Q. Please provide the review of Hydro's Industrial Energy Efficiency program performed by the company CLEAResult (completed in the first quarter of 2014).

A. Please refer to PUB-NLH-465 Attachment 1 for a copy of the Industrial Energy Efficiency program evaluation completed by CLEAResult in April 2014.

PROCESS EVALUATION

INDUSTRIAL ENERGY EFFICIENCY PROGRAM PILOT

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Executive Summary

Newfoundland & Labrador Hydro (Hydro) launched the Industrial Energy Efficiency Program (IEEP) as a pilot in 2010. The pilot program was designed to engage and assist Hydro's major industrial customers, connected at transmission voltage, to improve their energy use efficiency and reduce electricity consumption. The competitiveness and profitability of the industrial customers can be enhanced by reducing industrial energy use intensity and lowering energy costs while the IEEP conservation culture can lead to reduced resource use and improving the province's environment. For Hydro, the purpose of the IEEP is to acquire least-cost energy resources to reduce fuel consumption at the Holyrood Generating Station.

Offering a pilot program provides a test of the Hydro program design and has allowed Hydro to learn more about the energy use needs of their industrial customers. Also a pilot program helps to define features and characteristics likely to contribute to the successful implementation of a full program.

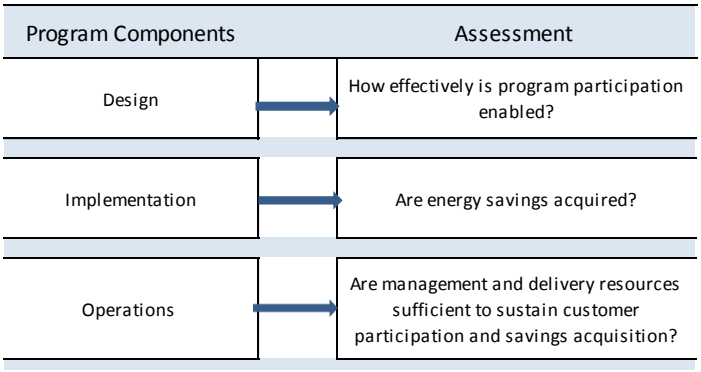
CLEAResult has conducted this process evaluation of the IEEP Pilot, 2010 to 2013, to assess the effectiveness of the pilot program, identifying accomplishments and areas for improvement, and to provide recommendations. The evaluation perspective is retroactive. A review was conducted of the pilot program design, the activities and outcomes surrounding program implementation, and the operations of the program over the pilot period. The findings and recommendations presented here relate to the pilot program. The scope of this evaluation does not include assessing the viability of the pilot program as a full program, or preparing a recommendation for further energy efficiency programming for industrial customers.

The process evaluation results do conclude that the IEEP is a viable program. However, the decision to go to a full program relies on CDM planning criteria and targets. The average cost of savings acquisition ($/kWh), the savings potential for each customer class, the savings acquisition time per kWh, and resource constraints will contribute to the final decision. Outcomes may be going to a full program per IEEP, adjusting the IEEP and then launching a full program, or other options. Investigating alternative program options, including the possibility of adding an energy manager program offering, is recommended. Other suggested actions are described later in the Executive Summary and in Section 6 of this report.

Findings Overview

The evaluation looks at the program components of design, implementation, and delivery. Exhibit 1 summarizes the outcomes being assessed for each component to determine program effectiveness.

Exhibit 1 Evaluation Assessment



Design

The program's design is assessed by how effectively participation is enabled, how sustainable program components are, and how the design contributes to achieving customer satisfaction.

As designed, the program components and process have engaged participants throughout the pilot period and have facilitated the implementation of successful customer projects. Participants have indicated during evaluation interviews that they are satisfied with the IEEP and would like to see the program continue.

Implementation

The expected outcome from program implementation is the acquisition of energy savings by the utility. Successful implementation relies on program features such as incentives for energy savings, customer eligibility criteria, and program outreach closely linked to customers' market intelligence. The evaluation looks for execution and completion of participant projects, which rely on the program representatives' roles and services. According to the program tracking information, the IEEP walk-through audits have identified project annual savings of 321 gigawatt hours (GW·h). Closed projects are delivering 3.3 GW·h annually. This demonstrates that implementation of the IEEP pilot has been effective and the program is able to complete the acquisition of energy savings from customer projects.

However, participant activity levels, based on identified projects, have been low with regards to completing energy studies and moving ahead to implement projects.

Operations

Successful program operations rely on effective management of program resources, delivery activities, and customer relations. The evaluation looks at the planning, documentation, and data management that program staff relies on to perform their assignments, and that inform management and administration.

Recommendations

The recommendations for each program component have been grouped by time frame, as shown in Exhibit 2. The short term recommendations focus on developing a coordinated approach to communications with industrial customers, customer relationship management and efficient deployment of program resources. In the medium term the recommendations focus on building CDM capacity for industrial programs and expanding the options for program acquisition of energy savings from industrial customers and increasing program delivery efficiency.

Exhibit 2 Recommendations Summary Table

Program Components	Short Term *Six to Twelve Months*	Medium Term *Eighteen to Twenty-Four Months*
Design	Prepare a marketing and communications plan	Investigate alternative program design – Energy Management
	Design a central repository for customer relationship management	Prepare a pilot program for an alternative design
Implementation	Bundle utility services offered to industrial customers	Prepare a joint communication plans with customers
	Prepare an evaluation plan and schedule	
Operations	Manage customer relationship data collection and tracking	Increase capacity of CDM staff and expand services to industrial energy users
	Provide participants with project tracking statements	Add market weights to customer project management and tracking

Short Term Recommendations *(six to twelve months)*

The following recommendations focus on industrial customer communications, data management capability for customer relationship management, and program evaluation planning. Once in place, there will be a strong base upon which to engage the industrial customers throughout the program planning and implementation phases.

Design

✓ Prepare a CDM marketing and communications plan for industrial customers

Work with communications staff to develop a marketing and communications strategy and approach that will inform CDM program design work for continued industrial programming. A continuing program for industrial customers requires a multi-year marketing and communication plan that matches the program life, laying out specific actions and deliverables for the early part of the period and general direction for the remaining years. Electricity is a large operating cost for industry and, in general, capital spending is required to permanently reduce energy costs. It is the consultants' experience that program success requires engaging plant operators and plant management regularly. A plan is needed to present the options, resource requirements, and costs, for selection and implementation by each program.

A bundled service approach to industrial customer communications could integrate the Hydro service information into a custom package for each customer. Such an approach demonstrates customer focus and cost-efficient utility service management. Customers may find it more efficient as well

✓ Design a central repository for customer relationship management

Develop customer intelligence data collection parameters and data organization in a prototype file that can be used for customer project tracking, analysis, and reporting. A central repository of specific customer and market intelligence can serve as a reference for program staff and management. The information received by the evaluators was somewhat fragmented and did not necessarily align with the customer information received during the evaluation interviews. To ensure maintenance and utilization of this information by operations, a data collection file and, if applicable, a relational database should be designed.

Implementation

✓ Include the customers' bundle of utility services in program communications and messages

Further CDM programming for industrial customers will strengthen Hydro's relationship with the customers. A message describing each customer's Hydro services can be leveraged to introduce the programming to new contacts and/or to continue working with existing contacts and their identified projects.

In preparation for implementing the communication plan, establish a customer contact directory of all Hydro representatives for each industrial customer.

Bundle communication material that integrates customer intelligence information with communication packages and goals:

- Publish *Leave Behinds*, with IEEP stamp/takeCHARGE Brand, with inclusive messages.

- *Leave Behinds* may include program brochures, technology information, updates to standards/regulations, event notices, relevant research papers, equipment offers, and Best Practices/Case Studies reports.
- Prepare calendar schedule for communicating with each customer.
- Prepare individual customer packages and calendars.

✓ Prepare a program evaluation plan and schedule

Program evaluations are the tools that assist in assessing program performance and pointing out improvements. Evaluation planning is best done concurrently with implementation planning. This practice allows time to address any identified shortcomings before program launch.

Programs must remain dynamic to be able to respond to myriad factors that can influence customers' decision making and still remain on track to meet utility expectations. Plan for both process and impact evaluations, including schedules. The customer project measurement and verification (M&V) reports and results would serve as input to the impact evaluation.

Operations

✓ Manage customer relationship data collection and tracking

Reliable customer and contact information is an important factor in effective program operations. Using the data collection formats and files that have been prepared for managing the IEEP, operations staff is positioned to populate and update records and files on an ongoing basis. Data collection should be designed to eliminate redundancies and provide a single source for information.

Customers' organization and contact information is vital to maintaining effective program delivery by industrial program staff. The updated contact information may be of service to other Hydro customer representatives as well. The organizational updates may be linked to shifts in corporate priorities and trigger a follow-up call from the industrial program staff to the participant contact.

✓ Provide participants with project tracking statements

The IEEP process comprises several steps, with variable duration between each step for each customer project. Tracking the status of customer projects along with staff activity by process steps could provide a quick snapshot of industrial program activity. Generating a report for each customer would also provide them with a snapshot of the status of their projects and provide a regular program/participant communication opportunity.

While tracking would be ongoing in the industrial program process, the customer project status report would be produced periodically in conjunction with the communications plan and schedule arranged with the customer. Regular project status reports provide the customer with project

tracking documentation that can be easily passed on to managers and others at the industrial site. Industrial program activity reports could also be generated as needed by the industrial program management.

Medium Term Recommendations *(eighteen to twenty-four months)*

The medium term recommendations focus on increasing industrial program services with energy management training for program staff and assessing alternative program designs for expanding the program's energy savings acquisition potential.

Design

✓ Investigate alternative program design

Given few customers dispersed across a large geographical area, it is difficult to readily increase the IEEP program delivery cost-effectiveness or accelerate savings acquisition. For other jurisdictions with more customers, there is a project ramp-up rate that increases as more customers become program participants. Total project activity relies on customer throughput. For Hydro, once each eligible customer is participating, the number of projects at any given point in time will be relatively flat. Consequently there will be little opportunity to reduce average program costs.

To maximize energy savings acquisition from industrial programming, other energy efficiency delivery models warrant investigation. The IEEP provides a strong foundation for future industrial customer CDM programming. Other models can build on the IEEP project development process. They can provide the focus and integration industrial companies require to incorporate energy efficiency into their policies and planning, while adopting energy efficient operating practices and investing in savings measures.

A model that is suggested as worth investigating is energy management. Specifically, a certified energy management professional is hired by the industrial customer to provide comprehensive energy management planning and project implementation. Utilities in other jurisdictions (for example, BC Hydro and Bonneville Power Authority) offer co-funding for an energy manager's salary. A Certified Energy Manager (CEM) is a professional who has completed a comprehensive learning and problem-solving forum to acquire a broader understanding of the latest energy cost reduction techniques and strategies. CEMs provide valuable services to large energy users, including industry, governments, universities, schools, and hospitals.

✓ Prepare a pilot program for an alternative design

To pursue an alternative program design, prepare a preliminary document that can be shared with industrial customers to obtain their feedback and comments. The document can also contribute to seeking approval for the customer-endorsed pilot design. A component of the design will comprise the IEEP developed 'infrastructure' to handle project identification, feasibility, financial arrangements and contracts to deliver verified results.

Implementation

✓ Prepare joint communication plans with customers

It can be difficult to sustain effective communications over time, particularly when priorities change and new staff takes over responsibility for energy savings programs at either the customer site or at Hydro. Establishing and documenting shared communication goals with customer contacts can enable others to 'pick up the ball' when staff changes occur. Exhibit 3 presents sample goals and targets for a joint communication plan.

Exhibit 3 Sample Shared Communication Goals and Annual Targets

COMMUNICATION GOALS
1. To provide energy efficiency program progress/updates, technical updates for customers' energy efficient equipment, industrial energy efficiency case studies, customer's projects' status, and regular tracking reports. 2. To share information about customer opportunities, priorities, concerns, and energy issues. 3. To explore opportunities for improving energy use efficiency in the customer plant.
ANNUAL TARGETS
1. Minimum 4 connections, including 2 in-person meetings; 2. Minimum 2 connections will provide new information regarding energy efficiency; and 3. Minimum 1 connection will cover budget and planning issues.
Format options include interactive web-based meeting, site visit, and invitation to industry association/utility sponsored event.

Operations

✓ Increase the capacity of CDM staff and expand services to industrial energy users

Industrial energy efficiency programs rely on multi-year relationships with customers as participants. As easily identified projects are installed, other business or process priorities will replace the focus on improving energy use efficiency, company resource constraints may arise, and/or attention to program involvement may wane. Increasing the sales and energy management skills offered by the industrial program staff can help prevent these issues by addressing them before they supplant energy efficiency as a company priority.

Providing sales training to industrial program staff, who are in regular contact with customer organizations, can build the program capacity to offer services. Energy management training to acquire Certified Energy Manager status would enhance the ability of CDM staff to identify potential projects and work with all levels of customer organizations planning and developing policy and procedures that support energy use improvement. The 5-day course presents the technical, economic and regulatory aspects of effective energy management to professionals. Other utility customer sectors that could benefit from energy management services include institutions, campuses, municipalities, hospitals, universities, and school districts.

- ✓ Coordinate customer project management and tracking with customer priorities

  The inventory of identified projects will grow and each will have its own rate of progression through the program steps. A weighting factor applied to each outstanding project could help IEEP staff prioritize services to those projects imminently ready to advance. Updates to participants' priorities and projects' status can be captured in the scheduled meetings set out in the joint communications plan and inform the update of the weighting factors.

  The inventory of customer identified projects can be amalgamated for savings and cost analysis. Applying weightings to factors such as likelihood-to-proceed date, estimated date of development start up, approved capital budgets, and industrial output can be applied to rank the customer identified projects included in the tracking database. For those projects moving ahead concurrently, potential energy savings and cost estimates for the efficiency measures can help prioritize CDM staff efforts. Bottlenecks in the program process can be quickly spotted, and any found on the program operations side can be addressed with adjustments to handle the volume of activity.

Glossary

Acquired energy savings
The reduced energy consumption due to the installation of efficient equipment, process improvement, or change in operating practices, and for which an energy efficiency program supplied incentives, is acquired energy savings.

CDM
"CDM" means conservation and demand management.

CEM
Certified Energy Manager

CFL
Compact Fluorescent Light bulb

Claw back
“Clawback” or “claw back” refers to any money or benefits that have been given out but need to be returned due to special circumstances, which are mentioned in a contract.

Customer
An industrial customer, connected at transmission voltage to the Hydro electric system.

DSM
Demand side management is the modification of consumer demand for energy through various methods such as financial incentives and education.

Eligible customer
"Eligible customer" means, in respect of IEEP, a Hydro industrial customer that meets the applicable IEEP Eligibility Criteria.

Energy audit
An on-site inspection of customers’ electricity-using equipment and end use systems with, and cataloguing energy consumption and customer demand. The purpose is to provide energy end use breakdown information to the customer and the utility. Audits are useful for load research, for DSM program design and for identifying energy savings opportunities and specific energy savings projects.

Energy management
Energy management is the proactive, organized and systematic coordination of procurement, conversion, distribution and use of energy to meet the requirements, taking into account environmental and economic objectives.

Energy savings
The reduction in energy consumption due to the installation and operation of efficient technologies or practices and activities that improve energy use efficiency. Energy savings have associated capacity reductions. In this document, the term "energy" refers specifically to "electricity" unless otherwise noted.

Energy use intensity
Energy use intensity expresses a facility's energy use as a function of its size or other characteristics.

Feasibility Study
A detailed study of the consumption of electricity of a system within a facility, or of a facility, in order to assess and evaluate measures, or their implementation, that could give rise to electricity savings.

Financial incentive
Certain financial features in the utility's DSM programs designed to motivate customer participation. They may include features designed to reduce a customer's net cash outlay, payback period or cost of financing.

Gigawatt hour (GW·h)
One million kilowatt hours.

Impact evaluation
A process used to measure the change in energy and/or demand usage (such kWh, kW and therms) attributed to energy efficiency and demand response programs.

Incentive
Financial support (e.g., rebates, low-interest loans) to install energy efficiency measures.

Industrial customer (IC)
Large industry facilities connected to Hydro at transmission voltage.

Industrial Energy Efficiency Program (IEEP)
A pilot program designed to engage and assist Hydro's major industrial customers, connected at transmission voltage, to improve their energy use efficiency and reduce electricity consumption.

Industrial Energy Efficiency Specialist (IEES)
CDM staff member responsible for IEEP delivery, study reviews, and project development plans.

Process evaluation
A systematic assessment of an energy efficiency program for the purposes of (a) documenting program operations at the time of the examination, and (b) to identify and recommend improvements that can be made to the program to increase the program's efficiency or effectiveness for acquiring energy resources while maintaining high levels of participant satisfaction.

"Leave behind"
Item left by a salesperson with a customer as a reminder of the firm and/or good or service being sold.

Marginal cost of supply
The cost of one additional unit of a commodity billed under a complex rate schedule.

Measure
"Measure" means any activity undertaken for the primary purpose of obtaining or effecting, directly or indirectly, energy savings, including the installation, retrofit, replacement, modification or commissioning of equipment, systems, processes or behaviours that consume or result in the consumption of electricity.

Measurement and Verification (M&V)
The process of using measurements to reliably determine actual savings created within an individual facility or end use system by an energy management program. Savings cannot be directly measured, since they represent the absence of energy use. Instead savings are determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions.

Participant
"Participant" means an eligible customer who has been engaged by the program and is formally participating.

Program design
The method or approach for making, doing, or accomplishing an objective by means of a program.

Program evaluation
Comprises impact and process evaluation.

Program Penetration
The level of program participation among qualified customers.

Project Development Agreement
IEEP contract for project incentives. This agreement stipulates the terms and conditions of the incentive payments and defines the payment schedule which is based on specific project milestones.

Project Proposal
IEEP participant prepares a proposal for submission to, and evaluation by Hydro.

Kilowatt (kW)
One thousand watts; a basic unit of measurement of electric power. (The amount of energy transferred at a rate of one kilowatt for one hour is a kilowatt hour.)

Kilowatt hour (kW·h)
The basic unit of measurement of electric energy. One kilowatt hour represents the power of one thousand watts for a period of one hour. (A typical non-electrically heated home in B.C. uses about 10,000 kWh per year.)

Load
An end use device or an end use facility that consumes power. The amount of electric power supplied to meet one or more end user's needs.

Load forecast
An estimate of expected electricity requirements that have to be met by the electrical system in future years.

Megawatt (MW)
One thousand kilowatts.

Power Smart
BC Hydro's DSM initiative, originally launched in 1989. Power Smart includes a full range of DSM programs aimed at BC Hydro's Residential, Commercial and Industrial customers. Manitoba Hydro also offers DSM programs under the Power Smart label.

Sector
A group of customers having a common type of economic activity. Utilities typically divide their customers into three principal sectors: Residential, Commercial and Industrial. Commercial and Industrial sectors may be further divided by code such as contained in the North American Industry Classification System (NAICS).

Walk-through audit
The preliminary audit (alternatively called a simple audit, screening audit or walk-through audit) is the simplest and quickest type of audit. It involves minimal interviews with site-operating personnel, a brief review of facility utility bills and other operating data, and a walk-through of the facility to become familiar with the building operation and to identify any glaring areas of energy waste or inefficiency.

Typically, only major problem areas will be covered during this type of audit. Corrective measures are briefly described, and quick estimates of implementation cost, potential operating cost savings, and simple payback periods are provided. A list of energy conservation measures requiring further consideration is also provided. This level of detail, while not sufficient for reaching a final decision on implementing proposed measure, is adequate to prioritize energy-efficiency projects and to determine the need for a more detailed audit.

Watt
The basic unit of measurement of electric power.

1 Introduction

Newfoundland & Labrador Hydro (Hydro) launched the Industrial Energy Efficiency Program (IEEP) as a pilot in 2010. The pilot program was designed to engage and assist Hydro's transmission level industrial customers to improve their energy use efficiency and reduce electricity consumption. The competitiveness and profitability of the industrial customers can be enhanced by reducing industrial energy use intensity and lowering energy costs while the IEEP conservation culture can lead to reduced resource use and improving the province's environment. For Hydro, the purpose of the IEEP is to acquire least-cost energy resources to reduce fuel consumption at the Holyrood Generating Station.

Offering a pilot program provides a test of the Hydro program design and has allowed Hydro to learn more about the energy use needs of their industrial customers. Also a pilot program helps to define features and characteristics likely to contribute to the successful implementation of a full program.

CLEAResult has conducted this process evaluation of the IEEP Pilot, 2010 to 2013, to assess the effectiveness of the pilot program, identifying accomplishments and areas for improvement, and to provide recommendations. The evaluation perspective is retroactive. A review was conducted of the pilot program design, the activities and outcomes surrounding program implementation, and the operations of the program over the pilot period. The findings and recommendations presented here relate to the pilot program. The scope of this evaluation does not include assessing the viability of the pilot program as a full program, or preparing a recommendation for further energy efficiency programming for industrial customers.

1.1 Program Overview

The Industrial Energy Efficiency Program (IEEP) Pilot provides Hydro's industrial customers opportunities to improve their energy use efficiency through investments in capital projects that are enhanced with Hydro incentives to increase the efficiency of the projects.

The highlights of the pilot program process, in general, are as shown in Exhibit 4.

Exhibit 4 IEEP Pilot Process Highlights

IEEP Pilot Process Overview	
High Level Energy Audit	High level energy audit performed on the industrial site, funded by the IEEP
Feasibility Study Funding Application	Customer prioritization of identified projects, selection for further investigation, and application for IEEP funding assistance

IEEP Pilot Process Overview	
Feasibility Study	Completion of a project feasibility study for identified projects prioritized by the customer, with funding assistance from the IEEP
Project Development Agreement - Submitted	Customers wishing to proceed with feasible projects may submit their study along with the IEEP completed application for acceptance, evaluation for capital funding assistance, and approval by Hydro (see *Note 1*)
Project Development Agreement - Finalized	The next step before proceeding to project implementation is to finalize a Project Development Agreement outlining project deliverables, expected energy savings, and the obligations of both parties, including the incentive to be provided by Hydro.
Project Close-Out	Post-implementation, the project's energy savings are measured and verified to determine the incentive value to be paid out. The value will be adjusted to reflect measured results that are less than 85 percent of estimated and will be 'clawed back' for those projects in service for less than three years.

Note 1 Eligible customers may submit a Project Development Agreement with a feasibility study completed without IEEP funding assistance.

1.2 Program Context

Hydro has a mandate to deliver reliable, least cost energy to residents and industry in Newfoundland and Labrador. In executing this mandate Hydro finalized plans in 2009 for a pilot energy efficiency program to serve its transmission voltage customers. The pilot program design is unique in that it targets 100 percent of this group of four customers. Traditional CDM pilot programs target only a few members of the eligible customer class so that the pilot may focus on determining the program features and savings measures that will optimize program penetration rates while offering a successful portfolio of cost-effective savings measures.

The IEEP pilot, launched in 2010, recognizes the environment in which the customers are operating: international business and finance, commodity markets, competitive alternatives for their products, and shareholder demands. When also considering myriad industrial processes, not to mention equipment age and process efficiencies that characterize each customer's operation, IEEP provides a custom approach that is able to focus on the conservation and demand management (CDM) opportunities that can improve the performance of customers' capital projects.

Implementation of the pilot program was assigned to a dedicated IEEP staff member who manages, markets, and engages customers for the IEEP pilot. As well, engineering services are available to visit customers' sites, review energy use technical issues with program applicants, and review applications for feasibility study funding, feasibility studies, and project applications as required. The assigned engineer also provides recommendations and approvals for study funding applications, feasibility study reviews and recommended payment, and project applications. Project post-implementation measurement and verification are performed by certified measurement and verification professionals engaged by Hydro, or are conducted through coordination with the customer.

Prior to Spring 2012 Hydro had received project applications from only one of the four eligible customers. Customers held the perception that the IEEP administrative requirements would be onerous while Hydro's perspective was that the program incentive was not sufficient to overcome the customers' perceived 'cost' of participating in the program. To dispel the perception that the program's administration was cumbersome, IEEP held a two-month Fire Sale, March 26th to May 25th 2012. The sale offered an increased incentive rate for projects that applied for Feasibility Study funding during the sale period.

1.3 Program Results

Exhibit 5 summarizes the program activity during the pilot period. As a result of high level energy audits funded by IEEP or as previously identified by the customers, thirty CDM projects have been identified amongst the four eligible customers. All but one eligible customer received high level energy audits. Funding has been approved for 11 feasibility studies. Eight studies have been completed. There have been six applications for Project Development Agreements, all of which have been signed by the parties as of the launch of this evaluation. Three CDM projects have yet to begin implementation and three have been implemented and are in service. All three in service projects have submitted their M&V reports per the Project Development Agreement. The three M&V studies have been reviewed and the projects closed. A fourth closed project was influenced by the program. It is a lighting project identified during the Fire Sale, after which the customer chose to install the project without further participation in the IEEP.

Exhibit 5 Summary of IEEP Pilot Activity 2010 - 2013

Pilot Activity	Total	Customer 1	2	3	4
Project Identification	30	16	5	8	1*
Feasibility Study					
No Funding Application	18	6	4	8	
Funding Approved	11	10	1		
Complete	8	8			
Project Development Agreement	6				
Implementation Not Started	3	3			
In Service	3	3			
Measurement and Verification					
Study Submitted	3	3			
Study Reviewed	3	3			
Project Close	4	3			1*
*** IEEP Influenced**	1				1

Total savings delivered by the implemented IEEP projects (Closed) are delivering annual energy savings of 3.3 GWh at a resource acquisition cost of $0.046 per kWh. Exhibit 6 summarizes the costs and impact of the closed IEEP projects.

Exhibit 6 Closed IEEP Projects Summary

Project Development Agreement	Costs			Measure			Benefits	Total Resource		Simple Payback
	Utility	Customer	Total	Life	Energy	Capacity	Energy		Net Benefits	Participant
CLOSED				*years*	*kWh*	*kW*	*dollars*			
Pump 1123 replacement	$32,926	$32,926	$65,851	6	612,071	71	$245,646	3.7	$179,795	1.5
Bleach Tower Bypass	$106,172	$134,914	$241,086	6	2,436,000	282	$977,655	4.1	$736,569	1.5
Outside lighting / photocells	$15,414	$15,414	$30,828	6	289,611	0	$116,231	3.8	$85,403	1.4
TOTALS	$154,511	$183,254	$337,765		3,337,681	353	$1,339,532	4.0	$1,001,767	

It was thought that the brief window of opportunity offered to eligible customers to obtain higher incentive amounts (via a "Fire Sale") would create a sense of urgency and increase program participation. IEEP staff would be able to demonstrate how the program facilitates project identification, access to funding for feasibility studies, and ease of finalizing an incentive agreement.

Some interest was expressed by all customers. However, after discussions, and IEEP staff helping to complete application forms, and submit applications for funding for feasibility studies, the eligible participants did not increase their IEEP project activity. One identified project proceeded without further IEEP assistance and in another case IEEP's main customer contact left their position before gaining corporate and operations' attention and support for IEEP.

1.4 Evaluation Objectives

The purpose of CDM programs is to address the barriers to increasing the efficiency of energy use by all consumers. A program evaluation must look at how well the barriers have been addressed and identify areas that can be improved.

This process evaluation reviews the IEEP pilot design, implementation, and program operations, shown in Exhibit 7. Important also are the program adaptations that have occurred during the pilot's operation. Observations and comments from the review serve as input to identifying program results that are consistent with expectations and those results that are not as expected. From the evaluation results program improvements will be identified, along with suggested action items.

Exhibit 7 Evaluation Assessment

Program Components	Assessment
Design	How effectively is program participation enabled?
Implementation	Are energy savings acquired?
Operations	Are management and delivery resources sufficient to sustain customer participation and savings acquisition?

The evaluation areas are program design, implementation, and delivery. Program participation relies on program design, while successful implementation relies on program components such as incentives, eligibility criteria, and outreach which aligns with customers' expectations and market positions. Operations rely on effective management of program resources, activity oversight, and customer relations.

1.5 Evaluation Activities

Exhibit 8 summarizes the information collected as input to this evaluation. Data and information for the IEEP was collected electronically from Hydro and from www.nlh.nl.ca/HydroWeb.

Interview questionnaires were drafted for program participants, eligible non-participants, and Hydro staff. Confirmed interview candidates were sent the questionnaire prior to phone interviews, which were conducted during December 2013 and January 2014.

Exhibit 8 Information Collection

Information	Source
IEEP Communications	IEEP documentation
Forms	IEEP documentation
Program Development Agreements	IEEP documentation
'Fire Sale' Report	IEEP documentation
Project Economic Analysis	IEEP documentation
Project Tracking Workbook	IEEP documentation
Interviews	
Participant Interviews	3
Non-participant interviews	0
Staff Interviews	2
Web Based Review	
Newfoundland Labrador Hydro	www.nlh.nl.ca
Newfoundland and Labrador Board of Commissioners of Public Utilities	www.pub.nf.ca
Nalcor Energy	www.nalcor.com
Industrial Energy Efficiency Programs	
Energy Smart Industrial Program (ESIP)	Bonneville Power Administration
Energy Management Pilot	
Continuous Energy Improvement Pilot	California
Industrial Power Smart	BC Hydro
Industrial Power Smart	Manitoba Hydro
Industrial Accelerator	Ontario Power Authority

Hydro was also interested in knowing the participation levels experienced in other jurisdictions by industrial CDM pilot programs. The evaluators investigated the program activity for 2 pilot programs and the annual activity for 3 operating programs, listed in Exhibit 8 above.

2 Program Design

The program's design is assessed by how effectively participation is enabled, how sustainable program components are, and how it meets with customer satisfaction. The program must address barriers that prevent energy users from moving forward on their own with investments in energy efficiency. Market acceptance of the program is the indicator of program design success.

2.1 Roles

The IEEP pilot is the first Energy Efficiency program offered to Hydro's transmission level Industrial Customers. The Energy Efficiency staff roles and program resources have successfully implemented the pilot program. While the pilot level of resourcing was sufficient to achieve

success, any planning for a full program will have to consider increased resource levels to meet aggressive annual savings targets.

2.1.1 Energy Efficiency Management

The Energy Efficiency Manager at Newfoundland and Labrador Hydro provides oversight and management for the IEEP. The manager was the first staff member of Hydro Energy Efficiency and was responsible for starting the program, including planning and 2010 implementation of the IEEP pilot. The manager made the initial presentations to the eligible customers. At that time, Energy Efficiency was reporting to System Operations.

2.1.2 IEEP Staff

The Industrial Energy Efficiency Specialist (IEES) is an engineering role, responsible for technical support for audit reviews, identifying project priorities with participants, and reviewing funding request applications and completed feasibility studies. To determine the evaluation criteria for assessing the project, the IEES consults with other areas within Hydro, such as Regulatory, Risk Analysis and System Operations. Once the project is assessed, the IEES completes the economic analysis for the project incentive, and incorporates the resulting amount into the project development agreement.

A full time IEES for the program was available from October 2008 to January 2010 and from February 2011 until March 2013. The role was handled by two individuals part-time during the first year of the pilot, one supporting the technical needs and one the customer relations component. During the current review of the pilot program, while new applications are not being accepted, resources are available to continue processing existing projects that are downstream of feasibility study completion. As needed, external consultants are being assigned technical reviews.

2.1.3 Eligible Customers

At IEEP start-up there were four eligible customers for the pilot. During the interim, another major industrial customer has been designing, constructing and commissioning a nickel mine and concentrator facilities at Long Harbour to support the Voisey's Bay mine in Labrador. Currently their activities are split evenly between construction, commissioning, and operations. Exhibit 9 presents company information for the eligible customers.

Exhibit 9 Major Industrial Customers

Major Industrial Customers	Production	Employees	Location
Corner Brook Pulp and Paper	Thermo-mechanical pulp (TMP) and newsprint	610 full-time and casual workers in the mill,	Corner Brook, Newfoundland
North Atlantic Refining Ltd. (NARL)	Low-sulphur, clean fuels from sour crude	Approximately 550 people	Come By Chance, Newfoundland

Major Industrial Customers	Production	Employees	Location
Iron Ore Company of Canada (IOC)	Iron ore (open pit mine)	Approximately 1,900 people	Labrador
Teck Resources	Copper and zinc concentrates	Approximately 300 people.	Central Newfoundland (100km Southwest of Grand Falls-Windsor)
Vale	Nickel sulphide concentrate (also containing copper and cobalt) and copper sulphide concentrate	Approximately 450 people are employed at the mine and concentrator operations	Long Harbour, Newfoundland

2.2 Survey Introduction

The survey opened with general questions about the companies' outlook for market conditions, the companies' interest in efficiency, their participation in other demand-side management programs, and their overall view of the IEEP. The following list summarizes the responses received from the three customers interviewed.

- Commodity markets are relatively stable, with a 'healthy order book', 'long-term contracts in place', and 'market prices are expected to be fine in the long-term'.
- Industrial processes are complex and operations' focus is on reliable operations. For example an operations goal is to "adjust processes and equipment to stabilize product quality and machine performance to reduce costs". For another operation "availability of power is tantamount along with reliability but efficiency helps". For new plant the priority is to "make sure the process works first and optimize later".
- Efficiency is important to everyone. One does not need more production but does "need more efficiency and cost reduction".
- Total cost of energy is a large portion of total operating costs. For one customer, the cost of energy, including feedstock, is the second highest contributor to total production costs. For another, energy costs are over $100 million, or 10 to 15 percent of total annual operating costs.

The survey also asked about company strategies for managing greenhouse gas emissions. Responders mentioned company interest in opportunities for demand reduction in conjunction with reducing fossil fuel use and total energy costs.

- Interviewed companies are preparing to address compliance requirements for greenhouse gas and other air emissions by moving towards using efficient fossil fuels, self-generation with waste heat and renewable fuels, and possibly fuel switching to electricity. Long-term oil supply is expected to be more costly than electricity supply costs.

- Reducing/eliminating Bunker C oil and diesel fuel consumption is a priority for customers. Decision criteria for selecting new equipment include assessing operational impact on the plant facility's total emissions.
- Companies are expressing interest in demand reduction opportunities that could provide income to invest in clean fuel equipment and systems. One company would like to "explore providing variable power to Hydro" from their plant.

2.3 Program Design

Major industrial operations are complex and each is unique. Their corporate and operating goals are not generally aligned with optimizing energy use efficiency and their project managers must continuously meet budgets, schedules, labour, and engineering challenges to complete their work. Utilities share many of these same characteristics with large industry. Both rely on formal business procedures and protocols to guide their relations and achieve shared goals. The IEEP pilot provides formal procedures and protocols for assessment and feasibility of each project and its associated energy savings. Binding contracts are put in place and installed projects' savings are measured and verified to finalize the paid incentive.

However, an important characteristic that industry and utilities share: they both invest in long-term resources and assets. Large industrial projects will take several years to be implemented. The IEEP pilot includes documented requirements and formal approvals designed to span the changes and adjustments that will occur during the project construction and implementation period. For the utility, those assets remain in their service territory regardless of changes in ownership or operations.

2.3.1 Market Barriers

The IEEP design is not new and has been implemented in other jurisdictions. The market barriers for industrial energy efficiency improvements are universal, while the ranking of the barriers may vary depending on local policies, regulations, and rules. Common barriers that successful energy efficiency programs recognize are:

- Energy efficiency is not a driver for industry. Their business is production.
- Process reliability is top priority. New techniques and technologies are viewed as risky.
- As a for-profit enterprise, resources are constrained and access to capital is competitive across the enterprise.

2.3.2 IEEP Program Components

Recognizing the uniqueness of each customer and project, the IEEP has been designed to develop custom projects. This design allows the utility to identify energy savings opportunities from myriad energy use applications in industry. Rather than prescribe the savings measure, the IEEP offers funding to study opportunities and develop project proposals, the results of which are subject to professional utility or third-party technical review. The design provides the

participants with the option of simultaneously bringing forth several savings projects related to a single system that is being upgraded. The IEEP pilot considered both customers' retrofit and new build/expansion projects.

Step 1 - High Level Energy Audit
To begin, Hydro fully funds a high level, plant-wide Energy Audit (walk-through audit) of the customer's plant facility. The audit is conducted by an energy auditor familiar with industry and qualified to identify typical energy saving projects for similar facilities. The auditor provides Hydro and the customer with a list of prioritized projects, each of which may warrant further evaluation.

Step 2 - Feasibility Study
After selecting a project (or projects) to investigate further, the IEEP process requires a completed Feasibility Study of the proposed savings measure be submitted for review. The participant may submit a request for funding assistance to complete the Feasibility Study.

Approved funding applications are eligible for 50 percent, to a maximum of $50,000, of approved study costs. Participants must maintain at least a 25 percent stake in the study. The completed feasibility study is issued to the participant and submitted to Hydro for review. Customer studies completed prior to their IEEP participation may also be submitted for Hydro's review and acceptance at Hydro's discretion.

Step 3 - Project Proposal and Development Agreement - Submittal
The participant prepares detail project information, including the Measurement and Verification (M&V) Plan, and submits a Project Development Agreement to Hydro for review and signatures.

Step 4 - Project Development Agreement - Finalized
The Project Development Agreement (PDA) upon review stipulates the terms and conditions of the incentive payments. The appendices to the Project Development Agreement comprise the IEEP documentation and project information. Upon agreement, the PDA is signed by the parties.

The project incentive offered by Hydro is the least of the following:

- $0.100/kWh of estimated first-year energy savings (first 12 months of project in-service) for Island Projects and $0.045/kWh for Labrador projects,
- Project reduced simple payback to 1.5 years, or
- 50 percent, to a maximum of $500,000 of eligible project costs.

Projects that receive financial assistance from other programs may receive a reduced IEEP incentive amount.

Step 5 - Project Close Out, Measurement and Verification
After project completion, the Measurement and Verification plan is implemented to determine the payout incentive amount. That incentive amount may be adjusted if verified savings are less than 85 percent of the estimate. Claw back provisions are in the Project Development Agreement for projects that remain in service less than three years.

2.4 Outcomes

When customers participate in the program and are satisfied with the results from their participation, the program design has overcome the market barriers. Participant satisfaction also indicates how well the program process and project documentation have been received by participants.

Based on program information supplied, consultants' experience, and interviews with three program participants, the following observations have been made regarding the program design.

Participants' Assessment

- Personal presentation of IEEP introduction was well received. Some participants were able to "see clearly that there was something in it" for their company. The program "has looked at process improvements that provide energy savings".
- IEEP presentations were made to customer managers and staff working with other Hydro representatives as well. At one company, responsibility for IEEP development was shifted after the project identification step to another corporate unit. There was no IEEP follow up activity and the corporate unit has since essentially disbanded.
- Installations of the IEEP improvement projects would have been significantly delayed without incentives.
- "IEEP reinforces the corporate strategy to reduce costs to improve competitiveness globally. All employees know the strategy."
- In another case the evaluation interviewee's contact information was provided by Hydro but the interviewee had no knowledge of the IEEP program prior to the interview request. It was thought likely that the original IEEP contact had left the company. The evaluation interviewee requested Hydro IEEP follow-up with company.
- At one company the IEEP contact is responsible for identifying projects and then serves as "owner's rep" during project implementation. However, eventually the IEEP contact was assigned full-time to a large project and became unavailable to continue participating in IEEP projects. "If the ball did drop, then it needs to be picked up again." The company wants to see "IEEP rejuvenated" at their operations.

Staff Assessment

- Have not seen the participant activity expected.
- Major barriers to participation have been addressed.
- Program launch considered the small number of eligible participants and focused on Hydro presentations at eligible customer offices and facilities, relying on a meeting format.

Evaluator Observations

- Awareness of energy efficiency benefits is not sufficient to remove the customer barriers to prioritizing energy efficiency or program participation. It is the beginning of a

relationship whereby the utility provides the customer with the support and guidance they need to fit the program into their organization and administration. Awareness may trigger interest but relationship attentiveness builds the trust and confidence needed to take action.

- Three of the initial four eligible customers were interviewed. All interviewees are interested in the IEEP continuing.
- As a pilot, by definition, the IEEP is temporary which can cause some to associate uncertainty with the program's availability. For some, the uncertainty is motivation to move quickly while the program is available; for others, the pilot program life may not be seen as long enough to match their capital planning horizon.
- Three customers initially eligible for the program moved ahead to complete high level walk-thru audits and audit reports, indicating that the IEEP introduction to the program and presents the benefits of energy efficiency improvements were successful.
- Only one of the initial IEEP customer contacts remains in a position to integrate IEEP screening regularly into the company's project management. It is no coincidence that this company has been the most active IEEP participant.
- Each of the industrial customers has several Hydro representatives working with them. The customer's main Hydro contact was also assigned responsibility for IEEP involvement. It was not long in one case before the IEEP responsibility was moved away from the main Hydro contact to another area in the company, responsible for the environment. The company's mandate for the environment shifted to focus on reducing fossil fuel consumption and emissions. Subsequently energy efficiency and the IEEP were dropped from the company's environment mandate.
- As the workload of the customer IEEP contact grows, time for IEEP involvement and integration diminishes. If the customer IEEP contact is assigned full-time to a specific project then all other company projects may proceed without any IEEP involvement.

2.5 Program Participation Levels

To address Hydro's concern about the participation activity in the IEEP pilot, a sample of participation levels in industrial efficiency programs was investigated. The sample is shown in Exhibit 10. In the case of pilot programs, the design is usually tested on a small number of candidates to keep the scale manageable and to learn as much as possible before investing in the infrastructure and resources to offer the program to an entire class of customers. Such is the case for both the Bonneville Power Administration Energy Management Pilot, which may be made available to 20,000 customers and the California Continuous Energy Improvement pilot which will be offered to 36,000 customers. Only 19 and 38 participants respectively were in each of the pilot programs.

A program of similar design to IEEP, the Ontario Power Authority's Industrial Accelerator, was able to receive 62 funding requests for feasibility studies from 54% of eligible customers in its first year of full operation.

Exhibit 10 Industrial Program Participation

	Program Name	Location	Utility	Launch Date	Status	Participation	Customer Class Size	Notes
1	Energy Smart Industrial Program (ESIP) Energy Management Pilot	Pacific Northwest, US	Bonneville Power Administration	2010	Pilot	19	20,000	Including 482 transmission Voltage Connected
2	Continuous Energy Improvement	California	Investor-owned Utilities Pacific Gas & Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E) and Southern California Gas (SoCal Gas).	2010	Pilot	38	36,000	The PUC's 2013- 2014 guidance decision directs the CEI program to further serve as an integrated pilot program for Integrated DSM strategic planning, with expansion to mid-size businesses.
3	Industrial Power Smart	Manitoba	Manitoba Hydro	2010/11	Full	2,348	68,520	General Service Customers, including industrial
4	Industrial Power Smart	British Columbia	BC Hydro					
5	Industrial Accelerator	Ontario	Ontario Power Authority	2009	First Year	26	48	Transmission Voltage Connected; 26 participants, applications for studies(62) and projects (9)

Meanwhile the IEEP as a pilot received 11 funding requests from two customers (50 percent of participants). The IEEP averaged 2.8 funding requests per total eligible customers while Ontario's Industrial Accelerator averaged 1.3 requests per total eligible customer. The IEEP pilot, based on a design consistent with fully operating programs in other jurisdictions compares favourably to the programs in Exhibit 10.

3 Implementation

The program's implementation is assessed by how effectively the program activities engage the market, identify savings opportunities for customers, and track customers' participation. The evaluation must consider the rigour with which the program services are delivered to the customers, including utility documentation of direct communications with customers and participants, customer project studies received, project proposals submitted, final project agreements, and M&V studies received and reviewed.

An industrial energy efficiency program has been implemented successfully when program elements are easily adapted into the participant's project development process. Program documentation must provide assurances to all parties of process compliance, technical due diligence, and delivered savings benefits throughout the program life.

3.1 Market Development

The IEEP has addressed 100 percent of its target market. Program kick-off meetings were held with all eligible customers to introduce the IEEP. Customers were also reminded of the benefits of IEEP during 'Fire Sale' campaign in the first half of 2012.

3.2 Delivery

The IEEP design is similar to other industrial energy efficiency programs that are operating successfully in other jurisdictions (Ontario). Applying the design of an operating program may have lead Hydro to underestimate the market awareness and relationship development needed to sustain customer engagement. Presenting the program is the beginning of the relationship that will build customer support and their active participation in the program. Once shared priorities are established, customer's planning and project development can accommodate and even integrate the program steps as well.

The pilot IEEP is CDM's first direct engagement with industrial customers. Industrial customer requirements change as the companies respond quickly to remain competitive. For customers it is difficult to pay attention to energy efficiency. It is even more difficult to regain customer attention if it has moved on due to changed company priorities. Communication and staying in touch can keep the program resilient while providing the incremental accommodations that may be needed by customers to keep energy efficiency as a priority.

Given the multiple Hydro representatives with whom the customers come into regular contact, it is easy to understand why one person within the company is assigned as the main Hydro contact. It is also easy to understand how difficult it is to elevate IEEP or CDM against the higher responsibilities associated with maintaining reliable power systems and plant operations.

3.3 Eligible Customer Documentation

Based on reviewed program documentation and interview responses, it appears that IEEP and participant communications are not formally recorded. Comprehensive record keeping with copies of participant communications, staff notes, and customer documentation can enable CDM staff or others in the utility to follow up in a timely manner as needed. It is expected that IEEP forms, studies, and agreements are filed in sequential order by date, and comprise the IEEP record for each customer.

IEEP participant documentation and records provide an important source of input to program development and customer relationship management. Practically the IEEP process builds an inventory of customer identified projects. As the customer relationship grows there are fewer hidden barriers to successfully 'mining' the project inventory over time.

3.4 Outcomes

The expected outcome from program implementation is the acquisition of energy savings by the utility. A strong framework is needed to track participant identified and planned projects with sufficient documentation so that project development may occur efficiently over time. The

evaluation looks for execution and completion of participant projects, which combined with the framework rely on the program representatives' roles and services.

Based on program information supplied, consultants' experience, and interviews with three program participants and two Hydro staff, the following observations are made regarding the program implementation.

Participants' Assessment

- Program incentives are seen as sufficient to "make projects go". The program addresses cash flow concerns and creates the opportunity to advance projects.
- The flexibility of the process, e.g. adapting language and adjusting forms, is appreciated.
- There is operational awareness of the IEEP program and it is having an impact on customers' approach to acquiring energy savings. Customers recognize that there are more potential savings in their operations than those already identified.
- The IEEP process is compatible with one company's project management process; the identification and feasibility study steps are consistent with company project development practices. This customer wants to "do feasibility studies on all projects so Hydro is engaged from the start".
- As large industrial operators, participants have in-house engineering capabilities. Project design does not generally include specific energy analysis. Energy efficient equipment can be readily procured to improve system performance and reduce overall energy costs.
- For specialized energy analysis, participants rely on outside engineering specialists that have experience designing electrical systems and have knowledge of the Newfoundland Labrador electric system.

Staff Assessment

- There are multiple Hydro contacts with major industrial customers.
- One customer has integrated the IEEP process into their project screening and prioritizing.
- Full-time technical resource available during design and Years two and three of IEEP pilot.
- The IEEP design does not address the major barrier to customer project implementation, which is the long project payback period due to low electricity rates.
- Hydro's marginal cost of supply is high and supports investment in low-cost CDM projects.
- Customers are interested in seeing what the opportunities could be.
- One-day field service to Labrador requires three Hydro working days (two days of travel).
- Hydro staff needs longer periods at customers' plant to become familiar with people, plans, and operations/processes.
- IEEP has the resources to process applications and project proposals at current volume levels.

Evaluator Observations

- IEEP participants have identified several projects but have not begun feasibility studies to determine which projects are most worthwhile.
- Participants' priorities will dictate the integration of IEEP procedures and schedules for project implementation over one or more business cycles.
- Single CDM engineer responsible for most IEEP front-office and back-office functions.
- Same CDM representative for all four customers, located across the service area.
- Visits to participants' facilities and sites are focused on IEEP objectives as time and scheduling constraints do not allow for exploration of customers' activities and progress in efficiency–related projects.
- The lengthy 'pilot' status may have sent an inadvertent message and left major industrial customers uncertain as to the IEEP status for the long term.
- CDM messaging to be effective needs to be about technology and energy savings measures or practices when the audience are those responsible for operations, facilities maintenance, or new construction. Financial incentives and administrative assistance are appreciated but they do not provide the thought leadership that builds long-term changes in practices and behaviour.

4 Operations

Although this is a pilot program and it is not expected that the IEEP is formalized within Hydro's CDM organization, the evaluation looks at the planning, documentation, and data management that comprise industrial program operations to assess effectiveness of facilitating the IEEP staff in performing their roles, including management, administration, and program representatives.

4.1 Organization

CDM, working in a collaborative manner, can be flexible and dynamic in meeting customer and corporate needs, provided that individual workload is manageable and all are productive. Adequate staffing, office resources, budget, training, compensation, and planning are fundamental to successful organization.

4.2 Planning

Operations planning are to ensure resources are available as needed to perform the program functions in a manner that sustains program and participant activity and can assure the program success.

4.3 Roles and Responsibilities

IEEP operational oversight and management rests with the Energy Efficiency Manager who is responsible for all CDM programs. The Energy Efficiency Manager also reports CDM activities and outcomes to the manager's direct superior, the Vice President of Corporate Relations, as well as monthly reports to the Leadership Team and.

The IEES engineer is responsible for field contact with participants to administer the IEEP process for identified projects. The IEES engineer provides the in-house technical reviews of studies, project proposals, feasibility study funding requests, and project development agreements.

4.4 Communications

The CDM organization lends itself well to frequent and timely updates about program and participant activities and required actions to be taken. CDM communications with program participants is focused on program requirements in the case of IEEP.

CDM communications across Nalcor and with government agencies is managed through regular reporting and engagement as needed. However, CDM communications across Hydro is experiencing mixed messages as CDM is being singled out to respond to policy and strategic directives from executives and officials. These issues may be somewhat focused on the IEEP pilot due to its level of potential energy savings available.

4.5 Data and Records Management

It has been possible to manage IEEP data and project information without specific application software or major IT support. This level of data management is appropriate for a pilot project.

4.6 Outcomes

The effectiveness of program operations can be seen in the focus of the organization to facilitate program representatives' roles facing the customers and managers' responsiveness to program activities and stakeholder feedback.

Based on program information supplied, consultants' experience, and interviews with three program participants, the following observations are made regarding the program operations.

Participants' Assessment

- The customer who has adapted readily to the IEEP found the process and schedule to be flexible.
- The customer was appreciative that the IEEP operation is "not bureaucratic" and that there was lots of help with applications.
- At two customer facilities, the initial customer contact for IEEP was reassigned, or left the company after the pilot presentation. In one case, the interviewee was completely unaware of the IEEP and its role in the company, while another did not realize that the "ball had been dropped" through changes in corporate priorities for the environment.
- Although the "ball did drop", the interviewee, the original IEEP customer contact, did know that the company was happy to participate with Hydro in the local community energy campaign to provide CFLs and build energy efficiency awareness. The company is open to other opportunities to participate in Hydro CDM community activities.

Staff Assessment

- The IEES manages customer contact relationship throughout customer's IEEP participation; their responsibilities include sales and marketing to the customers; engineering review of projects and studies, and administration of preparing incentive payments.
- CDM staff group (5) work closely together, in a collaborative manner.
- Manager reports CDM progress directly to executive management.
- Annual program activity targets are set.
- CDM training occurs when needs are identified.
- Evaluations have not been scheduled on a regular basis.
- CDM is aligned with System Operations and Corporate Relations.
- Econometric load forecast has not incorporated CDM resource acquisition as the forecast savings have not yet been of a large enough magnitude.
- There is limited interaction with Customer Service, which serves distribution customers.
- CDM's role and objectives are concurrent with government direction.
- Hydro interested in how the IEEP and its results line up with messaging.
- CDM's role is part of Hydro's response to government's direction and plan to increase energy efficiency (Energy Efficiency Action Plan – 2011).

Evaluator Observations

- Direct IEEP sales to customers are best performed by the IEES. Successful sales require focus and time to engage with the participants to explore savings opportunities. The IEES, given enough time on site and with the customer, is the best candidate to build up Hydro's CDM industrial file while providing the support that participant needs to incorporate IEEP screening throughout their plant project management.
- Even with few customers, program collateral that can be customized is needed to serve as 'Leave Behind' with customers and stakeholders external to Hydro. Developing synergies with industry and professional associations can help develop a thought-leadership role for the IEES.
- Industrial energy efficiency savings acquisition takes years. Industry does not turn on a dime, much like utilities. There is too much at stake. The IEEP can recognize this shared characteristic with an inclusive portrayal of industry and utility as resource managers creating long-term value for the citizens of Newfoundland and Labrador.
- Management is working to establish best practices for program planning, operations, and evaluation within the CDM area.
- A design consideration for a renewed IEEP is energy management, whereby a dedicated energy management professional works part or full time at the customer plant to advance energy efficiency practices throughout the corporate, planning, financing, innovation, maintenance, overhaul, and new construction functions. Given that the customers are international corporations and compete corporately and globally for funding and markets, energy management assistance may provide significant value to the customers' long-term operation.

5 Program Effectiveness

5.1 Design

The major industrial customers have and are participating in the IEEP, although progression through the program steps has been sporadic and slow. It is difficult to determine if, and how the customers can be motivated to advance their energy savings opportunities. Customers that have participated gladly stated their satisfaction with the program.

The IEEP, with its applications, forms, technical requirements, and signed agreements is designed to address the delays and lags inherent in working with customers focused on operations and process reliability, maintaining productivity, and avoiding all production risk to ensure their competitive position. The documentation is the record, ready to inform others and enable those newly assigned to carry on with program delivery and project implementation and verification.

Interviewed customers are enthusiastic about the program continuing beyond the pilot phase.

5.2 Implementation

The IEEP walk-thru audits have identified project annual savings of 321 GWh. Closed projects are delivering 3.3 GWh annually. This demonstrates that implementation of the IEEP pilot has been effective and the program is able to complete the acquisition of energy savings from customer projects.

5.3 Operations

As a pilot program, CDM provided sufficient resources to build customer awareness, complete walk-thru audits that have identified 30 project opportunities, and administer three projects through to closure and energy savings verification.

6 Recommendations and Actions

The recommendations for each program component have been grouped by time frame, as shown in Exhibit 11. The short term recommendations focus on developing a coordinated approach to communications with industrial customers, customer relationship management and efficient deployment of program resources. In the medium term the recommendations focus on building CDM capacity for industrial programs and expanding the options for program acquisition of energy savings from industrial customers and increasing program delivery efficiency.

Exhibit 11 Recommendations Summary Table

Program Components	Short Term *Six to Twelve Months*	Medium Term *Eighteen to Twenty-Four Months*
Design	Prepare a marketing and communications plan	Investigate alternative program design – Energy Management
	Design a central repository for customer relationship management	Prepare a pilot program for an alternative design
Implementation	Bundle utility services offered to industrial customers	Prepare a joint communication plans with customers
	Prepare an evaluation plan and schedule	
Operations	Manage customer relationship data collection and tracking	Increase capacity of CDM staff and expand services to industrial energy users
	Provide participants with project tracking statements	Add market weights to customer project management and tracking

6.1 Short Term Recommendations *(six to twelve months)*

The following recommendations focus on industrial customer communications, data management capability for customer relationship management, and program evaluation planning. Once in place, there will be a strong base upon which to engage the industrial customers throughout the program planning and implementation phases.

Design

✓ Prepare a CDM marketing and communications plan for industrial customers

Work with communications staff to develop a marketing and communications strategy and approach that will inform CDM program design work for continued industrial programming. A continuing program for industrial customers requires a multi-year marketing and communication plan that matches the program life, laying out specific actions and deliverables for the early part of the period and general direction for the remaining years. Electricity is a large operating cost for industry and, in general, capital spending is required to permanently reduce energy costs. It is the consultants' experience that program success requires engaging plant operators and plant management regularly. A plan is needed to present the options, resource requirements, and costs, for selection and implementation by each program.

A bundled service approach to industrial customer communications could integrate the Hydro service information into a custom package for each customer. Such an approach demonstrates customer focus and cost-efficient utility service management. Customers may find it more efficient as well

✓ Design a central repository for customer relationship management

Develop customer intelligence data collection parameters and data organization in a prototype file that can be used for customer project tracking, analysis, and reporting. A central repository of specific customer and market intelligence can serve as a reference for program staff and management. The information received by the evaluators was somewhat fragmented and did not necessarily align with the customer information received during the evaluation interviews. To ensure maintenance and utilization of this information by operations, a data collection file and, if applicable, a relational database should be designed.

Implementation

✓ Include the customers' bundle of utility services in program communications and messages

Further CDM programming for industrial customers will strengthen Hydro's relationship with the customers. A message describing each customer's Hydro services can be leveraged to introduce the programming to new contacts and/or to continue working with existing contacts and their identified projects.

In preparation for implementing the communication plan, establish a customer contact directory of all Hydro representatives for each industrial customer.

Bundle communication material that integrates customer intelligence information with communication packages and goals:

- Publish *Leave Behinds*, with IEEP stamp/takeCHARGE Brand, with inclusive messages.
- *Leave Behinds* may include program brochures, technology information, updates to standards/regulations, event notices, relevant research papers, equipment offers, and Best Practices/Case Studies reports.
- Prepare calendar schedule for communicating with each customer.
- Prepare individual customer packages and calendars.

✓ Prepare a program evaluation plan and schedule

Program evaluations are the tools that assist in assessing program performance and pointing out improvements. Evaluation planning is best done concurrently with implementation planning. This practice allows time to address any identified shortcomings before program launch.

Programs must remain dynamic to be able to respond to myriad factors that can influence customers' decision making and still remain on track to meet utility expectations. Plan for both process and impact evaluations, including schedules. The customer project measurement and verification (M&V) reports and results would serve as input to the impact evaluation.

Operations

✓ Manage customer relationship data collection and tracking

Reliable customer and contact information is an important factor in effective program operations. Using the data collection formats and files that have been prepared for managing the IEEP, operations staff is positioned to populate and update records and files on an ongoing basis. Data collection should be designed to eliminate redundancies and provide a single source for information.

Customers' organization and contact information is vital to maintaining effective program delivery by industrial program staff. The updated contact information may be of service to other Hydro customer representatives as well. The organizational updates may be linked to shifts in corporate priorities and trigger a follow-up call from the industrial program staff to the participant contact.

✓ Provide participants with project tracking statements

The IEEP process comprises several steps, with variable duration between each step for each customer project. Tracking the status of customer projects along with staff activity by process steps could provide a quick snapshot of industrial program activity. Generating a report for each customer would also provide them with a snapshot of the status of their projects and provide a regular program/participant communication opportunity.

While tracking would be ongoing in the industrial program process, the customer project status report would be produced periodically in conjunction with the communications plan and schedule arranged with the customer. Regular project status reports provide the customer with project tracking documentation that can be easily passed on to managers and others at the industrial site. Industrial program activity reports could also be generated as needed by the industrial program management.

6.2 Medium Term Recommendations *(eighteen to twenty-four months)*

The medium term recommendations focus on increasing industrial program services with energy management training for program staff and assessing alternative program designs for expanding the program's energy savings acquisition potential.

Design

✓ Investigate alternative program design

Given few customers dispersed across a large geographical area, it is difficult to readily increase the IEEP program delivery cost-effectiveness or accelerate savings acquisition. In other jurisdictions with large numbers of customers, there is a project ramp-up rate that increases as more customers become program participants. Total project activity relies on customer throughput. For Hydro, once each eligible customer is participating, the number of projects at any given point in time will be relatively flat. Consequently there will be little opportunity to reduce average program costs.

To maximize energy savings acquisition from industrial programming, other energy efficiency delivery models warrant investigation. The IEEP provides a strong foundation for future industrial customer CDM programming. Other models can build on the IEEP project development process. They can provide the focus and integration industrial companies require to incorporate energy efficiency into their policies and planning, while adopting energy efficient operating practices and investing in savings measures.

A model that is suggested as worth investigating is energy management. Specifically, a certified energy management professional is hired by the industrial customer to provide comprehensive energy management planning and project implementation. Utilities in other jurisdictions (for example, BC Hydro and Bonneville Power Authority) offer co-funding for an energy manager's salary. A Certified Energy Manager (CEM) is a professional who has completed a comprehensive learning and problem-solving forum to acquire a broader understanding of the latest energy cost reduction techniques and strategies. CEMs provide valuable services to large energy users, including industry, governments, universities, schools, and hospitals.

✓ Prepare a pilot program for an alternative design

To pursue an alternative program design, prepare a preliminary document that can be shared with industrial customers to obtain their feedback and comments. This document can also contribute to seeking approval for the customer-endorsed pilot design. A component of the design will comprise the IEEP developed 'infrastructure' to handle project identification, feasibility, financial arrangements and contracts to deliver verified results.

Implementation

✓ Prepare joint communication plans with customers

It can be difficult to sustain effective communications over time, particularly when priorities change and new staff takes over responsibility for energy savings programs at either the customer site or at Hydro. Establishing and documenting shared communication goals with

customer contacts can enable others to 'pick up the ball' when staff changes occur. Exhibit 12 presents sample goals and targets for a joint communication plan.

Exhibit 12 Sample Shared Communication Goals and Annual Targets

COMMUNICATION GOALS
4. To provide energy efficiency program progress/updates, technical updates for customers' energy efficient equipment, industrial energy efficiency case studies, customer's projects' status, and regular tracking reports. 5. To share information about customer opportunities, priorities, concerns, and energy issues. 6. To explore opportunities for improving energy use efficiency in the customer plant.
ANNUAL TARGETS
4. Minimum 4 connections, including 2 in-person meetings; 5. Minimum 2 connections will provide new information regarding energy efficiency; and 6. Minimum 1 connection will cover budget and planning issues.
Format options include interactive web-based meeting, site visit, and invitation to industry association/utility sponsored event.

Operations

✓ Increase the capacity of CDM staff and expand services to industrial energy users

Industrial energy efficiency programs rely on multi-year relationships with customers as participants. As easily identified projects are installed, other business or process priorities will replace the focus on improving energy use efficiency, company resource constraints may arise, and/or attention to program involvement may wane. Increasing the sales and energy management skills offered by the industrial program staff can help prevent these issues by addressing them before they supplant energy efficiency as a company priority.

Providing sales training to industrial program staff, who are in regular contact with customer organizations, can build the program capacity to offer services. Energy management training to acquire Certified Energy Manager status would enhance the ability of CDM staff to identify potential projects and work with all levels of customer organizations planning and developing policy and procedures that support energy use improvement. The 5-day course presents the technical, economic and regulatory aspects of effective energy management to professionals. Other utility customer sectors that could benefit from energy management services include institutions, campuses, municipalities, hospitals, universities, and school districts.

✓ Coordinate customer project management and tracking with customer priorities

The inventory of identified projects will grow and each will have its own rate of progression through the program steps. A weighting factor applied to each outstanding project could help IEEP staff prioritize services by bringing forward those projects imminently ready to advance. Updates to participants' priorities and projects' status can be captured in the scheduled meetings set out in the joint communications plan and inform the update of the weighting factors.

The inventory of customer identified projects can be amalgamated for savings and cost analysis. Applying weightings to factors such as likelihood-to-proceed date, estimated date of development start up, approved capital budgets, and industrial output can be applied to rank the customer identified projects included in the tracking database. For those projects moving ahead concurrently, potential energy savings and cost estimates for the efficiency measures can help prioritize CDM staff efforts. Bottlenecks in the program process can be quickly spotted, and any found on the program operations side can be addressed with adjustments to handle the volume of activity.