities.

2.1 *RESIDENTIAL SECTOR*

The number and type of residential sector programs offered in 2014 was significantly reduced compared to those offered in 2013 due to budget and savings reductions in the 2014 DSM plan. The following outlines highlights of program activities:

- Although the residential Home Improvement program offer was reduced, it included incentives for insulation, heat pumps, and heat pump water heaters. Beginning in July, customers applied for the program through the DSMC online application process. PowerSense collaborated with BC Hydro and FEI to provide a province-wide retrofit rebate offer through the Home Energy Rebate Offer (HERO) program. By focusing on the most cost-effective retrofit measures and using a "whole house" approach, the utility partners worked together to provide incentives to customers for insulation and draft proofing, space heating, water heating and ventilation. Marketing efforts were also integrated between the BC utilities.
- The BC utilities partnered with the Ministry of Energy and Mines to develop a proposal to provide three year funding to support a Home Performance Stakeholder Council with the goal of developing the recommendations of the Home Energy Performance Strategy report completed in late 2013.

- The New Home program offer was reduced from a rebate offer for either a Performance or Prescriptive path to a rebate that only covered the cost of an EnerGuide home evaluation. Marketing efforts continued to be integrated with EEC natural gas rebate offers. Customers applying for rebates accessed joint program information and a joint rebate application containing both gas and electric measures. Customers began applying for the program through the DSMC online application process midyear.

- The Appliance Retail Program was discontinued in 2014. From 2011 to 2013 this program provided incentives to customers purchasing ENERGY STAR refrigerators, clothes washers, freezers and dishwashers. In 2014, a small pilot program ran in the Kelowna Home Depot location offering a double-up rebate on the most efficient ENERGY STAR® certified clothes washers and refrigerators. The pilot program tested customer uptake on the higher efficiency qualifications for refrigerators and clothes washers.

- The Residential Lighting program continued to offer instant point-of-sale rebates on ENERGY STAR certified lighting products. The program worked in collaboration with BC Hydro's twice-yearly campaign to provide continuity to customers and lighting retailers across the BC market.

- The long-standing air source heat pump loan continued for electrically-heated customers' homes. The pilot Residential Efficiency Loan Program (RELP), an on-bill financing program, ended in early 2014 due to low uptake and a regulatory change.

- PowerSense continued to distribute Energy Savings Kits to low income households. PowerSense also worked with FEI and BC Hydro on a direct mail piece through the Ministry of Social Development's cheque stub run which reached over 180,000 recipients provincially and invited qualified customers to apply for a free kit.

- In partnership with the Ministry of Energy and Mines and in collaboration with the BC Non-Profit Housing Association, PowerSense replaced 992 refrigerators, which were 15 or more years old, with new ENERGY STAR refrigerators in low-income multi-unit residential buildings.

- PowerSense sought and received funding from the Ministry of Energy and Mines to collaboratively provide retro-fit upgrades for up to 80 First Nation homes. An RFP was issued in late 2014 for work to begin in 2015.

2.2 *COMMERCIAL AND INDUSTRIAL SECTORS*

PowerSense continued to offer core Commercial and Industrial sector programs with few changes from previous years. The following outlines the key programs offered:

- The Commercial Product Rebate[1] program offered prescribed rebates for commercial lighting, HVAC, refrigeration, and commercial kitchen appliances. The program was

[1] Formerly marketed as Energy Rebate Centre (ERC)

offered through point-of-sale rebates at lighting wholesalers and directly to customers. In mid-2014 the offers list was updated and LED lighting offers were expanded. For the first time, marketing of the program was market specific with efforts focussed on the restaurant and hotel/motel sectors. The program was added to the DSMC portal in September.

- The Custom Building Efficiency Program, which provides offers for larger, more complex energy efficiency measures and upgrades, remained largely the same from 2013, although the energy modelling offer was enhanced. The eligibility policy and process structures were improved, and the program was added into the DSMC portal in mid-2014.
- The Building Optimization Program was not expanded but existing customers continued to make improvements to their buildings' operations and significant energy savings were realized.
- PowerSense worked collaboratively with the FEI Energy Efficiency and Conservation (EEC) team to offer low-cost comprehensive energy walk-through assessments, which included some direct installation of low-flow water and ENERGY STAR lighting measures, for medium size businesses.
- In collaboration with BC Hydro and FEI, PowerSense assumed the Ministry of Energy and Mines' LiveSmart Business Efficiency Advisor (BEA) program and was able to offer free walk-through audits for small commercial enterprises. The energy advisor for the PowerSense service area focussed efforts on the hotel/motel sector.

2.3 *SUPPORTING INITIATIVES*

The Supporting Initiatives projects fulfill the education adequacy requirements in the DSM Regulation, as well as support customers to better understand energy usage and how to reduce it. In an effort to maximize cost-effectiveness, programs and promotions were conducted in collaboration with FEI whenever possible. The following is a brief overview of activities:

- Education Programs (elementary and secondary) – Energy is Awesome (curriculum-based education packages for educators and volunteer presenters), and sponsorship of Destination Conservation (Elements Society), and Beyond Recycling (Wildsight) programs;
- Education Programs (post-secondary) – sponsorship of BC Post-Secondary Co-op Energy Conservation (Redbird Communications) for Selkirk College and BC Electrical Association lighting training for electricians;
- Community Outreach – participation in local home, garden and trade shows;
- Community Outreach – A joint pilot program with BC Hydro and FEI focusing on household energy efficiency items was offered in the fall. Air Miles were given to RONA customers who purchased items such as weather stripping, thermostats, and low flow

shower heads. The pilot results were less than forecast and the BC Utility partners are discussing ideas for alternative promotions within home improvement retailers;

- Community Events – sponsorships of CHBA Tommie Awards, City of Grand Forks Solar Car Competition, and SICA – Invest Northwest, and BC Electrical Association conferences;
- Contractor Program – Although PowerSense and FEI disaggregated the Trade Ally program, PowerSense restarted the creation of its own contractor program to provide an on-line customer reference tool and to expand relations and further promote PowerSense rebate programs with contractors that install energy efficiency measures.

2.4 *PLANNING AND EVALUATION*

The Planning and Evaluation activities in 2014 included completing customer surveys and reports necessary for program planning, and conducting program evaluations. FBC collaborated with BC Hydro and FEI in planning the first BC-wide dual-fuel Conservation Potential Review, and worked together with FEI to issue a joint commercial end-use survey to be undertaken in 2015.

The Monitoring and Evaluation activities in 2014 included the comprehensive evaluation of the Commercial Product Rebate program and completion of the first half of the evaluation of the Home Improvement program. The executive summary of the Commercial Product Rebate program evaluation report is included in Appendix C.

In 2014, PowerSense began implementation of the "cloud-based" DSMC software for tracking and reporting DSM programs. Programs were added throughout the year and customers were able to apply online for the Home Improvement program, New Home program, Energy Saving Kits, Commercial Product Rebate program, and Custom Business Efficiency program. Residential Lighting and HERO were also set up in DSMC in 2014.

2.5 *POWERSENSE PROGRAMS OFFERED IN 2014*

The following tables summarize the PowerSense program offerings and indicate program status and progress of integration with FEI's EEC programs.

Table 2-1: Residential Programs 2014

Program and Measures	Status	Integrated with FortisBC Energy Utilities for combined offer
ENERGY STAR Appliances	Pilot	No
ENERGY STAR Retail Lighting Rebate	Ongoing	No (electricity only)
Heat Pump (Air Source and Geo-Exchange)	Ongoing (Air Source) Discontinued (Geo-Exchange)	No (electricity only)

Program and Measures	Status	Integrated with FortisBC Energy Utilities for combined offer
TLC Heat Pump Maintenance	Suspended*	-
New Home	Reduced	Yes (Marketing and Application Process)
Home Improvement (Retrofit)	Reduced	Yes (Marketing)
HERO (Retrofit)	New	Yes
Reduce Your Use (energy assessments)	Discontinued	-
On-Bill Financing	Completed in Q1	Yes
Low Income – Direct Installation Common Area Lighting	Completed	-
Low Income – Direct Installation In-suite Measures	Suspended*	-
Low Income – Refrigerator Replacement	One time	No (electric only)
Low Income – Energy Savings Kits	Ongoing	Yes
Rental and Low-Income Housing	RFP issued in 2014	Yes (where appropriate)
Supporting Initiatives	Ongoing	Yes (where appropriate)
Contractor program	Enhanced	No
WaterSavers (low-flow measures)	Suspended*	-

Table 2-2: Commercial and Industrial Programs 2014

Program and Measures	Status	Integrated with FortisBC Energy Utilities for combined offer
Commercial Product Rebate** program	Ongoing	No
Building Improvement (New)	Ongoing	In progress
Building Improvement (Retrofit)	Ongoing	No
Municipal Water Infrastructure	Suspended	No (electric only)
Building Optimization	Closed to new participants	Yes
Partners in Energy	Ongoing	No
Energy Efficiency Studies	Ongoing	Yes
Industrial Efficiency	Ongoing	No
Irrigation Pumps	Ongoing	No (electric only)
Green Motors (motor rewinds)	Discontinued	-

* Suspended in 2014 due to budget constraints, with the intent to resume in 2015 and/or 2016.
** Formerly marketed as Energy Rebate Centre (ERC)

3. ENERGY SAVINGS BY SECTOR

The energy savings that PowerSense achieved in the year ended December 31, 2014 are shown in the table below.

Table 3-1: Energy Savings by Sector

SECTOR	Approved	Actual	% of Plan Achieved
	GWh		
Residential	5.8	8.7	150%
Commercial	6.2	5.3	85%
Industrial	0.8	0.6	77%
Total Savings (GWh)	12.8	14.6	114%

Note: Differences due to rounding

Overall PowerSense achieved 114 percent of the Plan goal of 12.8 GWh savings in 2014. Residential energy savings exceeded Plan with 150 percent of savings, whereas Commercial and Industrial sector energy savings were below Plan at 85 and 77 percent respectively. These results are discussed in more detail in the following sections.

3.1 *DETAIL OF ENERGY SAVINGS*

The following tables provide details on the DSM energy savings in each sector, including DSM activities in the service territories of the municipal Wholesale customers.

Table 3-2: Residential Energy Savings

Residential	Plan	Actual	% of Plan Achieved
	GWh		
Home Improvement Program	2.3	1.4	60%
Low Income and Rental	0.7	2.3	323%
Residential Lighting	2.1	3.4	160%
Heat Pumps	0.6	0.9	156%
New Home Program	0.1	0.7	748%
Total Savings (GWh)	5.8	8.7	150%

Note: Differences due to rounding

In the year ended December 31, 2014, the energy savings results from Residential programs were 150 percent of Plan. The Energy Diet promotions and closing of several PowerSense programs at the end of 2013 caused spillover of rebate processing into the beginning of 2014, which contributed to achieving savings beyond the 2014 Plan in most programs.

The Low Income and Residential Lighting programs exceeded Plan with savings of 323 and 160 percent. The point-of-purchase incentive campaigns in March-April and October were effective and contributed to the success in Residential Lighting. The Heat Pump and New Home

programs also exceeded Plan with 156 and 748 percent savings. The Home Improvement program fell short of forecast with 60 percent of savings.

The LiveSmart BC collaboration was closed to new applicants on March 31, 2014 and resulted in 0.5 GWh of retrofit energy savings, which are recorded in the Heat Pump and Home Improvement (HIP) programs. The HERO program, a new province wide collaboration between the three primary BC Utilities, launched mid-year contributing 0.2 GWh savings to the Heat Pump and Home Improvement programs.

PowerSense continued to provide energy savings kits containing energy efficient measures for low-income households. Approximately 775 kits were provided to qualified low income, senior homeowners, and home or apartment renters through community outreach activities, food banks or direct mail. The program was implemented in partnership with the EEC group.

Table 3-3: Commercial Energy Savings

Commercial	Plan	Actual	% of Plan Achieved
	GWh		
Lighting	3.4	3.4	100%
Building and Process Improvement	2.6	1.9	73%
Irrigation	0.2	0.0	0%
Total Savings (GWh)	6.2	5.3	85%

The Commercial sector recorded savings of 5.3 GWh, or 85 percent of the 2014 Plan. Many of these savings were realized through the Commercial lighting programs, including “at the counter” product rebates and custom lighting retrofits, such as the lighting upgrade at a South Okanagan greenhouse, producing 0.15 GWh of savings.

BIP energy savings were 1.9 GWh or 73 percent of Plan. An example of a Building and Process Improvement (BIP) custom project is a heating and ventilation upgrade at an elementary school in the Okanagan, contributing 0.13 GWh of savings.

In 2014 the municipal water infrastructure program was discontinued. Similarly with reduced resources, PowerSense did not have the capacity to design and launch a new irrigation program, albeit efficient pump incentives were available through the DSMC portal.

Table 3-4: Industrial Energy Savings

Industrial	Plan	Actual	% of Plan Achieved
	GWh		
Industrial Efficiency	0.8	0.6	77%
Total Savings (GWh)	0.8	0.6	77%

The Industrial Efficiency program achieved savings of 0.6 GWh, or 77 percent of the 0.8 GWh Plan for 2014. An example of an Industrial Efficiency project is the process improvement at a Kootenay lumber mill which resulted in 0.3 GWh of energy savings.

The table below disaggregates the Wholesale DSM savings, which are included in the sector tables above.

Table 3-5: Wholesale Energy Savings by Municipality

Wholesale Activity	GWh	MW	% of GWh*
Penticton	0.3	0.06	24%
Summerland	0.4	0.03	29%
Grand Forks	0.1	0.01	10%
Nelson	0.5	0.06	37%
Total Savings (Wholesale)	1.3	0.17	100%

*Of savings attributable to the Wholesale class

Note: Differences due to rounding.

The total Wholesale energy savings, which were acquired within the service areas of the four municipal electric utilities served by FBC, were 1.3 GWh and 0.17 MW in 2014. The largest DSM savings results occurred within Summerland and Nelson municipal utility service areas.

4. PROGRAM COSTS BY SECTOR

Table 4-1 presents the actual costs incurred in the year ended December 31, 2014, compared to the approved Plan. The percent of plan savings achieved by sector is shown for comparison purposes.

Table 4-1: Costs by Sector/Component

SECTOR/COMPONENT	Plan	Actual	% of Plan Costs	% of Plan Savings
	($000s)			
Residential	1,037	1,694	163%	150%
Commercial	1,134	1,184	104%	85%
Industrial	148	188	127%	77%
Supporting Initiatives	190	207	109%	-
Monitoring & Evaluation	202	205	102%	-
Planning & Admin	290	373	129%	-
Recoveries from 2013	-	(378)	-	-
Total	3,001	3,473	116%	114%

The total costs amounted to $3,473,000 or 116 percent of the 2014 Plan, commensurate with overall savings. The total net cost benefited from belated, one-time recoveries from FEI for 2013 that landed in the FBC 2014 fiscal year.

Generally, the Sector and Component expenditures exceed the relative magnitude of Plan savings, as the Company retained core staffing pending the amended DSM Regulation[2] that precipitated the revised 2015-16 DSM Plan filing in August 2014 that was subsequently approved by Order G-186-14.

Table 14 in Appendix A (DSM Summary Report) contains an additional breakdown of total program costs, including the customer portion of incremental project costs. It also shows that $1.9 million of expenditures, or 55% of the total FBC costs, were used in customer incentives.

A breakdown of utility program costs per sector and program component follows.

4.1 *DETAIL OF COSTS*

The following tables provide details on the DSM program costs for each sector and component in the PowerSense portfolio.

[2] Demand-Side Measures Regulation 326/2008, as amended by B.C. Reg 141/2014 effective July 10, 2014.

Table 4-2 - Residential Costs

Residential	Plan	Actual	% of Plan Achieved
	($000s)		
Home Improvement Program	394	394	100%
Low Income and Rental	242	502	208%
Residential Lighting	176	291	165%
Heat Pumps	158	252	160%
New Home Program	67	254	379%
Total	1,037	1,694	163%

The utility cost of the Residential programs was $1,694,000 or 163 percent of Plan for 2014. The New Home program continued to be very successful and while the costs are over budget, they are commensurate with savings. The Home Improvement program was on budget, although costs exceeded savings, which was partially due to the development of the HERO program. Due to carried-over 2013 contractual commitments, the Low Income and Rental programs exceeded their savings objectives and budget for the year. Similarly, the Residential Lighting, Heat Pump and New Home program expenditures and savings were ahead of Plan due to the significant number of 2013 applications received towards the end of 2013 and processed in 2014.

Table 4-3: Commercial Costs

Commercial	Plan	Actual	% of Plan Achieved
	($000s)		
Lighting	510	646	127%
Building and Process Improvement	592	533	90%
Irrigation	32	5	16%
Recoveries from 2013	-	(291)	-
Total	1,134	893	79%

Commercial sector costs in 2014 amounted to $893,000 or 79 percent of Plan. The largest cost component of Commercial programs was the Lighting program, which includes incentives paid through the Commercial Product Rebate program. The expenditures for Irrigation are well below budget due to the aforementioned capacity issue.

Table 4-4: Industrial Costs

Industrial	Plan	Actual	% of Plan Achieved
	($000s)		
Industrial Efficiency	148	188	127%
Total	148	188	127%

Industrial sector costs incurred by the Company were $188,000 for 2014, or 127 percent of Plan. The Industrial sector expenditures exceed Plan and the savings fell short of Plan, partially because of retaining an extra FTE in the Technical Advisor role until the 2015-2016 DSM Plan was accepted. The Industrial sector is also characterized by large projects that generally occur less frequently than in other sectors, therefore, PowerSense Technical Advisors may engage with industrial customers over a long period of time before a project eligible for a rebate materializes.

Portfolio level costs, which are not specifically associated with individual programs, include the following components: Supporting Initiatives, Monitoring and Evaluation, and Planning and Administration. These costs are summarized in the table below.

Table 4-5: Portfolio Costs by Component

COMPONENT	Plan	Actual	% of Plan Achieved
	($000s)		
Supporting Initiatives	190	207	109%
Monitoring & Evaluation	202	205	102%
Planning & Administration	290	373	129%
Recoveries from 2013	-	(87)	-
Total	682	785	115%

The Supporting Initiative costs for 2014 were $207,000 or 109 percent of the $190,000 Plan. Supporting Initiatives spending continued to drive community outreach and direct customer communication, which has traditionally been a strong component of PowerSense programming. In 2014, the community ambassador roles were discontinued because of reduced budget, and PowerSense representatives attended few community events. The Earth Hour promotion was not promoted by PowerSense due to budget reductions in 2014.

The Planning and Evaluation (P&E) budget is separated into two main components: Monitoring and Evaluation (M&E), and Planning and Administration. Monitoring and Evaluation was on budget in 2014. Planning and Administration was over budget, mainly due to retaining an extra 0.5 FTE pending the 2015-2016 DSM Plan acceptance. One of the main expenditures under P&E is on program evaluations and reports conducted by third party consultants. The executive summary of the evaluation report completed in 2014 is included in Appendix C.

5. FINANCIAL RESULTS

This section provides the financial and benefit/cost test results for 2014 and includes information about how the benefits were calculated for the total resource cost test (TRC) and the modified total resource cost test (mTRC)[3].

The table below presents the financial and benefit cost tests by program. It also includes the Planning and Evaluation costs, which are allocated to the programs by savings achieved.

Table 5-1: Financial Results for Year ended December 31, 2014 by Program

Program	Program Benefits	Utility Program Costs	Planning & Evaluation		Customer Incurred Costs	Total Resource Costs	Total Resource Benefit/Cost Ratio	
			Planning & Admin.	Monitoring & Eval.				
	($000s)						TRC	mTRC
Residential								
Home Improvement	1,305	394	36	20	306	755	1.5	1.5
Low Income and Rental	1,098	502	59	32	-	593	1.9**	1.9
Residential Lighting	1,166	291	87	48	203	629	1.5	1.5
Heat Pumps	766	252	22	12	544	830	1.6	1.6
New Home Program	783	254	19	10	7	290	2.7	2.7
Residential Total	**5,117**	**1,694**	**222**	**122**	**1,059**	**3,098**	**1.7**	**1.7**
Commercial								
Lighting	1,801	646	86	47	415	1,194	2.0	2.0
Building and Process Improvement	1,756	533	49	27	916	1,526	1.4	1.5*
Irrigation	-	5	-	-	-	5	0.0	0.0
Commercial Total	**3,557**	**1,184**	**135**	**74**	**1,331**	**2,725**	**1.6**	**1.7**
Industrial								
Industrial Efficiency	367	188	16	9	132	344	1.2	1.2
Industrial Total	**367**	**188**	**16**	**9**	**132**	**345**	**1.2**	**1.2**
Supporting Initiatives		207				207	-	-
Recoveries from 2013		(378)				(378)		
Total	**9,041**	**2,895**	**373**	**205**	**2,522**	**5,996**	**1.6**	**1.7**

Note: Minor differences due to rounding

* mTRC benefits applied to certain program measures

** Low Income benefits increased by 40 percent

An overall total resource benefit/cost ratio of 1.6 was achieved in 2014. The benefit/cost ratios for the individual programs are also detailed in the table above. The Residential sector program performance resulted in a benefit/cost ratio of 1.7 and the Commercial sector achieved a benefit/cost ratio of 1.6 and the Industrial sector benefit/cost ratio was 1.2.

The Low Income program attained a benefit/cost ratio of 1.9 with the 40 percent benefits lift as per the DSM Regulation, s4(2)(b).

[3] Ibid.

Program benefits are primarily based on the present value of avoided power purchase costs which are calculated using the long-term avoided power purchase cost[4] over the measure lifespan, plus a deferred construction expenditure (DCE) factor of $35.60 per kW-year.

Total resource costs shown in Table are a total of Company costs and customer costs. The customer costs are the customers' portion of incremental costs for new construction measures and the energy efficiency portion of retrofit measure costs. In the calculation of the TRC and mTRC tests, the incremental portion of cost is adjusted by the program NTG (net-to-gross) ratios.

The modified total resource benefit/cost ratio (mTRC) is also shown in Table . The benefits used in the mTRC were boosted using FBC's LRMC[5] of BC clean resources plus a fifteen percent adder for non-energy benefits (NEB). The mTRC benefits were applied the commercial new building construction measures, which required NEB to achieve an mTRC greater than unity (1.0).

The mTRC results do not differ substantially from the TRC results. The Commercial sector benefit/cost ratio increased from 1.6 to 1.7 with the use of mTRC. Residential and Industrial benefit/cost ratios were unaffected by incorporation of the mTRC as none of these programs required the mTRC to pass the TRC benefit cost test. Overall, the Total benefit/cost ratio increased from 1.6 to 1.7 using the prescribed mTRC method.

The Company's DSM program expenditure related to the measures that are subject to the mTRC was estimated to be $195,000 or 5.6 percent of the 2014 DSM expenditure, which is within the regulated mTRC impact cap.

[4] As per the 2012 LTRP, approved by BCUC Order G-110-12, the long-run avoided power purchase cost was $84.94/MWh.

[5] Ibid. The long-run marginal cost (LRMC) was $111.96/MWh for BC "clean" resources.

6. ON-BILL FINANCING PILOT PROGRAM

The On-Bill Financing (OBF) pilot program, which was marketed as the Residential Energy Efficiency Loan program, was mandated by the provincial government and provided loans of up to $10,000 to residential customers in the South Okanagan to make energy efficiency improvements to their homes. The loans are to be repaid on the customers' electricity bills over the next 10 years. This pilot program was launched on November 1, 2012 and was closed on March 31, 2014.

The OBF pilot program costs are separate from the DSM budget and in accordance with BCUC Order G-163-12, FBC created a non-rate base deferral account to capture the OBF pilot program costs. In 2014, the FBC portion of the OBF pilot program costs were $9,000.

Appendix A
DSM SUMMARY REPORT IN BCUC FORMAT

Table 1: FBC Demand Side Management Summary Report for Year ended December 31, 2014

Sector/Program	Utility Program Costs				Planning & Evaluation		Total Utility Costs	Customer Incurred Cost	Total Resource Cost	Program Benefits*	Energy Savings	Benefit/Cost Ratios				Levelised Cost
	Direct Incentives	Direct Information	Program Labour	Program Dev.	Planning & Admin.	Monitoring & Eval.						Total Resource*	Modified Total Resource**	Rate Impact	Uility Cost	
	($000s)										MWh					¢/kWh
Residential																
Home Improvements Program	205	28	97	64	36	20	450	306	755	1,305	1,391	1.5	1.5	0.6	2.9	5.2
Low Income and Rental	424	5	33	40	59	32	593	-	593	1,098	2,286	1.9	1.9	0.7	1.9	6.5
Residential Lighting	244	4	23	20	87	48	427	203	629	1,166	3,411	1.5	1.5	0.6	2.7	4.6
Heat Pumps	166	3	57	27	22	12	286	544	830	766	865	1.6	1.6	0.6	2.7	9.8
New Home Program	187	5	37	24	19	10	283	7	290	783	733	2.7	2.7	0.7	2.8	3.5
Residential Total	**1,225**	**45**	**248**	**176**	**222**	**122**	**2,039**	**1,059**	**3,098**	**5,117**	**8,686**	**1.7**	**1.7**	**0.7**	**2.5**	**5.8**
Commercial																
Lighting	367	35	238	5	86	47	779	415	1,194	1,801	3,353	2.0	2.0	0.6	2.3	4.7
Building and Process Improvement	207	10	263	53	49	27	609	916	1,526	1,756	1,926	1.4	1.5	0.8	2.9	8.1
Irrigation	(4)	-	9	-	-	-	5	-	5	-	-	0.0	0.0	0.0	0.0	-
Commercial Total	**571**	**46**	**510**	**58**	**135**	**74**	**1,393**	**1,331**	**2,725**	**3,557**	**5,279**	**1.6**	**1.7**	**0.7**	**2.6**	**6.2**
Industrial																
Industrial Efficiency	132	2	54	-	16	9	212	132	344	367	614	1.2	1.2	0.7	1.7	8.4
Industrial Total	**132**	**2**	**54**	**-**	**16**	**9**	**212**	**132**	**345**	**367**	**614**	**1.2**	**1.2**	**0.7**	**1.7**	**8.4**
Supporting Initiatives	-	40	167	-	-	-	207	-	207	-	-	-	-	-	-	-
Recoveries from 2013	-	-	-	-	-	-	(378)	-	(378)	-	-	-	-	-	-	-
TOTAL	**1,928**	**133**	**978**	**234**	**373**	**205**	**3,473**	**2,522**	**5,996**	**9,041**	**14,580**	**1.6**	**1.7**	**0.7**	**2.6**	**5.9**

Note: Minor differences due to rounding

* Benefits calculated using the long-term avoided power purchase cost of $84.94/MWh.

** Benefits for some measures calculated using BC clean power levelized price of $111.xy/MWh plus 15% NEBs.

Appendix B

HISTORICAL SUMMARY OF FBC'S DSM COSTS AND ENERGY SAVINGS

Table 1: Historical FBC DSM Costs and Energy Savings 2009-2010

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
		2009 (Actual)							**2010 (Actual)**						
		Spend ($000s)			Energy Savings (MWh)			TRC[3]	Spend ($000s)			Energy Savings (MWh)			TRC[3]
		Planned	Actual	Variance	Planned	Actual	Variance	(B/C)	Planned	Actual	Variance	Planned	Actual	Variance	(B/C)
1	**Residential**														
2	Home Improvements	273	145	128	1,024	1,032	8	1.4	294	434	(140)	953	4,948	3,995	3.1
3	Building Envelope[1]														
4	Heat Pumps	515	677	(162)	5,642	3,188	(2,454)	0.7	624	749	(125)	6,377	3,239	(3,138)	1.2
5	Residential Lighting	263	306	(44)	2,822	3,349	526	2.8	243	278	(35)	2,383	2,589	206	2.4
6	New Home Program	341	496	(155)	1,216	1,735	518	2.2	254	247	7	1,392	477	(915)	1.1
7	Appliances[1]														
8	Electronics[1]														
9	Water Heating[1]														
10	Low Income[1]								100	131	(31)	1,000	385	615	0.7
11	Behavioural[1]														
12	*Residential Total*	**1,391**	**1,624**	**(233)**	**10,705**	**9,304**	**(1,401)**	**1.3**	**1,515**	**1,838**	**(323)**	**12,105**	**11,638**	**764**	**1.9**
13	**Commercial**														
14	Lighting	724	422	302	5,505	7,638	2,133	3.0	722	526	196	5,304	7,971	2,667	3.5
15	Building and Process Improvements	563	639	(75)	6,095	8,713	2,618	1.8	658	597	61	6,751	6,685	(67)	1.5
16	Computers														
17	Municipal (Water Handling)[2]														
18	Irrigation[2]														
19	*Commercial Total*	**1,287**	**1,060**	**227**	**11,600**	**16,351**	**4,751**	**2.2**	**1,380**	**1,123**	**257**	**12,055**	**14,655**	**2,600**	**2.1**
20	**Industrial**														
21	Compressed Air	71	41	30	811	398	(413)	0.9	87	25	62	938	114	(823)	0.7
23	EMIS														
22	Industrial Efficiencies	274	195	79	2,189	2,305	116	1.6	302	216	86	2,412	2,853	441	2.1
24	*Industrial Total*	**345**	**236**	**109**	**3,000**	**2,703**	**(297)**	**1.5**	**389**	**241**	**148**	**3,350**	**2,967**	**(383)**	**2.0**
25	**Programs Total**	**3,023**	**2,920**	**103**	**25,305**	**28,358**	**3,053**	**-**	**3,284**	**3,203**	**81**	**27,510**	**29,261**	**2,981**	**2.1**
26	Supporting Initiatives	141	141	0	-	-	-	-	148	155	(7)	-	-	-	
27	Planning & Evaluation	503	402	101	-	-	-	-	519	354	165	-	-	-	-
28	**Total**	**3,667**	**3,464**	**204**	**25,305**	**28,358**	**3,053**	**1.7**	**3,951**	**3,712**	**239**	**27,510**	**29,261**	**2,981**	**2.0**

[1] These programs were included in Home Improvements program

[2] Water Treatment and Wastewater Handling infrastructure were part of Building and Process Improvement

[3] Benefits calculated using RS3808 applicable at the time

Table 2: Historical FBC DSM Costs and Energy Savings 2011

		1	2	3	4	5	6	7
		2011 (Actual)						
		Spend ($000s)			Energy Savings (MWh)			TRC[3]
		Planned	Actual	Variance	Planned	Actual	Variance	(B/C)
1	**Residential**							
2	Home Improvements	2,145	479	1,666	8,960	3,692	(5,268)	1.6
3	Building Envelope[1]							
4	Heat Pumps	694	532	162	3,397	2,257	(1,140)	1.0
5	Residential Lighting	438	239	199	3,420	3,308	(112)	2.2
6	New Home Program	54	205	(151)	105	689	584	1.0
7	Appliances[1]							
8	Electronics[1]							
9	Water Heating[1]							
10	Low Income	305	245	60	540	1,447	(907)	1.0
11	Behavioural[1]							
12	*Residential Total*	**3,636**	**1,700**	**1,936**	**16,422**	**11,393**	**(6,843)**	**1.3**
13	**Commercial**							
14	Lighting	1,114	1,995	(881)	7,370	20,577	13,207	2.3
15	Building and Process Improvements	572	606	(34)	3,010	1,386	(1,624)	0.7
16	Computers							
17	Municipal (Water Handling)	432	231	201	3,560	2,199	(1,361)	1.6
18	Irrigation[2]							
19	*Commercial Total*	**2,118**	**2,832**	**(714)**	**13,940**	**24,162**	**10,222**	**1.9**
20	**Industrial**							
21	Compressed Air							
23	EMIS	10	9	1	80	-	(80)	-
22	Industrial Efficiencies	603	128	475	9,280	794	(8,486)	2.5
24	*Industrial Total*	**613**	**137**	**476**	**9,360**	**794**	**(8,566)**	**2.4**
25	**Programs Total**	**6,367**	**4,669**	**1,698**	**39,722**	**36,349**	**(5,187)**	**1.8**
26	Supporting Initiatives	725	658	67	-	-	-	-
27	Planning & Evaluation	750	590	160	-	-	-	-
28	**Total**	**7,842**	**5,918**	**1,924**	**39,722**	**36,349**	**(5,187)**	**1.6**

[1] These programs were included in Home Improvements program

[2] Irrigation was included in Municipal (Water Handling)

[3] Benefits calculated using RS3808 applicable at the time

Table 3: Historical FBC DSM Costs and Energy Savings 2012-2013

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		2012 (Actual)							**2013 (Actual)**							
		Spend ($000s)			Energy Savings (MWh)			TRC	Spend ($000s)			Energy Savings (MWh)			TRC	mTRC
		Planned	Actual	Variance	Planned	Actual	Variance	(B/C)	Planned	Actual	Variance	Planned	Actual	Variance	(B/C)	(B/C)
1	**Residential**															
2	Home Improvements	1,719	637	1,082	7,620	4,656	(2,964)	1.7	1,961	725	1,236	8,680	5,222	(3,458)	1.7	1.8
3	Building Envelope[1]															
4	Heat Pumps	703	636	67	3,397	2,161	(1,236)	1.0	698	532	166	3,397	2,100	(1,297)	1.3	1.9
5	Residential Lighting	328	337	(9)	2,530	2,599	69	1.8	313	473	(160)	2,467	3,300	833	1.4	1.4
6	New Home Program	43	314	(271)	90	1,040	950	1.4	45	782	(737)	93	3,000	2,907	1.9	1.9
7	Appliances[1]	247	332	(85)	690	1,248	558		267	241	26	739	578	(161)		
8	Electronics[1]															
9	Water Heating[1]															
10	Low Income	677	308	369	1,774	1,054	(720)	1.3	660	415	245	1,570	2,000	(430)	1.6	1.6
11	Behavioural[1]															
12	*Residential Total*	**3,717**	**2,564**	**1,153**	**16,101**	**12,758**	**(3,343)**	**1.5**	**3,944**	**3,168**	**776**	**16,946**	**16,200**	**(1,606)**	**1.6**	**1.8**
13	**Commercial**															
14	Lighting	1,157	2,152	(995)	7,390	14,256	6,866	2.2	1,170	1,235	(65)	7,140	7,600	460	2.0	2.0
15	Building and Process Improvements	659	612	47	3,410	1,959	(1,451)	1.3	738	594	144	3,730	2,600	(1,130)	1.6	1.6
16	Computers															
17	Municipal (Water Handling)	383	255	128	2,580	1,677	(903)	2.6	177	80	97	1,110	700	(410)	1.4	1.4
18	Irrigation[2]															
19	*Commercial Total*	**2,199**	**3,019**	**(820)**	**13,380**	**17,892**	**4,512**	**2.0**	**2,085**	**1,909**	**176**	**11,980**	**10,900**	**(1,080)**	**1.8**	**1.8**
20	**Industrial**															
21	Compressed Air															
23	EMIS	27	10	17	190	-	(190)	2.0	41	17	24	290	-	(290)	-	-
22	Industrial Efficiencies	323	163	160	2,290	937	(1,353)	-	323	307	16	2,290	2,500	210	1.0	1.0
24	*Industrial Total*	**350**	**173**	**177**	**2,480**	**937**	**(1,543)**	**1.9**	**364**	**324**	**40**	**2,580**	**2,500**	**(80)**	**1.0**	**1.0**
25	**Programs Total**	**6,266**	**5,756**	**510**	**31,961**	**31,587**	**(374)**	**1.8**	**6,393**	**5,401**	**992**	**31,506**	**29,600**	**(2,766)**	**1.9**	**2.0**
26	Supporting Initiatives	725	816	(91)	-	-	-	-	725	706	19	-	-	-	-	-
27	Planning & Evaluation	740	728	12	-	-	-	-	760	748	12	-	-	-	-	-
28	**Total**	**7,731**	**7,300**	**431**	**31,961**	**31,587**	**(374)**	**1.6**	**7,878**	**6,855**	**1,023**	**31,506**	**29,600**	**(2,766)**	**1.6**	**1.7**

[1] These programs were included in Home Improvements program

[2] Irrigation was included in Municipal (Water Handling)

Appendix C
EXECUTIVE SUMMARY

COMMERCIAL PRODUCT REBATE PROGRAM EVALUATION REPORT

EVERGREEN ECONOMICS

Evaluation of the FortisBC Commercial Product Rebate Program

March 30, 2015

DISCOVERY RESEARCH

Michaels energy

Dr. Phil Willems / PWP

1 Executive Summary

1.1 Introduction

This report presents the findings of the impact and process evaluation of the FortisBC Commercial Product Rebate Program covering the 2012-2014 period. This program was designed to help small- and medium-sized businesses determine which energy efficiency improvements would suit their business needs and to provide them with easy access to a large set of prescribed rebates. Customers access the program via a custom-built online application form, which provides a cost-effective means of reaching a more difficult to reach customer segment.

The evaluation relied on several data collection and analysis methods to complete the impact and process research:

- **Engineering analysis.** The Evergreen team reviewed the background information and technical assumptions used to determine the deemed savings for all measures covered by the Commercial Product Rebate Program. Recommendations for changing savings parameters are made where appropriate based on this review.
- **Participant phone surveys.** A phone survey was conducted on a sample of program participants (n=47). These surveys were used primarily to collect feedback on the program experience as part of the process evaluation.
- **Self-report free-ridership analysis.** A separate component of the participant phone survey was a battery of questions asking what equipment would have been installed if the FortisBC program had not been available. Responses for these questions were scored and used to create an estimate of program free-ridership.
- **Trade ally interviews.** Interviews were conducted with contacts provided by FortisBC (n=10) to evaluate the effectiveness of the program's design and delivery.

Details on each of these analysis methods and the evaluation estimates they produced are discussed below.

1.2 Impact Evaluation Results

1.2.1 Engineering Review

The engineering review examined the background and technical assumption used to develop the deemed savings values for the Commercial Product Rebate Program. General topic areas that were covered in the engineering review included:

- Lighting hours of use
- Lighting wattage reductions
- Electric griddles and convection ovens
- Hot food holding cabinets
- High efficiency air conditioning and RTU controllers
- Variable speed drives on HVAC pumps and fans
- Programmable thermostats

- Commercial refrigeration upgrades
- Air compressor and pool pump upgrades

In general, the deemed savings values for this program in all these areas are well documented, reasonable and consistent with industry practice found in other jurisdictions. We recommend changes to the deemed savings values in a few areas, but these have a small effect on the overall savings being claimed.

The engineering adjustments discussed above were applied to the Commercial Product participant data covering the 2012-2014 evaluation period. Since the vast majority of participation involved lighting measures, the engineering adjustments had a very small effect on the claimed program savings for this period. The engineering adjustments resulted in a 0.1 percent reduction in savings, which yields a 99.9 percent Gross Realization Rate; this rate is used as part of the overall evaluation savings calculation as discussed below.

1.2.2 Net Impact Analysis

The net impact analysis utilized a self-report survey method to estimate a free ridership rate for the program. For the purposes of this analysis, free-ridership measures the rate at which program participants would have installed the same program-qualifying equipment or taken the same action (e.g., installed energy efficient lighting) in the absence of the program. Information needed to support this approach was collected as part of the participant phone survey.

The self-report method calculates free-ridership as the sum of two components:

- The influence of program-related factors on a customer's decision to install equipment, termed the **Program Influence Score,** which can take on a value from 0 to 0.5; and
- The customer's description of actions they would have taken had the program not existed, termed the **Change Score**, which can also take on a value of 0 to 0.5.

The values for the two scores are determined from participant responses to survey questions, and summed to estimate a final free-ridership rate ranging from 0 to 1.0. The following sections describe how the evaluation team scored program influence and change in order to calculate free-ridership and net-to-gross adjustment factors for the program.

The net-to-gross calculation results for the Commercial Product Rebate Program are shown in Table ES-1, along with a breakdown of the major measure groups included in the survey sample. The weighted values are based on the expected *ex ante* savings for the measures installed by participants included in the survey sample. As expected, the net-to-gross value is lower for T8s (a more established measure that has been commonly adopted) and higher for newer technologies such as LEDs.

Table ES-1: Net-to-Gross Results[1]

	Observations	Unweighted Net-to-Gross Ratio	Weighted Net-to-Gross Ratio
All Commercial Products	44	0.49	0.50
LEDs	27	0.59	0.69
T8s	12	0.40	0.26
High Bays*	2	0.50	0.50
Other	3	0.00	0.00

Source: Analysis by Evergreen Economics of data collected through a telephone survey of Commercial Product Rebate program participants.

* Raw survey results of 0.50 for High Bays are shown in the table. However, given the small sample size (n=2), the LED value of 0.69 is assigned to High Bays in the final savings calculations.

1.2.3 Combined Impact Evaluation Results

Savings for the Commercial Product Rebate Program are calculated using each of the analysis components discussed above and are summarized in Table ES-2 for both energy (kWh) and demand (kW). The Gross Realization Rate is based solely on the engineering adjustments as applied to the current participant population. The weighted net-to-gross ratio is the result of applying the measure-level net-to-gross ratios discussed previously to the participant population. Note that the weighted net-to-gross value is also different (higher) between the survey sample and the participant population to better match the distribution of measures in the participant population.

To calculate the final savings for the program, the *ex ante* savings are multiplied by the Gross Realization Rate to determine Gross Annual Savings. This value is then multiplied by the net-to-gross ratio determined from the phone survey data to obtain Net Annual Savings. The Final Realization Rate (0.60) is obtained by dividing the Net Annual Savings value by the original *ex ante* savings total.

[1] 14 percent of participants purchased a combination of LEDs and T8s. However, because the survey only asked free-ridership questions for the primary measures, participants were categorized by whichever type of measure they purchased the most of under the FortisBC Commercial Product Rebate Program.

Table ES-2: Summary of Gross and Net Realized Savings

	Ex Ante Electrical Savings	Gross Realization Rate (%)	Gross Annual Savings	Net-to-Gross Ratio (Weighted)	Net Annual Savings	Final Realization Rate
Energy (kWh)	3,544,882	99.9%	3,543,268	0.60	2,114,444	60.0%
Demand (kW)	821.6	99.9%	821.1	0.60	491.3	60.0%

Source: Analysis by Evergreen Economics of impact evaluation results combined with participation data provided by FortisBC.

1.3 Process Evaluation

In August 2014, a phone survey was conducted with businesses that participated in the Commercial Product Rebate Program during the 2012-2014 period. To support the process evaluation, this survey covered a variety of topics including the program participation process, expected energy savings and overall satisfaction with the program. From a total sample frame of 195 participants, we were able to obtain 47 completed surveys for a response rate of approximately 24 percent.

Prior to the purchase of their new energy efficient equipment, participants learned about the FortisBC rebate program in a variety of ways. A majority of participants had not participated in a FortisBC energy efficiency program prior to their recent involvement with the Commercial Product Rebate Program, while a quarter of the participants indicated they had participated in at least one other FortisBC rebate program. The most common methods included learning about the rebate program through a contractor or distributor, by word of mouth (either from a business associate or co-worker), and from a FortisBC representative. Participants were also asked to assess how clear they found the information regarding the requirements to qualify for rebates. A majority of participants (57%) said the information was very clear, and none responded that the information was very confusing.

Throughout the survey, participants were asked several questions regarding satisfaction with various aspects of their participation in the Commercial Product Rebate Program. Participants were asked to rate these features using a scale from 1 to 10, with 1 being not at all satisfied and 10 being very satisfied.

Overall, participants reported a very high level of satisfaction across all aspects of the Commercial Product Rebate Program. More than 65 percent of participant responses were in the 8-10 range across all four categories. Conversely, less than 1 percent provided responses in the 1-4 range. Satisfaction was highest for the program overall, with 79 percent rating satisfaction in the 8-10 point range. Similarly, respondents also had high marks for the program application process, with 76 percent responding in the 8-10 point range. Satisfaction was only slightly lower with the rebate amount (68 percent in the 8-10 range) and with FortisBC overall (66 percent).

In addition to the participant phone surveys, the Evergreen team also conducted in-depth interviews with various entities involved in the program. In February of 2015, Evergreen Economics completed 10 interviews with electrical contractors, wholesalers, lighting retailers and end-user maintenance managers who participated in FortisBC's Commercial Product Rebate Program.

Across the range of trade allies, all of the participants were generally pleased with the Commercial Product Rebate Program. Specifically, multiple participants noted that the point-of-sale rebate process along with the actual rebate levels not only help drive sales, but also make energy efficient equipment affordable to customers that previously could not afford it.

While 40 percent of participants had no recommendations for improving the program, some of the minor improvements that trade allies suggested included:

- Clearly outlining the payment process on large-scale projects;
- Including rebate offerings for solar products;
- Increasing communication on program changes; and
- Providing marketing materials to contractors, wholesalers and retailers to help educate consumers on energy efficient equipment.

1.4 Conclusions and Recommendations

The following conclusions are derived from the FortisBC Commercial Product Rebate Program evaluation; these conclusions are accompanied by recommendations to improve the Commercial Product Rebate Program offering.

The point-of-sale rebate process helps streamline the Commercial Products program. Electrical contractors, wholesalers/retailers and end-user maintenance managers all said the point-of-sale rebate method has been effective in encouraging participation and making the program more efficient by providing immediate rebates. These trade allies also emphasized the simplicity of the program from the customer standpoint as an important benefit.

Recommendation #1: Continue to implement a point-of-sale rebate method for current offerings and look to further streamline large-scale retrofit projects that include lighting fixtures by minimizing paperwork and lag time between energy audit and customers receiving the appropriate rebate.

Participating contractors and wholesalers would like to receive more updates on program changes. Overall, participants were very satisfied with their interactions with FortisBC staff and felt that FortisBC staff members were able to answer any program-related questions they had. However, participants noted that additional communication with FortisBC staff on program changes would be helpful.

Recommendation #2: Email interested contractors and wholesalers with quarterly updates on the Commercial Product Rebate Program, especially highlighting any process changes or rebate updates.

Due to the recent changes, a majority of participants were unaware of the current administrative process. A majority of participants said they were unfamiliar with the new FortisBC online application and tracking website and were unaware of who was responsible for completing the rebate application under the new system.

Recommendation #3: Further educate participating contractors, wholesalers and retailers on the structure of the new online process, including the specific information needed on rebate applications, both from themselves and from end users, in addition to program updates on program-eligible products.

Most end-users (76%) heard about the program through an electrical contractor/distributor or through word of mouth. In contrast, FortisBC staff members were responsible for informing only 13 percent of end-users of the Commercial Product Rebate Program.

Recommendation #4: Continue to leverage contractors as a means to increase program awareness. In addition to working with contractors, consider increasing marketing efforts towards end-users to help educate commercial customers on the benefits of the program and to help drive program participation.

The current deemed savings values are well documented and are generally consistent with savings values used in similar programs. Based on our review of the eligible measures, it appears that the savings values are well documented, and that the deemed savings levels are appropriate for this program. However, a small number of lighting measures (13 out of 45 total) were found to have demand savings that varied significantly from what was expected.

Recommendation #5: Reference the lighting wattage reduction analysis performed by the Evergreen technical evaluators to help make program estimates more accurate and to allow the program to capture additional savings from the high wattage fixture measures.

Net impacts are consistent with similar programs. The net-to-gross ratios estimated for the program are consistent with expectations and the Evergreen team's experience with similar programs. In the Commercial Product Rebate Program, the significant number of T8s rebated through the program resulted in a lower overall net-to-gross ratio for the program. Since this measure is fairly common, it is not surprising that the level of free-ridership will be higher than for newer technologies such as LEDs.

Recommendation #6: Consider phasing out T8s to boost program net impacts.

Using a single lighting hours of use value results in less accurate impact estimates on a yearly basis as the distribution of participating customers across building types will shift over time. Accuracy of the deemed savings values could be improved by adjusting the operating hours based on building type. This is particularly true for lighting and some HVAC measures, where operating hours vary significantly by building type and are an important component in the savings calculations. If building type information is available, then the savings values can be tailored more closely to match the likely operating conditions for these measures.

Recommendation #7: Customer building type information should be collected as part of the program application to improve accuracy of the deemed savings values.

Ongoing management resources are needed to ensure that the program is run efficiently and customers and trade allies have the resources they need to interact with the program successfully. A prior administrator for the program noted that customers and trade allies needed a significant amount of help in filling in the customer rebate application—a task that is met by the

energy efficiency representative assigned to the program. Customers will likely require even more assistance given the recent move to the online application process and a program manager would be integral in improving the customer experience over time. Further evidence of the need for a robust support structure is that most trade allies were unaware of changes in program administrative processes, and many participating contractors and wholesalers would welcome more frequent updates on program changes. If, as recommended, T8s are eventually phased out and if revisions in assumed hours of use result in changes to incentive levels, timely and more frequent communications will need to be incorporated into the program, which would be more likely to happen with management resources dedicated to this program.

Recommendation #8: Have dedicated FortisBC program management resources (0.5 FTE) for the Commercial Product Rebate Program. This would help ensure sufficient resources, including ongoing oversight and direction for program staff, attention to program design and implementation of evaluation recommendations, resource for approving payments, improvement of self-service website instructions, to help answer questions about the participation process and provide timely updates on any program changes