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, 2021

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) – 2020 Annual Report

---

Attached please find the Electricity DSM Program 2020 Annual Report for FBC (the Annual Report).

Request for Confidentiality of Certain Information

FBC is filing full evaluation reports which were substantially completed in 2020 for the Retail Program (consisting of Residential Lighting and Appliance programs); and the Heat Pump programs provided in Appendix C. FBC requests that the full reports be filed on a confidential basis pursuant to Section 18 of the British Columbia Utilities Commission's Rules of Practice regarding confidential documents adopted by Order G-15-19. The full reports must be kept confidential on the basis that the reports contain customer-specific information that should not be disclosed to the public. In addition, the methodology and processes used in the report are proprietary to the consultants hired by FBC. The publicly available Executive Summary of the evaluations of the Programs are provided in Appendix B.

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

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachment

FortisBC Inc.

Electricity
Demand-Side Management Programs
2020 Annual Report

March 31, 2021

Table of Contents

List of Appendices

Index of Tables and Figures

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, 2020 and provides a summary of results achieved in 2020. The Report reviews the progress of FBC's DSM programs in meeting the approved 2019-2022 DSM Plan[1] (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 2020. 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 2020 by Program Area, including program-level comparisons of actual energy savings and costs to Plan.

Consistent with previous DSM annual reports, additional details on 2020 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.

1.1 *PORTFOLIO LEVEL RESULTS*

Table 1-1 provides an overview of FBC's 2020 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 1.6 on DSM expenditures of $10.2 million, an increase of $0.1 million over 2019. Electricity savings totalled 26.2 GWh, an increase of 0.3 GWh compared to 2019. 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 (mTRC) to pass.

FBC's actual 2020 DSM expenditures were 96 percent of 2020 Plan and the DSM energy savings were 81 percent of Plan. The savings shortfall was primarily in the Commercial and Industrial portfolios.

[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 2020

Program Area (Sector)	2020 Plan Savings (kWh)	Actual Savings (kWh)	2020 Plan ($000s)	Actual ($000s)	Benefit/ Cost TRC
Residential	5,624,721	7,201,977	$2,304	$2,339	2.4
Low Income	1,213,805	795,883	$ 873	$ 818	1.3
Commercial	15,466,737	11,149,823	$3,031	$2,805	1.4
Industrial	10,006,686	6,794,817	$1,788	$1,767	3.7
Education and Outreach	-	-	$ 497	$ 566	-
Supporting Initiatives	-	209,000	$ 838	$ 818	-
Portfolio	-	-	$ 913	$ 911	-
Demand Response	-	-	$ 324	$ 135	-
Total	**32,311,949**	**26,151,500**	**$ 10,568**	**$ 10,159**	**1.6**

FBC's DSM expenditures in 2020 were cost-effective according to the methodology set out in section 4 of the DSM Regulation, achieving a portfolio TRC value of 1.6. The TRC value of 1.3 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.

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 2020 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.

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. Extensive work was undertaken by FBC to support virtual learning during the COVID-19 pandemic and to translate Energy Leaders lessons into French.

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 $108 thousand, of the Plan $107 thousand, was recorded.

FBC supported step code adoption through its New Home Program (Section 2.3) and provided progressive rebates to align with the BC Energy Step Code (BCESC). It also provided funding for Community Energy Specialists to support local government policy development, as well as promote BCESC to 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 2020 funding transfers between Program Areas and carryover expenditure amounts available by Program Area for 2021. FBC notes that all funding transfers completed in 2020 were within the prescribed 25 percent of Program Area Plan threshold.

The 2020 transfers consisted of moving a total of $103 thousand, taken out of the Demand Response ($82 thousand), Supporting Initiatives ($20 thousand), and Portfolio ($1 thousand) Program Areas, and transferred into the Residential ($35 thousand) and Conservation Education & Outreach (CEO) ($68 thousand) Program Areas to support 2020 expenditures in those sectors.

A total of $409 thousand will be carried over into 2021, as shown by Program Area, in the last column of Table 1-2.

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

Program Area (Sector)	2020 Plan ($000s)	Actual ($000s)	Variance ($000s)	2020 Funding Transfers In (Out) ($000s)	Transfer as a Percent of Plan	2020 Carryover ($000s)
Residential	2,304	2,339	35	35	2%	-
Low Income	873	818	-55	-	-	55
Commercial	3,031	2,805	-225	-	-	225
Industrial	1,788	1,767	-20	-	-	20
CEO	497	566	68	68	14%	-
Supporting Initiatives	838	818	-20	-20	2%	-
Portfolio	913	911	-1	-1	0.1%	-
Demand Response	324	135	-190	-82	25%	108
Total	**10,568**	**10,159**	**-409**	-		**409**

A summary of the 2021 budget, including prior years' carryover amounts, is shown in Table 1-3.

Table 1-3: 2021 DSM Budget Including Carryover Amounts

Program Area (Sector)	2021 Plan ($000s)	2019 Carryover ($000s)	2020 Carryover ($000s)	2021 Budget incl. Carryovers ($000s)
Residential	2,519	-	-	2,519
Low Income	899	-	55	954
Commercial	3,052	-	225	3,278
Industrial	1,813	254	20	2,088
CEO	595	-	-	595
Supporting Initiatives	1,024	349	-	1,373
Portfolio	1,019	14	-	1,033
Demand Response	130	213	108	452
Total	**11,051**	**830**	**409**	**12,290**

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 2020. 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.

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

1.5 *PORTFOLIO SUMMARY*

FBC's DSM portfolio met the goal of cost effectiveness, with a portfolio level TRC Benefit/Cost ratio of 1.6 in 2020. 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 7.2 GWh, an 11 percent increase over 2019, and an overall TRC of 2.4. Approximately $2.3 million was invested in Residential energy efficiency programs in 2020, compared to $2.2 million in 2019, and 71 percent of those expenditures were incentives to customers. The energy savings achieved from Residential programs were 128 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 2020 compared to Plan, including incentive and non-incentive spending, and annual electric savings.

Table 2-1: 2020 Residential Program Area Results Summary

Program	Savings (kWh)		Plan ($000s)	Actual Expenditures ($000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Home Renovation	3,915,701	3,550,849	1,357	1,348	1,275	73
New Home	439,157	250,557	227	215	204	11
Lighting	1,121,669	3,400,571	163	238	158	80
Rental Apartment	148,193	-	54	37	12	25
Labour and expenses	-	-	503	501	-	501
Total	**5,624,721**	**7,201,977**	**2,304**	**2,339**	**1,650**	**689**

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 on overarching program. This program is a collaboration between the BC Utilities, and EMLI CleanBC Better Homes program.

Notable highlights for the year include:

- Enhanced rebates, as part of FBC's COVID-19 Recovery Support Plan, were offered for residential customers through the double rebates initiative that is available for installations completed by March 31, 2021. Additionally, expanded in-store and online retailer activities for residential electric rebates began in October and continued through November.

- 333 customers received heat pump rebates in 2020.
- Heat Pump Water Heater availability to consumers continued to be challenging due to a shortage of experienced contractors in the Kelowna area.
- Two point-of-sale retail campaigns were also captured under the home renovation program area. The first, which ran early in the year, focused on weatherization products and water savers. The second campaign, launched late summer, 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 Enabling Activities, s7.4 Trade Ally Network (TAN).
- 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. Similarly, a PRC initiative for insulation contractors is scheduled to launch in spring of 2021.

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 continued to see participation increase in 2020 with a majority of projects registering at the top tiers of the BC Energy Step Code. 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 to encourage builders to keep high performance a priority during the economic downturn.

2.4 RESIDENTIAL LIGHTING

Although LED lights continue to move towards market maturation and the onset of the pandemic in early 2020 resulted in the cancellation of the spring campaign, FBC was able to deliver a successful lighting campaign which exceeded planned savings by 203 percent and expenditures by 46 percent. A restructured approach, with an earlier campaign launch in the fall, saw robust participation in of point-of-sale rebates for LED lightbulbs, fixtures and lighting controls.

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)[3] and by FEI outside the SST.

Typically, the program provides direct installations for 8 to 10 participants per year. In 2020 in-suite work was discontinued early on in the year (approximately mid-March) due to the COVID-19 Pandemic. No direct installation of measures took place prior to mid-March 2020 and the restriction remained in effect for all of 2020 therefore the program reported no kWh savings in 2020.

2.6 SELECTED HIGHLIGHTS

The Residential Program Area realized 7.2 GWh of energy savings with actual expenditures of $2.3 million, and achieved a TRC of 2.4. In 2020, 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. 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.

[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 to deliver programs to Low Income customers, including non-profit housing organizations and charities serving low-income people. In 2020, FBC invested $818 thousand, which was less than the $937 thousand in 2019 due to COVID-19 impacts, and achieved 0.8 GWh in energy savings. The 2020 TRC was 1.3.

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

Table 3-1: 2020 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	287,208	74	75	51	23
Direct Install (ECAP)	881,470	223,578	687	343	190	153
Social Housing Support	82,934	285,098	46	286	270	16
Labour and expenses	-	-	65	114	-	114
Total	**1,213,805**	**795,883**	**873**	**818**	**512**	**306**

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 Self Install program is a partnership program with FEI.

The Self Install Program achieved 101 percent of Plan expenditures and 115 percent of Plan Savings. The Self-Install Program was promoted through on-line digital promotions, bill inserts and customer 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 50 percent of Plan expenditures and 25 percent of Plan Savings. The Direct Install Program was promoted to Low Income customers through one-to-one outreach efforts, partner referrals, referrals from the customer contact centre, and through direct mail to past participants of the ESK program.

In 2020, the COVID-19 pandemic impeded the Direct Install program from performing installations in customer's homes for approximately six months. During this time development work was undertaken to design safe working protocols with contractors, and to further the energy savings opportunities for manufactured homes.

3.4 SOCIAL HOUSING SUPPORT

This program area currently includes three measures:

- Rebates for energy studies, implementation support, and non-profit housing providers.
- Energy efficiency training for people facing barriers to employment through the REnEW (Residential Energy Efficiency Works) initiative, a collaborative effort with FEI.
- Rebates specifically designed for single-family dwellings in Indigenous communities, which also includes funding for enabling measures.

The Social Housing Support program far surpassed Plan expenditures and savings largely as a result of new rebates that were developed, and well received, for energy efficiency retrofits of homes in Indigenous communities.

3.5 SELECTED HIGHLIGHTS

Overall 2020 was a difficult year to achieve the participation goals of FBC's Low Income programs. While the Self Install program was popular and relatively unhindered by the COVID-19 pandemic, other programs such as Direct Install suffered. The Direct Install program, a program that typically accounts for a large portion of the portfolio savings, was out of market for approximately half the year. Even when the Direct Install program returned to market, some customers were doing their best to minimize contacts for anything they deemed not essential. On a more positive note, FBC and FEI introduced additional rebates in the Social Housing Support program which enabled Indigenous communities to self-manage their own retrofit projects. These rebates were well received and helped to offset the shortfall in the Direct Install program.

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 11.1 GWh, compared to 15.5 GWh in 2019, and achieved an overall TRC of 1.4 in 2020. Commercial program expenditures totaled $2.8 million, just slightly less than in 2019, of which 73 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: 2020 Commercial Program Results Summary

Program	Savings (kWh)		Plan ($000s)	Actual Expenditures ($000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Commercial Custom	5,346,000	3,554,306	964	618	609	10
Commercial Prescriptive	10,120,737	7,595,517	1,218	1,513	1,449	64
Labour and expenses	-	-	848	674	-	674
Total	**15,466,737**	**11,149,823**	**3,031**	**2,805**	**2,058**	**748**

The Commercial sector recorded savings of 11.1 GWh, or 72 percent of Plan, of which 68 percent were realized through the Prescriptive Program, primarily commercial LED lighting rebates. The remaining savings came through the Commercial Custom Program, which included new construction rebates for high performance buildings and a pilot recommissioning offer.

4.2 *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 support of both BC Energy Step Code-aligned buildings and non-aligned buildings.

FBC and FEI completed the pilot recommissioning offer, which identifies building operational improvements, in the FBC service territory with 13 participants. The BC Utilities also launched a province-wide recommissioning program – the Continuous Optimization Program – in October of 2020.

FBC and FEI also launched the Commercial Energy Assessment program in September 2020 that provided walkthrough and virtual energy assessments to small and medium businesses and organizations.

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 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.

New offers in 2020 included connected thermostats, heating, ventilation and air conditioning controls, and rink de-aerators.

4.4 *SELECTED HIGHLIGHTS*

The Commercial Program Area activity in 2020 resulted in 11.1 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 experienced higher than anticipated participation in its Custom Program offers for high performance new construction, particularly in the multi-unit residential sector. However, FBC saw limited activity in its Custom Program offers for retrofit due to a pause in infrastructure spending for key municipal, education, and health customers.

FEI and FBC also launched a limited time bonus offer to both Prescriptive and Custom Programs to encourage customers to invest in energy efficiency during 2020's challenging economic climate. The limited-time bonus offers for both programs expire in 2021. The bonus offer has yielded increased participation in the Prescriptive Program and has identified additional retrofit opportunities in the Custom Program that are forecast to be implemented in 2021 and 2022.

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 3.7, with electricity savings of 6.8 GWh, more than double the 2019 savings of 3.0 GWh. Actual Industrial expenditures in 2020 totalled $1.8 million, compared to $1.1 million in 2019, of which 87 percent was incentives.

Table 5-1 summarizes the Plan and actual expenditures for the Industrial Program Area in 2020, including incentive and non-incentive spending, and annual electricity savings.

Table 5-1: 2020 Industrial Program Results Summary

Program	Savings (kWh)		Plan ($000s)	Actual Expenditures ($000s)		
	Plan	Actual	Total	Total	Incentive	Non-Incentive
Industrial Custom	8,226,000	4,490,967	1,308	1,092	1,083	9
Industrial Prescriptive	1,780,686	2,303,850	290	455	455	1
Labour and expenses	-	-	190	220	-	220
Total	**10,006,686**	**6,794,817**	**1,788**	**1,767**	**1,537**	**230**
Plan including 2019 Carryover (254)			**2,042**			

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). In 2019, much of the program activity concerned investigating and encouraging efficient electric usage in new cannabis production facilities, while supporting existing industrial customers. In 2020, FBC realized much of the savings associated with those 2019 activities.

5.2 CUSTOM PROGRAM

This program provides incentives to encourage participants in pursuing a performance based approach to achieving 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.

In 2020, FBC also conducted a pilot to extend the FEI Strategic Energy Management cohort offer to one wood products customer in the FBC service territory. This pilot will be expanded into a full offer in 2021.

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.

5.4 *SELECTED HIGHLIGHTS*

Industrial Energy Efficiency Program Area activity in 2020 resulted in 6.8 GWh/year of electricity savings. These programs enabled industrial customers to conduct both simple and comprehensive energy efficiency upgrades at their buildings. FBC saw a significant increase in indoor agricultural LED lighting projects for both cannabis and traditional greenhouse applications. FBC will begin developing a prescriptive rebate for indoor agricultural LED lighting projects to launch later in 2021.

FEI and FBC also launched a limited time bonus offer to both Prescriptive and Custom Programs to encourage customers to invest in energy efficiency during 2020's challenging economic climate. The limited-time bonus offers for both programs expire in 2021. The bonus offer has yielded increased participated in the Prescriptive Program and has identified additional retrofit opportunities in the Custom Program that are forecast to be implemented in 2021 and 2022. However, as a consequence of the bonus offer, the ratio of expenditures to electricity savings was higher in 2020.

FBC also began providing enhanced compressed air system assessment services lending specialized testing equipment at no-cost to 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 2020, 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 2020 to maximize efficiencies across both utilities. Costs continue to be shared on school, residential and commercial outreach as applicable.

Table 6-1: 2020 Conservation and Outreach Results Summary

Program	Plan ($000s)	Actual ($000s)
Residential Education Program	221	193
Residential Customer Engagement Tool	207	58
Commercial Education Program	22	212
School Education Program	48	102
Total	**497**	**566**

6.2 RESIDENTIAL EDUCATION

FBC continued with its “We’ve got rebates” general marketing campaign during the first quarter of the year. As a result of the COVID-19 pandemic FBC pivoted the “We’ve Got Rebates” campaign to focus less on equipment upgrades and more on energy saving behaviour advice as British Columbians were asked to stay at home to prevent the spread of COVID-19. The campaign focused on ways customers could reduce their energy bills with low cost or no cost tips. As restrictions throughout the province eased in the fall, FBC produced a campaign to promote the increased residential rebates that were available until the end of the year. FBC and FEI continued to enhance the municipal landing page to further support municipalities’ 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 2021 as a result of challenges with the vendor software integration and home energy report display quality issues. As a result, focus was placed on launching the online portal and home energy reports for natural gas (FEI) customers successfully before completing development for the electricity (FBC) version. With the FEI version now in market, attention has shifted to completing development for the FBC version by mid-2021.

6.4 *COMMERCIAL EDUCATION*

Expenditures were higher than planned to drive program participation and awareness of Commercial rebate programs. The expenditures for paid media to reach commercial customers were underestimated in the DSM Plan. This will require a higher investment through the remaining DSM Plan years to ensure the message remains consistent in market for commercial customers.

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

CEO continued to provide information to customers and the public on electricity conservation and energy literacy. In collaboration with FEI, to continue to support and engage small to medium size businesses, FBC funded 593 energy assessments across the province. Customers received advice on saving energy and learned about rebates on high-efficiency upgrades. With the onset of COVID-19 in March 2020, FBC worked with its vendor to pivot the program to a virtual model to ensure continued support for small business customers. The virtual model expanded the reach to all FBC and FEI customers across the province. The virtual assessments focused on low cost, no cost measures to reduce business's energy consumption, as well as turn-down procedures for those who had closed their businesses due to the pandemic. Customers were referred to the program through the customer contact centre in addition to outbound calling by the vendor.

FBC's partnership with BC Hydro continued in 2020. This included collaboration on the Energy Wise Network Program for commercial customers which helps engage workplaces to save energy through training, networking, campaign toolkits, and energy coaching.

6.5 *SCHOOL EDUCATION*

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

FBC's Energy Leaders initiative offers curriculum-connected lesson plans for grades K-12. To further support teachers and parents through the COVID-19 pandemic, 32 lesson plans were modified to incorporate distance learning to support home-based and virtual learning. Further development was also completed to translate 147 lessons on Energy Leaders from grades 1-10 into French, including the distance learning modules. Grade 11 and 12 lessons are currently being translated to French and/or modified for distance learning. Professional development webinars have been created to help teachers get acquainted with the Energy Leaders lesson materials and the way they connect to the current curriculum.

To further support teachers during the pandemic, the BC Lions Energy Champions program and FBC's Energy is Awesome program have moved to virtual models.

For students enrolled in post-secondary institutions, FBC continued to deliver in-class (pre-pandemic) and virtual presentations to post-secondary institutions. This presentation speaks to demand side management policies and programs in British Columbia, as well as employment opportunities within the energy management area.

6.6 *HIGHLIGHTS*

The Commercial, Residential and School Education Programs are not incentive-based programs and therefore 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.

The initiatives described in CEO are designed to foster a culture of energy conservation in BC through activities designed to deliver overall conservation messaging, support energy efficiency literacy, and assist with increasing program awareness. By changing attitudes and behaviours, the Company will help communities reach their goals, help customers save energy and money, and increase participation in DSM programs. In 2020, this Program Area continued to explore new ways and seek out new opportunities and channels to connect with customers to ultimately grow the culture of energy conservation.

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 telephone and tracking system upgrades, are also reported herein.

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

Table 7-1: 2020 Supporting Initiatives Results Summary

	Savings (kWh)	Plan ($000s)	Actual ($000s)		
Program	Actual	Total	Actual ($000s)	Incentive	Non-Incentive
Commercial Energy Specialist	209,000	61	85	85	-
Community Energy Specialist	-	204	108	108	-
Trade Ally Network	-	151	152	-	$ 152
Codes and Standards	-	107	108	-	$108
Reporting Tool & Customer Portal	-	14	229	-	$ 229
Labour and Expenses	-	300	136	-	$ 136
Total	**209,000**	**838**	**818**	**$ 193**	**$ 625**
Plan incl. 2019 Carryover (349)		**1,187**			

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.

A Commercial Energy Specialist's key priority is 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 2020. Some organizations had new Energy Specialist positions start later in the year, hence a full year of funding was not distributed in those instances. FBC considers this an energy management program, and hence a specified demand-side measure, as defined in the DSM Regulation.

This program is funded as an enabling activity but claims kWh savings for projects completed by energy specialists that are not claimed by another FBC DSM program. The total verified annual savings for 2020 were 209,000 kWh.

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 coordinating development of community energy plans; developing and promoting 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 four participants in the SST in 2020. Some participants had their Community Energy Specialists in place for only part of the year, and some organizations delayed hiring to 2021 due to the COVID-19 pandemic; hence, the 2020 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, equipment manufacturers, distributors and, as of 2020, commercial Point of Sale partners were also added. 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 an essential 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;
- 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.

To support the trade allies through the challenging times posed by the COVID-19 pandemic, FBC engaged with several reputable third-party organizations to develop and/or offer training opportunities for the TAN members to help them stay competitive in the changing marketplace, and enable them to continue selling energy efficient products despite the pandemic. The training focused on improving their knowledge of best practices around improving Indoor Air Quality (IAQ) and selling energy efficient products in an uncertain market; in addition, a self-guided course was developed to help trade allies familiarize themselves with protocols and provincial guidelines aimed at improving employee and customer safety amid the pandemic.

7.5 CODES AND STANDARDS

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

- Review and updates to a document for CSA EXP07:19: Load-based and climate-specific testing and rating procedures for heat pumps and air conditioners;
- FBC has signed a 3-year funding agreement with CSA to continue supporting relevant codes and standards work.

FBC was also part of several committees to guide and contribute to the development of codes and standards, including CSA Communities and CSA Technical Committee on Heating Ventilation Air Conditioning and Refrigeration. FBC plans to continue participating in these projects and committees in 2021.

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 with the remaining residential and commercial programs set to launch in 2021.

The reporting tool offers customers an online portal to apply for their rebates as well as track its status. The tool also offers FBC and FEI a tracking software to process applications and provide in-depth reporting. The tool is fully integrated to other technologies such as Account Online and SAP accounting software.

As discussed in FBC's 2019 Annual Report, those integrations increased scope to the project and the schedule was delayed, which resulted in pushing a significant portion of 2019's budgeted costs into 2020.

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 2020 were $0.9 million, nearly 100 percent of Plan.

Table 8-1: 2020 Portfolio Expenditures Results Summary

Program	Plan ($000s)	Actual ($000s)
Monitoring and Evaluation	118	209
DSM Studies	133	101
Innovative Technologies	102	166
Labour and Expenses	560	435
Total	**913**	**911**
Plan including 2019 carryover (14)	**927**	

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 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 twice in the fall, using remote technology, to discuss 2020 YE forecast results and other business.

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-over[4] 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

Table 8-2 provides a list of the 2020 DSM Program evaluation and research activities undertaken by FBC in collaboration with utility partners as shown, chiefly FEI and BC Hydro.

Table 8-2: 2020 DSM Program Evaluation and Research Activities

Evaluation Name	Program Area	Type of Evaluation	Evaluation Partners	Evaluation Status
Commercial End Use Study	Enabling Activities	Customer Research	FEI	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. **Completed December 2020 by Sampson Research.**
Energy Audit 2020 Update	Enabling Activities	Process/Impact	FEI	The study is an update to an energy savings audit to verify energy savings from projects completed in 2020.**To be completed Q2 2021.**
Retail Program Evaluation	Residential	Process & Impact	FEI	Customer survey, literature review and consumption analysis for the residential retail programs. **To be completed Q2 2021.**
Heat Pump Program	Residential	Process & Impact	None	Customer survey, trade ally and staff interviews and engineering analysis for the residential heat pump offers. **To be completed Q1 2021.**
Participant and Building Owner Surveys	Residential / Commercial	Process	FEI	Surveys conducted with building owner and tenant to assess customer satisfaction, program awareness, and gather feedback for future program design. **2019 results: Completed February 2020 by Cohesium Research. 2020 results: To be completed Q2 2021.**
Direst Install Quality Assurance	Low Income	Evaluation Study	FEI & BCH	Ongoing quality assurance to ensure direct install measures are installed according to program policies and procedures.
Ongoing Customer Feedback Survey	Low Income	Process	FEI & BCH	Ongoing survey with Direct Install program participants to gather feedback on their customer experience, satisfaction with the program and the program representatives. **Completed March 2020 by Sentis Market Research.**
Partnership Program Evaluation Study	Portfolio	Evaluation Study	FEI	Research study to gather feedback from industry experts, document review of guidelines and best practices for Partnership programs. **To be completed Q2 2021.**

8.3 *EVALUATION REPORTS*

Two evaluation reports were substantially completed in 2020: the Retail Program (consisting of Residential Lighting and Appliance programs); and the Heat Pump programs. The Retail Program report was scheduled for 2019, however, the planned in-store customer intercepts were delayed in 2019 and subsequently cancelled in 2020 due to the COVID-19 pandemic. Ultimately, a literature review of comparable evaluation studies was completed in place of the in-store intercepts to finalize the report.

The executive summaries of the evaluations of the Retail Program and the Heat Pump programs are included in Appendix B. The full reports are confidentially provided to the BCUC in a separate appendix, Appendix C.

FBC requests that the Evaluation Reports be filed on a confidential basis pursuant to Section 18 of the BCUC's Rules of Practice regarding confidential documents adopted by Order G-15-19. The Evaluation Reports must be kept confidential on the basis that these reports contain customer-specific information that should not be disclosed to the public. In addition, the methodology and processes used in the reports are proprietary to the consultants hired by FBC.

High level findings of the Retail Program evaluation are:

- For Lighting/POS, the final net realization rate[5] is 66 percent of the original *ex ante*[6] kWh savings numbers, and 79 percent for kW savings. For Appliances, the final net realization rate is higher at 93 percent combined for all three appliances (washers, dryers and refrigerators).

- The spillover rate for the lighting program decreased considerably from the prior evaluation, from 0.77 to 0.15.

High level findings of the Heat Pump Program evaluation are:

- The program has a final net realization rate of 102 percent of the original *ex ante* kWh savings and 56 percent of kW savings.

- The free ridership and spillover rates for central and ductless heat pumps remained fairly consistent with the prior heat pump evaluation.

8.4 *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 2020 DSM Studies included:

- Disaggregation report to determine which end-use loads, and the magnitude thereof, could be detected from AMI data;

- 2020 Conservation Potential Review (CPR), to update the achievable potential available for FBC's DSM programs. The 2020 CPR update will be completed and filed with FBC's 2021 Long Term Electric Resource Plan (LTERP).

8.5 *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"[7]. FBC uses innovative technology funding to support feasibility studies, technology pilots, and field studies to assess the potential for these technologies.

In 2020, FBC funded a number of innovative technology studies. A field study to assess the performance of cold climate heat pumps was completed, in partnership with Natural Resources Canada, BC Hydro, and EMLI. This study will be used to help increase adoption of heat pumps and improve energy savings assumptions for the technology.

[5] The net realization rate is the gross realization rate multiplied by the final Net-to-Gross ratio.
[6] *Ex ante* refers to the estimates the Company used to prior to the evaluation.
[7] Technology innovation program defined in the Demand-Side Measures Regulation 326/2008 (amended Mar. 24, 2017).

Key results of the BC Cold Climate Heat Pump Field Study showed that:

- The average coefficient of performance (COP) was greater than 2.3 for ductless mini split units and 3.2 for central units. The COP declined with colder temperatures, however remained greater than 1 on average at temperatures down to -14ºC.
- For participants who switched to a heat pump from an electric heating system (baseboards/electric furnace), average savings were found to be 5,650 kWh and $810 over the year-long monitoring period.
- There is potential for widespread adoption of heat pumps in British Columbia within Climate Zones 4 and 5, which cover the southern part of the province.

Additionally, a pre-feasibility study was conducted that looked at a number of emerging technologies in the commercial/industrial sector including commercial drain water heat recovery, switched reluctance motors, and EndoCube refrigeration system controls. The results from this study will help inform whether to pilot these technologies or determine if the equipment is established enough to include in our prescriptive rebate programs.

9. DEMAND RESPONSE

9.1 *OVERVIEW*

The initial pilot phase of Demand Response (DR), testing the viability of voluntary demand response from a subset of FBC's top 50 large customers, was completed in 2020.

Table 9-1: 2020 Demand Response Results Summary

Program	Plan ($000s)	Actual Expenditures ($000s)		
	Total	Total	Incentive	Non-Incentive
Demand Response	**324**	**135**	**$ 55**	**$ 79**
Plan including 2019 carryover (213)	**538**			

The 2020 expenditures totaling $135 thousand, including $55 thousand of customer incentives, were considerably less than the $324 thousand Plan estimate developed in conjunction with the Kelowna Demand Response Assessment Report[8]. The procurement process yielded a more cost-effective proposal, hence, the 2020 Plan expenditures were not fully spent.

9.2 *KELOWNA AREA DEMAND RESPONSE PILOT – KEY FINDINGS*

The DR pilot, was launched in August 2019 and initially reported on last year. Extending the DR pilot for the full additional 2020 summer season saw a significant increase in Demand Response delivered, participation, and learnings for the pilot.

Expanding the pilot to include two industrial participants from the West Kootenay area, as well as increasing the incentive amount, attracted more participation and a more diverse set of participants. Participants found the voluntary (Manual DR) system attractive as it provided operational flexibility. Auto-DR is typically more common in mature markets, and would require more education, experience and additional lead time for installation.

Participant enrollment, response to dispatch, as well as performance all improved significantly in the winter and second summer seasons. A total of 12 sites were enrolled by the end of the DR Pilot, and made up an engaged customer base. The highest results were seen during both the coldest days in winter and the hottest days in summer, suggesting that DR can be a reliable resource.

The DR pilot generated peak reductions of 1.33 MW and 0.7 MW, in the summer 2020 and winter 2019-2020 seasons, respectively. All surveyed customers were satisfied with their experience and communicated interest in future participation.

[8] Appendix A-1 of FBC's approved 2019-2022 DSM Expenditure Plan

10. 2020 DSM PROGRAMS ANNUAL REPORT SUMMARY

In 2020, FBC achieved 96 percent of its total approved DSM expenditures and 81 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 59 percent of the overall portfolio expenditures. The total energy savings of 26.2 GWh include Residential at 7.2 GWh or 128% of Plan, and Industrial at 6.8 GWh that was more than double the 2019 result of 3.0 GWh, despite a shortfall of cannabis production facilities compared to Plan.

The Report detailed how FBC cost-effectively delivered these programs achieving an overall Benefit/Cost ratio of 1.6 as the portfolio level TRC. After intra-program transfers, all of which complied with the maximum 25% transfer limit, FBC was left with a $409 thousand residual amount that will be carried forward to be utilized within the 2019-2022 DSM Plan period.

FBC was able to increment its incentive expenditures and associated energy savings while putting in place 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, whilst 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 2020

Table A1-1: FBC DSM Summary Report for Year Ended December 31, 2020

	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	1,275	73	1,348	1,357	3,916	3,551	3.0	2.7	0.7	5.5
New Home	204	11	215	227	439	251	1.3	1.1	0.4	9.9
Lighting	158	80	238	163	1,122	3,401	4.1	10.5	0.6	3.1
Rental Apartment	12	25	37	54	148	-	-	-	-	-
Labour and expenses	-	501	501	503	-	-	-	-	-	-
Residential Total	**1,650**	**689**	**2,339**	**2,304**	**5,625**	**7,202**	2.4	2.7	0.6	5.7
Low Income										
Self-Install (ESK)	51	23	75	74	249	287	4.8	3.3	0.8	4.0
Direct Install (ECAP)	190	153	343	687	881	224	4.1	0.7	0.4	10.2
Social Housing Support	270	16	286	46	83	285	1.4	1.3	0.6	9.8
Labour and expenses	-	114	114	65	-	-	-	-	-	-
Low Income Total	**512**	**306**	**818**	**873**	**1,214**	**796**	1.3	1.0	0.5	10.0
Commercial										
Commercial Custom	609	10	619	964	5,346	3,554	1.1	5.7	1.0	10.4
Commercial Prescriptive	1,449	64	1,513	1,218	10,121	7,596	1.8	6.9	1.3	7.1
Labour and expenses	-	674	674	848	-	-	-	-	-	-
Commercial Total	**2,058**	**748**	**2,805**	**3,031**	**15,467**	**11,150**	1.4	5.0	1.2	8.6
Industrial										
Industrial Custom	1,083	9	1,092	1,308	8,226	4,491	3.8	3.7	0.9	3.0
Industrial Prescriptive	455	1	455	290	1,781	2,304	4.7	7.1	1.6	2.8
Labour and expenses	-	220	220	190	-	-	-	-	-	-
Industrial Total	**1,537**	**230**	**1,767**	**1,788**	**10,007**	**6,795**	3.7	4.1	1.1	3.2
Conservation Education and Outreach	-	566	566	497	-	-	-	-	-	-
Supporting Initiatives	193	625	818	838	-	209	-	-	-	-
Portfolio Expenditures	-	911	911	913	-	-	-	-	-	-
Demand Response	55	79	135	324	-	-	-	-	-	-
Total Portfolio	**6,005**	**4,154**	**10,159**	**10,568**	**32,312**	**26,152**	**1.6**	**2.8**	**0.8**	**7.6**

APPENDIX A-2: HISTORICAL SUMMARY OF DSM COST AND ENERGY SAVING RESULTS (2015 - 2019)

Table A2-1: Historical FBC DSM Costs and Energy Savings 2015 – 2019

Program Area*	Expenditures ($000s)										Energy Savings (MWh)									
	2019		2018		2017		2016		2015		2019		2018		2017		2016		2015	
	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Residential																				
HRR/Home Improvements	1,200	1,487	140	136	348	196	884	225	884	199	3,264	3,227	301	225	364	187	3,106	243	3,106	231
Heat Pumps	-	-	327	357	298	307	302	249	302	182	-	-	1,297	1,127	781	976	1,618	753	1,618	569
Residential Lighting	157	218	202	141	190	380	189	360	193	198	2,284	3,141	3,337	3,255	2,735	8,125	1,547	8,607	1,569	4,144
New Home Program	184	90	76	36	151	61	390	39	390	111	340	112	169	54	126	45	1,179	31	1,179	356
Appliances	-	-	159	204	133	337	96	245	96	71	-	-	215	303	126	494	288	242	288	52
Water Heating	-	-	25	25	-	-	-	-	387	2	-	-	38	38	-	-	-	-	850	5
Low Income (2015-2017)	-	-	-	-	-	-	952	1,111	824	287	-	-	-	-	2,739	693	2,598	1,214	2,598	282
Behavioral	-	-	165	16	200	5	106	79	85	-	-	-	240	67	3,097	20	1,048	587	888	-
Rental Apartment Program	54	33	53	19	206	77	-	137	-	-	148	21	306	87	508	295	576	840	-	-
Watersavers	-	-	-	-	30	1	430	72	-	-	-	-			17	12	948	21	-	-
Labour & Related Expenses	491	362	610	468	1,161	529	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residential Total	2,086	2,190	1,757	1,402	2,717	1,893	3,349	2,517	3,161	1,050	6,036	6,501	5,903	5,156	10,493	10,847	12,908	12,538	12,096	5,639
Low Income (2018-2019)																				
Low Income	-	-	731	396	-	-	-	-	-	-	-	-	1,229	687	-	-	-	-	-	-
Self Install (ESK)	74	143	-	-	-	-	-	-	-	-	249	527	-	-	-	-	-	-	-	-
Direct Install (ECAP)	665	519	-	-	-	-	-	-	-	-	891	636	-	-	-	-	-	-	-	-
Social Housing Support	41	60	-	-	-	-	-	-	-	-	72	186	-	-	-	-	-	-	-	-
Labour & Related Expenses	64	217	-	282	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Income Total	844	939	731	678	-	-	-	-	-	-	1,212	1,349	1,229	687	-	-	-	-	-	-
Commercial																				
Lighting	-	-	1,750	1,751	2,322	2,749	1,519	1,192	1,485	735	-	-	13,620	17,635	10,592	12,580	7,616	5,694	7,445	4,089
Building and Process Improvements	-	-	988	247	784	371	842	574	897	543	-	-	5,290	1,763	2,931	605	3,452	1,234	3,832	1,606
Computers	-	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-	378	-	-	-
Municipal (Water Handling)	-	-	-	-	-	-	79	4	79	36	-	-	-	-	-	-	759	-	759	187
Sm Business Direct Install	-	-	-	382	-	862	-	556	-	-	-	-	-	3,224	-	2,634	-	1,139	-	-
Irrigation	-	-	-	180	25	12	69	13	69	9	-	-	255	249	144	59	490	61	490	-
MURB New Construction	-	-	32	42	-	29	-	-	-	-	-	-	-	1,073	-	237	-	-	-	-
Commercial Custom	980	1,274	-	-	-	-	-	-	-	-	4,428	6,588	-	-	-	-	-	-	-	-
Commercial Prescriptive	1,371	1,505	-	-	-	-	-	-	-	-	11,114	8,375	-	-	-	-	-	-	-	-
Labour & Related Expenses	828	606	822	864	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Total	3,179	3,385	3,592	3,466	3,131	4,023	2,564	2,339	2,530	1,323	15,542	14,963	19,165	23,944	13,667	16,115	12,695	8,128	12,526	5,882

Program Area*	Expenditures ($000s)										Energy Savings (MWh)									
	2019		2018		2017		2016		2015		2019		2018		2017		2016		2015	
	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Industrial																				
Industrial Efficiency	-	-	305	240	309	206	209	300	202	226			1,188	1,615	1,566	876	1,585	2,099	1,537	1,087
Industrial Custom	1,288	640	-	-	-	-	-	-	-	-	8,226	1,868	-	-	-	-	-	-	-	-
Industrial Prescriptive	290	282	-	-	-	-	-	-	-	-	1,811	1,110	-	-	-	-	-	-	-	-
Labour & Related Expenses	185	174	72	157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Total	1,763	1,096	377	397	309	206	209	300	202	226	10,037	2,978	1,188	1,615	1,566	876	1,585	2,099	1,537	1,087
Programs Total	**7,872**	**7,610**	**6,457**	**5,943**	**6,157**	**6,122**	**6,122**	**5,156**	**5,893**	**2,599**	**32,827**	**25,791**	**27,485**	**31,402**	**25,726**	**27,838**	**27,188**	**22,765**	**26,159**	**12,608**
Supporting Initiatives	1,218	869	742	537	674	674	675	657	675	346	-	-	-	-	-	-	-	-	-	-
Planning & Evaluation	-	-	743	743	777	994	735	718	725	585	-	-	-	-	-	-	-	-	-	-
Conservation Education and Outreach	566	575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portfolio Expenditures	776	762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Demand Response	477	264	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portfolio Totals	**10,909**	**10,080**	**7,942**	**7,223**	**7,608**	**7,790**	**7,532**	**6,531**	**7,293**	**3,530**	**32,827**	**25,791**	**27,485**	**31,402**	**25,726**	**27,838**	**27,188**	**22,765**	**26,159**	**12,608**

*** 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. Behavioral was moved into Conservation Education & Outreach (CEO) which is now a program area.

Low Income: The Low Income was placed into its own program area, and 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 Efficiency program was separated into both the Industrial Custom and Prescriptive programs.

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

Labour & Expenses: Starting in 2018 these costs are broken out (shown) by program area. In prior years such costs were embedded into individual programs.

Appendix B
PROGRAM EVALUATION EXECUTIVE SUMMARIES

EVERGREEN ECONOMICS

Evaluation of the FortisBC Residential Retail (Lighting and Appliance) Programs

March 19, 2021

DISCOVERY RESEARCH

ECOMETRIC

Dr. Phil Willems / PWP

FORTIS BC™

Executive Summary

This report presents the independent evaluation results for the FortisBC Residential Lighting and Appliances program. The evaluation covered eligible measures that received rebates through the program between 2017 and mid-2019 and was conducted by the Evergreen Economics team that consists of the following firms:

- Evergreen Economics (prime contractor)
- EcoMetric
- Phil Willems/PWP
- Discovery Research

As part of this effort, both programs were evaluated:

- **Lighting.** The FortisBC Residential Lighting Program is a two-part campaign that provides point-of-sale (POS) rebates for energy efficient lightbulbs, as well as other non-lighting measures such as bathroom fans and smart thermostats made in the spring and fall at qualifying stores.
- **Appliances.** The FortisBC Residential Appliance Program provides rebates for the purchase of larger energy efficient measures such as clothes washers, clothes dryers, and refrigerators.

Evaluation Methods

The evaluation relied on three primary analysis methods to derive gross and net impacts for the program:

- **Engineering analysis.** All of the deemed savings values were subjected to an engineering review as part of the impact evaluation. This review involved assessing the values for reasonableness, examining key calculation components such as operating hours, and comparing the parameters with values found in other reference sources. Based on the review of the available information (and the spreadsheet tools used by the program to calculate savings), an engineering adjustment factor was calculated from the sample and then applied to the participant population.

- **Self-report free-ridership analysis.** Appliance program participants were targeted with a phone survey (n=196) that collected information on what equipment might have been installed (if any) had the product rebates not been provided by FortisBC. Responses for these questions were scored and used to create an estimate of program free ridership and spillover.

- **Literature review.** For the POS rebates for lighting and other measures, a literature review was conducted of comparable evaluation studies covering these measures to determine recommended values for these programs. Originally the evaluation team planned to conduct intercept surveys of customers at participating retailers. However, the team was denied access to the stores for the surveys and the literature review was completed as the next best alternative.

Impact Evaluation Results

The following tables summarize the impact analysis results. Table 1 shows the engineering adjustments for the Lighting/POS measures (both kWh and kW) and for the appliance measures (kWh only). The adjustments were due to changing the savings calculation input parameters such as hours of use based on different secondary sources that the evaluation team believed were more current and/or applicable to the FortisBC territory.

Table 1: Engineering Adjustments

Measure	Gross Realization Rate (kWh)	Gross Realization Rate (kW)
Lighting	99.7%	121.9%
Other POS	137.7%	98.7%
Clothes Washers	194.7%	--
Clothes Dryers	71.4%	--
Refrigerators	104.6%	--

Table 2 shows the results of the net impact analysis for both programs. For Lighting and the other POS measures (ceiling fans, smart thermostats), free ridership and spillover results were derived from the literature review of comparable residential lighting program evaluations. For the appliance measures, the free ridership and spillover numbers were calculated from the participant survey questions as part of the current evaluation.

Table 2: Net-to-Gross Results (Lighting/POS and Appliances)

Measure	Free Ridership	Spillover	Final Net-to-Gross Ratio*
Lighting	0.50	0.15	0.65
Ceiling Fans	0.38	0.04	0.66
Smart Thermostats	0.30	0.05	0.75
Clothes Washers	0.35	0.17	0.82
Clothes Dryers	0.38	0.15	0.77
Refrigerators	0.42	0.19	0.77

*Net-to-Gross is calculated as 1 - Free Ridership + Participant Spillover

Table 3 and Table 4 show the combined gross and net impact results for both programs. For Lighting/POS, the final net realization rate is 66 percent of the original *ex ante* kWh savings numbers, and 79 percent for kW savings. For Appliances, the final net realization rate is higher at 93 percent combined for all four appliances.

Table 3: Lighting/POS Impact Results

Unit	*Ex Ante* Savings	Gross Realization Rate (%)	Gross Annual Savings	Net-to-Gross Ratio	Net Annual Savings	Final Net Realization Rate
kWh	8,848,175	101.3%	8,962,421	0.65	5,825,574	66%
kW	6,421.94	121.8%	7,821.18	0.65	5,084	79%

Table 4: Residential Appliances Combined Results (kWh)

Unit	*Ex Ante* Savings	Gross Realization Rate (%)	Gross Annual Savings	Net-to-Gross Ratio	Net Annual Savings	Final Net Realization Rate
kWh	1,286,903	118.0%	1,518,744	0.79	1,199,808	0.93

Process Evaluation

The process evaluation consisted primarily of phone surveys of customers that participated in the Appliances program. Among 196 phone survey participants, 50 percent purchased reported receiving a rebate for an ENERGY STAR refrigerator, 42 percent purchased an ENERGY STAR clothes washer, and 41 percent received a rebate for an ENERGY STAR clothes dryer.

Nearly all of the appliances were installed in the participants' homes, with between 92 percent and 95 percent of those installations replacing an existing appliance—most of which were picked up by the installer, recycled, or sold / given away.

The vast majority of participants learned about FortisBC's Residential Appliance Program either from sales personnel at the store of purchase or by FortisBC advertising. Additionally, 81 percent of participants felt the rebate information was very clear, with less than 3 percent indicating the information was not at all clear.

Respondents were asked whether energy efficiency was a priority when deciding on the appliance(s) they ultimately chose. More than half of respondents (63 percent) rated energy efficiency as a "high priority" when making decisions on the appliance(s) they chose, with only a small portion (3 percent) of respondents reporting it was either a "small priority" or "not at all a priority".

Overall, a significant percentage of survey participants were very satisfied with the program overall (92 percent), the equipment they purchased through the program (91 percent), the overall rebate provided through the program (85 percent) and the time it took to receive the rebate (84 percent). Although respondents reported high levels of satisfaction with all of the program components, the time it took to receive the rebate received the lowest satisfaction rating, with seven percent of respondents reporting they were not satisfied. Some of the justification's participants provided for their low satisfaction ratings were that the rebate process was confusing, the program should include smaller household appliances, and the rebate should be given at the time of purchase.

Conclusions and Recommendations

General evaluation conclusions include the following:

Participants are generally very satisfied with the program. Survey responses indicate a high level of satisfaction, with over 90 percent of respondents being satisfied with the program overall.

Customers are concerned about energy efficiency but are only somewhat knowledgeable about ways to save energy. Participant surveys indicate that customers make energy efficiency a priority when deciding on equipment installations or retrofits. However, most (69 percent) are only somewhat knowledgeable about ways they can save energy in their homes. Evergreen recommends providing ongoing and additional resources to help promote ways to save energy in homes.

Net impacts consistent with similar programs. The net-to-gross ratios estimated for the appliance program are consistent with expectations and the Evergreen team's experience with similar programs. For the point-of-sale program, net-to-gross ratios used were based on a literature review of similar programs, since it was not possible to conduct an intercept survey to gather primary data.

Better tracking of specific lighting measures would improve the evaluation. The Evergreen team was not able to match the savings for 1,478 projects (44%) listed in the program tracking data to the savings calculated in the supplied deemed savings document. The savings in the deemed savings document are linked to the projects listed in the program tracking data using the Retailer SKU. The Evergreen team recommends FortisBC develop deemed savings for each Retailer SKU.

Review how deemed savings are tracked in the program tracking data. The energy and demand savings listed in the program tracking data did not match the deemed saving values for many of the Lighting and Appliance measures. Evergreen recommends FortisBC review the program tracking data to ensure there is agreement between the calculated deemed savings values and the values listed in the program tracking databases.

Routinely update list of energy efficient clothes dryers, clothes washers, and refrigerators using available data from the Consortium of Energy Efficiency (CEE). CEE actively maintains a list of equipment make/model numbers, size, and CEE efficiency Tier. Evergreen recommends FortisBC routinely update their internal list of make/model numbers and CEE tiers to ensure the consistent application of energy savings.

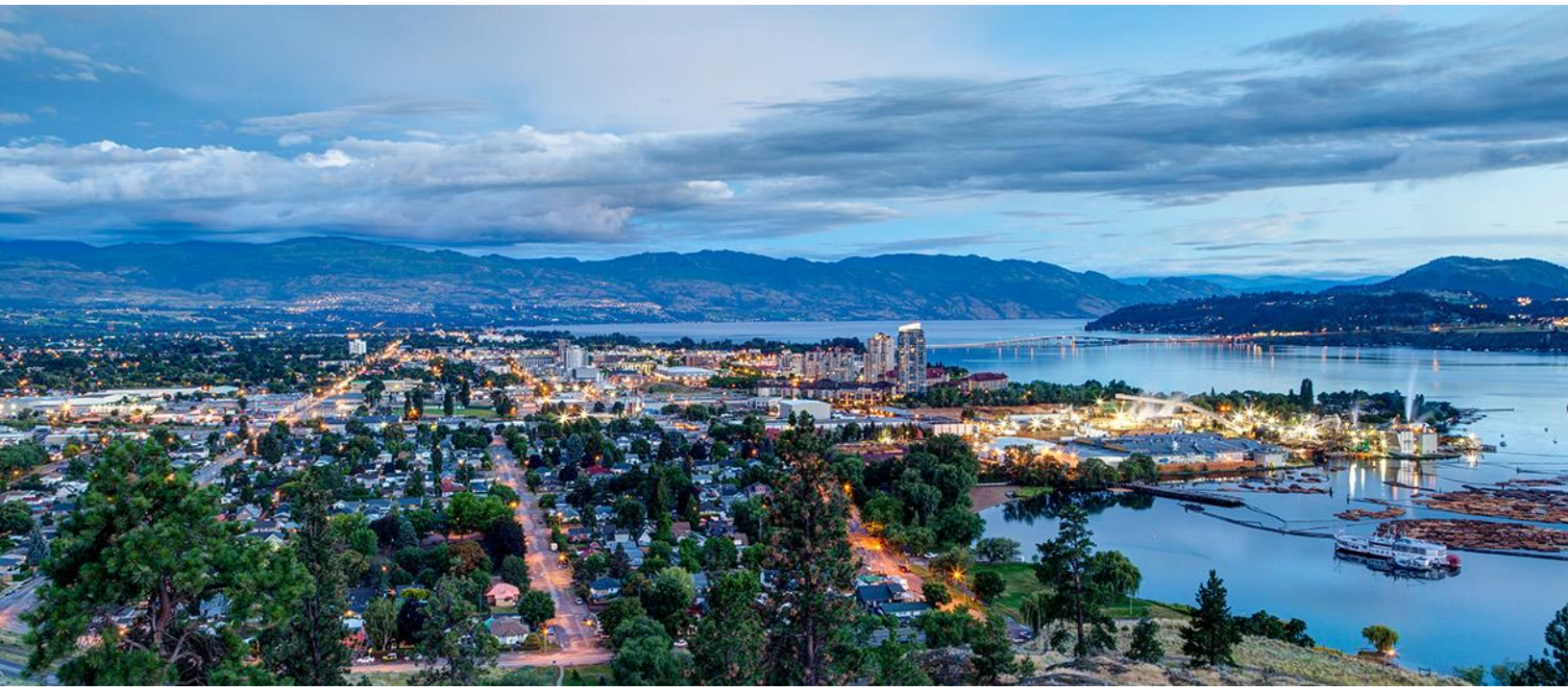
Track additional variables to more accurately calculate savings for clothes washers. The CEE savings matrix includes three variations of fuel types for domestic hot water (DHW) and dryer configurations – Electric DHW/Electric Dryer, Gas DHW/Electric Dryer, Gas DHW/Gas Dryer. Evergreen recommends FortisBC track they fuel type for both the DHW and dryer in the program tracking data.

Prior to a store visit, knowledge of rebates was low. In general, most respondents were not aware of the rebate offerings before entering the store, with 67 percent learning about the rebate from the store sales personnel. Evergreen recommends increasing marketing efforts outside of store sales personnel.

Evaluation of the FortisBC Residential Heat Pump Offer

Draft Report

March 19, 2021



Submitted by Evergreen Economics

1 Executive Summary

This report presents the independent evaluation results for the FortisBC Residential Heat Pump program. The evaluation covered eligible measures that received rebates through the program between 2017 and mid-2020 and was conducted by the Evergreen Economics team that consists of the following firms:

- Evergreen Economics (prime contractor)
- Michaels Energy
- Phil Willems/PWP
- Discovery Research

1.1 Evaluation Methods

The evaluation relied on two primary analysis methods to derive gross and net impacts for the program:

- **Engineering analysis.** All of the deemed savings values were subjected to an engineering review as part of the impact evaluation. This review involved assessing the values for reasonableness, examining key calculation components such as operating hours, and comparing the parameters with values found in other reference sources.
- **Self-report free ridership analysis.** Heat pump program participants were targeted with a phone survey that collected information on what equipment might be installed (if any) had the product rebates not been provided by FortisBC. Responses for these questions were scored and used to create an estimate of program free ridership and spillover.

1.2 Impact Evaluation Results

The following tables summarize the impact analysis results. **Error! Reference source not found.** shows the engineering adjustments for the heat pump measures (both kWh and kW).

Table 1: Engineering Adjustments

Measure	Gross Realization Rate (kWh)	Gross Realization Rate (kW)
All heat pumps	1.42	0.87
Heat pump water heaters	1.31	0.34
Heat pump tune-ups	1.00	1.00

Error! Reference source not found. shows the results of the net impacts analysis for the program. The free ridership and participant spillover numbers were calculated from the participant survey questions as part of the current evaluation.

Table 2: Net-to-Gross Results

Measure	Free Ridership	Participant Spillover	Final Net-to-Gross Ratio*
Central heat pumps	0.34	0.06	0.72
Ductless heat pumps	0.38	0.03	0.65
All heat pumps	0.36	0.04	0.68
Heat pump water heaters	0.13	0.55	1.42
Heat pump tune-ups	0.57	0.58	1.01

*Net-to-Gross is calculated as 1 - Free Ridership + Participant Spillover.
** Evergreen calculated a free ridership rate for loan survey participants of 0.25.

Error! Reference source not found. shows the combined gross and net impact results for the program. The program has a final net realization rate of 102 percent of the original *ex ante* kWh savings and 56 percent of kW savings.

Table 3: Heat Pump Program Impact Results Summary

Unit	*Ex Ante* Savings	Gross Realization Rate	Gross Annual Savings	Net-to-Gross Ratio	Net Annual Savings	Final Realization Rate
kWh	3,990,721	1.38	5,520,723	0.74	4,085,335	102%
kW	1,636	0.79	1,299	0.71	923	56%

1.3 Process Evaluation Results

The process evaluation consisted primarily of phone surveys of customers who participated in the Residential Heat Pump program. Among 285 phone survey participants, 36 percent reported receiving a rebate for a heat pump tune-up, 34 percent purchased a ductless air source heat pump, 18 percent purchased a central air source heat pump, and 12 percent purchased a heat pump water heater.

Participants initially learned about FortisBC's Residential Heat Pump program either from the contractor or vendor who installed the equipment or from FortisBC advertising. Additionally, 78

percent of participants felt the rebate information was clear, with 3 percent indicating the information was not clear.

Respondents were asked whether energy efficiency was a priority when deciding on the energy efficiency upgrade they ultimately chose. The majority of respondents (82%) rated energy efficiency as a "high priority" when making decisions on equipment installations and retrofits, with a small portion (<1%) of respondents reporting it was a "small priority."

Overall, surveyed participants expressed high levels of satisfaction with the Residential Heat Pump program. The majority of respondents reported high levels of satisfaction with all of the program components, which was consistent across all rebated program measures. Ninety-two percent of respondents were satisfied with the contractor who installed the equipment, followed by 89 percent being satisfied with the equipment rebated through the program, and 88 percent were satisfied with the program overall. Although respondents reported high levels of satisfaction with all of the program components, the rebate amount received the lowest satisfaction rating (but respondents were still satisfied), with 5 percent of respondents reporting they were not satisfied.

1.4 Conclusions and Recommendations

General conclusions and recommendations include the following:

Raise the heat pump loan limit to cover the full cost of an installed high efficiency heat pump. In today's market, even ductless heat pump systems often cost more than the current $6,500 cap on loans provided by the program, and most customers interested in using the loan program would have trouble coming up with the difference between the loan amount and the system cost, so contractors believe the loan limit should be raised. If desired, the loan limit could be raised to a higher amount specifically for central systems and multi-splits, both of which had average project costs in excess of $10,000 in the program database. Contractors also emphasize that loan program participants almost certainly would not be able to participate in the program without that support, making them true net participants in the program rather than potential free riders.

Let customers and contractors know that FortisBC will continue to support printed applications. A concern noted by numerous contractors is that older, less affluent customers often lack access to or proficiency in online tools, thereby making it difficult for them to use the online application. Many struggle with the application and even ask contractors to complete the form on their behalf, which both places a burden on the contractor and requires the customer to release account information and other personal data to the contractor to apply on the customer's behalf. Staff confirm that FortisBC is willing to assist with the application, but program outreach to both customers and contractors should emphasize that computer access is not required to participate in the program. Moreover, customer service representatives for the 800 numbers should be fully trained in the complex questions that may arise during the application process or should have access to someone within FortisBC who can handle such issues.

Offer rebates for replacing existing heat pumps. As the population of installed heat pumps begins to include even more units that are at least 10 years old, failures of those systems will become increasingly common, creating a potential opportunity for the heat pump program to influence the replacement decision. While savings from replacing an existing heat pump with a new premium efficiency model clearly cannot match those from replacing resistance heating systems, failure to recognize and incent the potential savings from a high efficiency new heat pump creates a lost opportunity for savings over at least the next decade. We recommend that FortisBC establish standards for determining savings in these situations, including perhaps a minimum age for the replaced equipment, as well as somewhat lower rebates and claimed savings.

Clarify Trade Ally Networks and certifications. There appears to be significant confusion among heat pump and heat pump water heater contractors regarding what it means to be a program trade ally. This is in part because of the long-standing existence of separate Trade Ally Networks (TANs) for contractors serving customers of the separate gas and electric utilities, as well as the emergence of a separate Program Registered Contractor (PRC) network for the CleanBC program, which is available to all customers in the province. We could not find a clear description of the various contractor networks and their associated requirements through the FortisBC website, which would help explain the confusion expressed by contractors—and presumably by customers seeking affirmation that they were choosing a reputable screened contractor. We strongly recommend that FortisBC provide a concise and easy to understand description of the various contractor networks, both in printed form and on the company website. This is especially important since FortisBC is moving in the direction of requiring all program-qualifying equipment to be installed by a certified contractor to be eligible for a rebate.

Improve program-specific training for Customer Service Representatives. Several interview respondents reported instances where customers, and even they as contractors, had received inaccurate information regarding program requirements and eligible measures. While it is understandable that the transition to an in-house call center would make it difficult for Customer Service Representatives (CSRs) who have to deal with questions regarding everything from bill issues and power outages to energy efficiency programs, it is important that customers and contractors get the accurate, up-to-date information they need. It may be possible to create a sub-group of CSRs with extra training in the efficiency programs to whom customers could be referred by other CSRs accustomed to handling more routine questions.

Expand outreach to less active contractors. While contractors who are very active in the program generally feel well informed about program updates, the one we spoke with who is less active said they find it difficult to keep up with program changes; for example, they were unaware of the double rebate offer until it had passed. Another, more active contractor said they had received no advance notice that this change was coming. A more systematic outreach effort to contractors who have done only a few projects through the program could serve to make them more aware of the benefits of the heat pump program generally and of trade ally status in particular. In addition,

as part of these outreach efforts, consider more advance notice to all participating contractors regarding upcoming promotions and changes in program requirements as the market evolves.

Ensure website and application data are consistent and up to date. Several contractors said they had encountered discrepancies between information posted on the FortisBC website and requirements included on the application form, and others said they were offering high efficiency equipment not shown on either the website or the application form. While it would obviously be challenging to update both the website and application in real time as new models come onto the market, the twice-yearly program updates agreed upon by the utilities and CleanBC may not be sufficient to keep up with changes in the market. We recommend the FortisBC consider a process whereby customers can be approved for newly available models that meet program criteria but are not shown on the most recent list of qualifying equipment.

Review the savings values for heat pump tune-ups. Because savings values for tune-ups were originally derived from a 2005 study that was conducted exclusively on central air source heat pumps, we recommend that FortisBC review the tune-up savings to determine a) whether the savings values should be adjusted for ductless systems and b) whether the savings should be adjusted based on the number of years since installation or since the most recent tune-up, which could affect the potential savings from proper maintenance.

Appendix C
PROGRAM EVALUATION FULL REPORTS

FILED CONFIDENTIALLY