March 13, 2013

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
26th Floor, Box 2319
Toronto, ON M4P 1E4

Dear Ms. Walli

Re: PowerStream Inc. (Licence ED-2004-0420)
Application for Board-Approved Conservation and Demand Management Program - Direct Install Refrigeration Program

Please find enclosed two (2) paper copies and a CD containing the above captioned application in PDF format. Please note also that this Application has been filed through the Board's Regulatory Electronic Submission System (RESS).

PowerStream Inc. ("PowerStream") is a distributor as defined in, and is licensed as such under, the *Ontario Energy Board Act, 1998*. PowerStream holds Electricity Distribution Licence ED-2004-0420.

PowerStream is seeking Board approval for a Direct Install Refrigeration (DIR) program to partially address its projected shortfall against its 2011-2014 CDM targets. The Application filed under this cover includes the following highlights:

- The DIR program is projected to cost $4.1Million and generates 3.3MW and 19.6 GWh of net savings, representing an additional 3.5% and 4.8% towards PowerStream's 2011-2014 demand and energy targets, respectively;

- The DIR program addresses market-specific needs of small commercial customers, a market segment that is underserved by the Electricity Retrofit Incentive Initiative within the Provincial Commercial & Industrial Program;

- The DIR program is robustly designed, cost-effective and low risk. In developing the DIR program, PowerStream undertook a thorough process including market and technology assessments, customer and stakeholder consultations, cost effectiveness screening, sensitivity and scenario analysis, and risk assessment and mitigation planning;

- The OPA strongly supports the proposed program and PowerStream's application to the OEB. The OPA sees potential for rolling out this program province wide. The proposed program complements the existing portfolio of province wide program initiatives and the OPA recommends that it be approved as a Board Approved Program; and

- The DIR program represents a prudent use of rate-payer dollars while minimizing customer confusion and avoiding any unnecessary duplication of resources, namely those of the OPA.

This application is respectfully submitted.

Yours truly,

Original signed by

Colin Macdonald
Vice President, Rates and Regulatory Affairs

cc. Raegan Bond, VP, Conservation and Demand Management
James Sidlofsky, BLG

PowerStream Inc.

Application for Board-Approved Conservation and Demand Management Program

Direct Install Refrigeration (DIR) Program

Submitted to:

Ontario Energy Board

March 13, 2013

Executive Summary

PowerStream is seeking Board Approval for a Direct Install Refrigeration (DIR) Program to partially address its projected shortfall against its 2011-2014 CDM targets.

The Ontario Energy Board (the "OEB") has assigned PowerStream a Conservation and Demand Management ("CDM") target of achieving 95.57 MW of demand reduction and 407.3 GWh of energy savings over the 2011-2014 period. PowerStream accepted the Ontario Power Authority's (the "OPA's") CDM Master Agreement in February 2011 and is currently delivering all available OPA-Contracted Province Wide Programs ("Provincial Programs") to eligible customers across our service territory[1]. While PowerStream's original CDM Strategy, filed with the OEB on October 29, 2010, was to meet its CDM targets solely through the delivery of Provincial Programs, PowerStream is currently projecting to achieve 56% of its demand reduction target and 89% of its energy savings target through the delivery of the Provincial Programs. Assuming approximately 21 MW[2] of savings from Time of Use (TOU) pricing, this brings PowerStream's demand forecast to approximately 79% of its demand target. This projection was developed at the end of 2012 based on two years of program delivery experience and one year (2011) of verified results from the OPA.

PowerStream's strategy for addressing this projected shortfall is two-fold: improve the design and delivery of the Provincial Programs and seek approval for a Board-Approved Program. First, and foremost, PowerStream remains committed to working with the OPA, the Electricity Distributors Association ("EDA") and other LDCs to optimize the design and delivery of the Provincial Programs. The Provincial Programs remain the cornerstone of PowerStream's portfolio and will be the key driver in whether PowerStream is able to meet its four year CDM targets.

As a secondary, additional strategy for meeting its CDM targets, PowerStream is seeking OEB approval of the Direct Install Refrigeration ("DIR") Program presented herein. Assuming an expeditious regulatory review process, an approval from the OEB in the second quarter of 2013 and a program launch by mid-Summer 2013, PowerStream is projecting to achieve 3.3 MW and 19.6 GWh from the program, which represents an additional 3.5% and 4.8% toward its demand and energy targets, respectively.

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[1] As of December 2011, PowerStream had 336,107 customers, of which 297,962 were Residential, 33,195 were Commercial under 50kW demand, and 4,614 were commercial over 50kW demand.

[2] The aggregate LDC CDM target of 1330MW established by the OPA included 308 MW of expected demand savings from the impact of TOU pricing on consumer behaviour. PowerStream has estimated 21MW for its territory as it is approximately 7% of the provincial customer base.

The DIR Program addresses market-specific needs and opportunities for CDM

Commercial facilities with commercial product refrigeration are relatively energy intensive industries compared to other commercial businesses. Refrigeration represents the largest single end-use of electricity in restaurants and grocers. There are many commercially available, proven, and cost-effective energy saving measures for commercial coolers and freezers, such as anti-sweat heater controls, strip curtains, night curtains, ECM motors, LED case lighting and cleaning of condenser coils.

PowerStream has observed that its small commercial customers are a market segment that is underserved by the Electricity Retrofit Incentive Initiative ("ERII") within the Provincial Commercial & Industrial ("C&I") Program, particularly for refrigeration measures, based on the disproportionately low penetration of the program within this market segment. While ERII has penetrated approximately 14% of PowerStream's General Service ("GS") >50kW accounts, less than 1% of GS <50kW customers have participated in ERII. Of all PowerStream ERII participants, only 2% have included refrigeration measures.

Despite the commercial availability and cost effectiveness of energy saving refrigeration measures, there are barriers preventing the small commercial customer segment from undertaking these and other conservation actions through ERII's "custom measures" track. Small commercial customers are well established as "hard to reach" customers within conservation programs. Typical barriers to their participation include lack of knowledge, time and capital resources. Direct installation programs are a common means to overcome some of these barriers and increase penetration of CDM programs within this customer segment. The DIR Program has been designed specifically to address these barriers.

The DIR Program is robustly designed, cost-effective and low-risk

In developing the DIR Program, PowerStream undertook a thorough process which included market and technology assessments, customer and stakeholder consultations, cost effectiveness screening, sensitivity and scenario analyses, and risk assessment and mitigation planning.

Participants in this program will receive a turn-key service which provides:

- a free electricity audit and assessment;
- a customized report and Energy Action Plan based on the electricity audit and assessment; and
- up to $2,500 of eligible refrigeration measures and services provided and installed at no charge.

The electricity audit and assessment will be based on at least the following data: Customer profile/firmographics (e.g. type of business, operating hours); historical electricity consumption;

and walk through audit results (e.g. load inventory, square footage, age of equipment). This data will be used to generate a customized report and Energy Action Plan that:

- Identifies key end-uses driving electricity consumption patterns in the facility;
- Recommends specific eligible refrigeration measures/services for installation and identifies associated energy and demand savings;
- Identifies additional opportunities for energy and demand savings related to other end-uses and cross promotes other CDM programs where applicable; and
- Provides a comparative benchmark of the facility's electricity use against similar businesses.

This information will be provided to participants in a comprehensive user friendly electronic report. The specific eligible refrigeration measures that will be included in the DIR Program are:

- Anti-sweat heater controls for cooler and freezers
- Strip curtains for walk-in coolers and freezers
- Night curtains on display cases
- Cleaning cooler/freezer condenser units
- Electronically Commutated Motor upgrade
- LED display case lighting

Based on a projected participation of 1,200 customers by the end of 2014, the program is projected to cost $4.1 Million (Table 1) and generate 3.3MW and 19.6 GWh of net savings (Table 2) toward PowerStream's 2011-2014 CDM Targets. With respect to cost effectiveness screening, the DIR Program passes both the Total Resource Cost ("TRC") test and Program Administrator Cost ("PAC") test (T**a**ble 3). At 0.04$/kWh, forecasted Levelized Unit Energy Cost ("LUEC") for the program compares favourably to the average LUEC of 0.03$/kWh for the existing portfolio of Provincial Programs[3].

[3] **Ontario Power Authority, December 2012**. *2011 Conservation Results*.

Table 1 DIR Program Budget

Cost ($ '000s)	**2012**	**2013**	**2014**	**Total**
Fixed Program Cost	78	538	582	1,198
Variable Program Costs	-	36	84	120
Subtotal – Program Costs	**78**	**574**	**666**	**1,318**
Customer Incentive costs	-	839	1,959	2,798
Total Delivery Cost	**78**	**1,414**	**2,625**	**4,117**

Table 2 DIR Program Projected Demand and Energy Savings

Implementation Year	Net Annual Demand Savings (MW)		Net Annual Energy Savings (GWh)		2011-2014 Net cumulative Energy Savings (GWh)
	2013	2014	2013	2014	
2013	1.0	0.9	4.9	3.3	8.2
2014		2.4		11.4	11.4
TOTAL	1.0	**3.3**	4.9	14.7	**19.6**

Table 3 DIR Program Cost Effectiveness Screening Results

Cost Benefit Test	Benefits ($ '000s)	Costs ($ '000s)	Net Benefit ($ '000s)	Ratio
Total Resource Cost (TRC) Test	10,479	3,861	6,618	2.7
Program Administrator Cost (PAC) Test	10,479	3,861	6,618	2.7

Costs ($ '000s)	3,861
Lifetime Electricity Savings (NPV), kWh	110,225,633
Levelized Unit Electricity Cost, $/kWh	0.04

To ensure prudent use of rate-payer funds and to provide confidence to the OEB in the robustness of PowerStream's projections for the DIR Program, PowerStream undertook a battery of sensitivity and scenario analyses on the baseline projections for the DIR Program. The baseline DIR Program projections have a significant amount of "buffer" to changes in any one variable before the program would no longer be cost effective. For example, participation in the program would have to drop to 85% below the baseline projection, for the program to no longer be cost effective. Scenarios where multiple variables changed simultaneously were also considered and the program proved to be robust. For example, if the number of participants, the savings per participant, and the Net-to-Gross ("NTG") factor were simultaneously reduced by 30% each, the program would remain cost-effective.

As part of the planning process for the DIR Program, PowerStream identified potential risk factors that could affect the success of the DIR program. Mitigation strategies have been

identified for risks that have at least a medium likelihood and impact of occurrence. PowerStream will also adopt the same comprehensive approach for monitoring, tracking and reporting progress in the delivery of the DIR Program that it currently uses for the Provincial Programs.

PowerStream engaged the OPA in detailed and thorough discussions early-on

PowerStream approached the OPA in late November 2012 to solicit feedback on the draft program design and to identify any concerns regarding potential duplication with the Provincial Programs. PowerStream consulted with OPA staff over a period of two months through a number of mechanisms:

- Three in-person meetings as well as several email and phone exchanges in December 2012 and January 2013
- OPA staff attendance at PowerStream's customer focus groups in December 2012
- Provision of draft program design documentation and projections (participation, energy and demand savings, budget, and cost effectiveness screening)

OPA staff responded positively to the draft program and indicated that they saw a potential opportunity to deliver this program province wide following a successful rollout of the program by PowerStream. As evidenced in its letter of support (enclosed as Appendix B to this Application), the OPA is fully supportive of PowerStream implementing the DIR Program as a Board Approved Program. The OPA is committed to working with LDCs to explore the option of adding the DIR Program to the Provincial Program portfolio at a later date. PowerStream is committed to working with the OPA and other LDCs in this regard by sharing the results and lessons learned from the PowerStream DIR Program.

The DIR Program complements and does not duplicate existing Provincial Programs

The DIR Program does not duplicate an existing Provincial Program or Initiative. In accordance with the CDM Code and Guidelines for Electricity Distributor Conservation and Demand Management (EB-2012-0003), PowerStream has provided herein the following information to substantiate its submission that the DIR Program does not duplicate an existing Provincial Program:

- **OPA's duplication assessment and letter of support**. This assessment is provided in Appendix B to this Application.
- **A detailed analytical comparison of the DIR Program with the two closest comparable provincial initiatives** - Small Business Lighting ("SBL") and ERII. The detailed comparison provided in Appendix C and the summary provided in Section 7.3 clearly establish the unique nature of the DIR Program.

- **A review and discussion of how the DIR Program does not meet any of the seven specific examples of duplication provided in the CDM Code and CDM Guidelines**.
- **A summary of how the DIR Program meets the expectations set out by the OEB in its CDM Guidelines regarding the characteristics of a non-duplicative CDM Program**.

On March 4, 2013, the OPA provided PowerStream with a letter summarizing its duplication assessment of the DIR Program and its support for the program. As can be seen in the letter at Appendix B to this Application, and as discussed below, the OPA strongly supports the proposed DIR program and PowerStream's application to the OEB. With respect to the matter of duplication, the OPA indicates that it "is of the opinion, that the question of duplication with respect to the proposed program does not have a clear answer." The OPA's assessment was that under sections 2.3.3 (a) to (e) of the CDM Code, the proposed program could be considered duplicative, while under the CDM Guidelines the proposed program meets the examples of what can constitute a non-duplicative program – namely a market-specific consideration which requires a novel approach. PowerStream does not fully agree with the OPA's interpretation of the CDM Code. PowerStream's understanding of, and position on, the non-duplicative nature of this program in relation to both the CDM Code and the Guidelines is provided in section 7.4, below.

The SBL Initiative is the closest existing Provincial Program comparator to the proposed DIR Program. Both programs are designed specifically for the "hard to reach" small business segment within the commercial and institutional sector by providing a turn-key direct installation service. The primary difference between SBL and the DIR Program is the specific end-use that is targeted and the measures that are offered – lighting versus refrigeration. A secondary difference is that the DIR program will also include a comprehensive electricity audit and assessment and provide customers with a personal Electricity Action Plan and a benchmark of their electricity use compared to other similar facilities. Based on customer focus group results, PowerStream believes that these additional unique features will provide significant value to the customer.

ERII, on the other hand, is geared primarily for medium to large non-residential facilities. ERII provides customers with financial rebates which cover up to 50% of the cost of energy efficient measures. The onus is on the customer to identify and manage the implementation of the retrofits on their own (including, among other matters, purchasing materials and hiring contractors). The ERII program includes a "custom" measures track where participants can apply for incentives from any measure which saves energy or demand in their facility, based on the actual achieved savings. In theory, one might suggest that the DIR Program could be seen as duplicative of the ERII custom measure track, however in practice this is not the case. As evidenced by the market penetration statistics for the program stated earlier, in the two years it

has been in market, the ERII initiative has failed to meet the needs of the small commercial segment or to stimulate refrigeration efficiency measures.

The DIR Program meets all of the elements of a non-duplicative program as described in the CDM Guidelines (Section 4, page 5). It addresses market-specific considerations, avoids market-place confusion and ensures the prudent use of rate-payer funds.

The OPA supports PowerStream's implementation of the DIR Program

The OPA strongly supports the proposed program and PowerStream's application to the OEB. Specifically, the OPA letter states that:

> *"The OPA sees potential for rolling out this program province wide. The OPA fully supports PowerStream leading the way in implementing the program and looks forward to leveraging PowerStream's results and lessons learned in order to build the business case for a provincial roll out. The proposed program complements the existing portfolio of province wide program initiatives and the OPA recommends that it be approved as a Board Approved Program."*

Summary

PowerStream is currently projecting a shortfall against its 2011-2014 CDM Targets. Implementation of the DIR Program will partially address this shortfall. PowerStream has developed a robust program design which complements the existing portfolio of Provincial Programs and will help better serve a customer segment that is widely accepted as "hard to reach" for conservation programs. PowerStream engaged the OPA early on in the program development process and is committed to helping the OPA build the business case for a provincial rollout of the program at a later date based on PowerStream's results. The OPA is fully supportive of PowerStream implementing the DIR Program and recommends that it be approved as a Board Approved Program. The DIR program represents a prudent use of rate-payer dollars while minimizing customer confusion and avoiding any unnecessary duplication of resources, namely those of the OPA, and PowerStream respectfully requests that the OEB approve its proposed DIR program.

Table of Contents

1 Background

The OEB has assigned PowerStream a CDM target of achieving 95.57 MW of demand reduction and 407.3 GWh of energy savings over the 2011-2014 period. The CDM Code, issued by the OEB in September 2010, sets out the regulatory framework through which PowerStream can meet its CDM targets. PowerStream can meet its targets through the delivery of Provincial Programs and/or Board-Approved Programs. In its original CDM Strategy, filed with the OEB on October 29, 2010, PowerStream forecasted achieving 100% of its CDM targets through the delivery of Provincial Programs. In its 2011 Annual CDM Report, filed with the OEB on September 28, 2012, PowerStream forecasted achieving 77% of its demand target and 100% of its energy target through the delivery of the Provincial Programs. The remainder of the demand savings was projected to come from TOU pricing implementation. In its Annual Report, PowerStream also flagged that there were risks and uncertainties with this forecast and that it would be investigating the opportunities and feasibility of potential Board-Approved CDM Programs.

At the end of 2012, PowerStream developed an updated four-year CDM forecast, based on: 2011 verified results from OPA; 2012 preliminary results (internal estimate) and an updated 2013 and 2014 outlook. PowerStream is currently projecting to achieve 56% of its demand target and 89% of its energy target through the delivery of the Provincial Programs. Assuming approximately 21 MW[4] of savings from TOU pricing, this brings PowerStream's demand forecast to approximately 79% of its demand target.

PowerStream's strategy for addressing this projected shortfall is two-fold: improve the Provincial Programs and seek approval for a Board-Approved Program.

First, and foremost, PowerStream remains committed to working with the OPA, the EDA and other LDCs to optimize the design and delivery of the Provincial Programs. The proposed Board-Approved CDM Program presented in this application – a Direct Install Refrigeration (DIR) Program - will not be sufficient to fully address PowerStream's projected shortfall against its CDM targets. The Provincial Programs remain the cornerstone of PowerStream's portfolio and will be the key driver with respect to whether PowerStream is able to meet its four year CDM targets. PowerStream is an active member of all four OPA-LDC Working Groups (Residential, Commercial & Institutional, Industrial, and Reporting & Evaluation) as well as the EDA CDM Caucus, contributing several days a month of staff time to these committees. PowerStream is

[4] The aggregate LDC CDM target of 1330MW established by the OPA included 308 MW of expected demand savings from the impact of TOU pricing on consumer behaviour. PowerStream has estimated 21MW for its territory as it is approximately 7% of the provincial customer base.

also supporting and participating in pilot projects (e.g. social benchmarking) and evaluation activities (e.g. ***peaksaver***) with the OPA.

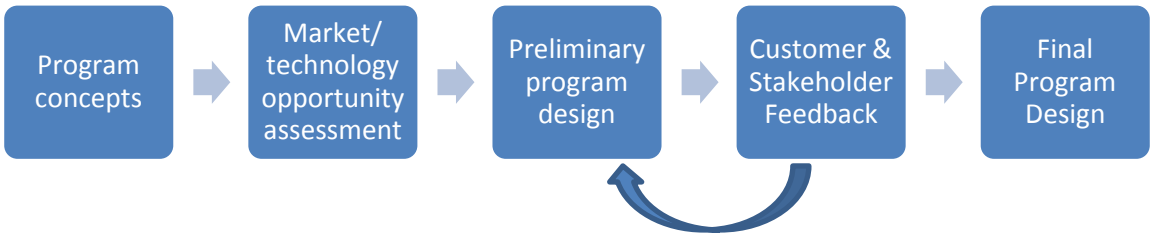
There are several issues with the current Provincial Programs which are impeding their performance and presenting risks to PowerStream in achieving its CDM targets. These issues are primarily related to program delivery (e.g. Participant Agreements and the online application system that are overly onerous/complicated), but there are also some program design concerns (e.g. equipment pricing caps in the Small Business Lighting Initiative). These barriers and opportunities have been well identified by the program working groups and solutions have been proposed in nearly all cases. To date, three rounds of changes to the Master Agreement and Schedules have been issued through the EDA and OPA collaborative change management process, and there are several additional rounds of changes currently in the process. These modifications have been positive, however, the overall change management process has been extremely slow and PowerStream believes this has resulted in lost opportunities and lower than forecasted results.

Therefore, PowerStream has adopted a secondary, additional strategy for meeting its CDM targets – seeking approval of a Board-Approved CDM Program. Assuming an expeditious regulatory review process, an approval from the OEB in the second quarter of 2013 and a program launch by mid-Summer 2013, PowerStream is projecting to achieve 3.3 MW and 19.6 GWh from the DIR Program, which represents an additional 3.5% and 4.8% toward its demand and energy targets, respectively.

2 Program Development Process

PowerStream undertook a thorough program development process which included market and technology assessments, customer and stakeholder consultation, and comprehensive analysis of program projections. Figure 1 below provides a simplified illustration of the program development process for the DIR Program.

Figure 1 Program development process



Beginning in early October 2012, PowerStream identified approximately ten program concepts for possible development. This list was narrowed down to four for further consideration, based on a qualitative assessment of:

- Potential energy and demand savings
- Potential program delivery cost
- Potential level of duplication with Provincial Programs
- Potential speed and ease of implementation

A high level opportunity assessment (market and technology) and program design were developed for each of the four programs. This included identification of eligible measures, estimation of program participation levels, forecasting energy and demand savings and preliminary cost effectiveness screening. At this point, in mid-November, the DIR Program was identified as the preferred candidate program for further development as it offers significant potential for resource savings, is cost effective, addresses a customer segment currently underserved by the OPA Contracted Province Wide Commercial & Institutional (C&I) Program and is built on a delivery method (direct installation) which PowerStream has successfully used in the past and which would allow it to quickly generate results that could have a material impact on its 2014 CDM targets.

Starting in mid-November, PowerStream developed a more detailed program design and refined its projections and analyses. In parallel, PowerStream undertook a comprehensive stakeholder consultation process to solicit feedback on the draft design from customers, the refrigeration industry and other key stakeholders. A summary of these consultations and the feedback received from customers and refrigeration industry is provided in Table 4 below. A discussion of consultation with and feedback from the OPA throughout the program development process is provided in Section 7.1.

Table 4 Summary of Consultations with Customers and Refrigeration Channel

	Consultation process	Summary of feedback and outcomes

Customers	• Customer focus groups conducted by Harris/Decima Inc. (on behalf of PowerStream) in December 2012
	• Four focus groups were conducted with PowerStream business customers. Separate groups were held for:
	  o Small Business customers who had participated in the provincial Small Business Lighting (SBL) Program
	  o Small Business customers who had not participated in SBL (2 groups)
	  o Medium & Large Business customers.
	
	Key study objectives were to:
	• Determine overall interest in the program and relevancy to the business;
	• Identify the key businesses (types/sector) qualified for the program;
	• Obtain feedback on the program design and incentive structure;
	• Characterize the varying opinions and attitudes towards the program based on business size and past participation in the SBL program; and
	• Discover the motivations and barriers to participation.
		• Businesses understand that their refrigeration equipment plays a large role in the size of their electricity bill. However they need more information on being energy efficient.
		• Their refrigeration equipment is critical to their business
		• Businesses want to learn more ways to be more efficient
		• On the whole, existing refrigeration equipment is old – new functionalities/ products to upgrade equipment are welcomed.
		• The initial introduction of the program should be through PowerStream, and not a third party.
		• Be persistent in the marketing of the program; and make sure it's loud and clear that it's a PowerStream-sponsored program

Refrigeration Channel	Consulted with Heating, Refrigeration and Air Conditioning Institute (HRAI) Consulted with two local refrigeration contractors and a local refrigeration equipment distributor	• Positive reception to program design • Confirmed that there is a need in marketplace for this type of program to help business owners understand their refrigeration energy use and how to manage it • All parties were eager to learn more about the program and how they could be involved

3 Opportunity Assessment

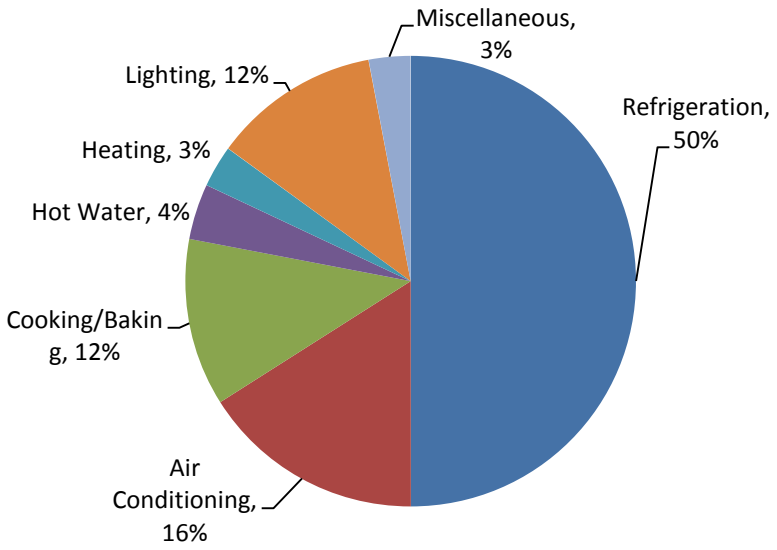
3.1 Sector and Technology Potential

Commercial facilities with commercial product refrigeration are relatively energy intensive industries compared to other commercial businesses. As seen in Table 5, below, grocery stores and restaurants typically use approximately three times the amount of electricity per square foot of retail space compared to offices and other retail businesses. Refrigeration represents the largest single end-use of electricity in these facilities – 50% for restaurants (Figure 2) and 72% for grocers (Figure 3).

Table 5 Electricity Intensity, by Commercial Customer Segment[5]

Sector	Electricity Intensity (kWh/ft^2)
Grocery Stores	52.5
Restaurants	43.4
Office space	16.5
Retail space	15.3

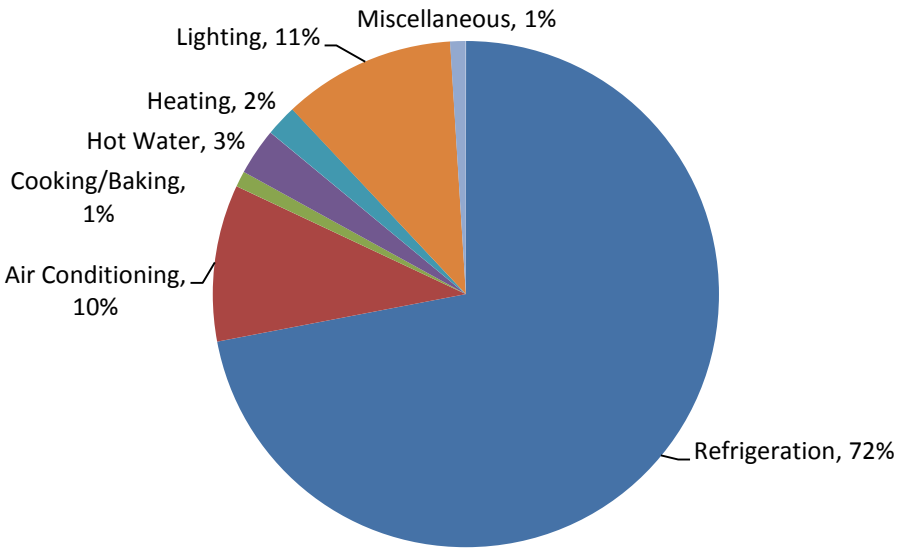
Figure 2 Breakdown of Average Restaurant electricity Consumption, by major end-use[6]



[5] **GreenSaver Inc, 2006**. *Small Business Commercial Energy Efficiency Study: Restaurants and Green Grocers – Final Report. Prepared for Conservation Bureau/Ontario Power Authority*

[6] Ibid.

Figure 3 Breakdown of Average Grocers Electricity Consumption, by major end-use[7]



There are many commercially available, proven, and cost-effective energy saving measures for commercial coolers and freezers, such as anti-sweat heater controls, strip curtains, night curtains, ECM motors, LED case lighting and cleaning of condenser coils.

3.2 PowerStream Market Potential

PowerStream has estimated that the market potential for these refrigeration measures in its service territory is approximately 18 MW and 666 GWh of lifetime energy savings. This estimate is likely conservative as it is based on the approximately 3,000 restaurants and 1,000 grocers in the PowerStream service territory. In reality, the actual market potential for these measures will be higher as there are many other small commercial businesses with product refrigeration including (for example) florists, medical labs, and school cafeterias.

3.3 Current Program Participation and Barriers

PowerStream has observed that its small commercial customers are a market segment that is underserved by the ERII initiative within the Provincial C&I Program, particularly for refrigeration measures, based on the disproportionately low penetration of the program within this market segment. While ERII has penetrated approximately 14% of PowerStream's GS >50kW accounts, less than 1% of GS <50kW customers have participated in ERII. Of all PowerStream ERII participants, only 2% have included refrigeration measures.

[7] Ibid.

Despite the commercial availability and cost effectiveness of energy saving refrigeration measures, there are barriers preventing the small commercial customer segment from undertaking these and other conservation actions through ERII's "custom measures" track. Small commercial customers are well established as "hard to reach" customers within conservation programs. Typical barriers to their participation include lack of knowledge, time and capital resources. The DIR Program has been designed specifically to overcome these barriers.

Direct installation programs are a common means to overcome some of these barriers and increase penetration of CDM programs within this customer segment. The Small Business Lighting ("SBL") initiative (part of the OPA-Contracted Province Wide C&I Program), which provides small businesses with up to $1,500 of installed lighting, has proven extremely effective at meeting the needs of small businesses customers and gaining traction in the market place. Since first being introduced in the province in 2007, this program has successfully achieved a market penetration rate of 40% across the province and 50% within PowerStream's service territory[8].

4 Program Design

4.1 Objective

The objective of this program is to achieve electricity savings and demand reductions, which will contribute towards PowerStream's 2011-2014 CDM targets, by offering a free electricity audit and assessment, and installation of up to $2,500 of eligible product refrigeration measures to eligible owners and tenants of commercial and institutional facilities within PowerStream's service territory.

4.2 Participant Eligibility

To be eligible for the program, the participant must:

- Have a General Service (GS) Account with PowerStream. Customers with residential accounts will not be eligible.
- Have an average annual demand of less than 250 kW.
- Have commercial grade refrigeration equipment used to cool products. Customers with residential refrigeration equipment will not be eligible.
- If the facility is leased, the participant must have the authority to have the measures installed as a condition of the lease or with the consent of the owner of the facility

[8] Research into Action, Nexant and Elenchus, September 2012. *Final Report – Evaluation of the 2011 Small Business Lighting Initiative*. *Prepared for Ontario Power Authority.*

4.3 Offer to Customer

Participants in this program will receive a turn-key service which provides:

- a free electricity audit and assessment;
- a customized report and Energy Action Plan based on the electricity audit and assessment; and
- up to $2,500 of eligible refrigeration measures and services provided and installed at no charge.

The electricity audit and assessment will be based on at least the following data:

- Customer profile/firmographics (e.g. type of business, operating hours)
- Historical electricity consumption
- Walk through audit results (e.g. load inventory, square footage, age of equipment)

This data will be used to generate a customized report and Energy Action Plan that:

- Identifies key end-uses driving electricity consumption patterns in the facility;
- Recommends specific eligible refrigeration measures/services for installation and identifies associated energy and demand savings;
- Identifies additional opportunities for energy and demand savings related to other end-uses and cross promotes other CDM programs where applicable; and
- Provides a comparative benchmark of the facility's electricity use against similar businesses.

This information will be provided to participants in a comprehensive user friendly electronic report.

The specific eligible refrigeration measures that will be included in the DIR Program are:

- Anti-sweat heater controls for cooler and freezers
- Strip curtains for walk-in coolers and freezers
- Night curtains on display cases
- Cleaning cooler/freezer condenser units
- Electronically Commutated Motor upgrade

- LED display case lighting

A description of these measures is provided in Appendix A.

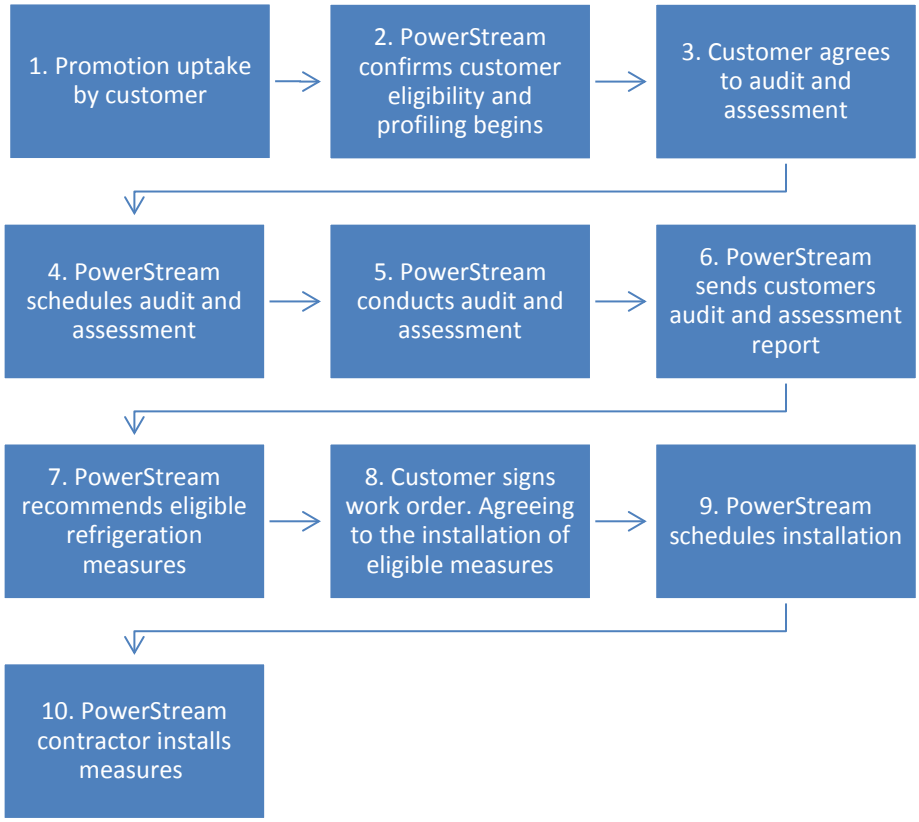
The list of eligible measures in the program may change from time to time based on factors such as: participant uptake, measure availability, cost and new technologies. For example, PowerStream is currently investigating the opportunity to include an evaporator control to the list of eligible measures. PowerStream will ensure that all eligible measures are cost-effective at the technology level. PowerStream does not foresee adding any measures to the DIR Program which are currently prescriptive measures in either ERII or SBL.

5 Program Delivery

5.1 Participation Process Flow

Figure 4 below provides a high level overview of the key steps in the program delivery process, from the participant's perspective.

Figure 4 Program participation process



The actual installation work (step 10) will be done by a qualified refrigeration mechanic licensed in Ontario, under contract with PowerStream. The entire process from steps 1 to 10 is estimated to take 3-6 weeks. After completion of the main process, a subset of participants will be visited by a third party firm, hired by PowerStream, to conduct quality assurance/quality control (QA/QC) checks as well as to collect and/or verify data for evaluation purposes. PowerStream will also follow up with all participants within 3-6 months of measure installation regarding their progress on other elements of their customized energy action plan, including: behavioural actions and participation in Provincial Programs.

5.2 Marketing and Outreach Strategy

The Marketing Strategy will focus on communicating how the DIR Program minimizes the typical barriers to small commercial customers participating in CDM programs – knowledge, time and capital resources. Based on feedback from the customer focus group, providing a full service offering to customers from information to insight to action is a significant value. Customers understand their refrigeration equipment from a functionality standpoint, but they did identify a need for more knowledge on how to be more energy efficient. As such, the comprehensive audit will be highlighted as a key value proposition of the program when marketing. In addition, the 100% funding of measures and the direct installation service will be key marketing messages.

With respect to messaging, there are two specific target groups within the eligible customer base for this program: past SBL participants; and SBL Non-Participants. Messaging to past SBL participants will leverage their positive experience with that program and focus on recognition (e.g. "as a business committed to energy efficiency, PowerStream would like to provide you with a new opportunity…"). PowerStream has had success with a similar approach in the residential ***peaksaver*** **PLUS** initiative, where this type of messaging yielded a 35% participation rate. Messaging to the SBL Non-Participants will focus on the value proposition of the program as stated above.

The following marketing tactics will be deployed for each target group: direct mail, follow up door to door community blitz, and direct calling. PowerStream has confidence that these direct marketing tactics will prove successful, based its experience in marketing the SBL initiative. According to PowerStream's on-going Conservation Awareness, Satisfaction and Attitudes (CASA) study[9], just over one-third (34%) of those qualified small business customers who are aware of the SBL initiative indicate they heard about it from a "PowerStream representative". This is followed by "word-of-mouth" (22%) and from a "contractor" (16%). This data, coupled

[9] Approximately 400 residential customers and 150 non-residential customers are surveyed by telephone monthly. The survey launched in September and October 2012 for residential and non-residential customers respectively.

with the 50 % market penetration that the SBL initiative has achieved, supports the conclusion that direct marketing is an effective method to reach this target segment.

6 Value Proposition

6.1 Benefits to Participants

The primary benefits to program participants will be:

- Up to $2,500 in free installed energy saving measures and services;
- The turn-key direct install approach minimizes the time required for the business to participate and potential disruptions to business operations;
- Reduced energy use and demand savings, which can lead to lower operating costs and increased profitability for their business;
- Increased understanding of their own facility's energy use, including how and when they use electricity and how their consumption compares to other similar facilities;
- Increased understanding of specific actions that they can take to efficiently manage their electricity use based on a personalized "Energy Action Plan"; and
- Increased understanding of their utility bill and time-of-use (TOU) rates, where applicable.

6.2 Benefits to Ontario

The net economic benefit of this program, for Ontario as a whole, is assessed by the Total Resource Cost ("TRC") test, as detailed in Section 8.4. According to the results of that test, this program will provide a benefit to Ontario of close to $10.5 million in avoided electricity costs over the life of the measures. The societal cost for the program will be $3.9 million, representing a net benefit of $6.6 million.

The program will also support the broader policy objective of creating a culture of conservation.

6.3 Benefits to PowerStream

The primary benefit of this program for PowerStream will be the achievement of 3.3 MW and 19.6 GWh in savings toward its 2011-2014 CDM Targets. Specifically, this program addresses approximately 43% of PowerStream's current projected shortfall against its energy target.

6.4 Benefits to OPA/other LDCs

The net economic benefit of this program, from the perspective of the electricity system, is assessed based on the Program Administrator Cost Test, as detailed in Section 8.4. As with the TRC test, PowerStream has determined using the PAC test that this program will provide a

benefit to the electricity system of close to $10.5 million in avoided electricity costs over the life of the measures. The delivery cost for the program, which is recovered across all ratepayers, will be $3.9 million, representing a net benefit of $6.6 million.

In consultations with the OPA on the draft design of this program, the OPA indicated that it sees an opportunity to roll this program out provincially. PowerStream would be more than happy to share the program results, lessons learned and actual program materials (such as participant agreements, checklists, templates and other items) with the OPA and/or other LDCs that are interested in building a business case for a broader rollout of this program.

7 Non-Duplication of OPA Programs

The DIR Program does not duplicate an existing OPA-Contracted Province Wide Program or Initiative. PowerStream acknowledges the provisions in the CDM Code against LDCs applying to the OEB for Board Approved Programs that duplicate Provincial Programs. PowerStream has reviewed the CDM Code and CDM Guidelines carefully and has worked closely with OPA staff since early December 2012 to ensure that it is bringing forward a program that is non-duplicative.

In accordance with the CDM Code and Guidelines, PowerStream has provided in this Application the following information to substantiate its submission that the DIR Program does not duplicate an existing provincial program:

- **OPA's duplication assessment and letter of support.** This assessment is provided in Appendix B.
- **A detailed analytical comparison of the DIR Program with the two closest comparable provincial initiatives** – as discussed above, the two closest comparable provincial initiatives are SBL and ERII. This detailed comparison is provided in Appendix C.
- **A review and discussion of the seven specific examples of duplication provided in the CDM Code and CDM Guidelines.**
- **A summary of how the DIR Program meets the expectations set out by the OEB in its CDM Guidelines** (at page 5) regarding "unique Board-Approved Programs that avoid market place confusion and ensure prudent use of rate-payer funds by avoiding duplication of resources, namely those of the OPA".

7.1 Consultation with OPA

PowerStream approached the OPA in late November 2012 to solicit feedback on the draft program design and to identify any concerns regarding potential duplication with the Provincial Programs. PowerStream consulted with OPA staff over a period of two months through a number of mechanisms:

- Three in-person meetings as well as several email and phone exchanges in December 2012 and January 2013
- OPA staff attendance at PowerStream's customer focus groups in December 2012
- Provision of draft program design documentation and projections (participation, energy and demand savings, budget, and cost effectiveness screening)

OPA staff responded positively to the draft program and indicated that they saw a potential opportunity to deliver this program province wide following a successful rollout of the program by PowerStream. With respect to program design, the only concern raised by OPA staff was the uncertainty regarding the persistence of energy savings from coil-cleaning. With respect to program delivery, OPA staff raised questions about what the optimal delivery approach might be, in terms of contractual arrangements with the refrigeration channel.

As evidenced in its letter of support (Appendix B), the OPA is fully supportive of PowerStream implementing the DIR Program as a Board Approved Program. The OPA is committed to working with LDCs to explore the option of adding the DIR Program to the Provincial Program portfolio at a later date. PowerStream is committed to working with the OPA and other LDCs in this regard by sharing the results and lessons learned from the PowerStream DIR Program.

7.2 OPA Assessment and Support Letter

On March 4, 2013, the OPA provided PowerStream with a letter summarizing its duplication assessment of the DIR Program and its support for the program. This letter is provided in Appendix B. As can be seen in the letter at Appendix B to this Application, and as discussed below, the OPA strongly supports the proposed DIR program and PowerStream's application to the OEB. With respect to the matter of duplication, the OPA indicates that it "is of the opinion, that the question of duplication with respect to the proposed program does not have a clear answer." The OPA indicates that this lack of clarity stems from a comparison of sections 2.3.3 (a) to (e) of the CDM Code with Section 4 of the CDM Guidelines. The OPA's analysis was that under the former, the proposed program could be considered duplicative, while under the CDM Guidelines the proposed program meets the examples of what can constitute a non-duplicative program – namely a market-specific consideration which requires a novel approach. PowerStream does not fully agree with the OPA's interpretation of sections 2.3.3 (a) to (e) of the CDM Code. PowerStream's understanding of, and position on, the non-duplicative nature of this program in relation to both the CDM Code and the Guidelines is provided in section 7.4, below.

Notwithstanding the OPA's position regarding the lack of clarity on duplication, the OPA strongly supports the proposed program and PowerStream's application to the OEB. Specifically, the OPA letter states that:

> *"The OPA sees potential for rolling out this program province wide. The OPA fully supports PowerStream leading the way in implementing the program and looks forward to leveraging PowerStream's results and lessons learned in order to build the business case for a provincial roll out. The proposed program complements the existing portfolio of province wide program initiatives and the OPA recommends that it be approved as a Board Approved Program."*

7.3 Comparison to Provincial Initiatives

Pursuant to Section 4 of the CDM Guidelines, PowerStream has included a detailed, analytical comparison of the proposed program with the Provincial Programs/Initiatives that most nearly provide similar activities, namely SBL and ERII. The detailed comparison is provided in Appendix C. A summary of the key differences between these programs is provided below. In addition to the comparison criteria outlined in the Guidelines (program objective, targeted customer segment, technology/measure used or implemented, marketing strategy and incentives provided), PowerStream has also included a comparison of the following program delivery elements:

- Audit/identification of energy savings opportunities
- Participation process – key steps
- Average timeline (from application to completion)
- Average project size
- Average incentive per participant

For these last three criteria, the information presented for the DIR Program is based on program design, while for the OPA initiatives the information is based on actual participation in 2011-2012.

As is the case with all CDM programs, the primary objective for each of the DIR Program, SBL and ERII is the same – to achieve energy and demand savings. The differences between the programs relate to the specific program design and delivery elements.

The SBL Initiative is the closest comparator to the proposed DIR Program. Both programs are designed specifically for the "hard to reach" small business segment within the commercial and institutional sector by providing a turn-key direct installation service. The primary difference between SBL and the DIR Program is the specific end-use that is targeted and the measures that are offered – lighting versus refrigeration. A secondary difference is that the DIR program will

also include a comprehensive electricity audit and assessment and provide customers with a personal Electricity Action Plan and a benchmark of their electricity use compared to other similar facilities. Based on customer focus group results, PowerStream believes that these additional unique features will provide significant value to the customer.

ERII, on the other hand, is geared primarily for medium to large non-residential facilities. ERII provides customers with financial rebates which cover up to 50% of the cost of energy efficient measures. The onus is on the customer to identify and manage the implementation of the retrofits on their own (including, among other matters, purchasing materials and hiring contractors). This approach can work well for medium to large commercial businesses that have knowledgeable and dedicated facilities staff. It has also worked very well for end-uses with engaged distribution and manufacturing channels, such as lighting. More than 80% of energy savings from ERII have come from lighting retrofits. Lighting manufacturers and distributors have been instrumental in the success of those programs, by using the programs as a sales tool and driving program participation. In approximately 90% of the applications to ERII, the channel has acted as the "applicant representative" and has applied to the program on behalf of the customer (with the customer's consent).

The ERII program includes a "custom" measures track where participants can apply for incentives from any measure which saves energy or demand in their facility, based on the actual achieved savings. In theory, one might suggest that the DIR Program could be seen as duplicative of the ERII custom measure track, however in practice this is not the case. As evidenced by the market penetration statistics for the program stated earlier, in the two years it has been in market, the ERII initiative has failed to meet the needs of the small commercial segment or to stimulate refrigeration efficiency measures.

7.4 Adherence to CDM Code and CDM Guidelines

Section 2.3.3 of the CDM Code indicates that

> *"CDM Programs that will be considered duplicative of OPA-Contracted Province-Wide CDM Programs include, but are not limited to, CDM Programs that have:*
>
> *(a) different customer incentive levels on products or services already offered through the OPA-Contracted Province-Wide CDM Programs;*
>
> *(b) different qualification requirements to receive customer incentives or services already offered through the OPA-Contracted Province-Wide CDM Programs;*
>
> *(c) different technology specifications for technologies already incentivized or utilized through the OPA-Contracted Province-Wide CDM Programs;*
>
> *(d) different marketing approaches for promoting customer incentives or services already offered through the OPA-Contracted Province-Wide CDM Programs; and*

(e) different budgets for delivering customer incentives or services already offered through the OPA-Contracted Province-Wide CDM Programs."

PowerStream submits that the DIR Program does not meet any of these examples of duplication. Examples (a), (b), (d) and (e) all relate to variations (incentives, qualifications, marketing or budgets) on services which are already offered through the Provincial Programs. As described in section 7.3 above, the service provided in the DIR Program is a turn-key audit, assessment and direct installation service by the program administrator. This service is not available within the existing Provincial Programs suite for refrigeration measures.

In its assessment letter, the OPA suggested that the DIR Program could be considered duplicative based on criteria (a) and (d) above, as "Incentives for the products and services offered in the proposed PowerStream program could be accessed through the ERII initiative, mainly as custom measures. PowerStream's program provides a different incentive level and marketing approach compared to ERII for the same products." PowerStream respectfully disagrees with this interpretation. The product/service being offered in ERII is a rebate, while the product/service being offered in the DIR Program is direct installation. PowerStream submits that the fact that the same technology is eligible under two different programs does not constitute duplication. Similarly, PowerStream does not consider direct installation to be simply a different "marketing approach". Marketing is the means of promoting a specific offer or product to a customer. Here, it is the products/offers that are different. For ERII, the product/offer is a partial rebate on energy efficiency upgrades. This is marketed through both mass marketing and direct marketing and sales techniques, as seen in Appendix C. For the DIR Program (as with SBL), the product/offer is a turnkey direct installation service. This is primarily marketed through direct marketing, such as direct mail, direct calling and door-to-door blitz.

Example (c) also does not apply, as the measures in the DIR Program would only be eligible under the "custom measures" track of ERII and this track by definition is not prescriptive and does not stipulate technology specifications or qualifications. The only exception is the LED display case lighting. This measure is currently available as a prescriptive measure in ERII. The technology specifications for this measure in the DIR Program will not differ from ERII.

The CDM Guidelines (at Section 4, page 4) provide two further examples indicating that

"the Board will generally consider CDM Programs that include the features listed below as duplicative of existing OPA-Contracted Province Wide CDM Programs:

- *CDM programs that combine conventional elements of two or more existing OPA programs; and/or*
- *CDM programs that extend an OPA program to a different market segment or segments (e.g. extending a residential program to the commercial sector)."*

These examples relate to combining and re-packaging existing OPA program elements or expanding a program to a different segment. Given that the service provided in the DIR Program is not currently available within any of the OPA Programs, these last two examples also do not apply to the proposed DIR program.

In addition to providing examples of what might constitute duplication, the CDM Guidelines (at Section 4, page 5) provide guidance on characteristics of non-duplicative programs as follows:

> *"Non-duplicative programs may include region-specific or market-specific considerations which would require novel approaches. These CDM programs could arise where specific industry concentration or customer type in a particular service area requires unique approaches in order for a distributor to achieve its CDM targets. Distributors should seek to develop unique Board-Approved CDM programs that avoid market-place confusion and ensure the prudent use of rate-payer funds by avoiding duplication of resources, namely those of the OPA."*

The DIR Program meets all of the elements described above, as follows:

- **Addressing market-specific considerations**. The DIR Program has been designed to address the specific needs of a market segment (small commercial customers with product refrigeration) that is currently being underserved by the Provincial Programs. Addressing this local market need is expected to contribute an additional 4% toward PowerStream's CDM targets and help it address its projected shortfall.

- **Avoiding market-place confusion**. The delivery of the DIR Program will minimize customer confusion through the use of direct marketing, the cross promotion of Provincial Programs and the use of the provincial Save on Energy branding. Cross promotion will help customers to understand all of the available CDM programs and to decide which programs they would like to pursue.

- **Ensuring prudent use of rate-payer funds**. The DIR Program is very cost effective, from both a societal and program administrator perspective, and therefore represents a prudent use of ratepayer funds. Based on 2011 Evaluation Results from the OPA, the Provincial Commercial & Institutional Program is cost effective with a TRC of 1.14[10]. Given that ERII is not currently penetrating the market segment to be targeted by DIR Program, but is still currently cost effective, there is little risk of the DIR Program

[10] **Environmental Commissioner of Ontario, 2012**. *Restoring Balance – Results. Annual Energy Conservation Report – 2011 (Volume Two).*

cannibalizing the cost effectiveness of ERII and/or duplicating the resources provided by the OPA. The DIR Program is filling a market gap, not duplicating efforts.

8 Program Projections

8.1 Participation

PowerStream projects that 1,200 facilities will participate in this program to the end of 2014. This projection is based on the assumption that there is an expeditious regulatory review process, that PowerStream receives approval from the OEB in the second quarter of 2013 and that PowerStream is in-market by mid-Summer 2013. Assuming a mid-2013 launch, PowerStream is projecting to have 360 participants in 2013 and 840 participants in 2014.

8.2 Energy and Demand Savings

The projected energy and demand savings for the program are summarized in Table 6 below. PowerStream projects achieving a total of 3.3 MW and 19.6 GWh toward its CDM Targets through this program. The lifetime energy savings from this program are projected at 146.9 GWh. A breakdown of these lifetime energy and demand savings by year is provided in Appendix D. These resource saving projections were developed based on 1200 participants, as described above, and using measure-level and program-level assumptions from a variety of sources. The specific values and sources used for each measure are provided in Appendix A.

Table 6 DIR Program projected energy and demand savings

Implementation Year	Net Annual Demand Savings (MW)		Net Annual Energy Savings (GWh)		2011-2014 Net cumulative Energy Savings (GWh)
	2013	2014	2013	2014	
2013	1.0	0.9	4.9	3.3	8.2
2014		2.4		11.4	11.4
TOTAL	1.0	**3.3**	4.9	14.7	**19.6**

All of the DIR measures are listed in the OPA's Quasi-Prescriptive Measures and Assumptions Lists (the "QP-MAL"). Prescriptive measures are an approach whereby "savings are prescribed on a per-participant or per-measure basis and represent an average level of savings that would be achieved by a participant implementing the energy efficient measure"[11]. Quasi-prescriptive measures are an approach whereby "savings are determined using a prescribed methodology that uses key, project-specific, inputs to estimate the savings for each participant or measure installed[12]." Where a prescriptive value for a given variable was available in the QP-MAL, this

[11] **Ontario Power Authority, 2011**. *EM&V Protocols and Requirements 2011-2014*. Pg. 97.
[12] Ibid.

value was used. This was the case for Effective Useful Life ("EUL")[13] and Seasonal Energy Savings Pattern. The assumed Net-to-Gross ("NTG") Adjustment factor was based on the most recent verified NTG value from the provincial Small Business Lighting Program (based on 2011 Program Evaluation)[14]. Given the similar program delivery approach and eligible customer base, PowerStream believes that this is an appropriate estimate for the NTG for the DIR Program. For annual energy savings, demand savings and incremental equipment cost, the QP-MAL requires the input of site/customer-specific values (such as co-efficient of performance of compressor, length of open display case, operating hours). This site-specific information will be collected from program participations in order that the calculations in the QP-MAL can be used to determine actual program savings. However, for the purposes of program design, an average value for each participant was used based on results from similar measures and programs in other jurisdictions, as detailed in Appendix A.

8.3 Budget

The projected program budget is summarized in Table 7 below. The estimated breakdown of the program costs, including program evaluation, is shown in Table 8 (by cost type) and **Table 9** (by expense category).

Table 7 DIR Program Budget (numbers may not add due to rounding)

Cost ($ '000s)	2012	2013	2014	Total	Marginal Cost	Allocable Cost
Fixed Program Cost	78	538	582	1,198	937	262
Variable Program Costs	-	36	84	120	120	-
Subtotal – Program Costs	**78**	**574**	**666**	**1,318**	**1,057**	**262**
Customer Incentive costs	-	839	1,959	2,798	2,798	-
Total Delivery Cost	**78**	**1,414**	**2,625**	**4,117**	**3,855**	**262**

Table 8 Breakdown of Program Costs, by CDM Code Cost Type and Driver (numbers may not add due to rounding)

Program Costs ($ '000s)	Total Cost	Marginal Cost	Allocable Cost	Cost Driver
(a) all salaries and labour costs including benefits	674	445	229	Estimated number of days per year for existing CDM staff
(b) contractor expenses	607	607	-	3rd party contracts for: program development; administration; marketing; and EM&V.
(c) billing and collection	-	-	-	Immaterial amount of time based on estimate of 1 invoice/month for 1.5 years
(d) customer care, advertising, and marketing	-	-	-	Customer care by CDM staff under (a); Marketing costs included under (b) above.

[13] The one exception is for Anti Sweat Heater Controls, where a more up to date EUL value was used.
[14] The verified NTG for the SBL Program in 2011 was 0.93. For the DIR Program design projections, this value was conservatively rounded down to 0.9.

(e) administration and general expenses	20	4	15	Hours spent by support services departments and per capita facilities/equipment costs. Cost for DIR Program estimated at 5% of total Shared Services cost for CDM Dept.
(f) IT costs	18	-	18	Hours spent and maintenance cost of software. Shared service cost is $4000 per employee per year.
(g) office equipment	-	-	-	Covered under (e) above.
(h) other	-	-	-	Estimated number of days per year for existing CDM staff
Total	**1,318**	**1,057**	**262**	

Table 9 Breakdown of Program Costs, by sub-category

Program Costs	**($ '000s)**
Program Development	104
Legal	50
Program Administration	806
Marketing	200
Evaluation, Measurement & Verification	158
Total	**1,318**

With respect to DIR program budget costs recovery, PowerStream proposes that, once the program is approved by the Board, the Independent Electricity System Operator (the "IESO") establish and administer a settlement process, which is separate from other global adjustment related financial settlement processes currently in place. The total costs recovery, including Fixed, Variable and Customer Incentive Costs, to be recovered from applicable market participants will be include in the monthly global adjustment charge. The proposed payment method as follows:

- For the payments attributed to DIR program Fixed Costs of $1,198 million, PowerStream proposes to provide a schedule to the IESO, upon OEB's funding approval. The applicable payment (s) to PowerStream will be processed for PowerStream's settlement statement for the last trading day of the month and included in its invoice, which is issued by the IESO ten business days after the end of the applicable month.

- For the payments attributed to the DIR program Variable and Customer Incentive Costs of $2,918 million, PowerStream proposes to provide the IESO the monthly payment amount within four business days following the end of each applicable month, in a manner to be determined by the IESO. The applicable payment (s) to PowerStream will be processed for PowerStream's settlement statement for the last trading day of the month and included in its invoice, which is issued by the IESO ten business days after the end of the applicable month.

8.4 Cost Benefit Analysis

In accordance with the CDM Code and Guidelines, PowerStream has undertaken a cost benefit analysis of the DIR Program using the OPA's Cost Effectiveness Tests, namely the Total Resource Cost (TRC) Test and the Program Administrator Cost (PAC) Test. In undertaking this analysis, PowerStream used the Avoided Supply Cost Assumptions Table provided in the OPA's Cost Effectiveness Guide, dated October 15, 2010, as well as the inflation rate (2%) and discount rate (4%) stipulated in the guide. All amounts are expressed in 2013 dollars.

The results of the cost benefit analysis for the DIR Program are summarized in **Table 10**. The Program passes both the TRC and the PAC tests. The results for both tests are identical for the DIR Program. This is because (a) there are no anticipated resource savings other than electricity savings (making the 'benefits' side of both tests identical); and (b) the customer incentive costs are the full incremental equipment costs (making the 'costs' side of both tests identical). At 0.04 $/kWh, forecasted Levelized Unit Energy Cost (LUEC) for the program compares favourably to the average LUEC of 0.03 $/kWh for the existing portfolio of Provincial Programs[15].

Table 10 Program cost effectiveness screening results

Cost Benefit Test	Benefits ($ '000s)	Costs ($ '000s)	Net Benefit ($ '000s)	Ratio
Total Resource Cost (TRC) Test	10,479	3,861	6,618	2.7
Program Administrator Cost (PAC) Test	10,479	3,861	6,618	2.7

Costs ($ '000s)	3,861
Lifetime Electricity Savings (NPV), kWh	110,225,633
Levelized Unit Electricity Cost, $/kWh	0.04

8.5 Sensitivity and Scenario Analysis

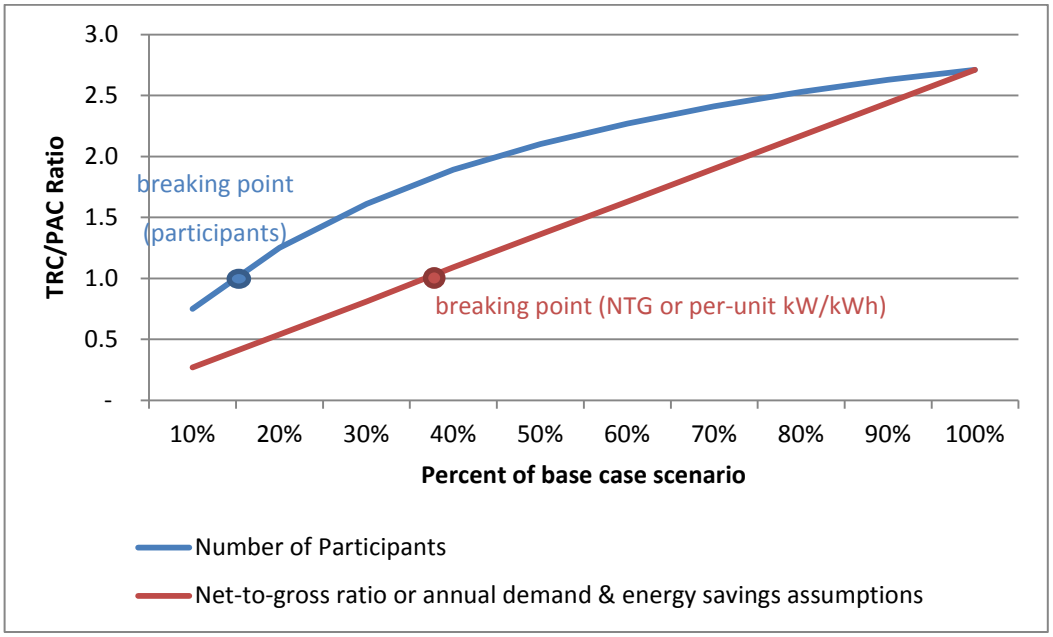
PowerStream recognizes that there are many assumptions and variables built into a CDM program forecasts and that actual program results can differ significantly from planned values. This presents a potential risk to the cost effectiveness of CDM programs. To ensure prudent use of rate-payer funds and to provide confidence to the OEB in the robustness of PowerStream's projections for the DIR Program, PowerStream undertook a battery of analyses on the baseline projections for the DIR Program, including:

- **Sensitivity analyses** on individual variables to find the breaking point at which the program would no longer be cost effective
- **Scenario analyses** that looked at the combined impact of changing multiple variables simultaneously

[15] **Ontario Power Authority, December 2012**. *2011 Conservation Results*.

The results of these analyses are shown in Figure 5, Figure 6 and Table 11 below. These results were also a major input to the risk assessment process described in the following section. With respect to sensitivity analyses, the baseline DIR Program projections have a significant amount of "buffer" to changes in any one variable before the program would no longer be cost effective. For example, participation in the program would have to drop to 85% below the baseline projection for the program to no longer be cost effective. Similarly, both the NTG factor for the program or the per-unit resource savings per participant would have to drop by more than 60% below the baseline projection for either of these factors to cause the program to no longer be cost-effective. On the cost side, the program could sustain a more than 300% increase in the cost of the energy saving devices and still be cost-effective.

Figure 5 Sensitivity analyses on participants, net-to-gross ratio, and annual demand & energy savings assumptions



Two scenarios (numbers 6 and 7, in Table 11) were examined where multiple variables changed simultaneously. In both of these scenarios the program remains cost effective. These scenarios were developed conservatively, by estimating negative variances across all variables.

Figure 6 Sensitivity analysis on incremental equipment cost

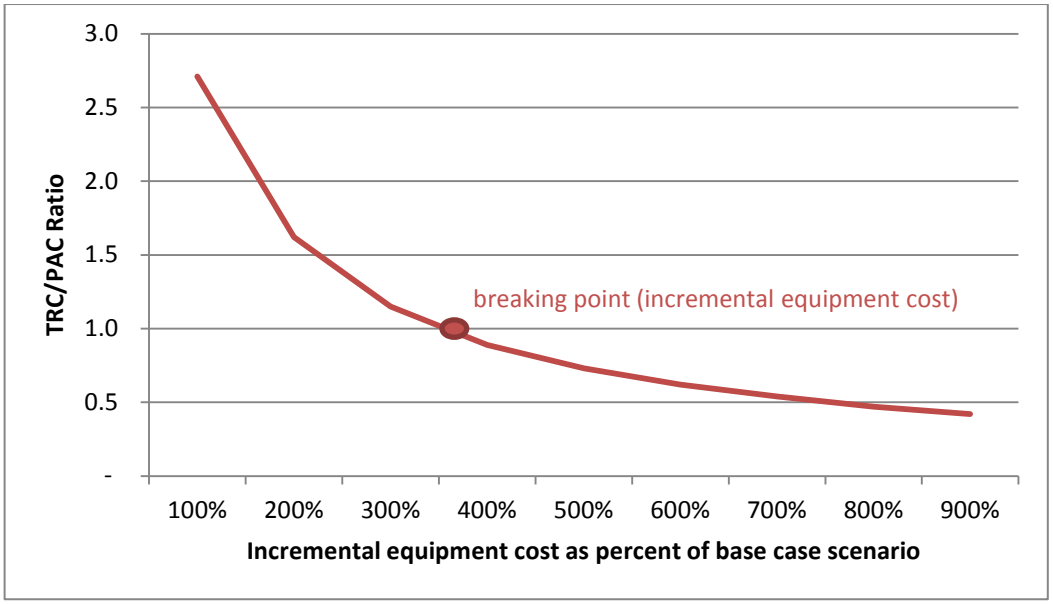


Table 11 Scenario analysis

	Description	2014 Net Peak Demand Savings (MW)	2013-2014 Net Cumulative Energy Savings (GWh)	Cost Effectiveness (TRC & PAC)		Levelized Unit Energy Cost ($/kWh)
				Net Benefit ($ millions)	Ratio	
1	Base case - 1200 participants and measure-level and program-level assumptions as per Appendix A	3.3	19.6	6.6	2.7	0.04
2	Under participation - only 40% of projected participants	1.3	7.8	2.0	1.9	0.05
3	No uptake on anti-sweat heater control	1.0	12.1	0.8	1.2	0.06
4	Increase incremental costs - 200% over budget on incremental cost	3.3	19.6	4.0	1.6	0.06
5	Program evaluation impact - 50% net-to-gross ratio	1.8	11.0	2.0	1.5	0.06
6	10% less participation, 10% less demand and energy savings per unit, and 10% less net-to-gross ratio	2.4	14.3	4.1	2.1	0.04
7	30% less participation, 30% less demand and energy savings per unit, and 30% less net-to-gross ratio	1.1	6.7	0.6	1.2	0.08

9 Risk Assessment and Mitigation

PowerStream undertakes risk assessment and mitigation planning as part of its regular business practices, including CDM. PowerStream undertakes an annual risk assessment of its CDM activities, both at a strategic and operational level. As part of the planning process for the DIR Program, PowerStream identified potential risk factors that could affect the success of the DIR program (Table 12). These factors were assessed on likelihood and possible impact of occurrence. Mitigation strategies have been identified for risks that have at least a medium likelihood and impact.

Table 12 DIR Program Risk Assessment and Mitigation

Risk Factor	Likeli-hood	Impact	Mitigation strategy (where applicable)
Low participation leads to minimal savings and/or negative cost effectiveness	L	H	The likelihood of these risks is estimated to be very low and as such no explicit mitigation strategy is required. As seen in Section 9, there is significant buffer in the participation projections and per-unit resource savings, such that either variable could drop by more than 60% without compromising the cost effectiveness of the program.
Verified measure/program level input assumptions (kWh, kW, NTG etc.) are significantly lower than forecasted, leading to minimal savings and/or negative cost effectiveness	L	H	
Program launches later than planned and there is insufficient time before end of 2014 to generate significant savings and/or ensure program is cost effective	L	H	
Program uptake is significantly above forecast and approved variable program funding is exhausted prior to end of 2014; if additional variable funding is not provided the program would need to be taken out of market, potentially leading to missed CDM opportunities and customer service issues.	M	H	PowerStream will closely monitor and track program uptake through it regular, comprehensive monitoring and reporting processes as described in Section 10. Should PowerStream foresee that program uptake will be sufficiently above forecast as to exceed the program budget, it will request approval from the Board to expand the variable funding budget, while remaining within the existing fixed budget.
Technology failure/issue with one of more installed measures	L/M	M/H	PowerStream will mitigate these risks through contractual provisions with the third parties providing and installing the energy saving measures. These provisions may include warranties, adherence to current codes and standards, insurance and liability.
Damage to participants' equipment or facilities during measures installation	L	M	
Cost of eligible measures increases significantly	L	L	PowerStream will track the actual costs of eligible measures, however this risk is estimated to be low based on the sensitivity analysis. The estimated costs were also developed with input from the refrigeration channel.
Inability to execute human resource plan for program delivery within given budget and/or timeline	M	H	To facilitate a quick program launch after approval from the OEB, PowerStream will continue working on the detailed implementation plan for the program in parallel OEB review and approval process. This will include developing job descriptions for incremental internal staff and scope of work for external contractors. PowerStream will also be engaging in discussions with potential third party vendors to assess their interest and ability to quickly ramp up once OEB approval is secured.
OPA rolls out similar program province wide prior to end of 2014, leading to potential confusion among PowerStream customers and/or negative impacts on local delivery channel	L	M	PowerStream will continue to work closely with the OPA – both directly, and through the four OPA-LDC Working Groups – to ensure that there is effective coordination of efforts in the delivery of all CDM programs.

10 Monitoring, Tracking and Reporting

PowerStream has adopted a comprehensive approach for monitoring, tracking and reporting progress in the delivery of the Provincial CDM Programs. These same processes, which will also be adopted for the DIR Program, include:

- Weekly monitoring of program activities, issues and accomplishments
- Monthly departmental review of program results to date against monthly forecasts. Key metrics which are tracked and reviewed include: expenditures, energy savings, demand savings, participation numbers, customer awareness and customer satisfaction.
- Quarterly progress reporting to senior Executive Management Team and Board of Directors
- Semi-annual update of program forecasts for 2011-2014 period – in August/September (after release of previous year's EMV results from OPA); and December.
- Periodic process reviews and debrief sessions to identify and capture 'lessons learned'

PowerStream will ensure that it follows all Accounting Treatment requirements for the delivery of the DIR Program as set out in section 5 of the CDM Code.

11 Evaluation Plan

Pursuant to section 3.1.4(a) of the CDM Code and section 10 of the CDM Guidelines, an Evaluation Plan for the DIR Program has been prepared and included in this Application as Appendix E. The Plan was developed in accordance with the OPA's Evaluation, Measurement and Verification ("EM&V") Protocols. The Plan was prepared by IndEco Strategic Consulting Inc. - a company on the OPA's EM&V Vendor of Record list.

Appendix A – Program Measures

Anti-Sweat Heater Controls

Condensation occurs in a refrigerated display case, when the cold air from the case meets warm/humid air (usually from a store's interior). This condensation can cause ice build-up on door gaskets and to fogging and "sweating" of the doors. This can lead to damaged equipment and also obstruct customer views of the products being displayed.

Photo credit: http://www.alohaenergygroup.com/products/anti-sweat-heater-controls

To avoid this condensation, anti-sweat heaters are used to heat the doors and frames of the refrigerated display cases. These heaters tend to operate on a continuous basis every day of the year.

Photo credit: http://www.ebay.com/itm/GREENWIZE-MT-ANTI-SWEAT-HEATER-CONTROL-COOLER-MEDIUM-TEMP-APPLICATIONS-W-CABLE-/310376980131

To ensure that the anti-sweat heaters are used only when needed, specific controls can be used. Anti-sweat heater controls work one of two ways: 1) Dew point sensor (in a specific area) or 2) moisture sensor (in the air). As such, the controls are pre-programmed to heat the doors and frames only when they detect that dew point or moisture. Generally, the heater is operates through a cycling process, on and off for a specific amount of time (e.g. 10 seconds on 30 seconds off). This saves money and energy in two ways – by reducing the amount of time the anti-sweat heater runs, and by reducing the amount of time that refrigeration system has to run in order to compensate for the heat generated by the anti-sweat heater.

Strip Curtains for Walk-in Coolers and Freezers

Strip curtains are plastic strips installed across the doors of walk-in fridges and freezes to help keep the cold air in the unit. The curtains are inexpensive and easy-to-install. The curtains save energy and money by keeping cool air inside the cooler and freezer and reducing the run time of the equipment.

Photo credit: http://applianceonsale.com/m-series-strip-curtain-for-walk-in-coolers-and-freezers-fits-openings-up-to-66-w-x-80-h

Night Curtains

Similar to strip curtains, night curtains or covers save energy by acting as a thermal barrier and keeping cool air open refrigerated cases when the store is not in operation. The night curtains are installed on the outside of the case and are drawn down – like shades on a window – when the store is closed. In addition to energy savings, night curtains can also help extend the shelf life and appearance of perishable food products, by reducing the product's exposure to light and ambient heat.

Photo credit: http://www.econofrost.com/moreonnightcovers.php

Cleaning Condenser Coils

The efficiency of evaporator coils is negatively impacted by the build-up of dirt and ice because the rate of heat transfer reduces and the refrigeration system needs to use more energy to maintain the same temperature. Coil cleaning can improve the overall efficiency of the system.

ECM Fan Motor Upgrade

Commercial walk-in refrigerators and freezers are kept cool by evaporator units which include a small fan that continuously move air across an evaporator coil. These fans are typically driven by a low efficiency electric motor. Replacing the evaporator fan motor with an electronically commutated motor (ECM) increases the efficiency of the system and save energy.

Photo credit: http://www.grainger.com/images/products/250x250/5ULD0_AS01.JPG

Photo credit: http://www.grainger.com/images/products/250x250/5ULD0_AS01.JPG

LED case lighting upgrade

Light-emitting diodes (LEDs) lighting are an energy efficient alternative to traditional fluorescent lamps used in refrigerated-display-case lighting. LEDs provide very good directional/task lighting and work well in cold temperatures. LED case lighting saves energy in two ways. First, LEDs reduce the energy required for lighting the refrigeration case. Second, since the LED lights generate less heat than fluorescent lights, they reduce the amount of energy needed by the refrigeration system to keep the unit cool.

Measure-Level Input Assumptions

Annual demand savings	Gross demand savings, kW	Source
Anti-sweat heater control - Cooler	0.510	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Anti-sweat heater control - Freezer	0.510	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Strip curtains - Walk-in Cooler	0.434	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Strip curtains - Walk-in Freezer	0.573	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Night curtains on cases	0.000	**BC Hydro 2012.** *BC Hydro Product Incentive Program Calculator*
Clean condenser coils - Cooler	0.050	**Clean Air Foundation, 2006**. *Ontario Convenience Store Association Report for Conservation Bureau*
Clean condenser coils - Freezer	0.180	**Clean Air Foundation, 2006.** *Ontario Convenience Store Association Report for Conservation Bureau*
ECM Fan Motor Upgrade	0.091	**Fisher Nickel, 2006.** *Evaporator Fan Motor Energy Monitoring Report for Pacific Gas & Electric*
LED Case Lighting	0.038	**Lighting Solutions, 2012.** *On-site Evaluation of Convenience Store Refrigeration Retrofits*
Annual demand savings	Gross energy savings, kWh	Source
Anti-sweat heater control - Cooler	1250	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Anti-sweat heater control - Freezer	1250	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Strip curtains - Walk-in Cooler	486	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Strip curtains - Walk-in Freezer	642	**Greensaver, 2007.** *Direct Install Small Business Pilot Interim Report for Ontario Power Authority*
Night curtains on cases	888	**BC Hydro 2012.** *BC Hydro Product Incentive Program Calculator*
Clean condenser coils - Cooler	438	**Clean Air Foundation, 2006**. *Ontario Convenience Store Association Report for Conservation Bureau*
Clean condenser coils - Freezer	1576	**Clean Air Foundation, 2006.** *Ontario Convenience Store Association Report for Conservation Bureau*
ECM Fan Motor Upgrade	1202	**Fisher Nickel, 2006.** *Evaporator Fan Motor Energy Monitoring Report for Pacific Gas & Electric*
LED Case Lighting	367	**Lighting Solutions, 2012.** *On-site Evaluation of Convenience Store Refrigeration Retrofits*

Effective Useful Life	Year(s)	Source
Anti-sweat heater control - Cooler	12	**Bonneville Power Administration, 2012.** *BPA EnergySmart Equipment Terms and Conditions*
Anti-sweat heater control - Freezer	12	**Bonneville Power Administration, 2012.** *BPA EnergySmart Equipment Terms and Conditions*
Strip curtains - Walk-in Cooler	5	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Strip curtains - Walk-in Freezer	5	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Night curtains on cases	5	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Clean condenser coils - Cooler	1	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Clean condenser coils - Freezer	1	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
ECM Fan Motor Upgrade	15	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
LED Case Lighting	15	**Lighting Solutions, 2012.** *On-site Evaluation of Convenience Store Refrigeration Retrofits*
Incremental Equipment Cost	CAD $	Source
Anti-sweat heater control - Cooler	100.00	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Anti-sweat heater control - Freezer	100.00	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Strip curtains - Walk-in Cooler	182.50	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Strip curtains - Walk-in Freezer	182.50	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Night curtains on cases	50.00	**Ontario Power Authority, 2010.** *OPA's Measures and Assumptions List*
Clean condenser coils - Cooler	30.00	**Clean Air Foundation, 2006**. *Ontario Convenience Store Association Report for Conservation Bureau*
Clean condenser coils - Freezer	30.00	**Clean Air Foundation, 2006**. *Ontario Convenience Store Association Report for Conservation Bureau*
ECM Fan Motor Upgrade	200.00	**Fisher Nickel, 2006.** *Evaporator Fan Motor Energy Monitoring Report for Pacific Gas & Electric*
LED Case Lighting	200.00	**Lighting Solutions, 2012.** *On-site Evaluation of Convenience Store Refrigeration Retrofits*

Measures	Seasonal Energy Use Pattern							
	Winter			Summer			Shoulder	
	Winter Peak (602hrs)	Winter Mid-Peak (688hrs)	Winter Off Peak (1614hrs)	Summer Peak (522hrs)	Summer Mid-Peak (783hrs)	Summer Off Peak (1623hrs)	Shoulder Mid-Peak (1305hrs)	Shoulder Off Peak (1623hrs)
Anti-sweat heater control - Cooler	6.55%	7.34%	18.79%	5.43%	8.83%	19.86%	13.68%	19.53%
Anti-sweat heater control - Freezer	6.55%	7.34%	18.79%	5.43%	8.83%	19.86%	13.68%	19.53%
Strip curtains - Walk-in Cooler	10.16%	11.39%	12.22%	8.43%	13.70%	11.23%	21.24%	11.63%
Strip curtains - Walk-in Freezer	10.16%	11.39%	12.22%	8.43%	13.70%	11.23%	21.24%	11.63%
Night curtains on cases	0.00%	0.00%	26.98%	0.00%	0.00%	41.45%	0.00%	31.57%
Clean condenser coils - Cooler	6.94%	7.42%	13.22%	8.83%	12.33%	19.87%	16.10%	15.30%
Clean condenser coils - Freezer	6.94%	7.42%	13.22%	8.83%	12.33%	19.87%	16.10%	15.30%
ECM Fan Motor Upgrade	6.84%	7.88%	18.44%	6.17%	8.89%	18.37%	14.72%	18.71%
LED Case Lighting	10.53%	13.77%	8.79%	12.69%	12.03%	9.01%	24.09%	9.09%

Appendix B - OPA Assessment and Support Letter (4 Pages)

ONTARIO POWER AUTHORITY

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March 4, 2013

Via Mail and Email:

Milan Bolkovic
PowerStream
161 Cityview Blvd.
Vaughan, ON, L4H 0A9

Dear Mr. Bolkovic:

On behalf of the OPA, I would like to thank you and your conservation staff for your effort and commitment as we have worked together to implement the suite of OPA-Contracted Province-Wide CDM programs ("Province-Wide Programs"). The collaboration between LDCs, including PowerStream, and the OPA has been a critical factor in achieving savings with an average cost of 3¢/kWh. The strength of our partnership is an important factor in setting us on the path to exceed the energy saving targets mandated by the OEB.

In your letter dated January 31, 2013, you requested that the OPA provide an analysis of whether the proposed Board-Approved CDM program ("Board-Approved Program") is duplicative of Province-Wide Programs. This letter provides that analysis. This letter includes a description of PowerStream's proposed Board-Approved Program, a summary of relevant Province-Wide Programs, and an analysis of potential duplication.

Proposed PowerStream Board-Approved Program

PowerStream has applied to the Ontario Energy Board ("the Board") for approval of a small commercial refrigeration direct installation program. This program would target opportunities in commercial facilities with product refrigeration, such as grocers, convenience stores and restaurants. These small businesses are electricity-intensive, and refrigeration typically accounts for approximately two-thirds of their total consumption. The goal of the program is to reduce refrigeration load in freezers and coolers. The proposed products and services are direct installation of controls and curtains, LED lights in display cases, cleaning of condenser coils, and ECM fan motors. The incentive offered to the customer is 100% coverage of the cost of the audit and installation of measures, plus 100% coverage of the cost of the measures up to a cap of $2,500. Customers would have non-residential, general service accounts with an average demand of less than 250 kW.

OPA-Contracted Province-Wide CDM Programs

The Province-Wide portfolio includes four programs: residential, commercial & institutional, industrial and low-income. Each of these programs includes a number of initiatives. The program most relevant to PowerStream's application is the commercial & institutional ("C&I") program.

The C&I program includes nine initiatives, four of which are relevant to the customers targeted by PowerStream:

- Small Business Lighting provides free installation of up to $1,500 in lighting-related conservation measures for general-service customers with an average demand of <50kW.

- Equipment Replacement Incentive Initiative (ERII) provides incentives for prescriptive, engineered and custom program measures. Incentives are calculated for each measure on the prescriptive or engineered lists. Incentives for custom measures are based on the electricity and/or demand savings. In no case can the incentive exceed 50% of the total project costs. Customers are responsible for installation and, in the case of custom projects, M&V plans.

- Existing Building Commissioning provides incentives for chilled water systems older than 3 years old that cool areas more than 50,000 ft^2, have not been refurbished or retrofitted within the last 3 years, and are not scheduled for replacement within the next two years. The project requires a certified Commissioning Agent and customers must be GS > 50 kW.

- Audit Funding provides funding for an audit and analysis of a building's energy consumption. The incentive amount is calculated on a per square foot basis, or a maximum of 50% of the total costs.

Analysis

The Board's Conservation and Demand Management Code for Electricity Distributors ("CDM Code") states in section 2.3.3 that a Board-Approved Program will not be approved if it duplicates a Province-wide program. Duplication is further defined in sub-sections (a) through (e). The Board's provides additional direction in section 4 of the Guidelines for Electricity Distributor Conservation and Demand Management ("Conservation Guidelines").

The OPA is of the opinion that the question of duplication with respect to the proposed program does not have a clear answer.

Incentives for the products and services offered in the proposed PowerStream program could be accessed through the ERII initiative, mainly as custom measures. PowerStream's program provides a different incentive level and marketing approach compared to ERII for the same products. Based on section 2.3.3 (a) and (d) of the CDM Code, this could be considered a duplication.

However, according to section 4 of the Conservation Guidelines, non-duplicative programs may include market-specific considerations which would require novel approaches. According to

PowerStream its small commercial customers are under-represented in the ERII program, particularly for refrigeration measures. While ERII has penetrated approximately 14% of PowerStream's General Service (GS) >50kW accounts, less than 1% of GS <50kW customers have participated in ERII. Of all PowerStream ERII participants, only 2% have included refrigeration measures. The low participation of small commercial customers in ERII may be a result of barriers including lack of time, expertise and capital for energy efficiency upgrades. A full service direct install approach is one approach for overcoming such barriers.

The OPA sees potential for rolling out this program province wide. The OPA fully supports PowerStream leading the way in implementing this program and looks forward to leveraging

PowerStream's results and lessons learned in order to build the business case for a provincial roll out. The proposed program complements the existing portfolio of province wide program initiatives and the OPA recommends that it be approved as a Board approved program. In the meantime, the OPA intends to work with LDCs to include this program idea into the Province-Wide portfolio of programs.

The OPA is supportive of innovative conservation and demand management (CDM) initiatives that contribute to meeting targets and foster a culture of conservation in Ontario. PowerStream is to be commended for seeking to identify new opportunities to advance conservation in Ontario. Such efforts will increase Ontario's overall CDM results and provide opportunities for learning that will inform the development of future programs for Ontario.

Yours Truly,

Andrew Pride
VP, Conservation

Cc: Julia McNally, Director, Market Transformation, Ontario Power Authority
Raegan Bond, Vice President, Conservation & Demand Management, PowerStream

Appendix C – Comparison with OPA-Contracted Province Wide Program Initiatives

	Direct Install Refrigeration Program (DIR)	Small Business Lighting Initiative (SBL)	Electricity Retrofit Incentive Initiative (ERII)
PROGRAM DESIGN			
Program objective	• Achieve electricity savings and peak demand reductions • Increase customers' understanding of their electricity use, how it compares to other similar facilities and how they can efficiently manage it	Achieve electricity savings and peak demand reductions	Achieve electricity savings and peak demand reductions
Targeted customer segment(s)	Commercial & Institutional	Commercial & Institutional	• Commercial & Institutional • Industrial
Targeted sub-segment	Small commercial and institutional facilities	Small commercial and institutional facilities	none
Targeted electricity end-use	Refrigeration	Lighting	none
Eligible participants	General Service (GS) Customers <250 kW average demand with commercial refrigeration	General Service Customers<50kW average demand	All General Service Customers
Technology/ measures used or implemented	• Anti-sweat heater controls • Strip curtains • Night curtains on cases • Cleaning condenser coils • Electrically Commutated Motor (ECM) • LED display case lighting	• 64 prescriptive lighting measures • 6 prescriptive water heating measures	• 193 prescriptive lighting, space cooling, ventilation, and other measures, including one prescriptive measure for refrigeration (LED display case lighting) • 7 engineered measures worksheets

Incentives provided/ Offer to customer	• Free electricity audit and assessment • Up to $2,500 of free eligible refrigeration measures installed	Up to $1,500 of free lighting products installed (note: in December 2012, the program offer was increased from $1,000 to $1,500).	Incentives available to customers differ according to the project 'track' (prescriptive, engineered or custom) as well as by the type of measure (lighting versus non-lighting), as follows: • **Prescriptive Projects (lighting and non-lighting)** – flat $ per unit installed (see appendix) • **Engineered & Custom Projects – lighting**: The greater of either $400/kW of demand savings or $0.05/kWh of first year electricity savings, up to 50% of the total cost of the project. • **Engineered & Custom Projects – non-lighting**: The greater of either $800/kW or $0.10/kWh of first year electricity savings, up to 50% of the total cost of the project
PROGRAM DELIVERY			
Marketing Strategy	Potential direct marketing tactics include direct mail; follow up door to door community blitz; and direct calling	• Mass Marketing (OPA & PowerStream) • PowerStream Direct Marketing: Door to Door; Direct calling; and Direct Mail (planned for 2013)	• Mass Marketing (OPA & PowerStream) • PowerStream Direct Mail • PowerStream in-house sales team • Trade allies/channel partners
Audit/ identification of energy savings opportunities (How? By whom?)	• The electricity audit and assessment includes the following: • Customer profile (type of business and behaviours); • Historical consumption analysis & self-benchmarking (kWh/ft2/yr); • Walk through audit (load inventory, square footage, operational details etc.); • Comprehensive user friendly report (electronic) with recommendations to direct install phase of the DIR and cross marketing all other province wide programs	Free walk-through lighting assessment (equipment inventory) provided to participant by a PowerStream representative.	ERII does not include an audit – energy savings opportunities are typically identified by customers themselves or by channel partners promoting a specific technology such as lighting manufacturers/distributors. The Commercial and Institutional Program includes a separate Energy Audit Initiative wherein participants can apply for an incentive to cover up to 50% of the cost of an energy audit. The auditor is selected and hired by the customer. The audit is generally equipment

			specific and does not include an analysis of the customer's historical electricity consumption.
Participation process – key steps	1. Promotion uptake by customer 2. PowerStream confirms customer eligibility and profiling begins 3. Customer agrees to audit and assessment 4. PowerStream schedules Audit and assessment 5. PowerStream conducts audit and assessment 6. PowerStream sends customers audit and assessment report 7. PowerStream recommends eligible refrigeration measures 8. Customer signs work order. Agreeing to the installation of eligible measures 9. PowerStream schedules installation 10. PowerStream contractor installs measures	1. Promotion uptake by customer 2. LDC confirms customer eligibility 3. Customer agrees to assessment 4. PowerStream schedules Assessment 5. LDC conducts assessment 6. LDC recommends eligible measures 7. Customer signs work order. Agreeing to the installation of eligible measures 8. LDC schedules installation 9. LDC installs measures	1. Customer develops and submits application in iCon (online application system) 2. LDC/OPA review and Pre-approve project 3. Customer prepares M&V plan and submits to LDC for approval (Custom track only) 4. Customer undertakes retrofit work themselves or hires a contractor 5. Customer notifies LDC of project completion 6. LDC/OPA Review and final approvals 7. LDC issues incentive payment to customer
Average timeline (from application to completion)	Approximately 3-6 weeks	Approximately 3-6 weeks	Average timeline across all tracks (custom, prescriptive and engineered) is about 6 months
Average project size	Program design estimate: • 2.8 kW net demand savings per participant • 12,823 kWh net first year energy savings per participant	Average actual project size in 2011-12: • 1.1 kW net demand savings • 4,713 kWh net first year energy savings	Average actual project size in 2011-12: • 8.5 kW net demand savings • 54,726 kWh net first year energy savings
Average incentive per participant	Program design estimate: $2,094	Average actual in 2011-12: $877	Average actual incentive in 2011-12: $9,273

Appendix D – Projected energy and demand savings by year

Implementation Year	Lifetime Demand Savings, MW															
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
2013	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.1	0.1	0.1	-
2014		2.4	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.3	0.3	0.3
Total	1.0	3.3	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.1	0.4	0.4	0.3

Implementation Year	Lifetime Energy Savings, GWh																
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
2013	4.9	3.3	3.3	3.3	3.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	1.4	1.4	1.4	-	44.1
2014		11.4	7.7	7.7	7.7	7.7	7.3	7.3	7.3	7.3	7.3	7.3	7.3	3.3	3.3	3.3	102.8
Total	4.9	14.7	11.0	11.0	11.0	10.8	10.4	10.4	10.4	10.4	10.4	10.4	8.7	4.7	4.7	3.3	**146.9**

Appendix E – Evaluation Plan (39 Pages)

INDECO
Strategic Solutions for a Changing World™

Direct Install Refrigeration Program EM&V plan

Direct Install Refrigeration Program

Evaluation, Monitoring & Verification Plan

This document was prepared for PowerStream Inc. by IndEco Strategic Consulting Inc.

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IndEco report B3852

4 March 2013

Contents

Introduction

The Direct Install Refrigeration Program Evaluation, Monitoring and Verification (EM&V) Plan was developed to accompany PowerStream Inc. (PowerStream)'s conservation and demand management program application to the Ontario Energy Board.

It is designed in compliance with the Ontario Power Authority (OPA)'s 2011-2014 EM&V Protocols and Requirements.

Market opportunity

Market size and savings potential

Grocery stores and restaurant typically use approximately three times the amount of electricity per square foot of retail space compared to offices and other retail businesses. Refrigeration represents the largest single end-use of electricity in these facilities – 50% for restaurants and 72% for grocers.

There are approximately 3,000 restaurants and 1,000 grocers in the PowerStream service territory. In addition, there are many other small commercial businesses with product refrigeration, including florists, medical laboratories, and school cafeterias. PowerStream has estimated that the market potential for the Direct Install Refrigeration program measures in the PowerStream service territory is approximately 18 MW, and 666 GWh of lifetime energy savings.

Section 3 of PowerStream's *Application for Board-Approved Conservation and Demand Management Program: Direct Install Refrigeration Program* provides additional information on the market size and savings potential of the Direct Install Refrigeration program.

Barriers and hurdles addressed

The market hurdles and market barriers addressed by the Direct Install Refrigeration Program are illustrated in Table 1.

Table 1 Barriers and hurdles addressed by the Direct Install Refrigeration Program

Segment	Obstacle	Description	Opportunity
Customer	Market hurdle	Limited awareness of the energy use and electricity costs of refrigeration equipment	Audit and assessment report will highlight the energy use and electricity costs of refrigeration equipment
Customer	Market hurdle	Limited knowledge of opportunities to reduce energy used for refrigeration	Audit and assessment report will identify opportunities to reduce energy used for refrigeration
Customer	Market hurdle	Limited time / human resources to invest in pursuing opportunities to reduce energy use	Direct install phase of program minimizes time / human resource requirements for businesses
Customer	Market hurdle	Limited access to capital to upgrade refrigeration equipment	Direct install phase of program does not require any financial investment from businesses
Customer	Market hurdle	Limited confidence that refrigeration equipment upgrades will yield a return-on-investment	Direct install phase of program eliminates financial risk for businesses, as no financial investment is required

Program description

Overview

The Direct Install Refrigeration (DIR) program targets 'hard to reach' small business segment within the commercial and institutional sector that have commercial grade refrigeration equipment used to cool products. Participants in the DIR program will receive a turn-key service that includes:

- a free electricity audit and assessment;
- a customized report and Energy Action Plan based on the electricity audit and assessment; and
- up to $2,500 of eligible refrigeration measures and services provided and installed at no charge.

The specific eligible refrigeration measures that will be included in the DIR Program are:

- Anti-sweat heater controls for cooler and freezers
- Strip curtains for walk-in coolers and freezers
- Night curtains on display cases
- Cleaning cooler/freezer condenser units
- Electronically Commutated Motor upgrade
- LED display case lighting.

Goals and objectives

The overall goal of the Direct Install Refrigeration program is to achieve electricity savings and demand reductions that will contribute towards PowerStream's 2011-2014 CDM targets. Specific objectives include:

- To achieve electricity savings and peak demand reductions;
- To increase awareness of energy efficiency measures and programs; and
- To stimulate changes in behaviour, technology and market conditions that favour energy efficiency.

Eligibility

In order to be eligible for the DIR program, customers must:

- Have a General Service (GS) Account with PowerStream. Customers with residential accounts will not be eligible.
- Have an average annual demand of less than 250 kW.

  Have commercial grade refrigeration equipment used to cool products (e.g. food to flowers). Customers with residential refrigeration equipment will not be eligible.

- If the facility is leased, the participant must have the authority to have the measures installed as a condition of the lease or with the consent of the owner of the facility.

Program elements

Table 2 describes the elements of the program that will, together, drive participation and energy and demand savings in eligible commercial and institutional customers. The participation process flow is provided in section 5.1 of PowerStream's *Application for Board-Approved Conservation and Demand Management Program: Direct Install Refrigeration Program*.

Table 2 Description of elements

Element	Description
Direct marketing	PowerStream will use direct marketing methods such as direct mail; follow up door to door community blitz; and direct calling to promote participation in the program.
Audit and assessment	Customers will receive a free electricity audit and assessment based on at least the following data: • Customer profile/firmographics (e.g. type of business, operating hours) • Historical electricity consumption • Walk through audit results (e.g. load inventory, square footage, age of equipment) Once the customer agrees to the audit and assessment, PowerStream will schedule and conduct the audit and assessment.
Electronic assessment report and work order	PowerStream will send customers a customized, user friendly (electronic) report and Energy Action Plan that: • Identifies key end-uses driving electricity consumption patterns in the facility; • Recommends specific eligible refrigeration measures/services for installation and identify associated energy and demand savings; • Identifies additional opportunities for energy and demand savings related to other end-uses and cross promotes other CDM programs where applicable; and • Provides a comparative benchmark of the facility's electricity use against similar businesses. PowerStream will also send customers a work order for up to $2,500 in eligible refrigeration measures.

Element	Description
Follow-up and installation scheduling	PowerStream will follow up with customers to encourage them to sign the work order. Once customers have signed the work order agreeing to the installation of measures, PowerStream will schedule the installation.
Measure installation	PowerStream will arrange for the installation of eligible refrigeration measures of up to $2,500 by a qualified refrigeration mechanic licensed in Ontario. Eligible measures are as follows: • Anti-sweat heater controls for cooler or freezers • Night curtains on display cases • Cleaning cooler/freezer condenser coils • Energy efficient evaporator fan motors (ECM motor upgrade) • LED display case lighting • Strip curtains for walk-in coolers and freezers.
Quality assurance visit	PowerStream will conduct quality assurance visits of a representative sample of participating facilities. Visits will collect information for EM&V. Visits will also reinforce participants' confidence in the program
Customer satisfaction survey	PowerStream will deliver surveys to a representative sample of program participants (both customers who proceeded to the direct install phase of the program, and those who did not). Surveys will collect information for EM&V. Surveys will also reinforce participants' confidence in the program.

Program timing

The initiative will be launched June 1, 2013 and will run until December 31, 2014.

Estimated participation

Table 3 presents the projected number of participants in each year that receive an audit and who complete the Direct Install phase of the program (full participants), as well as those that receive an audit and do not proceed to the Direct Install phase (partial participants).

Table 3 Estimated participation

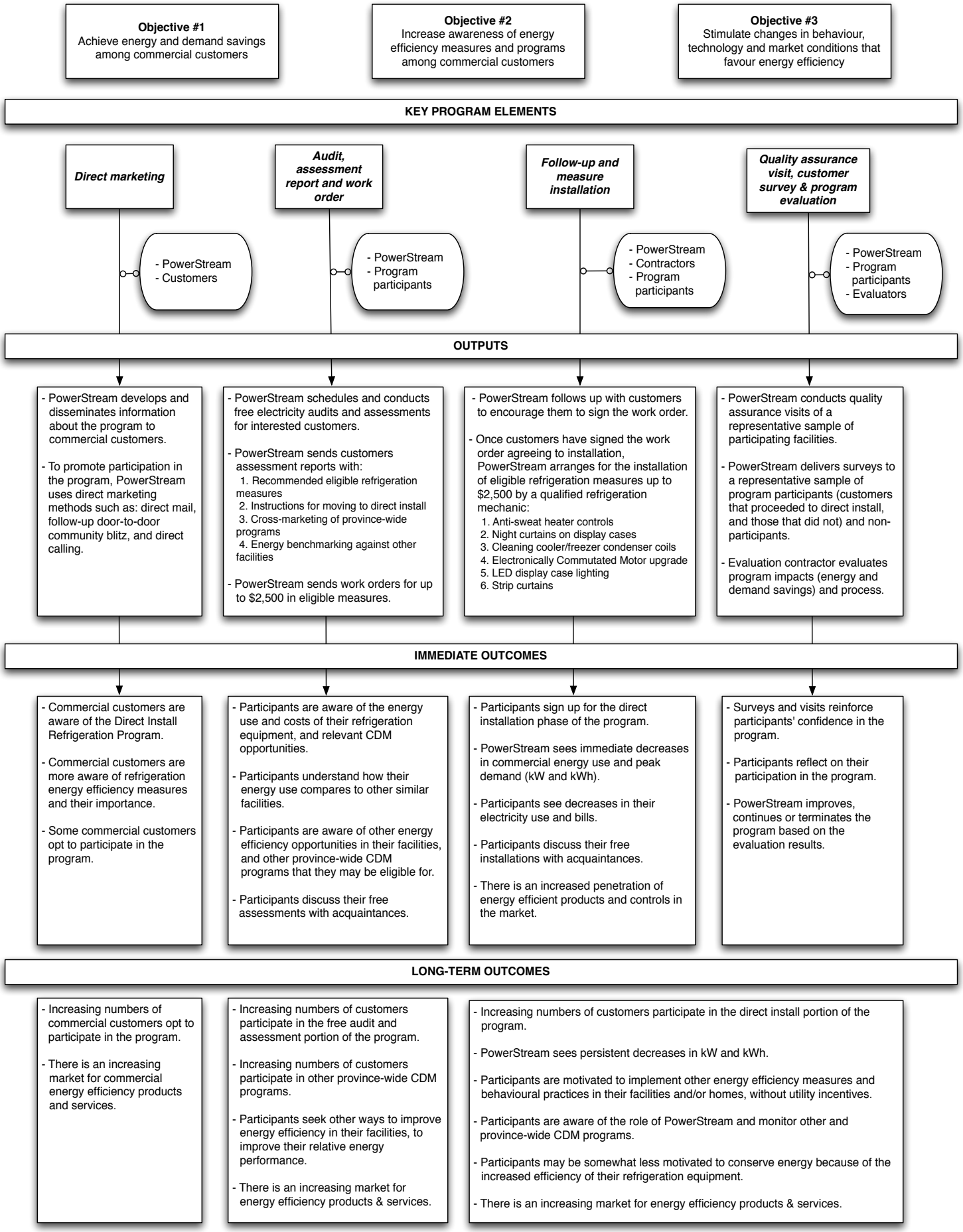
	2013	2014
Projected number of partial participants	180	420
Projected number of full participants	360	840

Budget

Section 8.3 of PowerStream's *Application for Board-Approved Conservation and Demand Management Program* presents the projected total budget of the Direct Install Refrigeration program.

Program theory and logic model

The logic model on the next page illustrates the theory of the PowerStream Direct Install Refrigeration Program. The evaluation will assess the immediate outcomes only.


Objective #1
Achieve energy and demand savings among commercial customers
Objective #2
Increase awareness of energy efficiency measures and programs among commercial customers
Objective #3
Stimulate changes in behaviour, technology and market conditions that favour energy efficiency
KEY PROGRAM ELEMENTS
Direct marketing
- PowerStream
- Customers
Audit, assessment report and work order
- PowerStream
- Program participants
Follow-up and measure installation
- PowerStream
- Contractors
- Program participants
Quality assurance visit, customer survey & program evaluation
- PowerStream
- Program participants
- Evaluators
OUTPUTS
- PowerStream develops and disseminates information about the program to commercial customers.
- To promote participation in the program, PowerStream uses direct marketing methods such as: direct mail, follow-up door-to-door community blitz, and direct calling.
- PowerStream schedules and conducts free electricity audits and assessments for interested customers.
- PowerStream sends customers assessment reports with:
1. Recommended eligible refrigeration measures
2. Instructions for moving to direct install
3. Cross-marketing of province-wide programs
4. Energy benchmarking against other facilities
- PowerStream sends work orders for up to $2,500 in eligible measures.
- PowerStream follows up with customers to encourage them to sign the work order.
- Once customers have signed the work order agreeing to installation, PowerStream arranges for the installation of eligible refrigeration measures up to $2,500 by a qualified refrigeration mechanic:
1. Anti-sweat heater controls
2. Night curtains on display cases
3. Cleaning cooler/freezer condenser coils
4. Electronically Commutated Motor upgrade
5. LED display case lighting
6. Strip curtains
- PowerStream conducts quality assurance visits of a representative sample of participating facilities.
- PowerStream delivers surveys to a representative sample of program participants (customers that proceeded to direct install, and those that did not) and non-participants.
- Evaluation contractor evaluates program impacts (energy and demand savings) and process.
IMMEDIATE OUTCOMES
- Commercial customers are aware of the Direct Install Refrigeration Program.
- Commercial customers are more aware of refrigeration energy efficiency measures and their importance.
- Some commercial customers opt to participate in the program.
- Participants are aware of the energy use and costs of their refrigeration equipment, and relevant CDM opportunities.
- Participants understand how their energy use compares to other similar facilities.
- Participants are aware of other energy efficiency opportunities in their facilities, and other province-wide CDM programs that they may be eligible for.
- Participants discuss their free assessments with acquaintances.
- Participants sign up for the direct installation phase of the program.
- PowerStream sees immediate decreases in commercial energy use and peak demand (kW and kWh).
- Participants see decreases in their electricity use and bills.
- Participants discuss their free installations with acquaintances.
- There is an increased penetration of energy efficient products and controls in the market.
- Surveys and visits reinforce participants' confidence in the program.
- Participants reflect on their participation in the program.
- PowerStream improves, continues or terminates the program based on the evaluation results.
LONG-TERM OUTCOMES
- Increasing numbers of commercial customers opt to participate in the program.
- There is an increasing market for commercial energy efficiency products and services.
- Increasing numbers of customers participate in the free audit and assessment portion of the program.
- Increasing numbers of customers participate in other province-wide CDM programs.
- Participants seek other ways to improve energy efficiency in their facilities, to improve their relative energy performance.
- There is an increasing market for energy efficiency products & services.
- Increasing numbers of customers participate in the direct install portion of the program.
- PowerStream sees persistent decreases in kW and kWh.
- Participants are motivated to implement other energy efficiency measures and behavioural practices in their facilities and/or homes, without utility incentives.
- Participants are aware of the role of PowerStream and monitor other and province-wide CDM programs.
- Participants may be somewhat less motivated to conserve energy because of the increased efficiency of their refrigeration equipment.
- There is an increasing market for energy efficiency products & services.

Previous program evaluations

As this is a new program for Ontario, evaluations of this specific program have not been completed. However, evaluations have been completed for similar programs in other jurisdictions. In this section, we provide a brief summary of the process and impact evaluation for the 2009 Bonneville Power Administration EnergySmart Grocer Program, the impact evaluation for the 2007 Connecticut Small Business Energy Advantage Program, and the process evaluation for the 2009-2010 Massachusetts Non-residential Small Business Direct Install Program.

These program evaluations indicate the following:

- Direct install programs with refrigeration measures are effective in achieving gross energy and peak demand savings (net-to-gross ratio was not assessed in any of the evaluations).
- Direct install programs with refrigeration measures are cost-effective, based on the Total Resource Cost (TRC) test and Program Administrator Cost (PAC) test.

The evaluations also include recommendations for improvement that have been incorporated into the design of PowerStream's Direct Install Refrigeration (DIR) program. These include:

- Metering before and after project implementation to improve the accuracy of energy savings estimates;
- Ensuring that energy and demand savings calculations are made according to the formulas provided in the Ontario Power Authority's 2011 Quasi-Prescriptive Measures and Assumptions document;
- Focusing on direct marketing; and
- Using the DIR assessment and report to disseminate information on other programs offered by PowerStream and the Ontario Power Authority.

2009 Bonneville Power Administration EnergySmart Grocer Program

Program overview

The EnergySmart Grocer Program provides grocers and other businesses that have refrigeration equipment with energy audits and information about efficient technologies, operations, and maintenance. It also assists grocers in making subsequent investments in energy-efficient equipment by providing incentives to reduce up-front costs. Services include: a no-cost energy audit and site-specific savings analysis; recommendations for energy-efficient upgrades; direct installation of quick payback measures; and financial rebates and rebate application assistance. Program participation and savings between January 2007 and March 2009 is summarized in Table 4 below:

Table 4 Participation in the EnergySmart Grocer Program and savings, 2007-2009

Participation and savings	Total (Jan 2007-March 2009)
Audits conducted	1,077
Number of free measures	1,664
Number of rebated measures	416
Installed savings from free measures (kWh/a)	3,805,123
Installed savings from rebated measures (kWh/a)	17,727,227
Total installed savings (kWh/a)	21,532,350

Types of measures

The program's refrigeration measures include the following:

- Auto-closers, gaskets, and doors
- Energy efficient lighting for cases (including LEDs)
- Anti-sweat controls
- Energy efficient cases
- ECM motors for compressor head fans
- ECM motors for evaporative motors
- Night covers
- Floating head pressure controls (with and without VFDs)
- Multiplex controls
- Vending machine controls.

Impact evaluation and results

Using billing and engineering methodologies, the impact evaluation confirmed that the program is likely achieving its reported energy savings. The evaluation found that the program achieved energy savings slightly higher than the estimated savings with the overall realization rate for measure savings very close (1.02) to the predicted first year energy savings values reported by the program implementation contractor.

The billing analysis utilized a Statistically Adjusted Engineering approach with three measure types (lighting, efficient cases, and floating head controls) providing statistically valid results. The engineering analysis focused on the non-deemed types of measures. Ten sites were included in the engineering analysis with the savings from these sites representing 35% of the total program savings and 50% of the non-deemed program savings. Individual measure realization rates varied; lighting (non-refrigeration) had a realization rate of 0.77 (based on billing analysis) and electronically commutated motors in

cases (ECMs) had a realization rate of 1.39 (based on engineering analysis). Net-to-gross ratio was not assessed as part of the evaluation.

Program cost effectiveness was assessed using a number of different cost effectiveness tests. The Total Resource Cost Test (TRC) produced a benefit/cost ratio of 1.42. The Utility Cost Test (also known as Program Administrator Cost Test) produced a ratio of 1.41. The Participant Cost Test produced a ratio of 20.18.

Process evaluation and results

The process evaluation included interviews with market actors and program materials review. Findings included:

- Utilities and customers both report high satisfaction with the program.
- The EnergySmart Grocer program's one-on-one and in-person visits are critical to gaining the trust and confidence of decision-makers in the commercial refrigeration target markets. End-use customers most often identified the Field Energy Analyst and Utility Representative as the most trusted source of their program information.
- End-use customers report the most valuable document they receive is the Energy Savings Report.

Relevant recommendations included:

- To minimize investments in any website upgrades or new promotional printed materials.
- To expand customer case studies to reach distinct target markets and feature these case studies prominently on the website and in meetings with customers.

2007 Connecticut Small Business Energy Advantage Program

Program overview

The Connecticut Small Business Energy Advantage Program (SBEA) promotes cost-effective energy efficiency retrofits, including refrigeration upgrades, lighting upgrades, lighting controls, and air compressor upgrades. It is funded by the Connecticut Energy Efficiency Fund and offered through two utility providers – Connecticut Light & Power Company (CL&P) and the United Illuminating Company (UI).

The SBEA is a direct install program, administered through several prime contractors who act as the single point of contact for customers. Commercial and industrial customers with an average 12-month peak demand between 10 kilowatts (kW) and up to 200 kW are eligible. Incentives are provided to offset a portion of the cost of the eligible measures, and interest-free financing is also available for qualified customers.

Types of measures

The program includes the following refrigeration measures:

- Evaporator fan controls in walk-in coolers and freezers
- Controls for heaters on cooler and freezer doors
- Night covers for open coolers
- Upgrades of evaporator fan motors to electrically commutated (EC) motors
- Vending machine controls (central controllers, vending misers or timers)

Impact evaluation and results

This impact evaluation determined gross energy and demand savings. Net energy and demand savings were not calculated as part of this impact evaluation. Evaluators collected data from a sample of sites and calculated realization rates by comparing gross verified savings to the savings reported by SBEA contractors. The realization rates were applied as adjustment factor at the program level to determine the program's gross energy and demand savings.

Gross savings were determined based on data collected from 121 site visits conducted on a sample of program participants between November 2008 to February 2009. Thirty of the 40 largest projects were selected into the sample, and the remaining sites were selected randomly. The evaluation goal was to achieve 80% confidence and +/- 10% precision at the utility level. The 121 sites included 3,392 measures, 53 of which were refrigeration measures. The 53 refrigeration measures verified using site visits represented 8.1% of the program total of 476 refrigeration measures.

During site visits, Cadmus staff members verified the type and quantity of equipment installed and deployed meters to measure runtime and energy use for refrigeration equipment. Meters were retrieved from each facility after approximately three weeks. In addition, data were downloaded from central refrigeration controllers for 19 coolers at nine customer sites, providing: temperature, evaporator fan operating time (%), door heater operating time (%), and time in bypass mode (%).

The energy savings realization rate for refrigeration measures was 106% after minor documentation adjustments and operation adjustments. The realization rate for refrigeration demand savings was only 9.32% for winter and 8.90% for summer, due to documentation errors; demand savings had been claimed for controls and night covers projects that Program Savings Documents indicated had no savings.

Evaluation recommendations included:

- Ensuring that savings calculations are made according to the formulas provided in the program documentation.[1]
- Metering selected measures before project implementation to improve accuracy of energy savings predictions.
- Providing education and follow-up for refrigeration measures to help ensure that equipment is operating properly in the longer term.

Gross energy savings and demand savings from refrigeration measures in the sample and at the program level are provided in Table 5 below.

Table 5 Connecticut Small Business Energy Advantage Program energy and demand savings from refrigeration measures

	# of measures (program total)	# of measures (sample)	Program total gross energy savings (MWh)	Sample gross energy savings (MWh)	Sample annual energy savings (MWh)	Sample demand savings (kW)
CL&P	476	31	2,172	88.2	94.2	1.53
UI	177	22	839	135	142	1.61
Total	**653**	**53**	**223**	**223**	**236**	**3.14**

2009-2010 Massachusetts Non-residential Small Business Direct Install Program

Program overview

The Small Business Direct Install (DI) Program provides non-residential utility customers in Massachusetts incentives to install specific energy efficiency measures including refrigeration upgrades. The program offers customers free audits of their facilities, identifies energy savings opportunities, recommends available financial incentives, and installs the agreed upon energy efficiency measures. The DI Program is delivered by the state's Program Administrators and is available to customers that have less than 300 kW average peak monthly demand.

Types of measures

The following refrigeration-related measures were implemented:

- Energy efficient evaporator fan motors (ECMs)
- Freezer door heater controls

[1] One of the largest adjustments made in the evaluation was a reduction in demand savings for refrigeration measures. The Program Savings Document stated that there are no demand savings for central controls on vending machines, but the project data showed that demand savings were claimed for most instances of this measure.

- LED lighting for refrigeration equipment
- Vending misers and controls
- Other refrigeration measures.

Process evaluation and results

A total of 5,689 small business customers participated in the DI program between 2009 and 2010. An additional 1,576 customers were partial participants (audit only). The program evaluation consisted of conducting a survey with participants, partial participants (audit only) and non-participants of the program. A summary of the most relevant findings are provided below:

- The majority of participating customers (65%) own and occupy the facility in which the program measures were implemented. Significantly fewer partial (audit-only) participants (51%) own the facility where they received the audit.
- Forty-four percent of non-participants own and occupy their facilities. Of those who do not own their facility, 60% make decisions about installing refrigeration equipment, and nearly all (94%) pay their electric bill.
- Program participants most often learnt about the program through Program Administrator representatives (28%), word of mouth (14%), direct mail (11%), and bill inserts (11%).
- Almost all participants (94%) report that they installed all of the equipment recommended to them by the program vendor.
- Participants were highly satisfied with all components of the program (e.g. measures installed, incentive amount, work of program vendors).

The evaluation's primary recommendation was to use the DI Program audit as a mechanism for the dissemination of information on other programs offered by the Massachusetts Energy Efficiency Program Administrators. Less than a third of program participants received information about other PA programs available to commercial and industrial customers through their engagement with the program. The evaluation team suggested a more systematic approach to disseminating information about other programs during the audit, including tailoring program recommendations to customer needs.

Evaluation goals and objectives

The evaluation will address both administrative and operational goals. Objectives will include: to assess the program impacts (verified savings), to assess cost-effectiveness, and to assess the delivery methods used to generate programmatic outputs. The evaluation will not assess long-term program outcomes; it will only assess immediate outcomes.

Overarching concerns

PowerStream has already conducted focus group sessions with prospective participants, and has addressed identified concerns in the design of the program. PowerStream has also met with the Heating, Refrigeration and Air Conditioning Institute of Canada, with two local refrigeration contractors, and with a distributor to identify and address potential concerns as part of the design of the program.

Overarching concerns of stakeholders include:

- Will businesses want to participate in the program?
- Who is being reached by the program? Who is not?
- How well does the program help businesses understand their energy use and increase their energy efficiency?
- How are program delivery agents interacting with customers?
- Is the installed equipment useful and high quality?
- What energy and peak demand savings can be directly attributed to the program?
- How cost-effective is the program?
- How might the program be improved?

Research questions

In response to the overarching concerns, the evaluation will address the following research questions through impact, cost-effectiveness, and process evaluation.

Impact evaluation:

- What is the direct impact of the entire program on energy savings and peak demand savings? What is the resulting monetary value of these energy impacts?
- What is the net-to-gross ratio for the program?
- What is the direct impact of the individual program elements on energy savings and peak demand savings?
- What is the magnitude of observed effects? What proportion of those effects can be attributed to the program?
- Were there any changes in behaviours of program participants, as compared to those of non-participants?

- What unintended impacts may have resulted from the program?
- What key factors are responsible for the verified savings?
- How accurate are the initial measure input assumptions for the initiative?

Cost-effectiveness evaluation:

- How much did the verified energy and demand savings cost to achieve?
- What is the cost-effectiveness of the program, as measured by the Total Resource Cost Test, the Program Administrator Costs test, and the Levelized Cost Test?

Process evaluation:

- How effective are the different marketing and outreach methods?
- How easy or difficult is it for customers to participate? What motivates them to participate?
- What barriers prevent customers from moving from assessment to installation? How can these barriers be addressed?
- How do participation levels compare to expectations? What groups are participating more or less than expected? Why?
- How useful are each of the elements of the assessment report (e.g. benchmarking, cross-promotion of other programs)? To what extent do they influence participants to take additional action to improve energy efficiency?
- How well does the installed equipment meet customers' needs?
- How well do program staff interact with customers?
- What recommendations do participants (direct install), partial participants (assessment only), and non-participants have for the program?
- Are the resources assigned to the program appropriate? How could resources be used more cost-effectively?

Evaluation elements

This section introduces the types of evaluations and provides a general description of the frequency and number of evaluations to be completed over the program implementation horizon. It also provides an estimated budget for the program evaluation.

Evaluation types

Annual impact evaluation (Year 1 and Year 2)

Year 1 and 2 impact evaluations will quantify the net energy and demand savings produced by the program. Impact evaluations will determine:

- Gross energy and peak demand savings;
- Net-to-gross ratio; and
- Net energy and peak demand savings.

Impact evaluations will draw on the following methods:

- Calculations based on PowerStream's project database and OPA quasi-prescriptive input assumptions
- Project-level M&V
- Participant surveys.

Annual cost-effectiveness evaluation (Year 1 and Year 2)

Year 1 and 2 cost-effectiveness evaluations will identify costs incurred by program administrators and by participants, and will compare costs to program savings (identified through impact evaluation) to determine the Total Resource Cost, Program Administrator Cost, and Levelized Delivery Costs.

Year 1 interim process evaluation

A Year 1 interim process evaluation will review the first three months of program delivery to determine if the program is performing as expected and to identify any changes or adjustments that are needed to improve program delivery. The Year 1 interim process will occur approximately 3 months after program launch. It will consist of a facilitated half day session with PowerStream staff and all external vendors working on program (e.g. installers and advertising agencies).

Annual process evaluation (Year 1 and Year 2)

Year 1 and 2 process evaluations will review the operations of the program to determine if it is performing as expected and to identify opportunities for improvement. Process evaluations will include:

- Participant and non-participant surveys
- Contractor interviews
- PowerStream program staff interviews.

Evaluation budget

The estimated budget for the full evaluation project (including all Year 1 and Year 2 evaluations) is $158,337. This EM&V budget is 4% of the total Delivery Cost of $3,958,424.

Evaluation approach

Year 1 impact evaluation

Study focus

The overall goal of the impact evaluation will be to determine the net energy and peak demand savings that can be directly attributed to the PowerStream Direct Install Program. The impact evaluation will thus focus on the following:

- Gross reported energy and peak demand savings
- Gross verified savings and realization rate
- Net-to-gross ratio
- Net energy and peak demand savings.

Data collection plan

The impact evaluation will collect data using the following methods:

- Onsite, project M&V (for calculation of verified gross savings)
- Review of information from the PowerStream database (for calculation of reported gross savings and realization rate)
- Survey with participants (for estimation of net-to-gross ratio).

Onsite monitoring and verification

Monitoring and verification will be performed in accordance with the Option B "Retrofit Isolation" approach described in the International Performance Monitoring and Verification Protocols, and in accordance with ASHRAE Guideline 14 (2002) *Measurement of Energy and Demand Savings*. M&V will include:

- Inventory of equipment (to document baseline equipment and control settings; and to verify installation of program measures and control settings);
- Interval metering of baseline equipment (to document / calculate baseline kW / kWh); and
- Interval metering of post-installation equipment (to document / calculate post-installation kW / kWh).
- Estimation of baseline and post-installation energy use and peak demand.

As part of audits, assessors will identify whether feeder circuits for refrigeration equipment can be metered. Where feeder circuits are accessible, they will ask for permission to install data loggers prior to measure installation. After customers sign work orders, program staff will install meters in facilities where customers have consented and will collect data for two weeks prior to project installation. After two weeks

of post-installation data have been collected, site visits will be used to retrieve data loggers. Site visits for meter installation and removal will also be used to conduct equipment inventories and document control settings / operating conditions before and after installation.

Program staff will conduct before and after metering for the first 25 to 30 facilities where it is possible to do so (with customer consent and access to feeder circuits). Additional onsite M&V will be conducted as needed to reduce uncertainty and improve confidence/precision. We will aim to achieve a 10% margin of error with a 90% confidence interval for the realization rate.

The evaluation team will estimate project-level verified savings based on the formula:

> Savings = (Baseline kWh or kW – Post-installation kWh or kW) ± Adjustments[2]

Where multiple measures have been installed, measure-level verified savings will be estimated based on engineering calculations.

Review of information from PowerStream database

The evaluation team will calculate the gross reported energy and peak demand savings for each project using the methodologies and input assumptions described in the 2011 OPA Quasi-Prescriptive Measures and Assumptions List. The equations / methodologies and input assumptions for each of the Direct Install Refrigeration Program measures are included in the 2011 OPA Quasi-Prescriptive Measures and Assumptions List.

Participant surveys

Participant surveys will be delivered to a random sample of participants, partial participants, and non-participants as part of program evaluation. Survey questions will include questions required to calculate adjusted, self-reported freeridership and spillover and determine the net-to-gross ratio.

Freeridership:

- Stated intention (participants' plans for equipment replacement in the absence of the program, and available capital to complete similar projects)
- Program influence (reported extent to which the program influenced participants' decisions to complete the qualified projects).

Participant spillover:

- Investments in energy efficient equipment since the program

[2] Adjustments will be made on a case-by-case basis, if changes in operating conditions or control settings between the baseline and post-installation periods are not due to the DIR program.

- Program influence (reported extent to which the program influenced participants' decision to invest in additional energy efficient equipment).

The evaluation team will determine an appropriate sample size to achieve a 10% margin of error with a 90% confidence interval for the net-to-gross ratio.

Analysis methods

Gross reported savings

Gross reported savings are the energy savings calculated using the assumptions found in PowerStream's planning documents. Gross reported savings will be calculated using information from the PowerStream project database and the methodologies and input assumptions included in the 2011 OPA Quasi-Prescriptive Measures and Assumptions List.

Gross verified savings and the realization rate

The realization rate reflects the portion of assumed savings that are actually achieved by the customer. The evaluation team will calculate the verified energy and demand savings for each project that is subject to onsite, project-level M&V. For each project, the verified savings values will be divided by the gross reported savings to determine the realization rate.

$$Savings_{verified} = Savings_{reported} * Realization\ rate$$

The realization rate will then be applied at the project-level to all projects, to produce an estimate of program-level verified savings. The evaluation team will also calculate the precision of the realization rate.

To the extent possible, measure-level results and realization rates will be used to review the measure input assumptions from the 2011 OPA Quasi-Prescriptive Measures and Assumptions List.

Net-to-gross ratio

The net-to-gross (NTG) ratio is used to determine the portion of gross verified savings that are specifically attributable to the PowerStream Direct Install Refrigeration Program. NTG ratios are calculated as a function of freeridership and program spillover.

Freeridership is an estimate of the percent of savings that would have occurred without the program intervention. Freeridership will be estimated based on participant survey questions regarding stated intention and program influence (adjusted, self reported freeridership, as outlined in the OPA 2011-2014 EM&V Protocols and Requirements). As in the OPA's Small Commercial Direct Install 2009-2010 Evaluation,

a program influence score will only be considered if participants report that they had plans to upgrade the equipment prior to the program (if stated intention score is greater than zero).[3]

Spillover is an estimate of the energy savings value of investments in efficiency that are independent of the program but that were influenced by program efforts. Participant spillover will be estimated based on participant interviews (adjusted, self reported, as outlined in the OPA 2011-2014 EM&V Protocols and Requirements).

NTG ratio will be calculated based on the freeridership rate and participant spillover rate according to the formula below.

NTG ratio = 1 – freeridership rate + participant spillover

Net savings

Net energy and peak demand savings will be calculated based on the gross verified savings and net-to-gross ratio (%), using the formula below.

$$Savings_{net} = Savings_{verified} * NTG\ ratio$$

The relative precision of the net savings value will be calculated based on the relative precision of the realization rate and the relative precision of the NTG ratio.

Limitations / caveats

Limitations of this approach may include: the cost of performing site visits and metering for an appropriate sample size; challenges accessing feeder circuits; difficulties determining the savings of individual measures when multiple measures have been installed; and large standard deviations. Uncertainty and precision analysis will help to address these limitations, and the sampling methodology has been developed to overcome these challenges. The target error margins and confidence levels may also be revised, if necessary. Furthermore, careful survey design and recruitment for participant and non-participant surveys will be needed to ensure that freeridership and spillover estimates are not skewed by sampling bias or response bias.

Study outputs

The final impact evaluation will report on the following at the program level:

- Gross reported energy and peak demand savings
- Gross verified savings and realization rate
- Net-to-gross ratio

[3] As for the OPA's Small Business Lighting Initiative, participants in the DIR Program will only receive free equipment. Unless they already had plans to complete the project, participants will have no logical reason to report that the program did not influence their decision to complete the project.

- Net energy and peak demand savings.

Where possible, the evaluation will also recommend updates to the measure input assumptions from the 2011 OPA Quasi-Prescriptive Measures and Assumptions List, based on measure-level savings and realization rates.

Evaluation dependencies

No evaluation dependencies (enabling stakeholders, access and data sharing requirements, etc.) are anticipated.

Year 1 cost-effectiveness evaluation

Study focus

The cost-effectiveness evaluation will determine the program's cost-effectiveness as measured by:

- Total resource cost (TRC)
- Program administrator cost (PAC)
- Levelized program delivery costs.

Data collection plan

The evaluation team will work with PowerStream to compile information on the following costs:

- Program administration costs
- Incentives paid
- Incremental equipment, operation and maintenance costs
- Total program delivery costs.

The evaluation team will also calculate the avoided supply costs (program benefits): the reduction in transmission, distribution, generation, and energy costs for the periods when there is a load reduction based on the OPA's CDM Cost-Effectiveness Test Guide.

Analysis methods

The evaluation team will calculate the TRC, PAC, and levelized program delivery costs using the methodologies specified in the OPA's 2011-2014 EM&V Protocols and Requirements.

Limitations / caveats

There are no limitations that are specific to the DIR program. However, as for other program evaluations, calculations of program cost-effectiveness depend on the accuracy of avoided cost forecasts.

Study outputs

The cost-effectiveness evaluation will include the following cost-effectiveness tests for the complete PowerStream Direct Install Refrigeration Program:

- TRC ratio
- PAC ratio
- Levelized delivery costs ($/MW-a and $/MWh)

It will also include the methodology used to calculate each metric and the breakdown of costs and benefits within each metric.

Year 1 interim process evaluation

Study focus

The interim process evaluation will assess the program's performance and identify opportunities for improvement in the following areas, based on the first three months of delivery:

- Marketing and outreach methods
- Program tools and services (assessment reports, benchmarking, cross-promotion, work orders, installation process)
- Installed equipment
- Barriers to customer participation

Data collection plan

Data will be collected through a facilitated half day session with PowerStream staff and all external vendors working on the program (e.g. installers and advertising agencies). Participants will also be invited to provide written comments and suggestions on a comment form at the start of the session.

Analysis methods

Qualitative methods will be used to compile workshop participants' comments regarding program performance in each of the study areas, and to develop recommendations for program improvement.

Limitations / caveats

Limitations of this approach include: participants may not all feel confident voicing their comments and suggestions in a group setting; less vocal participants may contribute less than the most vocal participants; and participants may be influenced by other participants' comments. The use of trained facilitators and written comment forms may help to address these limitations.

Study outputs

The interim process evaluation will discuss how the program is currently performing in each of the following areas:

- Marketing and outreach methods
- Program tools and services (assessment reports, work orders, installation)
- Barriers to customer participation.

It will provide recommendations for program improvement based on the first three months of delivery.

Evaluation dependencies

No evaluation dependencies are anticipated.

Year 1 process evaluation

Study focus

The process evaluation will assess the program's performance and identify opportunities for improvement in the following areas:

- Marketing and outreach methods
- Program tools and services (assessment reports, benchmarking, cross-promotion, work orders, installation process)
- Installed equipment
- Barriers to customer participation
- Resources assigned to the program

Data collection plan

Data will be collected using the following methods:

- Full participant, partial participant, and non-participant surveys
- Contractor interviews
- PowerStream program staff interviews
- Participation data review.

Full participants (completed direct installation) will be randomly selected from the PowerStream program database. Surveys with a statistically significant number of participants will focus on:

- Equipment use
- Program awareness
- Decision-making regarding participation in assessment and installation phase
- Program experience and satisfaction
- Project scope and measure selection
- Missed measure opportunities

- Interest / participation in other programs.

Partial participants (received assessment reports but did not complete direct installation) will also be randomly selected from the PowerStream program database. Surveys with a statistically significant number of partial participants will focus on:

- Equipment use
- Program awareness
- Decision-making regarding participation in assessment phase
- Decision-making regarding non-participation in installation phase
- Program experience and satisfaction
- Interest in alternative program design options
- Recommendations for program improvement.

Non-participating customers with commercial refrigeration equipment in the PowerStream service area will be identified using business databases (such as Scott's online directories) and the PowerStream customer database used for direct marketing. Surveys will target a random sample of businesses in each category of eligible businesses (e.g. convenience stores, restaurants, flower shops). Screening questions will be used to exclude businesses that are not eligible for the program. Surveys will address:

- Equipment use
- Program awareness
- Interest in participation
- Barriers to participation
- Interest / participation in other programs
- Recommendations for program improvement.

Contractors will be selected from the PowerStream database of installation contractors, excluding contractors (if any) that have completed fewer than three installations. Interviews will address:

- Interactions with customers
- Experience with program tools
- Interactions with PowerStream
- Recommendations for program improvement.

All ***PowerStream staff*** that played a major role in program design, delivery, and marketing will be interviewed. Interviews will address all of the process evaluation study issues: marketing and outreach methods, program tools and services (assessment reports, work orders, installation), barriers to customer participation, and resources assigned to the program (including data management and tracking tools used by PowerStream).

The evaluation team will also compile information from the PowerStream database to ***review data on participation.*** This will including exploring participation levels among different types of

businesses (e.g. convenience stores, restaurants), with different levels of electricity use, different project sizes, etc.

Analysis methods

Customer surveys. The analysis of participant, partial participant, and non-participant surveys will be primarily quantitative in nature. Analysis will summarize and interpret the data collected from the three surveys and highlight any relevant subgroup differences. The analysis will also highlight differences in the results along factors other than participation (e.g. type of business, size of business, use of refrigeration equipment, type of measure). Frequency distributions and cross-tabulation will be the primary survey analysis tools. Hypothesis testing (e.g. Chi-Square tests) will be used as required to determine the statistical significance of findings.

Contractor and PowerStream staff interviews. The analysis of the contractor and PowerStream staff interviews will be primarily qualitative (i.e., descriptive) in nature. The analysis will identify issues where respondents were generally in agreement, and will highlight the range of responses regarding issues where answers diverged.

Data on program participation will be compiled and analyzed using basic statistical techniques (e.g. frequency distributions and cross-tabulations). Findings will be presented in charts and tables.

Limitations / caveats

Limitations of this approach include: possible sampling biases and response biases; and customers, contractors, and PowerStream staff may not all feel confident voicing negative comments. Careful survey / interview question design and recruitment methods may help to address these limitations.

Study outputs

The process evaluation will present the analyses of each of the following data sources, as described in the *Analysis* section:

- Customer surveys (participant, partial participant, and non-participant);
- Contractor interviews; and
- PowerStream program staff interviews.

The analysis will specifically discuss how the program is currently performing in each of the following areas:

- Marketing and outreach methods
- Program tools and services (assessment reports, work orders, installation)
- Barriers to customer participation
- Resources assigned to the program.

Finally, it will provide recommendations for program improvement in each of the study focus areas.

Evaluation dependencies

No evaluation dependencies are anticipated.

Year 2 evaluation

Year 2 process evaluation, impact evaluation, and cost-effectiveness evaluations will be conducted using the same methodology as in Year 1. However, no interim process evaluation will be conducted in Year 2. In addition, Year 2 sample sizes will likely be larger because of higher overall program participation.

Data collection responsibilities

PowerStream will work cooperatively with the Evaluation Contractor on data collection. PowerStream will provide the Evaluation Contractor with access to data and information that may include the following:

- Market research
- Marketing activities and promotional material
- Program costs (by type of expenditure)
- Data on participation
- Data from site visits and baseline/post-installation metering
- Individual participant information, including contact information and facility characteristics (for survey design and execution).

The Evaluation Contractor will be responsible for collecting additional data from sources that may include the following:

- Survey of participating and non-participating customers
- Interviews with program administrators and contractors.

Evaluation schedule

Table 6 provides the schedule for the Year 1 and Year 2 evaluations.

Table 6 Evaluation schedule

Evaluation deliverable	Date
Year 1 Final evaluation plan	May 1, 2013
Year 1 Interim process evaluation report	Sep. 31, 2013
Year 1 Draft evaluation report	Feb. 28, 2014
Year 1 Final evaluation report	March 31, 2014
Year 2 Draft evaluation plan	Feb. 28, 2014
Year 2 Final evaluation plan	March 31, 2014
Year 2 Draft final evaluation report	Feb. 28, 2015
Year 2 Final evaluation report	March 31, 2015

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