



Doug Slater
Director, Regulatory Affairs

Gas Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (778) 578-3874
Cell: (778) 214-3842
Fax: (604) 576-7074
Email: doug.slater@fortisbc.com
www.fortisbc.com

March 31, 2020

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC
V6Z 2N3

Attention: Mr. Patrick Wruck, Commission Secretary and Manager, Regulatory Support

Dear Mr. Wruck:

Re: FortisBC Inc. (FBC)
Electricity Demand-Side Management (DSM) – 2019 Annual Report

Attached please find the Electricity DSM Program 2019 Annual Report for FBC (the Annual Report).

If further information is required, please contact Sarah Wagner, Senior Regulatory Analyst, at (250) 469-6081.

Sincerely,

FORTISBC INC.

Original signed:

Doug Slater

Attachment



FortisBC Inc.

**Electricity
Demand-Side Management Programs
2019 Annual Report**

March 31, 2020

Table of Contents

1. REPORT OVERVIEW.....	1
1.1 Portfolio Level Results.....	1
1.2 Meeting Adequacy Requirements of the Demand-Side Measures Regulation.....	2
1.3 Addressing BCUC Directives.....	3
1.4 Collaboration & Integration	5
1.5 Portfolio Summary	6
2. RESIDENTIAL PROGRAM AREA	7
2.1 Overview	7
2.2 Home Renovation	7
2.3 New Home	8
2.4 Residential Lighting	8
2.5 Rental Apartment.....	9
2.6 Selected Highlights	9
3. LOW INCOME PROGRAM AREA	10
3.1 Overview	10
3.2 Self Install	10
3.3 Direct Install.....	10
3.4 Social Housing Support	11
3.5 Selected Highlights	11
4. COMMERCIAL PROGRAM AREA	12
4.1 Overview	12
4.2 Prescriptive Program	12
4.3 Custom Program	13
4.4 Selected Highlights	13
5. INDUSTRIAL PROGRAM AREA	14
5.1 Overview	14
5.2 Prescriptive Program	14
5.3 Custom Program	15
5.4 Selected Highlights	15

6. CONSERVATION EDUCATION AND OUTREACH.....	16
6.1 Overview	16
6.2 Residential Education	16
6.3 Customer Engagement Tool	16
6.4 Commercial Education.....	17
6.5 School Education	17
6.6 Highlights.....	17
7. SUPPORTING INITIATIVES	18
7.1 Overview	18
7.2 Commercial Energy Specialist Program	18
7.3 Community Energy Specialist Program.....	19
7.4 Trade Ally Network	19
7.5 Codes and Standards.....	19
7.6 Reporting Tool & Customer Application Portal.....	20
8. PORTFOLIO EXPENDITURES	21
8.1 Overview	21
8.2 Program Evaluation Activities	21
8.3 DSM Studies	22
8.4 Innovative Technologies.....	22
9. DEMAND RESPONSE	24
9.1 Overview	24
9.2 Kelowna Area Demand Response Pilot	24
APPENDIX A – DETAILED BENEFIT-COST RATIOS.....	A-1
Appendix A-1 – DSM Programs Cost and Savings Summary Report for 2019	A1-1
Appendix A-2 – Historical Summary of DSM Cost and Energy Saving Results (2014-18).....	A2-1

Index of Tables and Figures

Table 1-1: DSM Portfolio Summary Results for 2019	2
Table 1-2: 2019 DSM Funding Transfers and 2020 Carryover Amounts	5
Table 2-1: 2019 Residential Program Area Results Summary	7
Table 3-1: 2019 Low Income Program Results Summary	10
Table 4-1: 2019 Commercial Program Results Summary	12
Table 5-1: 2019 Industrial Program Results Summary	14
Table 6-1: 2019 Conservation and Outreach Results Summary	16
Table 7-1: 2019 Supporting Initiatives Results Summary	18
Table 8-1: 2019 Portfolio Expenditures Results Summary	21
Table 8-2: 2019 DSM Program Evaluation and Research Activities	22
Table 9-1: 2019 Demand Response Results Summary	24
Table A1-1: FBC DSM Summary Report for Year Ended December 31, 2019	A1-1
Table A2-1: Historical FBC DSM Costs and Energy Savings 2014 – 2018.....	A2-1

1. REPORT OVERVIEW

This Demand-Side Management (DSM) Annual Report (the Report) provides highlights of FortisBC Inc.'s (FBC or the Company) DSM programs for the year ended December 31, 2019 and provides a summary of results achieved in 2019. The Report reviews the progress of FBC's DSM programs in meeting the approved 2019-2022 DSM Plan¹ (Plan) by educating and incenting FBC's customers to conserve energy and improve the energy efficiency of their homes, buildings and businesses.

Section 1.1 contains a statement of financial results (Table 1-1); including the Total Resource Cost (TRC) benefit/cost ratio cost-effectiveness test results by Program Area for 2019. Section 1.2 includes summaries of how FBC's DSM programs met the requirements of the British Columbia Demand-Side Measures Regulation (DSM Regulation) enacted under the Utilities Commission Act (UCA). Sections 2 through 9 of the Report provide an overview of DSM program activities in 2019, by Program Area, including program-level comparisons of actual energy savings and costs to Plan.

Consistent with previous DSM annual reports, additional details on 2019 program results, cost-effectiveness test results, as well as historical DSM costs and energy savings are included in Appendix A-1 and Appendix A-2, respectively.

An Evaluation report on Residential Products, including lighting and appliances, is underway but the customer in-store intercepts were not able to be undertaken during the fall retail campaign as planned, and therefore completion of the report for integration into the 2019 DSM Report is delayed. The intercepts are to be rescheduled during the next retail campaign, and the completed report is to be filed in due course.

1.1 PORTFOLIO LEVEL RESULTS

Table 1-1 provides an overview of FBC's 2019 energy savings, expenditures and TRC cost-effectiveness test results for all DSM programs, by Program Area and at the portfolio level. FBC achieved an overall portfolio TRC of 1.9 on DSM expenditures of \$10.1 million, an increase of \$2.9 million over 2018. Electricity savings totalled 25.8 GWh, a decrease of 5.4 GWh compared to 2018. All of FBC's DSM programs passed the TRC test at the program level, although certain measures, e.g. BC Step Code 5 in the New Home program, required the modified TRC to pass.

FBC's 2019 DSM expenditures were \$10.1 million or 92 percent of Plan. The 2019 DSM energy savings were 25.8 GWh or 79 percent of Plan, primarily due to lower than expected Industrial program participation and resulting impacts to energy savings.

¹ 2019-2022 DSM Plan expenditures were accepted by the Commission pursuant to Order G-47-19.

In accordance with past practice, additional detail and results for the TRC, Utility Cost Test (UCT), and the Ratepayer Impact Measure (RIM) cost effectiveness tests, and Levelized Costs are provided for the overall portfolio and each Program Area in Appendix A-1.

Table 1-1: DSM Portfolio Summary Results for 2019

Program Area (Sector)	2019 Plan Savings (kWh)	Actual Savings YE (kWh)	2019 Plan (\$000s)	Actual YE (\$000s)	Benefit/Cost TRC
Residential	6,036,698	6,501,343	\$ 2,086	\$ 2,189	2.7
Low Income	1,212,666	1,348,981	\$ 843	\$ 937	1.6
Commercial	15,541,892	14,962,886	\$ 3,178	\$ 3,385	2.1
Industrial	10,036,698	2,977,930	\$ 1,762	\$ 1,096	1.7
Education and Outreach			\$ 566	\$ 575	
Supporting Initiatives			\$ 1,218	\$ 869	
Portfolio			\$ 776	\$ 762	
Demand Response			\$ 477	\$ 264	
Total	32,827,954	25,791,140	\$ 10,906	\$ 10,077	1.9

FBC's DSM expenditures in 2019 were cost-effective according to the methodology set out in section 4 of the DSM Regulation, achieving a portfolio TRC value of 1.9. The TRC for low-income programs includes a 40 percent adder in the benefits, as per DSM Regulation, increasing the deemed cost effectiveness for the Low Income Program Area. The Low Income Program Area achieved a TRC of 1.6, after including the adder.

1.2 MEETING ADEQUACY REQUIREMENTS OF THE DEMAND-SIDE MEASURES REGULATION

FBC notes the Plan complies with the adequacy requirements of the DSM Regulation, including the most recent amendments that came into effect on March 24, 2017. The DSM Regulation adequacy requirements are as follows:

A public utility's plan portfolio is adequate for the purposes of Section 44.1 (8) c of the Act only if the plan portfolio includes all the following:

- a) a demand-side measure intended specifically to either (i) assist residents of low-income households to reduce their energy consumption, or (ii) reduce energy consumption in housing owned or operated by a local government, specified societies and associations, or a governing body of a first nation, if the benefits of the reduction primarily accrue to low-income households occupying the housing, the prescribed housing providers or the first nation governing body if the households in its housing are primarily low-income;
- 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;
- d) an education program for students enrolled in post-secondary institutions in the public utility's service area;
- e) one or more demand-side measures to provide resources as set out in paragraph (e) of the definition of "specified demand-side measure", representing no less than
 - (i) an average of 1% of the public utility's plan portfolio's expenditures per year over the portfolio's period of expenditures; and
- f) one or more demand-side measures intended to result in the adoption by local governments and first nations of a step code or more stringent requirements within a step code.

In later sections of the Report, FBC provides further details on how its 2019 DSM activities meet the adequacy of the DSM Regulation set out above. Section 3 of the Report discusses programs and incentives for low-income customers, including Energy Savings Kits (ESK), the Energy Conservation Assistance Program (ECAP) and the Non-Profit Custom Program. With regards to rental apartment buildings, FBC's offers include the Rental Apartment Efficiency Program (RAP), detailed in Section 2.5. Tenants can also access ECAP and ESK offers available to qualifying rental properties.

In terms of school education programs (Section 6.5), FBC funded a variety of initiatives for K-12 students, including FortisBC Energy Leaders, and also funded post-secondary student engagement initiatives.

FBC provided resources indicated by clause (e) for Codes and Standards (Section 7.5), which are fulfilled through third party funding arrangements. An expenditure of \$120 thousand, of the Plan \$97 thousand, was recorded.

FBC supported step code adoption through its New Home Program (Section 2.3) with progressive rebates to align with the BC Energy Step Code, and by funding Community Energy Specialists to local governments (Section 7.3).

1.3 ADDRESSING BCUC DIRECTIVES

The BCUC Decision and Order G-47-19 on FBC's 2019-2022 DSM Plan filing continues the practice of funding transfers between program areas, as stipulated and furthermore authorizes the Company to rollover unspent Plan amounts to the subsequent fiscal year.

The practice of transferring expenditure amounts within FBC's DSM portfolio applies to the tracking of actual versus approved spending amounts for each of the Program Areas. It acknowledges that the approved expenditure amount is a forecast and that actual spending in

each Program Area will inevitably vary from the forecast to some degree. A Program Area in which annual expenditures are somewhat less than Plan has availability within its approved program expenditure envelope to balance against a Program Area that might spend somewhat more than its approved amount. This balancing or 'transfer' allows FBC to maximize the use of its total approved portfolio expenditure amount while managing the uncertainties and external factors that can impact program development and delivery.

Rollover refers to any approved Program Area expenditure amount that was not spent in a given year (after accounting for funding transfers) and can therefore be spent in the following year. These amounts are 'rolled over' to the next year's annual approved spending limit. The ability to roll funds over from one year to the next also provides flexibility for FBC to manage uncertainties and external factors that can impact program development and delivery – in this case by making unspent expenditure amounts in one year available to benefit customers in the next year.

Order G-47-19 directs FBC "to continue filing DSM annual reports with the BCUC in the manner and form of previous years, but to also include information that clearly identifies all funding transfers that occur between program areas within a year, and the amounts to be rolled over to the following year for each program area". Furthermore, "[Only] In cases where a proposed transfer into or out of an approved program area is greater than twenty five percent of that program area's accepted expenditures for the year in question, prior BCUC approval is required."

The following Table 1-2 shows the 2019 funding transfers between Program Areas and carryover expenditure amounts available by Program Area for 2020. FBC notes that all funding transfers completed in 2019 were within the prescribed 25 percent of Program Area Plan threshold.

The 2019 transfers consisted of moving \$413 thousand out of the Industrial Program Area, which represents 23 percent of its Plan, and into the Residential (\$103 thousand), Low Income (\$94 thousand), Commercial (\$206 thousand) and CEO (\$9 thousand) Program Areas to support 2019 performance in those sectors. The remaining Industrial Program Area budget of \$254 thousand will be carried over into 2020.

The last column of Table 1-2 indicates the carryover amounts available, by program area, in 2020.

Table 1-2: 2019 DSM Funding Transfers and 2020 Carryover Amounts

Program Area (Sector)	2019 Plan (\$000s)	2019 Actual YE (\$000s)	2019 Actual less Plan (\$000s)	2019 Funding Transfers In (Out) (\$000s)	2019 Transfer as percent of Plan	2020 Carryover Amounts (\$000s)
Residential	\$ 2,086	\$ 2,189	103	103	5%	-
Low Income	\$ 843	\$ 937	94	94	11%	-
Commercial	\$ 3,178	\$ 3,385	206	206	6%	-
Industrial	\$ 1,762	\$ 1,096	(667)	(413)	-23%	254
Education and Outreach	\$ 566	\$ 575	9	9	2%	-
Supporting Initiatives	\$ 1,218	\$ 869	(349)	-		349
Portfolio	\$ 776	\$ 762	(14)	-		14
Demand Response	\$ 477	\$ 264	(213)	-		213
Total	\$ 10,906	\$ 10,077	(\$830)	\$ 0		\$ 830

1.4 COLLABORATION & INTEGRATION

FBC continues to collaborate and integrate DSM programming among BC's large energy utilities, as well as with other entities such as governments and industry associations. The Company recognizes that doing so will maximize program efficiency and effectiveness.

FBC, FortisBC Energy Inc. (FEI), and BC Hydro and Power Authority (BC Hydro) (collectively, the BC Utilities) continued to collaborate on various programs and projects through their voluntary Memorandum of Understanding (MOU), the purpose of which is to develop enhanced utility integration in support of government legislation, policy and direction.

As an example, in 2019 BC Hydro shared their Commercial End-Use Survey (CEUS) instrument, which FortisBC adapted to use in its joint gas/electric CEUS that was fielded in early 2020. The CEUS results will be used as key inputs to FortisBC's 2020 Conservation Potential Review updates.

The BC Utilities also continue to experience cost efficiencies from their collaboration efforts, including streamlined application processes for customers, extended program reach and consistent and unified messaging intended to improve energy literacy.

FBC, FEI and the Ministry of Energy, Mines and Petroleum Resources (MEMPR) continued to collaborate in 2019. FBC's collaboration with MEMPR on CleanBC initiatives includes administering incentives and enabling applications for CleanBC rebates through FBC's application processes to provide a streamlined customer experience.

Although collaborative activities are captured in Program Area sections, the tables contained throughout this Annual Report include only expenditure and savings information for FBC's expenditure portfolio.

1.5 *PORTFOLIO SUMMARY*

FBC's DSM portfolio met the goal of cost effectiveness, with a TRC value of 1.9 in 2019. FBC believes that both energy savings accounted for in the portfolio and the resulting TRC are conservative.

In addition to the direct energy benefits accounted for in the TRC, benefits from additional activities, such as CEO and Supporting Initiatives, play an important role in supporting the development and delivery of programs, while helping facilitate market transformation in British Columbia.

2. RESIDENTIAL PROGRAM AREA

2.1 OVERVIEW

The Residential Program Area achieved aggregate electricity savings of 6.5 GWh, a 25 percent increase over 2018, and an overall TRC of 2.7. Approximately \$2.2 million was invested in Residential energy efficiency programs in 2019, compared to \$1.4 million in 2018, and 75 percent of those expenditures were incentives to customers. The energy savings achieved from Residential programs were 107 percent of Plan.

Residential programs address customers' major end-uses in residential detached dwellings, townhomes, mobile homes and rental apartments, and include retrofit and new home applications. Residential programs, in combination with education and outreach activities, play an important role in driving the culture of conservation in British Columbia.

Table 2-1 summarizes the actual expenditures for the Residential Program Area in 2019 compared to Plan, including incentive and non-incentive spending, and annual electric savings.

Table 2-1: 2019 Residential Program Area Results Summary

Program	Savings (kWh)		2019 Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual YE	Total	Total	Incentive	Non-Incentive
Home Renovation	3,264,410	3,227,312	\$ 1,200	\$ 1,487	\$ 1,403	\$ 83
New Home	340,148	111,976	\$ 184	\$ 90	\$ 72	\$ 18
Lighting	2,283,947	3,141,261	\$ 157	\$ 218	\$ 174	\$ 44
Rental Apartment	148,193	20,793	\$ 54	\$ 33	\$ 4	\$ 28
Labour and expenses			\$ 491	\$ 362		\$ 362
Total	6,036,698	6,501,343	\$ 2,086	\$ 2,189	\$ 1,654	\$ 535

2.2 HOME RENOVATION

The Home Renovation Rebate (HRR) program encourages customers to take a whole home approach to their energy efficiency upgrades by consolidating space heating, water heating and building envelope measures into an overarching program. This program is a collaboration between the BC Utilities, and MEMPR CleanBC Better Homes program.

Notable highlights for the year include:

- FBC and program partners continue to support the evolving Home Performance industry through trades outreach, training, development of program registered contractor directories, site visits for program compliance quality installation and contractor accreditation initiatives. These activities provide value to customers through increased performance and longevity of installed equipment and improved comfort of their homes. Funding for these activities are outlined in Enabling Activities, Trade Ally Network.

- The optional Program Registered Contractor (PRC) initiative was launched for heat pump contractors, in partnership with BC Hydro. Contractors opting to participate in the PRC program were required to take part in best practices training and pass three site visits prior to receiving their Program Registered Contractor designation.
- A new measure introduced in 2019 was communicating or “smart” thermostats.
- Over 360 customers received heat pump rebates in 2019, an increase of 25 percent over 2018. Program improvements implemented in late 2018 streamlined the customer application process resulting in increased participation in 2019.
- Heat Pump Water Heater activity levels continue to gain traction with 47 participants installing such units, an 88 percent increase over 2018.
- Bathroom fan rebates, captured under the HRR program, were offered through the spring and fall retail campaigns.

2.3 NEW HOME

FBC, in collaboration with FEI, transitioned its whole home incentives from the ENERGY STAR standard to align with the five tiers of the BC Energy Step Code for Part 9 Buildings, as directed in the 2017 Amendment to the DSM Regulation. The Amendment supports the BC Utilities’ ability to provide incentives for builders who adopt and comply with the Energy Step Code in municipalities across BC.

The New Home Program continued to see participation increase in 2019 with a majority of projects registering at the top tiers of the BC Energy Step Code. FBC continues to collaborate with FEI, BC Hydro, MEMPR and BC Housing to provide education to builders and energy advisors, and support policy regarding High Performance Homes in BC.

2.4 RESIDENTIAL LIGHTING

As LED lights are moving towards market maturation it becomes increasingly difficult to maintain historical program participation levels. Two successful retail campaigns offering point-of-sale rebates, for lighting and other qualifying retail products, ran in spring and fall.

An initiative to retrofit lighting in Indigenous-owned housing was implemented with Indigenous communities within FBC’s service area. Inventories of existing bulb types and quantities were completed and LED replacements were supplied and shipped for installation by the communities.

The three initiatives combined resulted in program results exceeding planned savings by 38 percent and expenditures by 37 percent.

2.5 RENTAL APARTMENT

There are three components to the Rental Apartment Program (RAP):

1. To provide direct install in-suite energy efficiency measures for occupants (renters) in multi-family rental properties;
2. To provide rental building owners and/or property/management companies with energy assessments recommending building level energy efficiency upgrades, such as common area lighting upgrades; and
3. To provide support in implementing the recommended upgrades and applying for rebates.

The program is offered jointly by FEI and FBC in the shared service territory (SST)² and by FEI outside the SST. Ten buildings in the SST received in-suite installations in 2019, with 3,058 individual measures installed which included LED bulbs, low-flow showerheads and faucet aerators.

2.6 SELECTED HIGHLIGHTS

The Residential Program Area realized 6.5 GWh of energy savings with actual expenditures of \$2.2 million, and achieved a TRC of 2.7. In 2019, the Home Renovation and Lighting programs provided nearly equivalent savings results to the Residential Program area, delivering 49 percent and 48 percent respectively. In contrast, 63 percent of the 2018 energy savings were based on the Lighting program. The shift reflects FBC's efforts to reduce its reliance on lighting measures as that market matures.

FBC's Residential programs enabled customers to upgrade lighting and appliances, and to capture ongoing energy savings. These programs enabled FBC to continue building on relationships with the trades for education and program awareness. The combination of financial incentives, policy support, contractor outreach, and ongoing marketing is instrumental to the success of these programs in generating energy savings and fostering market transformation in the residential sector.

² The Shared Service Territory is the overlapping service territories of FBC and FEI where both natural gas and electricity are supplied.

3. LOW INCOME PROGRAM AREA

3.1 OVERVIEW

FBC worked collaboratively with FEI to deliver programs to Low Income customers, including non-profit housing organizations and charities serving low-income people. In 2019, FBC invested \$937 thousand and achieved 1.3 GWh in energy savings, compared to \$679 thousand and 0.7 GWh in 2018. The 2019 TRC was 1.6.

Table 3-1 summarizes the Plan and actual expenditures for the Low Income Program Area.

Table 3-1: 2019 Low Income Program Results Summary

Program	Savings (kWh)		Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual YE	Total	Total	Incentive	Non-Incentive
Self Install (ESK)	249,401	527,046	\$ 74	\$ 143	\$ 126	\$ 16
Direct Install (ECAP)	891,148	636,150	\$ 665	\$ 519	\$ 434	\$ 85
Social Housing Support	72,117	185,784	\$ 41	\$ 60	\$ 46	\$ 13
Labour and expenses			\$ 64	\$ 217	\$ -	\$ 217
Program	1,212,666	1,348,981	\$ 843	\$ 937	\$ 606	\$ 331

3.2 SELF INSTALL

The Self Install Program is a program whereby income-qualified participants receive an Energy Savings Kit (ESK) in the mail that includes energy saving measures along with an instruction booklet and directions to access online “how to” videos. All measures are easy-to-install measures that participants install themselves. The ESK offer is a partnership program with FEI.

The Self Install Program achieved 193 percent of Plan expenditures and 211 percent of Plan Savings. The Self-Install Program was promoted and distributed at local food banks and other community events, through on-line digital promotions, bill inserts and Contact Centre referrals. The Company also continued its partnership with the Ministry of Social Development and Social Innovation to promote the ESKs to their clientele.

3.3 DIRECT INSTALL

The Direct Install Program is a program whereby income-qualified participants receive an in-home visit from a program contractor to install basic measures (e.g. LED lighting, high efficiency showerheads, etc.) and provide customized energy efficiency coaching. Additionally some participants also qualify to receive more robust measures such as fridges and insulation. Partners in the Direct Install Program include FEI and BC Hydro.

The Direct Install Program achieved 78 percent of Plan expenditures and 71 percent of Plan Savings. The Direct Install Program was promoted to social housing providers through one-to-one outreach efforts, partner referrals, promotions through food banks, referrals from the Contact Centre and through direct mail to past participants of the ESK program.

3.4 *SOCIAL HOUSING SUPPORT*

The Social Housing Support program provides a straightforward path for qualifying participants to receive a Prescriptive rebate for upgrading to energy efficient equipment. Current rebates are specific to non-profit housing buildings and in the future may include rebates for single-family homes too.

The Support Program is currently targeted to social housing apartment buildings to replace inefficient equipment and systems with high-efficiency solutions. The program currently includes energy studies and implementation support.

The Support Program is a partnership with FEI and BC Hydro and integrates with BC Housing and BC Non-profit Housing Association funding channels.

The program achieved \$60 thousand in expenditures, of which \$46 thousand were prescriptive incentives for qualifying Social Housing Support providers and \$13 thousand for program administration.

3.5 *SELECTED HIGHLIGHTS*

Overall, 2019 results exceeded Plan targets, in terms of both energy savings and investments. An investment of \$937 thousand and achievement of 1.3 million kWh in energy savings represents a 38% growth in investments and a 90% growth in energy savings relative to 2018. These results are attributable to effective marketing, outreach, and partnerships.

4. COMMERCIAL PROGRAM AREA

4.1 OVERVIEW

Commercial DSM programs encourage commercial customers (including institutions and government) to reduce overall consumption of electricity and associated energy costs. The Commercial programs produced aggregate electricity savings of 15 GWh, compared to 23.9 GWh in 2018³, and achieved an overall TRC of 2.0 in 2019. Commercial program expenditures totaled \$3.4 million, approximately the same as in 2018, of which 68 percent was in the form of incentives.

Table 4-1 summarizes Plan and actual expenditures for the Commercial programs, including incentive and non-incentive spending, and annual energy savings achieved.

Table 4-1: 2019 Commercial Program Results Summary

Program	Savings (kWh)		2019 Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual YE	Total	Total	Incentive	Non-Incentive
Commercial Custom	4,428,000	6,587,964	\$ 980	\$ 1,274	\$ 1,268	\$ 5
Commercial Prescriptive	11,113,892	8,374,923	\$ 1,371	\$ 1,505	\$ 1,461	\$ 45
Labour and expenses	-	-	\$ 828	\$ 606	\$ -	\$ 606
Total	15,541,892	14,962,886	\$ 3,178	\$ 3,385	\$ 2,729	\$ 656

The Commercial sector recorded savings of 15 GWh, or 99 percent of Plan, of which 56 percent were realized through the Prescriptive Program, primarily commercial LED lighting rebates. The remaining savings came through the Commercial Custom Program, which included custom retrofit rebates on HVAC and motor projects, new construction rebates for high performance buildings and a pilot recommissioning offer.

4.2 PRESCRIPTIVE PROGRAM

This program provides rebates for the installation of high efficiency electric equipment in various applications including lighting, space heating, commercial kitchen, commercial laundry and refrigeration equipment. Simple rebates are provided for equipment that meet specific performance standards, as opposed to the Custom program, which requires more detailed analysis of measures as installed. The program makes use of midstream and downstream rebate delivery approaches, as warranted by the particularities of each appliance type and the market it is intended to serve.

³ 2018 experienced a one-time surge of activity, by several large institutional customers, replacing conventional fluorescent tubes with linear LEDs at multiple facilities.

4.3 CUSTOM PROGRAM

FBC and FEI provide incentives to encourage participants to pursue a performance based approach to achieving electricity savings in new and existing buildings. The program encourages detailed analysis of integrated energy saving measures to help identify all technically feasible and cost effective energy savings, and then follows up by providing support for the implementation of those measures. For new buildings, FBC and FEI offered custom program pathways for both support both BC Energy Step Code-aligned buildings and non-aligned buildings.

FEI and FBC launched a pilot recommissioning offer in the FBC services territory to 13 participants. The results of the pilot will be used to inform the planned successor FEI, FBC and BC Hydro recommissioning offer.

4.4 SELECTED HIGHLIGHTS

Commercial Energy Efficiency Program Area activity in 2019 resulted in 15 GWh/year of electricity savings. These programs enabled commercial and institutional customers to conduct both simple and comprehensive energy efficiency upgrades at their buildings.

FBC saw higher than anticipated participation in its custom program offers for high performance new construction, particularly in the health care and education sectors. FBC also completed the measurement and verification to release the final incentive payment for the City of Kelowna LED streetlight project, which accounted for significant portfolio electricity savings and incentive expenditures.

5. INDUSTRIAL PROGRAM AREA

5.1 OVERVIEW

The Industrial DSM programs continued to encourage industrial customers to consume electricity more efficiently. The Industrial programs achieved an overall TRC of 1.7, with electricity savings of 3.0 GWh, double the 2018 savings of 1.6 GWh. Actual Industrial expenditures in 2019 totalled \$1.1 million, compared to \$0.4 million in 2018, of which 83 percent was incentives.

Table 5-1 summarizes the Plan and actual expenditures for the Industrial Program Area in 2019, including incentive and non-incentive spending, and annual electricity savings.

Table 5-1: 2019 Industrial Program Results Summary

Program	Savings (kWh)		Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual YE	Total	Total	Incentive	Non-Incentive
Industrial Custom	8,226,000	1,867,847	\$ 1,288	\$ 640	\$ 581	\$ 59
Industrial Prescriptive	1,810,698	1,110,083	\$ 290	\$ 282	\$ 276	\$ 6
Labour and expenses			\$ 185	\$ 174	\$ -	\$ 174
Total	10,036,698	2,977,930	\$ 1,762	\$ 1,096	\$ 857	\$ 239

The Industrial Program Area is characterized by large intermittent projects that generally occur less frequently and take much longer to complete, so the realization of energy savings may shift to following year(s). In 2019, much of the program activity concerned investigating and encouraging efficient electric usage in new cannabis production facilities, while supporting existing industrial customers.

The Industrial Program Area saw lower than anticipated participation from cannabis cultivators, owing to fewer new facilities connected. The Industrial Program Area also saw lower than anticipated participation from the wood products industry, due a market decline. Together, this resulted in energy savings, and commensurate incentive expenditures, much lower than Plan. Program administrative costs are largely fixed, and FBC incurred higher costs (than Plan) for additional customer facility assessment studies that were undertaken. These study costs are anticipated to yield future energy savings projects.

5.2 PRESCRIPTIVE PROGRAM

This program provides rebates for the installation of high efficiency electric equipment in various applications including lighting, space heating, irrigation, variable speed drives and certain compressed air equipment. Simple rebates are provided for equipment that meet specific performance standards, as opposed to the Custom program, which requires more detailed analysis of measures as installed. The program makes use of midstream and downstream

1 rebate delivery approaches, as warranted by the particularities of each appliance type and the
2 market it is intended to serve.

3 **5.3 CUSTOM PROGRAM**

4 This program provides incentives to encourage participants in pursuing a performance based
5 approach to achieving electricity savings in new and existing industrial facilities. The program
6 encourages detailed analysis of integrated energy saving measures to help identify technically
7 feasible and cost effective energy savings, and then follows up by providing support for the
8 implementation of those measures.

9 **5.4 SELECTED HIGHLIGHTS**

10 Industrial Energy Efficiency Program Area activity in 2019 resulted in 3.0 GWh/year of electricity
11 savings. These programs enabled industrial customers to conduct both simple and
12 comprehensive energy efficiency upgrades at their buildings.

13 While the Industrial Energy Efficiency Program Area saw higher participation than previous
14 years, it did not meet the Plan expenditures and savings mostly owing to low investment in the
15 wood products sector and significantly lower than anticipated grid connections from cannabis
16 cultivation customers. However, for those cannabis cultivation customers that did connect to
17 FBC, significant opportunities were pursued in the Custom Program with respect to LED
18 agricultural lighting and energy efficient dehumidification technologies.

6. CONSERVATION EDUCATION AND OUTREACH

6.1 OVERVIEW

The Conservation Education and Outreach (CEO) Program Area continues to support the DSM Portfolio goals of energy conservation in a variety of ways. In order to foster a culture of conservation, several initiatives and campaigns were undertaken in 2019, providing information about behaviour change and customer attitudes on efficiency. Educating all types of customers and students who are future customers remains a priority and FBC is continuing to ensure steps are taken to make the information provided relevant and timely.

FBC continued its collaboration with FEI in 2019 to maximize efficiencies across both utilities. Costs continue to be shared on school, residential and commercial outreach as applicable.

Table 6-1 summarizes the Plan and actual expenditures for CEO in 2019.

Table 6-1: 2019 Conservation and Outreach Results Summary

Program	Plan (\$000s)	Actual (\$000s)
Residential Education Program	\$ 217	\$ 223
Residential Customer Engagement Tool	\$ 281	\$ 75
Commercial Education Program	\$ 21	\$ 178
School Education Program	\$ 46	\$ 100
Total	\$ 566	\$ 575

6.2 RESIDENTIAL EDUCATION

CEO continued to provide information to customers and the public on electric conservation and energy literacy and sought out new opportunities to reach customers. Community outreach continued to provide information to customers and the public on electric conservation and energy literacy and sought out new opportunities such as rebate open houses, to reach customers.

FortisBC (FBC and FEI) continued its successful “We’ve got rebates” general marketing campaign to increase awareness of C&EM’s rebate programs. The Company continued to enhance the municipal landing page to further support municipalities in their efforts to promote FBC and FEI rebates and behaviour change.

6.3 CUSTOMER ENGAGEMENT TOOL

The Residential Customer Engagement Tool expenditure was below Plan due to the launch being delayed to 2020 as a result of challenges with supporting systems integration.

6.4 COMMERCIAL EDUCATION

Expenditures were higher than planned to reflect the investment in the Small Business Outreach program as well as communications to further increase awareness and program participation.

To further support and engage small to medium size businesses, FBC, in collaboration with FEI, provided over 491 basic energy assessments in Kelowna, Penticton and Rossland. Customers received advice on saving energy and learned about rebates on high-efficiency upgrades. Of those, 188 businesses took advantage of a more in-depth assessment, which further quantified areas for energy savings and behaviour opportunities that could result in reduced energy consumption. Customers were provided a detailed report that communicated potential savings, incentives, payback and return on investment as well as customized recommendations for next steps.

6.5 SCHOOL EDUCATION

The online, curriculum-connected Energy Leaders school program moved to its third year in market and expanded to include grade eleven and twelve lessons. Energy Leaders now provides lesson plans for all grades from kindergarten to grade twelve. Additionally the following school programs were continued: Energy is Awesome, an interactive presentation focused on energy conservation and safety; and BC Lions Energy Champions program.

Support for the University of British Columbia Okanagan (UBCO) Smart Energy Research Chair continued in partnership with FEI. This work is expected to identify smart solutions around energy conservation, climate change mitigation, demand side management, the development of net-zero communities and provide recommendations and define long-term implementation strategies for smart energy choices. In collaboration with FEI, FBC continued to support behaviour education campaigns delivered by energy specialists in their respective organizations, including post-secondary.

6.6 HIGHLIGHTS

The FBC Commercial, Residential and School Education Programs are not incentive-based programs; thus FBC does not attribute direct savings to them. CEO costs are included at the Portfolio level and incorporated into the overall DSM Portfolio cost-effectiveness results.

Research and evaluation was conducted by an external consultant that provided recommendations regarding whether energy savings should be claimed for any of FortisBC's CEO initiatives. It was determined the CEO Program Area currently does not have any programs or initiatives where electric savings could be claimed. However, FBC will continue to explore behavioural change opportunities that may result in energy savings in the Residential and Commercial sectors.

7. SUPPORTING INITIATIVES

7.1 OVERVIEW

Supporting Initiatives support the goals of conservation and energy management in a variety of ways, from co-funding energy specialist positions, to promoting energy conservation at community events.

Supporting Initiative activities are not incentive-based programs, therefore FBC has not attributed any direct savings to them. Supporting Initiatives costs are included at the portfolio level and incorporated into the overall portfolio cost-effectiveness results. Non-Program Area specific costs, such as telephone and tracking system upgrades, are also reported herein.

Plan expenditures for 2019 were \$1.2 million and actual spending was \$0.9 million. Expenditures on Supporting Initiatives were 28 percent below Plan primarily due to partial year funding of Community Energy Specialist funding, and delay in launching the Reporting Tool.

Table 7-1: 2019 Supporting Initiatives Results Summary

Program	Plan (\$000s)	Actual (\$000s)		
		Total	Incentive	Non-Incentive
Commercial Energy Specialist	\$ 60	\$ 90	\$ 90	\$ -
Community Energy Specialist	\$ 150	\$ 45	\$ 45	\$ -
Trade Ally Network	\$ 152	\$ 102	\$ -	\$ 102
Codes and Standards	\$ 97	\$ 120	\$ -	\$ 120
Reporting Tool & Customer Portal	\$ 466	\$ 302	\$ -	\$ 302
Labour and expenses	\$ 293	\$ 210	\$ -	\$ 210
Total	\$ 1,218	\$ 869	\$ 135	\$ 734

7.2 COMMERCIAL ENERGY SPECIALIST PROGRAM

The Commercial Energy Specialist Program is a joint initiative between FBC and FEI that co-funds Energy Specialist positions in large commercial organizations, including institutional and local government customers. FBC provides up to \$30,000 per year in an annual contract, with a matching amount provided by FEI.

A Commercial Energy Specialist's key priority is to identify and implement opportunities for their organization to participate in FBC and FEI's DSM programs, while also identifying and implementing non-program specific opportunities to use electricity and natural gas more efficiently. There were three participants in this program in 2019. FBC considers this an energy management program, and hence a specified demand-side measure, as defined in the DSM Regulation.

7.3 COMMUNITY ENERGY SPECIALIST PROGRAM

This program funds Community Energy Specialist positions in local municipal governments and regional districts to facilitate energy efficiency planning activities. These include the coordination of the development of community energy plans; the development and promotion of community-level energy related policy; marketing initiatives to promote conservation and efficiency at the community level; and energy efficient design practices and organizational policies such as adopting advanced energy efficiency standards for the entities' own buildings.

There were three participants in this program in 2019. All participants had their Community Energy Specialists in place for only part of the year; hence, the 2019 Plan expenditures were not fully realized.

7.4 TRADE ALLY NETWORK

The Trade Ally Network (TAN) develops and manages a contractor network to promote DSM programs and energy-efficiency messaging. FBC identifies trade allies as equipment manufacturers, service contractors, and distributors and recognizes the influence these industry groups have with the end-use Residential and Commercial customers who make energy-efficiency decisions. This program also supports funding energy efficiency training as outlined in the DSM regulation. Enabling Activities are critical initiatives that support and supplement DSM program development and delivery.

FBC supported and provided education and co-op funding to TAN members to assist them with promoting the installation of high-efficiency appliances and C&EM rebates to their customers. Development work was undertaken in 2019 to expand the Trade Ally Network to include commercial point of sale partners, previously known as Commercial Partners.

7.5 CODES AND STANDARDS

The FBC codes and standards budget funded a number of Canadian Standards Association (CSA) projects:

- Development of an express document for express standard EXP10: Specifications for Testing and Rating Residential Split System Air-to-Water Heat Pump Systems Intended for Domestic Hot Water Service.
- Development of a whitepaper for heat recovery ventilator and energy recovery ventilation.
- Development of an express document for residential multi head units.

FBC also joined several CSA committees to guide and contribute to the development of codes and standards:

- Technical Committee on Building Energy Systems (C424)

- Steering Committee on Energy Efficiency & Renewables (SCOPEER)
- CSA Communities

FBC plans to participate in these projects and committees in 2020.

7.6 REPORTING TOOL & CUSTOMER APPLICATION PORTAL

The launch of the reporting tool and customer application portal was delayed to 2020, causing a portion of the costs of the project to not be realized in 2019.

The scope of the project increased as further program enhancements and integrations with other FortisBC applications were added to the implementation. These enhancements are anticipated to further benefit customers by seamless integration i.e. single sign-on, with other FortisBC technical solutions. These integrations allowed further customer facing enhancements to the system and to the DSM programs that will rely on the tool, resulting in an increase in the scope of the implementation. FBC took advantage of an opportunity to reduce overall licensing costs by advancing payment for licensing fees from future years into 2019.

8. PORTFOLIO EXPENDITURES

8.1 OVERVIEW

Formerly known as Planning & Evaluation (P&E), the actual Portfolio expenditures for 2019 were \$0.8 million, or 98 percent of Plan. Portfolio costs comprise largely of staffing costs and consultant fees for the various studies and pilots undertaken.

Table 8-1: 2019 Portfolio Expenditures Results Summary

Program	Plan (\$000s)	Actual (\$000s)
	Total	Total
Monitoring and Evaluation	\$ 104	\$ 146
DSM Studies	\$ 25	\$ 27
Innovative Technologies	\$ 100	\$ 121
Labour and expenses	\$ 547	\$ 468
Total	\$ 776	\$ 762

The Energy Efficiency and Conservation Advisory Group (EECAG) provides insight and feedback on FortisBC's Portfolio of DSM activities and related issues. This includes DSM program and Portfolio performance, development and design, funding transfers (exceeding the 25 percent threshold), policy and regulations that may impact DSM activities, and other issues and activities as they arise. The EECAG met on November 21, 2019 to discuss the 2019 results to-date and provide input on program barriers and opportunities to expand participation.

8.2 PROGRAM EVALUATION ACTIVITIES

Primary types of Evaluation, Measurement and Verification (EM&V) activities include the following:

- Process evaluations, where surveys and interviews of participants and trade allies are used to assess customer satisfaction and program success;
- Impact evaluations, to measure the achieved energy savings attributable from the program, including free-ridership and spill-over⁴ impacts; and
- Measurement & Verification (M&V) activities, to confirm project specific energy savings associated with energy conservation measures.

The specific Evaluation impact studies funded in 2019 include the Commercial Product Rebate program evaluation (report was filed with 2018 DSM report), and the Retail Products (lights &

⁴ Free-ridership refers to participants who would have participated in the absence of the program and spillover refers to additional reductions in energy consumption or demand that are due to program influence.
Reference: National Renewable Energy Laboratory, <https://www.nrel.gov/docs/fy17osti/68578.pdf>

appliances) program evaluation. The latter study is still in progress, awaiting in-store customer intercept surveys, and will be filed upon completion.

Table 8-2 provides a list of the 2019 DSM Program evaluation and research activities undertaken by the Company in collaboration with utility partners, chiefly FEI and BC Hydro.

Table 8-2: 2019 DSM Program Evaluation and Research Activities

Evaluation Name	Program Area	Type of Evaluation	Evaluation Partners	Evaluation Status
Commercial End Use Study	Enabling Activities	Communications	FortisBC Energy Inc. & FortisBC Inc.	Survey conducted with commercial customers including multi-family residential buildings to collect information about the building, the business(es) occupying the building, the fuel choice for heating, cooling and cooking, the types and ages of the appliances installed, energy-use behaviors, and customer attitudes towards energy issues. To be completed Q2 2020
Retail Program Evaluation	Residential	Process & Impact	FortisBC Energy Inc. & FortisBC Inc.	Customer survey, literature review and consumption analysis for the residential retail programs. To be completed Q2 2020
Participant and Building Owner Surveys	Residential / Commercial	Process	FortisBC Energy Inc. & FortisBC Inc.	Surveys conducted with building owner and tenant to assess customer satisfaction, program awareness, and gather feedback for future program design. 2018 results: Completed February 2019 by Cohesium Research 2019 results: To be completed Q1 2020
Furnace Quality Assurance	Low Income	Evaluation Study	FortisBC Energy Inc., FortisBC Inc. & BC Hydro	Ongoing quality assurance to ensure direct install measures are installed according to program policies and procedures.
Ongoing Customer Feedback Survey	Low Income	Process	FortisBC Energy Inc., FortisBC Inc. & BC Hydro	Survey with Direct Install program participants to gather frequent and ongoing feedback on their customer experience, satisfaction with the program and the program evaluators. 2018 results: Completed March 2019 by Sentis Market Research 2019 results: To be completed Q2 2020
Smart Learning Thermostat Pilot	Innovative Technologies	Measurement & Verification	FortisBC Energy Inc. & FortisBC Inc.	Measurement of energy savings, installation and customer acceptance associated with smart learning thermostats. Completed April 2019 by APEX Analytics LLC

8.3 DSM STUDIES

DSM studies undertake key research, e.g. end-use surveys, and support long-term planning such as Conservation Potential Reviews. The Company's 2019 DSM Studies included:

- Residential cluster analysis, to identify key end-uses associated with monthly load profiles;
- Develop Commercial End-Use Survey (CEUS) instrument, to be fielded in early 2020; and
- Joint gas/electric portfolio review to gauge FortisBC DSM performance and capability to scale up program depth and breadth.

8.4 INNOVATIVE TECHNOLOGIES

Innovative technology funding supports the development of or increased use of a "technology, a system of technologies, or a building or industrial facility design that could achieve significant

1 reductions of energy use or significantly more efficient use of energy”⁵. FBC uses innovative
2 technology funding to support feasibility studies, technology pilots, and field studies to assess
3 the potential for these technologies.

4 In 2019, FBC funded several innovative technology studies including cold climate heat pumps,
5 cannabis production, and electric vehicle service equipment (EVSE). FBC launched a field
6 study to assess the performance of cold climate heat pumps in partnership with Natural
7 Resource Canada, BC Hydro, and MEMPR. Concluding in 2020, this field study will provide
8 valuable data on the performance of cold climate heat pumps in BC to help increase adoption
9 and improve energy savings from heat pumps. Cannabis production could add significant load
10 to FBC’s electric system. FBC is currently studying the potential energy savings for a number of
11 measures that growers could use to produce cannabis more efficiently in partnership with
12 several other Canadian and American utilities. Finally, electric vehicles are another developing
13 sector that will increase load and potentially system peaks. The EVSE feasibility study looked at
14 the opportunities and costs to mitigate negative impacts on peak demand. The following section
15 describes the stand-alone Demand Response pilot program, which is also related to reducing
16 demand and peak loads.

17

⁵ Technology innovation program defined in the Demand-Side Measures Regulation 326/2008 (amended Mar. 24, 2017).

9. DEMAND RESPONSE

9.1 OVERVIEW

The Kelowna Demand Response Pilot program for Commercial and Industrial (C&I) customers was launched in the summer of 2019. Its primary purpose was to test the viability of voluntary demand response from a subset of FBC's top 50 C&I customers in the Kelowna area.

Table 9-1: 2019 Demand Response Results Summary

Program	Plan (\$000s)	Actual (\$000s)
	Total	Total
Demand Response	\$ 477	\$ 264
Total	\$ 477	\$ 264

The \$477 thousand Plan expenditure was based on an estimate from the consultants who authored the Kelowna Demand Response Assessment Report⁶. The \$264 thousand expenditure reflects the actual cost incurred based on cost savings achieved through the procurement process, and the mid-summer start.

9.2 KELOWNA AREA DEMAND RESPONSE PILOT

The recruitment phase revealed various barriers to participation including the program novelty i.e. temporary load curtailment, compared to FBC's traditional energy savings programs.

The program Implementer utilized FBC's AMI platform for this pilot. The AMI meters' Zigbee radio signal was transferred via cellular modem to the Implementer software platform; providing participants with near real-time graphical load profile, and subsequently utilized AMI data to verify event response levels and participant incentives.

The summer pilot results were limited by: few participants, a foreshortened 2-month window, relatively mild summer weather and reliance on site personnel to respond. The 2019-20 winter phase ran for the full 4 months starting Nov 1st. By then more participants were in place, including a major Kelowna pump-house and two secondary schools.

⁶ Appendix A-1 of FBC's approved 2019-2022 DSM Expenditure Plan.

APPENDIX A – DETAILED BENEFIT-COST RATIOS

APPENDIX A-1 – DSM PROGRAMS COST AND SAVINGS SUMMARY REPORT FOR 2019

Table A1-1: FBC DSM Summary Report for Year Ended December 31, 2019

Program Area	Annual Electricity Savings (MWh)		Utility Expenditures (\$000s)			Cost Effectiveness Tests (Benefit/Cost Ratio)				Levelized cost (¢/kWh)
	Plan	Actual	Incentive	Non-Incentive	Total	Plan	TRC	UCT	RIM	
Residential										
Home Renovation	3,264	3,227	1,403	83	1,487	1,200	2.3	3.6	0.8	7.2
New Home	340	112	72	18	90	184	1.4	1.8	0.5	10.0
Lighting	2,284	3,141	174	44	218	157	5.0	22.9	1.2	2.4
Rental Apartment	148	21	4	28	33	54	5.8	0.7	0.4	17.6
Labour and expenses	-	-	-	362	362	491				
Residential Total	6,037	6,501	1,654	535	2,189	2,086	2.7	4.8	0.9	5.1
Low Income										
Self Install (ESK)	249	527	126	16	143	74	3.3	3.2	0.8	4.4
Direct Install (ECAP)	891	636	434	85	519	665	2.0	1.7	0.7	8.7
Social Housing Support	72	186	46	13	60	41	2.3	3.5	0.7	5.9
Labour and expenses	-	-	-	217	217	64				
Low Income Total	1,213	1,349	606	331	937	843	1.6	1.6	0.7	8.9
Commercial										
Commercial Custom	4,428	6,588	1,268	5	1,274	980	2.0	4.9	0.8	6.0
Commercial Prescriptive	11,114	8,375	1,461	45	1,505	1,371	2.4	7.5	1.3	5.3
Labour and expenses	-	-	-	606	606	828				
Commercial Total	15,542	14,963	2,729	656	3,385	3,178	2.1	5.2	1.0	6.0
Industrial										
Industrial Custom	8,226	1,868	581	59	640	1,288	1.9	3.3	1.0	7.0
Industrial Prescriptive	1,811	1,110	276	6	282	290	1.9	5.4	1.5	6.7
Labour and expenses	-	-	-	174	174	185				
Industrial Total	10,037	2,978	857	239	1,096	1,762	1.7	3.3	1.1	7.5
Conservation Education and Outreach	-	-	-	-	575	566	0.0	0.0	0.0	0.0
Supporting Initiatives	-	-	135	734	869	1,218	0.0	0.0	0.0	0.0
Portfolio Expenditures	-	-	-	762	762	776	0.0	0.0	0.0	0.0
Demand Response	-	-	-	264	264	477	0.0	0.0	0.0	0.0
Total Portfolio	32,828	25,791	5,981	3,521	10,077	10,910	1.9	3.3	0.9	6.9

APPENDIX A-2 – HISTORICAL SUMMARY OF DSM COST AND ENERGY SAVING RESULTS (2014-18)

Table A2-1: Historical FBC DSM Costs and Energy Savings 2014 – 2018

	2014						
	Plan	Spend (\$000s) Actual	Variance	Plan	Energy Savings (MWh) Actual	Variance	TRC (B/C)
Residential							
Home Improvements	295	391	96	1,881	1,299	(582)	1.5
Heat Pumps	158	252	94	553	865	312	1.6
Residential Lighting	176	291	115	2,136	3,411	1,275	1.5
New Home Program	67	254	187	98	733	635	2.7
Appliances ¹	-	-	-	-	-	-	-
Water Heating	99	3	(96)	425	92	(333)	-
Low Income	242	502	260	707	2,286	1,579	1.9
Behavioural ¹			-			-	-
<i>Residential Total</i>	1,037	1,694	657	5,800	8,686	2,886	1.7
Commercial							
Lighting	510	646	136	3,359	3,353	(6)	2.0
Building and Process Improvements	592	533	(59)	2,641	1,926	(715)	1.4
Municipal (Water Handling)	-	5	5	-	-	-	-
Irrigation	32	-	(32)	200	-	(200)	0.0
<i>Commercial Total</i>	1,134	1,184	50	6,200	5,279	(921)	1.6
Industrial							
Compressed Air ²			-				
Industrial Efficiencies	148	188	40	800	614	(186)	1.2
<i>Industrial Total</i>	148	188	40	800	614	(186)	1.2
Programs Total							
Supporting Initiatives	190	207	17				
Planning & Evaluation	492	579	87				
Recoveries from 2013		(378)	(378)				
Total	3,001	3,473	472	12,800	14,580	1,780	1.6

¹ In 2014, these programs were included in Home Improvements program.

² In 2014, Compressed Air was included in Industrial Efficiencies.

³ In 2015, Computers was added to Process Improvements and had no Spending or Savings.

	2015						
	Spend (\$000s)			Energy Savings (MWh)			TRC
	Plan	Actual	Variance	Plan	Actual	Variance	(B/C)
Residential							
Home Improvements	884	199	(685)	3,106	231	(2,875)	1.7
Heat Pumps	302	182	(120)	1,618	569	(1,049)	1.5
Residential Lighting	193	198	5	1,569	4,144	2,575	5.3
New Home Program	390	111	(279)	1,179	356	(823)	1.1
Appliances ¹	96	71	(25)	288	52	(236)	1.2
Water Heating	387	2	(385)	850	5	(845)	1.5
Low Income	824	287	(537)	2,598	282	(2,316)	1.3
Behavioural ¹	85	-	(85)	888	-	(888)	0.0
<i>Residential Total</i>	3,160	1,050	(2,110)	12,096	5,639	(6,457)	2.9
Commercial							
Lighting	1,485	735	(750)	7,445	4,089	(3,356)	2.0
Building and Process Improvements	897	543	(354)	3,832	1,606	(2,226)	1.6
Municipal (Water Handling)	79	36	(43)	759	187	(572)	2.3
Irrigation	69	9	(60)	490	-	(490)	0.0
<i>Commercial Total</i>	2,530	1,324	(1,206)	12,526	5,882	(6,644)	1.8
Industrial							
Compressed Air ²							
Industrial Efficiencies	202	226	24	1,537	1,087	(450)	2.0
<i>Industrial Total</i>	202	226	24	1,537	1,087	(450)	2.0
Programs Total							2.2
Supporting Initiatives	675	346	(329)				0.0
Planning & Evaluation	725	585	(140)				0.0
Recoveries from 2013			-				
Total	7,292	3,531	(3,761)	26,159	12,608	(13,551)	2.0

¹ In 2014, these programs were included in Home Improvements program.

² In 2014, Compressed Air was included in Industrial Efficiencies.

³ In 2015, Computers was added to Process Improvements and had no Spending or Savings.

	2016						
	Spend (\$000s)			Energy Savings (MWh)			TRC
	Plan	Actual	Variance	Plan	Actual	Variance	(B/C)
Residential							
Home Improvement Program	884	225	(659)	3,106	243	(2,863)	1.6
Behavioural	106	79	(27)	1,048	587	(461)	4.1
Rental	-	137	137	576	840	264	4.5
Watersavers	430	72	(358)	948	21	(927)	2.3
Appliances	96	245	149	288	242	(45)	1.6
Lighting	189	360	171	1,547	8,607	7,059	10.7
Heat Pumps	302	249	(53)	1,618	753	(865)	1.6
New Home Program	390	39	(351)	1,179	31	(1,148)	1.4
Low Income Housing	952	1,111	159	2,598	1,214	(1,385)	0.9
<i>Residential Total</i>	3,348	2,518	(830)	12,908	12,538	(370)	4.0
Commercial							
Lighting	1,519	1,192	(327)	7,616	5,694	(1,922)	1.6
Sm Business Direct Install	-	556	556	-	1,139	1,139	1.6
Building Improvement	842	574	(268)	3,452	1,234	(2,218)	1.0
Computers	55	-	(55)	378	-	(378)	
Municipal (WWTP)	79	4	(75)	759	-	(759)	0.0
Irrigation	69	13	(56)	490	61	(429)	2.1
<i>Commercial Total</i>	2,564	2,339	(225)	12,695	8,128	(4,566)	1.5
Industrial							
Industrial Efficiency	209	300	91	1,585	2,099	514	6.9
<i>Industrial Total</i>	209	300	91	1,585	2,099	514	6.9
Programs Total	6,122	5,158	(964)	27,188	22,766	(4,422)	2.6
Portfolio Level Activities			-			-	
P&E, M&E, Dev	735	718	(17)			-	
Supporting Initiatives	675	657	(18)			0	
Total	7,532	6,533	(998)	27,188	22,766	(4,422)	2.3

	2017						
	Spend (\$000s)			Energy Savings (MWh)			TRC
	Plan	Actual	Variance	Plan	Actual	Variance	(B/C)
Residential							
Home Improvement Program	348	196	(152)	364	187	(177)	1.8
Behavioural	200	5	(195)	3,097	20	(3,077)	1.1
Rental	206	77	(129)	508	295	(213)	6.7
Watersavers	30	1	(30)	17	12	(6)	1.2
Appliances	133	337	204	126	494	368	2.2
Lighting	190	380	190	2,735	8,125	5,390	6.0
Heat Pumps	298	307	8	781	976	195	1.9
New Home Program	151	61	(91)	126	45	(81)	2.1
Low Income Housing	1,161	529	(632)	2,739	693	(2,046)	1.4
<i>Residential Total</i>	2,718	1,891	(827)	10,493	10,847	354	3.6
Commercial							
Lighting	2,322	2,749	427	10,592	12,580	1,989	2.2
Sm Business Direct Install	-	862	862	-	2,634	2,634	3.3
Building Improvement	784	371	(413)	2,931	605	(2,326)	1.3
Computers	-	-	-	-	-	-	0.0
Irrigation	25	12	(13)	144	59	(84)	7.6
MURB New Construction	-	29	29	-	237	237	2.3
<i>Commercial Total</i>	3,131	4,023	892	13,666	16,115	2,449	2.2
Industrial							
Industrial Efficiency	309	206	(103)	1,566	876	(690)	4.8
<i>Industrial Total</i>	309	206	(103)	1,566	876	(690)	4.8
Programs Total	6,158	6,120	(38)	25,726	27,838	2,113	2.7
Portfolio Level Activities							
P&E, M&E, Dev	777	994	217			-	
Supporting Initiatives	674	674	0			-	
Total	7,610	7,788	179	25,726	27,838	2,113	2.4

	2018						
	Spend (\$000s)			Energy Savings (MWh)			TRC
	Plan	Actual	Variance	Plan	Actual	Variance	(B/C)
Residential							
Home Improvement Program	140	136	4	301	225	76	1.3
Heat Pumps	327	357	(30)	1,297	1,127	170	1.3
Appliance Program	159	204	(45)	215	303	(88)	4.2
Residential Lighting	202	141	61	3,337	3,255	82	1.3
New Home Program	76	36	40	169	54	115	1.8
Rental Apartment Program	53	19	34	306	87	219	4.9
Behavioral	165	16	149	240	67	173	1.2
Heat Pump Water Heaters	25	25	-	38	38	-	1.5
Labour & Related Expenses	610	468	142	-	-	-	-
<i>Residential Total</i>	1,755	1,403	355	5,903	5,157	747	2.2
Low Income Housing							
Low Income	731	396	335	1,229	687	542	1.0
Labour & Related Expenses	-	282	(282)	-	-	-	-
<i>Low Income Total</i>	731	678	53	1,229	687	542	1.0
Commercial							
Lighting	1,750	1,751	(1)	13,620	17,635	(4,015)	1.0
Sm Business Direct Install	-	382	(382)	-	3,224	(3,224)	3.8
Building Improvement	988	247	741	5,290	1,763	3,527	2.2
Irrigation	-	180	(180)	255	249	6	0.6
MURB New Construction	32	42	(10)	-	1,073	(1,073)	2.0
Labour & Related Expenses	822	864	(42)	-	-	-	-
<i>Commercial Total</i>	3,592	3,467	125	19,165	23,944	(4,779)	1.6
Industrial							
Industrial Efficiency	305	240	65	1,188	1,615	(427)	1.5
Labour & Related Expenses	72	157	(85)	-	-	-	-
<i>Industrial Total</i>	377	397	(20)	1,188	1,615	(427)	1.5
Programs Total	6,455	5,945	510	27,485	31,403	(3,918)	1.7
Portfolio Level Activities							
Planning & Evaluation	743	743	-	-	-	-	-
Supporting Initiatives	742	537	205	-	-	-	-
Total	7,940	7,225	715	27,485	31,403	(3,918)	1.6