Appendix 2

Saskatoon HELP Rebate Design Report

Establishing HELP Rebate Options

June 30, 2021

City of Saskatoon

ICF

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Executive Summary

The City of Saskatoon is seeking to significantly reduce its Greenhouse gas (GHG) emissions through a series of initiatives. One such initiative is the Home Energy Loan Program (HELP) which would provide loans to homeowners for energy efficiency retrofits, and with them, rebates to lower barriers to participation and encourage involvement in the program. The purpose of this report is to provide insight into how to set rebate amounts to maximize retrofits, stay within budget, and not over-incentivize customers. The proposed rebate amounts have been set with an understanding of such rebates in other jurisdictions and complementary programming.

To determine energy savings and GHG emissions reduction for each measure, results from similar jurisdictions with evaluated Technical Reference Manuals with verified prescriptive savings amounts for each measure were used. Annual GHG emissions reduction were determined by multiplying the electricity and gas savings with the respective grid emissions factors for Saskatoon. Lifetime savings were determined by multiplying the annual savings by the expected useful life of the measure.

The emergence of a new national Greener Homes Grant program by NRCan that was not anticipated at the time of HELP design led to a different program design approach than would typically be taken. While the Greener Homes Grant program provided an additional point of evidence to set the rebate pricing, considerations needed to be made for how the overlapping program would impact participation in Saskatoon's program. It also raised concerns about potential "double-dipping" in the absence of the prospect of data-sharing between Saskatoon and NRCan. The NRCan program can impact HELP uptake in both positive and negative ways which were outside of the scope of this project but should be given further consideration. To account for these impacts, the report considers a scenario above the originally expected participation of 420 participants, and also considers scenarios at the 600 participant level to account for the increased rebates, and with it, a higher incentive to participation. Additionally, rebate amounts on the energy efficiency measures that appear in both the Saskatoon and NRCan programs, were reduced in Saskatoon's program to limit the expected combined rebate so as to not exceed 50% of the cost, on average, between the two programs.

All the individual measure rebates, corresponding energy savings, and GHG emissions reduction were then multiplied by expected uptake and the number of participants to capture the relative popularity of different measures. This provided a summary for participation in the program. Ten separate participation scenarios were explored in this manner taking into consideration different participation levels, different measure eligibility, and additional rebates for income qualified participants. The ten scenarios display the expected outcome based on the number of participants in the program. A full breakdown of each measure, including the roll up summary into each scenario is included in Appendix B.

Generally, many of the scenarios fail to achieve the expected impacts due to lower participation. The scenarios that were best suited to the City's goals were scenarios 5 & 6, which achieved the most savings for the expected level of participation while staying within budget and achieving the additional goal of assisting income qualified participants attain additional savings. For this reason, it is recommended that the City of Saskatoon plan for and pursue scenario 5 or 6 depending on how NRCan's Greener Home Grant program impacts the Home Energy Loan Program.

Background

The City of Saskatoon has set targets to reduce Greenhouse Gas (GHG) emissions by 40% below 2014 levels by 2023, and 80% by 2050, as well as community emissions by 15% below 2014 by 2023 and 80% by 2050. The Low Emissions Community Plan lays out a comprehensive plan to achieve these goals through a set of concrete actions. One of those actions is the establishment of the Home Energy Loan Program (HELP) which will provide loans for Saskatoon homeowners to improve energy efficiency and generate renewable power.

As part of the program, the City is also looking to extend rebates to residents to help encourage participation in HELP by offsetting the cost of programs. The City is requesting funds from the Federation of Canadian Municipalities (FCM) to assist with the cost of the rebates. To complete the application, a full breakdown of measures, rebates, GHG emission reductions, and expected participation levels needs to be provided to FCM. ICF was engaged to develop the information needed for the City's application.

Approach

To accomplish this objective, three primary tasks were performed. The first was a kick-off meeting. The kick-off meeting provided insight into the City's priorities and the objectives of the program. At this meeting, previous work, such as the initial program design was shared, and the highlights reviewed. This information provided the foundation upon which the rest of the tasks were built.

The next task was the jurisdictional scan which comprises a later section of this report. To accomplish this, jurisdictions across Canada with similar residential rebate programs were reviewed and compared to provide insight into what the expected "market rate" was for certain rebates. The programs that were most closely aligned were Efficiency Manitoba's residential programming, the City of Edmonton's Home Energy Retrofit Accelerator, and Efficiency Nova Scotia's various residential programs. Other jurisdictions were also compared for certain measures that were not part of those three main programs.

Lastly, a full measure build up was performed under ten separate scenarios for the City. The highlights of that task are explored in the Program Design section of this report, and a full breakdown is provided in Appendix A. Of these ten scenarios, four are broken out in this report for a final decision from the City for their submission.

Greener Homes Grant Program Impact

After this project launched, Natural Resources Canada ("NRCan") initiated a country-wide residential rebate program, the Greener Homes Grant Program, that is expected to overlap with the HELP. As participants can potentially participate in both programs, and there may not be a data sharing agreement between the two programs, this program heavily impacted the results of the rebate design. Rebates for measures that existed in both programs were limited to help ensure that rebates would not exceed 100% of the cost of the measure.

The Greener Homes Grant Program could also impact the City's program in other ways as well. The first is that a separate program may impact the participation levels in the HELP program in one of two ways. The Greener Homes program could cause lower participation as it provides an alternative program to potential participants who may opt to just apply to a single program to avoid the additional administrative burden. Alternatively, having a second program complement the HELP program's rebates may actually drive participation higher than originally expected as there is additional funding for retrofits which lowers the cost barrier to participants.

The second impact is in ownership of the Greenhouse gas (GHG) savings attributed to the retrofits. Typically, in programs such as the HELP program and/or the Greener Homes program, the program administrator "buys" the GHG savings from the participants so that they cannot be double counted. In a situation where applicants can apply for both programs, both program administrators cannot take ownership of the GHG savings unless they work out an agreement, which typically involves data sharing of some sort, which requires the approval of the participant.

The impact of the Greener Homes Program is outside of the scope of this project, and so has not been fully explored in the project. The above commentary may not be the only impacts from the NRCan program, and the City should consider all impacts further. In addition, it is recommended that the City communicate with NRCan to discuss these impacts and potentially others and find ways to mitigate them as early as possible.

Jurisdictional Scan

On May 27, 2021, ICF met with the City of Saskatoon for the project kick-off. As part of that meeting, relevant jurisdictions across Canada were highlighted to help direct the jurisdictional scan. Jurisdictions discussed during the meeting included City of Edmonton, Manitoba, and Nova Scotia. ICF agreed to research other relevant jurisdictions for similar program offerings to ensure that as many eligible measures as possible were found and compared.

ICF has utilized various sources to perform this jurisdictional scan, including but not limited to, the following:

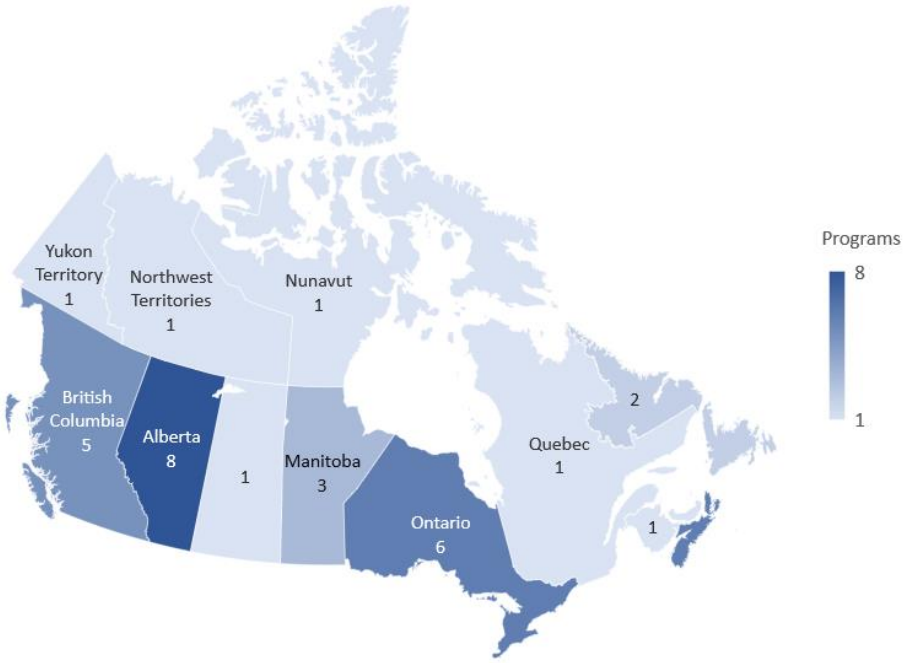
- Program-specific websites
- PACE Canada
- U.S. Department of Energy website
- Interviews with program managers

The jurisdictions were chosen with the goal of comparing residential programs entailing the energy efficiency, renewable energy, water conservation and other relevant measures the City of Saskatoon is interested in offering through HELP. Whether each program can be stacked with other programs was also reviewed. Rebate-stacking information is only available for some of the programs.

Regions

The jurisdictional scan of relevant programs is based on the review of program information available online. A total of 25 programs were reviewed from across Canada. This includes programs offered at municipal, provincial and federal level. Since the Canada Greener Homes Grant program is offered across Canada, each province and territory in Exhibit 1 at least has one program offering.

Exhibit 1: Map of Jurisdictions Reviewed



The majority of the measures proposed by the City of Saskatoon as part of the rebate package are offered through the programs reviewed with the exception of solar inverters (which are typically included with solar PV systems, not as a separate measure), and bird marker measures. The most common energy efficiency measures included insulation, air sealing, energy efficient furnaces, and smart thermostat. Solar PV systems are the most common renewable energy measure. The most common water conservation measure includes low-flow toilet. Rebates on Level-2 EV chargers and battery storage systems are less common and only offered by two programs each. Exhibit 2 provides an overview of measures offered in different jurisdictions.

An overview of the measures, and the rebate provided in each jurisdiction is provided in Exhibit 2.

A summary table of all of the programs that were explored in each region is provided in Appendix A.

Exhibit 2: Summary of Measures by Jurisdiction

Jurisdiction	Furnaces	Boilers	Central Air Conditioners	Windows	Door	Wall Insulation	Celling/ Attic Insulation	Basement Insulation	Air Sealing	Water Heaters	DWHR Systems	Heat Recovery Systems (HRV)	Smart Thermostats	Air-source Heat Pumps	Geothermal Heat Pumps	Solar Water Heaters	Solar PV Panels	Solar Inverters	Low-flow Toilet Replacement	Low-Flow Fixture & Faucets	Irrigation Control Systems	Rainwater Catchment s	Level-2 EV Chargers	Battery Storage Systems	Window Glazing & Bird Markers
Municipal																									
Edmonton	X			X		X	X	X	X	X	X	X	X	X	X		X						X		
Halifax																X	X								
Toronto	X	X	X	X	X	X	X	X	X	X	X				X	X	X		X				X	X	
Medicine Hat	X		X						X				X				X			X					
Banff	X				X											X	X		X			X			
Guelph																			X						
Halton																			X						
Kelowna																					X				
Comox Valley																					X				
Provincial																									
Nova Scotia						X	X	X	X		X	X	X	X	X	X	X			X					
Manitoba						X	X	X				X	X												
Ontario	X	X		X	X	X	X	X	X	X			X												
B.C.	X	X		X	X	X	X	X		X				X											
N.L.									X											X					
Federal																									
Canada				X	X	X	X	X	X	X			X	X	X		X							X	

Exhibit 3: Overview of rebate offerings in different jurisdictions

Measures	Alberta	Ontario	Nova Scotia	British Columbia	Newfoundland and Labrador	Canada Greener Homes Grant (Canada)	Proposed HELP Rebate
Furnace	$250-$500/unit	$250/unit		$800-$1000/unit			$450/unit
Boiler		$1,000/unit		$1,000/unit			$450/unit
Window	$50-$200/unit	$40/unit	$30/unit	$50-$100/unit (max. $2,000)		$125-$250/unit	$120/unit
Door	$100/unit	$40/unit	$30/unit	$50-$100/unit (max. $2,000)		$125/unit	$100/unit
Wall Insulation	$1.05/sq.ft.	Up to $3,000/home	Up to $1,500/home	Up to $1,200/home	Up to $1,000/home	Up to $5,000/home	$100/100 sq.ft.
Celling / Attic Insulation	$0.66/sq.ft.	$650/home	Up to $750/home	Up to $900/home	Up to $1,000/home	Up to $600/home	$125/100 sq.ft.
Basement Insulation	$1.05/sq.ft.	Up to $1,250/home	Up to $600/home	Up to $1,200/home	Up to $1,000/home	Up to $1,500/home	$125/100 sq.ft.
Air Sealing	Up to $435/home	Up to $150/home	$200/home		$2-$3/strip or door kit	Up to $1,000/home	$200/home
Tankless Water Heater	$415/unit	$400/unit		$1,000/unit			$350/unit
Gas Storage Water Heater	$110/unit	$400/unit		$200-$1,000/unit			$300/unit
Heat Pump Water Heater	$460/unit		$400/ton	$1,000/unit		$1,000/unit	$600/unit
Drain-water Heat	$300/unit		$200/unit				$300/unit

Measures	Alberta	Ontario	Nova Scotia	British Columbia	Newfoundland and Labrador	Canada Greener Homes Grant (Canada)	Proposed HELP Rebate
Recovery System							
Heat Recovery System (HRV)	$270/home				$175/unit		$400/unit
Smart Thermostat	$85/unit	$75/unit				$50/unit	$80/unit
Air-source Heat Pump	$800/ton		$300-$500/ton	$1,000-$3,000/unit		Up to $5,000/unit	$600 - $4700/unit
Geothermal Heat Pump	$1600/ton		$600/ton			Up to $5,000/unit	$7,500/unit
Solar Water Heater	$650/unit		$1000/unit				$1,000/unit
Solar PV System (incl. panels & inverter)	$0.40/watt, $1.00/watt to a max of $6,000, $750/kW to a max of 20 kW	$600/kW[1]				$1,000/kW	$500/kW up to a maximum of $3,500 per household.
Low-flow Toilet	$100 or 50% of the cost/unit	$50 - $75/unit					$50/unit

[1] Incentive converted from $0.6/W to $600/kW to keep the units consistent with other programs.

Measures	Alberta	Ontario	Nova Scotia	British Columbia	Newfoundland and Labrador	Canada Greener Homes Grant (Canada)	Proposed HELP Rebate
Low-Flow Fixture & Faucet	Up to $200/home				$10/showerhead, $1/faucet aerator		$3/aerator, $10 /showerhead
Irrigation Control System				$40/unit, $300/unit (smart controller)			$40/unit
Rainwater Catchment	$50/unit						$50/unit
Level-2 EV Charger	Lower of $600 or 50% of the installed cost			Up to 50% of costs, to a max of $350.			$600/unit
Battery Storage System						$1,000/home	$300/kWh of usable capacity installed. Up to a maximum of $4,000 per household
Window Glazing & Bird Markers							$7/window

Interviews

As part of jurisdictional scan, ICF conducted consultations with program managers from specific programs to better understand the barriers to program participation, program implementation challenges and any other useful insights. This section summarizes the results of the consultations.

City of Toronto: Home Energy Loan Program

Home Energy Loan Program (HELP) provides homeowners a loan of up to $75,000 to cover the cost of home energy improvements. The amortization term varies from 5 to 20 years depending on the type of upgrade. The program was launched as a pilot in 2014 and has been renewed twice. It was extended for five more years in 2021 and the current term runs till 2025. The program only provides loans, and the participants can apply for rebates through other programs incentivizing the home upgrades. Popular measures applied under the program include heating and cooling equipment and insulation measures. Interest in solar PV systems has increased steadily over past few years. The program is stackable with either NRCan's Greener Home Grants or Enbridge's Home Efficiency Rebate. Participants cannot apply for rebates through both programs. Exhibit 4 shows the program participation and uptake numbers. Outstanding bills (property taxes and utility bills) was one of the major reasons for the applicants becoming ineligible for participating in the programs. The dropout rate due to unpaid bills was 6% in 2019 and increased to 24% in 2020. For 2021, the dropout rate due to unpaid bill is at 10%. For properties subject to a mortgage, lender's consent is required to participate in the program. City of Toronto indicated that the biggest drop-off during the past years has resulted from applicants unable to provide a completed consent form from the mortgage lender. The dropout rate resulting from nonfulfillment of lender consent was 56% in 2019 and 53% in 2020. City has focused on driving the participation through advertising, program related information on property tax bills, webinars, and information session at different events across the City.

Exhibit 4: Toronto HELP Program Application Summary

	2021	2020	2019	Jan 2014 – March 2018
Applications Received	70	93	141	677
Eligible Applicants	20	22	34	354
Projects Completed	1	16	*42*[2]	160
Program Expenditure	Not Available	Not Available	Not Available	$2.7 million

The City of Toronto indicated that the program participation has not been restricted by the program budget. The participation barriers noted by the City include:

- Major challenge to participation is lack of consent from mortgage lenders to allow property owners to take out loans for home upgrades.
- Outstanding property taxes and utility bills
- Home insured by Canada Mortgage and Housing Corporation (CMHC) are currently not eligible to participate in the program.
- Lack of knowledge regarding home upgrades.
- Lack of awareness about the program that can be attributed to limited marketing budget.

Some of the challenges encountered during program implementation include:

- Multiple reviewers are involved in the approval process to minimize fraud and risks, but this process makes issuing a loan labor intensive and can result in delays.
- Currently there is no proper CRM for tacking approval process.

[2] Completed projects are more than the eligible applicants in cases where the projects are carried over from previous year.

The City of Saskatoon should take note of the participation barriers as they could heavily impact Saskatoon's HELP program participation.

City of Edmonton: Home Energy Retrofit Accelerator Program (HERA)

Home Energy Retrofit Accelerator Program (HERA) provides rebate to homeowners for energy efficiency upgrades. Rebates are available to help cover the costs of an EnerGuide label and subsequent upgrades to your home. The program was launched in January 2021 for a term of 3 years (depending on available funds). The program has a budget of $1.8 million over a period of three years. Program has received 346 applications since the start of the program. Program provides a variety of measures to improve home energy efficiency. Most popular measures include attic insulation, smart thermostats, windows, and furnaces. Applicants are eligible for 20% bonus[3] for implementing at least three measures within a period of 18 months. The program is stackable with the NRCan's Greener Home Grants, but the incentives are capped at 100% of the project cost. It should be noted that a PACE-style program is not currently available as part of the City of Edmonton program, however one is currently in the design phase, and expected to be launched in the next year. The participation barriers noted by the City include:

- Lack of information regarding energy efficiency and its value.
- Inexpensive energy (natural gas and electricity) resulting in low ROI for most of the measures.
- Average homeownership is much shorter than the ROI (resulting in split-benefit between current and future homeowner).
- Lack of confidence in equipment contractor and lack of info regarding the choice of a suitable contractor.
- Pre- and post-project EnerGuide evaluations can be a barrier as applicants see it as an additional step.
- Project financing.

Some of the challenges encountered during program implementation include:

- Delays due to COIVD-19 resulting in a delayed program launch.
- Delays in EnerGuide evaluations due to COVID-19.
- Limited opportunities to promote the program.
- Limited marketing budget.

City of Halifax: Solar City Program

Solar City Program is for eligible property owners, which include residential, non-profits, places of worship, co-operatives and charities. The program offers property owners access to solar energy options, which can be financed through the Halifax Regional Municipality. The program was launched as a pilot in 2012. The current version of the program was launched in 2016. The solar energy options include solar electric (PV), passive solar hot air and passive solar hot water. These solar energy measures are eligible for incentives offered through Efficiency Nova Scotia programs such as SolarHomes Program and Green Heat Program. For measures where rebates are available through Efficiency Nova Scotia programs and NRCan's Greener Home Grants, participants can apply for rebates through only one program. Solar PV systems are the most common measure applied for under the program as about 95% of the applications are for solar PV system. Exhibit 5 shows the program participation since the program launch. City of Halifax indicated that about 10% of the applicants that register for Solar City Program go through with the project implementation. The City also indicated that the program is adequately funded and there are no budgetary constraints to program participation.

[3] 20% of rebate amount for applied measures

Exhibit 5: City of Halifax Solar City Participation

Year	Executed Participant Agreements
2016 - 2017	65
2018	161
2019	217
2020	109
2021	42

The participation barriers noted by the City include:

- System cost.
- Long payback period.
- Lack of information regarding technology and choice of appropriate contractor.
- Loan payback term (10 years currently).

Some of the challenges encountered during program development and implementation include:

- Setting up a competitive interest rate.
- Shortage of capacity to process applications.

Program Design

To complete the program design component, ICF's used our program modelling tool that displays information about the measure and measure costs, demonstrates expected baseline of uptake and market standards based on evaluated programs in other jurisdictions, and calculates the expected rebate, energy savings (gas and electric), GHG savings, and expected bill savings on a measure-by-measure basis. This breakdown is then rolled up into the expected program level savings under ten separate scenarios.

The tool uses evaluated savings and costs from proxy jurisdictions. When determining which dataset to use, the following considerations are made:

- Available data source, that's been reviewed by a third-party evaluator;
- similar climate;
- similar target audience; and
- similar program / measure type.

Included in the document are the individual calculations performed for each measure to provide full transparency on the calculations, with any assumptions documented and sourced. Additionally, the calculations take into consideration actual grid emission factors for Saskatchewan's electricity generation and natural gas usage to provide an accurate representation of the GHG savings for each measure.

The complete measure breakdown is provided in Appendix B.

Scenarios

The following scenarios were considered as part of the rebate design:

- Scenario 1: Low uptake (minimum expected) from the initial HELP Program Design
- Scenario 2: Medium uptake from the initial HELP Program Design
- Scenario 3: High uptake (maximum expected) from the initial HELP Program Design

- Scenario 4: Very-high uptake (above maximum) from the initial HELP Program. This was in consideration of the additional program from NRCan which may provide incentive for more homeowners to participate in the HELP Program.
- Scenario 5: High uptake, Other Assumptions: (1) 40% of total participants are low-income, (2) All participants are eligible for rebates regardless of income levels, and (3) Low-income participant will get 8 selected measures for free.
- Scenario 6: Very-high uptake. Other Assumptions: (1) 40% of total participant are low-income, (2) All participants are eligible for rebates regardless of income levels, and (3) Low-income participant will get 8 selected measures for free.
- Scenario 7: High uptake. Other Assumptions: (1) 40% of total participant are low-income, (2) Only low-income participants are eligible for rebates, and (3) Low-income participant will get 8 measures listed below for free.
- Scenario 8: Very-high uptake. Other Assumptions: (1) 40% of total participant are low-income, (2) Only low-income participants are eligible for rebates, and (3) Low-income participant will get 8 measures listed below for free.
- Scenario 9: High uptake. Other Assumptions: (1) 40% of total participant are low-income, (2) Only low-income participants are eligible for furnace, boiler, air conditioning, and water heater rebates, and other participants will be eligible for rebates for all other products (i.e., excluding furnace, boiler, air conditioning, and water heater), and (3) Low-income participant will get 8 measures listed below for free.
- Scenario 10: Very-high uptake. Other Assumptions: (1) 40% of total participant are low-income, (2) Only low-income participants are eligible for furnace, boiler, air conditioning, and water heater rebates, and other participants will be eligible for rebates for all other products (i.e., excluding furnace, boiler, air conditioning, and water heater), and (3) Low-income participant will get 8 measures listed below for free.

These scenarios were requested by the City of Saskatoon during the review meetings. In addition to these scenarios, the cost of waiving the planned administrative fee for all participants was also included. See Exhibit 6 for a summary of the scenarios.

Exhibit 6: Summary of Different Scenarios

Scenario	Estimated Participation (# of Homes) during Program Period (4 Years)	Total Electricity Savings (kWh)	Total Fossil Fuel Savings (GJ)	Net Energy Savings (GJ)	Lifetime GHG Reduction (tCO_{2e})	Total Rebate ($)	Waiver of Admin Fee (@$500)	Rebate + Admin Fee
Scenario 1	120	243,842	9,215	10,092	6,947	893,633	60,000	$953,633
Scenario 2	295	604,144	22,568	24,743	17,054	2,180,757	147,500	$2,328,257
Scenario 3	420	862,569	32,160	35,265	24,315	3,098,426	210,000	$3,308,426
Scenario 4	600	1,226,084	45,918	50,331	34,694	4,421,086	300,000	$4,721,086
Scenario 5	420	872,074	32,531	35,671	24,509	3,238,974	210,000	$3,448,974
Scenario 6	600	1,239,677	46,449	50,911	34,971	4,622,792	300,000	$4,922,792
Scenario 7	420	363,329	13,169	14,477	9,905	1,369,716	210,000	$1,579,716
Scenario 8	600	507,400	18,873	20,699	14,142	1,963,246	300,000	$2,263,246

Scenario 9	420	870,006	28,929	32,061	22,288	3,087,724	210,000	$3,297,724
Scenario 10	600	1,236,789	41,323	45,776	31,815	4,406,942	300,000	$4,706,942

As can be seen in Exhibit 6 above, the City of Saskatoon has a variety of scenarios to choose from to meet their program objectives. Of the scenarios that fall within the original program design expectations (1-3, 5, 7 and 9), Scenario 5 provides the greatest opportunity for savings.

Rebates

ICF worked with the City to identify appropriate rebate amounts for each measure. Some factors that went into the determination of rebates for each measure include:

- Targeting 20-50% rebate of incremental cost of measure;
- within range of existing programs (where applicable); and,
- the HELP rebate combined with the NRCan Greener Home rebate does not exceed 100% of the measure cost - because the data sharing agreement between the City and NRCan is unknown at this time, it was determined that the best way to safeguard the program from over payment (people receiving rebates for more than they paid for the measure) was to ensure that the rebate amount together with NRCan's rebate averaged less than 100% when combined.

The table of rebates for each measure, including the NRCan rebate and the combined total can be found in Exhibit 7.

Exhibit 7: Summary of Measure Rebates

Measure Code	Base case	NRCan Green Homes Grant ($)	NRCan Green Homes Grant (Rebate Unit)	Proposed HELP Rebate per Home	HELP Rebate Unit	HELP Rebate as % of Incremental Cost	HELP Rebate + NRCan Grant as % of Incremental Measure Cost
SHELP01011	ENERGY STAR High-efficiency Furnace	N/A		$450.00	per home	53%	53%
SHELP01021	ENERGY STAR High-efficiency Boiler	N/A		$450.00	per home	48%	48%
SHELP01041	ENERGY STAR Window	$125.00	per unit	$120.00	per Unit	32%	65%
SHELP01042	ENERGY STAR Exterior Door	$125.00	per unit	$100.00	per Unit	33%	75%
SHELP01051	Exterior Wall Insulation (+R 20)	$3,800.00	per home (+R-20)	$888.00	per home	16%	85%
SHELP01052	Celling/ Attic Insulation (+R 38)	$1,800.00	per home (R-50)	$1,495.47	per home	16%	36%
SHELP01053	Basement Insulation (+R 20)	$1,500.00	per home (R-22)	$1,027.82	per home	22%	54%
SHELP01054	Weather Stripping	N/A		$100.00	per home	44%	44%
SHELP01055	Air Sealing	$550.00	Per home (Meet the target in RUR)	$200.00	per home	21%	80%
SHELP01061	ENERGY STAR High-efficiency Gas Storage Water Heater	N/A		$300.00	per home	55%	55%
SHELP01062	ENERGY STAR High-efficiency Gas Tank-less Water Heater	N/A		$350.00	per home	46%	46%
SHELP01063	ENERGY STAR Electric Heat Pump Storage Water Heater	$1,000.00	per home	$600.00	per home	34%	92%
SHELP01071	Drain-water Heat Recovery System	N/A		$300.00	per home	32%	32%

Measure Code	Base case	NRCan Green Homes Grant ($)	NRCan Green Homes Grant (Rebate Unit)	Proposed HELP Rebate per Home	HELP Rebate Unit	HELP Rebate as % of Incremental Cost	HELP Rebate + NRCan Grant as % of Incremental Measure Cost
SHELP01081	Heat Recovery Ventilation System (HRV)	N/A		$400.00	per home	32%	32%
SHELP01091	Smart Thermostats	$50.00	per home	$80.00	per home	40%	65%
SHELP02011	Ductless Mini-Split Heat Pump (DMSHP)_Electric resistance	N/A	The grant is for units having HSPF >10 (mainly cold climate), where as ENERGY STAR requirement is 8.5	$600.00	per home	27%	27%
SHELP02012	Ductless Mini-Split Heat Pump (DMSHP)_Heating Oil	N/A		$600.00	per home	27%	27%
SHELP02013	Ductless Mini-Split Heat Pump (DMSHP)_Natural Gas	N/A		$600.00	per home	27%	27%
SHELP02021	Cold Climate DMSHP Electric resistance	$5,000.00	per home (max.)	$3,750.00	per home	18%	43%
SHELP02022	Cold Climate DMSHP Heating Oil	$5,000.00	per home (max.)	$3,750.00	per home	19%	45%
SHELP02023	Cold Climate DMSHP Natural Gas	$5,000.00	per home (max.)	$3,750.00	per home	19%	45%
SHELP02031	Centrally Ducted Heat Pump (CDHP)_Electric Furnace	N/A	The grant is for units having HSPF >10 (mainly cold climate), where as ENERGY STAR requirement is 8.5	$2,800.00	per home	48%	48%
SHELP02032	Centrally Ducted Heat Pump (CDHP)_Heating Oil	N/A		$2,800.00	per home	48%	48%
SHELP02033	Centrally Ducted Heat Pump (CDHP)_Natural Gas	N/A		$2,800.00	per home	48%	48%
SHELP02041	Cold Climate CDHP Electric Furnace	$5,000.00	per home (max.)	$4,700.00	per home	26%	55%
SHELP02042	Cold Climate CDHP Heating Oil	$5,000.00	per home (max.)	$4,700.00	per home	26%	55%
SHELP02043	Cold Climate CDHP Natural Gas	$5,000.00	per home (max.)	$4,700.00	per home	26%	55%
SHELP02051	Geothermal/Ground Source Heat Pump (GSHP)_Electric Furnace/Boiler	$5,000.00	per home (capacity of the units in QPL are much larger than 6.25 Tons of heating)	$7,500.00	per home	25%	42%
SHELP02052	Geothermal/Ground Source Heat Pump (GSHP)_Heating Oil	$5,000.00		$7,500.00	per home	25%	42%
SHELP02053	Geothermal/Ground Source Heat Pump (GSHP)_Natural Gas	$5,000.00		$7,500.00	per home	25%	42%
SHELP02061	Solar Water Heater with Electric Backup	N/A		$1,000.00	per home	20%	20%
SHELP02062	Solar Water Heater with Gas Backup	N/A		$1,000.00	per home	20%	20%
SHELP02071	Solar PV Panels and Inverter	$1,000.00/up to $5,000 per home	kW	$2,500.00	per home	20%	61%
SHELP03011	Low-flow Toilet	N/A		$100.00	per home	49%	49%
SHELP03021	Low-flow Faucet aerators	N/A		$9.00	per home	36%	36%
SHELP03022	Low-flow Showerheads	N/A		$15.00	per home	40%	40%
SHELP03031	Irrigation Control Systems	N/A		$40.00	per home	50%	50%
SHELP03041	Rainwater Catchment	N/A		$50.00	per home	50%	50%
SHELP04011	Level 2 EV Charging Station System	N/A		$600.00	per home	75%	75%
SHELP04021	Battery Storage System	$1,000.00	per home	$7,500.00	per home	34%	39%

Measure Code	Base case	NRCan Green Homes Grant ($)	NRCan Green Homes Grant (Rebate Unit)	Proposed HELP Rebate per Home	HELP Rebate Unit	HELP Rebate as % of Incremental Cost	HELP Rebate + NRCan Grant as % of Incremental Measure Cost
SHELP04031	Window Glazing and Embedded Markers for Birds	N/A		$77.00	per home	31%	31%
SHELP05011	Renovating to Net Zero Bonus	N/A	N/A	$10,000	per home	N/A	N/A

In addition to the rebates listed above, some scenarios (specifically 5-10) included the following measures be provided to income qualified households at no cost:

- Programmable thermostat;
- Weather stripping;
- Air sealing;
- Low flow toilet;
- Low flow faucet aerators;
- Low flow showerheads;
- Rainwater catchment; and,
- Window glazing and embedded markers for birds.

Bonus Rebates

In addition to the standard rebates provided by the program, the City requested that bonus rebates be provided in certain circumstances to promote additional energy savings. Homes that undergo enough renovations to receive the Net-zero Renovations Label[4] will be eligible for an additional $10,000 rebate. This is based on the cost of the certification expected to be about $5,000, as well as to off-set the cost of applying, and the additional renovations that need to occur to make a house net-zero, or net-zero ready. Net zero certification is not expected to exceed 20 participants over the life of the program. It should be noted, the Canadian Home Builders Association Net Zero Renovations Label may not be publicly available at time of program launch, and that requirement should only be added to the program when it is available and there are certifiers available in Saskatoon.

Other discussed bonus rebates revolved around the idea of bonuses for applicants with different measure categories (i.e., energy efficiency and renewable energy on the same application). However, without knowing which scenario the City plans on selecting, multi-category rebates could not be set as it was unclear how much budget was remaining. Additionally, with rebates set at a level that would help them not exceed 100% when combined with NRCan, providing multi-category bonuses increase the risk that the program, in concert with NRCan, may provide more than 100% of the cost of the measure.

Administrative Fees

In all of the scenarios, the City should be able to waive the administrative fees for participating in the program. Covering of the administrative fees leads to an additional $60,000 to $300,000 in additional budget spend depending on the scenario, however in all cases this fit under the program budget cap. Further, by removing the administrative costs to participating, the City lowers the barriers to participating in the program, particularly for smaller projects and income qualified participants. This action is expected to increase the number of participants in the program.

[4] Canadian Home Builder Association, 2021, https://www.chba.ca/CHBA/HousingCanada/Net_Zero_Energy_Program/NEW__Net_Zero_Renos/CHBA/Housing_in_Canada/Net_Zero_Energy_Program/Net_Zero_Renovations.aspx?hkey=b852ae22-f006-4b50-9ed6-7754cfbc6652

Energy and GHG Savings

The following table demonstrates the expected energy savings and corresponding GHG savings expected for each measure. This is determined by understanding what the expected standard baseline equipment and comparing the difference in energy use for the energy efficient model. The savings are calculated on both an annual basis as well as a lifetime basis determined by the expected measure life for each measure (as seen in other jurisdictions).

Once savings are calculated, the GHG emissions associated with natural gas and the electrical grid in Saskatchewan are factored in to gather the annual and lifetime savings.

Measure Code	Measure Name	Electricity Savings (kWh)	Gas Savings (GJ)	Water Savings (Gallons)	1st Year (2022) GHG Reduction (tCO2e)	Lifetime GHG Reduction (tCO2e)
SHELP01011	ENERGY STAR High-efficiency Furnace	0.00	12.29	0.00	0.63	7.96
SHELP01021	ENERGY STAR High-efficiency Boiler	0.00	9.85	0.00	0.51	7.23
SHELP01041	ENERGY STAR Window	57.63	2.83	0.00	0.17	2.35
SHELP01042	ENERGY STAR Exterior Door	13.36	0.81	0.00	0.05	0.66
SHELP01051	Exterior Wall Insulation (+R 20)	18.00	0.93	0.00	0.06	0.68
SHELP01052	Celling/ Attic Insulation (+R 38)	15.51	1.09	0.00	0.06	0.78
SHELP01053	Basement Insulation (+R 20)	36.60	2.60	0.00	0.15	1.85
SHELP01054	Weather Stripping	9.18	0.05	0.00	0.01	0.07
SHELP01055	Air Sealing	59.50	0.08	0.00	0.03	0.31
SHELP01061	ENERGY STAR High-efficiency Gas Storage Water Heater	0.00	4.99	0.00	0.26	2.43
SHELP01062	ENERGY STAR High-efficiency Gas Tank-less Water Heater	0.00	1.73	0.00	0.09	0.84
SHELP01063	ENERGY STAR Electric Heat Pump Storage Water Heater	-1419.04	17.33	0.00	0.19	3.85
SHELP01071	Drain-water Heat Recovery System	-0.82	4.66	0.00	0.24	3.01
SHELP01081	Heat Recovery Ventilation System (HRV)	0.00	4.62	0.00	0.24	2.49
SHELP01091	Smart Thermostats	106.10	5.59	0.00	0.34	2.76
SHELP02011	Ductless Mini-Split Heat Pump (DMSHP)_Electric resistance	941.46	0.00	0.00	0.46	3.64
SHELP02012	Ductless Mini-Split Heat Pump (DMSHP)_Heating Oil	-1459.35	9.80	0.00	0.02	2.04
SHELP02013	Ductless Mini-Split Heat Pump (DMSHP)_Natural Gas	-1454.65	9.50	0.00	-0.23	-0.51
SHELP02021	Cold Climate DMSHP Electric resistance	1995.76	15.64	0.00	1.79	16.15
SHELP02022	Cold Climate DMSHP Heating Oil	-1804.96	15.64	0.00	0.28	5.28
SHELP02023	Cold Climate DMSHP Natural Gas	-1800.80	15.08	0.00	-0.11	1.16
SHELP02031	Centrally Ducted Heat Pump (CDHP)_Electric Furnace	945.14	0.00	0.00	0.47	3.66
SHELP02032	Centrally Ducted Heat Pump (CDHP)_Heating Oil	-1450.96	9.86	0.00	0.03	2.12
SHELP02033	Centrally Ducted Heat Pump (CDHP)_Natural Gas	-1450.96	9.50	0.00	-0.22	-0.49
SHELP02041	Cold Climate CDHP Electric Furnace	2000.93	0.00	0.00	0.99	7.74
SHELP02042	Cold Climate CDHP Heating Oil	-1799.79	15.64	0.00	0.29	5.30
SHELP02043	Cold Climate CDHP Natural Gas	-1799.79	15.08	0.00	-0.11	1.16
SHELP02051	Geothermal/Ground Source Heat Pump (GSHP)_Electric Furnace/Boiler	2904.41	0.00	0.00	1.43	14.09
SHELP02052	Geothermal/Ground Source Heat Pump (GSHP)_Heating Oil	-1226.81	17.00	0.00	0.67	12.21

Measure Code	Measure Name	Electricity Savings (kWh)	Gas Savings (GJ)	Water Savings (Gallons)	1st Year (2022) GHG Reduction (tCO2e)	Lifetime GHG Reduction (tCO2e)
SHELP02053	Geothermal/Ground Source Heat Pump (GSHP)_Natural Gas	-1226.81	16.39	0.00	0.24	6.07
SHELP02061	Solar Water Heater with Electric Backup	2386.01	0.00	0.00	1.17	9.23
SHELP02062	Solar Water Heater with Gas Backup	0.00	13.97	0.00	0.72	7.53
SHELP02071	Solar PV Panels and Inverter	1110.83	0.00	0.00	0.55	5.39
SHELP03011	Low-flow Toilet	5.36	0.00	983.16	0.00	0.03
SHELP03021	Low-flow Faucet Aerators	5.37	0.31	424.37	0.02	0.14
SHELP03022	Low-flow Showerheads	24.63	1.56	1728.22	0.09	0.70
SHELP03031	Irrigation Control Systems	0.00	0.00	3318.18	0.00	0.00
SHELP03041	Rainwater Catchment	0.00	0.00	1487.42	0.00	0.00
SHELP04011	Level 2 EV Charging Station System	0.00	0.00	0.00	0.00	0.00
SHELP04021	Battery Storage System	1.28	0.00	0.00	0.00	0.00
SHELP04031	Window Glazing and Embedded Markers for Birds	0.00	0.00	0.00	0.00	0.00
SHELP05011	Renovating to Net Zero Bonus	0.00	0.00	0.00	0.00	0.00

Recommended Action

As noted, it is difficult to know the impact of the federal Greener Homes program, and for that reason the decision has been made to abide by the original program design estimates. For the purposes of this report, the expectation is that the participation level will hit the original program design limit for participants but not exceed it (Scenarios 3,5,7 and 9). The analysis (Scenarios 4,6,8 and 10) shows that even if participation exceeds expectations there should be room for it within the allotted program budget for the additional participants.

To determine whether the City should select Scenario 3,5,7 or 9 is a program design philosophy decision that can only be made by the City. Should the City decide to focus on treating all participants the same, Scenario 3 should be used for planning purposes. It is worth noting that it is unclear if there is coordination FCM and NRCan, and whether FCM will be willing to fund a program similar to the one instituted by NRCan. Scenario 3 is the scenario most similar to the NRCan program, and if such considerations are being weighed by FCM, there is a possibility the program is at risk of not being funded.

If the City decides to make special considerations for income qualified participants, one of Scenario 5, 7, or 9 should be selected. Further to the point above, the NRCan does not make special considerations for income qualified participants, and as such an application to FCM that provides special provisions for this group may be evaluated more favourably. It is important to note that only Scenario 5, which provides rebates for all participants but also provides free equipment for low-income participants, is expected to utilize an amount close to the original stated program budget of $6 million.

Scenarios 7 and 9 which provide rebates only for income qualified participants fail to utilize the full desired budget. If these scenarios are selected, considerations should be made for the lower expected budget use or adjustments would need to be made to the rebate levels to maximize budget, although there may be risk in doing so. Raising rebate levels beyond a certain level risks overpaying participants to install energy efficient measures in their home, and in doing so can means the budget has not been optimized to achieve its maximum potential. In some instances, raising rebates could create scenarios where participants are receiving more than 100% of the retrofit cost when paired with the NRCan rebate. If changes to the proposed rebate levels need to occur, they should be done with caution.

Using Scenarios 7 or 9 without further adjustment to the expected participation levels or rebate amounts, for the purposes of the City's application to the FCM may result in receiving reduced funding from the FCM.

Given all of these considerations, Scenario 5 appears to be the best suited to achieve the City's goals with the HELP program within the original program design, in that it is a mass-market program with special considerations for income qualified participants and is the closest to the $6 million of desired budget. Should the City expect that the addition of the Greener Homes Grant Program by NRCan will bolster participation in the program, then Scenario 6 which accounts for increased participation is best suited for the City's goals.

Appendix A: Jurisdictional Review Program Details

Program	Location	Target Sector	Energy Efficiency (EE) / Renewable Energy (RE) / Water Conservation (WC) / Other	Stackable Rebate with Other Programs?	Rebate Cap
Municipal Programs					
Home Energy Retrofit Accelerator	Edmonton, Alberta	Residential	EE	Yes	Up to 40% of eligible costs (incl. equipment, installation & professional services)
Change Homes for Climate Solar Program	Edmonton, Alberta	Residential	RE	N/A	Up to 40% of the total eligible expenses or $4,000 per Dwelling
Electric Vehicle Charger and E-Bike Rebate Program	Edmonton, Alberta	Residential, Commercial	Other	N/A	Residential EV Charger: 50% of cost (equipment & installation) up to a max. of $600. Commercial EV Charger: 50% of cost (equipment & installation) up to a max. of $2,000.
Clean Energy Improvement Program	Multiple Municipalities, Alberta	Residential, Commercial	EE, RE	Yes	Up to 100% of project cost
Clean Energy Financing Program	Multiple Municipalities, Nova Scotia	Residential	EE, RE	Yes	Bridgewater: $15,000 - $20,000 (depends on property value)

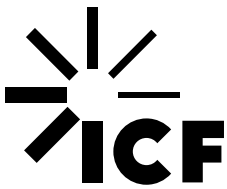
Program	Location	Target Sector	Energy Efficiency (EE) / Renewable Energy (RE) / Water Conservation (WC) / Other	Stackable Rebate with Other Programs?	Rebate Cap
					Lunenburg: $10,000 Digby: $15,000 Barrington: $10,000 Yarmouth: $15,000 Amherst: $15,000 - $25,000 (depends on property value) Cumberland: $15,000 - $25,000 (depends on property value)
Solar City Program	Halifax, Nova Scotia	Residential, Non-Profits	RE	Yes	Up to maximum of 105% of quoted cost (equipment, installation, labour, warranty or maintenance plan, any other associated cost
Home Energy Loan Program	Toronto, Ontario	Residential	RE, EE, Other	Yes	Up to $75,000
HAT Smart	Medicine Hat, Alberta	Residential	EE, RE, WC	N/A	Solar PV: Up to a max. of $6,000 Scratch & Win: Up to a max. of $200
Residential Environmental Rebates	Banff, Alberta	Residential	EE, RE, WC	N/A	Toilet: Lesser of $100/toilet or 50% of cost

Program	Location	Target Sector	Energy Efficiency (EE) / Renewable Energy (RE) / Water Conservation (WC) / Other	Stackable Rebate with Other Programs?	Rebate Cap
Solar PV Rebates	Banff, Alberta	Residential, Commercial	RE	N/A	$750/kW of solar capacity installed, to a maximum of 20 kW
Royal Flush Toilet Rebate	Guelph, Ontario	Residential	WC	N/A	Up to two toilets
Water-Efficient Toilet Rebate Program	Halton, Ontario	Residential	WC	N/A	1 toilet
Irrigation Controller Rebate	Kelowna, British Columbia	Residential, Commercial	WC	N/A	1 controller/home
Smart Control Irrigation Rebate	Comox Valley Regional District, British Columbia	Residential	WC	N/A	Up to a $300
Provincial Programs					
Home Energy Assessment	Nova Scotia	Residential	EE, RE	N/A	Up to $5,000
Solar Homes Program	Nova Scotia	Residential	RE	N/A	Max. rebate $6,000, up to 25% of eligible pre-tax system costs
Free Energy Efficient Products and Installation	Nova Scotia	Residential	EE, WC	N/A	Not available
Home Insulation Rebate	Manitoba	Residential	EE	N/A	Up to 100% of insulation material cost
Home Energy Upgrades	Manitoba	Residential	EE	N/A	Home appliances & smart thermostat: Up to $325

Program	Location	Target Sector	Energy Efficiency (EE) / Renewable Energy (RE) / Water Conservation (WC) / Other	Stackable Rebate with Other Programs?	Rebate Cap
Home Efficiency Rebate Program	Ontario	Residential	EE	N/A	Up to $5,000
Smart Thermostat Program	Ontario	Residential	EE	N/A	$75
CleanBC Better Homes and Home Renovation Rebate Program	British Columbia	Residential	EE	Yes	Up to 100% of cost of upgrade
Take Charge (Instant Rebate)	Newfoundland and Labrador	Residential	EE, WC	N/A	Not available
EV Charger Rebate Program	British Columbia	Residential	Other	Yes	Up to 50% of costs, to a maximum of $350.
Federal Programs					
Canada Greener Homes Grant	Canada	Residential	EE, RE, Other	Yes	- Up to $600 for the cost of pre- and post-retrofit EnerGuide evaluations - Up to $5,000 total for the implementation of eligible retrofits

Appendix B: Program Design

See attached spreadsheet labelled Appendix B.

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