



Diane Roy
Vice President, 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: (604) 576-7349
Cell: (604) 908-2790
Fax: (604) 576-7074
www.fortisbc.com

March 31, 2022

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

Attention: Mr. Patrick Wruck, Commission Secretary

Dear Mr. Wruck:

Re: FortisBC Inc. (FBC)
Electricity Demand-Side Management (DSM) – 2021 Annual Report

Attached please find the Electricity DSM Program 2021 Annual Report for FBC (the Annual Report).

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

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachment



FortisBC Inc.

**Electricity
Demand-Side Management Programs
2021 Annual Report**

March 31, 2022

Table of Contents

1. REPORT OVERVIEW.....	1
1.1 Portfolio Level Results	1
1.2 Meeting Adequacy Requirements	2
1.3 Funding Transfers and Carryover	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	8
2.6 Selected Highlights.....	9
3. LOW INCOME PROGRAM AREA	10
3.1 Overview	10
3.2 Self Install	10
3.3 Direct Install.....	11
3.4 Social Housing Support	11
3.5 Selected Highlights.....	11
4. COMMERCIAL PROGRAM AREA	13
4.1 Overview	13
4.2 Custom Program	13
4.3 Prescriptive Program	13
4.4 Selected Highlights.....	14
5. INDUSTRIAL PROGRAM AREA	15
5.1 Overview	15
5.2 Custom Program	15
5.3 Prescriptive Program	16
5.4 Selected Highlights.....	16

6. CONSERVATION EDUCATION AND OUTREACH.....	17
6.1 Overview	17
6.2 Residential Education.....	17
6.3 Residential Customer Engagement Tool	17
6.4 Commercial Education	18
6.5 School Education	18
6.6 CEO Highlights.....	19
7. SUPPORTING INITIATIVES	20
7.1 Overview	20
7.2 Commercial Energy Specialist Program	20
7.3 Community Energy Specialist Program.....	21
7.4 Trade Ally Network.....	21
7.5 Codes and Standards	22
7.6 Reporting Tool & Customer Application Portal	22
8. PORTFOLIO EXPENDITURES	24
8.1 Overview	24
8.2 Program Evaluation Activities	24
8.3 DSM Studies	26
8.4 Innovative Technologies	26
9. DEMAND RESPONSE	28
9.1 Overview	28
9.2 Kelowna Area Demand Response Pilot	28
10. SUMMARY	29

List of Appendices

Appendix A Detailed Benefit-Cost Ratios

- A-1** DSM Programs Cost and Savings Summary Report For 2021
- A-2** Historical Summary of DSM Cost and Energy Saving Results (2016 – 2020)

Index of Tables and Figures

Table 1-1: DSM Portfolio Summary Results for 2021	2
Table 1-2: 2021 DSM Funding Transfers and Carryover Amounts (\$000s)	4
Table 1-3: 2022 DSM Budget Including Carryover Amounts	5
Table 2-1: 2021 Residential Program Area Results Summary	7
Table 3-1: 2021 Low Income Program Results Summary	10
Table 4-1: 2021 Commercial Program Results Summary	13
Table 5-1: 2021 Industrial Program Results Summary	15
Table 6-1: 2021 Conservation and Outreach Results Summary	17
Table 7-1: 2021 Supporting Initiatives Results Summary	20
Table 8-1: 2021 Portfolio Expenditures Results Summary	24
Table 8-2: 2021 DSM Program Evaluation and Research Activities	25
Table 9-1: 2021 Demand Response Results Summary	28

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, 2021 and provides a summary of results achieved in 2021. 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 2021. Section 1.2 sets out 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 2021 by Program Area, including program-level comparisons of actual energy savings and costs to Plan.

Consistent with previous DSM annual reports, additional details on 2021 program results, cost-effectiveness test results and levelized costs, as well as historical DSM program costs and energy savings are included in Appendix A-1 and Appendix A-2, respectively.

Throughout the Report, any difference in the totals between the DSM Portfolio Overview and Program Area tables are due to rounding. Where "zero" values occur, they may be a reflection of rounding to the nearest \$000 expenditure level when expenditures were under \$500.

1.1 PORTFOLIO LEVEL RESULTS

Table 1-1 provides an overview of FBC's 2021 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 1.5 on DSM expenditures of \$12.7 million, an increase of \$2.5 million over 2020. Electricity savings totalled 29.7 GWh, an increase of 3.4 GWh compared to 2020. All of FBC's DSM programs passed the TRC test at the Program Area-level.

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

Table 1-1: DSM Portfolio Summary Results for 2021

Program Area (Sector)	2021 Plan Savings (kWh)	2021 Actual Savings (kWh)	2021 Plan Including Carryover (\$000s)	2021 Actual (\$000s)	Benefit / Cost TRC
Residential	5,951,085	7,895,902	\$ 2,519	\$ 2,896	1.9
Low Income	1,216,882	734,623	\$ 954	\$ 842	1.3
Commercial	15,290,514	12,321,921	\$ 3,277	\$ 3,497	1.4
Industrial	10,113,556	8,700,452	\$ 2,087	\$ 2,653	2.3
Education and Outreach	-	-	\$ 595	\$ 599	-
Supporting Initiatives	-	-	\$ 1,373	\$ 1,093	-
Portfolio	-	-	\$ 1,033	\$ 793	-
Demand Response	-	-	\$ 451	\$ 311	-
Total	32,572,038	29,652,898	\$ 12,289	\$ 12,683	1.5

FBC's actual 2021 DSM expenditures were 103 percent of 2021 Plan including carryover and the DSM energy savings were 91 percent of Plan. While savings exceeded plan in the Residential program area, they were lower than expected in the Low Income, Commercial and Industrial areas.

1.2 MEETING ADEQUACY REQUIREMENTS

The 2019-2022 DSM 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 2021 DSM activities meet these adequacy requirements. 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.

FBC funded a variety of initiatives for K-12 students, including Energy Leaders, Energy is Awesome and Energy Champions. Work to support virtual learning during the Covid-19 pandemic, including translating Energy Leaders lessons into French, was completed in 2021. In collaboration with FEI, FBC also funded post-secondary student education initiatives (UBC Okanagan research chair and the UBC Okanagan and Okanagan College Green Construction Research and Training Centre's Wilden Living Lab 2 project).

FBC provided resources indicated by clause (e) for Codes and Standards (Section 7.5), which are fulfilled through third party funding arrangements. A total of \$109 thousand was invested, which represents 1 percent of the overall Plan for 2021.

FBC supported BC Energy Step Code (the "Step Code") adoption through its New Home Program (Section 2.3) and provided progressive rebates to align with the Step Code. It also provided funding for Community Energy Specialists to support energy conservation behaviour campaigns (organizational and community-based) and to promote the Step Code to municipal building inspection staff and local builders and developers (Section 7.3).

1.3 FUNDING TRANSFERS AND CARRYOVER

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 and furthermore allows the Company to carry over 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.

Carryover refers to any approved Program Area expenditure amount that was not spent in a given year (after accounting for funding transfers between Program Areas) and can therefore be carried over to the following year(s) within the approved DSM Plan time frame. These amounts are ‘carried over’ into the next years’ annual approved spending limit. The ability to carry 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 from the reporting year available to benefit customers in the following Plan years.

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 2021 funding transfers between Program Areas and carryover expenditure amounts available by Program Areas for 2022. FBC notes that all funding transfers completed in 2021 were within the prescribed 25 percent of Program Area Plan threshold. All carryover amounts from 2019 and 2020 were used prior to utilizing funding transfers from other Program Areas.

Table 1-2: 2021 DSM Funding Transfers and Carryover Amounts (\$000s)

A	B	C	D	E	F	G	H	I
Program Area (Sector)	2021 Plan as Filed	Carried Over from 2020 Underspend	2021 Transfers Between Program Areas	2021 Plan after Carryover and Transfers	2021 Actual	Variance (F-E)	Plan Amount Carried Over to 2022	Transfer as a percent of Plan as Filed D/B
Residential	2,519	-	236	2,755	2,896	141	(141)	9%
Low Income	899	55	(112)	842	842	-	-	-12%
Commercial	3,052	225	100	3,377	3,497	119	(119)	3%
Industrial	1,813	274	300	2,387	2,653	265	(265)	17%
CEO	595	-	4	599	599	-	-	1%
Supporting Initiatives	1,024	349	(256)	1,117	1,093	(24)	24	-25%
Portfolio	1,019	14	(240)	793	793	-	-	-24%
Demand Response	130	321	(33)	419	311	(108)	108	-25%
Total	11,051	1,238	-	12,289	12,683	394	(394)	-

Table 1-2 identifies a total expenditure of \$394 thousand above the approved amount for 2021. However, both the Supporting Initiatives and Demand Response Program Areas had additional carryover totalling \$132 thousand (\$24 thousand and \$108 thousand, respectively) after the 25 percent inter-program transfer limit that will be used to support program activities in those areas in 2022. Thus, after inter-program transfers, FBC has an over expenditure in the Residential, Commercial, and Industrial Program Areas totalling \$526 thousand (\$141 thousand, \$119 thousand, and \$265 thousand, respectively).

FBC did not anticipate exceedances in the Residential, Commercial, and Industrial Program Areas prior to year-end. The Program Area summary sections of the Report explain the reason for unanticipated exceedances. As such, in Table 1-3 below, FBC has allocated negative dollar amounts totalling \$526 thousand to three Program Areas (Residential, Commercial, and Industrial) to be carried over into 2022, reducing spending in those areas. FBC is requesting approval to carry forward these negative amounts to the final year of the 2019-2022 DSM Plan period as part of a separate application filed concurrently with the Report.

Table 1-3: 2022 DSM Budget Including Carryover Amounts

Program Area (Sector)	2022 Plan (\$000s)	2021 Carryover (\$000s)	2022 Budget incl. Carryover (\$000s)
Residential	\$ 2,795	\$ (141)	\$ 2,654
Low Income	\$ 930	\$ -	\$ 930
Commercial	\$ 3,047	\$ (119)	\$ 2,927
Industrial	\$ 1,815	\$ (265)	\$ 1,549
CEO	\$ 666	\$ -	\$ 666
Supporting Initiatives	\$ 1,044	\$ 24	\$ 1,069
Portfolio	\$ 956	\$ -	\$ 956
Demand Response	\$ 133	\$ 108	\$ 240
Total	\$ 11,385	\$ (394)	\$ 10,991

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.

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 British Columbia Ministry of Energy, Mines and Low Carbon Innovation (EMLI)², continued to collaborate in 2021. FBC's collaboration with EMLI 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 the 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 portfolio level TRC Benefit/Cost ratio of 1.5 in 2021. FBC believes that both energy savings accounted for in the portfolio and the resulting TRC are conservative, thus likely understated.

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 Formerly known as the Ministry of Energy, Mines and Petroleum Resources (MEMPR).

2. RESIDENTIAL PROGRAM AREA

2.1 OVERVIEW

The Residential Program Area achieved aggregate electricity savings of 7.9 GWh, a 9 percent increase over 2020, and an overall TRC of 1.9. Approximately \$2.9 million was invested in Residential energy efficiency programs in 2021, compared to \$2.3 million in 2020, and 79 percent of those expenditures were incentives to customers. The energy savings achieved from Residential programs were 133 percent of Plan.

The Residential Program Area predominantly includes residential customers living in detached dwellings, townhomes, mobile homes, and rental apartments. Program offers 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 2021 compared to Plan, including incentive and non-incentive spending, and annual electric savings.

Table 2-1: 2021 Residential Program Area Results Summary

Program	Savings (kWh)		Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Home Renovation	4,267,137	4,083,454	\$ 1,505	\$ 1,654	\$ 1,644	\$ 9
New Home	570,530	350,798	\$ 308	\$ 422	\$ 389	\$ 33
Lighting	965,225	3,428,272	\$ 137	\$ 219	\$ 209	\$ 10
Rental Apartment	148,193	33,379	\$ 54	\$ 59	\$ 44	\$ 15
Labour and Expenses	-	-	\$ 515	\$ 542	-	\$ 542
Total	5,951,085	7,895,902	\$ 2,519	\$ 2,896	\$ 2,287	\$ 608

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. In 2021 this program was a collaboration between the BC Utilities and EMLI's CleanBC Better Homes program.

Notable highlights for the year include:

- As part of the Double Rebates offer which launched in fall of 2020, the deadline for double rebate eligible installations occurred on June 30, 2021. The deadline was previously extended from March 31, 2021 to enable higher quality installations, as well as to respond to equipment shortages related to high customer demand and COVID-19 pandemic supply chain interruptions. Heat pump water heater availability to consumers continued

to be challenging due to a limited supply chain and shortage of experienced contractors in the Kelowna area.

- Point-of-sale retail rebates were also captured under the HRR Program Area. This included a comprehensive suite of measures including weatherization, water savers, communicating thermostats and bathroom fans. Lighting measures were also included in this campaign and are described in Section 2.4.
- 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 is outlined in Section 7.4 Enabling Activities, Trade Ally Network (TAN).

2.3 NEW HOME

FBC's new home incentives 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 saw participants grow at the top tiers of the BC Energy Step Code as well as further uptake of appliance incentives. FBC continues to collaborate with FEI, BC Hydro, EMLI, and BC Housing to provide education to builders and energy advisors, and support policy regarding the construction of High Performance Homes in BC.

As part of FBC's COVID-19 Recovery Support Plan, the New Home program provided enhanced incentives that will remain in market until the end of 2022 allowing for builders to plan for the incorporation of energy efficient measures and execute plans over the life of the project.

2.4 RESIDENTIAL LIGHTING

Two successful retail campaigns ran in spring and fall, offering point-of-sale rebates for lighting and other qualifying retail products. The combined initiatives resulted in exceeding planned savings by 255 percent and expenditures by 60 percent. Continued revisions of program design, with an earlier campaign launch in the spring, resulted in robust participation in point-of-sale rebates for LED lightbulbs, fixtures, and lighting controls.

2.5 RENTAL APARTMENT

There are three components to the 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)³ and by FEI outside the SST. Participation in 2021 was lower than anticipated due to the ongoing impacts of the COVID-19 pandemic.

2.6 *SELECTED HIGHLIGHTS*

The Residential Program Area realized 7.9 GWh of energy savings with actual expenditures of \$2.9 million, and achieved a TRC of 1.9. In 2021, the Home Renovation and Lighting programs provided the majority of energy savings results to the Residential Program Area.

FBC's Residential programs enabled customers to upgrade lighting and appliances, and to capture ongoing energy savings. The combination of financial incentives, policy support, contractor outreach, and education is instrumental to the success of these programs in generating energy savings and fostering market transformation in the residential sector.

³ 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 and BC Hydro to deliver programs to Low Income customers, including Indigenous communities, non-profit housing providers and charities serving low income families and individuals. In 2021, FBC invested \$842 thousand, an increase from the \$818 thousand invested in 2020, and achieved 0.7 GWh in energy savings. The TRC achieved for 2021 was 1.3.

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

Table 3-1: 2021 Low Income Program Results Summary

Program	Savings (kWh)		Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Self Install (ESK)	249,401	93,119	\$ 74	\$ 41	\$ 35	\$ 6
Direct Install (ECAP)	872,107	377,345	\$ 705	\$ 413	\$ 289	\$ 124
Social Housing Support	95,374	264,159	\$ 52	\$ 195	\$ 190	\$ 5
Labour and expenses	-	-	\$ 67	\$ 193	\$ -	\$ 193
Total	1,216,882	734,623	\$ 899	\$ 842	\$ 513	\$ 329
Plan including 2020 carryover of \$55			\$ 954			

3.2 SELF INSTALL

The Self Install Program is a program whereby low income participants receive an ESK 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 Self Install program is a partnership program with FEI.

The Self Install Program achieved 55 percent of Plan expenditures and 37 percent of Plan savings. In addition to the kits that were delivered to customers, expenditures were driven by ongoing promotional activities and investment in measure inventory. The Self Install Program was promoted through on-line digital promotions, bill inserts and customer contract centre referrals. FBC also continued its partnership with the Ministry of Social Development and Social Innovation to promote ESKs to their clientele. In 2021, FBC saw a decline in participation despite the completion of promotional activities consistent with prior years. This decline may be attributed to shifting customer priorities as a result of the ongoing COVID-19 pandemic, extreme weather events, or to the competing offers in market which saw higher incentives offered for various measures.

3.3 DIRECT INSTALL

The Direct Install Program is a program whereby low income 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 59 percent of Plan expenditures and 43 percent of Plan savings. Expenditures were driven by ongoing investment in program development and program promotion and outreach. The Direct Install Program was promoted to low income customers through one-to-one outreach efforts, partner referrals, customer contact centre referrals, and through direct mail to past participants of the Self Install Program. In 2021, the COVID-19 pandemic impeded the Direct Install Program. Safety protocols, designed to keep customers and contractors safe, impacted outreach efforts and placed limits on performing installations in customers' homes. Extreme weather events also negatively impacted the program.

3.4 SOCIAL HOUSING SUPPORT

This Program Area currently encompasses:

- Rebates for commercial measures, funding for energy studies, and implementation support for non-profit housing providers and charities;
- Rebates for residential measures and funding for enabling measures, including offers targeted to Indigenous communities through the Indigenous Communities Conservation Program (ICCP) and the Indigenous Communities New Home Program (ICNHP); and
- Energy efficiency training for people facing barriers to employment through the Residential Energy Efficiency Works (REnEW) initiative, a collaborative effort with FEI.

The Social Housing Support Program achieved 372 percent of Plan expenditures and 277 percent of Plan savings. The expenditures exceeded the savings in part due to the higher installation rates of enabling measures. In 2021, the Social Housing Support Program far surpassed Plan expenditures and savings, largely due to the sustained uptake of offers by Indigenous communities. The Social Housing Support Program was primarily promoted through one-to-one outreach efforts and partner referrals.

3.5 SELECTED HIGHLIGHTS

Overall, 2021 was a difficult year to achieve the participation goals of FBC's Low Income Program Area. Both the Self Install and Direct Install Programs were hindered by the COVID-19 pandemic and extreme weather events. These programs typically account for a larger portion of the Low Income Program Area expenditures and savings. FBC continued to invest in development work and maintaining both the Self Install and Direct Install Programs in market for continuity purposes. For example, within the Direct Install Program, FBC invested in developing more robust

- 1 measures, such as draftproofing and insulation for customers living in manufactured/mobile
- 2 homes. On a positive note, the performance of the Social Housing Support Program indicates the
- 3 continued successful uptake of offers by Indigenous communities which helped to offset the
- 4 shortfall in the other Program Areas.

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 12.3 GWh, compared to 11.1 GWh in 2020, and achieved an overall TRC of 1.4 in 2021. Commercial program expenditures totalled \$3.5 million, of which 79 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: 2021 Commercial Program Results Summary

Program	Savings (kWh)		Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Commercial Custom	6,048,000	5,215,201	\$ 1,006	\$ 1,081	\$ 1,068	\$ 13
Commercial Prescriptive	9,242,514	7,106,720	\$ 1,177	\$ 1,767	\$ 1,701	\$ 66
Labour and expenses	-	-	\$ 869	\$ 649	\$ -	\$ 649
Total	15,290,514	12,321,921	\$ 3,052	\$ 3,497	\$ 2,769	\$ 728
Plan including 2020 carryover of \$225			\$ 3,277			

4.2 CUSTOM PROGRAM

FBC and FEI provide incentives to encourage participants to pursue a performance based approach to achieve electricity savings in new and existing commercial 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 support of both BC Energy Step Code-aligned buildings and non-aligned buildings.

FBC, FEI, and BC Hydro jointly operate the Continuous Optimization recommissioning offer, which identifies building operational improvements. FBC and FEI also completed the pilot recommissioning offer in the FBC service territory with 13 participants. The pilot was used to inform updates to the Continuous Optimization offer.

4.3 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. Simple rebates are provided for equipment that meets 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

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

3 The Commercial Prescriptive Program increased its incentive expenditures compared to 2020
4 primarily due to enhanced rebate offers in the form of FBC's COVID-19 recovery offers to support
5 commercial customers in an economic downturn. The increased rebates were offered for a limited
6 time and ended on December 31, 2021.

7 **4.4 SELECTED HIGHLIGHTS**

8 The Commercial Program Area activity in 2021 resulted in 12.3 GWh of electricity savings. These
9 programs enabled commercial and institutional customers to conduct both simple and
10 comprehensive energy efficiency upgrades at their buildings.

11 FEI and FBC launched a limited time COVID-19 recovery offer to both Prescriptive and Custom
12 Programs to encourage customers to invest in energy efficiency during 2021's challenging
13 economic climate. The limited-time COVID-19 recovery offers for both programs expired in 2021.
14 The COVID-19 recovery offer has yielded increased participation in the Prescriptive Program and
15 has identified additional retrofit opportunities in the Custom Program that were implemented in
16 2021 and will continue to be implemented into 2022. As a result, FBC experienced an increase in
17 total incentive expenditure and savings at the Commercial portfolio level compared to 2020.

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 2.3, with electricity savings of 8.7 GWh, 1.8 GWh more than 2020 savings. Actual Industrial expenditures in 2021 totalled \$2.7 million, compared to \$1.8 million in 2020, of which 87 percent were incentives.

Table 5-1 summarizes the Plan and actual expenditures for the Industrial Program Area in 2021, including incentive and non-incentive spending, and annual electricity savings.

Table 5-1: 2021 Industrial Program Results Summary

Program	Savings (kWh)		Plan (\$000s)	Actual Expenditures (\$000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Industrial Custom	8,226,000	4,828,760	\$ 1,308	\$ 1,841	\$ 1,833	\$ 9
Industrial Prescriptive	1,887,556	3,871,692	\$ 311	\$ 487	\$ 466	\$ 21
Labour and expenses	-	-	\$ 195	\$ 324	\$ -	\$ 324
Total	10,113,556	8,700,452	\$ 1,813	\$ 2,653	\$ 2,299	\$ 354
Plan including 2020 carryover of \$274			\$ 2,087			

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 the following year(s).

5.2 CUSTOM PROGRAM

This program provides incentives to encourage participants to pursue a performance-based approach to achieve electricity savings in new and existing industrial facilities. The program encourages detailed analysis of integrated energy saving measures to help identify technically feasible and cost-effective energy savings, and then follows up by providing support for the implementation of those measures. The Industrial Custom Program increased its incentive expenditures compared to 2020 primarily due to enhanced rebate offers in the form of FBC's COVID-19 recovery offers to support industrial customers in an economic downturn. The increased rebates were offered for a limited time and ended on December 31, 2021. FBC is currently conducting a pilot that extends the FEI Strategic Energy Management cohort offer to seven customers in the FBC service territory. The FBC Strategic Energy Management cohort pilot activities are expected to be complete by May 2023. At that point, FBC will assess the results to determine if the pilot can be transitioned into a program.

5.3 ***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 meets 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 specifics of each appliance type and the market it is intended to serve.

In 2021, a prescriptive rebate for horticultural LED lighting was developed to address the increasing demand for indoor agricultural LED lighting projects, specifically for the cannabis and traditional greenhouse sectors. This new prescriptive rebate offer launched in January 2022.

5.4 ***SELECTED HIGHLIGHTS***

Industrial Energy Efficiency Program Area activity in 2021 resulted in 8.7 GWh/year of electricity savings. These programs enabled industrial customers to conduct both simple and comprehensive energy efficiency upgrades at their buildings. Due to FBC seeing a significant increase in indoor agricultural LED lighting projects for both cannabis and traditional greenhouse applications, FBC developed a prescriptive rebate for indoor agricultural LED lighting projects that launched in January 2022.

FEI and FBC launched limited time COVID-19 recovery offers to encourage customers to invest in energy efficiency during 2021's challenging economic climate. The limited-time COVID-19 recovery offers expired in 2021. The COVID-19 recovery offer has helped additional retrofit opportunities to be identified and implemented in the Custom Program by FBC's industrial customers.

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 2021, providing information about behaviour change and customer attitudes on efficiency. Educating all types of customers, and students (who are future customers), remains a strong priority. FBC is continuing to ensure steps are taken to make the information provided relevant and timely.

FBC continued its collaboration with FEI in 2021 to maximize efficiencies across both utilities. Costs continue to be shared on school, residential, and commercial outreach, as applicable.

Actual expenditures were 101 percent of Plan and are summarized below in Table 6-1.

Table 6-1: 2021 Conservation and Outreach Results Summary

Program	Plan (\$000s)	Actual (\$000s)
Residential Education Program	\$ 229	\$ 134
Residential Customer Engagement Tool	\$ 264	\$ 179
Commercial Education Program	\$ 29	\$ 160
School Education Program	\$ 72	\$ 127
Total	\$ 595	\$ 599

6.2 RESIDENTIAL EDUCATION

FBC continued with its “We’ve got rebates” general marketing campaign throughout the heating season, which continued to raise awareness of its rebate programs. FBC and FEI continued to enhance the municipal landing page to further support municipalities’ efforts to promote FBC and FEI rebates and behavioural changes to promote energy conservation. FBC engaged residential customers and promoted energy conservation through activities such as Fresh Air Cinema Events and outreach at South Okanagan food banks. Due to the COVID-19 pandemic, FBC paused its home show outreach activities and reduced its general advertising. As a result, the Residential Education Program’s expenditures were lower than originally budgeted.

6.3 RESIDENTIAL CUSTOMER ENGAGEMENT TOOL

My Energy Use is an enhancement to Account Online to provide customers better understanding of their home’s energy use. The tool was launched for FBC electric customers in June 2021. Through the My Energy Use portal, customers can receive personalized insights into their individual home energy use and earn incentives for participating in energy-savings activities. FBC

1 is then able to use the data collected to enhance program recruitment. In addition to the portal,
2 FBC mailed home energy reports four times to approximately 12,000 electric customers. The
3 reports help customers understand their energy usage in comparison to energy used by similar
4 homes and encourages customers to reduce their energy use through actionable
5 recommendations.

6 Lower than anticipated expenditures can be primarily attributed to the program launching later in
7 the year than expected, resulting in fewer than anticipated reports being sent out and lower than
8 anticipated customer incentives being provided.

9 **6.4 COMMERCIAL EDUCATION**

10 The eighth annual Efficiency in Action awards were held virtually and delivered jointly by FEI and
11 FBC. These awards recognize FEI and FBC commercial customers that have most effectively
12 used C&EM programs and achieved natural gas and electricity energy savings.

13 CEO continued to provide information to customers and the public on electricity conservation and
14 energy literacy. In collaboration with FEI, FBC funded 335 small to medium-sized business energy
15 assessments in interior BC communities serviced by FBC. Customers received advice on saving
16 energy and were informed of rebates on high-efficiency upgrades. With evolving COVID-19
17 pandemic restrictions, FBC worked with its vendor to deliver the program both virtually and in-
18 person to ensure continued support to the business community. Customers were enrolled in the
19 program through the customer contact centre and by outbound calling by the vendor.

20
21 FBC's commercial education program partnership with FEI and BC Hydro continued in 2021. This
22 included collaboration on the Energy Wise Network Program, which helps engage workplaces to
23 save energy through training, peer networking, campaign toolkits, and energy coaching.

24 Expenditures were higher than planned to drive program participation and awareness of
25 Commercial rebate programs with emphasis on small to medium-sized businesses.

26 **6.5 SCHOOL EDUCATION**

27 FBC's Energy Leaders initiative offers curriculum-connected lesson plans for grades K-12. To
28 further support teachers and parents through the COVID-19 pandemic, 53 grade 11 and 12
29 lessons were translated to French and/or modified for distance learning, and 40 Grade 6 and 7
30 French and English worksheets with PDF fillable forms were added to the Energy Leaders site.
31 Additionally, 40 professional development webinars were delivered to help teachers learn about
32 the Energy Leaders lesson materials.

33 To further support teachers during the pandemic, the BC Lions Energy Champions and FBC's
34 Energy is Awesome programs were delivered virtually.

35 For students enrolled in post-secondary institutions, FBC continued to deliver virtual
36 presentations. This presentation speaks to demand side management policies and programs in

1 British Columbia, as well as employment opportunities within the energy management area.
2 Additionally, FBC co-sponsored a UBC Okanagan research chair to explore building energy
3 efficiency.

4 Expenditures were higher than planned to reflect the additional development work completed to
5 support teachers, parents and students during the pandemic.

6 **6.6 CEO HIGHLIGHTS**

7 FBC continued its collaboration with FEI in 2021 to maximize efficiencies across both utilities.
8 Costs continue to be shared on school, residential and commercial outreach, as applicable. The
9 Commercial, Residential, and School Education Programs are not incentive-based programs and
10 therefore FBC does not attribute direct savings to them. CEO expenditures are included at the
11 Portfolio level and incorporated into the overall DSM Portfolio cost-effectiveness results.

12 The initiatives described in CEO are designed to foster a culture of energy conservation through
13 activities and messaging that promotes overall conservation awareness, support energy
14 efficiency literacy, and help increase program participation.

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.

The majority of Supporting Initiative activities are comprised of non-incentive based programs (with the exception of the Commercial and Community Energy Specialist 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 office expenditures and tracking system expenses, are also reported herein.

Actual expenditures were 98 percent of Plan and are summarized below in Table 7-1.

Table 7-1: 2021 Supporting Initiatives Results Summary

Program	Plan (\$000s)		Actual Expenditures (\$000s)	
	Total	Total	Incentive	Non-Incentive
Commercial Energy Specialist	\$ 62	\$ 173	\$ 173	\$ -
Community Energy Specialist	\$ 260	\$ 224	\$ 224	\$ -
Trade Ally Network	\$ 208	\$ 119	\$ -	\$ 119
Codes and Standards	\$ 122	\$ 109	\$ -	\$ 109
Reporting Tool & Customer Portal	\$ 64	\$ 153	\$ -	\$ 153
Labour and Expenses	\$ 308	\$ 315	\$ -	\$ 315
Total	\$ 1,024	\$ 1,093	\$ 397	\$ 695
Plan including 2020 carryover of \$349	\$ 1,373			

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 \$40 thousand per year in an annual contract, with a matching amount provided by FEI for Energy Specialist, Energy Analyst or a Thermal Energy Manager positions.

The key priorities of these positions are to identify and implement opportunities for their organization to participate in FBC's and FEI's DSM programs, while also identifying and implementing non-program specific opportunities to use electricity and natural gas more efficiently. There were seven participants in the SST in 2021. FBC considers this an energy management program, and a specified demand-side measure, as defined in the DSM Regulation.

This program is funded as an enabling activity but claims energy savings for any project completed by Energy Specialists that are not claimed by another FBC DSM program. There were no additional verified savings for 2021 beyond those already accounted for in other DSM programs.

The 2021 program expenditures were higher than forecast due to more positions being funded at more organizations than anticipated in the Plan.

7.3 COMMUNITY ENERGY SPECIALIST PROGRAM

The Community Energy Specialist Program funds positions in local municipal governments and regional districts to facilitate energy efficiency planning activities. These activities include:

- Coordinating development of community energy plans;
- Developing and promoting community-level energy policies;
- Marketing initiatives to promote conservation and efficiency at the community level; and
- Adopting energy efficient design practices and policies in government and regional districts buildings.

There were five participants in the SST in 2021, including a participant from the Okanagan Nation Alliance. Some participants had their Community Energy Specialists in place for only part of the year due to the COVID-19 pandemic; hence, the Plan expenditures were not fully realized.

7.4 TRADE ALLY NETWORK

The Trade Ally Network (TAN) is FBC's contractor network whose main objective is to advance energy efficiency messaging and to promote the Company's DSM programs. The TAN is comprised of contractors, electricians, distributors and Point of Sale partners who offer rebates at the point of sale to commercial and industrial customers. FBC recognizes the important role these industry groups play when it comes to influencing residential and commercial customers when making energy efficiency decisions.

TAN is a key initiative under Enabling Activities that supports and supplements DSM program development and delivery, by providing FBC with a direct communication channel with the industry stakeholders. TAN also supports the interests of FBC by:

- Providing trade allies with co-op funding for advertising delivering targeted messaging about energy efficiency, and to promote C&EM rebate programs; and
- Funding eligible training that relates to the promotion and sales of high efficiency appliances, appliance safety, installation, best practices, or similar courses related to energy efficient measures that support FBC's current rebate programs.

In 2021, TAN contractors were responsible for 73 percent of the 2021 Residential Heat Pump rebates. To further support Point of Sale Partners and advance commercial DSM programs, work was undertaken in 2021 to build an online search tool on the FBC website that allows commercial customers to find and connect with Point of Sale Partners. The tool is expected to launch in Q1 2022.

Due to supply-chain disruptions caused by the COVID-19 pandemic, trade allies' participation in co-op advertising programs was lower than expected. In addition, due to COVID-19 restrictions, TAN member events were executed virtually, and expenses typically associated with in-person events were not incurred. FBC continued to develop and offer training focused on the best practices for installing high-efficiency electric appliances and education that allows TAN members to maintain competitiveness and flexibility to continue selling energy efficient upgrades.

FBC continued to support an optional contractor accreditation initiative in partnership with BC Hydro and EMLI's CleanBC Better Homes. Accreditation involved contractors taking part in best practices training and quality assurance on a sampling of their work. This initiative began with heat pump and insulation contractors and has expanded to fenestration contractors, HVAC contractors, and Energy Advisors in 2021. FBC's funding to the Home Performance Stakeholder Council (HPSC) in 2021 was lower than previous years which contributed to the lower than planned expenditures in the TAN portfolio.

7.5 CODES AND STANDARDS

FBC has signed a three-year funding agreement with the Canadian Standards Association (CSA) to support relevant codes and standards work. This funding supports a number of projects including:

- Review and updates to a document for CSA EXP-07: Load-based and climate-specific testing and rating procedures for heat pumps and air conditioners; and
- Development of a document for CSA EXP-10: Load-based and climate-specific testing and rating procedures for split system air-to-water heat pumps for domestic hot water heat pumps for domestic hot water service.

FBC was also part of several committees to guide and contribute to the development of codes and standards, including CSA Communities and the CSA Technical Committee on Heating Ventilation Air Conditioning and Refrigeration. FBC plans to continue participating in these projects and committees in 2022.

7.6 REPORTING TOOL & CUSTOMER APPLICATION PORTAL

The reporting tool and customer application portal is a joint initiative between FBC and FEI. The tool launched seven residential programs in 2020 and five programs launched in 2021, with the remaining programs set to launch in 2022.

- 1 The reporting tool offers customers an online portal to apply for rebates and track a rebate's
- 2 status. The tool also offers FBC and FEI with a tracking software to process applications and
- 3 provide in-depth reporting. The tool is fully integrated to other technologies such as Account
- 4 Online and SAP. The ongoing evolution of C&EM programs and the highly integrated nature of
- 5 the tool to support a streamlined customer experience have resulted in a longer project timeline
- 6 and higher expenditures than anticipated when the Plan values were developed in 2018.

8. PORTFOLIO EXPENDITURES

8.1 OVERVIEW

Portfolio expenditures consist largely of Planning & Evaluation (P&E) activities, include staffing costs and consultant fees for the various studies, plus Innovative Technology pilots undertaken. The actual Portfolio expenditures for 2021 were \$0.8 million, 78 percent of Plan.

Table 8-1: 2021 Portfolio Expenditures Results Summary

Program	Plan (\$000s)	Actual (\$000s)
Monitoring and Evaluation	\$ 107	\$ 101
DSM Studies	\$ 182	\$ 118
Innovative Technologies	\$ 156	\$ 15
Labour and Expenses	\$ 574	\$ 560
Total	\$ 1,019	\$ 793
Plan including 2020 carryover of \$14	\$ 1,033	

Portfolio expenses also include any costs incurred to engage the Energy Efficiency and Conservation Advisory Group (EECAG). EECAG members provide insight and feedback on FBC's Portfolio of DSM activities and important feedback on future DSM planning.

EECAG provides input on both the electric and natural gas portfolios for FBC and FEI. The EECAG met over four partial day engagement sessions in 2021, one key topic included the drafted FBC DSM expenditure plan.

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 measures undertaken by customers.

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>

- 1 FBC was involved in several shared evaluations and undertook one solo evaluation in 2021.
- 2 FBC's impact evaluation activities that took place in 2021 will be finalized and reported in 2022.
- 3 Table 8-2 provides a list of the 2021 DSM Program evaluation and research activities undertaken
- 4 by FBC in collaboration with utility partners as shown, chiefly FEI and BC Hydro.

5 **Table 8-2: 2021 DSM Program Evaluation and Research Activities⁵**

Evaluation Name	Program Area	Type of Evaluation	Evaluation Partners	Evaluation Status
Energy Audit 2020 Update	Enabling Activities	Process & Impact	FortisBC Energy Inc. & FortisBC Inc.	The study is an update to an energy savings audit to verify energy savings from projects completed in 2021. Completed June 2021 by Prism Engineering. Preliminary results provided in 2020 Annual Report.
Energy Specialist Program Evaluation 2021	Enabling Activities	Process & Impact	FortisBC Energy Inc. & FortisBC Inc.	The evaluation study includes program and industry stakeholder surveys and an energy savings audit on a subset of completed 2021 projects. To be completed Q2 2022
Community Energy Specialist Program Evaluation 2021	Enabling Activities	Process	FortisBC Energy Inc. & FortisBC Inc.	Program evaluation consisting of a process evaluation and interviews with internal and external stakeholders in order to gather feedback for future program design. To be completed Q2 2022
Insulation Measures Characterization Analysis	Residential	Market Study	FortisBC Energy Inc., FortisBC Inc. & BC Hydro	Characterization analysis of insulation measures incented as part of the Home Renovation Rebate Program. Completed December 2021
New Home Program Evaluation	Residential	Process & Impact	FortisBC Energy Inc. & FortisBC Inc.	Program evaluation of the New Home rebate program consisting of contractor and customer surveys, impact analysis, and an analysis on customer usage with hybrid models. To be completed Q2 2022
Participant and Building Owner Surveys	Residential / Commercial	Process	FortisBC Energy Inc. & FortisBC Inc.	Surveys conducted with building owners and tenants to assess customer satisfaction, program awareness, and gather feedback for future program design. 2020 results: Completed April 2021 2021 results: To be completed Q2 2022
Direct Install 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.

6

⁵ Table 8-2 does not include Prefeasibility Studies. Please refer to the Innovative Technologies section (Section 8.4) for details.

Evaluation Name	Program Area	Type of Evaluation	Evaluation Partners	Evaluation Status
Customer Feedback Surveys	Low Income	Process	FortisBC Energy Inc., FortisBC Inc. & BC Hydro	Ongoing surveys with Direct Install program participants to gather feedback on their customer experience, satisfaction with the program and the program representatives. 2021 Survey results completed February and March 2021.
Customer Engagement Tool Evaluation	CEO	Impact	FortisBC Energy Inc. & FortisBC Inc.	Evaluation of the overall program, validation of the treatment and control group selection, and net savings attributed to the distribution of the Home Energy Reports. To be completed Q2 2022
Partnership Program Evaluation Study	Portfolio	Market Study	FortisBC Energy Inc. & FortisBC Inc.	Research study to gather feedback from industry experts, documentation review of guidelines and best practices for Partnership programs. Completed May 2021
Compliance Site Inspections	Commercial and Industrial	Compliance	FortisBC Inc.	Site inspections to verify installation rate of rebated Commercial and Industrial equipment, Completed December 2021

8.3 DSM STUDIES

DSM studies undertake key research, (e.g. end-use surveys), and support long-term planning such as Conservation Potential Reviews (CPR). The Company's 2021 DSM studies included the 2020 CPR, to update the achievable potential available for FBC's DSM programs. The 2020 CPR update was completed in the second quarter of 2021 and filed with FBC's 2021 Long Term Electric Resource Plan (LTERP).

8.4 INNOVATIVE TECHNOLOGIES

Innovative technology funding supports the development, or increased use, of a "technology, a system of technologies, or a building or industrial facility design that could achieve significant reductions of energy usage or significantly more efficient use of energy"⁶. FBC uses innovative technology funding to support feasibility studies, technology pilots, and field studies to assess the potential for these technologies.

In 2021, FBC funded a number of innovative technology studies, including:

- In partnership with FEI, an update to a Connected Homes study to characterize the energy and non-energy benefits of connected home technologies and estimate their energy savings potential in the FBC and FEI service area. The study is also meant to

⁶ Technology innovation program defined in the Demand-Side Measures Regulation 326/2008 (amended Mar. 24, 2017).

1 inform a potential pilot project to investigate the use of connected home technologies as
2 DSM measures.

- 3 • In partnership with FEI, a study on residential hybrid heating system controls as a DSM
4 opportunity. This study assessed the market opportunity, technical characteristics, and
5 energy savings potential of these controls. This study looked at both integrated controls,
6 such as those built into modern air source heat pumps, and dual-fuel thermostats.

- 7 • In partnership with BC Hydro and the Centre for Energy Advancement through
8 Technological Innovation (CEATI), FBC contributed to a study investigating the interactive
9 effects of horticultural LEDs with HVAC controls in greenhouse and warehouse
10 operations. The study will take place in 2022.

- 11 • FBC has begun a hydronic additive field study for commercial electric customers.
12 Hydronic additives are chemical additives to non-potable heating systems that improve
13 the system's heat transfer efficiency. Hydronic additives have seen success in natural
14 gas hydronic applications in the past, and FEI currently offers a prescriptive rebate for
15 this technology. The goal of this pilot is to investigate the magnitude of energy savings
16 for electrically heated hydronic additive systems, including hydronic systems with heat
17 pumps. Another goal of the pilot is to determine the impact of hydronic additives during
18 the cooling season. This study will begin customer recruitment in 2022.

9. DEMAND RESPONSE

9.1 OVERVIEW

FBC implemented the next pilot phase in its Kelowna demand response pilot, testing the viability of automated demand response for residential customers.

Table 9-1: 2021 Demand Response Results Summary

Program	Plan (\$000s)	Actual Expenditures (\$000s)		
		Total	Incentive	Non-Incentive
Demand Response	\$ 130	\$ 311	\$ -	\$ 311
Plan including 2020 carryover of \$321	\$ 451			

The 2021 expenditures totaling \$311 thousand exceeded the Plan budget of \$130 thousand, but was covered with carryover from previous years. Retaining the demand-response implementer and developing pilot-specific marketing materials were the main drivers of demand response expenditures in 2021.

9.2 KELOWNA AREA DEMAND RESPONSE PILOT

Following the completion of the commercial and large loads phase of the Kelowna Area Demand Response Pilot, FBC began designing the Kelowna Residential Demand Response Pilot. The scope of the pilot includes investigating voluntary demand response interventions for electric space heating, electric water heating, air conditioning, pool pump, and electric vehicle chargers.

In Q2 2021, FBC completed a procurement process and retained an implementer to set up the residential demand response back-end software, smart device integration, and demand response controller installation network for hot water and pool pumps. Activities for the remainder of the year were focussed on customizing the IT back end for the pilot, developing marketing materials, and working with the equipment suppliers to enable their devices to work on the pilot.

Recruitment of Kelowna participants began on January 31, 2022 and the pilot will complete in early 2023.

10. SUMMARY

In 2021, FBC achieved 115 percent of its total approved DSM expenditures and 91 percent of its annual energy savings target for the year, based on the 2019-2022 DSM Plan. Customer incentives were the largest cost component, making up 65 percent of the overall portfolio expenditures. The total energy savings of 29.7 GWh was largely made up of Commercial savings of 12.3 GWh, Industrial savings of 8.7 GWh, and Residential savings of 7.9 GWh.

This 2021 Annual Report details how FBC delivered its energy conservation programs in a cost effective manner, achieving an overall Benefit/Cost (TRC) ratio of 1.5. After intra-program transfers, all of which complied with the maximum 25 percent transfer limit, FBC has allocated negative dollar amounts totalling \$526 thousand to three Program Areas (Residential, Commercial, and Industrial) to be carried over into 2022. FBC is requesting approval to carry forward these negative amounts to the final year of the 2019-2022 DSM Plan period as part of a separate application filed concurrently with the Report.

FBC was able to increase its incentive expenditures and associated energy savings over 2020 while maintaining strong COVID-19 safety protocols in accordance with provincial health directives. The Company continues to offer a robust portfolio of DSM programming accessible to all customer rate classes, while meeting the adequacy requirements of the DSM Regulation and operating according to the Company's DSM Guiding Principles.

Appendix A

DETAILED BENEFIT-COST RATIOS

Appendix A-1

**DSM PROGRAMS COST AND SAVINGS SUMMARY REPORT
FOR 2021**

APPENDIX A - DETAILED BENEFIT-COST RATIOS
Table A-1: FBC DSM Summary Report for Year Ended December 31, 2021

	Utility Expenditures (\$000s)				Annual Electricity Savings (MWh)		Cost Effectiveness Tests (Benefit/Cost Ratio)			
Program Area	Incentive	Non-Incentive	Total	Plan	Plan	Actual	TRC	UCT	RIM	Levelized cost (¢/kWh)
Residential										
Home Renovation	1,644	9	1,654	1,505	4,267	4,083	1.5	2.4	0.6	8.5
New Home	389	33	422	308	571	351	3.0	3.5	1.4	13.3
Lighting	209	10	219	137	965	3,428	5.0	11.5	0.6	2.3
Rental Apartment	44	15	59	54	148	33	-	0.5	0.3	5.0
Labour and expenses	-	542	542	515	-	-	-	-	-	-
Residential Total	2,287	608	2,896	2,519	5,951	7,896	1.9	2.7	0.6	7.4
Low Income							-	-	-	-
Self Install (ESK)	35	6	41	74	249	93	6.1	1.8	0.6	2.9
Direct Install (ECAP)	289	124	413	705	872	377	2.9	0.9	0.4	7.2
Social Housing Support	190	6	195	52	95	264	2.2	1.9	0.7	5.9
Labour and expenses	-	193	193	67	-	-	-	-	-	-
Low Income Total	513	329	842	899	1,217	735	1.3	1.0	0.5	9.0
Commercial							-	-	-	-
Commercial Custom	1,068	13	1,081	1,006	6,048	5,215	1.1	5.0	0.9	10.2
Commercial Prescriptive	1,701	66	1,767	1,177	9,243	7,107	1.9	5.5	1.2	6.7
Labour and expenses	-	649	649	869	-	-	-	-	-	-
Commercial Total	2,769	728	3,497	3,052	15,291	12,322	1.4	4.3	1.0	8.6
Industrial							-	-	-	-
Industrial Custom	1,833	9	1,841	1,308	8,226	4,829	2.2	2.6	1.0	5.3
Industrial Prescriptive	466	21	487	311	1,888	3,872	2.8	10.6	1.6	4.4
Labour and expenses	-	324	324	195	-	-	-	-	-	-
Industrial Total	2,299	354	2,653	1,813	10,114	8,700	2.3	3.7	1.2	5.2
Conservation Education and Outreach	-	599	599	595	-	-	-	-	-	-
Supporting Initiatives	397	695	1,093	1,024	-	-	-	-	-	-
Portfolio Expenditures	-	793	793	1,019	-	-	-	-	-	-
Demand Response	-	311	311	130	-	-	-	-	-	-
Total Portfolio	8,265	4,418	12,683	11,051	32,572	29,653	1.5	2.7	0.8	8.2

Appendix A-2

**HISTORICAL SUMMARY OF DSM COST AND ENERGY
SAVING RESULTS (2016-2020)**

	Expenditures (\$000s)										Energy Savings (MWh)									
	2020		2019		2018		2017		2016		2020		2019		2018		2017		2016	
	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Residential																				
HRR/Home Improvements	1,357	1,348	1,200	1,487	140	136	348	196	884	225	3,916	3,551	3,264	3,227	301	225	364	187	3,106	243
Heat Pumps	-	-	-	-	327	357	298	307	302	249	-	-	-	-	1,297	1,127	781	976	1,618	753
Residential Lighting	163	238	157	218	202	141	190	380	189	360	1,122	3,401	2,284	3,141	3,337	3,255	2,735	8,125	1,547	8,607
New Home Program	227	215	184	90	76	36	151	61	390	39	439	251	340	112	169	54	126	45	1,179	31
Appliances	-	-	-	-	159	204	133	337	96	245	-	-	-	-	215	303	126	494	288	242
Water Heating	-	-	-	-	25	25	-	-	-	-	-	-	-	-	38	38	-	-	-	-
Low Income (2015-2017)	-	-	-	-	-	-	-	-	952	1,111	-	-	-	-	-	-	2,739	693	2,598	1,214
Behavioral	-	-	-	-	165	16	200	5	106	79	-	-	-	-	240	67	3,097	20	1,048	587
Rental Apartment Program	54	37	54	33	53	19	206	77	-	137	148	-	148	21	306	87	508	295	576	840
Watersavers	-	-	-	-	-	-	30	1	430	72	-	-	-	-	-	-	17	12	948	21
Labour & Related Expenses	503	501	491	362	610	468	1,161	529	-	-	-	-	-	-	-	-	-	-	-	-
Residential Total	2,304	2,339	2,086	2,190	1,757	1,402	2,717	1,893	3,349	2,517	5,625	7,203	6,036	6,501	5,903	5,156	10,493	10,847	12,908	12,538
Low Income (Since 2018)																				
Low Income	-	-	-	-	731	396	-	-	-	-	-	-	-	-	1,229	687	-	-	-	-
Self Install (ESK)	74	75	74	143	-	-	-	-	-	-	249	287	249	527	-	-	-	-	-	-
Direct Install (ECAP)	687	343	665	519	-	-	-	-	-	-	881	224	891	636	-	-	-	-	-	-
Social Housing Support	46	286	41	60	-	-	-	-	-	-	83	285	72	186	-	-	-	-	-	-
Labour & Related Expenses	65	114	64	217	-	282	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Income Total	872	818	844	939	731	678	-	-	-	-	1,213	796	1,212	1,349	1,229	687	-	-	-	-
Commercial																				
Lighting	-	-	-	-	1,750	1,751	2,322	2,749	1,519	1,192	-	-	-	-	13,620	17,635	10,592	12,580	7,616	5,694
Building and Process Improvements	-	-	-	-	988	247	784	371	842	574	-	-	-	-	5,290	1,763	2,931	605	3,452	1,234
Computers	-	-	-	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-	378	-
Municipal (Water Handling)	-	-	-	-	-	-	-	-	79	4	-	-	-	-	-	-	-	-	759	-
Sm Business Direct Install	-	-	-	-	-	382	-	862	-	556	-	-	-	-	-	3,224	-	2,634	-	1,139
Irrigation	-	-	-	-	-	180	25	12	69	13	-	-	-	-	255	249	144	59	490	61
MURB New Construction	-	-	-	-	32	42	-	29	-	-	-	-	-	-	-	1,073	-	237	-	-
Commercial Custom	964	619	980	1,274	-	-	-	-	-	-	5,346	3,554	4,428	6,588	-	-	-	-	-	-
Commercial Prescriptive	1,218	1,513	1,371	1,505	-	-	-	-	-	-	10,121	7,596	11,114	8,375	-	-	-	-	-	-
Labour & Related Expenses	848	674	828	606	822	864	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Total	3,030	2,806	3,179	3,385	3,592	3,466	3,131	4,023	2,564	2,339	15,467	11,150	15,542	14,963	19,165	23,944	13,667	16,115	12,695	8,128
Industrial																				
Industrial Efficiencies	-	-	-	-	305	240	309	206	209	300	-	-	-	-	1,188	1,615	1,566	876	1,585	2,099
Industrial Custom	1,308	1,092	1,288	640	-	-	-	-	-	-	8,226	4,491	8,226	1,868	-	-	-	-	-	-
Industrial Prescriptive	290	455	290	282	-	-	-	-	-	-	1,781	2,304	1,811	1,110	-	-	-	-	-	-
Labour & Related Expenses	190	220	185	174	72	157	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Total	1,788	1,767	1,763	1,096	377	397	309	206	209	300	10,007	6,795	10,037	2,978	1,188	1,615	1,566	876	1,585	2,099
Programs Total	7,994	7,730	7,872	7,610	6,457	5,943	6,157	6,122	6,122	5,156	32,312	25,944	32,827	25,791	27,485	31,402	25,726	27,838	27,188	22,765
Supporting Initiatives	838	818	1,218	869	742	537	674	674	675	657	-	209	-	-	-	-	-	-	-	-
Planning & Evaluation	-	-	-	-	743	743	777	994	735	718	-	-	-	-	-	-	-	-	-	-
Conservation Education and Outreach	497	566	566	575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portfolio Expenditures	913	911	776	762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Demand Response	324	135	477	264	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10,566	10,160	10,909	10,080	7,942	7,223	7,608	7,790	7,532	6,531	32,312	26,153	32,827	25,791	27,485	31,402	25,726	27,838	27,188	22,765

In the 2019-2022 DSM Expenditures Plan, several existing DSM programs were reorganized and/or consolidated into new programs:

Residential: The Residential Home Improvements program name changed to the Home Renovation Rebate (HRR) program. Heat pumps, water heaters and appliances were consolidated into the HRR program.

Low Income: The Low Income program was separated into Self-Install, Direct Install and Social Housing Support.

Commercial: The Commercial Custom and Prescriptive programs both include lighting. MURB New Construction was moved into the Custom program and Building and Process Improvements was moved into the Prescriptive program.

Industrial: The Industrial Efficiencies program was separated into both the Industrial Custom and Prescriptive programs.

Portfolio Expenditures: Planning & Evaluation was moved into this portfolio.