

March 31, 2010

Regulatory Affairs Correspondence
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British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, BC
V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

**Re: Terasen Gas Inc. ("TGI") and Terasen Gas (Vancouver Island) Inc. ("TGVI")
(collectively the "Companies")
Energy Efficiency and Conservation Program - 2009 Annual Report
British Columbia Utilities Commission (the "Commission") Decision dated April
16, 2009 and Order No. G-36-09 Compliance Filing**

On April 16, 2009, the Commission issued its Decision and Order No. G-36-09 (the "Decision") on the Companies Energy Efficiency and Conservation ("EEC") Application approving funding for TGI and TGVI for 2009 and 2010 programs.

In the Decision, the Companies were directed to file annual EEC Reports on all of the EEC initiatives and activities, expenditures and results by the end of the first quarter following year-end and for each year of the funding period.

Further funding for 2011 was approved for each of the Companies in their respective 2010-2011 Negotiated Settlement Agreements¹ approved by the Commission

Attached, pursuant to the Decision, the Companies respectfully submit their first annual EEC Report for 2009 (the "Report"). In the Report, the Companies seek the following from the Commission:

1. Acceptance of the 2009 EEC Report;
2. Approval of the attribution of savings from regulation to be on a case-by-case basis; and
3. Approval for the attribution of 6 years of post-regulation savings to a Condensing Water Heater Initiative.

¹ Negotiated Settlement Agreements approved on November 26, 2009 for TGI by Order No. G-141-09 and TGVI by Order No. G-140-09

If you have any questions regarding this submission please contact the undersigned or Sarah Smith, Manager, Marketing and Energy Efficiency at (604) 592-7528.

Yours very truly,

**TERASEN GAS INC.
TERASEN GAS (VANCOUVER ISLAND) INC.**

Original signed:

Tom A. Loski

Attachments

cc (email only): EEC Stakeholder Group



Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc.

Energy Efficiency and Conservation Programs 2009 Annual Report

March 31, 2010

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1. REPORT OVERVIEW

1.1 Background

Terasen Gas Inc. (“Terasen Gas” or “TGI”) and Terasen Gas (Vancouver Island) Inc. (“TGVI”) (collectively referred to as “the Companies”) have been involved with Energy Efficiency and Conservation (“EEC”) since the 1990’s. The Companies’ earlier EEC activities were referred to in previous regulatory filings with the British Columbia Utilities Commission (the “Commission” or the “BCUC”) as Demand Side Management (“DSM”) activity.

Simply defined, EEC or DSM activity refers to activities designed to affect customers’ use of natural gas – generally to encourage them to reduce their consumption. These programs have been successful in the past in promoting the efficient use of natural gas, encouraging the adoption of low carbon energy alternatives, reducing energy costs for customers, and supporting government policy by reducing greenhouse gas emissions (“GHGs”). Yet until recently the Companies’ efforts were limited in terms of impact because of the relatively minimal funding allocated for EEC programs.

On May 28, 2008, TGI and TGVI collectively filed their Energy Efficiency and Conservation Programs Application (the “EEC Application”), seeking approval of increased funding of EEC programs for the timeframe of 2008-2010. On April 16, 2009, the Commission released its decision on the EEC Application and Order No. G-36-09 (the “EEC Decision”), which approved funding in aggregate of \$41.5 million (\$34.4 million for TGI and \$7.1 million for TGVI). On November 26 2009, the Commission released Orders G-141-09 and G-140-09 approving Negotiated Settlement Agreements (“NSAs”) in the 2010 – 2011 Revenue Requirement Applications for TGI and TGVI respectively. The NSAs allocated a further \$32.35 million in EEC expenditure for TGI, and \$6.1 million for TGVI, to bring the total approved EEC expenditure to 2011 for both utilities to approximately \$80 million.

This EEC Annual Report (“EEC Annual Report” or the “Report”) outlines how the Companies are already using this additional funding to further EEC, and how they will continue to broaden and enhance these efforts in 2010-2011. As the Report will make clear, the Companies are making effective use of the newly available funds to promote EEC and support the province’s goal of GHG reductions.

This report overview outlines the purpose of this Report and its content.

1.2 EEC Annual Report: Taking Stock of Progress, Taking Accountability

This Report serves two purposes.

First, this Report demonstrates that the Companies are meeting the accountability mechanisms included in their proposal to the Commission. One such mechanism was the requirement to file EEC Annual Reports as follows:

“A requirement that Terasen submit annually to the Commission, by the end of the first quarter following year-end, for each year of the funding period, a report on all EEC initiatives and activities, expenditures and results for TGI and TGVI.”

Second, it reflects the Companies' commitment to taking stock of the success and progress of efforts to promote EEC since the Commission's EEC Decision. The Commission specified the following information be included in the EEC Annual Reports:

“The Commission panel accepts Terasen's accountability undertakings, and considers that, while the proposal to evaluate the EEC project using the TRC test at the Portfolio level has been accepted, TRC calculations for each program area, initiative and measure should also be included in the accountability reporting as a means of assessing the components of the Project and their ongoing effectiveness.

Commission Panel directs that the annual EEC Report include the following:

- *TRC, RIM, UC, and Participant test calculations of DSM at the Program Area initiative and individual measure levels in addition to the total Portfolio level reporting. Reporting of the Residential & Commercial EE program areas should also be made at the New Construction and Retrofit levels.*
- *any inter and intra Program Area initiative funding transfers, with supporting rationale, and the impact of such transfers on the transferor and transferee Program areas, initiatives, and measures as the case may be.*
- *data for fuel switching programs should be tracked in a manner which allows for reporting types of fuels replaced by natural gas, including estimated GHG impacts.*

The Commission Panel also directs Terasen to include in its annual EEC Report to the Commission a discussion of its internal data gathering, monitoring and reporting control processes. The discussion should include a description of how these processes ensure that funds expended and the statistical results of the programs implemented are completely and accurately recorded and monitored, including any related internal check and audit processes. The report should also discuss how Terasen has measured or estimated the results of the EEC expenditure initiatives.”

The Commission also directed the Companies to redesign and resubmit the Attribution to Regulatory Change with its next EEC Annual Report, “reflecting the provisions of the DSM regulation which come into effect for [the Companies] on June 1, 2009”³ (please refer to Section 8).

The Companies believe that the details contained in this EEC Annual Report satisfy the requirements of the EEC Decision.

¹ EEC Decision, page 2

² Ibid, page 42

³ Ibid, page 40

1.3 Organization of the EEC Annual Report

This Report is a comprehensive overview of the Companies' efforts to seek funding for, and then to resource, design and implement a comprehensive EEC initiative in 2009 and beyond. It officially serves as the EEC Annual Report for 2009; it also identifies the Companies' plans for EEC activities in 2010. Collectively these sections (and this EEC Annual Report) demonstrate that the Companies are developing and carrying out an effective portfolio of EEC Programs and associated activities.

This Report includes the following sections:

2. A History of Commitment to DSM

This section outlines the Companies' long-standing commitment to DSM activities, despite a comparatively low level of funding. The fact that the Companies have historically been engaged in DSM efforts will help to ensure that the transition to a broad, robust EEC portfolio is a smooth one.

3. Appropriate Resources: Financial and Human

In this section, the Companies describe the funding requested for EEC activities and the amounts approved by the Commission. It details how these funds are necessary for the Companies to create the kind of robust EEC plan that will reshape customer behavior. The section also details how the Companies have established a well-resourced EEC team and how external consultants will be used to supplement that team's expertise.

4. 2009 Activities: Establishing the EEC Foundation

This section details how the Companies have developed a comprehensive EEC Portfolio of programs with associated activities. It will outline that while 2009 and early 2010 were collectively a transition period, the Companies used this time to launch programs that have already delivered value to stakeholders.

5. 2010 Plan: Building on the EEC Foundation

This section outlines how the 2010 EEC activity will build on the existing portfolio by adding several other programs and initiatives. These include High-Carbon Fuel Switching, Conservation for the Interruptible Industrial Sector, and Innovative Technologies.

6. Conservation Potential Review ("CPR")

In this section, the Companies describe their plans for conducting an update to the 2006 CPR in 2010 to establish the basis for EEC funding in 2012 and beyond.

7. Sound Internal Controls and Reporting Mechanisms

This section outlines the data collection plan and business practices the Companies have put in place for EEC activities to ensure that these activities are in compliance with the general controls of the Company.

8. Market Transformation and Attribution

This section recognizes the Companies' leadership role related to the introduction of Regulated Standards and their commitment to undertake activities which encourage and support Market Transformation. The Companies also set out their proposal for the attribution of savings from regulation to be attributed to utility programs on a case-by-case basis.

1.4 Summary

The Companies have a long history of delivering successful DSM and EEC programs efficiently and effectively, which have brought value to stakeholders, while providing energy savings and GHG reductions.

Now that the Commission has granted increased funding to the Companies, both the scope of EEC efforts and their impact has increased significantly. This Report outlines these successes and how they lay the groundwork for an ongoing EEC campaign.

1.5 Approvals Sought

The Companies respectfully request the following from the Commission:

1. Acceptance of the 2009 EEC Annual Report; and
2. Approval for the attribution of savings from regulation to be on a case-by-case basis as outlined in Section 8; and
3. Approval for the attribution of 6 years of post-regulation savings to a Condensing Water Heater Initiative, as described in Section 8.

A draft form of Order is provided in Appendix K.

2. A HISTORY OF COMMITMENT TO DSM

The EEC Program approved by the Commission and launched by the Companies in 2009 builds upon a legacy of commitment to DSM. Despite limited funding, TGI has, since 1997, created and carried out DSM programs. TGVl also has a track record of managing DSM programs (i.e. fuel switching, load building). This experience and understanding of DSM priorities serves as an important foundation for the Companies' expanded efforts.

This section outlines the Companies' proven commitment to DSM (and now EEC).

2.1 Historical EEC Activities Overview: 1990s - 2008

The Companies have a track record of being committed to DSM and EEC initiatives.

Since 1997, TGI has delivered value to its customers through DSM initiatives. These began on July 23, 1997 when TGI received approval from the Commission for its 1998-2002 Revenue Requirements Application. In this Application the Commission endorsed a mechanism to pursue DSM resources.

On July 29, 2003, by Order No. G-51-03, TGI received approval from the Commission for a Multi-Year Performance Based Rate Plan Settlement Agreement (the "PBR Settlement Agreement") for the period 2004-2007. This PBR Settlement Agreement was extended by the Commission, by Order No. G-33-07, for the 2008-2009 period.

EEC funding levels were established at approximately \$1.50 million per year for incentives with funds being placed in a deferral account and amortized over three years. Additionally, non-incentive expenses of approximately \$1.624 million per year were treated as Operations and Maintenance ("O&M") expense and were expensed in the year incurred.

TGVl too has a history of pursuing DSM efforts.

Since its inception TGVl has successfully delivered load building and fuel switching programs, delivering value for both customers and TGVl despite the limited funding available. Historically, TGVl's DSM activities were aimed at employing marketing programs to attract new customers and add load in order to improve the utilization of the gas delivery system on Vancouver Island.

TGVl's efforts became more formal and developed when in 2005 TGVl received approval from the Commission for the 2006-2007 Negotiated Settlement Agreement, through which DSM expenditures were approved. In addition, the Commission approved the two-year extension of the Negotiated Settlement Agreement terms for 2008 and 2009 by Order No. G-34-07, which included approval for DSM expenditures.

TGVl has historically had DSM expenditures of approximately \$650,000 per year for incentives, plus \$500,000 per year for non-incentive costs. For TGVl, incentive expenditures were placed in a deferral account and fully amortized the year following incurrence and non-incentive costs were treated as O&M and were expensed in the year incurred.

In summary, despite the relatively low level of funding and resources available up until 2008, TGI and TGVl delivered cost-effective programs bringing value for stakeholders.

3. THE RIGHT RESOURCES: FINANCIAL AND HUMAN

The Companies' EEC efforts depend on having access to the requisite resources to create and execute a broad portfolio of initiatives. As this section demonstrates, through 2011, the Companies have access to a level of funding that will allow the Companies to deliver the EEC activities identified in the EEC Application. As well, the Companies have established an initial organizational structure that will enable delivery of most of the initiatives identified in the EEC Application. This section describes funding approvals for EEC activity through 2011, and the Companies anticipate filing a request for continued funding for EEC activity for 2012 and beyond early in 2011. The long-term success of the Companies' EEC activity and efforts to support market transformation is dependent on continued stable, secure funding for EEC initiatives.

3.1 Appropriate Funding: 2008-2010

On May 28, 2008, TGI and TGVI collectively filed their Energy Efficiency and Conservation Programs Application (the "EEC Application"), seeking approval of increased funding of EEC programs for the timeframe of 2008-2010. The EEC Application requested approval for total funding of \$56.6 million over three years (\$46.944 million for TGI and \$9.667 million for TGVI), deferral treatment by charging the expenditures to a regulatory asset deferral account with an amortization period of 20 years, and a portfolio methodology for evaluating the costs and benefits of the overall EEC portfolio.

On April 16, 2009, the Commission released its Decision and Order No. G-36-09 (the "EEC Decision"), which approved funding in aggregate of \$41.5 million (\$34.4 million for TGI and \$7.1 million for TGVI).

This funding represented a significant increase from what had been previously allocated for DSM activities and ensures the Companies have the financial resources to execute on proposed EEC initiatives between 2008 and 2010.

Specifically, the following proposed expenditures were accepted:

- (a) \$31.077 million for the combined Residential Energy Efficiency and Commercial Energy Efficiency programs;
- (b) Expenditures for programs or initiatives directed at fuel switching away from fossil fuels which have a higher carbon content than that of natural gas;
- (c) \$6.918 million for Conservation, Education and Outreach;
- (d) \$3.0 million for Joint Initiatives; and
- (e) \$0.5 million for a Conservation Potential Review.

The Commission also approved deferral treatment of all expenditures with an amortization period not to exceed 10 years, and approval of a portfolio approach to evaluating the costs and benefits of the overall EEC portfolio.

The above funding approvals from the Commission provided the Companies with the financial resources they required to create and launch a portfolio of EEC programs that have already begun to deliver value to customers while supporting provincial goals of promoting conservation

and reducing GHGs. The programs and their impact to date are described in more detail in Section 4.

3.2 Funding for the Future: 2010 and 2011 EEC Funding

In June 2009, both TGI and TGVI filed their respective 2010-2011 Revenue Requirements Applications. In these applications the Companies sought, among other things, to:

- Increase EEC funding to add programs for Interruptible Industrial customers (TGI only) and Innovative Technologies;
- Reallocate approved funding to add to Affordable Housing; and
- Extend to 2011 the programs and funding approved by the Commission in the EEC Decision.

The expenditures for conventional energy efficiency for 2011 were set to match the forecast expenditures for 2010. Furthermore, the same portfolio-level Total Resource Cost ("TRC") approach as that which was approved in the EEC Decision was used to analyze and assess EEC expenditures.

When the Commission approved TGI's and TGVI's NSAs⁴, this included the approval of EEC funding for TGI and TGVI for 2010 and 2011. This funding (summarized in Table 3-1) ensures that TGI and TGVI will have access to requisite funding for continued EEC activities in the 2010 to 2011 period.

Table 3-1: TGI and TGVI EEC Approved Funding for 2010 and 2011

(\$000s)	TGI		TGVI	
	2010	2011	2010	2011
Residential and Commercial Programs	23,075	23,075	4,726	4,726
Affordable Housing	2,400	2,400	600	600
Industrial Interruptible	435	1,875	-	-
Innovative Technologies	2,300	4,669	478	956
Total	28,210	32,019	5,804	6,282

As a result of the additional approved funding through their respective NSAs, the Companies have greater flexibility and funding available to continue to offer energy savings activities to customers through 2011.

3.3 Resources and Staffing

The Companies were effective in delivering DSM initiatives from 2005 to 2008 through their Marketing and EEC team. As a result of the increased EEC funding approved in the EEC Decision, the Companies have restructured their Marketing and EEC teams to add the

⁴ For TGI Order No. G-141-09 and for TGVI Order No. G-140-09, both dated November 26, 2009.

resources necessary to effectively deliver the EEC programs. The Companies will manage the EEC resource requirements as necessary, on an ongoing basis, to efficiently and effectively develop, implement and deliver the portfolio of EEC activities and programs.

The following sections outline the structure of the Companies' internal and external resources designed to optimally deliver the EEC programs.

3.3.1 Resources and Staffing Expenditures

As discussed earlier in Section 2, TGI and TGVI have historically been able to deliver a certain level of energy savings to customers by delivering EEC programs with relatively few resources.

The Companies drew on the experience it had developed in these earlier, successful DSM/EEC initiatives to determine how to best allocate its resources. Careful consideration was given to where to allocate funding.

Table 3-2 below provides a resource view of the EEC expenditures for 2009.

Table 3-2: Resource View of EEC Expenditures for 2009 (\$000)

	TGI	TGVI	TGI & TGVI
Labour Costs	854	15	869
Non-Labour Costs	4,750	453	5,203
Employee Expenses/Supplies	167	15	182
Incentives, Program Admin Costs & Fees	3,667	86	3,753
Promo & Advertising	642	344	986
Contractor Costs	274	8	282
Total Costs	5,604	468	6,072

3.3.2 Staffing for EEC: Assembling the Right Internal Resources

The EEC team was built on a small but strong foundation. Prior to the EEC Decision, the Marketing and Energy Efficiency team consisted of four core staff members including a DSM Lead, a Marketing Program Specialist and a Program Specialist all reporting to the Manager of Marketing and Efficiency. Additional support for the DSM activities was provided by the Technical Sales Support staff, the Commercial and Industrial Account Management team, and the Residential New Construction Account Management team, on a part-time, as needed basis.

In order to deliver on the programs and activities approved in the EEC Decision, the Marketing group went through an extensive organizational structure change to put in place a cohesive team for the development and execution of the EEC initiatives.

Much of the group's time in 2009 was spent on recruiting, hiring and training the staff the Companies would need in order to successfully deliver the activities approved in the EEC Decision. A recruiting process commenced after the EEC Decision for approximately three

months duration. The following additional positions were established and filled in 2009 to support the EEC activities and programs:

- EEC Program Manager Residential
- EEC Program Manager Commercial
- EEC Program Manager Affordable Housing
- EEC Program Manager Conservation, Education and Outreach
- EEC Program Manager Qualified Dealer
- Marketing Program Specialist Residential
- Marketing Program Specialist Commercial
- Marketing Program Specialist Conservation, Education & Outreach
- Marketing Program Specialist Affordable Housing
- Energy Technology Specialist
- EEC Communications Coordinator
- EEC Administration Assistant

The new structure of the Marketing and EEC team for 2009 is designed and effectively resourced to deliver on the expanded portfolio of EEC programs the Companies must deliver.

3.3.3 2010 Internal Resources: Continuing to Develop Organizational Capability

For 2010, the Companies are anticipating the necessary addition of EEC Program Managers for Innovative Technologies, Interruptible Industrial and Customer Financing. At this time, the labour budget for the EEC activities for 2010 is estimated at \$1.545 million. The structure of the EEC team for 2010 may change over the course of the year as new opportunities and activities are identified and deployed. Additional staff and changes in reporting structure may need to be put in place in order for the Companies to continue to deliver the expanded Portfolio of EEC Programs.

3.3.4 Staffing for EEC: Drawing on the Right External Resources

While the EEC team provides the primary resources for design, implementation, administration and delivery of the EEC programs, for specific or specialized EEC activities, the Companies also engage the services of outside consultants. These consultants are engaged to supplement internal resources and expertise. External consultant resources are used to support certain activities on an as-required basis determined by the business needs.

The following is a summary of the primary external consultants used and the services for which they are typically engaged.

- Habart and Associates: The Companies have been working with Habart and Associates ("Habart") consulting firm for a number of years. In 2009, Habart provided support and services on a number of projects, including a DSM training seminar for the new

members of the EEC team, Information Requests (“IRs”) support, furnace program billing analysis (in partnership with John Sampson Research), estimation of energy impacts for program measures as well as several other projects.

- Willis Energy Services (“Willis”): Willis is another long-term external consultant who has provided the Companies with consulting and support of the DSM models as well as support with answering IRs specific to these models.
- KnowledgeTech Consulting (“KnowledgeTech”): The Companies have also engaged KnowledgeTech, whose Information Technology (“IT”) expertise was used to assist with the Demand Side Management System (“DSMS”). The DSMS addresses the requirement for more robust program tracking and reporting. More information about the DSMS can be found in Section 7.1.

In addition to the consultants mentioned above, the EEC team hired several other consultants to assist with program evaluation, market research projects and specific requests. The details of this activity are provided under the Enabling Activities sections, Section 4.8 for 2009 and Section 5.13 for 2010.

3.4 Resources: Conclusion

The April 16, 2009 Commission approval of funding in aggregate of \$41.5 million and subsequent approval of TGI and TGVI's 2010-2011 NSAs (and associated 2010 and 2011 EEC funding) ensured the Companies would have access to the financial resources so that programs could be launched for the benefit of customers.

Drawing on these funds, the Companies have since developed and structured the appropriate internal team to carry out their mandate. Further, the Companies have prudently engaged external consultants where appropriate to draw on expertise.

The resources that are now in place ensure the Companies are appropriately positioned to develop, implement and deliver the expanded portfolio of EEC activities and programs.

4. 2009 ACTIVITIES: ESTABLISHING THE EEC FOUNDATION

Following the EEC Decision in April of 2009, the Companies set out to establish a foundation that year for broader EEC programs. The primary focus of 2009 (a “transition” year) was building the EEC team described in Section 3.

While most programs and activities did not get underway until the second half of 2009, the results achieved in this short time demonstrate successful execution of an expanded EEC portfolio and programs.

This section will elaborate on this by examining at a high level:

- 4.1 EEC Program Portfolio and Associated Program Areas: Growing Scope
- 4.2 2009 Portfolio & Program Results – Delivering Value While Laying Foundation

Then this section continues with program specific details as follows, looking in detail at how the Companies pursued EEC objectives through:

- 4.3 Residential Energy Efficiency Programs
- 4.4 Commercial Energy Efficiency Programs
- 4.5 Conservation for Affordable Housing Programs
- 4.6 Joint Initiatives
- 4.7 Conservation, Education and Outreach Programs
- 4.8 Enabling Activities
- 4.9 EEC Stakeholder Group Activities
- 4.10 Summary 2009 EEC Activities: Successfully Establishing the Foundation

The results reflect a partial year of activity for 2009 as most of the programs were rolled out in the second half of 2009 once the EEC Decision was issued and the staffing resources were set in place; these results are for programs where activities were performed in 2009 and where the related program expenditures may continue to occur in 2010.

Yet despite the relatively short time frame in which they have been launched, these programs are already delivering value to customers while furthering the province’s goals around GHGs reduction and the promotion of conservation.

4.1 EEC Program Portfolio and Associated Program Areas: Growing Scope

The Companies' EEC Portfolio consists of multiple Program Areas. Each Program Area includes all specifically related programs, measures and activities. While the Companies had an EEC Portfolio for many years, the limited funding meant the scope of the Portfolio was limited. With the Commission's approval of additional funding (see Section 3.1), the groundwork was laid to expand the Portfolio.

As might be expected, EEC activity in 2009 experienced a considerable expansion in all Program Areas. Furthermore, a new Program Area was created for Conservation for Affordable Housing, in order to recognize its importance and profile within the Companies' EEC activity.

Also created were two additional non-Program Area specific sections related to the EEC Portfolio:

- Enabling Activities (activities that are supportive of the Companies' EEC program development and delivery) and
- EEC Stakeholder Group Activities (the work achieved with the EEC Stakeholder Group in 2009).

Further information for each Program Area and Activity can be found in subsequent sections of this Report.

4.2 2009 Portfolio and Program Results: Delivering Value While Laying Foundation

Considering that the Companies' expanded EEC activity did not get underway until late Q3 when the additional EEC staff had been hired and trained, the overall portfolio results are reasonable.

Table 4-1 below shows overall program results including the overall incentive and non-incentive amounts spent on EEC programs, annual energy savings, Net Present Value ("NPV") of the energy savings over measure life, and the TRC results. For 2009, the overall EEC portfolio achieved close to 1.3 million Gigajoules ("GJs") in measure life energy savings which is considerably higher than the measure life energy savings achieved in 2008 (612,651 GJs).

Table 4-1: 2009 Overall Portfolio Results Brought Value to Customers and the Companies

Utility	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Total for Incentive and Non-Incentive Expenditures (\$000)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	TRC
TGI	3,245	2,498	5,743	125,267	1,223,559	1.2
TGVI	98	419	518	5,698	60,541	0.8
Total Results	3,344	2,917	6,261	130,965	1,284,100	1.2

The TRC results for TGI are at 1.2 and for TGVl are at 0.8 and the overall Portfolio TRC results are 1.2, so the overall Portfolio result complies with the Commission's acceptance of the Companies' proposal regarding Portfolio level TRC of greater than one to be considered cost-effective. The 2009 TRC result for TGVl was 0.8. This is because programs for TGVl were halted in 2007, pending submission and approval of the EEC Application and only restarted in Q2 of 2009 once the EEC Application was approved. Thus the programs for TGVl in 2009 had very little opportunity to gather momentum in terms of participation rates, leading to a lower TRC. The Companies anticipate that over the course of 2010, participation in programs on TGVl will increase as the market becomes more aware of the availability of EEC initiatives for TGVl. Note the difference between the Total for Incentive and Non-Incentive Expenditure (\$6.261 million) shown in the table above, and the Total Costs (\$6.072 million) in the Table 3-2 of Section 3.3.1 is \$188,306. This is because the latter figure (\$6.072 million) is based on the actual expenditures in 2009, while the former figure (\$6.261 million) is based on the amounts associated with each 2009 program that might be incurred in 2010, thus providing a more complete view of individual program costs.

The value delivered through these early Portfolio efforts can be seen in more detail when the results are presented by Program Areas. These results are shown below in Table 4-2. Further details on cost-benefit analysis can be found in Appendix J.

Table 4-2: 2009 Expanded Program Areas Brought Value to Customers and the Companies

Program Area	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	TRC
Residential Programs	2,022	166	55,031	574,607	1.2
TGI	1,975	138	52,901	553,543	1.2
TGVl	47	28	2,130	21,063	1.4
Commercial Programs	925	147	74,373	693,352	2.1
TGI	874	140	70,804	653,874	2.1
TGVl	51	7	3,569	39,478	2.0
Conservation for Affordable Housing (TGI & TGVl)	390	0	1,352	14,236	0.7
Joint Initiatives (TGI & TGVl)	7	428	210	1,905	0.8
Conservation, Education & Outreach (TGI & TGVl)	N/A	612	N/A	N/A	N/A
Enabling Activities (TGI & TGVl)	N/A	266	N/A	N/A	N/A
Other Portfolio Level Activities (TGI & TGVl)*	N/A	1,298	N/A	N/A	N/A
Total	3,344	2,917	130,965	1,284,100	1.2

*Other Portfolio Level Activities include research & evaluation, consultants' fees, non-program administration activities & labour

Note that the Companies have created a discrete Program Area specific to Conservation for Affordable Housing, moving it out of the Joint Initiatives Program Area in order to recognize its importance, which was emphasized in the EEC Decision and the NSAs. Further, the Companies have specifically allocated \$3 million annually to Conservation for Affordable Housing for 2010 and 2011, so the budget for this Program Area is considerable.

As shown in the Table 4-1 and 4-2 above, the EEC portfolio in 2009 brought value to customers and the Companies. The details of each Program Area are further discussed in the following sub-sections and more comprehensive program details can be found in Appendix D.

In 2010, the EEC team will further expand the program portfolio by building on the existing programs and by adding three Program Areas, the details of which are discussed in Section 5. Overall, the EEC Portfolio delivered value for customers in 2009, as measured by a Portfolio-level TRC of 1.2.

This Report will now examine each of the programs and activities through which the Companies pursued EEC objectives in 2009; these programs and activities also serve to lay the foundation for broader work and greater results in 2010 and beyond.

4.3 Residential Energy Efficiency Programs

Residential Energy Efficiency programs are offered in TGI and TGVI service areas. For EEC purposes, residential customers include end-use customers living in a residential single-family home, row house, townhouse or mobile home.

4.3.1 Program Goals

Residential Energy Efficiency programs encourage households to reduce their overall consumption of natural gas and help to manage their energy bills.

In addition to saving energy, Residential Energy Efficiency programs focus on the following objectives:

- Prepare the market for adoption of new energy efficient technologies through incentives, and support of government regulations;
- Upgrade existing low efficiency systems to capture energy savings associated with reducing the overall consumption of natural gas;
- Educate the trades community about upcoming regulations and gain an understanding of technical requirements or other barriers associated with new product introductions;
- Educate consumers about the advantages of energy efficient furnaces and boilers and provide incentives for their adoption when necessary;
- Engage manufacturers by supporting new technologies and provide advertising opportunities to the Companies customer base;
- Develop cost-effective programs with a TRC greater than 1.0 that optimize the proportion of incentives over administration and marketing costs; and
- Conduct program evaluation that confirms savings claims and guides program development of future programs.

4.3.2 Two Retrofit Programs in the Market

There were two Residential Energy Efficiency retrofit programs offered in 2009: the ENERGY STAR® Heating System Upgrade Program, which includes participants from the provincial government's LiveSmart BC Residential Retrofit Incentive Initiative, and the EnerChoice Fireplace Program.

Table 4-3 provides a summary of the 2009 Residential Energy Efficiency programs for TGI and TGVI. The ENERGY STAR® Heating System Upgrade Program surpassed its original target of 8,180 heating systems, achieving 7,930 by December 31, 2009 with the expectation of achieving 15,000 upgrades once all applications are processed in 2010. The EnerChoice Fireplace program, although program participation numbers were less than expected, achieved its primary objective of education and outreach about the importance of energy efficient fireplaces.

Table 4-3: 2009 Residential Energy Efficiency Programs for TGI and TGVI are cost effective and deliver substantial energy savings

Program		Description	Retrofit			
			Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	TRC	
					TGI	TGVI
1	ENERGY STAR® Heating System Upgrade	\$250 Incentive for upgrading heating system to ENERGY STAR® rated appliance	1,233	299,201	1.1	0.9
	ENERGY STAR® Heating System Upgrade - LiveSmart BC	\$250 Incentive for upgrading heating system to ENERGY STAR® rated appliance as part of LiveSmart BC incentive portfolio	871	231,121	1.2	1.2
2	EnerChoice Fireplace	\$50 Dealer Incentive to promote and educate customers about Energy Efficient Fireplaces	84	44,285	2.6	2.4

The highlights of the 2009 Residential Energy Efficiency programs are as follows:

- The ENERGY STAR® Heating System Upgrade Program, including participants from LiveSmart BC, will surpass the replacement target of 8,180 furnaces or boilers outlined in the EEC Application, upon completion of application processing in 2010. The program will achieve energy savings of 530,322 GJs over the life time of the measure. The program achieved a TRC of 1.1 in TGI and 1.0 in TGVI. This demonstrates that the program is cost-effective and has substantial energy savings over the lifetime of the measure.
- The EnerChoice Fireplace Program encouraged dealers to educate consumers about the merits of energy efficient fireplaces through a \$50 sales promotion incentive ("SPIFF")⁵. Participant numbers were lower than the 2008 program because dealers found the SPIFF application process to be onerous during their peak sales season. The program achieved energy savings of 44,285 GJs over the life time of the measure. The program achieved a TRC of 2.6 in TGI and 2.4 in TGVI. Although the program's projected energy savings goals were not met, the education and outreach objectives of the program were met. Since EnerChoice education for dealers has been met, the 2010 program will involve consumer incentives.

⁵ A Sale Promotion Incentive Fund, or SPIFF, is an incentive directed to a salesperson for selling a specific product. For the purpose of the EnerChoice Fireplace program, sales people were eligible for a \$50 rebate cheque for each EnerChoice fireplace they sold.

Residential Energy Efficiency programs are described in further detail below.

4.3.3 ENERGY STAR® Heating System Upgrade Programs

<u>Program Area:</u>	Residential Energy Efficiency Programs
<u>Target Market:</u>	Retrofit
<u>Duration:</u>	TGI: Sep 1, 2008 through Dec 31, 2009 TGVI: April 16, 2009 through Dec 31, 2009
<u>Incentives:</u>	\$250 bill credit Manufacturer's coupons September through December, 2008 and 2009
<u>Partner:</u>	LiveSmart BC Residential Retrofit Incentive Initiative

Program Administration:

Accenture Utilities Business Process Outsourcing Services ("ABSU"), a subsidiary of Accenture Inc., through a subcontracting arrangement with CustomerWorks LP.

Program Objectives:

- Upgrade a minimum of 8,180 heating systems;
- Prepare market for adoption of ENERGY STAR® provincial furnace regulations for retrofit market, January 1, 2010;
- Educate the trades community about upcoming regulations;
- Educate consumers about the advantages of energy efficient furnaces and boilers and provide an incentive that promotes a proactive replacement decision;
- Engage manufacturers by distributing coupons for ENERGY STAR® furnaces and boilers and providing funds for co-marketing opportunities; and
- Develop a cost effective program with TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs.

Background:

The Companies have maintained ENERGY STAR® Heating Upgrade programs in the market since 1996. The most recent iteration of the ENERGY STAR® Heating System Upgrade Program was launched September 1, 2008 in the TGI service territory and April 16, 2009 in the TGVI service territory.

The program offered a \$250 bill credit to partially offset the estimated \$850 incremental cost of purchasing ENERGY STAR® furnaces or boilers over mid-efficiency models. In addition to the \$250 incentive, from September to December, 2009 furnace and boiler manufacturers provided coupons for discounts and extended warranties for ENERGY STAR® heating systems.

The primary program objective was to reap the energy savings associated with upgrading low or mid-efficiency heating systems. In addition, the program focused on preparing the market for

January 1, 2010 changes to the BC Energy Efficiency Act Standards for gas furnaces outlined in the Ministry of Energy Mines and Petroleum Resources ("MEMPR") Enforcement Bulletin 09-03⁶. The regulated energy efficiency standard for these products is an Annual Fuel Utilization Efficiency ("AFUE") equal to or greater than 90%. These regulations took effect for new residential construction on January 1, 2008 and for replacement furnaces in existing dwellings on December 31, 2009. The BC provincial regulation changes align with Natural Resources Canada ("NRCan") regulations for new and existing buildings across Canada. Significant outreach to consumers, trades and manufacturers helped facilitate the industry's transition to the new regulation.

Please refer to Appendix D for detailed program description.

Results:

As of December 31, 2009, the number of participants to date was 7,930 with expectations of achieving over 15,000 participants once final applications are processed in 2010. Given that the goal for program participation in the EEC Application was 8,180, this program has been extremely successful with participation surpassing that goal.

Table 4-4 provides program highlights of the ENERGY STAR® Heating System Upgrade Program performance metrics for 2009 including number of participants, incentives to non-incentives spending, net annual energy savings, and the savings over the lifetime of the measure. The free rider rate suggests that 43% of participants may have upgraded their appliance without the incentive, so this proportion of participants has been backed out of the energy savings. The positive TRC indicates that there are positive energy savings within a cost-effective program.

⁶ Please refer to Appendix C for a copy of the MEMPR Enforcement Bulletin 09-03.

Table 4-4: ENERGY STAR® Heating System Upgrade Program Performance Summary illustrates that programs are cost effective and deliver substantial energy savings

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
The Companies	TGI	4,391	1,098	101	27,882	293,682	43%	1.1
	TGVI	83	21	14	527	5,519	43%	0.9
LiveSmart BC	TGI	3,391	848	7	21,532	226,799	43%	1.2
	TGVI	65	16	-	413	4,322	43%	1.2
Total	TGI	7,782	1,946	108	49,414	520,482	43%	1.1
	TGVI	148	37	14	940	9,840	43%	1.0

Note: The Companies Participation Rates are based on the number of bill credits issued as of December 31, 2009 including 371 bill credits that were issued in 2008 that were not included in previous program reports. The LiveSmart BC participant numbers were based on number of furnaces invoiced as of Dec 31, 2009.

In 2009, \$1.98 million in incentives were distributed. Total spend for non-incentive dollars was \$122,000. Notably, non-incentive spending represented only 6% of total spending. This demonstrates that the most significant portion of the program's expenditures are going towards incentives and that program administration and marketing are very cost effective.

As outlined in Table 4-4 above, based on 2009 participants, the program is achieving annual gas savings of 50,354 GJ's and 530,322 GJ's over the life time of the measure.

The Free Rider Rate used for this analysis was 43% based on customer feedback from the extensive 2005-2007 Furnace Program Evaluation (refer to Appendix D) that surveyed consumers and contractors. The 2005-2007 Furnace Program evaluation highlighted additional program benefits of a 30% spillover and noted that customers were advancing their purchase decision an average of 2.3 years. The additional energy savings benefits from spillover are not included in the program's TRC calculations, thus the TRC reported is conservative.

TRC results were 1.1 for TGI and 1.0 for TGVI. The TGVI TRC is slightly lower due to lower participant numbers as the program was introduced over seven months later than the TGI program. In addition, the TGVI opportunity for furnace replacement is lower due to the fact that there is newer furnace stock since natural gas service was first introduced to Vancouver Island in 1990.

For cost benefit analysis please refer to Appendix J.

Summary:

The most recent iteration of the ENERGY STAR® Heating System Upgrade Program achieved its objectives in preparing the market for the introduction of provincial and federal regulations

requiring the installation of ENERGY STAR® furnaces in 2010, in addition to replacing a significant number of furnaces resulting in energy savings. In wrapping up this program in 2010, it is anticipated that the Companies will have provided \$3.75 Million in funding for 15,000 heating system upgrades since September 2008, a significant contribution to this industry, resulting in large energy savings impacts. The full program overview and results will be discussed in the 2010 EEC Annual Report.

The partnership with LiveSmart BC was very successful in terms of adding 3,456 participants in 2009 with an additional 3,835 projected to be processed in 2010. The LiveSmart BC Residential Retrofit Incentive Initiative, launched in May 2008 by the Provincial government, provided incentives to reward residential retrofits that saved energy and reduced GHGs. This high profile program was very successful attracting over 40,000 participants in 15 months. In order to receive the \$250 Terasen rebate through LiveSmart BC homeowners were required to complete a home energy assessment with a Certified Energy Advisor, licensed by NRCan⁷. The data was transferred from NRCan to LiveSmart BC. LiveSmart BC then invoiced Terasen. The partnership with LiveSmart BC is discussed in greater detail in the Section 4.6.

Since regulations require that mid-efficiency furnaces can no longer be manufactured, but can still be sold, the Companies are monitoring mid-efficiency furnace inventory through communications with industry. The results of these stakeholder discussions will determine the market need for a 2010 ENERGY STAR® Heating System Upgrade early retirement program as outlined in Section 5.5.2.6. Such a program would have the additional benefit of proactive furnace replacement savings.

4.3.4 EnerChoice Fireplace Program

<u>Program Area:</u>	Residential Energy Efficiency Programs
<u>Target Market:</u>	Retrofit
<u>Duration:</u>	TGI and TGV: Sep 1, 2009 through Dec 31, 2009
<u>Incentive:</u>	\$50 Sales Promotion Incentive Fund ("SPIFF") for each fireplace sold Manufacturer Coupons
<u>Partner:</u>	Hearth Patio and Barbecue Association of Canada ("HPBAC")
<u>Program Administration:</u>	HPBAC and EEC staff

⁷ Home Energy Assessments for existing homes are provided by NRCan-certified Home Energy Advisors. The initial assessment is referred to as the D-visit and includes a detailed evaluation of the home's energy efficiency levels, as well as various tests to determine air leaks and recommendations for retrofits that will improve the home's energy efficiency rating. The second visit, referred to as the E-visit, measures energy performance after the recommended retrofits have been completed.

Program Objectives:

- Encourage the sale and installation of energy efficient heater style fireplaces to reap the associated energy savings;
- Further the education and awareness of the EnerChoice label to consumers and industry;
- Further relationships with manufacturers and distributors of natural gas fireplaces, through the HPBAC;
- Engage manufacturers by distributing coupons for EnerChoice fireplace discounts and accessories; and
- Develop a cost effective program with TRC greater than 1.0.

Background:

Promoting energy efficient fireplaces is an important component to EEC programs since natural gas fireplaces account for 13% of residential natural gas consumption (based on 2006 CPR findings). In addition, 85% of The Companies customers have at least one fireplace or heating stove, based on the 2008 Residential End Use Study ("REUS") findings. The Companies are encouraging their customers to adopt energy efficient gas fireplaces designed for heating rather than simply decorative fireplaces for ambience.

The Enerchoice Fireplace label is a Canadian label reserved for products that meet or exceed efficiency levels as determined by an independent committee managed by HPBAC. Since there is currently no ENERGY STAR® rating for natural gas fireplaces, and there are no pending standards from the U.S. Department of Energy, the Canadian fireplace industry has developed its own efficiency label, branded EnerChoice. The EnerChoice designation can only be applied to free-standing stoves with Fireplace Efficiency ("FE") 66% or higher, fireplaces that are 62.4% or higher and inserts that are 61% and higher.

Please refer to Appendix D for detailed program description.

Results:

The EnerChoice Fireplace Program achieved some positive results, and the Companies gained valuable insight into how to further improve and modify the program in 2010.

Table 4-5 provides program highlights of the EnerChoice Fireplace Program performance metrics for 2009, including number of participants, incentives and non-incentives spending, net annual energy savings, and the savings over the lifetime of the measure. The free rider rate suggests that 24% of participants may have selected an EnerChoice fireplace without the incentive, so this proportion of participants has been backed out of the energy savings. The positive TRC indicates that there are positive energy savings within a cost-effective program.

Table 4-5: EnerChoice Fireplace Program Performance Summary illustrates that programs are cost effective by their positive TRC and had a strong educational component as evidenced by the non-incentive spending component that was primarily marketing costs

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
TGI	592	30	31	3,487	33,062	24%	2.6
TGVI	202	10	14	1,190	11,223	24%	2.4

Note: Actual numbers are based on the number of SPIFF applications processed by March 1, 2010 to reflect 2009 overall program performance. The incentives are not in the 2009 actuals budget but presented as an adjustment.

Based on the 2008 program, the Companies projected a program participant goal of 1,200 although only 794 units were achieved. Dealers reported that they found the SPIFF application process to be onerous during their peak sales season. Based on this feedback, the 2010 program will be a consumer-based incentive.

In 2009, \$40,000 in incentives was distributed while total spend for non-incentive dollars was \$45,000, which is to be expected given that the primary objective of the program was education and outreach.

As outlined in Table 4-5, the program is achieving annual gas savings of 4,677 GJ's and 44,285 GJ's over the life time of the measure. The Free Rider Rate was 24% as used on former fireplace programs.

When total program spending is compared to the avoided cost of gas, positive TRC calculations were 2.6 for TGI and 2.4 for TGVI.

For cost benefit analysis please refer to Appendix J.

Planned Improvements For 2010

Enerchoice Fireplace program evaluation on the 2008 and 2009 programs will be conducted in 2010. Billing analysis will be conducted on a random sample of 2008 program participants to validate energy savings claims for EnerChoice appliances. An EnerChoice awareness survey to dealers is being proposed to determine the market penetration of EnerChoice education and awareness programs and gain feedback on future requirements for EnerChoice educational programs.

The EnerChoice Fireplace Program achieved its primary objective in encouraging dealers to educate consumers about the merits of energy efficient fireplaces, through a \$50 dealer incentive. Although EnerChoice fireplace program participation numbers by dealers was down over 2008, education and awareness of energy efficient fireplaces was met, as demonstrated by industry feedback on the success of the manufacturers' coupon program. This could be an example of spillover since customers purchased EnerChoice through the awareness building

aspects of the program, rather than the incentive itself. The result is a cost-effective program in terms of reduced expenditures on incentives, marketing and administration.

Dealers are well educated on the merits of the EnerChoice label through the Companies' 2008 and 2009 dealer incentive program. As a result, a consumer incentive program to promote the purchase of energy efficient fireplaces is under development. Please refer to Section 5.5.2.3 for a discussion of the Companies' planned 2010 activities for EnerChoice fireplaces.

4.3.5 Summary

Overall the 2009 Residential Energy Efficiency Programs were very successful. They engaged customers in upgrading appliances to capture energy savings, supported the introduction of new provincial regulations, and reached out to the trades community for education and program awareness. These programs exemplify the role that a utility can play in market transformation.

4.4 Commercial Energy Efficiency Programs

Commercial customers are comprised of a variety of different organizations, both private and public in nature. They consume anywhere from 100 to over 40,000 GJ/yr, and are provided service through various customer rate classes. Typical examples include small and large multi residential buildings, small businesses, retail stores, large commercial office space, schools and universities, government, hospitals, and manufacturing facilities.

Commercial Energy Efficiency programs are aimed at encouraging commercial customers to reduce their overall consumption of natural gas, and their energy costs. These programs are offered in TGI and TGVI service areas, to both New Construction and Retrofit applications. Program offerings for TGI and TGVI are identical, and there is little difference for new construction and retrofit participants.

4.4.1 Program Goals

Commercial Energy Efficiency programs focus on the following objectives:

- Upgrade existing low efficiency systems to capture energy savings associated with reducing the overall consumption of natural gas
- Prepare the market for the adoption of new energy efficient technologies through incentives, and support of government regulations.
- Educate commercial customers about the advantages of energy efficient appliances and provide incentives for their adoption when necessary.
- Engage the trades community and manufacturers by supporting new, energy efficient technologies.
- Develop cost effective programs with a TRC greater than 1.0 that optimize the proportion of incentives over administration and marketing costs
- Conduct program evaluations that confirm savings claims and guide the development of future programs.

4.4.2 Three Commercial Energy Efficiency Offerings

Space heating accounts for approximately 75% of gas consumption in the commercial sector. Thus the Companies program offerings in this initial year of EEC activity are heavily oriented towards this end use. There were three Commercial Energy Efficiency programs offered in 2009:

- The Efficient Boiler Program,
- The Light Commercial ENERGY STAR® Boiler Program, and
- The Energy Assessment Program.

Table 4-6 provides a summary of the 2009 Commercial Energy Efficiency programs for TGI and TGVI.

Table 4-6: Solid performance from Commercial Energy Efficiency Programs in 2009

Program		Description	New Construction		Retrofit		TRC	
			Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	TRC	
							TGI	TGVI
1	Efficient Boiler Program	Rebate program for high efficiency commercial boilers > 300 MBH Input	15	9,869	928	635,497	2.0	2.0
2	Light Commercial ENERGY STAR® Boiler Program	Rebate program for high efficiency commercial boilers < 300 MBH Input	-	-	52	35,589	3.3	-
3	Energy Assessment Program	No charge energy use assessments of commercial facilities	N/A	N/A	77	12,396	2.4	-

The highlights of the 2009 Commercial Energy Efficiency programs are as follows:

- The Efficient Boiler Program increased its participant numbers over both 2007 and 2008 combined, due in large part to the reinstitution of funding for retrofit applications. As such, total spending and energy savings have increased significantly, while the TRC has remained a healthy 2.0, indicating that the program benefits are double its costs. The program will accrue net energy savings of 635,497 GJ's over the life time of the measure.
- The Light Commercial ENERGY STAR® Boiler Program was officially launched in August, and had, by year's end had provided incentives for 29 boilers. The program is already logging gas savings, and has initially turned in a strong TRC of 3.3, despite initial development and communications costs. The program accrued net energy savings of 35,589 GJ's over the life time of the measure.
- The Energy Assessment Program has continued to provide guidance in energy efficiency to commercial customers and has saved an average of 299 GJ/yr per participant, translating into a total projected energy savings of 12,396 GJ's. In 2009 the program turned in a TRC result of 2.4.

The Commercial Energy Efficiency programs are described in further detail below.

4.4.3 Efficient Boiler Program

<u>Program Area:</u>	Commercial Energy Efficiency Programs
<u>Target Market:</u>	New Construction / Retrofit
<u>Duration:</u>	TGI: 2005 – December 31, 2011 TGVI: 2005 – December 31, 2011
<u>Incentive:</u>	Refer to Appendix D for full incentive details

Program Objectives:

- Reduce commercial sector gas consumption by encouraging the installation and use of high as opposed to standard efficiency boilers for space heating.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate medium to large commercial customers about the advantages of high efficiency boilers and provide an incentive to facilitate the purchase of high efficiency technology.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs
- Support and prepare the way for any provincial regulation requiring increased boiler efficiency.

Background:

In operation since 2005, the Efficient Boiler Program is TGI and TGVI's flagship Commercial Energy Efficiency program aimed at reducing gas consumption associated with space heating. Fully $\frac{3}{4}$ of commercial gas consumption in British Columbia is used for space heating. The program is designed to stimulate investment in appropriately sized, energy-efficient space heating boilers that reduce natural gas usage and associated operating costs.

High efficiency boiler technology, when used as part of a properly designed heating system, generates significant annual energy savings over a comparatively long estimated measure life. In fact, high efficiency boilers represent one of the most significant sources of achievable savings for the commercial sector in British Columbia⁸. Fully 35% of such savings is attributable to high efficiency boilers. The use of boilers can be found, to varying degrees, in virtually all commercial area groups including the large and medium classes of commercial, multi-residential, and institutional customers. Typical installations include:

- Office buildings
- Apartment buildings / Stratas
- Schools / Universities
- Hospitals
- Care Homes

⁸ Terasen Gas Conservation Potential Review, Commercial Sector Report, Marbek Resource Consultants, April 2006

Small commercial customers also use boilers, however this program is designed to incent larger boilers than they would typically require. Refer to the Light Commercial ENERGY STAR® Boiler program for a boiler program geared towards smaller commercial customers.

High efficiency boiler technology can be up to 95% efficient versus roughly 80% for new standard efficiency boilers. By encouraging the use of high efficiency boilers, the Efficient Boiler Program directly targets the commercial sector's most significant source of gas consumption (space heating) via one of its most widely used, and longest lasting gas burning appliances (boilers). Installing such boilers today has a lasting impact by reducing gas consumption now, while paving the way for market transformation and ultimately more stringent regulation.

Please refer to Appendix D for detailed program description.

Results:

Table 4-7 provides program highlights of the Efficient Boiler Program performance metrics for 2009. As may be seen, the performance as judged by TRC was solid, though some participation issues need to be addressed. A discussion of the results and program learnings follows the table.

Table 4-7: Efficient Boiler Program – Solid TRC performance

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
New Const	TGVI	1	13	2	892	9,869	18%	2.0
Retrofit	TGI	61	783	101	54,422	605,888	18%	2.0
	TGVI	3	39	5	2,676	29,608	18%	2.0

The program significantly increased its participation rate surpassing the combined totals of 2007 and 2008. This was largely due to the reinstitution of incentives for retrofit applications as of October 1, 2008; all but 1 participant in 2009 was a retrofit customer. Incentives for retrofit customers were excluded throughout most of 2008 due to budgetary constraints. Once the DSM budget situation improved, incentives for retrofits were once again made available.

While program participation in 2009 remains less than the program's all time high participation rate of 85 participants in 2006, it never-the-less represents a notable success in view of the generally poor prevailing economic climate and the uncertainty over the availability of incentives created by the exclusion of retrofit customers in early 2008. Furthermore, participants who complete the installation of their boiler and receive an incentive payment generally report that the incentive is better than adequate.

While the increased participation is encouraging, the lack of new construction participants as well as the low participation rate from Vancouver Island are both notable. There are several factors which have likely contributed to this situation:

1. It seems reasonable that the economic situation of late 2008 through most of 2009 played a central role in discouraging new construction projects which may have otherwise participated in the program.
2. Based on discussions with potential participants there appears to be a perception of uncertainty in the market surrounding the availability of the incentive. This seems to be largely due to program termination dates previously in place (i.e. previous program deadline, August 2009). New construction participants especially believe that the program's funding will expire before they can finish constructing their new building / facility, leading them to conclude that attempting to participate in the program is not worth their time or effort.
3. The use of fuel oil for boilers remains significant on the island. A sizeable proportion of these oil burning potential participants have limited familiarity with TGVl may thus not be aware of the company's incentive programs. This would necessarily preclude their participation in the program.

By year end the efficient boiler program had committed to pay as much as \$834,800 to participants who successfully complete their boiler installation within 1 year of submitting their program application. This compares reasonably well with the highest ever annual commitment of \$1,075,455 experienced in 2006, before the availability of the rebate was first eliminated and then reinstated for retrofit applications. The objective now is to build upon the current momentum and rate of participation in the program in order to maximize commercial sector gas savings.

When total program spending is compared to the avoided cost of the gas the program turns in healthy TRC results in the neighbourhood of 2.0 indicating significant total benefits result from the operation of this program. With Free Rider Rate estimated to be approximately 18%, the annual net energy savings derived from the program's participants is 57,990 GJ's. Given that the program's target customer group annually consumes more than 13,000,000 GJ's for space heating, significant room for growth remains.

For cost benefit analysis please refer to Appendix J.

Planned Improvements For 2010

In 2010 the Companies' will expend additional time and effort dedicated to promotions in order to raise awareness of the program and increase participation from the new construction and Vancouver Island markets.

In 2010 the Companies plan to perform an in-depth evaluation study on the program's performance at reducing gas consumption. The results of this study will serve to confirm and/or provide additional insight into the gas savings associated with the program. For additional information on the proposed evaluation study please refer to Section 5.13.3.1.

Further to the issues noted above, the program process has received generalized criticism from program participants for being too cumbersome. In addition to making the program complex and difficult for many potential participants to understand, the process also imposes a significant administrative burden on the Companies. The Companies plan to streamline the program process in 2010.

4.4.4 Light Commercial ENERGY STAR® Boiler Program

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: August, 2009 – December 31, 2011
TGVI: August, 2009 – December 31, 2011

Incentive:

Providing that the boiler is used for space heating and/or domestic water heating in combination with space heating:

- Condensing boilers: \$5 per MBH⁹
- Near condensing boilers: \$3 per MBH

Program Objectives:

- Reduce commercial sector gas consumption by encouraging the installation and use of high efficiency (ENERGY STAR® rated) as opposed to standard efficiency boilers for space heating.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate small to medium commercial customers about the advantages of energy efficient appliances and provide incentives for their adoption when necessary.
- Engage the trades community and manufacturers by supporting new, energy efficient technologies.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs
- Support and prepare the way for any provincial regulation requiring increased boiler efficiency.

Background:

Launched in August of 2009, the Light Commercial ENERGY STAR® Boiler Program is TGI and TGVI's most recent offering aimed at reducing energy consumption associated with space heating. In contrast to the Efficient Boiler Program described above, this program focuses on smaller boilers. The program designed to encourage small to medium commercial customers to install energy efficient boilers by offering a cash incentive that is calculated based on the quantity, size and type of boiler.

High efficiency boiler technology, when used as part of a properly designed heating system, generates significant annual energy savings over a comparatively long estimated measure life. Refer to Section 4.4.3 for a description of the benefits and energy saving potential of high efficiency boilers. Typical facilities which see the installation of small boilers include:

- Small to medium apartment buildings

⁹ Note: 1 MBH = 1000 BTU/hr (BTU = British Thermal Unit = the heat energy required to raise 1 pound of water by 1 degree Fahrenheit)

- Small to medium office buildings
- Schools / Universities

Please refer to Appendix D for a detailed program description.

Results:

While the program's newness resulted in limited initial uptake, the TRC performance was generally encouraging.

Table 4-8 provides program highlights of the Light Commercial ENERGY STAR® Boiler Program performance metrics for 2009. A discussion of the results and program learnings follows the table.

Table 4-8: Light Commercial ENERGY STAR® Boiler Program – Encouraging start but work to be done on participation

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
Retrofit	TGI	11	32	20	3,197	35,589	18%	3.3

The Light Commercial ENERGY STAR® boiler program is brand new as of August of 2009. The initial response to the program has been positive from those who have successfully participated, with participants citing the program's simplicity and speed of response as positive qualities.

On the other hand program awareness remains low for the moment due to its relative newness; a situation which is quite clearly reflected in the participation numbers. The program's participants have thus far been entirely from the TGI retrofit market. Many design professionals, trades people and target customers remain unaware of the program's existence. A sustained direct promotional effort, as well as collaboration with partners in industry associations, is required to raise the program's profile among a wider audience.

For cost benefit analysis please refer to Appendix J.

Planned Improvements For 2010

2010 will see enhanced program promotions and, late in the year, a stakeholder feedback session in view of raising awareness and participation levels for the program for both TGI and TGV.

So far, the program has turned in a very healthy TRC result of 3.3 in the TGI retrofit market. It is however too early in the program lifespan to draw solid conclusions based on this number. Should the TRC remain high through 2010 despite increased spending on program promotions, consideration will be given to increasing the value of the incentive or providing an additional incentive to the installer, independent of that which is currently delivered to the customer.

4.4.5 Energy Assessment Program

Program Area: Commercial Energy Efficiency Programs

Target Market: Retrofit

Duration: TGI: 2001 – December 31, 2011
TGVI: 2001 – December 31, 2011

Incentive: A free, walkthrough energy assessment (\$1200 value).

Program Objectives:

- Enable and encourage commercial customers to reduce gas consumption by identifying sources of high gas consumption within their facilities and proposing implementable measures aimed at reducing consumption.
- Educate commercial customers about gas use within their own facilities and the steps they can take to minimize consumption.
- Foster a culture of conservation among commercial sector customers (including Multi-Unit Residential Buildings (“MURBs”), institutional and manufacturing customers) by assisting them to review their energy consumption critically.
- Direct (where applicable) participants to available incentive programs including Terasen’s existing boiler programs.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs

Background:

The Energy Assessment Program has been in operation since 2001 with minor modifications over the years. This program is designed to identify inefficiencies in natural gas energy consumption and provide recommended solutions in the following sectors: condominium and apartments, food processors, greenhouses, hospitals, hotels, industry, offices, recreation centres, restaurants, schools, warehouses/offices, and wood products.

Inefficiencies are identified in participant’s facilities via an onsite walkthrough assessment by an energy efficiency consultant. The consultant then produces a report, describing the observed inefficiencies and outlining proposed energy savings measures which may be implemented to reduce gas consumption. The Companies then forward the report to the participant.

The Energy Assessment program allows the Companies to help foster a culture of conservation among commercial customers by visiting their facilities directly and helping educate them on their gas use. It is an important “first contact” which can lead to subsequent savings via the implementation of energy savings measures, with the assistance of incentive programs where applicable.

Please refer to Appendix D for a detailed program description and Section 5.13.3.3 for details on the Energy Assessment Program Evaluation.

Results:

While participation in the program declined between 2008 and 2009, the program was still able to generate gas savings.

Table 4-9 provides program highlights of the Energy Assessment Program performance metrics for 2009. The program continues to generate savings, though modifications are required in 2010. A discussion of the results and program learnings follows the table.

Table 4-9: Energy Assessment Program - Continues to generate savings

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
Retrofit	TGI	49	59	18	13,186	12,396	10%	2.4

Participation in this program was down from 77 participants in 2008 to 49 in 2009 and there were no participants in the program for TGVI. Despite the “free to participant” nature of the program, the economic situation of 2008 / 2009 no doubt precluded any thought of investing in energy efficiency among many organizations as business managers focused on the health of their core business. Furthermore the program has not been strenuously promoted due to issues as discussed below.

For cost benefit analysis please refer to Appendix J.

Planned Improvements For 2010

The current design of the program will undergo several changes in 2010 in view of addressing several current and future issues as well as enhancing its overall performance at reducing gas consumption per participant. More specifically some of the areas for improvement include:

1. A low rate of implementation of the recommended energy savings measures.
2. No commitment by participants to implement any of the energy savings measures.
3. The lack of a formal mechanism to track energy savings.
4. The level of detail provided is increasingly not up to what many participants require.
5. The attribution of energy savings will increasingly conflict with other programs

For a description of the proposed modifications to address these issues refer to Section 5.6.2.4. Once changes are made to the program process and administration more effort will be expended on raising the program’s awareness level in the market place. This can very likely be accomplished via industry partners in addition to the Companies’ own promotional efforts.

The Companies are currently engaged in a second evaluation study of the program (an initial study was completed in 2008) based on participation from July 2007 through July 2009. This study will provide additional needed insight into the program’s performance and allow the Companies to confirm the data underlying the performance results presented above. Furthermore the evaluation study will provide additional insight into where the program may be

modified to enhance its performance. Refer to Section 5.13.3.3 for details on the Energy Assessment Program Evaluation.

4.4.6 Summary

The Companies have a track record of promoting Commercial Energy Efficiency programs. With the additional funding provided through Commission approvals they significantly broadened their efforts in TGI and TGVI service areas, to both New Construction and Retrofit applications. The Efficient Boiler Program, the Light Commercial ENERGY STAR® Boiler Program, and the Energy Assessment Program all generally performed well in 2009, delivering value to Customers. Using the experience gleaned from these programs the Companies have identified targeted opportunities to improve effectiveness and produce further gains in 2010.

4.5 Conservation for Affordable Housing Programs

Conservation for Affordable Housing programs focuses on reducing energy consumption for low income customers, which in turn reduces their energy costs and their GHGs. Conservation for Affordable Housing is a new area of activity for the Companies. In order to recognize its importance, the Companies have created a discrete Program Area for Conservation for Affordable Housing. Although the Companies have in the past been active within working groups and task forces related to energy conservation in affordable housing, there previously weren't financial resources to contribute towards implementing programs that reduce energy consumption for residents of Affordable Housing. Now, with the additional funding provided by the Commission EEC Decision, the Companies have been able to develop programs that target this important stakeholder group.

4.5.1 2009 Programs Led to Meaningful Early Results

After receiving approval to invest in the Conservation for Affordable Housing Program Area, the Companies have spent a significant portion of 2009 on facilitation, coordination, planning, and development of programs that will be implemented in 2010 and beyond.

Despite the longer term focus of this work, the Companies also rolled out three projects that were completed in 2009. These projects were:

- The Meridian Village Project;
- The LiveSmart Carry Over Project (through the MEMPR Low Income Partnership Funding); and
- The Energy Conservation for Affordable Housing Forum.

In addition, the Companies have also continued the facilitation of the BC Working Group for Energy Efficiency for Affordable Housing and the Affordable Energy Conservation Task Force.

Table 4-10 provides a summary of the 2009 Conservation for Affordable Housing projects for the Companies. The 2009 projects were focused on retrofits and were implemented in TGI's service territory however the Energy Conservation for Affordable Housing Forum had a province-wide perspective.

Table 4-10: 2009 Conservation for Affordable Housing Projects for TGI and TGV

Project	Description	Retrofit			
		# of Units or Participants	Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	TRC
1	Meridian Village	124	230	14,236	0.7
2	LiveSmart Carry Over	557	989	67,601	1.1
3	Energy Conservation for Affordable Housing Forum	83	5	N/A	N/A

Notes:

- 1) The final assessments have not been completed for the LiveSmart Carry Over project. Figures presented here are estimates only.
- 2) LiveSmart Carry Over was funded through the MEMPR Low Income Partnership Funding and therefore not included in the portfolio level TRC calculation.
- 3) As per DSM regulation, the TRC calculation for all low income programs applies a deemed benefit of 130% of what the benefit would be recognized as in an able-to-pay program's TRC calculation. This regulation is applied in the TRC figures shown above.

Notable achievements through the Conservation for Affordable Housing projects in 2009 are:

- In 2009 the Companies invested a total of \$1.219 million in retrofits benefiting 557 units and achieved a NPV of 81,837 GJs in energy savings.
- The Meridian Village project completed furnace upgrades in 124 town house units and achieved a projected energy savings of 14,236 GJs over the lifetime of the furnaces. The program achieved a TRC of 0.7. This set of town houses received upgraded furnaces through this Meridian Village project and also received additional energy efficiency measures through the LiveSmart Carry Over project.
- The LiveSmart Carry Over project completed a variety of energy efficiency upgrades benefiting a total of 557 units. Final evaluation of this project will be completed by the end of April, 2010. Estimated savings are 67,601 GJs based on prior LiveSmart Energy Assistance Program experience which would equate to a TRC of 1.1.
- The Energy Conservation for Affordable Housing Forum attracted a total of 83 participants. The Companies were a sponsor of the Forum, contributing \$5,000 to the costs of the forum, and played a central role in the coordination, administration and facilitation of the Forum.

Conservation for Affordable Housing projects are described in further detail below.

4.5.2 Meridian Village Furnace Upgrade

Program Area: Conservation for Affordable Housing Programs

Target Market: Retrofit

Duration: Furnaces installed between September 2009 and December 2009

Incentive: \$1,850 per furnace

Partners: Metro Vancouver Housing Corporation (“MVHC”), LiveSmart Energy Assistance Program (“LEAP”), ecoEnergy

Program Objectives:

- Carry out an exploratory furnace upgrade project in a social housing complex to determine savings potential.
- Extend the LiveSmart Carry Over project’s energy savings by upgrading 124 furnaces to high efficiency models.
- Create a partnership with MVHC, a key social housing provider.
- Gain experience and build capacity within the Conservation for Affordable Housing Program Area.

Background:

The Meridian Village furnace upgrade project was the Companies’ first project in the Conservation for Affordable Housing program area. The furnace upgrade project, described in this section was an opportunity to extend the other energy savings measures that this town house complex received under the LiveSmart Carry Over project, described in the following section. Together, these two projects provided the opportunity to analyse the impact of a comprehensive energy efficiency retrofit in low income town houses. Total savings from the Meridian Village project combined with the LiveSmart Carry Over project will be compiled in April 2010. This section describes savings attributed to the furnace installation alone.

The Meridian Village project was presented to Terasen Gas as a proposal from eaga Canada Services Inc¹⁰ on behalf of the MEMPR’s LEAP program aimed at social housing providers. The Meridian Village complex, located in Port Coquitlam, is owned by MVHC.

TGI contributed \$229,400 of the total \$620,000 that was used to install 124 high-efficiency furnaces. Contributions are summarized in Table 4-11.

Table 4-11: Meridian Village Contributors

# of Furnaces	LEAP	ecoENERGY	Terasen Gas	MVHC
124	\$80,600	\$80,600	\$229,400	\$229,400

The townhouses in this complex are individually metered and the tenants all pay rent to the owner. This was an especially good selection for energy efficiency investments because all the furnaces were oversized at 60,000 to 70,000 BTU. By installing smaller, two-stage high efficiency furnaces (94% AFUE, 45,000 BTU), the furnaces will now be able to run at approximately 25,000 BTU the majority of the time.

Results:

Table 4-12 provides highlights of the Meridian Village Project performance metrics for 2009.

¹⁰ eaga Canada Services Inc. a social enterprise and provider of green support services and solutions in the residential sector. eaga Canada Services Inc. focuses on tackling climate change, promoting residential energy efficiency and delivering social inclusion for low income households

Table 4-12: Meridian Village Performance Summary

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
TGI	124	229	0	1352	14,236	N/A	0.7

Note: As per DSM regulation, the TRC calculation for all low income programs applies a deemed benefit of 130% of what the benefit would be recognized as in an able-to-pay program's TRC calculation. This regulation is applied in the TRC figures shown above.

Overall, this project achieved the objective of extending the LEAP and ecoEnergy grants and extending the measures that were installed through the LiveSmart Carry Over Program. All 124 units had new high efficiency furnaces installed which resulted in NPV energy savings of 14,236 GJ's based on 10.9 GJ's savings per unit annually. The Companies incurred less than \$500 in non-incentive costs largely due to MVHC taking on much of the administration of this project. The Free Rider Rate was not applicable for this project because none of these furnaces would have been upgraded if it were not for TGI's incentive.

An additional benefit of this project is that there is an improvement to quality-of-life for the residents resulting from better air quality and quieter furnaces. By installing new high efficiency furnaces that use smaller motors, the noise from the furnace operation was reduced considerably and the new standard-sized air filters can be easily and regularly replaced resulting in far more effective air filtration than the old custom-sized and improperly fitted filters, however this benefit cannot be monetized.

The resulting TRC (0.7) is lower than 1.0, which indicates that the 30% energy savings benefits allowed for low-income conservation activities may not be adequate to push programs for this sector, where the full cost of the measure rather than just the incremental cost for energy efficiency goes into the cost side of the TRC calculation. The Companies intend to hold discussions with MEMPR on this topic, to see what actions need to be taken to ensure that covering the full cost of a measure is viable from a benefit-cost perspective.

For cost benefit analysis please refer to Appendix J.

4.5.3 LiveSmart Carry Over

Program Area: Conservation for Affordable Housing Programs

Target Market: Retrofit

Duration: Installations completed between September 2009 and January 2010.

Incentive: Average incentive of \$1,700 per unit

Program Objectives:

Complete the energy efficiency installations that were identified under the LEAP program.

Background:

On March 31, 2009, through the Low Income Partnership Funding agreement, MEMPR awarded TGI and TGV I a grant of \$5.155 million to support and develop DSM programs for low-income individuals in British Columbia. These funds are incremental to the funds approved in the EEC Decision and the LiveSmart Carry Over project was entirely funded with the Low Income Partnership Funding (described further in Section 5.8.3.4).

In August 2009, MEMPR informed the Companies that due to fiscal restructuring occurring within government, the budget that MEMPR had allocated for the LEAP was cut by as much as \$1.4 million. The LEAP was a provincial energy efficiency program for low income residents of British Columbia that was developed and administered by MEMPR. MEMPR encouraged the Companies to use the Low Income Partnership Funding to complete energy efficiency retrofits in five affordable housing complexes throughout Metro Vancouver. These retrofits would otherwise not be completed. These retrofits included items such as new high efficiency boilers, programmable thermostats, attic insulation, draft proofing and other energy savings measures. The buildings and estimated efficiency measures for this project are shown in Appendix E.

The Companies committed \$965,803 to complete the energy efficiency retrofits for the five sites that were gas customers. As at the end of 2009, this contract was substantially complete.

Results:

Table 4-13 provides highlights of the LiveSmart Carry Over Project performance metrics for 2009 based on the budgeted expectations given that the final results of the project will not be known until the formal post-installation energy assessments are completed.

Table 4-13: LiveSmart Carry Over Performance Summary (Based on Budget Expectations)

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
TGI	557	947	42	7,130	67,601	N/A	1.1

Note: The cost-benefit analysis and the TRC shown above are using the same cost-benefit analysis used for all low-income EEC programs (including the deemed benefit of 130% for low-income programs) however, this program is funded through the MEMPR Low Income Partnership Funding (not the funds approved through the EEC Application).

The \$947,000 in incentives is based on a budget allowance of \$1,700 per unit. Estimates at the onset of the project were that the installations would average \$1,667 per unit as represented by the total installation amount of \$928,462 in Appendix E. The Non-Incentive amount of \$42,000 includes the estimated \$37,341 for assessments and an estimate of \$5,000 for the Companies' administration, communication, evaluation and development. The projected NPV energy savings is 67,601 GJs which yields a TRC of 1.1.

4.5.4 Working Group and Task Force

Throughout 2009, the Companies have continued the facilitation of the BC Working Group for Energy Efficiency for Affordable Housing (“Working Group”) and the Affordable Energy Conservation Task Force (“Task Force”).

At the request of MEMPR, the Companies formed the Working Group in September 2008 with the objective of ensuring that lower income homes can actively participate in, and benefit from, targeted energy efficiency programs. The Working Group consists of a large and diverse group of stakeholders engaged in the topic of energy efficiency in the low income niche. Refer to Appendix E for the member organizations of this Working Group.

To meet the objective of ensuring that lower income homes are included in energy efficiency programs, work has begun on an Affordable Energy Conservation Strategy paper (“Strategy Paper”). Because the Working Group is large and geographically dispersed, a subset of the Working Group, called the Task Force has taken on the coordination role for the development of the Strategy Paper. The Task Force has also been responsible for coordinating an Affordable Energy Conservation Forum, held in March 2009. The Affordable Energy Conservation Forum is further described in the next section and the Member organizations of the Task Force are presented in Appendix E. The Strategy Paper is further described in Section 5.8.2.1.

4.5.5 Affordable Energy Conservation Forum

The Affordable Energy Conservation Forum (the “Forum”) was coordinated by the Task Force and attended by many members of the Working Group. The Companies were a Sponsor for the Forum (contributing \$5,000) and a primary coordinator for the event with two staff members actively involved in many aspects of facilitation, coordination and administration for the forum.

The event was successful in attracting a diverse group of 83 stakeholders (a full list of attending organizations is shown in Appendix E) to come together to discuss opportunities to deliver affordable energy conservation strategies to lower-income groups across the province.

The Forum focused on household energy efficiency and its objectives were as follows:

- To share information, strengthen relationships and build trust among stakeholders in energy efficiency, low-income service support and affordable housing sectors;
- To identify key issues, challenges and opportunities associated with integrating energy efficiency into low-income service support and affordable housing sectors;
- To identify best-practices from Low Income Energy Efficiency Programs (“LIEEPs”) around the globe;
- To identify the key components of a “made in BC strategy” to address improving efficiency for low-income families; and
- To identify concrete steps to strengthen the availability of energy efficiency for low-income families with a focus on opportunities for increased coordination and/or collaboration among key stakeholders.

It was the hope of the Task Force that by establishing a baseline for dialogue, efforts at the forum could be directed toward finding affordable energy conservation solutions for lower income households in British Columbia.

Feedback from the Forum suggested that the event was effective in bringing together stakeholders to focus on energy poverty and the surrounding issues. The attendees appreciated hearing about success stories in other jurisdictions and expressed the desire to attend another similar forum in the future.

Another outcome of the Forum is the initiative of the Task Force to oversee the creation of the Strategy Paper. The Task Force has taken some steps towards creating this Strategy Paper however it is a lengthy process. This process is described further in Section 5.8.2.1.

The Task Force has had some initial discussions about hosting another Affordable Energy Conservation Forum and there is general agreement that a Forum should be held again at some point in 2010 or 2011 after the draft strategy has been written.

4.5.6 Summary

Conservation for Affordable Housing programs represent a new area of activity and focus for the Companies, one made viable through the funding approved by the Commission. And while 2009 was a year where the groundwork was being laid for this portfolio, three projects were also launched that delivered immediate results.

With this foundation in place the Companies look forward to continuing and broadening their efforts in 2010 and beyond.

4.6 Joint Initiatives

Joint Initiatives are EEC programs that involve mutually beneficial collaborations between groups such as government agencies or other utility partners. To further such Joint Initiatives programs, in July 2009 the Companies signed a Memorandum of Understanding (“MOU”) with BC Hydro to facilitate increased utility collaboration on DSM. The purpose of the MOU is to drive efficiencies in program promotion, administration, and share DSM expertise to bring education and incentive programs to residents across BC. It is the Companies’ intention to complete a similar MOU with FortisBC in 2010.

4.6.1 Joint Initiatives Draw on Complementary Strengths

The first Joint Initiatives the Companies will pursue are collaborations between utilities and government to develop market adoption of new technologies and energy efficiency education and outreach. Utilities have the funds and technical resources to manage pilots for new technologies to validate savings claims. As technology becomes main stream, utility incentive programs can help support education and ultimately compliance of new efficiency regulations across the supply chain. Governments can support activities such as home energy assessments, where no energy savings can be attributed to the assessments themselves, while utilizing the utility’s cost-effective marketing channels to their shared constituency of consumers and trades.

The second type of Joint Initiative the Companies intend to seek out are those between utility partners. These are compelling because they can extend the market reach of a program to include all households regardless of whether or not they use electric or natural gas space and

water heating. Each utility has strong brand recognition and cost-effective marketing channels. Working together creates synergies that drive program participation, energy savings and outreach while reducing administration and marketing costs.

4.6.2 Overview: 2009 Joint Initiatives

The Companies have launched Joint Initiatives that are benefiting customers and furthering EEC goals. Joint Initiatives are EEC programs that enable partnerships between utilities and government or utilities and other utilities. These partnerships enable sharing of costs, expertise and more in furthering the pursuit of EEC goals.

There were two actual Joint Initiative programs offered in 2009: EcoEnergy Home Energy Assessments in partnership with LiveSmart BC and a Tier 3 ENERGY STAR® Washer and Dryer Rebate Program in partnership with FortisBC. Table 4-14 provides a summary of the 2009 Joint Initiatives programs for TGI and TGVI.

Table 4-14: 2009 Joint Initiatives Programs for TGI and TGVI

Program		Description	Retrofit			
			Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	TRC	
					TGI	TGVI
1	EcoEnergy Home Energy Assessments (D-Visits) through LiveSmart BC	\$75 Incentive to cover the partial cost of Home Energy Assessment provided by an NRCan certified Home Energy Advisor	408	0	N/A	N/A
2	Tier 3 ENERGY STAR® Washer and Dryer Rebate with Fortis BC - Six week pilot	\$50 Incentive for Tier 3 washers and dryers in Fortis BC service territory	6.5	1,905	0.8	N/A

The highlights of the 2009 Joint Initiatives programs are as follows:

- EcoEnergy Home Assessment funding, provided through a partnership with LiveSmart BC, demonstrates the Companies' support for energy assessments as a critical first step in the retrofit process and "whole home" incentives. Over \$400,000 in assessment funding was distributed in 2009, although no energy savings can be claimed directly as a result of this program. Rather, energy assessments are an avenue into other retrofit incentive programs that drive energy savings.
- Fortis BC Tier 3 ENERGY STAR® Washer and Dryer Rebate Pilot promoted energy and water efficient laundry practices in the Okanagan. TGI partnered with FortisBC in order to extend the reach to natural gas water heating customers. The six-week pilot was so successful that a 2010 program is under development.

These Joint Initiatives programs are described in further detail below.

4.6.2.1 EcoEnergy Home Energy Assessment (D-Visit Audit) through LiveSmart BC

<u>Program Area:</u>	Joint Initiatives
<u>Target Market:</u>	Retrofit
<u>Duration:</u>	August 16, 2009 through March 31, 2010
<u>Incentive:</u>	\$75 subsidy from utility partner (based on fuel source) and \$75 from MEMPR
<u>Partners:</u>	TGI, TGVI, BC Hydro, FortisBC and MEMPR

Program Administration:

LiveSmart BC

Program Objectives:

This program intends to achieve the following:

- Provide incentives for Home Energy Assessments as the first step in improving the energy efficiency of existing building stock
- Support LiveSmart BC in the interim funding period prior to new program iteration in April, 2010
- Initiate collaborative discussions with BC Hydro, FortisBC and MEMPR

Background:

The LiveSmart BC Residential Retrofit Incentive Initiative was initially launched in May 2008 as a three year program. However with significant federal and provincial incentives, the program was oversubscribed, and provincial funding expired on August 16, 2009. At that time the Companies chose to contribute funds in support of the LiveSmart BC program, and to expand the opportunities for energy efficient retrofits for their customers.

The Companies agreed to provide a \$75 subsidy for home energy assessments (D-Visit audits) to natural gas heated homes in their service territory, while the electric utilities provide the same subsidy for electrically heated homes in their service territories. MEMPR matched the utilities \$75 for a total of \$150 subsidy for home energy assessments. LiveSmart BC administered the program and utilities flowed subsidy payments through MEMPR to the service organizations known as Certified Energy Advisors.

Results:

In 2009, TGI supported 5,182 assessments and TGVI supported 263 for a distribution of \$408,375 in subsidy funds. Total non-incentive dollars were \$15,895 for TGI and \$3,516 for TGVI and included \$10,000 for LiveSmart BC program data for evaluation. LiveSmart BC covered program administration costs.

Due to the nature of this project in that the assessment is an evaluation step only, the Companies cannot claim energy savings for these expenditures.

Planned Improvements for 2010:

The Companies recognize the importance of home energy assessments as the first step in the energy efficient retrofits. Through the process, homeowners are made aware of retrofits that can be undertaken to improve energy efficiency, reduce energy bills and improve the comfort of their home. It is anticipated that the Companies will have provided funding for an estimated 15, 000 assessments and contributed \$1.125 million from August 16, 2009 through March 31, 2010, which is the provincial fiscal year end.

4.6.2.2 FortisBC PowerSense ENERGY STAR® Tier 3 Washer Dryer Pilot

<u>Program Area:</u>	Joint Initiatives
<u>Target Market:</u>	Retrofit market in FortisBC territory (Okanagan)
<u>Duration:</u>	Six Weeks Summer 2009
<u>Incentive:</u>	\$50 per washer and \$50 per dryer
<u>Partner:</u>	FortisBC

Program Administration:

FortisBC

Program Objectives:

- Capture the energy savings associated with promoting energy and water efficient laundry practices in the Okanagan.
- Determine program participation rates and logistics for a 2010 program
- Determine logistics associated with utility collaboration for appliance programs

Background:

As part of the EEC domestic hot water strategy, the Companies can provide incentives for energy and water efficient appliances. To do so most effectively the Companies will partner with BC Hydro and FortisBC in order to extend the reach of the FortisBC washer and dryer rebate program to homes with natural gas space heating and water heating.

The FortisBC washer and dryer rebate program was part of a larger pilot project to promote energy efficient laundry practices in the Okanagan. FortisBC ran a six week pilot in the early summer of 2009. In partnership with Terasen Gas, it provided \$100 incentives to customers who purchased a Tier 3 ENERGY STAR® washer and dryer or \$50 for a Tier 3 washer.

Tier 3 is the Consortium of Energy Efficiency's highest energy efficiency designation for the most energy and water efficient models available in the marketplace. TGI provided the Tier 3

washer and dryer incentives to any program participants who heated their water with natural gas or installed natural gas dryers.

In joining with FortisBC the Companies and their partner are able to share marketing and administration costs, and more effectively educate customers about the advantages of ENERGY STAR® appliances and conservation.

Results:

Although the pilot project was conducted during a low purchase season and with limited advertising and promotion, the program was successful, far exceeding projected goals. In total, 239 rebates were distributed with about 90 per cent of the rebates given to participants who replaced both a washer and a dryer.

Table 4-15 provides program highlights of the FortisBC Tier 3 ENERGY STAR® Washer and Dryer Rebate Program Performance metrics for 2009.

Table 4-15: FortisBC Tier 3 ENERGY STAR® Washer and Dryer Rebate Program Performance Summary

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
TGI	130	6.5	-	210	1,905	43%	0.8

Participant numbers are based on 121 washers and 9 natural gas dryers

One hundred and twenty-one washers and nine natural gas dryers were eligible for a TGI rebate. The washer count was based on participants declaring that they had natural gas water heating. The dryer count was based on an eight per cent estimate of natural gas dryers in the FortisBC service areas as determined by their 2008 REUS.

As outlined in Table 4-15, based on 2009 participants, the program is achieving annual gas savings of 210 GJ's and a projected 1,905 GJ's over the life time of the measure. For this analysis a Free Rider Rate of 43% was used. This represents the proportion of 2006 shipped appliances that are ENERGY STAR®, a number obtained from FortisBC, and BC Hydro. Since rebates are only applied to the Tier 3 portion of ENERGY STAR® models, TGI recognizes that the Free Rider Rate is over-estimated. The Companies are contacting Canadian Appliance Manufacturers Association ("CAMA") and NRCAN, to obtain a more accurate estimate of the market share of Tier 3 washers and dryers as a portion of total ENERGY STAR® appliances in the market. Once known, this number will be used for the Free Rider Rate for 2010 program development.

TGI paid out \$6,500 in incentive dollars and all marketing and administrative support was provided by FortisBC. The TRC was 0.8 based on the 43% Free Rider Rate that over-estimates the portion of Tier 3 appliances. The model will be revised once Tier 3 market data is obtained.

For cost benefit analysis please refer to Appendix J.

Planned Improvements for 2010:

The FortisBC Tier 3 ENERGY STAR® washer and dryer program met the objectives of promoting energy and water efficient laundry practices in the Okanagan, capturing the savings associated with the installations, and gaining the knowledge to roll out a more extensive program in 2010. Although the TRC was marginal, the Companies believe energy efficient washer programs are fundamental to the domestic hot water strategy in terms of renewing appliances and outreach on the importance of hot water conservation.

The outcome of this pilot is a learning exercise for future energy and water efficiency appliance programs for utility partner collaboration.

4.6.3 Summary

Joint Initiative programs provide numerous mutually beneficial advantages to all partners in the collaboration. In working together, utilities and government partners can extend the reach of incentives, provide cost-effective education and outreach, and generate even greater energy savings and greenhouse gas reductions. Based on 2009 successes, the Companies are expanding their Joint Initiative projects in 2010 (refer to Section 5.9).

4.7 Conservation, Education and Outreach (“CEO”) Programs

Successful EEC programs depend on creating and promoting awareness, which in turn generates desire by all customers to participate in EEC activities. One important way to generate this kind of support is to foster and develop a conservation culture within British Columbia. To achieve this, the Companies have established and implemented Conservation, Education and Outreach (“CEO”) initiatives. The goal is to ensure that customers are aware of and will be receptive to incentive programs when they are proposed. Additionally, CEO initiatives support the energy conservation and GHG reduction goals established by the Government of BC.

4.7.1 Supporting EEC Goals through Shared Principles

CEO initiatives have two priorities:

- Assist the community in embracing change through education of the public on energy conservation behaviours and benefits; and
- Increase participation in EEC incentive programs through education on the Companies’ conservation initiatives in general.

CEO initiatives follow many of the same program principles that were put forth in the EEC Application, in particular:

- Programs will have a goal of universality; offering access to energy efficiency and conservation for all residential and commercial customers, including low income customers through the DSM for Affordable Housing initiative;

- Where possible, programs will be uniform across the service territories of the Companies, so customers will have equal participation opportunity; and
- Programs will be multi-year so as to create a sense of funding certainty necessary to effectively implement them in the marketplace.

4.7.2 Diverse Possibilities Require Careful Screening

Given the diverse range of possible CEO activities, and the numerous regions and customer groups they can target, care must be taken when decided which initiatives to pursue. The Companies consider many factors before settling on the right initiatives. These include (but are not limited to):

- potential participant reach;
- geographically spread across TGI and TGVI service territories;
- attendance demographics and alignment of those demographics with our customers;
- media involvement, i.e. print, online, radio, in-person, cooperative advertising, or a combination thereof; and
- level of engagement with customers; activity-based vs. sponsorships and partnerships with third parties.

CEO initiatives are not individually put through the California Standards Tests at a program level. For further discussion on CEO evaluation techniques, refer to Section 5.13.3.4 and Appendix D.

4.7.3 Evolving Focus of CEO Activities Reflected in 2009 Priorities

With the EEC Decision and the new funding that accompanied it also came a new focus for CEO activities. This new focus came partly from the Commission Panel, which directed the Companies to review and refocus the CEO program.

Historically, the Companies have distributed print and online publications, exhibited at home and trade shows, and engaged in limited involvement with school programs.

And while in its EEC Application the Companies submitted a proposal developed in consultation with Wasserman + Partners Advertising, the EEC Decision suggested allocating funds away from the mass media campaign. Instead it was suggested initiatives should encompass other initiatives, including conservation education activities within the school system and affordable housing initiatives.

In 2009, the Companies expanded on initiatives which had previous proven to be successful in reaching a large number of consumers. In addition, the Companies also launched a number of new initiatives in Q4. Existing and new CEO initiatives have used limited mass media channels, and instead increased the engagement level with the public in order to achieve the CEO objectives.

As many of these initiatives began in Q4 and are continuing into 2010, much of evaluation for the CEO initiatives will be conducted in 2010 and are further described in Section 5.10. Table 4-16 provides a summary of the 2009 CEO initiatives and costs for TGI and TGVI.

Table 4-16: 2009 CEO Initiatives and Costs

Initiatives		Description	Expenditures (\$000s)		Total Expenditure (\$000s)
			TGI	TGVI	
1	Print and Online Publications	Energy conservation education promoted through bill inserts, newspaper and magazine ads, trade show guides, newsletters, directories, and terasengas.com.	209	12	221
2	Trade Shows and Events	Participated in residential home shows and commercial trade shows to reach customers and educate on energy efficiency rebate programs.	76	26	102
3	Students and Schools Outreach: Destination Conservation	K-12 program educating students and teachers about energy conservation and efficiency and providing them with curricula and support materials.	77	40	117
4	Students and Schools Outreach: Beyond Recycling	K-7 program educating students and teachers about energy conservation in West and East Kootenays			
5	Students and Schools Outreach: BC Green Games	K-12 competition for students to submit digital entries of their environmental projects.			
6	Students and Schools Outreach: School Assembly Presentations	K-7 school assembly presentations on energy conservation through interactive competitions.			
7	Energy Champion Program	Educate children and youth about energy conservation behaviour changes, using tlrregional sports team events..	123	3	126
8	Team Terasen Outreach	Outreach group delivering the Company's EEC message by connecting with customers at community events and festivals.	45	0	45
Total - Actual			530	81	611

The activities that make up the CEO initiatives are designed to create and promote awareness and educate the public. Increased awareness and education results in higher levels of participation in EEC activities and programs. The CEO activities for 2009 are set out and described in further detail below.

4.7.4 Print and Online Publications

Print and online publications are a cost-effective communications channel for delivery of information when compared to other communication channels such as television and mass media. The goal of the CEO print and online publications is to continually inform customers about various low-cost and no-cost upgrades they can perform at home to reduce their energy

consumption. These publications also provide tips and hints to help guide consumers in their decision making when purchasing energy efficient equipment. Print publications target customers that are already contemplating home renovations or equipment upgrades.

In 2009, the Companies continued to provide information through: customer bill inserts, magazine advertisements, appliance information sheets, industry association newsletters and directories, and the corporate website, www.terasengas.com. Conservation messages focus on seasonal actions that coincide with customers' usage of natural gas, for example water heating actions in the summer and space heating in the fall and winter. The core conservation educational print publication is the "Hot Tips" booklet. This booklet contains a number of energy saving tips for homeowners. It is distributed to customers who participate in EEC activities and programs to identify further opportunities for energy efficiency. The Hot Tips booklet is distributed at all trade shows and events.

4.7.5 Trade Shows and Events

Trade show and event activities remain an effective way to reach customers with general low-cost and no-cost energy saving information. Trade shows and events create opportunities for dialogue with customers to answer general energy related questions, the Companies' incentive programs and promote participation.

The Companies have exhibited in trade shows since 2006, and continued trade show activity in 2009 by participating in residential home shows, and Canadian Home Builders' Association ("CHBA") events. The CHBA branches represent the British Columbia residential housing industry. The CHBA branches are made up of members within the residential construction industry who liaise with local governments, promote the interests of housing consumers, and work to ensure a fair market place.

The majority of the attendees to these trade shows are homeowners specifically looking for home renovation and equipment upgrade information. Depending on the show's size, total attendance can range from 5,000 to 45,000. In addition, the Companies have display exhibits at industry specific shows targeting business customers. Based on the increasing number of customer inquiries regarding conservation and equipment retrofits, the Companies believe that participation in trade shows is an essential initiative in educating customers about EEC programs. For a complete list of 2009 trade shows and events, please refer to Appendix D.

4.7.6 Students and Schools Outreach

While limited EEC funds limited the scope of activity, the Companies have historically supported conservation education in schools. Since receiving the EEC Decision, the Companies have increased their student and schools outreach through a variety of initiatives.

The goal of the Companies' school outreach activities is to educate students on natural gas and how gas fits into the province's energy picture. Education also explores energy conservation. By reaching out to students, the Companies are instilling conservation knowledge early. The goal is to foster a "culture of conservation".

As school programs generally run over the September to June time period, the initiatives described below are continuing into 2010 and will undergo an evaluation after they have been completed.

4.7.6.1 Destination Conservation

TGI has been supporting the Pacific Resource Conservation Society's Destination Conservation ("DC") program since the 1999-2000 school year. DC is a three-year K-12 school program involving students, teachers and school facilities management staff. In 2009, the DC program was made available for the TGVI service territory. The main purpose of the program is to educate schools on ways to reduce consumption of energy, waste and water, and motivate them to participate in energy conservation projects.

The Companies' support for DC is with a goal to bring in at least two additional school districts each year that would not have participated if the funding had not been available. With a multi-year school program in place, this provides stability in planning for the teacher and students to be able to build upon previous lessons and projects. Please refer to Appendix D for further detail on the Companies' funding and summary of the school districts that are currently participating in the DC program.

4.7.6.2 Beyond Recycling Program

The Beyond Recycling program is a new program in 2009, delivered by the Wildsight organization. Wildsight is a non-profit organization that focuses on biodiversity and healthy human communities in the Columbia region. Beyond Recycling provides students with an understanding of the connection between consumption patterns and environmental impacts.

The program contains lessons in reducing waste and greenhouse gas emissions and the role of natural gas in BC. The Companies co-fund the program with Environment Canada's EcoAction Community Funding Program, and FortisBC. The funding of this program is to ensure conservation outreach to schools that may not otherwise have been able to participate. See Appendix D for additional details on the Beyond Recycling program.

4.7.6.3 BC Green Games

BC Green Games, which first started in the 2008-2009 school year, is a province-wide competition hosted by Science World. This is a new initiative for the Companies, who are co-sponsoring with BC Hydro, and participate in both the Advisory Committee and Judging Panel. By co-sponsoring this initiative, the Companies are able to introduce the concept of natural gas as a resource and the need for energy conservation into the students' environmental projects.

The Green Games competition requires student teams to submit digital entries on their environmental projects for prizes. BC Green Games ties into other initiatives such as Destination Conservation and Beyond Recycling by providing a means to showcase team projects that were developed in those programs. Where Destination Conservation and Beyond Recycling successes would have been limited to the school or community, BC Green Games allows students to learn about initiatives in other schools, learn from their peers, and build on their existing or new projects for the next year. See Appendix D for additional details on BC Green Games.

4.7.6.4 School Assembly Presentations

By reaching into schools in partnership with athletes the Companies have taken meaningful actions in their efforts to foster a “culture of conservation.” One such new initiative that the Companies supported in 2009 was a partnership with the BC Lions, where players from the team delivered interactive and informative presentations to assemblies at 50 elementary schools throughout BC.

The Companies co-funded the program along with LiveSmart BC, including both the Ministry of Education and the Ministry of the Environment, and Plutonic Power. The goal of this initiative was to launch a program that interacted with students and brought conservation education directly into the schools.

The assembly presentation featured B.C. Lions players talking to students about environmental responsibility and then engaging with them in competitive games that focused on recycling, water, and energy conservation. After the assembly, the players visited a Grade 5 class for a more in-depth lesson. This initiative was successful in that it reached at least 15,000 students. Partnering with the BC Lions has been beneficial as the players act as role models in promoting energy conservation and teamwork. Refer to Appendix D for a list of the schools that received the presentations.

4.7.6.5 Energy Champion Program

The Energy Champion program is a new initiative that the Companies developed and executed through local sports teams such as the BC Lions, Vancouver Giants, and the BC Hockey League. The goal of this program is to educate children and youth on energy conservation behaviour in a fun and rewarding manner.

These partnerships enable the Companies to leverage traditional media channels, such as radio, as well as the sports teams’ online and social media channels. Because these channels are well developed in the market and reach out to a large number of the teams’ fans, they provide the Companies with easy and immediate access to important stakeholders.

Moreover, partnering with regional sports clubs is an excellent way to reach out to families. Many families have children participating on sports teams and this program contributes to building positive associations with sports. Sports fans are generally loyal and highly engaged with teams they identify with. Often, engaging through team websites and newsletters allows the Companies targeted access to a specific audience through a low-cost communication channel.

The Energy Champion program is designed to engage both the youth audience and their parents. As the sports clubs’ season runs from approximately September to April, the Energy Champion program will be continuing into 2010 and will undergo an evaluation after it has been completed. Please refer to Appendix D for detailed program description.

4.7.7 Team Terasen Outreach

The Team Terasen Outreach group (“Team Terasen”) is similar to the BC Hydro Community Outreach team. First launched in 2007, it is a grassroots channel for delivering the Companies’ EEC messages. It connects the Companies’ customers through educational and interactive activities.

These events and activities generally attract a large audience as most of the events are free for the public to attend and reside in local communities. These activities have proven to be a cost-effective method of reaching out to the public that would normally be absent from home shows. By attending local community events, this allows customers to put a “face” to Terasen and learn about energy conservation. These opportunities contribute to the Companies’ goal of building a culture of conservation.

In 2009, the goal of the Team Terasen was to expand into the Fraser Valley area and generally into corporate offices. Refer to Appendix D for a complete list of events attended in 2009.

4.7.8 Summary

The CEO initiatives follow many of the same Program Principles that were put forth in the EEC Application. They are programs that are designed to be accessible to all customers, uniformly across TGI and TGVI territories, and are multi-year programs to ensure effective implementation and stability in the marketplace. The objective of CEO initiatives is to support the development of a conservation culture within British Columbia.

The initiatives described throughout this section will continue to promote and educate the public on energy conservation behaviours. The result will be fostering a “culture of conservation”, which will benefit communities, increase participation in EEC incentive programs, and ultimately support shared goals of the Companies and province.

4.8 Enabling Activities

Enabling Activities are activities that support the Companies’ EEC program development and delivery. They play a very important role within EEC in that they provide resources common to the support and ultimately, the delivery of all Program area activities.

4.8.1 Four Key Areas of Focus In 2009

In 2009, Enabling Activities fall into four major categories:

Research and Evaluation (Section 4.8.2): These include two general areas of activity: market research and program evaluation. Market research provides invaluable information used for planning and implementing effective programs and program evaluation helps to measure the effectiveness of a particular program and/or initiative. The highlights of the 2009 Research and Evaluation activities are as follows:

- Delivery of the 2008 REUS results, which includes data that assists in program planning and development, marketing, education and communication activities.

- Participation in the second wave of a study that focuses on North Americans' attitudes, perceptions and behaviours around sustainability and social responsibility as well as the impacts they have on lifestyle choices, brand relationships and purchase decisions.
- Completion of the Residential Retrofit Market Evaluation for Terasen Gas, to evaluate the residential retrofit market and audit the LiveSmart BC Residential Retrofit Incentive program to determine the viability of the LiveSmart BC brand and identify opportunities and threats in regarding its continued use.
- Completion of the second phase of the ENERGY STAR® Heating System Upgrade Evaluation that provides the Companies with estimates of program impact on natural gas sales and carbon dioxide emissions, in addition to determining the status of market transformation for high efficiency furnaces.

Efficiency Partners Program (Section 4.8.3): Formed to consolidate and enhance existing service and supplier relationships, to provide a delivery pathway for all EEC programs to customers. The EEC Decision ruling did not approve the discrete Trade Relations budget area put forward for these supporting activities as it was identified as a duplication of commercial and residential program delivery expenditure. The expenditures in this area are part of the overall overhead of EEC program delivery and are included in the overall EEC TRC. The EEC Stakeholder Group has not identified any objection to this approach. These various industry groups, including manufactures, service contractors, distributors and retailers, influence end use Residential and Commercial customers who make energy efficiency decisions. Customers will defer to advice received from these groups. The activity highlights of the Efficiency Partners Program for 2009 are as follows:

- Evaluation of the existing Qualified Dealer program and development of a new Contractor program for B-Ticket Contracting companies.
- Establish energy efficiency equipment manufacturer and supplier contacts.
- Identify all contractor stakeholder groups.
- Development of the new Contractor program with a rebrand and expansion of the scope of the existing TGVI Qualified Dealer program. Expansion of service areas to include the TGI Lower Mainland and Interior.
- TGVI surveys and Contractor focus groups were completed where EEC gained valuable information useful in developing the new support programs.

Codes and Standards (Section 4.8.4): Utilities play an important role in energy efficiency market transformation through support for the development of Codes and Standards. Government and regulating bodies are constantly seeking the participation and input of stakeholder groups, such as utilities, which have a unique understanding of energy supply and customer demand cycles. The Province's Energy Plan target levels and the timing of implementation are directly connected to effective market transformation in all EEC Program Areas. Utilities also play a role in keeping industry informed of developing codes and in alerting

stakeholder groups of any unintended consequences that may arise out of proposed codes and standards. The activity highlights for the Codes and Standards for 2009 are as follows:

- Codes and Standards that have relevance to EEC program development were benchmarked.
- A focus on the development of the upcoming new construction building code with an EnerGuide 80 efficiency target. Involvement at this time is crucial as very aggressive code changes with poor direction could have a negative effect on EEC programs and the market transformation process.

Pilot Programs (4.8.5): These test the effectiveness of a particular measure in the EEC market place. Pilots are utilised to verify potential savings and identify potential market transformation barriers in order to effectively design and implement EEC programs. They are also theoretically (and practically) known to improve the success of market adoption of a particular technology; allowing for a select group of customers to test new technologies prior to widespread delivery to the market place. The highlights for the 2009 Pilot Programs are as follows:

- The Okanagan Spray N' Save Pilot Program was developed and launched. Its primary goal to verify potential energy savings for kitchen spray valves used in the commercial kitchen applications.
- The TGVI Furnace Servicing Pilot Program was implemented with the objective of promoting the benefits of annual furnace servicing. Increasing awareness of energy efficiency appliances. Customers are rewarded for their service with a \$25 gift card to a local food store chain.

Table 4-17 below provides an overview of the 2009 expenditures for the Enabling Activities.

Table 4-17: 2009 Enabling Activities – Expenditures

Program		Description	Expenditure (\$000s)	
			TGI	TGVI
1	Research and Evaluation*	Market Research and Evaluation for potential EEC programs	12	3
2	Efficiency Partners Program	Delivering EEC programs through B-Ticket Contract Companies	7	20
3	Codes and Standards	Codes and Standards related to EEC Program areas	10	3
4	Pilot Programs	Verify potential savings and identify market barriers	28	224**

*Note that \$15K (\$12K for TGI and \$3K for TGVI) shown in this table reflects the actual amount spent on R&E Activities in 2009; the variance is explained in table 4-18.

**Note that \$224,000 is based on \$199,023 paid out in 2009 and \$26,000 that will be paid in 2010.

Further information on each of the four areas of the 2009 Enabling Activities is listed below.

4.8.2 Research and Evaluation

In general, the Companies engage in two general areas of activity in this area: market research and program evaluation. Both are important – market research because it provides invaluable information used for planning and implementing effective programs; and program evaluation because it helps to measure the effectiveness of a particular program and/or initiative. This section provides a high level description of the research and evaluation activities EEC undertook in 2009; further details for these studies are provided in Appendix D.

4.8.2.1 Overview: Research

Market research is defined as systematic, objective collection and analysis of data about a particular target market, competition, and/or environment. It always incorporates some form of data collection; sometimes this means primary research (collected directly from a respondent), in other cases it means secondary research (collected from additional sources including related literature, the Internet and media sources).

It is important to conduct both secondary and primary research because together they allow the researchers to gain valuable insight about energy efficiency and conservation. Armed with this knowledge they are better able to develop, implement and evaluate programs and activities.

4.8.2.2 Overview: Evaluation

Evaluation of EEC programs and activities allows EEC staff to measure the effectiveness of the programs. Historically, the Companies have conducted evaluation studies for DSM programs since the late 1990s.

In general, program evaluations are designed in two stages. During the program design phase, the program evaluation concept is determined. The primary purpose of this is to understand the data that will be required for the evaluation, and to determine how much of this can be collected during program operation, for example, as part of the incentive application. By doing this development prior to program launch, better quality data can be collected and at a lower cost than if evaluation design is left until the time for the evaluation.

Once the program has operated for a sufficient period of time, an impact evaluation can be undertaken, and the detailed program evaluation plan will be developed. In the past, the evaluations conducted on behalf of the Companies have been conducted by outside consultants who have been selected based on relevant experience and cost. Once selected, the consultant then develops the detailed evaluation plan for review and discussion with the Companies. When the plan has been approved, the consultant typically begins the field research which includes but not limited to field research (i.e. with participants and with the relevant trade allies), billing analysis, sub metering etc. Once field research is completed, the study moves into the analysis phase that results into a final report and develops a report.

4.8.2.3 Research and Evaluation Studies Conducted In 2009

As enabling activities, these expenditures are included in the overall portfolio-level EEC TRC test results. Each of the research and evaluation activities the Companies undertook in 2009 are further discussed below; the costs associated with these activities are shown in the table below:

Table 4-18: 2009 Research and Evaluation Studies

Study		Description	Expenditure (\$000s)	Expenditure (\$000s) 2009	Variance
1	REUS	Usage of natural gas in the residential sector	20	0	Paid in 2008
2	Residential Retrofit Market Evaluation	Assess LiveSmart BC brand awareness among BC residents	18	0	Paid in 2010
3	ENERGY STAR® Heating System Upgrade Evaluation	Verify energy savings for furnaces and boilers	9	0	Paid in 2008
4	SHIFT Report	Attitudes towards sustainability	30	15	\$15,000 paid in 2009 \$15,000 paid in 2010
Total			77	15	

In 2009, the Companies undertook a number of EEC research and evaluation activities, including REUS, Sustainability and Social Responsibility Attitudes Study (“SHIFT”) Report, Residential Retrofit Market Evaluation for Terasen Gas, and ENERGY STAR® Heating System Upgrade Evaluation. The details of each study and summary of results are provided below.

4.8.2.4 Residential End USE Study (“REUS”)

The primary aim of the 2008 REUS was to understand how natural gas was being used by TGI and TGVI’s existing residential customers – and to compare the results with those from the earlier studies (described in Appendix D).

The findings suggest that declines in weather- normalized use rates (i.e. gas consumption per household) have been experienced in four of the five TGI’s regions between 1999 and 2008. Overall, the Companies’ use rates are down 15.5% since 2002, and 20.7% since 1999. Whistler was the only region experiencing an increase in its residential use rate since 2002 (+6.4%).

The 2008 REUS report is a resource for the Companies’ management and staff to determine attributes regarding the existing customer base. It summarizes the survey data and identifies key trends specifically to meet the needs of forecasting, program planning, marketing, and communication functions within the Company. The EEC team uses the findings for program planning and development, marketing, education and communication activities. Further details are described in Appendix D.

4.8.2.5 Sustainability & Social Responsibility Attitudes Study Report (“SHIFT Report”)

In the early 2009, the Companies had an opportunity to be involved in the second wave of an annual market research study that focuses on North Americans’ attitudes, perceptions and

behaviours around sustainability and social responsibility as well as the impacts they have on lifestyle choices, brand relationships and purchase decisions.

The Companies participated in the study with a goal to gain an insight on what drives consumers to make sustainable and socially responsible choices as it relates to energy efficiency, insight into the sustainability profile of people who had already made sustainable and socially responsible choices related to home energy, and their behavioural profile. The study found that 69% of Canadians say they have already made sustainable and socially responsible choices related to home energy; lighting and home heating are the top two areas they say they have made such choices and purchase decisions.

The findings will be used as a reference guide to develop products & programs, select strategic affiliations and develop positioning and marketing communications strategies. Further details are described in Appendix D.

4.8.2.6 Residential Retrofit Market Evaluation for Terasen Gas

In November 2009, Terasen Gas commissioned Angus Reid Strategies to evaluate awareness levels among members of the general population regarding energy efficiency programs, rebates and incentives. The study was designed to provide insight into the various factors that motivate homeowners to participate in incentive programs, as well as to determine awareness of existing programs and brands.

The findings demonstrate that respondents are interested in reducing their energy bills and choose to participate in incentive programs for financial reasons, especially to save money over time. Reducing waste and protecting the environment were also identified as important reasons to participate in energy efficiency programs. In addition to incentive amounts, administrative processes can also influence participation rates, and respondents stated that program simplicity and centralized information were key factors in deciding whether or not to participate in an incentive program. Brands evaluated in the survey included Terasen Gas, BC Hydro Power Smart, Fortis BC PowerSense, LiveSmart BC, ENERGY STAR®, EnerChoice, among others.

The findings from this study will be used by the Companies and the utility partners to determine the strategy for the joint residential retrofit program described in Section 4.6. The findings will also act to guide program planning and development, marketing, education and communication activities. Further details are described in Appendix D.

4.8.2.7 ENERGY STAR® Heating System Upgrade Evaluation

In order to evaluate the effectiveness of the 2005-2007 ENERGY STAR® Heating System Upgrade Program, the Companies commissioned Habart in summer 2007. The goal of the study was to assess the effectiveness and participant satisfaction of the program through field research and verify energy savings through billing analysis.

The report consisted of two phases. The completed report of phase one of this study and the costs associated with it was filed in the response to EEC Application BCUC IR 1.71.2.1 on July 11, 2008. The primary objective of the second phase of the evaluation was to update estimates of program energy and demand savings using a comparison of weather-normalized billing histories for participants, and a comparative sample of non-participants (billing analysis).

The study found that 57% of participants in the Companies program credited it for influencing their decision to purchase a high efficiency furnace. Furthermore, based on net 9.6 GJ per annum savings per high efficiency furnace, the program generated 78.8 terajoules (“TJs”) in annual savings for the first 2.3 years and 47.4 TJs of annual savings in subsequent years. The findings were used for program development and for estimating energy savings achieved through the subsequent waves of the programs. For further details, please refer to Appendix D.

4.8.3 Efficiency Partners Program

End use Commercial and Residential gas customers rely heavily on the opinions of industry specialists when making efficiency decisions. The Efficiency Partners program area was formed in the latter part of 2009, to enhance existing supporting activities and identify new activity areas to meet the needs of delivering new EEC programs.

4.8.3.1 Overview

The Efficiency Partners program areas are aimed at building relationships with various industry groups. These groups include: manufacturers, service contractors, distributors retailers, and companies that influence residential/commercial end use customers who are making energy efficiency decisions. As customers rely on the advice of these groups, an ongoing relationship with these efficiency partners is vital to effective EEC program delivery.

4.8.3.2 2009 Focus and Expenditures

For 2009 the program focus was on evaluating and developing the new Contractor program and maintaining the Qualified Dealer Co-op advertising activities for the TGVI service area. Table 4-19 identifies areas of operation and annual expenditures.

Table 4-19: 2009 Efficiency Partners Expenditures

Contractor Program	Expenditures (\$000s)				
	Q1	Q2	Q3	Q4	Total
TGI	0	1	2	4	7
TGVI	0	0	2	4	6
TGVI Co-op Advertising	3	3	3	4	14

The 2009 Efficiency Partners Contractor program detail are further discussed in Appendix D of this Report.

4.8.4 Codes and Standards

With the expansion of the Companies EEC activities, efforts were made to identify current codes and standards that have relevance to EEC program development and implementation. The BC Energy Plan maps out emission and energy reduction targets levels. These aggressive target levels have a direct effect EEC programs in almost every area.

4.8.4.1 Potentially Significant Impact of Codes and Standards

One of the outcomes of market transformation is regulation through Codes and Standards. EEC programs are directly affected by these regulations. Prematurely aggressive efficiency target levels with a lack of equipment and service history to meet these performance levels could slow down or stop market transformation. This could result in substantial load shift to other energy sources, disturbing the energy supply balance thus effecting energy delivery rates to all customers.

Utilities also play a role in keeping industry informed of developing regulations and alerting the stakeholders groups of any unintended consequences that may arise out of proposed codes and standards.

There are a number of product areas where regulations are connected to EEC programs:

- Commercial Water Heaters and Boilers
- Residential Furnace
- BC Building Code
- Residential Boiler
- Hearth Products
- Residential Domestic Hot Water Heater
- EnerGuide 80 Building Code For 2010
- Towards Net Zero Buildings in BC for 2020

EEC department members work on key market committees that have the greatest effect on program areas. The Companies' Technical Sales and Support ("TSS") department maintains working relationships with various additional committees. A staff member of Technical Sales is assigned to the EEC group to provide a conduit to the services and knowledge of the Companies' TSS department and a point of liaison with TSS on regulation and codes and standards.

4.8.4.2 Focused on Regulatory Involvement to Promote EEC Goals

Keeping current is important, however the Companies' participation in the development phase of regulation allows for more effective EEC program delivery and successful DSM market transformation. This requires various levels of involvement. Codes and Standards are established at a Federal level and adopted with or without changes at the Provincial level. The BC Provincial government has a history of early adoption of regulations with aggressive energy and emission reduction levels. This puts BC industry stakeholder groups in the market transformation hot seat.

In the highlights section of Codes and Standards, the Utilities level of regulatory involvement is indicated by one of three involvement classifications:

- **Monitoring:** For most applications the Companies *Monitor* the status of Codes and Standards through update reviews and representation on the Canadian Standards Association steering committee. This gives us the ability to keep current and provide input to potential changes to all CSA codes. This is the lowest level of involvement.

- **Stakeholder Engagement:** For select Provincial Code adoption committees, the Companies participate at a *Stakeholder* level, actively attending meetings with other key market stakeholders and providing guidance to the end adoption recommendations.
- **Developing Regulations:** In support of Government's Energy and Climate Change objectives, the Companies take a *Development* role with potential Provincial regulations that potentially have a direct effect on EEC program market development. This may or may not involve financial support to provide computer modelling to identify the differences in Natural Gas use. This is the highest level of Involvement.

The sections that follow are the highlights of codes and standards as they apply to EEC program areas and are presented in order of the Companies Involvement Level.

4.8.4.3 Standards and Company Involvement: Monitoring Level

What follows is a list of codes and standards where the Companies monitor status and remains abreast of potential changing CSA codes.

Commercial Water Heater and Boiler Regulations

There are no current proposals for regulation changes to commercial water heater or commercial boiler standards. However these products have been discussed in 2009, and discussions will continue in 2010. There are a number of different codes and regulations here defined by BTU cut points and domestic potable vs. heat usage application. We monitor these codes and ongoing changes.

Residential Furnace Regulations

For new construction, gas furnaces manufactured on or after January 1st 2008, must have minimum fuel efficiency level of 90% AFUE.

For existing dwelling retrofits, gas furnaces manufactured on or after December 31st, 2009 must have a minimum fuel efficiency level of 90% AFUE. As in stock furnaces manufactured before the cutoff date can still be retailed, customers still have a mid-efficiency choice. The Utilities had a stakeholder involvement with the adoption of this standard and now will monitor any changes that may come out of implementation.

New Construction BC Building Codes

The following Federal regulation changes came into effect on September 2008 as the first steps to reduce greenhouse gas emissions related to buildings and construction.

- R20 Insulation for frame walls Natural Gas heated buildings for areas of 3500 deg days or less
- Increase attic space insulation from RSI 7.7 (R43.72) to RSI 9.0 (R 51.1) in the colder areas of BC (4500 deg days and more)

- Achievement of an EnerGuide System rating of 77 as an acceptable alternative to compliance with insulation table for residential buildings
- Non residential building Part 9 buildings must now provide thermal insulation in wall, roof and suspended floor assemblies. The amount of insulation is derived from ASHRAE 90.1-2004
- All other buildings (primarily Part 3) must comply with ASHRAE 90.1-2004 standard

The Companies worked on a stakeholder level with the Provincial adoption of this code and monitors implementation.

4.8.4.4 Standards and Company Involvement: Stakeholder Level

Below is a list of codes and standards where the Companies participate with other industry stakeholders and provide input as regulations are developed.

Residential Boiler Regulations (Still in proposal stage)

Effective September 2010, gas hot water boilers are to have a minimum 82% AFUE and no constant burning pilot light.

Table 4-20 outlines NRCan's proposed standards for residential boilers:

Table 4-20: Proposed Residential Boiler Regulations

Boiler Type Minimum	Effective Date September 1, 2010	Effective Date September 1, 2012
Gas Hot Water	82% AFUE No constant burning pilot	Automatic means for adjusting water temperature
Gas Hot Water equipped with tank-less domestic water heating coils	82% AFUE No constant burning pilot	-
Gas Steam	80% AFUE No constant burning pilot	-
Oil Hot Water	84% AFUE No constant burning pilot	Automatic means for adjusting water temperature
Oil Hot Water equipped with tankless domestic water heating coils	84% AFUE	-
Oil Steam	82% AFUE	-
Electric Hot water	-	Automatic means for adjusting water temperature

The Residential boiler code has remained unchanged since 1998, and the new version is due to come out in 2010, with no major changes expected. We will review the code at a monitoring level.

Hearth Product Regulations

There is currently no regulation for minimum efficiency of Hearth Products. However, Natural Resources Canada requires that fireplace should have Fireplace Efficiency ("FE") rating label. Models currently available range from 30% to 70% AFUE.

The CSA has established an appliance testing procedure for manufacturers to establish efficiency ratings. The Companies were involved with industry stakeholders to develop the EnerChoice top tier labelling system to help customers identify efficiency levels.

4.8.4.5 Standards and Company Involvement: Developing Level

The following is a list of codes and standards where the Companies are involving in developing regulation:

Residential Domestic Hot Water Heater Regulations

Water heating represents about 20% of household energy use in Canada. Water heating will account for an ever increasing share of energy use as envelope construction, appliances and HVAC continue to improve in efficiency while conventional water heating equipment has changed little. A proposed 5 year plan to regulation changes are listed in Table 4-21.

Table 4-21: Proposed Domestic Hot Water Tank Regulations

Type	Minimum Efficiency	Effective Date
Gas Storage -151L water heater	0.62 EF	September 1, 2010
Gas Storage -189L water heater	0.61 EF	September 1, 2010
Gas Storage Water Heater	0.67 EF	2011 (Proposed)
Gas Storage Water Heater	0.80 EF	2014 (Proposed)
For the first two items, EF rating is based on a formula $EF = 0.70 - (0.0005 \times V)$		
V=volume of storage water tanks in litres.		
Storage tank volumes of 151 litres and 189 litres are typical residential heater sizes.		

The first phase of this regulation begins September 1st 2010, but still allows for the sale of any less efficient water heaters manufactured prior to this date. Customers will still have a choice until existing inventories are exhausted. This first tier of change should not provide adverse market problems, however manufacturers have indicated that they have concerns with the second and third tiers of the proposed regulation. Utilities are working to try to bring stakeholders together to determine the appropriate market transformation plan.

The Companies' proposal for the attribution of savings from the introduction of the 2014 water heater regulations is discussed in Section 7 of this report.

EnerGuide 80 New Construction Building Code For 2010

The Provincial Government has announced that they are working toward the implementation of EnerGuide 80 ratings for the BC Building Code to take effect in late 2010. The current rating of 77 and the new 80 rating are stepping stones toward a Net zero level set for 2020. The Province of British Columbia is updating the energy efficiency requirements in Part 10 of the BC Building Code for residential buildings. Along with Industry stakeholders a study was started in 2009 to determine potential combinations of overall building envelope thermal requirements, air tightness, and equipment efficiency which will meet EnerGuide 80.

The Companies are involved at a partner level with BC Hydro and other industry stakeholders in the steps involved with code assessment and development. A number of base cases were modelled utilising the NRCan Hot 2000 program, using the following variations:

- Various archetypes of detached home, row home

- Primary space heating system: electric, natural gas (water heating is assumed to match)
- Climate Zones in BC: Southern Coastal (<4000 DD), Southern Interior (4000 – 5000 DD), Northern Interior (>5000 DD)

The modelling study will be completed by the end of January 2010. A stakeholder committee will be struck to develop the guidelines for changes to the BC building code based on the results of the modelling study and input from the representing groups.

To date it is clear that a review of the existing D audit process will be required as more weight is placed on the resulting EnerGuide rating of the home. Our participation is vital as decisions here will affect Companies EEC programs.

Towards Net Zero Buildings in BC for 2020 (Future Code)

The Province of BC has announced that they are moving toward a net zero energy or net zero energy capable (Passive House standard) construction code by 2020. Terasen Gas participates in both the EnerGuide 80 and Net Zero committees as the first leads to the second as an end goal.

A net zero home at a minimum, supplies to the power grid, an amount equal to the total amount of energy consumed. Combining the amount of energy (electricity and if applicable natural gas) utilised to operate a home and provide an equal amount of solar generated energy back to the grid when possible. A Passive house generates and stores all it requires without connection to any utility supply. Net zero energy capable construction code by 2020 will require the development of an implementation road map to identify the barriers and develop solutions with all stakeholder groups.

We are participating at a stakeholder level at this point in development. The group is identifying barriers at this point and listed below are some of the questions we will need to answer:

- What will be the role of the utilities be when net zero and passive houses appear in numbers?
- What are the ramifications to the Gas Industry of pursuing net zero energy buildings as opposed to net zero *emissions* buildings as a target for building codes?
- With EnerGuide 80 and Net Zero what is the best measuring stick for energy performance in buildings? For the residential sector? For the commercial/institutional sectors? How should we set our targets and how do we know in the future if we're achieving them?
- What actions need to be undertaken with building the trades/professions/industries and their associations to rapidly facilitate net zero/high energy performance in new construction and retrofit work when we as a province may be ahead of the regulatory requirement nationally?
- What is the role of occupant energy efficiency education and behaviour and who shares responsibility for ongoing, impactful occupant education?

4.8.5 Pilot Programs

As previously outlined, Pilot Programs test the effectiveness of a particular measure in the EEC market place. Pilots are utilised to verify potential savings and identify potential market transformation barriers in order to effectively design and implement larger-scale EEC programs. In 2009, EEC conducted the following two Pilot Programs; the details and the costs associated with these Pilot Programs are provided below.

- TGI developed and launched the Okanagan Spray N' Save Pilot program to investigate and confirm both the potential energy savings as well as the market acceptance of low flow pre-rinse spray valves used in commercial kitchens.
- The EEC team developed the TGVI Furnace Servicing Pilot program, "Give Your Furnace Some TLC," to promote the benefits of annual furnace servicing.

Table 4-22: 2009 Pilot Program - Expenditure

Pilot Program		Description	Expenditure (\$000s)
1	Okanagan Spray N' Save Pilot Program	Verify energy savings for commercial kitchen spray valves	28
2	TGVI Servicing Pilot Program	Promote the benefits of annual furnace servicing	199

4.8.5.1 Okanagan Spray N' Save Pilot

Program Area: Commercial Energy Efficiency Programs

Target Market: Retrofit

Duration: Okanagan only May – September, 2009

The program focused on the Okanagan Valley because it is geographically concentrated area with a relatively high concentration of restaurants.

Similar low flow spray valve programs exist at other utilities, however some doubt exists as to the ultimate benefits of the technology. Running the Okanagan Spray N' Save pilot has allowed Terasen Gas to gather the data required to more properly assess the merits of low flow spray valves as part of a DSM program offering.

Low flow spray valves were installed free of charge in 276 restaurants, representing 92% of the program's target. An initial arithmetic analysis of the recorded data suggests that each spray valve saves over 8 GJ/year. The program therefore achieved a projected energy savings of 9,513 GJ's, and a TRC of 2.8 over the 5 year life time of the low flow spray valves.

A more empirically driven evaluation study is slated for completion in 2010. The details of the evaluation are provided in Section 5.13.3.2. Refer to Appendix D for further details on the Okanagan Spray N' Save Pilot program and Evaluation of Okanagan Spray N' Save Pilot Program.

4.8.5.2 TGVF Furnace Servicing Pilot

Program Area: Residential Energy Efficiency Programs

Target Market: Retrofit

Duration: TGVF October 2009 – June 30 2010

Customers are rewarded for their service with a \$25 Save-On-Foods gift card. The objectives of the pilot were to:

- Provide education and awareness about energy efficient appliances and their maintenance
- Determine if a \$25 Gift Card was enough value to incent customers to take action
- Obtain feedback from the trades community on whether the program helped them engage customers in conversations about efficiency, safety and the opportunity to upgrade existing appliances

If the pilot is successful, a similar program will be launched across the province in January of 2011. Due to the Companies' inability to verify savings from the program, direct savings claims cannot be made; however, it can be argued that there is the increased potential for appliance replacements post furnace servicing. The total budget for this program is \$224,000 which includes incentives, program administration, marketing, and evaluation of which \$199,023 was paid out in 2009. Refer to Appendix D for further details.

4.8.6 Summary

Enabling Activities provide important support for effective EEC program development, delivery and evaluation. Most EEC programs work on the principal of market transformation with eventual mandate by regulation as the end game.

Research and Evaluation provides the information required to develop a market development plan. Pilot Programs verify savings and help identify market barriers. The Efficiency Partners Program aids in efficient delivery of EEC programs and provides the vital industry feedback for program adjustments. Regulation target levels and implementation timeframes require guidance from industry stakeholders.

Given the aggressive BC government provincial emission targets, participation on the various Codes and Standards committees is critical to establish a proper energy balance. Poorly constructed or timed regulations could result in a void of products and services and disrupt market transformation process. Unsuccessful area market transformation could result in an unbalanced shift to one energy source creating a supply and demand problem, resulting in rate increases to the customer base.

The Companies believe that the results of Enabling Activities in 2009 demonstrate their value and intend to continue, refine and improve such activities in 2010.

4.9 EEC Stakeholder Group Activities

In the EEC Application, the Companies recognized the need for accountability for the EEC initiative and proposed to form and engage an EEC Stakeholder Group. The objectives of the EEC Stakeholder Group are to guide and provide input on EEC activity.

4.9.1 Soliciting Appropriate Stakeholder Involvement

The Companies intend to hold biannual EEC workshops with at which the Companies would present updates on program progress; these would also act as a forum for stakeholder input on developing new programs and refining existing programs.

The members of the EEC Stakeholder Group were solicited through Regulatory Stakeholders (those that have historically intervened in the Companies' regulatory proceedings), from industry groups that the Companies' engage with, experts in design of programs and initiatives, and from key contacts from the Companies' Residential, Commercial, and Community Relations departments.

Representation was sought from the following areas within both TGI and TGVI service territories for the stakeholder group:

- Provincial, municipal, and First Nation governments
- Non-Governmental Organizations
- Consumer advocates, representing residential customers
- Affordable housing advocates
- Commercial customers
- Trade organizations
- Equipment manufacturers
- Other utilities

4.9.2 Early Progress from Stakeholder Meetings

The first EEC Stakeholder Group meeting was held on December 9, 2009. As this was the first EEC Stakeholder meeting, the Companies presented an introduction to DSM/EEC, a summary of the EEC Application and the resulting EEC Decision, government regulation, and a general description from each program area of initiatives to come.

A post-meeting survey was emailed to the EEC Stakeholder Group shortly after and received a 65% response rate, with over 90% of respondents stated that they were overall, either very or somewhat satisfied with the first EEC Stakeholder Group meeting. Attendees commented on the strong presenters and expressed their desire to provide ongoing feedback in future meetings.

Appendix F includes the EEC Stakeholder Group members list, and the 2009 EEC Stakeholder Group meeting invitation, agenda, and meeting minutes.

Please also refer to Section 5.14 for the description of the completed and proposed EEC Stakeholder Group activities for 2010.

4.9.3 Summary and Next Steps

The initial meeting was successful in introducing key stakeholders to the EEC Decision and its resulting programs. The EEC Stakeholder Group will provide a forum for open dialogue and feedback on future program design and initiatives.

4.10 Summary 2009 EEC Activities: Successfully Establishing the Foundation

The second half of 2009 represented the inception of the Companies' efforts to develop and execute on the broader EEC mandate; a mandate made possible by earlier Commission approval of funding. While the year could fairly be characterized as one of transition, (from earlier, narrowly focused but successful DSM activities, to the broad efforts of 2010 and beyond), it should also be considered one of meaningful results.

In addition to the establishment of the EEC team, the Company:

- Overall - Established a new, broadened EEC Program Portfolio and Associated Program Areas.
- Residential - Launched two Residential Energy Efficiency retrofit programs: the ENERGY STAR® Heating System Upgrade Program, and the EnerChoice Fireplace Program. The ENERGY STAR® program surpassed its original target of 8,180 furnaces to achieve 15,000 furnace replacements once all applications are processed in 2010.
- Commercial - Expanded its Commercial programs by increasing participation in the Efficient Boiler Program and by continuing to help customers save energy every year through the Energy Assessment Program. Finally, the Companies launched the Light Commercial ENERGY STAR® Boiler program, which is already logging gas savings.
- Affordable Housing - Laid the foundation for the Conservation for Affordable Housing program area, while also rolling out three projects: the Meridian Village Project, the MEMPR Low Income Partnership Funding, and the Energy Conservation for Affordable Housing Forum.
- CEO - Introduced and continued Conservation Education and Outreach Programs, which collectively sought to foster a "culture of conservation". Through targeting powerful media channels, traditional forums such as trade shows, innovative partnerships with local sports clubs and more, the Companies promoted attitudes and values that will increase commitment to EEC activities.
- Enabling - Undertook Enabling Activities that deepened understanding of markets, verified savings, identified market barriers, established relationships with suppliers to the energy efficiency industry, and built upon regulatory policy.
- EEC Stakeholders - Selected the right stakeholders to make up the EEC Stakeholder Group, then provided them with an overview of DSM/EEC, the EEC Application and the resulting EEC Decision, government regulation, and a general description from each program area of initiatives to come.

While these results reflect a partial year of activity for 2009 (most of the programs were rolled out later in the second half of 2009 once the EEC Decision was issued and the staffing resources were set in place), they are nevertheless ones the Companies take pride in. Collectively they represent a strong foundation for EEC activities in the latter part of 2010 and beyond.

5. 2010 PLAN: BUILDING ON THE EEC FOUNDATION

The establishment of an EEC team and broad Program Portfolio in 2009 (and early 2010) provides the Companies with a strong foundation to build on in 2010. The material presented in this section on 2010 planned activity represents only the activity planned at the time of writing. The Companies anticipate that there will be more and other activities undertaken in 2010 as additional opportunities for EEC activity are identified. While the Companies intend to continue with the majority of Portfolio Programs from 2009, they will take steps to refine their effectiveness while introducing three new Program Areas.

5.1 Three New Program Areas

In 2010, the Companies' EEC team plans to further expand the program portfolio by adding three additional Program Areas: High-Carbon Fuel Switching, Interruptible Industrial Program Area and Innovative Technologies.

- The High-Carbon Fuel Switching Program Area lowers GHGs by using natural gas in place of higher carbon fuels such as coal, oil or propane. In addition, further energy savings will be recovered by replacing high-carbon appliances with efficient natural gas appliances such as ENERGY STAR® furnaces or boilers.
- The Interruptible Industrial Program Area implements energy efficiency and conservation activities for these customers, while at the same time managing the risk associated with large financial investments in energy efficiency for interruptible industrial customers and the resulting magnitude of the anticipated energy savings.
- The Innovative Technology Programs will promote and pilot emerging commercially available technologies. The current portfolio of Innovative Technologies includes Solar Thermal Hot Water, NGV for Commercial Vehicles, Hydronic and Combination Space Heating Systems, Residential Ground Source Heat Pumps ("GSHP") and Commercial and Industrial GSHP Systems.

Note that these Program Areas are in the very early stages of their development and as such, their scope is not yet fully formed. It is therefore necessary to engage in further research, and explore and address additional opportunities in these Program Areas as they arise.

5.2 New Program Areas Complement Existing Offerings

This section looks carefully at these three new Program Areas while also examining the set of offerings within existing Program Areas, which will be refined and continued. In aggregate, the Companies believe the Program Areas and associated activities constitute a robust and effective collection of EEC initiatives.

The Program Areas examined in this section are as follows:

- 5.5 Residential Energy Efficiency;
- 5.6 Commercial Energy Efficiency;

- 5.7 High-Carbon Fuel Switching;
- 5.8 Conservation for Affordable Housing;
- 5.9 Joint Initiatives;
- 5.10 Conservation, Education and Outreach;
- 5.11 Interruptible Industrial Sector;
- 5.12 Innovative Technologies;
- 5.13 Enabling Activities;
- 5.14 EEC Stakeholder Group Activities; and
- 5.15 2010 EEC Portfolio: Summary.

5.3 Expected Programs

The Companies' EEC Portfolio consists of multiple Program Areas. Each Program Area includes all specifically related programs, measures and activities.

Table 5-1 below shows overall program results including the overall incentive and non-incentive amounts that will be spent on EEC programs, annual energy savings, present value energy savings over measure life, and the TRC results.

Spending in 2010 will increase over 2009, as will expected savings. The total amount budgeted thus far for incentives for 2010 is \$7.979 million. This is significantly higher than the 2009 expenditure on incentives of \$3.344 million. Similarly, the total non-incentive amount for 2010 is \$9.912 million which is again significantly higher than the non-incentive expenditure of \$2.917 million for 2009. It should be noted that these are projected activities and expenditures in Q1 2010; as more activities and budgets are developed through the course of the year, projected expenditures and the associated savings will increase. These increases are associated with the increased amount of activity planned for EEC activities in 2010, which will result in higher annual energy savings (208,725 GJs for 2010 vs. 130,965 GJ s for 2009) and the present value of the measure life energy savings is significantly higher in 2010 at 2,031,015 GJs for 2010 than 1,284,100 GJs for 2009.

The projected portfolio TRC result for 2010 is 1.0 which includes non-program expenses that are allocated to the Portfolio level of \$8.553 million. While the TRC analysis presented below includes these portfolio-level expenditures on the cost side of the equation, there is currently nothing allocated on the benefit side of equation for these portfolio-level expenditures, even though some of the portfolio-level activity will result in energy savings. This is the case because the Companies do not currently have enough information to be able to estimate with confidence the magnitude of the benefit from some of these portfolio-level expenditures. A key example of this would be in the area of Pilots – the Companies have allocated \$1.432 million to Pilots such as the Custom Design Pilot discussed in Section 5.13.6.2. Energy savings will accrue from the Custom Design Pilot, however these savings are unknown at the time of writing and so are not included in the benefits side of the TRC analysis presented below. The Companies are conducting these Pilots in order to determine the benefits from the technologies and systems that are being piloted.

Further, the one-time costs for implementation of the DSMS are included in the portfolio-level expenditures for 2010, as are the one-time costs for the CPR. Similarly, the funds approved for the development of an Interruptible Industrial EEC program are also included in the 2010 portfolio-level TRC. These one-time costs reduce the overall TRC because the Companies account for the costs but these expenditures will provide value over years to come. The Companies will be monitoring the performance of the 2010 portfolio on a monthly basis to ensure that the overall Portfolio level TRC remains at 1.0 or greater and will consult with the EEC Stakeholder group if it appears that the performance of the Portfolio will be challenged by the fact that 2010 is very much a development year, where a number of new programs will be heavily front-end-loaded with pilot, development and promotional costs. The final actual 2010 portfolio-level TRC will be presented in the 2010 Annual Report to be filed in March 2011.

Table 5-1: 2010 Overall Portfolio Will Bring Value to Customers and the Companies

Utility	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Total for Incentive and Non-Incentive Expenditures (\$000)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	TRC
TGI	6,447	7,917	14,365	191,183	1,869,069	1.0
TGVI	1,531	1,994	3,526	17,542	161,946	1.1
Total Results	7,979	9,912	17,890	208,725	2,031,015	1.0

5.4 2010 Activities by Program Area Level and Activity

Table 5-2 below shows the results for 2010 activities by Program Area. The work completed in 2009 set the stage for the 2010 EEC portfolio and program activities. In 2010, the Companies plan on continuing to operate a number of existing programs (with some modifications), while rolling out several new incentive programs to the market place. The 2010 EEC portfolio is responsive to the requirements in the DSM Regulation that to be considered adequate, a public utility's plan portfolio submitted after June 1, 2009 should include the following:

- a demand-side measure intended specifically to assist residents of low-income households to reduce their energy consumption (see Section 5.8.3);
- if the plan portfolio is submitted on or after June 1, 2009, a demand-side measure intended specifically to improve the energy efficiency of rental accommodations (see Section 5.8.3 and 5.8.3);
- an education program for students enrolled in the public utility's service area (see Section 5.10.2.4);
- if the plan portfolio is submitted on or after June 1, 2009, an education program for students enrolled in post-secondary institutions in the public utility's service area (see Section 5.10.2.4).

Additional consideration will be given to simplifying program processes and administrative burdens for participants and the Companies. The 2010 programs will aim to meet customer and market needs; for example, high carbon fuel switching program initiatives will provide significant

benefits to the Province of BC's GHGs reduction strategy, and increased Conservation for Affordable Housing programs will continue to meet the EEC program principle of universality – offering access to energy efficiency and conservation for all customers.

Other activities will increase the Companies' participation in mutually beneficial collaborations between groups such as government agencies or BC utility partners. CEO programs and Enabling Activities will continue to support, and promote awareness of EEC Activities, which in turn, generate buy-in from partners and desire to participate in program activities from customers.

The Commission's approval of the NSAs confirmed funding of EEC programs through 2011, with the addition of funding for two new Program Areas: Interruptible Industrial Program Area and Innovative Technologies. High-Carbon Fuel Switching was approved in the EEC Decision in 2009. These new Program Areas will see the development and delivery of programs in the second half of 2010, and through 2011. In 2011, the Companies plan to file an application to the Commission related to EEC funding for the timeframe beyond 2011, so preparation for this filing will commence in the latter part of 2010.

Table 5-2: 2010 Programs Will Bring Value to Customers and the Companies

Program Area	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	TRC
Residential Programs	2,791	220	74,906	755,601	1.4
TGI	2,561	180	68,385	692,757	1.3
TGVI	230	40	6,521	62,844	1.5
Commercial Programs	1,527	346	112,562	1,106,704	2.1
TGI	1,332	277	97,730	956,981	2.1
TGVI	194	69	14,832	149,722	2.2
High Carbon Fuel Switching	750	225	(16,125)	(169,145)	1.5
TGI	225	25	(4,838)	(50,954)	1.6
TGVI	525	200	(11,288)	(118,191)	1.4
Conservation for Affordable Housing	2,911	567	37,382	337,855	0.0
TGI	2,329	454	29,905	270,285	0.0
TGVI	582	113	7,476	67,571	1.0
Joint Initiatives (TGI & TGVI)	N/A	717	N/A	N/A	N/A
Conservation, Education & Outreach (TGI & TGVI)	N/A	1,775	N/A	N/A	N/A
Enabling Activities (TGI & TGVI)	N/A	439	N/A	N/A	N/A
Interruptible Industrial DSM (TGI & TGVI)	N/A	435	N/A	N/A	N/A
Other Portfolio Level Activities (TGI & TGVI)*	N/A	5,188	N/A	N/A	N/A
Total	7,979	9,912	208,725	2,031,015	1.0

*Other Portfolio Level Activities include CPR, Research, Evaluation & Training, Consultants' fees, implementation of DSM Tracking System, Pilot Programs, efficiency partners programs and non-program administration activities (labour costs)

Note that the "Other Portfolio Level Activities" include a number of portfolio-level items. For 2010 these activities and the costs associated with them are listed below:

- Conservation Potential Review (\$500,000)
- Research, Evaluation and Training (\$906,587)

- Consultant Fees (\$100,000)
- Efficiency Partners and Codes and Standards (\$439,000)
- Implementation of DSM Tracking System (\$704,000)
- Pilot Programs (\$1,432,500)
- Labour Costs (\$1,545,000)

As shown in the Table 5-1 and 5-2 above, the EEC portfolio in 2010 will bring value to customers and the Companies. The details of each Program Area are further discussed in the following sub-sections.

5.5 Residential Energy Efficiency Programs

In 2010, the Companies plan on completing the existing 2009 Residential Energy Efficiency programs, while rolling out several new incentive programs to the market place. The programs are categorized as: 2009 programs that are under completion, new programs being launched in Q1 and Q2 in 2010, and programs under consideration for Q3 and Q4. Table 5-3 provides a summary of the 2010 Residential Energy Efficiency programs for TGI and TGI VI.

5.5.1 Program Goals

2010 Residential Energy Efficiency programs are focused on the following general objectives:

- Upgrade existing low efficiency systems to capture energy savings associated with reducing the overall consumption of natural gas. The focus in 2010 will be on hot water heaters, fireplaces, and possibly a furnace early retirement program.
- Prepare the market for the adoption of new energy efficient technologies through incentive programs and support of government regulations. The focus in 2010 will be on domestic hot water technologies. A program for 0.61 Efficiency Factor ("EF") tanks will be launched in Q2. During Q3 and Q4, the Companies plan to conduct pilots for Tier 3 water tanks (0.80 EF and higher) in order to develop programs for 2011 and beyond. (Please refer to Section 5.13.6 for information about these pilots.)
- Introduce programs for new home construction to ensure that all new homes adopt the latest energy efficient technologies and provide incentives where necessary.
- Educate the trades community about upcoming regulations and gain an understanding of technical requirements or other barriers associated with new product introductions
- Educate consumers about the advantages of energy efficient appliances and provide incentives for their adoption when necessary. Take the opportunity to incorporate energy conservation messaging within program marketing materials.
- Engage manufacturers by supporting new technologies and providing advertising opportunities to the Companies' customer base

- Develop cost effective programs with a TRC greater than 1.0 that optimize the proportion of incentives over administration and marketing costs
- Conduct program evaluation that confirms savings claims and guides program development of future programs.

5.5.2 Residential Energy Efficiency Programs – Portfolio Overview: New and Existing Programs

Generally speaking, the Companies' 2010 residential EEC programs fall into three categories. There are 2009 programs that are ongoing and expected to be completed in 2010. There are new programs launching in Q1 and Q2 and there are programs under consideration for launch. The chart below outlines the programs in each category and their associated costs and savings.

Table 5-3: 2010 Residential Energy Efficiency Programs for TGI and TGVI

Program		Description	New Construction		Retrofit		TRC	
			Incentive & Non-Incentive Expenditure	NPV Energy Savings	Incentive & Non-Incentive Expenditure	NPV Energy Savings	TGI	TGVI
	2009 Programs Under Completion							
1	ENERGY STAR® Heating System Upgrade - 2009	\$250 Incentive for upgrading heating system to Energy Star rated appliance	N/A		977	249,358	1.2	1.1
	ENERGY STAR® Heating System Upgrade - LiveSmart BC - 2009	\$250 Incentive for upgrading heating system to Energy Star rated appliance as part of LiveSmart BC incentive portfolio			974	255,496	1.2	1.1
	2010 Programs Launching in Q2							
2	Domestic Hot Water 62% ENERGY STAR® Tanks	\$50 Consumer Incentive and \$50 Contractors Incentive to prepare the market for new regulations	Under Development		460	49,869	0.8	0.8
3	EnerChoice Fireplace Consumer Incentive - 2010	\$100 consumer coupon to incent customers to choose EnerChoice			600	200,878	2.8	2.8
	2010 Energy Efficiency Residential Programs Under Consideration							
4	Furnace - Early Retirement Program	Re-educate market about high efficiency furnaces and urge customers to upgrade early	N/A		Under Development		Under Development	
5	Furnace Service Campaign - "Give your furnace some TLC"	Educate the market about the importance of appliance maintenance and create opportunities to upgrade appliances for efficiency						

The highlights of the 2009 retrofit energy efficiency programs under completion are as follows:

- The ENERGY STAR® Heating System Upgrade Program, including participants from LiveSmart BC, will surpass the EEC application replacement target of 8180 furnaces or boilers, with expectations of 15,000 participants. Final overview of program performance will be presented in the Companies' Report on 2010 EEC activities, to be presented by the end of Q1 2011.

The highlights of 2010 retrofit and new construction energy efficiency programs are as follows:

- The ENERGY STAR® Hot Water Heater Retrofit Program (61%+ EF) is being launched in Q2 to prepare the trades community for the implementation of the September 1, 2010

provincial regulations requiring 61% EF minimum efficiency levels, and educate consumers about ENERGY STAR® water tanks.

- The EnerChoice Fireplace Retrofit program will educate consumers about the merits of choosing energy efficient fireplaces.

The highlights of new programs under consideration are as follows:

- The ENERGY STAR® Hot Water Heater New Construction Program will be launched in Q2 with the objective of ensuring that all new homes adopt the energy efficient hot water heaters.
- The EnerChoice Fireplace New Construction Program will be launched in Q2 with the objective of ensuring that all new homes adopt energy efficient natural gas fireplaces.
- A Furnace Early Retirement Program may be launched based on stakeholder feedback on the numbers of mid-efficient furnace inventory remaining for sale and the results of economic modelling.
- A Furnace Service Program, based on the TGVl pilot (refer to Section 4.8.5.2) may be launched province-wide during the summer months that are generally a slow time for gas contractors.

The Residential Energy Efficiency programs for 2010 are described in further detail below.

5.5.2.1 ENERGY STAR® Heating System Upgrade Program

It is anticipated that the ENERGY STAR® Heating System Upgrade Program (which includes participants from LiveSmart BC) will surpass the EEC application replacement target of 8180 furnaces or boilers, with expectations of well over 15,000 participants. This will make it a tremendously successful Program in the Residential portfolio.

Although this Program completed in 2009, it is discussed here because the application deadline for the Companies' program is March 31, 2010 and participant data from the LiveSmart BC program may not be received until the second quarter of 2010. Therefore, the final program overview will be reported in the Companies' EEC report on 2010, once all final participation numbers have been received.

Table 5-4 outlines the energy savings estimates for participants that will be processed in 2010. In this period, it is projected that an additional \$1.9 million in incentives will be distributed generating an additional 504,854 GJ's in energy savings over the life time of the measure.

Table 5-4: ENERGY STAR® Heating System Upgrade Participants Processed in 2010 forecasts significant energy savings within a cost-effective program

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
The Companies	TGI	3,609	902	40	22,916	241,380	43%	1.2
	TGVI	120	30	5	762	7,979	43%	1.1
LiveSmart BC	TGI	3,635	909	10	23,082	242,246	43%	1.2
	TGVI	200	50	5	1,270	13,250	43%	1.1
Total	TGI	7,244	1,811	50	45,998	483,626	43%	1.2
	TGVI	320	80	10	2,032	21,229	43%	1.1

Note: The Companies Participation Rates are based on the estimated number of bill credits issued from January 1, 2010 through to completion of application processing by ABSU (expected April 30, 2010.) The LiveSmart BC participant numbers are an estimate of the total number of heating systems invoiced to TGI/TGVI in 2010 (expected June 30, 2010). This is an estimate from MEMPR based on 2009 trends and is subject to change. The forecasted number of heating systems from MEMPR's LiveSmart BC participant data is a total of 8000, of which 3835 are for the 2010 invoicing period. Full program overview will be presented in the 2010 EEC Report.

For cost benefit analysis please refer to Appendix J.

5.5.2.2 ENERGY STAR® Domestic Hot Water Heater Retrofit Program

Program Area: Residential Energy Efficiency Programs

Target Market: Retrofit

Duration: TGI & TGVI: May 1, 2010 through April 1, 2011

Incentive:
\$50 rebate cheque for consumer
\$50 rebate cheque for contractor / Point of Sale Contact

Program Administration:

Consumer-Response Marketing

Program Objectives:

- Educate the market about the introduction of provincial regulations on September 1, 2010

- Educate consumers about ENERGY STAR® water heaters and the importance of hot water conservation
- Upgrade a minimum of 3600 Hot Water Heaters to 0.61 EF or higher
- Promote contractor relations between the Companies and contractors, as well as between contractors and customers
- Engage manufacturers and distributors through co-marketing opportunities
- Engage manufacturers in labelling tanks for Efficiency Factor

Background:

The primary program objective is to educate the market about September 1, 2010 changes to the BC Energy Efficiency Act Standards for gas and propane fired water heaters outlined in MEMPR Information Bulletin 09-05¹¹. The secondary program objective is to reap the energy savings associated with upgrading water heating systems.

BC provincial regulations require that all water tanks manufactured after September 1, 2010 be Tier One with an efficiency rating of at least 0.61 depending on tank size. Program benefits include education and outreach to consumers, trades, distributors, Big Box and small retailers, and manufacturers. One program challenge is the fact that manufacturers do not label water heaters with efficiency ratings. Manufacturer engagement will be an important component of the program.

Estimates of hot water energy consumption as a percentage of household energy use range from 15% (2006 Terasen Gas Conservation Potential Review ("CPR")) to 30% (BC Govt Energy Efficient Building Strategy). The CPR states that Domestic Hot Water ("DHW") accounts for 21% of residential natural gas consumption and notes a 2% annual energy improvement as hot water systems are upgraded. Even greater savings will be realized as water heating appliances become more efficient.

BC's hot water tank market is difficult to estimate. The following data is collected from the Canadian Institute of Plumbing and Heating ("CIPH"), MEMPR 2008, and the 2008 REUS.

- 60% of the residential market is comprised of natural gas hot water tanks.
- Based on estimates from CIPH, approximately 121,409 hot water tanks are sold annually in BC.
- 68,840 are natural gas tanks and of those, 20% are high efficiency models, meaning 0.61 EF and greater.

Water tank statistics from the 2008 REUS include the following:

- 89% of the Companies customers have gas hot water tanks
- 38% of the Companies customers have replaced water tanks over the past five years which by calculation represents a 7.6% annual churn rate.
- Of those that are replaced:
 - 83% are only done at the time of failure or imminent failure
 - 9% were undertaken for the purpose of increasing energy efficiency

¹¹ Please refer to Appendix C for the MEMPR Information Bulletin 09-05. *BC Energy Efficiency Act Standards: Gas and Propane-Fired Water Heaters.*

The \$50 Consumer Incentive will drive public awareness about the importance of water tank efficiency, increase prominence of the ENERGY STAR® label, urge customers to be proactive about the water tank purchase decision, and provide an opportunity to raise awareness about the importance of hot water conservation. By developing this program, we are encouraging customers to request high efficiency water heaters in all retrofit situations. However, this process will take time to drive market transformation.

A \$50 Contractor Incentive will urge contractors and distributors to promote efficient water tanks. Since the large majority of purchase decisions are completed out of necessity due to tank failure, customers are reliant on independent contractors to provide energy efficient appliances and advise them on the benefits of choosing energy efficient appliances.

Please refer to Appendix D for detailed program description.

Projected Outcome:

Table 5-5 provides highlights of the ENERGY STAR® Hot Water Program energy savings estimates:

Table 5-5: ENERGY STAR® Domestic Hot Water Heater Performance Forecast indicates a marginal cost benefit test although regulation compliance is the most important aspect of this program

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
Retrofit	TGI	3,000	300	80	4,800	41,589	20%	0.8
	TGVI	600	60	20	960	8,280	20%	0.8

*In the retrofit program, the number of participants actually refers to number of units (water tanks sold). This is a split incentive between contractor and customer. Distributing two cheques per unit will cost more and thus the administration costs are higher on the retrofit program over new construction.

As outlined in Table 5-5, the projected program participant target of 3,600 is achievable with a modest marketing budget. By offering an incentive for both the contractor and for the consumer buy-in from one or both stakeholders will help drive program participation. Through bill inserts, The Companies have a cost-effective direct-to-consumer marketing channel. Through mail-outs to the BC Safety Authority Registered Contractor database, the Companies have a cost-effective direct to trades marketing channel. Furthering the relationship between trades and consumers will drive the promotion of all energy efficiency programs.

The projected spending forecast is \$360,000 in incentives and \$100,000 for non-incentives. Non-incentive spend is less than 30% of total spend. The program is forecasted to achieve annual gas savings of 5760 GJ's and close to 50,000 GJ's over the lifetime of the measure. Although the TRC for this program is marginally less than 1.0, the program is an important component in an overall campaign to help manufacturers, distributors, installers, and customers prepare for new Provincial regulations, in effect September 1, 2010, which require that all Hot Water Heaters manufactured after that date be Tier One. By planning and promoting this program in conjunction with MEMPR, the Companies are building an important relationship and demonstrating a willingness to support regulations and efficiency compliance among trades.

Program evaluation will include billing analysis in 2012 and potentially surveys to distributors and contractors to monitor the trends in market penetration of ENERGY STAR® eligible models.

For cost benefit analysis please refer to Appendix J.

Summary:

The market information presented demonstrates the great need for Energy Efficiency education across the hot water equipment supply chain – from manufacturers and distributors through to consumer education. Through the joint incentive, provided to customers and installers, the program is also designed to increase awareness of the ENERGY STAR® brand, and to help ensure that customers who are replacing their tank in an emergency situation both choose install an ENERGY STAR® (or equivalent) tank and have access to an ENERGY STAR® (or equivalent) tank through their installer.

This program is an important component in an overall strategy to help manufacturers, distributors, installers, and customers prepare and adopt new Provincial regulations, in effect September 1, 2010, which require that all Hot Water Tanks manufactured after that date be Tier One. The Companies will be actively evaluating Tier Three Technologies (>0.8 EF) and developing a market transformation strategy. Please refer to Section 5.13.6.4 for more information about Tier 3 pilot programs that will be launched in Q3 and Q4.

5.5.2.3 EnerChoice Fireplace Consumer Incentive Program

Program Area: Residential Energy Efficiency Programs

Target Market: Retrofit

Duration: May 2010 through April 2011, with possible extension

Incentive: \$150 (proposed)

Partners: HPBAC

Program Administration:

Consumer Response Marketing Ltd.

Program Objectives:

- Encourage the sale and installation of energy efficient heater style fireplaces to reap the associated energy savings.
- Further the education and awareness of the EnerChoice label to consumers and industry.
- Further relationships with manufacturers and distributors of natural gas fireplaces, through the HPBAC.

- Develop a cost effective program with TRC greater than 1.0 and maximize the proportion of incentives over administration and marketing costs

Background:

Promoting energy efficient fireplaces is an important component to EEC programs. Natural gas fireplaces account for 13% of residential natural gas consumption (2006 CPR), and 85% of customers have at least one fireplace or heating stove (2008 REUS). Through this program the Companies are encouraging their customers to adopt energy efficient gas fireplaces designed for heating rather than simply decorative fireplaces for ambience.

In 2009, TGI and TGVI offered fireplace retailers the opportunity to receive a \$50 SPIFF for educating customers and promoting the purchase of energy efficient fireplaces. According to the HPBAC members, the marketing campaign and manufacturer's coupons were well-received. They believe that dealers are now well educated on the merits of EnerChoice fireplaces coming out of the 2008 and 2009 TGI programs and 2009 TGVI programs.

In order to further educate consumers about the merits of energy efficient fireplaces, the 2010 EnerChoice program will provide a \$150 consumer rebate for EnerChoice purchases. TGI and TGVI will engage HPBAC members to co-promote the offer through retailer and manufacturer channels. Promotions will include bill inserts, advertisements in community newspapers, summer home shows, Team Terasen, online media purchase, and partnering with associations and NGO's.

Please refer to Appendix D for detailed program description.

Projected Outcome:

Table 5-6 provides program highlights of the EnerChoice Fireplace Consumer Incentive Program performance metrics for 2010 based on our forecast.

Table 5-6: EnerChoice Fireplace Consumer Incentive Performance Forecast

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
Retrofit	TGI	3,000	450	50	17,670	167,542	24%	2.8
	TGVI	600	90	10	3,534	33,336	24%	2.8

The projected participation rates of 3600 participants should be achievable when partnering with HPBAC members to cost-effectively drive the program. The Free Rider Rate is 24% based on previous customer surveys.

As outlined in Table 5-6 the projected spending forecast is \$540,000 in incentives and \$60,000 for non-incentives. The program is forecasted to achieve annual gas savings of 21,000 GJ's and 200,000 GJ's over the life time of the measure.

Program evaluation from 2008 and 2009 programs will help determine the future direction of EnerChoice programs.

For cost benefit analysis please refer to Appendix J.

Summary:

With fireplaces using 13% of residential natural gas consumption, it is critical to educate homeowners about the importance of choosing energy efficient models. As more models become available the minimum efficiency standard can be increased over time. The Companies will continue to foster their relationship with HPBAC to assist in driving fireplace efficiency.

**5.5.2.4 ENERGY STAR® Domestic Hot Water Heater New Construction
(Under Development)**

Program Area: Residential Energy Efficiency Programs

Target Market: New Construction

Duration: To be Determined

Incentive: To be Determined

Program Objectives:

- Educate the market about the introduction of provincial regulations on September 1, 2010
- Encourage the sale and installation of energy efficient water heaters to reap the associated energy savings.
- Educate builders and developers about ENERGY STAR® water heaters and the importance of hot water conservation

Background:

The Companies' goal is to promote the adoption of the latest energy efficient appliances as standard practice for new construction. Incentive programs help build this awareness. The \$100 incentive will go to the builder or developer of a new home, to encourage the installation of ENERGY STAR® Domestic Hot Water heater. The new construction component of the ENERGY STAR® Domestic Hot Water program has not been finalized at the time of writing but will be based on the retrofit program assumptions and processes.

5.5.2.5 EnerChoice Fireplace New Construction Component (Under Development)

Program Area: Residential Energy Efficiency Programs

Target Market: New Construction

Duration: To be determined

Incentive: To be determined

Program Objectives:

- Encourage the sale and installation of energy efficient heater style fireplaces to reap the associated energy savings.
- Further the education and awareness of the EnerChoice label to builders and developers.
- Further relationships with manufacturers and distributors of natural gas fireplaces, through the HPBAC.

Background:

The Companies' goal is to promote the adoption of the latest energy efficient appliances as standard practice for new construction. Incentive programs help build this awareness. The \$150 incentive will go to the developer or builder of a new home. The opportunity to extend this program to multi-family residential is under consideration based on further research. The new construction program has not been finalized at the time of writing but will be based on the retrofit program assumptions and processes.

5.5.2.6 Furnace Early Retirement Program (Under Development)

Program Area: Residential Energy Efficiency Programs

Target Market: Retrofit

Duration: To be determined

Incentive: To be determined

Program Objectives:

If research suggests the program is viable, the Companies may consider launching an ENERGY STAR® Heating System Early Retirement program, with a limited time offer. This program will educate homeowners about the value of high efficiency ENERGY STAR® furnaces and persuade homeowners to make a proactive replacement decision for additional energy savings.

Background:

The 2008 REUS suggests that only 16% of the Companies' customers have high efficiency furnaces (90% AFUE and higher), 39% have mid-efficiency furnaces (78% to 85% AFUE), and 45% have standard efficiency (less than 78% AFUE) furnaces. This means that 45% of the Companies' customers have an urgent need to upgrade their standard efficiency furnaces – some of which may have efficiency levels as low as 55%. This Program, should it be launched, would be designed to promote and encourage upgrades to high efficiency furnaces.

This program is in the early stages of development and still requires discussions with a large number of stakeholders. The Companies are evaluating available market and technical data to establish a sound business case and cost benefit analysis before proceeding.

Inventory stocks must be assessed. Although the BC Energy Efficiency Act Standards for Gas Furnaces applies to furnaces manufactured after December 31, 2009, mid-efficiency models can still be sold. Therefore there remains a large inventory of mid-efficiency furnaces in the market. The Companies are gathering industry feedback to estimate the size of the leftover mid-efficiency inventory.

The Companies are also gathering anecdotal evidence of lower efficiency furnaces that are due for replacement remaining in place and having repairs “jerry rigged” as a way to avoid some of the venting issues that British Columbians may face with the introduction of government’s 90% efficient furnace regulation.

5.5.2.7 Furnace Service (“Give Your Furnace Some TLC”) Program (Under Development)

Program Area: Residential Energy Efficiency Programs

Target Market: Retrofit

Duration: To be determined

Incentive: \$25 Save-On Foods Gift Card

Program Objectives:

The primary objectives of the program will be:

- Provide education and awareness about energy efficient appliances and their maintenance
- Engage customers and contractors in conversations about efficiency, safety and the opportunity to upgrade existing appliances

No direct savings claims can be made from this program however the spillover effects would be appliance replacement.

Background:

In 2009, the EEC team developed the TGVI furnace servicing pilot program, “Give Your Furnace Some TLC,” to promote the benefits of annual furnace servicing. The program was successful with over 300 applications received within 8 weeks of launching the program, demonstrating that customers will respond well to a \$25 gift card incentive. Due to the success of the pilot, the Companies intend to roll out the program across the province in the summer of 2010.

5.5.3 Summary

Building on the success of the 2009 Residential Energy Efficiency Programs, 2010 programs will focus on energy savings associated with hot water heaters, fireplaces, a furnace service program, and possibly a furnace early retirement program. The Companies are also assessing opportunities for the New Construction market. In addition to energy and GHG savings, the programs will assist the provincial government with engaging industry in compliance with regulations, include conservation messaging in program outreach materials, and engage the trades, suppliers and manufacturers.. These programs are critical to the Companies' role in driving market transformation in the residential sector.

5.6 Commercial Energy Efficiency Programs

The Companies' commitment to Commercial Energy Efficiency programs was demonstrated in the 2009 initiatives described in Section 4.4. In 2010, the Companies plan on continuing to operate a number of these existing programs (with some modifications), while rolling out several new energy efficiency incentive programs to the market place.

5.6.1 Program Goals

Commercial Energy Efficiency programs focus on the following objectives:

- Upgrade existing low efficiency systems to capture energy savings associated with reducing the overall consumption of natural gas
- Prepare the market for the adoption of new energy efficient technologies through incentives, and support of government regulations.
- Educate commercial customers about the advantages of energy efficient appliances and provide incentives for their adoption when necessary.
- Engage the trades community and manufacturers by supporting new, energy efficient technologies.
- Develop cost effective programs with a TRC greater than 1.0 that optimize the proportion of incentives over administration and marketing costs
- Conduct program evaluations that confirm savings claims and guide the development of future programs.

5.6.2 Commercial Energy Efficiency Programs – Portfolio Overview: New and Existing Programs

The focus of 2010 will be to build on successes while broadening offerings to capitalize on new opportunities to promote Commercial Energy Efficiency programs.

Existing programs which will be continued and/or improved include:

- Efficient Boiler Program;
- Light Commercial ENERGY STAR® Boiler Program; and
- Energy Assessment Program.

New programs for 2010 will include the;

- Efficient Commercial Water Heater Program;
- Commercial Cooking Program;
- Commissioning Program; and
- Process Heat Program.

Table 5-7 provides a summary of the 2010 Commercial Energy Efficiency programs for TGI and TGVI.

Table 5-7: Solid performance expected again in 2010

Program	Description	New Construction		Retrofit		TRC	
		Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	TGI	TGVI
1	Efficient Boiler Program	148	99,200	1,068	724,574	2.1	2.0
2	Light Commercial Energy Star Boiler Program	37	25,821	235	131,721	3.4	3.4
3	Efficient Commercial Water Heater Program	91	21,193	214	49,959	1.1	1.0
4	Energy Assessment Program	N/A		80	24,538	2.6	2.1
5	Process Heat Program	Under Development					
6	Commercial Cooking Program	Under Development					
7	Commissioning Program	Under Development					
8	Victoria Spray N' Save Program	Under Development					

Both existing and new programs in this Portfolio are expected to deliver value. The anticipated benefits from the 2010 existing Commercial Energy Efficiency programs are as follows:

- The Efficient Boiler Program will continue to generate gas savings in 2010. The Companies look forward to extending the incentive to include domestic hot water heating

in combination heat / hot water systems, as well as simplifying the program process. These measures combined with improved program promotions should contribute to increase participation in 2010.

- In 2010 the Light Commercial ENERGY STAR® Boiler Program will provide strong value via TRC performance, while reducing commercial sector gas consumption. A sustained effort at raising the program's profile should lead to increased participation.
- The Energy Assessment Program will see changes aimed at increasing its effectiveness at getting participants to implement energy savings measures. Additional administrative changes will be implemented to avoid double counting of gas savings where such may be attributed to either the energy assessment program, or one of the Companies' other incentive programs.

The 2010 new Commercial Energy Efficiency programs are also expected to produce meaningful results in the following ways:

- The new Efficient Water Heater Program will round out the Companies' incentive offering for high efficiency potable water heating equipment. 2010 will be a learning year which will set the tone for the future of the program.
- The Commercial Cooking Program will provide rebates to reduce the incremental cost of high efficiency commercial kitchen appliances and help drive their adoption by the market.
- The Commissioning Program will capture gas savings by encouraging owners to critically examine their building or facility's operating performance and take simple yet powerful, operationally focused steps to reduce gas consumption.
- The Process Heat program will enable the Companies to assist manufacturing, agricultural and light industrial customers reduce their gas consumption by reducing the incremental cost of investing in high efficiency process heating appliances. The program is likely to be built around high efficiency boilers, though it may include incentives for additional measures.

The Commercial Energy Efficiency programs for 2010 are described in further detail below.

5.6.2.1 *Efficient Boiler Program*

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: 2005 – December 31, 2011
 TGVI: 2005 – December 31, 2011

Program Updates for 2010:

For 2010, the program will be subject to several initiatives aimed at addressing the issues noted in Section 4.4.3, and encouraging increased participation:

1. The program's terms and conditions will be modified to include domestic hot water loads in the incentive calculation providing the program will maintain a healthy positive TRC. This will increase the value of the incentive and explicitly recognize the value of generating potable hot water from a high efficiency source.
2. The Companies will organize a program stakeholder feedback session, including contractors, suppliers, governing authorities and major customers, to gather input on the program design from the market. This will accomplish two objectives: It will help raise awareness of the program and, it will provide needed and direct insight from industry participants on the program's structure and operation.
3. Subsequent to the stakeholder feedback session the Companies will work to simplify and adapt the program's process and update its communications collateral in view of:
 - Making it easier / simpler for participants to take advantage of the program
 - Educating participants on boilers and the steps involved in their installation
 - Reducing the program's administrative burden / overhead

Background:

As discussed in Section 4.4.3, the Efficient Boiler Program is TGI and TGVI's flagship Commercial Energy Efficiency program. Its aim is to reduce gas consumption associated with space heating.

Results in 2009 were generally positive as the Programs saw strong performance despite an underperforming economy. On the other hand, participation from certain sectors – New Construction, Vancouver Island – was noticeably absent.

Please refer to Appendix D for a detailed program description.

Projected Outcome:

The Companies believe that the Efficient Boiler Program will continue to provide solid performance throughout 2010.

Table 5-8 provides program highlights of the Efficient Boiler Program performance metrics for 2010 based on our forecast.

Table 5-8: Efficient Boiler Program continues to reduce gas consumption in 2010

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
New Const	TGI	8	103	13	7,137	79,461	18%	2.1
	TGVI	2	26	6	1,784	19,739	18%	2.0
Retrofit	TGI	65	835	107	57,990	645,619	18%	2.1
	TGVI	8	103	24	7,137	78,955	18%	2.0

As noted above, there are, however changes envisioned for the program in 2010. All of the changes will ultimately be designed to encourage additional customers to participate in the program by increasing the value of the incentive, and reducing the administrative burden currently imposed on those who wish to participate. Increasing the program's participant numbers furthers the Companies' goal of reducing the commercial sector's gas consumption and bringing about market transformation.

While the Companies do expect the programs participation numbers to increase in 2010 versus those of 2009, some dampening effect is to be expected as the lag effect from the poor economic climate in 2009 carries through in the construction sector through much of 2010. Participation from the New Construction market seems likely to increase at a modest pace as many multi residential projects, which may have applied for an incentive in 2010, were put on hold in 2009.

For cost benefit analysis please refer to Appendix J.

Summary:

In 2010 the Companies plan to perform an in-depth evaluation study on the program's performance in reducing gas consumption. The results of this study will serve to confirm and/or provide additional insight into the gas savings associated with the program. For additional information on the proposed evaluation study please refer to Section 5.13.3.1.

5.6.2.2 Light Commercial ENERGY STAR® Boiler Program

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: August 2009 – December 31, 2011
TGVI: August 2009 – December 31, 2011

Program Updates for 2010:

Because the program is still relatively new, changes or updates to the program will be limited in 2010 as the Companies gather feedback from participants. The program's initially strong TRC performance suggests that there is some opportunity to adjust the program in view of attracting additional participants. Such a change may be made later in the year and could include:

- An increase to the value of the participant's incentive
- A sales incentive for boiler distributors to encourage the sale of ENERGY STAR® boilers
- An installation incentive for contractors to encourage them to install ENERGY STAR® boilers

Background:

Launched in August 2009, the Light Commercial ENERGY STAR® Boiler Program is the Companies' most recent offering aimed at reducing energy consumption associated with space heating. Program objectives for 2010 are the same as those outlined in Section 4.4.4, the 2009 Light Commercial ENERGY STAR® Boiler Program.

Please refer to Appendix D for a detailed program description.

Projected Outcome:

Table 5-9 provides program highlights of the Light Commercial ENERGY STAR® Boiler Program forecasted performance metrics for 2010.

Table 5-9: Light Commercial ENERGY STAR® Boiler Program to gain market traction

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
New Const	TGI	5	14	9	1,453	16,177	18%	3.4
	TGVI	3	9	5	872	9,644	18%	3.4
Retrofit	TGI	40	115	75	11,624	129,270	18%	3.4
	TGVI	10	29	16	2,906	2,451	18%	3.4

The Light Commercial ENERGY STAR® Boiler program is expected to turn in a TRC performance in 2010 more or less in line with what has been seen in 2009. Contributing to the program's forecasted strong performance in terms of TRC is its relative simplicity. This serves to make participation easier for customers and keeps administrative overhead low for the Companies.

Participation should improve throughout the year though as a new program, a sustained effort at program promotions is essential to raise awareness of and ensure increased participation. To garner participants for TGVI the profile of the EEC programs needs to be raised on Vancouver Island. Sustained promotional efforts in conjunction with the Efficiency Partners are expected to significantly address this situation moving forward. As more market participants become aware of the program and the benefits of installing high performance boilers, participation in the Light Commercial ENERGY STAR® boiler program is expected to exceed what was seen in 2009.

For cost benefit analysis please refer to Appendix J.

Summary:

A performance evaluation study will be conducted on the program towards the end of 2010 or early in 2011. While the cost of this study has not been firmly established as of the writing of this report, it is not expected to exceed the \$30,000 estimated cost of the Efficient Boiler Program performance evaluation. A \$30,000 charge for program evaluation has been included in the numbers presented above.

5.6.2.3 *Efficient Commercial Water Heater Program*

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: April, 2010 – December 31, 2011
 TGV: April, 2010 – December 31, 2011

Incentive:

Providing that the water heater is used for domestic water heating only:

Storage water heaters / Hot water supply boilers

- \$5 per MBH¹² for water heaters with a thermal efficiency of 90% or higher
- \$3 per MBH for water heaters with a thermal efficiency of 84% to 89.9%

On-demand water heaters

- \$2.50 per MBH for water heaters with a thermal efficiency of 90% or higher

Program Objectives:

The Companies will be making the Efficient Water Heater program available to their commercial customers in early 2010. Through this program the Companies intend to:

- Reduce commercial sector gas consumption by encouraging the installation and use of high as opposed to standard efficiency water heaters for domestic hot water heating.
- Increase year over year participation rates in view of maximizing gas savings and bringing about market transformation.
- Educate commercial customers about the advantages of high efficiency water heaters and provide an incentive to facilitate the purchase of high efficiency technology.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs.
- Prepare the way for and support any provincial regulation requiring increased water heater efficiency.
- Given that one of the targets for this program is Multi-Family Residential Buildings, this program will satisfy clause 3(a) of the DSM Regulation, which states that in order to be considered adequate, a utility's plan portfolio must include measures for rental accommodation.

¹² Note: 1 MBH = 1000 BTU/hr (BTU = British Thermal Unit = the heat energy required to raise 1 pound of water by 1 degree Fahrenheit)

Background:

The 2006 CPR identifies water heating as the commercial sector's second greatest source of natural gas consumption by volume, at around 14% percent of the total. Yet despite their prevalence, few water heaters are as efficient as they could be. This presents an opportunity for a program that encourages commercial enterprises to upgrade or purchase heaters that are more efficient.

The need is clear: data from the Air-Conditioning, Heating, and Refrigeration Institute ("AHRI")¹³, Consortium for Energy Efficiency ("CEE")¹⁴ and discussions with manufacturer's reps indicates a maximum combustion efficiency of approximately 80%. High efficiency water heating equipment is generally "condensing" type with a combustion efficiency of approximately 95%. Moreover, the penetration rate of high efficiency technologies in the DWH market is low¹⁵, especially for stand-alone DHW plants.

Uptake of the more efficient technology is inhibited by several barriers:

1. Higher initial cost / length of simple payback
2. Lack of awareness of products available
3. Nature of replacement market (Emergency replacement handled entirely by a plumber or gas fitter)
4. Negative perception of high efficiency technologies
5. Skeptical as to positive net benefits
6. Split Incentives

As a result, the existing market momentum favours the continued installation of standard efficiency units. While the existing boiler programs will provide a financial incentive for customers who generate DHW in combination space heat/DHW plants, a gap in market coverage exists for segments which make use of standalone DHW plants. The new Efficient Water heater program will bridge this gap.

Targeting Heavy Users:

The program is expected to appeal primarily to commercial customers who typically exhibit high domestic hot water usage such as:

- Commercial Kitchens
- Multi-Unit Residential Buildings
- Hotels/Motels
- Laundries

Some limited participation may be expected from other sectors such as:

- Hospitals & Medical Facilities

¹³ *AHRI Database of Certified Product Performance, Water heaters*, available at: <http://www.ahridirectory.org/>

¹⁴ "Market and Technology Characterization for Commercial GasWater Heaters", CEE, June 2008

¹⁵ "Measures and Assumptions for Demand Side Management (DSM) Planning", Navigant Consulting, April 16, 2009

- Secondary Schools
- Large Commercial/Retail buildings

Please refer to Appendix D for a detailed program description.

Projected Outcome:

In the short to medium terms, the efficient water heater program is not expected to provide results similar to those realised by the boiler programs. Table 5-10 provides program highlights of the Efficient Water Heater Program forecasted performance metrics for 2010.

Table 5-10: Modest initial TRC performance in the program's first year

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
New Const	TGI	25	62	17	2,185	18,932	5%	1.1
	TGVI	3	7	5	262	2,261	5%	1.0
Retrofit	TGI	60	149	41	5,244	45,436	5%	1.1
	TGVI	6	15	10	524	4,523	5%	1.0

The performance of the program in its introductory year is expected to be modest. TRC's and program participation rates should remain relatively low while spending on promotions will be high in view of raising awareness. Vancouver Island is expected to see low participation, given TGVI's experience with its current incentive programs; the island generally lags behind the mainland in terms of participation on a per capita basis. The profile of the EEC programs needs to be raised on the island. Sustained promotional efforts in conjunction with the Efficiency Partners Program are expected to significantly redress this situation moving forward.

Also minimizing initial effectiveness is the reality that high efficiency technology is relatively new to domestic hot water heating, and as such the incremental price difference remains high. The cost to benefit ratio is therefore adversely impacted from the outset. As the incremental cost of the technology is reduced over time this situation will be improved. Furthermore, participation in the program is expected to be more limited than in the boiler programs, as only participants with high hot water requirements (as outlined above) are expected to obtain a reasonable payback by using high efficiency hot water heaters.

For cost benefit analysis please refer to Appendix J.

Summary:

As the market place becomes more aware of the program it is expected that increased participation will lead to improved performance in 2011. The program's simple structure should, similar to the Light Commercial ENERGY STAR® Boiler Program, help to keep administrative spending low over the long run and also contribute to a solid TRC showing.

5.6.2.4 *Energy Assessment Program*

Program Area: Commercial Energy Efficiency Programs

Target Market: Retrofit

Duration: TGI: 2001 – December 31, 2011
 TGVI: 2001 – December 31, 2011

Program Updates for 2010:

The program will see several changes in 2010 aimed at improving its performance. Changes will include:

1. Requiring participants to pay for 50% of the assessment initially. The remaining 50% will be reimbursed once a participant has implemented all identified energy savings measures with a payback period of less than 2 years.
2. Developing a formalized energy savings tracking methodology.
3. Remarketing and promoting the program so as not to conflict with the Custom Design Program (refer to Section 5.13.6.2 Custom Design Pilot Program for a description of this program) and to ensure that participants in the program are those for whom a simple energy assessment as opposed to a full energy audit will suffice.

As the Companies continue to develop additional Energy Efficiency incentive programs, the Energy Assessment program risks coming into conflict with those programs when claiming GJ savings. As such, the Companies are considering restructuring the Energy Assessment Program as an enabling activity whose costs may be accounted for in the overall Commercial Energy Efficiency Program TRC.

Background:

As discussed in Section 4.4.5, the Energy Assessment Program is designed to identify inefficiencies in natural gas energy consumption and provide recommended solutions to commercial customers who consume more than 2000 GJ per year. The Companies strongly believe that an Energy Assessment program is essential to:

1. Reaching out to and engaging commercial customers on matters of energy efficiency.
2. Fostering a culture of conservation within the commercial sector in the province.

Please refer to Appendix D for a detailed program description.

Projected Outcome:

The Energy Assessment Program will be modified in late 2010 to improve its effectiveness in terms of GJ's saved per dollar spent, at reducing commercial sector gas consumption. In the meantime TGI and TGVI will run the program as is, though promotion of the program will be limited and its performance is expected to be impacted as a result.

Table 5-11 provides program highlights of the Energy Assessment Program performance metrics for 2010 based on our forecast.

For cost benefit analysis please refer to Appendix J.

Table 5-11: Energy Assessment Program Performance Metrics

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
Retrofit	TGI	45	54	16	12,110	22,087	10%	2.6
	TGVI	5	6	4	1,346	2,451	10%	2.1

The Companies are currently engaged in a second evaluation study of the program (an initial study was completed in 2008) based on participation from July 2007 through July 2009. This study will provide additional needed insight into the program's performance and allow the Companies to confirm the data underlying the performance results presented above. Furthermore the evaluation study will provide additional insight into where the program may be modified to enhance its performance. Refer to Section 5.13.3.3 for details on the Energy Assessment Program Evaluation.

5.6.2.5 Process Heat Program (Under Development)

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: To be determined
TGVI: To be determined

Program Objectives:

- Reduce gas consumption among manufacturing / light industrial customers by encouraging the installation and use of high as opposed to standard efficiency water appliances in manufacturing processes.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate manufacturing / light industrial customers about the advantages of reducing gas consumption and provide an incentive to facilitate the purchase of high efficiency technology.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs.

Background:

The Process Heat program will capture gas savings by directly addressing inefficient equipment or operations in manufacturing processes. This may include items such as old boilers, piping insulation, process controls, etc. Target participants will include organizations in agriculture,

food processing and manufacturing such as asphalt production. The program is likely to include a capital cost incentive and may include an additional monitoring and performance incentive.

5.6.2.6 *Commercial Cooking Program (Under Development)*

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: To be determined
 TGVI: To be determined

Program Objectives:

- Reduce gas consumption in commercial cooking operations by encouraging the installation and use of high as opposed to standard efficiency cooking appliances.
- Increase year over year participation rates in view of maximizing gas savings and bringing about market transformation.
- Educate commercial kitchen customers about the advantages of reducing gas consumption and provide an incentive to facilitate the purchase of high efficiency technology.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs.
- Prepare the way for and support any provincial regulation requiring increased commercial cooking appliance efficiency.

Background:

According to the 2006 CPR, commercial cooking represents the third most important consumer of gas in British Columbia's commercial sector gas users. The Commercial Cooking program will capture gas savings by encouraging the use of high efficiency (generally ENERGY STAR® rated) cooking appliances in commercial kitchens. Typical appliances include fryers, ovens, boilers, steamers and ranges. Target participants will include restaurants, health care, care homes, education and institutional organizations. The program will likely be delivered in the form of an appliance purchase rebate.

5.6.2.7 *Commissioning Program (Under Development)*

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: To be determined
 TGVI: To be determined

Program Objectives:

- Reduce gas consumption among the commercial sector's existing building stock by providing an incentive to help commercial customers maximize their facilities operating performance.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate commercial sector customers about the impacts of poorly maintained / operated building systems and provide an incentive to facilitate both the maintenance of existing equipment, as well as the implementation of proper operating strategies.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs.

Background:

Studies indicate that building commissioning, especially of existing buildings, represents one of the most cost effective sources of energy savings and GHG reductions. The Commissioning program will capture gas savings by ensuring that participating facilities / buildings are operated in the most efficient and effective manner possible.

Target participants will generally include government, medium to large commercial, large multi-residential, health care, education and institutional organizations. The program will likely be delivered in the form of a performance based incentive, wherein participants will be given a certain dollar amount per GJ actually saved.

The Companies are working to partner with BC Hydro on its currently operating commissioning program known as the Continuous Optimization program. If the TRC tests are positive, the Companies will begin paying for the gas side measures required to operate the program and subsequently claim the GJ savings.

5.6.2.8 Victoria Spray Saver Program (Under Development)

Program Area: Commercial Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI: Not Available
TGVI: May through August 2010

Program Objectives:

- Reduce gas consumption in associated with dishwashing by installing low flow pre rinse spray valves in food service establishments.
- Install new low-flow pre-rinse spray valves in approximately 300 locations in the greater Victoria area.
- Maintain a program TRC greater than 1.0 and optimize the proportion of incentives over administration and marketing costs.

Background:

The Companies are planning to run another Spray Saver program in 2010 in conjunction with BC Hydro. The program will focus on the greater Victoria region and, similar to the Okanagan program, will seek to achieve a reduction in natural gas consumption associated with the production of hot water by reducing hot water use in commercial kitchens. TGVI will install, free of charge, new low-flow pre-rinse spray valves in willing food service facilities (i.e. restaurants, coffee shops, delis, groceries, etc.) in order to reduce the volume of hot water used in dishwashing.

5.6.3 Summary

The Companies intend to broaden their commitment to Commercial Energy Efficiency programs in 2010.

Existing programs such as the Efficient Boiler Program, Light Commercial ENERGY STAR® Boiler Program, and the Energy Assessment Program will each be refined and continued.

Where market research suggests it will create value to do so, the Companies will also roll out new programs to increase the Portfolio's impact in the Commercial space. These new programs include the Efficient Water Heater Program, Commercial Cooking Program, the Commissioning Program, and the Process Heat Program.

Collectively this portfolio will continue to create value in 2010 with the important stakeholder group of Commercial customers while laying a foundation for continued EEC efforts in 2011 and beyond.

5.7 High Carbon Fuel Switching

High Carbon Fuel Switching program initiatives are designed to result in lower overall GHGs by using natural gas in place of higher carbon fuels such as coal, oil or propane. In addition, further GJ savings will be recovered by replacing older less efficient high-carbon appliances with high efficiency natural gas appliances such as ENERGY STAR® furnaces or boilers.

5.7.1 Residential Retrofit Program Focus for Portfolio in 2010

The first program is a residential retrofit program, focused on converting oil or propane heating systems to ENERGY STAR® natural gas appliances. This program, the Switch 'N' Shrink Program, is described below.

As 2010 progresses, other programs still at the initial concept stage will be evaluated for inclusion in this Program Area.

5.7.1.1 *Switch 'N' Shrink Program*

Program Area: High Carbon Fuel Switching

Market: Retrofit

Duration: January 1, 2010 to December 31, 2010 with possible extension

Incentive: \$1000 rebate cheque for oil or propane conversion
\$50 rebate cheque for Electronically Commutated Motors ("ECM") from BCHydro or FortisBC

Partners: BCHydro and FortisBC

Program Administration:

Consumer Response Marketing

Program Objectives:

The program is designed to achieve the following:

- Provide a \$1000 incentive to encourage homeowners to convert their primary heating system from higher carbon oil or propane to a high efficiency natural gas heating system
- Upgrade a minimum of 750 homes
- Develop relationships with associations for co-marketing opportunities, for example BC Insurance Brokers Association, real estate associations, environmental groups
- Work with MEMPR to include this program as part of the provincial greenhouse gas reduction strategy
- Develop a cost effective program with TRC greater than 1.0 that achieves significant energy savings, cost savings and greenhouse gas reduction benefits

Background:

A 2005 Statistics Canada Victoria market report indicated that 21% of the households still used oil (19% natural gas) and represented 29,000 oil customers. This market potential demonstrates the huge opportunity to reduce GHG's through natural gas conversions.

The Switch 'N' Shrink Program offers participants a \$1000 rebate for converting their primary home heating system (furnace or boiler) from higher carbon oil or propane to an ENERGY STAR® natural gas heating system. The participant lowers their energy bills, increases their property value, reduces the potential of an environmental hazard, and shrinks their carbon footprint.

The program is available to all new and existing customers (where primary heating source is oil or propane) in all of the Companies' service areas except Whistler, beginning January 1, 2010.

ENERGY STAR® heating systems installed with an ECM are eligible for an additional \$50 incentive funded by BC Hydro and FortisBC.

The program is offered to all BC residents, however almost 70% of the 1233 conversions in 2009 were on Vancouver Island, where the use of oil is more prevalent than in the rest of the Companies' service territory. Homes near a gas main are more likely to participate, however all potential customers may want to take advantage of this program. On-Main Market potential for TGVl oil and propane conversions is difficult to estimate, but could range from 20,000 to 40,000 households.

Please refer to Appendix D for a detailed program description.

Projected Outcome:

The program will deliver significant energy, cost, and GHG benefits through 750 conversions. Table 5-12 provides program highlights of the projected Switch 'N' Shrink Program performance metrics for 2010.

Table 5-12: Switch 'N' Shrink Program Performance Forecast illustrating the effective cost benefit tests associated with the Switch 'N' Shrink program

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)*	NPV Energy Savings (GJ)*	Free Rider Rate	TRC
TGI	225	225	25	(4,838)	(50,954)	50%	1.6
TGVl	525	525	200	(11,288)	(118,191)	50%	1.4
Total	750	750	225	(16,125)	(169,145)	50%	1.5

* Note: Energy savings in a fuel switching program are negative since this is a load building program from higher carbon fuel sources (oil and propane) to lower carbon natural gas.

The overall program benefits are captured by avoiding higher carbon fuel costs while incurring lower natural gas fuel costs for an overall reduction in net GHG emissions. The net benefit for the participant is in reduced energy costs while helping BC meet its provincial GHG reduction targets. From a Utility standpoint, the benefit is in adding more customers to the distribution system, especially where a gas service already exists in close proximity, keeping the overall system costs per customer down. Table 5-13 illustrates these points and the significant energy, cost and GHG savings that are obtained based on 750 furnaces converted from oil to natural gas.

Table 5-13: Switch 'N' Shrink Program Benefits analysis illustrating significant energy, cost, and GHG benefits per 750 conversions

Utility	NPV Natural Gas Incurred (GJ)	NPV Oil Displaced (GJ)	NPV Energy Savings (GJ)	NPV Costs to Purchase Natural Gas (\$000s)	NPV Costs to Purchase Oil (\$000s)*	NPV Cost Savings upon Conversion (\$000s)	GHG Savings (tCO ₂ e)
TGI	50,954	56,033	5,079	540	1,226	687	1,375
TGVI	118,191	130,743	12,552	1,259	2,845	1,586	3,242
Total	169,145	186,776	17,631	1,799	4,071	2,273	4,617

* Note: Source of Energy prices –November, 2009 http://www.mjervin.com/index_PetroleumPrices.htm where Oil = \$22.50 / GJ

The oil to natural gas conversion overall program benefits are significant when considering the energy savings over the lifetime of the measure. Significant benefits per 750 conversions include the following:

- 17,631 net GJ's of energy saved
- \$2.27 Million in net cost savings
- 4,617 net tCO₂e

The program performance estimate of 750 participants is likely conservative based on initial interest from contractors, as well as considerable interest from the BC Interior region for conversion projects. Incentive dollars are forecasted at \$750,000 while total spend for non-incentive dollars is estimated at \$225,000. The \$1000 incentive is meant to cover the incremental cost of upgrading to a natural gas furnace, rather than replacing an existing oil furnace with another oil furnace. Non-incentive spending represents only 30% of total spend.

The 50% Free Rider Rate was based on the assumption that half of the program participants would convert because of the incentive and the other half would have converted regardless of the program. This Free Rider Rate is in alignment with the 43% Free Rider Rate used in the ENERGY STAR® Heating System Upgrade Program. The overall TRC for this program is 1.5.

Please refer to Appendix D for a detailed program description.

Summary

The High Carbon Fuel Switching Program Area, within which Switch 'N' Save is the first program to market, will result in significant energy, dollars, and GHG savings over time. For every 750 oil-to-efficient natural gas conversions, fossil fuel consumption is reduced by 17,631 GJ's of energy, approximately \$2.2 Million is saved by customers, and 4617 tons of GHG's are reduced. High carbon fuel switching program initiatives, such as the Switch 'N' Shrink program, will provide significant benefits to the Province of BC's GHG reduction strategy.

5.8 Conservation for Affordable Housing Programs

The first of the EEC Program Principles is that, “Programs will have a goal of being universal, offering access to energy efficiency and conservation for all residential and commercial customers, including low income customers through the DSM for Affordable Housing initiative.”

The Companies are staying true to this principle by developing and implementing programs that are of no cost or low cost to low-income participants. Further, the DSM Regulation states that a (public) utilities’ portfolio is adequate only if it provides (amongst other things) measures specifically intended to assist residents of low-income households and those living in rental accommodations to reduce their energy consumption.¹⁶

The Companies believe firmly in these guiding principles, and their commitment to them is reflected in the Conservation for Affordable Housing Programs they will implement in 2010.

5.8.1 Program Portfolio Overview

The 2010 Conservation for Affordable Housing Portfolio consists of two program categories: studies and programs aimed at low-income individuals and renters. The initiatives discussed in this section satisfy the requirements in clauses 3(a) and 3 (b) of the DSM Regulations for measures aimed at residents of low-income households and rental accommodations.

Table 5-14 provides a summary of the 2010 Conservation for Affordable Housing program’s initiatives.

Table 5-14: 2010 Conservation for Affordable Housing Programs Initiatives

Project	Description	Retrofit		
		Incentive & Non-Incentive Expenditure (\$000s)	NPV Energy Savings (GJ)	TRC
1	BC Affordable Energy Conservation Strategy (study)	50	N/A	N/A
2	Strategic Energy Management Plan (study)	18	N/A	N/A
3	CHF BC Energy Performance Housing Inventory (study)	15	N/A	N/A
4	REnEW	258	N/A	N/A
5	Energy Savings Kits (ESK)	349	30,193	1.2
6	Energy Conservation Assistance Program*	3,130	307,662	1.0

* The Companies plan to use \$1.5 million of the MEMPR Low Income Partnership funds to contribute to BC Hydro through our ECAP partnership. The remaining budget for ECAP and all the remaining investments shown above are EEC investments in the Conservation for Affordable Housing program area. Only EEC investments will be included in the overall portfolio level TRC calculation.

Note: As per DSM regulation, the TRC calculation for all low income programs applies a deemed benefit of 130% of what the benefit would be recognized as in an able-to-pay program’s TRC calculation. This regulation is applied in the TRC figures shown above.

¹⁶ See Appendix B, Demand Side Measures Regulation, November 7, 2008, Section 3 (b).

5.8.2 Committed to Developing Expertise Through Research

The first component of the Conservation for Affordable Housing Program Area is a set of studies the Companies will participate in during 2010. Through these studies, TGI and TGVI will gain expertise in and insight into this market segment and its unique requirements.

There are three studies related to Conservation for Affordable Housing that the Companies are already planning to be involved in during 2010.

5.8.2.1 BC Affordable Energy Conservation Strategy Paper

The Affordable Energy Conservation Strategy Paper ("Strategy Paper") is being developed (through research and a consultation process) to provide recommendations that ensure that low income homes can actively participate in and benefit from targeted energy efficiency programs in this province.

The Companies are facilitating the Working Group and Task Force which is overseeing the development of this Strategy Paper. Currently, the Strategy Paper is in the research phase which is expected to be completed by the end of March. The research is focused on the current challenges, opportunities and best practices relating to energy efficiency programs for low income individuals and is being completed by a University of Victoria Environmental Law Centre student.

Following the research, the Task Force will identify what areas of research are still lacking and undergo a consultation process in order to address the gaps identified in the research. The research outcomes and the plan for consultation process will be shared with the Working Group at the next Working Group meeting in May, 2010. It is expected that the strategy paper will be developed by the end of 2010.

5.8.2.2 Strategic Energy Management Plan Study ("SEMP")

The second study that the Companies are supporting is the Strategic Energy Management Plan ("SEMP"). This study is commissioned by the Companies and BC Hydro and will be performed by City Green Solutions and the BC Non-Profit Housing Association. The study is specifically focused on the non-profit housing sector and seeks to match energy consumption information with building characteristics in order to prioritize energy efficiency investments. This study will be completed by Q3 2010.

5.8.2.3 Co-Operative Housing Federation – BC Energy Performance Housing Inventory

The third study is the Co-operative Housing Federation's ("CHF") BC Energy Performance Housing Inventory which is a first step towards addressing the complex nature of working with Co-operative Housing. This step will allow CHF BC to gain a better understanding of their housing stock. This is modelled on the success of BC Non-Profit Housing Association's Asset Analysis study. This inventory will allow for a strategic approach to be designed that will ultimately allow for the prioritization of energy retrofits in Co-ops in BC. This study will be commissioned by the Companies, BC Hydro and BC Housing and will be performed by City Green and eaga Canada Ltd.

5.8.2.4 Additional Studies

The above studies are presently the only three planned for 2010. However, there may be other opportunities in 2010 for further studies and those opportunities will be assessed as they arise.

5.8.3 Conservation for Affordable Housing Programs

The second component of the Portfolio is a collection of tactical programs. These have been developed by the Companies in partnership with electric utilities.

The Companies have developed and launched an Energy Efficiency Training Program titled, Residential Energy and Efficiency Works ("REnEW"). The Companies have also made progress towards the implementation of an Energy Savings Kit, and integration into the Energy Conservation Assistance Program. As well, initial concepts have been developed to further invest some of the MEMPR Low Income Partnership Funding.

These programs are described in detail below.

5.8.3.1 REnEW, Residential Energy and Efficiency Works

Program Area: Conservation for Affordable Housing Programs

Target Market: Retrofit

Duration: February, 2010 to December, 2011

Incentive: The Companies will contribute approximately \$257,500 per year.

Funding Partners:

- FortisBC
- BC Hydro
- Ministry of Advanced Education and Labour Market Development

Delivery Partners:

- The Companies are the lead developer and administrator for this program. Other contributors and delivery partners include:
 - BladeRunners
 - Aboriginal Community Career Employment Services Society ("ACCESS")
 - John Howard Society, Central and South Okanagan
 - Southern Interior Construction Association

Program Objectives:

- Enhance and expand the energy efficiency retrofit industry
- Add energy-efficiency-focused capacity to delivery agents that work within low-income sectors
- Increase the quality of energy efficiency retrofitting installations through training

- In the long term, by increasing the supply of skilled energy efficiency workers, utilities will be able to implement energy efficiency retrofits at lower costs.

Background:

The Companies are leading a capacity-building program aimed at increasing the supply of qualified energy assessors and installers. This energy-efficiency focused training has been developed by the Companies, John Howard Society, Bladerunners, the Southern Interior Construction Association, FortisBC and BC Hydro. By facilitating this training course and increasing the supply of workers skilled in energy efficiency retrofitting, the Companies believe that the delivery costs of DSM programs that involve retrofitting will be decreased, and our ability to implement programs in remote communities will be enhanced.

The training program has been initially designed for, and targeted to, the clientele of the John Howard Society in Kelowna, and BladeRunners in the Lower Mainland. John Howard Society's clientele is primarily those who have had contact with the justice system. BladeRunners works with Inner City disadvantaged 'street-involved' youth. The Companies intend to offer the course a total of 5 times in 2010 and will include at least one Vancouver Island course offering.

Given the clientele that the Companies are seeking to assist through this initiative, the training will not require any prerequisite qualifications other than the desire to pursue work in the energy efficiency industry. Training will be 4-5 weeks and includes classroom time and in-the-field, hands-on experience. The training will cover a breadth of content including general energy conservation education, an understanding of energy as a resource, concepts such as 'house as a system', as well as the application and installation of energy efficiency measures. In addition to the energy-related education, the program includes general construction trade training and highly desired certifications such as WHMIS, First Aid, and Construction Safety Training System. The program is primarily focused on the energy efficiency industry and prepares graduates for employment relating to utilities' direct-install DSM programs. The training also opens the door to further formal training such as certified energy advisors.

Projected Costs:

The average estimated cost per course in-take is based on costs associated with the first two in-takes. The cost estimate of \$103,000 includes the costs of trainers, course development costs, food for participants during the course, a full set of tools for the participants, and overhead costs of program delivery agents.

Table 5-15 shows estimates of costs associated with offering this program.

Table 5-15: REnEW Program Cost Estimates

Utility cost per in-take	\$ 103,000
Number of in-takes	5
Total Annual Utility Costs	\$ 515,000
BC Hydro and/or Fortis BC Annual Contributions	\$ 257,500
The Companies Annual Contribution	\$ 257,500

As the program is expanded to other parts of our service territory the Companies will look for additional funding partners.

5.8.3.2 *Energy Savings Kits (“ESK”)*

Program Area: Conservation for Affordable Housing Programs

Target Market: Retrofit

Duration: May, 2010 to December, 2011

Incentive: The Companies will contribute approximately \$13.76 per ESK

Partners:

- FortisBC
- BC Hydro

Program Objectives:

- Enable over 11,000 low-income participants to self-install energy efficiency measures in their homes.
- Make energy efficiency more accessible to low-income customers by addressing the key barriers to energy efficiency in this sector (including affordability, availability and awareness)
- Provide energy savings for TGI/TGVI
- Provide low-income customers with the opportunity to reduce their energy consumption which will also reduce their energy bills and GHG emissions.
- Create a culture of conservation through increased knowledge and awareness of conservation behaviours.

Background:

ESK is a self-installed kit of energy saving measures. BC Hydro and FortisBC have ESK's already available to their low-income electricity customers. The intention is to partner with BC Hydro and FortisBC in order to simplify the process for shared customers and reduce administration and marketing costs.

With the Companies' involvement in this project the ESK offer will become a broadly marketed and easily accessed program available to customers in all three utility partners' regions, regardless of their fuel type. Participants will be able to call a toll-free number, or visit a website to apply for the program. Based on the approval of a customer's application, instructions will be sent to a supplier to send out the kit. The only eligibility criteria will be that the participant is a low income customer of any of the three utilities. The definition of "low income customer" for this program is based upon Statistics Canada Low Income Cutoff ("LICO").

The intention is to have the application process and the packaging of the ESK jointly branded so that the customer will have a seamless experience from the time they hear about the ESK offer to the time it is delivered to their home. The kit will be delivered at no cost to the participants

and will include several easy to install energy savings measures, such as water heater pipe wraps, low flow shower heads, faucet aerators, weather stripping, foam tape for door insulation, and other measures. The ESK will also include educational brochures that will help customers reduce their energy consumption through simple behavioural changes.

The intention is to have the kits available by May 2010.

Projected Outcome:

The incentive amount of \$162,000 (for both TGI and TGVI) is the estimated cost of the ESK including packaging and delivery. The Energy Savings NPV of 30,193 GJs is based on achieving an aggressive goal of sending 11,000 ESKs to customers in 2010. The resulting TRC is 1.2.

Table 5-16 describes estimated performance and investments in the ESK.

Table 5-16: ESK Program Estimates

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
TGI	9,000	130	150	3,947	24,155	8%	1.2
TGVI	2,000	32	37	987	6,038	8%	1.2

Note: As per DSM regulation, the TRC calculation for all low income programs applies a deemed benefit of 130% of what the benefit would be recognized as in an able-to-pay program's TRC calculation. This regulation is applied in the TRC figures shown above.

5.8.3.3 Energy Conservation Assistance Program ("ECAP")

Program Area: Conservation for Affordable Housing Programs

Target Market: Retrofit

Duration: June, 2010 to December, 2011

Incentive: The Companies will contribute approximately \$850 per participant.

Partner: BC Hydro

Program Objectives:

- Enable over 3,000 low-income participants to receive comprehensive energy evaluations in their homes and have a suite of energy efficiency measures installed for them.

- Make energy efficiency more accessible to low-income customers by addressing the key barriers to energy efficiency in this sector (including affordability, availability and awareness)
- Provide energy savings for TGI/TGVI
- Provide low-income customers with the opportunity to reduce their energy consumption which will also reduce their energy bills and GHG emissions.
- Create a culture of conservation through increased knowledge and awareness of conservation behaviours.
- Leverage the graduates of the REnEW program to perform retrofits in qualified customers homes.

Background:

The Energy Conservation Assistance Program (“ECAP”) is a targeted program that, in its current state, is only offered by BC Hydro to low income high electricity users. The Companies intend to participate in this program and broaden its reach and impact to include low income natural gas users.

Presently prospects are identified through social housing providers, program delivery agents and targeted communications. Recipients of the Energy Savings Kits are also prospects for participation in this program if they meet the minimum energy consumption criteria. The program involves assessments of energy savings opportunities, and installation of energy efficiency measures, which currently include items such as attic insulation, crawl space insulation and draft proofing.

With the Companies’ involvement in this program, the target will be expanded to include all high energy users regardless of their home heating fuel source.

Projected Outcome:

This initiative is in its very early stages of development, and budgeted amounts may vary significantly from the early estimates provided in Table 5-17. The intention is to have the program available to gas customers by the end of Q2, 2010.

Table 5-17: ECAP Early Budget Estimates

Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)	Annual Energy Savings (GJ/yr)	NPV Energy Savings (GJ)	Free Rider Rate	TRC
TGI	2,600	2,200	304	25,955	246,130	4%	1.0
TGVI	650	550	76	6,489	61,532	4%	1.0

As per DSM regulation, the TRC calculation for all low income programs applies a deemed benefit of 130% of what the benefit would be recognized as in an able-to-pay program's TRC calculation. This regulation is applied in the TRC figures shown above.

The incentive amount of \$2,750,000 (for both TGI and TGVI) is based on an average of just under \$850 per participant. The Energy Savings NPV of 307,662 GJ is based on achieving an aggressive goal of 3,250 participants in 2010. The resulting TRC is 1.0.

5.8.3.4 MEMPR Low Income Partnership Funding

As discussed in Section 4.5.3, on March 31, 2009, MEMPR awarded TGI and TGVI a grant of \$5.155 million to support and develop programs for low-income individuals in British Columbia. This agreement stipulated that \$1.5 million is to be contributed to projects with BC Housing, \$1.5 million for projects with BC Hydro, and \$2.155 million allocated for the development of additional TGI and TGVI programs for low-income participants. This funding is to be invested by March 31, 2012.

The \$1.5 million that was stipulated to go to BC Housing has since had \$1 million re-allocated at the request of MEMPR to go towards the Super Efficient New Construction ("SENC") program for superior energy performance in new construction projects that house low-income occupants. The SENC Program Oversight and Evaluation Committee chaired by MEMPR and including representatives from the Companies, MEMPR, BC Hydro and FortisBC selected six projects, and intend to have the contracts finalized and signed with individual construction project proponents by April 30, 2010. Table 5-18 below includes the selected projects.

Table 5-18: Super Efficient New Construction

Project		Funding Request in Submission	Total Funding by SENC
1	Elizabeth Fry Society Transition House for Women and Children	\$500,000	\$222,000
2	Union Street EcoHeritage Project	\$269,000	\$125,000
3	Educational / Commercial Affordable Housing Project	\$250,000	\$200,000
4	Ucluelet Passive House	Unclear From Proposal	\$75,000
5	CRD Affordable Housing Project	\$500,000	\$278,000
6	Dawson Green	\$180,000	\$100,000
Total			\$1,000,000

The remaining \$500,000 was allocated to the \$2.155 million for the development of additional TGI and TGVI programs for low-income participants.

The \$1.5 million for projects with BC Hydro is stipulated to go towards comprehensive retrofits of 750 natural gas heated homes in partnership with BC Hydro's low income programs. Specifically, the Companies intention is to apply this \$1.5 million to a partnership on BC Hydro's ECAP program described above. The estimated investments in the ECAP program is well above \$1.5 million and the remaining investment will come from the EEC approved funding for Conservation for Affordable Housing.

A portion (\$965,803) of the \$2.655 million stipulated for TGI and TGVI programs for low-income participants has been used to fund retrofits under the LiveSmart Carry Over project described in Section 4.5.3. The remaining \$1.689 million will go towards additional TGI and TGVI programs that have not yet been developed, but that may include a partnership with FortisBC to fund the energy efficiency retrofits in four buildings in Kelowna where John Howard Society clients live.

5.8.4 Summary

The Companies are committed to developing and implementing programs that are of no cost or low cost to low-income participants. Further to this commitment, the Companies will participate in at least three studies in 2010 to gain further insight into the unique needs of this market segment. The Companies will also introduce a series of programs developed in partnership with electric utilities – an Energy Efficiency Training Program (REnEW), an Energy Savings Kit, and integration into the Energy Conservation Assistance Program.

These initiatives will promote conservation attitudes and create value through savings in a market segment that needs to be included in EEC programming. The programs described in this section satisfy the plan portfolio adequacy requirements in the DSM Regulation for energy savings measures for residents of low income housing.

5.9 Joint Initiatives For Energy Efficiency Programs

In 2010, the Companies will continue to participate in mutually beneficial collaborations between groups such as government agencies or BC utility partners. Please refer to Section 4.6 for more background on Joint Initiative projects.

5.9.1 Joint Initiative Program Portfolio

In 2010 the Companies will continue to carry out the EcoEnergy Home Assessment (in partnership with LiveSmart BC) while developing and rolling out new Joint Initiatives.

Joint Initiatives programs for 2010 include the EcoEnergy Home Assessments with LiveSmart BC, BC Hydro and FortisBC that will end March 31, 2010. Utility Partners are collaborating on developing a program for energy efficient home retrofits for the able-to-pay sector (as opposed to the Affordable Housing sector discussed above). Other programs under consideration include appliance rebates with FortisBC, and working with BC Hydro to fund Energy Specialists to complement BC Hydro's Energy Manager Initiative.

Table 5-19 provides a summary of the 2010 Joint Initiatives.

Table 5-19: 2010 Joint Initiatives Energy Efficiency Programs are currently under development with Utility Partners and government to provide energy savings programs and outreach across the province

Program	Description	New Construction		Retrofit		TRC	
		Incentive & Non-Incentive Expenditure	NPV Energy Savings	Incentive & Non-Incentive Expenditure	NPV Energy Savings	TGI	TGVI
1	EcoEnergy Home Energy Assessments (D-Visits) through LiveSmart BC	\$75 Incentive to cover the partial cost of Home Energy Assessment provided by an NRCan certified Home Energy Advisor	N/A	717	0	N/A	N/A
2	Utility Partner Collaboration - Home Renovation Project	TGI, TGVI, BCH, FortisBC and MEMPR in discussions.	N/A	Under Development			
3	Energy and Water Efficient Appliance Programs	Work with FortisBC to provide incentives for energy and water efficient appliances	N/A	Under Development			
4	Energy Specialists	Provide funding for Energy specialist focused on natural gas savings to complement BCHydro's Energy Manager	N/A	Under Development			

The highlights of the 2010 existing Joint Initiatives programs are as follows:

- EcoEnergy Home Assessment funding, provided through a partnership with LiveSmart BC, demonstrates the Companies' support for energy assessments as a critical first step in the retrofit process and "whole home" incentives. From August 16, 2009 to March 31, 2010 the Companies expect to provide funding for 15,000 assessments with a contribution of \$1.125 Million.

The highlights of the new 2010 Joint Initiatives programs are as follows:

- Utility Partners have been collaborating to develop a program for energy efficient home retrofits. The Companies are working with utility partners and MEMPR to define roles and determine how each party will contribute to delivering a successful program to customers.
- TGI is working with FortisBC on programs for energy and hot water efficient appliance rebates. TGI's participation extended the program reach to natural gas water heating customers and those with gas dryers.
- The Companies are in discussion with BC Hydro about providing funding for an Energy Specialist that would be put in place to complement the BC Hydro Energy Manager program. Through utility collaboration, large commercial and institutional entities, municipalities, universities, school districts, health regions and industry associations could access expertise to reduce energy (both electric and natural gas) and save money.

The Joint Initiatives programs for 2010 are described in further detail below.

5.9.1.1 *EcoEnergy Home Assessment (D-Visit Audit) Support Through LiveSmart BC*

Program Area: Joint Initiatives

Target Market: Retrofit

Duration: August 16, 2009 through March 31, 2010

Incentive: \$75 subsidy from Utility Partner (based on fuel source) and \$75 from MEMPR

Partners: TGI, TGVI, BC Hydro, FortisBC and MEMPR

Program Administration:

LiveSmart BC

Program Objectives:

- Provide incentives for Home Energy Assessments as the first step in improving the energy efficiency of existing building stock
- Support LiveSmart BC in the interim funding period prior to new program iteration in April, 2010

Background:

Please refer to Section 4.6.2.1 for more information about this program

Projected Outcome:

Table 5-20 provides program highlights of the EcoEnergy Home Assessments Program estimated performance metrics for 2010.

Table 5-20: EcoEnergy Home Assessments Participant Numbers and Contribution

	Utility	Participants	Incentive Expenditure (\$000s)	Non-Incentive Expenditure (\$000s)
Invoiced: Aug 16 - Dec 31, 2009	TGI	5,182	389	16
	TGVI	263	20	4
Estimates: Jan 1 - Mar 31, 2010	TGI	7,644	573	-
	TGVI	1,911	143	-
Total	TGI	12,826	962	16
	TGVI	2,174	163	4
Program Total Estimates *		15,000	1,125	20

* program estimates from MEMPR based on NRCan D- visit data

Recognizing the importance of the home energy assessment as the first step in energy efficient retrofits, the Companies anticipate subsidizing a total of 15,000 assessments for a contribution \$1.125 million from August 16, 2009 through March 31, 2010, which is the provincial fiscal year end. Due to the nature of this project, in that the assessment is an evaluation step only, the Companies recognize that no energy savings can be claimed directly as a result of this program. Rather, the Home Energy Assessment is an avenue into other retrofit incentives that result in energy savings.

5.9.1.2 Utility Partner and LiveSmartBC - Home Renovation Program (Under Development)

<u>Program Area:</u>	Joint Initiatives
<u>Target Market:</u>	Retrofit
<u>Duration:</u>	To be determined
<u>Offer:</u>	Final offer to be determined
<u>Partners:</u>	TGI, TGVI, BC Hydro, FortisBC, NRCan, and MEMPR

Background:

The Companies are working with BC Hydro and FortisBC to establish a Utility Partner collaboration model for a BC Home Renovation program. The primary objective of the collaboration is to develop a platform that is sustainable and can remain in the market for many years without relying on the contribution of any one partner. The Utility Partners support the “whole home” or “house as a system” approach to energy savings, and in parallel to consumer incentives the Utility Partners will develop a longer term vision to jointly fund education and outreach, working to engage consumers and the trades in energy efficient retrofits.

This Joint Initiative between Terasen Gas, BC Hydro and Fortis BC is in the design stage and the structure of the program is subject to change. The Utility Partners remain committed to working together with other stakeholders to bring a sustainable home renovation program to the province of BC.

5.9.1.3 Water and Energy Efficient Appliance Programs (Under Development)

During the summer of 2009, the Companies partnered with FortisBC on a six week pilot to promote energy and water savings by providing \$50 incentives to customers in their service territory who purchased a Tier 3 ENERGY STAR® Washer or Dryer. An expanded program is being planned for 2010 in the FortisBC service territory. Working with other utilities will leverage administrative processes, reduce costs and increase program participation by sharing marketing channels.

5.9.1.4 5.9.5 *Energy Specialist Program with BC Hydro (Under Development)*

The Companies are working with BC Hydro to provide funding for an Energy Specialist that would be put in place to complement the BC Hydro Energy Manager program.

There are a number of large commercial and institutional entities, municipalities, universities, school districts, health regions and industry associations where BC Hydro funds the activities of an Energy Manager, who is charged with uncovering opportunities for energy savings projects. The Companies will fund the activities of an Energy Specialist, for mutual customers where a BC Hydro Energy Manager is in place, who would complement the activities of the Energy Manager by focussing on natural gas savings opportunities. Due to the early development stage for this program, no budget had yet been set at the time of writing.

This would bring a more complete approach to energy savings projects for large commercial and institutional entities, municipalities, universities, school districts, health regions and industry associations in British Columbia.

5.9.2 Summary

Joint Initiatives provide numerous mutually beneficial advantages for the Companies' energy efficiency programs. In working together, utilities and government partners can extend the reach of incentives, provide cost effective education and outreach, and generate significant savings and greenhouse gas reductions.

5.10 Conservation, Education and Outreach ("CEO") Programs

As described in Section 4.7, the objective of CEO initiatives is to support the development of a conservation culture within British Columbia. CEO activities help to ensure that customers are aware of and will be receptive to incentive programs when they are proposed.

Crucial to the success of EEC programs is creating and promoting awareness of conservation in general which generates desire by participants to engage in EEC activities. The CEO objectives ultimately lead to the success of the individual programs and support the energy conservation and GHG reduction goals established by the Government of BC.

5.10.1 Guiding Principles Remain in Place

The CEO programs are intended to allow engagement and opportunities for participation by all customer sectors. As with the CEO activity in 2009, the CEO activity for 2010 will follow many of the same Program Principles that were put forth in the EEC Application, in particular:

1. Programs will have a goal of universality; offering access to energy efficiency and conservation for all residential and commercial customers, including low income customers through the DSM for Affordable Housing initiative;
2. Where possible, programs will be uniform across the service territories of the Companies, so customers will have equal participation opportunity; and

3. Programs will be multi-year so as to create a sense of funding certainty necessary to effectively implement them in the marketplace.

5.10.2 CEO – Portfolio Overview: Existing and New Programs

Several initiatives undertaken in 2009 launched in Q4 of that year and are continuing into 2010. As many of these initiatives are still very new to the market, they have not had time to achieve momentum. Evaluation of the initiatives will be conducted at completion. For the proposed evaluation budget refer to Section 5.13.3.4 and for a further description of techniques for evaluation for this Program Area, refer to Appendix D.

New initiatives are also being pursued in 2010, some of which include ethnic outreach and employee education. Table 5-21 summarizes the initiatives and proposed expenditures for 2010, which align with the approved funds for the CEO program area for TGI and TGVI.

Table 5-21: 2010 CEO Initiatives and Proposed Expenditures

Initiatives		Description	Expenditures (\$000s)		Total Expenditure (\$000s)
			TGI	TGVI	
1	Print and Online Publications	Energy conservation education promoted through bill inserts, newspaper and magazine ads, trade show guides, newsletters, directories, and terasengas.com.	165	33	198
2	Ethnic Outreach	Targeted in-language (Punjabi and Mandarin) online & print media, and event attendance, to reach key ethnic markets.	75	15	90
3	Trade Shows and Events	Participation in residential home shows and commercial trade shows to reach customers and educate on energy efficiency rebate programs.	245	49	294
4	Students and Schools Outreach	Destination Conservation Beyond Recycling BC Green Games School Assembly presentations	400	80	480
5	Energy Champion Program	Educate children and youth about energy conservation behaviour changes, using regional sports team events.	446	89	535
6	Team Terasen Outreach	Outreach group delivering the DSM message by connecting with customers at community events and festivals.	112	23	135
7	Employee Education	Energy conservation education and action program focused on engaging employees in the Company.	36	7	43
Total (Budget)			1479	296	1775

CEO initiatives that will be undertaken in 2010 are described in further detail below.

5.10.2.1 Print and Online

As noted in Section 4.7.4, print and online advertising are more cost effective compared to television and mass media approaches, and will be targeted at customers already inclined to home renovations. Consequently in 2010, the Companies will continue to promote energy conservation through a variety of print and online channels.

The goal of print and online information pieces is to keep conservation top of mind through continued and consistent education. These educational pieces have also been vital among our stakeholders, such as contractors and industry associations, for distribution among their customers and members, so this method of communication will continue. Feedback from the March 11, 2010 EEC Stakeholder meeting has indicated that additional education initiatives provided from the Companies would be valuable for stakeholder members and constituents. Please refer to the Stakeholder Priorities in Appendix F.

5.10.2.2 Ethnic Outreach

British Columbia is a culturally diverse province, and a successful EEC portfolio will be aware of the unique needs of ethnic groups. The ethnic marketing and communications outreach campaign beginning in 2010 is to make conservation education accessible to all customers.

New Canadians - primarily coming from China (23%), India, the Philippines and South Korea¹⁷ - are a main source of population growth and housing demand in British Columbia. Within six months of arrival, 17% of new immigrants to British Columbia are homeowners, and after four years more than half are homeowners. Statistics show that 17% of the British Columbia's do not speak English in their homes as a primary language and in over 28% of those homes, English is their second language.¹⁸ Thus, it is important to communicate conservation information that is relevant and easily understood by these ethnic audiences. Refer to Appendix D for proposed initiatives planned for the ethnic audiences.

5.10.2.3 Trade Shows and Events

The Companies will continue to engage with customers at various home and trade shows around the Province to promote energy conservation, and the new EEC programs.

Similar to Section 4.7.5, the goals for the trade show and event activities in 2010 will be to provide face to face interaction with customers to communicate incentive programs, CEO initiatives and engagement programs, and to provide educational materials that can be distributed or displayed at customers' facilities. Refer to Appendix D for a proposed list of trade shows and events.

5.10.2.4 Student and Schools Outreach

As indicated in Section 4.7.6 school programs run over the September to June time period and so many initiatives will continue into the first half of 2010. For the 2010-2011 school year, the Companies will continue to support educational programs that have an energy conservation

¹⁷ According to the Canadian Mortgage and Housing Corporation's 2009 Annual Provincial Outlook on Housing

¹⁸ <http://www12.statcan.ca/census-recensement/2006/as-sa/97-555/tables-tableaux-notes-eng.cfm>

component, like Destination Conservation, Beyond Recycling, BC Green Games and school assembly presentations. The goal of these programs is to increase the number, awareness and involvement of schools and students around the province. With continued funding support made available to these programs, this allows for improved planning by teachers and school environmental groups to build on existing knowledge and conservation projects. Lastly, new initiatives and increased engagement on energy conservation with post secondary students will also be pursued. This area of activity satisfies clauses 3(c) and 3(d) of the DSM regulation, which requires a utility to have education programs for school-age and post-secondary students in the portfolio plan in order to be considered adequate.

5.10.2.5 Energy Champion Program

As in Section 4.7.6.5, the goal of the Energy Champion program is to educate children and youth on energy conservation. Similar to the school year, program activations with the various sports teams such as Vancouver Giants, BC Lions, and with teams in the BC Hockey League run from September to April/May. As these partnerships began only in Q4 of 2009, they will be continuing into 2010.

The purpose of these partnerships is to enable the Companies to leverage on traditional media channels, such as radio, as well as the sports teams' online and social media channels - channels that are well developed in the market and reach out to a large number of the teams' fans.

In 2010, an exciting new partnership for the Energy Champion Program with the Vancouver Canucks is being launched. The objective of this partnership is to engage the Vancouver Canucks' audience on energy conservation, through a variety of online and in-game activities. Refer to Appendix D for further detail on executing the Energy Champion program.

5.10.2.6 Team Terasen Outreach

The Team Terasen will continue to reach out to the public at local community events in 2010.

As described in Section 4.7.7, as most of the community events are free to the public, this is a cost effective method for the Companies to reach out to a large number of customers. One of the goals for Team Terasen for 2010 is to increase the number of events attended in the service territories of TGI and TGVI, and expand the geographic scope of events attended beyond the Lower Mainland.

Refer to Appendix D for a proposed list of Team Terasen events.

5.10.2.7 Terasen Employee Education

The Companies employ approximately 1,300 individuals, many of whom are themselves customers – and many of whom regularly interact with customers.

The EEC department has traditionally communicated EEC initiatives and incentive programs to employees via the Companies' intranet, newsletters and training specifically for the call centre staff. The goal of the Terasen Employee Education program is to create a large group of "EEC Ambassadors" within the Companies that are able to promote EEC programs and initiatives

which they can engage in for their own benefit, as well as communicate EEC programs and initiatives in their dealings with the public, friends and family.

The expansion of EEC initiatives and programs makes it necessary to provide the Companies' employees with continual education on all EEC programs, incentives, CEO activities and initiatives being implemented.

5.10.3 Summary

The objective of CEO initiatives is to keep conservation top of mind with customers, thus supporting the development of a conservation culture within British Columbia.

The 2010 CEO initiatives follow many of the same Program Principles that were put forth in the EEC Application. Universality and accessibility to all customers, uniformity across TGI and TGVI service territories, and the notion that multi-year programs are ideally suited to ensure effective implementation and stability in the marketplace.

The initiatives promote and educate the public on energy conservation behaviours which benefit the community and help embrace change. The CEO activities inform the public about the Companies' conservation initiatives and result in increased participation in EEC incentive programs.

5.11 Interruptible Industrial Sector Programs

As discussed in Section 3.2, TGI sought funding approval for EEC Programs for Interruptible Industrial customers in the 2010-2011 Revenue Requirements Application. As part of the NSA, the parties agreed that EEC funding for Interruptible Industrial programs for 2010 would be \$435,000. These programs will focus on mitigating the risks associated with large financial investments in energy efficiency for interruptible industrial customers.

TGI is currently in the process of developing a strategy for EEC for Interruptible Industrial customers; however, the broad areas of activity for this program area for 2010 are not expected to deviate significantly from the information put forward in the 2010-2011 Revenue Requirements Application.

The Industrial Stakeholder group will be re-convened and significant input garnered from this group on program design and implementation. The main area of activity in the Interruptible Industrial Program Area for 2010 will be to undertake the Energy Savings Potential Studies identified in the proceeding.

The Companies believe these investments in this portfolio will better lay the foundation for significant capital investments by large industrial customers and that these investments can produce significant reductions in commercial energy use.

5.12 Innovative Technologies

Innovative Technologies are best described as market ready technologies that have little or no market penetration in the BC energy efficiency landscape. They can be defined as emerging and/or enabling technologies. Some of these technologies include, but are not limited to, solar thermal DHW systems, GSHPs, hydronic systems, sterling engines, micro co-generation, natural gas transportation, and fuel cells. Hydronic systems can be classified as enabling technologies as they have the flexibility and potential to receive future energy from District Energy Systems (“DES”). Innovative Technologies are solutions the Companies can support through programs delivering energy reductions and savings to our customers for now and into the future.

5.12.1 Funding in Place for 2010-2011 Program Development

As discussed in Section 3.2, TGI and TGVI sought funding approval for EEC Programs related to Innovative Technologies in their respective 2010-2011 Revenue Requirements Applications. In November 2009, TGI received approval for Innovative Technologies program budget of \$2.334 million in 2010 and \$4.669 million for 2011, for a total budget of \$7.003 million. TGVI also received approval for Innovative Technologies budget of \$478,000 in 2010 and \$958,000 for 2011, for a total budget of \$1.435 million.

As part of their respective NSAs, the parties agreed that the Innovative Technology Programs will be managed by TGI and TGVI as a separate segment of the overall EEC portfolio.

5.12.2 Late 2009 – Early 2010: Working With Stakeholders

Stakeholder consultation has been a critical component in laying the foundation for future Innovative Technology programs. As discussed in Section 4.9, an EEC Stakeholder Group was formed in December 2009, and had its second meeting on March 11, 2010 (the details of which are provided in Appendix F).

The meeting achieved several important goals; it:

- Provided an opportunity to discuss details of how the weighted average TRC is applied to the Innovative Technologies portfolio. It also allowed the group to discuss proposed Innovative Technologies program portfolio and program costs.
- It introduced the EEC Stakeholder Group to the feedback mechanism that affords them an opportunity to voice any concerns on the Companies’ approach to Innovative Technologies, and to provide ongoing dialogue.

Following the meeting, the Companies’ Manager of Technical Sales Support sent a request for feedback from the Stakeholder Group. The goal was to ensure any concerns they may have with the practical application of the weighted average TRC or with the portfolio of proposed activity for Innovative Technologies have been brought forward and noted. At the time this report was written, we received feedback from two members of the Stakeholder Group – and since no opposition on the proposed Innovative Technologies portfolio and TRC approach had been voiced, it seems reasonable to conclude the Stakeholder Group is supportive.

5.12.3 Late 2009 – Early 2010: Establishing the Innovative Technologies Framework

At a high level, TGI and TGVl also took important actions to lay the groundwork for the introduction of incentive programs for Innovative Technologies in 2010. Specifically:

- TGI and TGVl restructured the existing portfolio list of Innovative Technologies to include Solar Thermal Hot Water, NGV for Commercial Vehicles, Hydronic and Combination Space Heating Systems, Residential GSHP and Commercial and Industrial GSHP Systems. TGI and TGVl will treat NGV fuel switching from diesel as part of or normal course of EEC activities.

The restructured Innovative Technologies portfolio is described below in Table 5-22 and Table 5-23, along with possible program costs and the relevant TRC weighting of technologies. As program design progress, some technologies may be replaced in the portfolio. However the weighted average of the portfolio will be 1.0 or greater.

Table 5-22: Innovative Technologies Portfolio Program Cost Breakdown TGI

	Incentive Expenditures (\$000s)	Non-Incentive Expenditures (\$000s)	Total Expenditures (\$000s)	TRC
Solar Thermal Hot Water	240	48	\$288	0.8
NGV Commercial Vehicles	800	8	\$808	1.5
Hydronic and Combination Heating Systems	100	20	\$120	0.4
Residential GSHP Systems	100	7	\$107	0.2
Commercial/Industrial GSHP Systems	600	5	\$605	1.0
Total	1,840	88	\$1,928	1.2

Table 5-23: Innovative Technologies Portfolio Cost Breakdown TGVl

	Incentive Expenditures (\$000s)	Non-Incentive Expenditures (\$000s)	Total Expenditures (\$000s)	TRC
Solar Thermal Hot Water	\$50	\$10	\$60	0.6
NGV Commercial Vehicles	\$166	\$2	\$168	1.4
Hydronic and Combination Heating Systems	\$21	\$4	\$25	0.4
Residential GSHP Systems	\$21	\$1	\$22	0.2
Commercial/Industrial GSHP Systems	\$125	\$2	\$127	1.1
Total	\$383	\$19	\$402	1.2

5.12.4 Striving to Establish Appropriate Incentives

TGI and TGVl recognize how critical it is for the Innovative Technologies portfolio to carefully set and offer incentives.

Further to this, the Companies intend to remove the Partner Incentive Costs currently provided for Solar Thermal from the TRC calculations for the Innovative Technologies portfolio. Utility incentives for Innovative Technologies are designed to promote emerging technologies. As in the case of solar thermal, incentives are provided by the local, provincial and

federal governments. These incentives are also intended to encourage the adoption of this technology.

As the California Standard Practice Manual states “... *all equipment costs, installation, operation and maintenance, cost of removal (less salvage value), and administration costs, no matter who pays for them, are included in this test. **Any tax credits are considered a reduction to costs in this test*** (Emphasis Added)”. Therefore the Companies believes that Partnership Incentives that come from local, provincial and federal governments may be treated as if they are a tax credits and will be applied to reduce the costs of the technology in the test.

While the Commission and the Companies agree the Innovative Technologies Portfolio will have a weighted average TRC of 1.0 or greater for 2010 and 2011, the Companies may seek the Commission’s approval allowing a weighted average TRC of less than 1.0 in future filings. By their nature, Innovative Technologies are new and costs for encouraging adoption may be high, but early experience is necessary to develop knowledge and encourage market uptake.

5.12.5 Summary and Next Steps

Innovative Technologies represent an important component of the Companies’ overall commitment to EEC activities. There is appropriate funding in place, and a forum for stakeholder consultation and feedback has been established. Inventive Technologies are solutions the Companies can support though programs delivering energy reductions and savings to our customers for now and into the future.

The next step: TGI and TGVI will begin program design in Q2 2010 for Innovative Technologies.

5.13 Enabling Activities

As discussed in Section 4.8, in 2009 the Companies pursued Enabling Activities in support of broader EEC activities and programs. They fall into four major categories: Research and Evaluation, Efficiency Partners Program, Codes and Standards and Pilot Programs. In 2010 these four areas of focus will remain the same and the Companies will increase and broaden their planned activities in each.

5.13.1 Broader Commitment In Four Continued Areas of Focus

Research and Evaluation:

The highlights of the 2010 Research and Evaluation activities are as follows:

- TGI and TGVI plan to undertake a thorough investigation of the gas savings associated with the Efficient Boiler Program. The results of this investigation will serve to confirm or modify the underlying assumptions currently used to evaluate this program and to establish incentive levels.
- TGI will empirically evaluate the results of the Okanagan Spray N’ Save program that took place in 2009. The results will be used to establish a reasonable and prudent

estimate of the gas savings attributable to low flow spray valves, and the program more generally.

- TGI and TGVl are engaged in an evaluation of the Energy Assessment Program This exercise will evaluate program effectiveness, verify energy savings, and identify areas of improvement via billing analysis and phone based interviews.
- CEO activities to be evaluated for effectiveness through methods such as: advertising tracking, process evaluations, and web analytics.

Efficiency Partners Program:

As described in Section 4.8.3, 2009 provided a good starting point to develop the Efficiency Partners Program. The highlights of the 2010 Efficiency Partners program activities are as follows:

- Contractor program focus group meetings will be held in the Lower Mainland and Interior to gather input from contractors on what elements of a contractor program they would find to be of most interest, and most beneficial to them and our mutual customers.
- Develop and roll-out the new Contractors program.
- Develop and start quarterly Efficiency Partners newsletters.
- The Co-op Advertising program will still be available for those that are registered with the Company's contractor program and a review of the value of this element will be conducted.

Codes and Standards:

A full listing of all monitored areas of regulation can be found in Section 4.8.4. EEC will remain active with developments on Code and Standards committees as they pertain to EEC program and market development, and this will continue to be an important activity area. The activity highlights for the Codes and Standards for 2009 are as follows:

- In 2010, monitoring and participation in developing codes and standards that have relevance to EEC program areas will enable the EEC team to anticipate, develop and implement effective programs.
- Of particular interest in 2010 will be the development of the BC Building Code for new home construction with EnerGuide 80 efficiency targets.
- Residential Hot Water heater regulations will continue to require a partnership with government and manufacturers to achieve a market transformation plan.

Pilot Programs:

In 2010, EEC plans to expand this area by including six new pilot programs. The highlights for the 2010 Pilot Programs are as follows:

- Behaviour Change Pilot Programs are currently in development to influence commercial and municipal customers' behaviour and if successful, the program design will expand to other large commercial, institutional, and municipal customers.
- The Custom Design Pilot Program is slated to be offered to commercial programs in 2010. The program seeks to capture energy savings associated with measures and systems (technologies or operational strategies), which are otherwise difficult to incent as part of a prescriptive program. It will apply to measures which reduce gas consumption of space and / or domestic hot water heating, for both new construction as well as retrofits.
- Fireplace Timers Pilot Program is currently in market, and aims to study the effect that installing electronic timers on 'decorative' natural gas fireplaces in multi-family residential strata and apartment buildings has on natural gas consumption.
- A Tier 3 Domestic Hot Water Heater Pilot Program to confirm energy savings and build a knowledge base as we approach 0.80 EF regulations in 2013. All viable technologies will be identified and tested including condensing tankless and condensing storage tank systems. This pilot will include technical issues, installation difficulties and establish methods for overcoming marketing barriers.
- Drain Water Heat Recovery Pilot Program will be conducted to validate manufacturers' claims about energy efficiency on the technology.
- The EnerGuide 80 Pilot Program for new homes and retrofits to determine the best way to incent customers and builders to adopt more energy efficient building practices.

5.13.2 Enabling Activities Budget

The expenditures in this area are part of the overall overhead of EEC program delivery and are included in the overall portfolio level expenditures.

The Commission did not approve the EEC discrete Trade Relations budget area put forward for these supporting activities as it was identified as a duplication of commercial and residential program delivery expenditure.

As the Companies' EEC initiative continues to expand through 2010 and beyond, the Efficiency Partner and Codes and Standards areas have the potential to consume significant resources. As the Efficiency Partner and Codes and Standards areas develop, it may be necessary to reassess the need to establish a separate Program Area for these activities in the future, with its own budget.

Table 5-24 below shows the budgeted amount for Enabling Activities for 2010.

Table 5-24: 2010 Expanded Enabling Activities Budget

Program		Description	Expenditure (\$000s)	
			TGI	TGVI
1	Research and Evaluation	Market research used for planning & implementing programs and measure program/activity effectiveness	452	113
2	Efficiency Partners Program	Delivering EEC programs through B-Ticket Contract Companies	311	78
3	Codes and Standards	Codes and Standards related to EEC Program areas	40	10
4	Pilot Programs	Test the effectiveness of measure/activity in the market	1,146	287

Further information on each of the four areas of the 2010 Enabling Activities is listed below.

5.13.3 Research and Evaluation

In addition to the Conservation Potential Review Study, discussed in detail in Section 6, the Companies' EEC group has a number of other research and evaluation projects planned for 2010 outlined below.

Note that this is not an exhaustive list and may change as the year progresses, based on business priorities. Those initiatives currently planned are discussed below.

The estimated costs associated with these activities are also shown in Table 5-25. The first line item in the Table is a contingency amount of \$100,000 for potential studies that the EEC team might undertake in 2010 the subjects of which have not yet been identified. The second line item in the table of \$33,000 includes two studies carried out in 2009 as shown in Table 4-18 : \$15,000 for the second milestone of the Sustainability & Social Responsibility Attitudes Study Report ("SHIFT Report") and \$17,800 for Residential Retrofit Market Evaluation for Terasen Gas. Due to the timing of these two studies, these payments were made in January 2010. Further details for these studies are provided in Appendix D.

Table 5-25: Research and Evaluation Activities 2010 Budget

Study		Description	Expenditure (\$000s)
1	Contingency/Additional Studies	Budget for additional studies & contingency amount	100
2	Variance between 2009 & 2010	Studies conducted in 2009 but paid in 2010	33
3	Efficient Boiler Program Evaluation	Gas savings associated with the Efficient Boiler Program	35
4	Okanagan Spray N' Save Pilot Program Evaluation	Determine average gas savings per spray valve	40
5	Energy Assessment Program Evaluation	Verify energy savings and identify areas of improvement.	18
6	Conservation, Education and Outreach Evaluation (Multiple Programs)	Cost effectiveness of CEO initiatives	340
Total Estimate Amount			566

5.13.3.1 Efficient Boiler Program Evaluation

In 2010, TGI and TGVI plan to undertake a thorough investigation of the gas savings associated with the Efficient Boiler Program. The study will assess the actual savings per boiler installation as well the rate of successful boiler installation. The results of this investigation will serve to confirm or modify the underlying assumptions currently used to analyze the program. The costs of the study are estimated at \$35,000. Furthermore, if the proposed methodology does not impose significant administrative costs on the program, it may subsequently be used to track gas savings on an on-going basis. For further details refer to Appendix D.

5.13.3.2 Okanagan Spray N' Save Pilot Evaluation

In the first half of 2010, TGI will evaluate the results of the Okanagan Spray N' Save program that took place in 2009. The cost of the study is estimated to be \$40,000. Results will be compared and used to establish a reasonable and prudent estimate of the gas savings attributable to this technology program.

The initial phase of the evaluation has been completed. It consisted of an arithmetic analysis of participant specific survey information collected by the program operator at the time of low flow spray valve installation. The analysis made use of the recorded water flow reduction volumes and output water temperatures as well as the average ground water temperature in the Okanagan region and the estimated spray valve operating hours to determine the average gas savings per spray valve. Preliminary analysis suggests savings of approximately 8.71 GJ/yr.

In the second phase of the evaluation, approximately 30 participants will be selected for metering of their actual hot water consumption in order to empirically confirm the gas savings associated with the spray valves. For further details on this subsequent phase of the evaluation study refer to Appendix D.

5.13.3.3 *Energy Assessment Program Evaluation*

TGI and TGVI are currently in the process of evaluating the performance of the Energy Assessment Program. The goal of this evaluation study is to evaluate program effectiveness, verify energy savings and identify areas of improvement.

In 2008, the Companies retained a consultant to perform an evaluation study of the Commercial Energy Assessment Program for the period of mid – 2005 through June 2007. The study determined that approximately 35% of customers who received Terasen Gas energy assessments implemented some or all of the recommended measures and that the total amount of energy savings resulting from audits conducted during the 2005 -2007 audit period was 129,000 GJs.

In January 2010, the same consultant was retained to conduct the second wave of the study. The company was awarded the contract to maintain the continuity of the project and to manage costs; the cost of the second wave was \$17,800. Starting in January 2010, the consultant interviewed 53 participants out of the 158 customers who participated in the Commercial Energy Assessment program between July 2007, and July 2009. These customers included the following groups: care homes; manufacturing companies; apartments and stratas; hotels and restaurants; as well as large public facilities and offices.

It is anticipated that the complete finalized report will be available by the end of April, 2010.

5.13.3.4 *Conservation Education and Outreach Evaluation*

As several new CEO initiatives have been introduced into the portfolio, it has become increasingly important to evaluate the cost effectiveness of CEO initiatives in order to justify the expenditures associated with these activities. The estimated budget for evaluation of the CEO activities is set at \$340,000 (which is based 15% of the overall CEO budget for 2010). The Companies intend to use these funds to evaluate CEO programs in 2010.

CEO initiatives are diverse and can vary in nature. Their effectiveness can be measured through methods such as: advertising tracking, process evaluations, and web analytics. These evaluation methods will be used to evaluate the CEO initiatives described in Section 5.10.

Advertising tracking can investigate the effectiveness of specific commercials or campaigns in terms of the recall of specific messages, changes in people's perceptions, and behavioural changes in the target audience. Process evaluations measure the effectiveness of the program by assessing how well the program met a set of goals or metrics defined by the program administrators. Web analytics is the process of understanding the Companies' online presence so that it can be optimized. Modifications to improve the initiatives can take place once one or more of these forms of evaluation takes place. For a further description of the evaluation techniques for CEO initiatives, please refer to Appendix D.

The specific methods to evaluate each CEO initiative will be selected later in the year and depending on the scope of the evaluation, may be assessed internally or evaluated by an independent research firm.

5.13.4 EEC Efficiency Partners Program

Strong uptake of EEC programs through the course of 2010 will require strong Efficiency Partner group support. It is important for industry stakeholders with end-use customer influence to be aligned with the Companies' stance of promoting high efficiency appliances, due to their direct customer contact. To promote this support the Companies will broaden their Partners Program in 2010.

Focus groups will be held in the Lower Mainland and Interior; the focus will be the development of the new Contractor program. These focus groups will differ from those held on Vancouver Island in 2009, as there is no established Qualified Dealer Program in the Lower Mainland and Interior. The purpose of these meetings is to gather input from contractors on what elements of a contractor program they would find to be of most interest, and most beneficial to them and the Companies' mutual customers. Program framework and procedures will be developed based on information gathered and the new program will be rolled out in conjunction with a new name and logo in the second and third quarter of 2010.

The focus of the second and third quarter of 2010 will be on promoting the program to contractors. From second quarter to year end, the focus will be on registering contractors in the program. Energy efficiency workshops will be offered in the last quarter of 2010 with the support of equipment suppliers.

Direct contact with gas contracting companies, manufacturers, suppliers, and other service groups connected to the gas industry (e.g. home auditors and inspectors) is essential; these groups must be educated as to the benefits of high efficiency equipment and their concerns of availability and complexity assuaged.

Table 5-26 is an estimate of the expenditures required to develop and maintain the 2010 contractor program.

Table 5-26: Expanded 2010 Contractor Program Budget

Contractor Program	Expenditure (\$000s)	
	TGI	TGVI
Promotion, Brochures and Trade Magazine adds	8	2
Conference and Trade Shows	40	10
Application Admin \$5.00 per	4	1
Quarterly Contractor Newsletter	19	5
Program Development Labour	72	18
Program Development Expenses	40	10
Efficiency Work Shops	72	18
Website portion development with user tools	16	4
Co-op Advertising	20	5
Total	291	73

To help promote energy efficient natural gas products and services, a Co-op Advertising program will still be available for those that are currently registered with the Company's contractor program. In the future, Co-op Advertising will be included as part of the program package for the new Contractors' Program.

The 2009 guidelines (as discussed in Section 4.8.3) will remain in effect with the addition of an energy efficiency component or promotion of an EEC Program. Table 5-27 identifies estimates of the Co-op advertising reimbursement activity projected for 2010 by quarter.

Table 5-27: Co-op Advertising Reimbursement Estimate

Contractor Co-op Advertising	Expenditure (\$000s)				
	Q1	Q2	Q3	Q4	Total
TGI	2	3	7	7	20
TGVI	1	1	2	2	5

Increased levels of participation in the Co-op advertising program are expected as the numbers of participants increase in the new Contractor program. A review of the current structure and effectiveness of the Co-op Advertising program is underway and adjustments will be made as the year progresses.

The Efficiency Partners New Contractor program is further discussed in greater detail in Appendix D of this Report.

5.13.5 Codes and Standards

In 2009, current codes and standards that have relevance to EEC program development and implementation were benchmarked for monitoring. See Section 4.8.4 for details of Codes and Standards as they pertain to EEC program areas. The regulatory focus for 2010 will be on the new construction building code to EnerGuide 80 development, and the Residential Hot water storage tank Tier Three regulations starting at 0.61 EF and ending at 0.80 EF.

As mentioned before in Section 4.8.4.3, the Provincial Government has announced that they are working toward the implementation of EnerGuide 80 ratings for the BC Building Code to take effect in late 2010. The current rating of EnerGuide 77 and the new EnerGuide 80 rating are stepping stones toward a Net zero level set for 2020. The Province of British Columbia is updating the energy efficiency requirements for residential buildings in Part 10 of the BC Building Code. Along with Industry stakeholders, a study was started in 2009 to determine potential combinations of overall building envelope thermal requirements, air tightness, and equipment efficiency which will meet EnerGuide 80.

A modelling study is complete and a stakeholder committee has been struck to develop the guidelines for changes to the BC building code based on the results of the modelling study and input from the representing groups. Actual implementation of the code changes are targeted for September of 2011. As a partner in this code development, it is important to ensure the code does not dictate energy type. New homes may require different construction processes for different fuels at this efficiency rating.

As mentioned previously, actual measurement of the EnerGuide ratings may be compulsory in the new code. A review of the existing D audit process, including the fuel use inconsistencies of the *HOT2000* software that is currently in use, will be required. With whole home labelling and industry moving toward performance measurement, more weight will be placed on the resulting EnerGuide rating of the home. Utility representation is vital as decisions related to the BC Building Code will affect Companies' EEC programs. This EcoEnergy audit review will be conducted under the Joint Initiatives program area, see Section 5.9.1.2.

As industry moves toward a net zero energy or net zero energy capable construction code (also known as the Passive House) by 2020, each tier of code development demands lower energy utilisation, increasing the cost of building design, construction techniques, and insulating materials that make up the building shell. At the EnerGuide 85 efficiency level, energy generation devices must be utilized for any further efficiency gains. These differences are also affected by the type of energy utilised to heat the home. Terasen Gas participates in both the EnerGuide 80 and Net Zero committees as the first leads to the second as an end goal. Below is the definition of a Net Zero home:

- A net zero home, at a minimum, supplies to the power grid, an amount equal to the total amount of energy consumed. Combining the amount of energy (electricity and if applicable natural gas) utilised to operate a home and provide an equal amount of solar generated energy back to the grid when possible. A Passive house generates and stores all it requires without connection to any utility supply.

In the area of domestic hot water, government has announced plans to introduce three-tier efficiency regulations in 2010 leading to a regulation requiring a minimum EF of 0.80 in 2013. The Companies' approach to water heater market transformation is discussed in greater detail in Section 8. 2010 will see a continuation of the Companies' work on Residential Domestic Hot Water Regulations discussed in Section 4.8.4.5.

In 2010, monitoring and participation in developing codes and standards that have relevance to EEC program areas will enable the EEC team to anticipate, develop and implement effective programs. The planned budget for this area of activity for 2010 is estimated at \$50,000; this is based on a time commitment equivalent to ½ full-time position.

5.13.6 Pilot Programs

In 2009, two Pilot Programs were conducted and with the growth of all Program Areas, Pilot Programs will become the second step after research in developing effective new EEC programs. To date, there are six Pilot Programs underway or planned to start in 2010.

Table 5-28 identifies estimates of the Pilot Programs activity projected for 2010.

Table 5-28: 2010 Estimated Pilot Programs Activities - Budget

Pilot Program		Description	Expenditure (\$000s)
1	Behaviour Change Pilot Programs (Commercial & Institutional Pilot)	Commercial & Institutional Pilot: Online tool where users learn about energy conservation, and make social commitments towards behavioural changes and GHG reducing actions.	485
2	Behaviour Change Pilot Programs (Municipalities)	Municipalities Pilot: staff engagement plan for 5 municipal customers	25
3	Custom Design Pilot	Incentive program to encourage energy savings via otherwise difficult to incent measures	457
4	Fireplace Timers Pilot	Pilot program to evaluate the effectiveness of time of operation control devices on decorative fireplaces	75
5	Domestic Hot Water Tier Three Technologies Pilot	Initial studies to develop market transformation for Tier Three Water Heater Systems	250
6	Drain Water Heat Recovery Pilot	To validate manufacturers' claims regarding energy efficiency	25
7	Home Labelling Pilot in Price George	To raise awareness of the value of purchasing an energy efficient home	10
8	EnerGuide 80 Pilot Program	To develop new building code standard for EnerGuide 80 (New Construction & Retrofit)	80
9	TGVI Servicing Pilot Program	To promote the benefits of annual furnace servicing (carry over from 2009)	26
Total			1,433

5.13.6.1 Behavior Change Pilot Programs

The Companies are currently exploring programs that can influence commercial, institutional and municipal customer behaviour. The goal of the behaviour change pilot programs is to develop a successful program design and then expand to other (large) commercial, institutional and municipal customers.

Behaviour change, or community based social marketing, looks to identify the barriers to behaviour change, design a strategy utilizing behaviour change tools, and then implement that strategy.

The benefits of implementing a behaviour change program include understanding the psychological and motivational aspects of human behaviour in decision-making and the power of community and peer influence to develop an engagement strategy that may have a longer-lasting impact than traditional mass media campaigns.

In dealing with some commercial, institutional and municipal customers, they have anecdotally indicated that as they are strapped for financial resources, they have to focus their efforts in low cost, or no cost, behaviours in an effort to reduce energy costs. Refer to Section Appendix D for detailed examples of behaviour change pilot programs the Companies are pursuing as a result of customer demand.

5.13.6.2 Custom Design Pilot

<u>Program Area:</u>	Commercial Energy Efficiency Programs
<u>Target Market:</u>	New Construction / Retrofit
<u>Duration:</u>	TGI and TGVI: May 2010 – December 31, 2011

The Custom Design Pilot is currently in development. It is slated to be the next major Commercial Energy Efficiency Program Area offering of 2010 after the Efficient Water Heater Program. The program seeks to capture energy savings associated with measures and systems (technologies or operational strategies), which are otherwise difficult to incent as part of a prescriptive program. Running the Custom Design Pilot in 2010 will allow the company to develop experience with a large scale, non-prescriptive program, while evaluating the assumption underlying the proposed incentives for appropriateness. Learning from 2010 can then be incorporated into a full-blown Custom Design program for 2011.

This pilot will apply to measures which reduce gas consumption of space and / or domestic hot water heating, for both new construction as well as retrofits. Process loads and fuel switching measures other than to renewable energy sources will not generally be eligible for participation in the program. However, measures which recuperate waste heat from manufacturing process for use in reducing space or hot water heating requirements may be eligible.

The Custom Design Pilot will capitalize upon the creative potential of the marketplace, and help foster expertise in advanced energy efficiency design in the province of BC. The program will build additional insight into energy efficiency within Terasen Gas.

The proposed Custom Design Pilot consists of two components:

- a) A fully funded energy study (up to \$50,000) to estimate the potential energy savings from client proposed measures
- b) A capital cost incentive (initial estimate of approximately \$3/GJ saved) based upon the estimated energy savings and expected persistency of the measures implemented by the client

The Companies are working with BC Hydro in view of harmonizing the energy study requirements of the proposed Custom Design pilot with those of BC Hydro's Power Smart Partners and Commercial New Construction programs. The utilities aim to allow participants in either BC Hydro's programs or the Companies' programs to have a single energy study performed, which could be submitted for incentive funding at both the gas and electricity utilities. The budget for 2010 for this complex Pilot is \$457,000; the high costs are associated with the engineering studies required for this pilot.

5.13.6.3 Fireplace Timers Pilot

<u>Program Area:</u>	Commercial Energy Efficiency Programs
<u>Target Market:</u>	New Construction / Retrofit
<u>Duration:</u>	TGI and TGVI: Present – March 31, 2011

The purpose of the Fireplace Timers Pilot is to study the effect that installing electronic timers on 'decorative' natural gas fireplaces in multi-family residential strata and apartment buildings has on natural gas consumption. Should the gas savings potential prove significant enough, the pilot can be rolled out as a full scale program.

Decorative gas fireplaces are those which are installed to provide ambiance as opposed to space heat. It is believed that these fireplaces tend to be used excessively when they are present in apartment buildings or stratas in the absence of a user-pay scenario (i.e. the occupant who consumes the gas via the fireplace does not pay a bill associated with its operation). Selected participants who comply with all of the program requirements will be eligible to receive free timers and an incentive of \$30 per timer installation.

Preliminary studies have suggested that the gas saving potential of these timers could be as high as 6 GJ/yr per fireplace, while market research indicates there are approximately 17,000 decorative gas fireplaces in multi residential buildings in the Vancouver area alone. The evaluation of the results, slated for spring of 2011 (after the timers have been in operation for 1 full heating season) will confirm the savings obtained per timer. The budget for this pilot program is set at \$75,000.

5.13.6.4 Domestic Hot Water Tier Three Technologies Pilot

Program Area: Residential Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI and TGVI: Present – March 31, 2011

Provincial regulations may require that all hot water tanks manufactured be Tier Three (EF 0.80 or greater) as early as 2013. Given that Tier Three technologies are fairly new to residential applications, the Companies will develop a pilot to confirm energy savings and build a knowledge base about Tier Three technologies, including technical issues or difficulties in installation and end-use.

Water heating accounts for approximately 20% of energy use in an average residential home, so increasing the efficiency factor of water heating appliances can have a significant impact on total energy use. Habart developed an implementation plan for market transformation in the condensing water tank market, in a recent report commissioned by the Companies and attached in Appendix I. The report outlines the importance of conducting a pilot for condensing water tank technology, due to the newness of the product, and further identifies pilots as an opportunity to provide training to the contracting community as well as to develop relationships with manufacturers and distributors, ensuring that the product can reach the shelves for consumers.

Tier Three technologies are varied, but two important methods for achieving Tier Three efficiency levels (EF 0.80 or greater) are condensing hot water tanks and tankless water heaters.

- A condensing water heater is similar to a standard efficiency gas storage water heater but has an improved heat exchanger that allows thermal efficiency ratings as high as 96% and recovery rates as much as four gallons per minute.

- On-demand or “tankless” water heaters heat water only as it is needed and used. This equipment may incorporate condensing technology with resulting efficiencies higher than 90%.

Working with a variety of manufacturers, the Companies will measure the gas and water consumption in approximately 20 homes for 6 months, installing the Tier Three technologies after three months, and measuring the difference in energy consumption between the three months prior to installation and the three months following the installation of the Tier Three tanks. The Tier Three Technologies pilot is in the early design stages and the structure of the pilot is subject to change, based on feedback from industry, manufacturers, and contractors.

The pilot will also give the Companies the opportunity to work with manufacturers and contractors to provide training on Tier Three Technology installation procedures. They will also have the opportunity to help develop solutions, in advance of regulations, to technical and marketing issues.

The budget for the Tier Three technologies pilot is expected to be \$250,000 to cover the purchase and installation of 20 Tier Three tanks, the purchase and installation of sub-metering devices for gas and water flow, and pilot evaluation. This pilot is the foundation for all future programs with the primary objective of water heater transformation that will result in significant energy savings across the residential sector.

For further details refer to Appendix D.

5.13.6.5 Drain Water Heat Recovery Pilot program

Program Area: Residential Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI and TGI VI: Present – March 31, 2011

The Companies will conduct a pilot program to identify opportunities to save energy through Drain Water Heat Recovery technology.

At first glance there seems to be a significant opportunity for savings. Conventionally, most of the heat from domestic hot water is washed down the drain. Drain Water Heat Recovery technology can capture large amounts of wasted heat energy by using it to preheat the incoming cold water thereby substantially lowering water heating costs. Consisting of a copper potable water tube wound and moulded around a central copper drain tube, heat is transferred from the waste water flowing down the drain tube to the cold water simultaneously moving upward through the wound coil. The water can be increased by as much as 15°C by the Drain Water Heat Recovery unit.

Since this is new technology, pilot tests will be conducted to confirm energy savings, develop the cost benefit analysis, and develop a drain water heat recovery program for new construction. The estimated costs to run this pilot in 2010 are \$25,000.

Given that this pilot is in the very early stages of development, it requires discussions with a large number of stakeholders. The Companies are evaluating available market and technical data to establish a sound business case and cost benefit analysis.

5.13.6.6 Home Labeling Pilot in Prince George

Program Area: Residential Energy Efficiency Programs

Target Market: Retrofit

Duration: Prince George: Present – March 31, 2011

The Companies have agreed to partner with the City of Prince George and MEMPR to provide \$10,000 each in marketing support to this initiative. The City of Prince George will encourage home sellers/buyers to conduct an energy audit for houses before they are listed for sale.

The program provides a \$75.00 rebate to home sellers for participating in a home energy audit. In addition to the home energy audit, home sellers are required to work with their local Real Estate agent to post the audit outcomes on Multiple-Listing Service MLS®. Posting the EnerGuide Rating on MLS® provides information to the new home owner on the energy efficiency of the home, therefore increasing home marketability.

Before a province wide program can be considered this pilot will help identify:

- potential changes required to the home auditing process to insure consistency
- potential label format and mounting location
- marketing strategies to gain acceptance

One of the major objectives of the Industry and Government is to establish Whole Home Efficiency Labelling, which would provide a label to be mounted on a home, posting an EnerGuide performance rating. The posted efficiency rating will be a valuable tool for home buyers, raising awareness of the value in purchasing an energy efficient home. This pilot will provide a good first step toward a potential Province wide program.

5.13.6.7 EnerGuide 80 Pilot

Program Area: Residential Energy Efficiency Programs

Target Market: New Construction / Retrofit

Duration: TGI and TGI VI: Present – March 31, 2011

At present, the Province of British Columbia is in the process of evaluating and developing new building code standards which would move the current EnerGuide 77 efficiency rating to a new target of EnerGuide 80 for new home construction. There is potential for the Companies to provide incentives to encourage the early adoption of EnerGuide 80 ratings for new home construction, and to provide existing gas heated homeowners with incentives to perform efficiency upgrades that result in EnerGuide rating improvements.

EnerGuide home efficiency performance levels are determined by performing Home Energy Assessments. Older homes need periodic renewal of major energy efficiency components including windows, furnace, and fresh air ventilation systems, so the actual score of a 20 year old home will depend in large part on whether these systems have been updated or are original. The EnerGuide 80 retrofit program would help customers increase the EnerGuide rating of their home, and aid in preparing the market for a home labelling requirement before mandatory requirements are established.

Currently, there are two compliance paths that builders and developers can follow to meet the building code EnerGuide 77 standard: Prescriptive and Measurement. The Prescriptive path exists in the code as a guideline or recipe to build a home that potentially meets the EnerGuide 77 level. A Measurement path requires the measurement and verification of the actual performance level of the home through New Home Energy Assessments, performed by a contractor working in concert with the builder. If the update to the BC Building Code in late 2010 recommends eliminating or discouraging the prescriptive path, all new home constructions will require a New Home Energy Assessment.

Retrofits

Incentives for retrofits in the EnerGuide 80 program will focus on moving older houses up the EnerGuide scale. The EnerGuide 80 program would potentially assign incentives based on the number of points a house moves up the EnerGuide scale

New Construction

As new building codes will not take effect until mid-2011, now is the time to encourage builders and developers, through incentives, to begin building homes to the EnerGuide 80 standards. Ideally, incentives will help builders and developers define the prescriptive measures that will achieve EnerGuide 80 standards, and prepare the market for the new building code changes.

The estimated budget for this pilot program is \$80,000. For further details refer to Appendix D.

5.13.7 Summary

Enabling Activities are important initiatives that support broader EEC activities and programs. The Companies initiated these activities in 2009 in four categories, and as outlined above, the amount of activity for all four areas will increase dramatically in 2010. This increase is designed to further create supportive conditions for a successful 2010 EEC portfolio.

Research and Evaluation activities have a number of studies planned and the list of Pilot Programs will expand as well. The Efficiency Partners Program will grow to include the TGI service area represented by potentially adding another 1000 contractors delivering EEC programs. Given the aggressive BC government provincial emission targets, participation in the development of the new construction building code will strengthen our communication with the building industry. Hot water tank regulations and tier three pilots will be necessary for the development of an effective market transformation plan to help protect the end use customer.

Many of these enabling activities are supportive of the province's Energy Plan. The degree of the Companies' work in Enabling Activities will be evaluated over the course of the year to

determine whether the Efficiency Partners program and the Codes and Standards work require the establishment of a discrete budget for this work.

5.14 EEC Stakeholder Group Activities

The EEC Stakeholder Group serves an important function; it provides the Companies with guidance and input on its EEC activities. The Group first met in late 2009, and has since indicated it is supportive of planned activities. In 2010 the Companies intend to continue working closely with the Stakeholder Group to gain their insight and perspective as the broader EEC Portfolio is rolled out.

5.14.1 Planned Activities

Two meetings are planned for 2010 with the EEC Stakeholder Group with the first meeting having already taken place on March 11.

The March 11 meeting afforded each group the opportunity to understand each other's respective organizations. The EEC department asked the stakeholders to present their organization's priorities and described how the Companies can help each of their organization. The Companies provided this information, and also presented on an overview of alternative energy solutions and innovative technologies program area. Finally they reviewed with the group at a high level the contents of this EEC Annual Report.

The agenda, meeting minutes, and list of stakeholder priorities from the March 2010 EEC Stakeholder Group meeting can be found in Appendix F.

The Companies intend to hold an additional EEC Stakeholder Group meeting in Q4 2010 to gather feedback about improvements to existing programs, and potential new programs.

5.14.2 Proposed Budget

Table 5-29 summarizes a proposed budget for the stakeholder sessions.

Table 5-29: Proposed Budget for EEC Stakeholder Group Meetings for 2010

	Expenditure (\$)
Venues and Equipment Rental	1,500
Meals	5600
Stakeholder travel and administration	7,500
Total Budgeted Expenditure	14,600

5.15 2010 EEC Portfolio: Summary

The Companies' commitment to develop and roll out a comprehensive EEC Portfolio was demonstrated in 2009 and early 2010.

Those programs which were very successful in this early “transition” period will form the foundation of the Companies’ 2010 Portfolio. For example, the Efficient Boiler Program (generating gas savings for commercial customers) will be continued and improved in 2010. The Companies will continue to forge partnerships through Joint Initiatives to draw on the knowledge and expertise of LiveSmart BC, BC Hydro and FortisBC, among others.

The 2010 Portfolio will introduce initiatives and programs that seek to reach more than traditional residential and commercial customers. The Companies will continue their efforts to develop a better understanding of the needs of low-income home-owners and renters so they can assist them in making smart energy choices; the Companies will also work to promote conservation with new immigrants; they will reach out to children and schools; and they will work to create conservation champions from within TGI and TGVl’s employees.

New Program Areas will also be introduced in 2010. The High-Carbon Fuel Switching Program Area lowers GHGs by using natural gas in place of higher carbon fuels. The Interruptible Industrial Program will help large customers become more efficient while also reducing the risk to the Companies and ratepayers associated with large financial investments in energy efficiency. And the Innovative Technology Programs will promote and pilot emerging commercially available technologies.

Through this broader Portfolio in 2010 the Companies are confident they will increase their efforts to promote conservation in all customer classes.

6. CONSERVATION POTENTIAL REVIEW (“CPR”)

Results of a CPR form the basis for future program development within a comprehensive EEC portfolio. The Companies drew heavily on the 2006 CPR as they moved from the small set of DSM activities to the broader Portfolio of EEC initiatives. Now the Commission has approved the request for \$500,000 to fund a new CPR, and the Companies intend to undertake one and so establish the basis for a request for funding in 2011 and beyond.

6.1 Purpose of CPR

A CPR study examines available technologies and determines their "conservation potential", which includes the amount of energy savings that can be achieved through energy efficiency and conservation programs over the study period, through economic screening. The CPR compares the economic and achievable potential of viable measures to a base case scenario¹⁹. In general, the CPR has three key objectives:

- Characterization of available natural gas technologies inclusive of energy efficiency and fuel substitution;
- Identification of the size of the potential opportunities over a set study period; and
- Economic modeling of EEC measures, fuel substitution and energy efficiency measures.

6.2 New CPR In 2010 Will Create Important Planning Document

The EEC Decision approved the request for \$500,000 for an updated CPR, specifically: “The Commission considered the CPR to be an important tool for use in developing, supporting and assessing this and future EEC/DSM expenditure Applications. The Commission accepted the EEC Application’s CPR update expenditure proposal.”

In 2010, the Companies intend to develop the requirements for the updated CPR, which would form the basis for an application to the Commission for approval for EEC funding beyond 2011. It is anticipated that the preparation phase will commence during Q2, 2010. The Companies plan to outsource the research, development and delivery of CPR and will release a Request For Proposals for the project with the intent to find the best consultant organization to perform the work. It is estimated that the study will be completed by Q4, 2010.

Similar to the goals of 2006 CPR, the goals of the 2010 CPR are to provide a comprehensive planning document that the Companies can use on an ongoing basis to:

- Develop a long range energy efficiency and fuel choice strategy, including an analysis of the savings opportunities available from the implementation of large-scale Alternative Energy Systems;

¹⁹ Economic Potential is the proportion of energy savings that could be achieved if all measures identified in the CPR were implemented. Achievable Potential is the proportion of energy savings identified in the Economic Potential that could be realistically achieved within the study period. Achievable Potential recognized that it is practically difficult to induce customers to purchase and install all the energy efficiency or fuel choice option that meet the criteria identified in the study.

- Design and implement energy efficiency and fuel choice programs and initiatives;
- Assess the impact of energy efficiency and fuel choice program on both peak and annual loads;
- Identify equipment and technologies that could be used for energy efficiency and fuel choice programs; and
- Set annual energy efficiency and fuel choice targets and budgets.

Assuming the study is launched in April, Figure 6-1 provides a timeline for the rollout of the deliverables for the CPR study.

Figure 6-1: Timeline for CPR study

Task Description	April	May	June	July	August	September	October	November	December
Develop Project Scope									
Issue RFP									
Select Vendor									
Project Start									
Field Research									
Analysis									
Report Writing									
Report Reviewing/Feedback									
Report Presentation									
Final Feedback/Wrap up									

6.3 Summary

The 2006 CPR was an important foundational document for the Companies EEC Application. Now, with the Commission's approval of \$500,000 for an updated CPR, the Companies intend to create this revised document that will identify the most compelling EEC opportunities.

When it is completed, the updated 2010 CPR will form the primary basis of the Companies' EEC funding requests for 2012 and beyond, which the Companies anticipate they will submit in 2011. It is the Companies' belief that sustained and stable funding for utility EEC efforts is necessary in order to create market momentum and to support the transformation of the energy market with ever-increasing efficiency levels.

7. DATA GATHERING, REPORTING AND INTERNAL CONTROL PROCESSES

In its EEC Decision, the Commission directed the Companies to include a discussion in the Annual Report of the Companies internal data gathering, monitoring and reporting control practices. This section addresses that direction. As this section demonstrates, the Companies have business practices in place for EEC activities to ensure that these activities are in compliance with the general controls of the Company.

This section provides high level information on data gathering, and on the Companies' business practices related to program development and application processing. It also includes comments from the Companies' Internal Audit group on EEC initiative controls.

7.1 **DSM System Project: Meeting the Growing Need for New Tracking and Reporting**

The expansion of EEC programs resulting from the EEC Decision has created a need to develop a robust data capture and reporting system. With the anticipated increase in the number of programs and participants, the existing Excel-based DSM tracking and reporting methods would not be capable of handling the future business needs and requirements of the EEC Activities. The Companies determined that a new tracking system was needed to enable it to:

- Track EEC program participation, costs and energy savings for incentive-based programs;
- Track information about non-incentive programs and activities;
- Track actual and forecasts vs. budgets;
- Provide reports for internal and external stakeholders including program partners and the Commission;
- Allow for scenario modelling for program planning and design; and
- Support DSM benefit-cost analysis on a program by program basis as well as at the portfolio level (or EEC plan level).

To address the requirement for more robust program data gathering, tracking and reporting, the DSM System ("DSMS") project was launched in the fall of 2008. The Companies conducted research on the potential solutions available in the marketplace, as well as investigated having a system custom-built.

The Companies eventually selected a web-based program tracking and reporting system called TrakSmart, and entered into an Agreement with TrakSmart's provider Nexant, to obtain the TrakSmart system. Project implementation commenced early in 2010. Based on the project schedule, the DSMS will be implemented and will be operational by November 2010. The costs associated with implementing and maintaining DSMS will be added to the portfolio level expenditures in 2010. The costs to implement DSMS are \$685,000 US and they are included in the Portfolio-level expenditures for 2010.

Once the DSMS is implemented, it will increase the ability of the Companies to capture and report on the following features:

- Program participants' information, costs and energy savings for EEC programs and activities;
- Forecasting / extrapolation based on estimates and actuals;
- Expenses and budget tracking associated with the EEC;
- Interface with SAP²⁰ application;
- Costs (program, incentive and administrations) associated with EEC projects; and
- Capture of information on a per participant basis i.e. equipment models, reasons for rejection etc.

Once the DSMS is in place and the transition period from the current system to new is completed, these features will help the EEC team to make data gathering, tracking and reporting more efficient and increase the overall efficiency of the workflow.

7.2 Robust Business Case Process Applied to All Programs

Before a new EEC program can be implemented, a program plan or business case must first be developed. The Companies are committed to putting each program through a high level of internal scrutiny before moving ahead with a program, and believe doing so ensures an increased chance of program effectiveness.

The business case developed includes information about program rationale and purpose as well as description of target audience, assumptions, costs-benefit tests and proposed evaluation methods is developed. Cost-benefit analysis is performed using the California Standard Tests ("CST") as outlined in California Standard Practice Manual. In partnership with Willis, the Companies have developed an in-house cost-benefit modelling tool based on CST that provides the following areas of analysis:

- Benefits incurred over measure life of the individual programs; including energy savings over the measure life of the program;
- Total costs incurred in implementing the program including administrative, incentive, marketing and evaluation; and
- The four CST tests (Rate Impact Measure ("RIM"), Utility, Participant and TRC).

The results from this modelling are used as inputs for the business cases, which are approved in accordance with the Companies' policy on financial authorization levels.

²⁰ System, Applications and Products ("SAP") is a financial tool used by the Companies. All EEC expenditures are captured within SAP.

7.3 Incentive Applications Vetted for Compliance with Program Requirements

Ensuring that all customer applications are compliant with program requirements is also part of the internal control process. The Companies' EEC activity has a number of mechanisms in place to ensure compliance of incentive applications with program requirements.

The verification process is specific to each program and is dependent on the type of program, its complexity, the financial value of the incentive and other parameters. The general principles applied are as follows:

1. Each application is reviewed for completeness and accuracy.
2. Applications must meet the criteria outlined in the terms and conditions of the program put forward through the approval process. Please refer to Appendix G for a copy of the Efficient Boiler Program's Terms and Conditions as an example.
3. Once approved, incentives are distributed to participants.
4. Copies of application and supporting documents are filed and stored for seven years in case of an audit.

7.4 Internal Audit Services

The EEC team engaged the Companies own Internal Audit Services ("IAS") group to review the controls associated with the EEC Initiative. Generally speaking, IAS found that there were no major weaknesses in the process and control environment, but that there were minor weaknesses requiring prompt management attention to ensure that the risks identified were mitigated. Management either has already taken action to address IAS' recommendations, or is going to do so as agreed upon on a timely basis.

The primary findings of weaknesses within the controls related to the Companies' EEC initiative are presented and commented upon below:

- Process and internal control documentation for various EEC programs was not readily available. This is true of some of the Companies' long-running initiatives such as the Efficient Boiler Program, however all new programs have process documentation in the Business Case for the Program, and on a go-forward basis, the EEC team will seek input from IAS on controls needed on a program-by-program basis
- Some of the EEC programs are administered by third-parties; however, their performance was not often monitored by the Companies. A periodic review of the effectiveness of third party administrators is recommended to ensure that quality of the program administration is acceptable, and this will be implemented by the EEC team on a go-forward basis
- There was one incident noted by IAS where an application approved did not follow one of the published terms and conditions of a program. The EEC team will ensure that program terms and conditions are followed.

The full report from the Companies' IAS group can be found at Appendix H.

7.5 Summary

The Companies are committed to strong internal controls in all aspects of the EEC Program. As demonstrated in this section, the Companies' business practices related to program development, application processing, and ongoing monitoring are all sound and subject to continuous improvement.

The Companies' EEC team is implementing a robust data gathering and program participation tracking system (the DSMS) in order to accommodate the increased level of EEC activity arising from the funding approval. Expenditures reported through the DSMS will be gathered from SAP, which tracks all of the Companies' financial activity.

All business case and financial approvals are performed in accordance with the Administrative Policy on the Companies' Authorization Levels. There are solid business practices in place related to EEC activity, such as a requirement for a detailed business case for all new programs and initiatives.

The Companies' Internal Audit group has reviewed the processes of the EEC team and while generally the controls related to EEC activity are adequate, there are some areas for improvement that the EEC team either already has addressed, or is in the process of addressing.

In 2010 and beyond the Company will continue to monitor its internal controls and to work with Internal Audit to do the same so that all aspects of the EEC Program are carried out with appropriate diligence and scrutiny.

8. MARKET TRANSFORMATION AND ATTRIBUTION

The Companies' EEC Application outlined a number of Principles that will guide the Companies' EEC activity, one of which is that EEC programs will support Market Transformation. The Companies believe in this mandate and are taking action to ensure that its activities encourage and support Market Transformation.

Moreover, the Utility is playing a leadership role in paving the way for the introduction of Regulated Standards, and believes energy savings resulting from these standards should be attributed to utility programs.

This section outlines the Companies' belief in these two guiding principles, and the actions that are being taken in support of each.

8.1 Committed to Contributing to Market Transformation

The EEC activity around water heaters, whole home initiatives such as labelling and the move to a performance-based building code, and codes and standards work in general, supports market transformation efforts. Utility EEC activity is a key component of Market Transformation efforts.

The Companies have a role to play in preparing the marketplace for the introduction of Regulated Standards. The areas where the Companies could contribute to market transformation include:

- disseminating information;
- educating stakeholders about efficient products, systems, and buildings;
- supporting training related to the design, installation and maintenance of efficient products, systems and buildings;
- addressing price barriers through incentives;
- supporting the development of voluntary measures; and
- advising government on the development of Regulated Standards.

There are a number of EEC initiatives discussed in this report that support Market Transformation, however the most immediate initiative is for domestic hot water, which is discussed below

8.2 Playing a Leadership Role in Market Transformation: Attribution of Savings

Utilities play an integral role in paving the way for the introduction of Regulated Standards. It is because of this key role, the Companies believe that energy savings resulting from regulation should be attributed to utility programs.

In the EEC Application, the Companies proposed a formulaic approach to the attribution of savings from the introduction of minimum energy efficiency performance standards (henceforth referred to as “regulation”) to utility market transformation programs. In the EEC Decision, this proposal was rejected, and the Companies were directed to redesign and resubmit a modified proposal for attribution of savings from the introduction of regulation in this report. Further, in its EEC Decision, the Commission noted that:

“The Commission Panel accepts the position of BC Hydro that attribution of savings should be considered on a case-by-case basis and that the attribution rate should reflect the level of support for market transformation. The Commission Panel shares the BCSEA/SCBC’s concern, as detailed in Mr. Plunkett’s evidence, that the attribution concept can distort program design.”²¹

The Commission Panel further directed the Companies to give consideration to factors such as the length of time a particular program element has been operative at the time any applicable regulation is introduced and how compatible the program initiative is with the new regulation (i.e. if a regulation is introduced with a higher or lower threshold or standard than the program design).

8.3 Newly Developed Attribution Model Reflects Industry Best Practices

In the process of developing a modified proposal for attribution of savings from regulation, the Companies reviewed practices in Ontario and consulted with BC Hydro and FortisBC. As a result of the review and consultation, the Companies propose that the attribution of savings from regulation should be considered on a case-by-case basis, consistent with BC Hydro’s position. The Companies would propose any cases for attribution from the introduction of regulation in their Annual EEC Report to the Commission.

The information below outlines the Companies’ proposal to attribute savings from the introduction of a provincial government regulation requiring condensing water heaters in residential installations in 2013. It is based upon a strategy paper on Condensing Water Heaters written for the Companies by Habart, which is provided in Appendix I.

MEMPR has indicated that in 2013, the minimum efficiency threshold for residential water heaters will be 0.80 EF. In order to reach 0.80 EF, water heater manufacturers will need to use condensing technology. At this time, there are currently no models of condensing water heaters available that are appropriately sized for residential applications. While no pricing information is available on this product, Habart has assumed the incremental cost for a condensing water heater is likely to be approximately \$1,750, which makes the technology non-cost-effective for customers.

In support of the government’s proposed regulation, the Companies propose implementing a Condensing Water Heater Initiative (“CWHI”) to transform the market for residential water heaters. The CWHI consists of a customer purchase incentive of \$1,000 along with a fairly significant training and marketing campaign as outlined in Habart’s strategy paper in Appendix I. The Companies believe this CWHI would encourage the development of residential condensing

²¹ EEC Decision, page 40-41

water heaters by manufacturers, and encourage the uptake of these water heaters by the marketplace. Increased demand will result in incremental manufacturing cost savings through economies of scale and cause lower pricing to the end consumer. The CWHI assumes that this level of activity by the Companies will result in an annual decline of 10% in the cost of Condensing Water Heaters, and increasing penetration of Condensing Water Heaters year over year.

It is the Companies' view that the market transformation process to transform the market for residential domestic hot water to the point where there is sufficient market penetration of 0.80 EF equipment to be able to introduce regulation of 0.80 EF as the minimum efficiency standard will take approximately 7 years.

Without the Companies' activity in this area, it is unlikely that government's proposed regulation will be successful as this technology does not exist today. In order to make this CWHI cost-effective, the Companies would need attribution of 6 years of savings from this particular regulation, which is not unreasonable given that the regulation will not succeed without the Companies' activity to transform this marketplace.

A spreadsheet detailing the benefit-cost scenario for the CWHI can be found in Appendix I.

The proposal above aligns with BC Hydro's policy of attribution on a case-by-case basis, as well as the BCSEA's concerns in that without this Initiative, government's desire to introduce regulation of residential water heaters to 0.80 EF is not likely to succeed.

The Companies are requesting Commission approval of this modified proposal for the attribution of savings from regulation to be on a case-by-case basis. The Companies are also seeking approval to attribute 6 years of post-regulation savings to a market transformation initiative for condensing water heaters.

8.4 Summary

Changing market behaviour and developing Regulated Standards that encourage conservation are both complementary yet critical components of a broader EEC Portfolio. The Companies believe firmly in both principles; they are taking a lead role in promoting market transformation making it possible for government to introduce new standards. Because of this leadership the Companies believe that energy savings resulting from the new standards should be attributed to utility programs. The attribution model put forward in this Report reflects industry best practices and has the confidence of the Companies.

The Companies will continue with their efforts to transform the marketplace while seeking Commission approval of its modified proposal for the attribution of savings on a case-by-case basis.

Appendix A
GLOSSARY

GLOSSARY OF TERMS

ABSU – Accenture Utilities Business Process Outsourcing Services

AFUE – Annual Fuel Utilization Efficiency

AHRI – Air-Conditioning, Heating, and Refrigeration Institute

BC Hydro – British Columbia Hydro and Power Authority

BCUC – British Columbia Utilities Commission, the provincial body regulating utilities in British Columbia.

BTU - British Thermal Unit = the heat energy required to raise 1 pound of water by 1 degree Fahrenheit)

CCE – Consortium for Energy Efficiency

CEO – Conservation, Education and Outreach

CHBA – Canadian Home Builders' Association

CHF – Co-operative Housing Federation

CIPH – Canadian Institute of Plumbing and Heating

Commission – British Columbia Utilities Commission, the provincial body regulating utilities in British Columbia.

Companies – Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc.

CPR – Conservation Potential Review, a study completed to identify opportunities for energy savings across gas and electrical energy delivery infrastructures and improvements to overall energy utilization efficiency.

CST – California Standard Tests

CWHI - Condensing Water Heater Initiative

DC – Pacific Resource Conservation Society’s Destination Conservation program

DES - District Energy Systems

DHW – Domestic Hot Water

DSM – Demand-Side Management, defined as “any utility activity that modifies or influences the way in which customers utilize energy services”. From Terasen Gas’ perspective, the primary objectives of DSM are to increase the overall economic efficiency of the energy services it provides to customers and maintain the competitive position of natural gas relative to other energy sources.

DSMS – Demand Side Management System

ECAP - Energy Conservation Assistance Program

ECM - Electronically Commutated Motors

EEC – Energy Efficiency and Conservation

EEC Application – 2008 Energy Efficiency and Conservation Programs Application

EEC Decision – BCUC Order No. G-36-09

EF – Efficiency Factor

ESK - Energy Savings Kit

FE – Fireplace Efficiency

Forum – Affordable Energy Conservation Forum

Free Rider Rate – percent who would have implemented an EE measure even without the program.

GHGs – Greenhouse Gas Emissions

GJ – Gigajoule – a measure of energy equivalent to one billion joules. One joule of energy is equivalent to the heat needed to raise the temperature of one gram (g) of water by one degree Celsius (°C) at standard pressure (101.325 kPa) and standard temperature (15°C).

GSHP – Ground Source Heat Pump

Habart - Habart & Associates

HPBAC – Hearth, Patio & Barbecue Association of Canada

IAS – Internal Audit Services

IRs – Information Requests

IT – Information Technology

KnowledgeTech – KnowledgeTech Consulting Inc.

LEAP – LiveSmart Energy Assistance Program

LIEEPs – Low Income Energy Efficiency Programs

MBH - 1 MBH = 1000 BTU/hr (BTU = British Thermal Unit = the heat energy required to raise 1 pound of water by 1 degree Fahrenheit)

MEMPR – Ministry of Energy Mines and Petroleum Resources

MOU – Memorandum of Understanding

MURB – Multi-Unit Residential Buildings

MVHC – Metro Vancouver Housing Corporation

NPV – Net Present Value

NRCan – Natural Resources Canada

NSA – Negotiated Settlement Agreement

NSP – Negotiated Settlement Process

O&M – Operating and Maintenance Costs

Participant Test – is the measure of the quantifiable benefits and costs to the customer due to participation in a program.

PBR – Performance Based Rate

PBR Settlement Agreement – Multi-Year Performance Based Rate Plan Settlement Agreement

QDP – Qualified Dealers Program

REnEW - Residential Energy and Efficiency Works

Report – EEC Annual Report

REUS – Residential End Use Survey

RIM – Rate Impact Measure test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program.

SAP - System, Applications and Products - financial tool in which EEC expenditures are captured within

SEMP - Strategic Energy Management Plan

SENC - Super Efficient New Construction

SHIFT - Sustainability and Social Responsibility Attitudes Study

SPIFF – Sales Promotion Incentive Fund

Strategy Paper - Affordable Energy Conservation Strategy Paper

Task Force – Affordable Energy Conservation Task Force

Team Terasen – Team Terasen Outreach group

Terasen Gas – Terasen Gas Inc, TGI, a subsidiary of Terasen Inc.

TGI – Terasen Gas Inc., a subsidiary of Terasen Inc.

TGI RRA – TGI 2010-2011 Revenue Requirements Application

TGVI – Terasen Gas (Vancouver Island) Inc., a subsidiary of Terasen Inc.

TGVI RRA RDA – TGVI 2010-2011 Revenue Requirements and Rate Design Application

TJ – Terajoule – equal to 1000 gigajoules.

TRC – Total Resource Cost test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs.

TSS - Technical Sales and Support department

Utility Cost Test – measures the net costs of demand-side management programs as a resource option based on the costs incurred by the utility (including incentive costs) and exclude the net costs incurred by the participant.

Willis – Willis Energy Services

Working Group – BC Working Group for Energy Efficiency for Affordable Housing

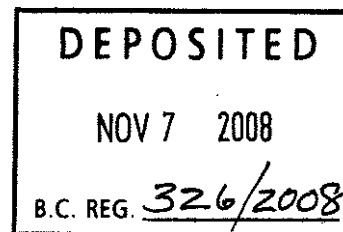
Appendix B
DSM REGULATION

**PROVINCE OF BRITISH COLUMBIA
REGULATION OF THE MINISTER OF
ENERGY, MINES AND PETROLEUM RESOURCES**

Ministerial Order No.

M 271

I, Richard Neufeld, Minister of Energy, Mines and Petroleum Resources, order that the attached regulation is made.




Date



Minister of Energy, Mines and
Petroleum Resources

(This part is for administrative purposes only and is not part of the Order.)

Authority under which Order is made:

Act and section:- Utilities Commission Act, R.S.B.C. 1996, c. 473, s. 125.1 (4) (e)

Other (specify):- _____

November 3, 2008

R/1175/2008/27

DEMAND-SIDE MEASURES REGULATION

Definitions

1 In this regulation:

“Act” means the *Utilities Commission Act*;

“bulk electricity purchaser” means a public utility that purchases electricity from the authority for resale to the public utility’s customers;

“community engagement program” means a program delivered by

(a) a public utility to a public entity either

(i) to increase the public entity’s awareness about ways to increase energy conservation and energy efficiency or to encourage the public entity to conserve energy or use energy efficiently, or

(ii) to assist the public entity to increase the public’s awareness about ways to increase energy conservation and energy efficiency or to encourage the public to conserve energy or use energy efficiently, or

(b) a public utility in cooperation with a public entity to increase the public’s awareness about ways to increase energy conservation and energy efficiency or to encourage the public to conserve energy or use energy efficiently;

“education program” means an education program about energy conservation and efficiency, and includes the funding of the development of such a program;

“energy device” has the same meaning as in the *Energy Efficiency Act*;

“energy efficiency training” means training for persons who

(a) manufacture, sell or install energy-efficient products,

(b) design, construct or act as a real estate broker with respect to energy-efficient buildings,

(c) manage energy systems in buildings, or

(d) conduct energy efficiency audits;

“energy-using product” has the same meaning as in the *Energy Efficiency Act* (Canada);

“expenditure portfolio” means the class of demand-side measures that is composed of all of the demand-side measures proposed by a public utility in an expenditure schedule submitted under section 44.2 of the Act;

“low-income household” means a household whose residents receive service from the public utility and who have, in a taxation year, a before-tax annual household income equal to or less than the low-income cut off established by Statistics Canada for that year for households of that type;

“plan portfolio” means the class of demand-side measures that is composed of all of the demand-side measures proposed by a public utility in a plan submitted under section 44.1 of the Act;

“public awareness program” means a program delivered by a public utility

- (a) to increase the awareness of the public, including the public utility's customers, about ways to increase energy conservation and energy efficiency or to encourage the public, including the public utility's customers, to conserve energy or use energy efficiently, or
- (b) to increase participation by the public utility's customers in other demand-side measures proposed by the public utility in an expenditure portfolio or a plan portfolio

but does not include a program to increase the amount of energy sold or delivered by the public utility;

"public entity" means a local government, first nation, non-profit society incorporated under the *Society Act* or trade union;

"regulated item" means

- (a) an energy device,
- (b) an energy-using product,
- (c) a building design, or
- (d) thermal insulation;

"school" means a school regulated under the *School Act* or the *Independent School Act*;

"specified demand-side measure" means

- (a) a demand-side measure referred to in section 3 (c) or (d),
- (b) the funding of energy efficiency training,
- (c) a community engagement program, or
- (d) a technology innovation program;

"specified standard" means a standard in any of the following:

- (a) the Energy Efficiency Standards Regulation, B.C. Reg. 389/93;
- (b) the Energy Efficiency Regulations S.O.R./94-651;
- (c) the British Columbia Building Code, if the standard promotes energy conservation or the efficient use of energy;

"technology innovation program" means a program

- (a) to develop a technology, a system of technologies, a building design or an industrial facility design that is
 - (i) not commonly used in British Columbia, and
 - (ii) the use of which could directly or indirectly result in significant reductions of energy use or significantly more efficient use of energy,
- (b) to do what is described in paragraph (a) and to give demonstrations to the public of any results of doing what is described in paragraph (a), or
- (c) to gather information about a technology, a system of technologies, a building design or an industrial design referred to in paragraph (a).

Application

- 2 (1) This regulation applies only with respect to demand-side measures proposed by the authority.

- (2) Effective June 1, 2009,
 - (a) subsection (1) is repealed, and
 - (b) section 3 does not apply to a public utility that is owned or operated by a local government or has fewer than 10,000 customers.

Adequacy

- 3 A public utility's plan portfolio is adequate for the purposes of section 44.1 (8) (c) of the Act only if the plan portfolio includes all of the following:
 - (a) a demand-side measure intended specifically to assist residents of low-income households to reduce their energy consumption;
 - (b) if the plan portfolio is submitted on or after June 1, 2009, a demand-side measure intended specifically to improve the energy efficiency of rental accommodations;
 - (c) an education program for students enrolled in schools in the public utility's service area,
 - (d) if the plan portfolio is submitted on or after June 1, 2009, an education program for students enrolled in post-secondary institutions in the public utility's service area.

Cost effectiveness

- 4 (1) Subject to subsections (4) and (5), the commission, in determining for the purposes of section 44.1 (8) (c) or 44.2 (5) (d) of the Act the cost-effectiveness of a demand-side measure proposed in an expenditure portfolio or a plan portfolio, may compare the costs and benefits of
 - (a) the demand-side measure individually,
 - (b) the demand-side measure and other demand-side measures in the portfolio, or
 - (c) the portfolio as a whole.
- (2) In determining whether a demand-side measure referred to in section 3 (a) is cost effective, the commission must,
 - (a) in addition to conducting any other analysis the commission considers appropriate, use the total resource cost test, and
 - (b) in using the total resource cost test, consider the benefit of the demand-side measure to be 130% of its value when determined without reference to this subsection.
- (3) In determining whether a demand-side measure of a bulk electricity purchaser is cost-effective, the commission must consider the benefit of the avoided supply cost to be the authority's long-term marginal cost of acquiring new electricity to replace the electricity sold to the bulk electricity purchaser and not the bulk electricity purchaser's cost of purchasing electricity from the authority.
- (4) The commission must determine the cost-effectiveness of a specified demand-side measure proposed in a plan portfolio or an expenditure portfolio by determining whether the portfolio is cost effective as a whole.

- (5) If the commission is satisfied that a public awareness program proposed in a plan portfolio or an expenditure portfolio is likely to accomplish the goals set out in paragraph (a) or (b) of the definition of "public awareness program", the commission must determine the cost-effectiveness of the program by determining whether the portfolio is cost-effective as a whole.
- (6) The commission may not determine that a proposed demand-side measure is not cost effective on the basis of the result obtained by using a ratepayer impact measure test to assess the demand-side measure.
- (7) In considering the benefit of a demand-side measure that, in the commission's opinion, will increase the market share of a regulated item with respect to which there is a specified standard that has not yet commenced, the commission may include in the benefit a proportion of the benefit that, in the commission's opinion, will result from the commencement and application of the specified standard with respect to the regulated item.

Appendix C

BC ENERGY EFFICIENCY ACT STANDARDS

Appendix C provides the reader with the Provincial regulations pertaining to the two most common Residential gas-fired appliances:

- Forced Air Furnaces – MEMPR Enforcement Bulletin 09-03
- Water Heaters – MEMPR Information Bulletin 09-05

B.C. ENERGY EFFICIENCY ACT STANDARDS:

Gas Furnaces

MEMPR ENFORCEMENT BULLETIN 09-03



What products are you regulating? The British Columbia *Energy Efficiency Act (EEA)* Automatic operating gas-fired central forced-air furnaces that use propane or natural gas and have an input rate not exceeding 66 kW (225 000 Btu/h). The regulation applies to residential and commercial furnaces.

Are you forcing me to replace my furnace? No. The regulation only applies to purchases of new or replacement furnaces. Individuals can keep their existing furnaces for as long as they wish.



What is the regulated energy efficiency standard for those products? Such products must achieve an Annual Fuel Utilization Efficiency (AFUE) equal to or greater than 90%, as tested under the standard CSA P.2-07: *Testing Method for Measuring the Annual Fuel Utilization Efficiency of Residential Gas-fired Furnaces and Boilers*. These products are commonly known as “condensing furnaces.”

When will the regulations take effect in British Columbia?

For furnaces for new residential construction and all commercial buildings: January 1, 2008.

Replacement furnaces in existing dwellings: December 31, 2009.



Can I sell my inventory of non-compliant products after the effective date?

For furnaces for new residential construction, any products manufactured after January 1, 2008 must comply with the regulation.

For replacement furnaces, any products manufactured after December 31, 2009 must comply with the regulation. If you have unsold inventory of products manufactured before the effective date, they can still be sold legally in British Columbia after the effective date.

Are there any exemptions to these regulations? Furnaces for recreational vehicles are exempted from the regulation. The Ministry is also providing an extended timeline for “through the wall” furnaces. A through-the-wall gas furnace is a gas-fired furnace that is designed and marketed to be installed in an opening in an exterior wall that is fitted with a weatherized sleeve. For through-the-wall gas-fired furnaces only, the 90% AFUE standard will come into effect on December 31, 2012.

B.C. ENERGY EFFICIENCY ACT STANDARDS:

Gas Furnaces

MEMPR ENFORCEMENT BULLETIN 09-03



How can I tell if a product is compliant with the energy efficiency regulations?

Suppliers can demonstrate compliance with the standard by ensuring that the product is listed in the Natural Resources Canada furnace database, and that the database indicates an AFUE equal to, or greater than 90%: www.oeenrcan.gc.ca/residential/business/manufacturers/search/gas-furnace-search.cfm?attr=4

Who enforces this regulation? The Ministry of Energy, Mines and Petroleum Resources is responsible for enforcing all regulated standards under the *EEA*.

What are the penalties for non-compliance? Under the *EEA*, the Ministry can conduct inspections to verify compliance with the *Act* and regulations. *EEA* enforcement begins with education and voluntary compliance measures. Ministry staff follow up on all complaints and other information respecting non-compliance, and communicate directly with industry participants to develop a compliance plan.

The Ministry can also seek to have those who have contravened the legislation charged under the *Offence Act*. An offence can result in fines up to \$2,000.

What do I do if I see a non-compliant product for sale or distribution? Please circulate this enforcement bulletin to the retailer or distributor. You can also report infractions to Erik Kaye, Ministry of Energy, Mines and Petroleum Resources at 250-356-1507 or Erik.Kaye@gov.bc.ca



For more information on B.C.'s Energy Efficiency Act:
www.empr.gov.bc.ca/EAED/EnergyEfficiency/Pages/EEAct.aspx

B.C. ENERGY EFFICIENCY ACT STANDARDS:

Gas and Propane-Fired Water Heaters



The Best Place on Earth

MEMPR INFORMATION BULLETIN 09-05



What products are you regulating? Storage-type water heaters with a rated storage capacity of 76 to 380 litres and an input of 75 000 Btu/h or less, for use with natural gas or propane.

Are you forcing me to replace my water heater? No. The regulation applies to voluntary purchases of new or replacement water heaters. Individuals can keep their existing water heaters for as long as they wish.

What is the regulated energy efficiency standard for those products? The Energy Factor (EF) must be greater or equal to¹ :
 $0.70 - (0.0005 \times V)$

Here are the new minimum EF levels for several common sizes:

Rated Storage Capacity in litres (US gallons)	Minimum Energy Factor
114 L (30 US gal)	0.64
151 L (40 US gal)	0.62
181 L (48 US gal)	0.61
189 L (50 US gal)	0.61
246 L (65 US gal)	0.58
283 L (75 US gal)	0.56

For a lookup table with all sizes, go to:

www.empr.gov.bc.ca/EAED/EnergyEfficiency/Pages/EEAct.aspx

When will the regulation take effect? September 1, 2010

Can I sell my inventory of non-compliant products after the effective date? Any water heaters manufactured after September 1, 2010 must comply with the regulation. If you have unsold inventory of products manufactured before the effective date, they can still be sold legally in British Columbia after the effective date.

How can I tell if a product is compliant with efficiency regulations? Suppliers can ensure compliance with the standard by stocking only products that meet the minimum EF level outlined above. If the manufacturer's product literature is not clear on this point, Natural Resources Canada has a gas water heater database which lists EF by model number, which can be found at www.oee.nrcan.gc.ca/residential/business/manufacturers/search/gas-water-heaters-search.cfm?attr=4

¹ In this equation, V is the water heater's rated storage capacity in litres, as tested under the standard CAN/CSA-P.3-04: *Testing Method for Measuring Energy Consumption and Determining Efficiencies of Gas-Fired Storage Water Heaters*.

Gas and Propane-Fired Water Heaters



The Best Place on Earth

MEMPR INFORMATION BULLETIN 09-05



Do ENERGY STAR water heaters meet the new standard?

As of September 1, 2010, all new ENERGY STAR water heaters will be compliant with the B.C. regulation. ENERGY STAR water heaters manufactured before September 1, 2010 may not meet the standard in all cases, please check the database referenced in the previous question to confirm. Note: the ENERGY STAR standard is the same for all water heater sizes, whereas the new B.C. requirements vary with the tank size.

Who enforces this regulation? The Ministry of Energy, Mines and Petroleum Resources is responsible for enforcing all regulated standards under the *EEA*.

What are the penalties for non-compliance? Under the *EEA*, the Ministry can conduct inspections to verify compliance with the *Act* and regulations. *EEA* enforcement begins with education and voluntary compliance measures. Ministry staff follow up on all complaints and other information respecting non-compliance, and communicate directly with industry participants to develop a compliance plan.

The Ministry can also seek to have those who have contravened the legislation charged under the *Offence Act*. An offence can result in fines up to \$2,000.

What do I do if I see a non-compliant product for sale or distribution?

Please circulate this information bulletin to the retailer or distributor. You can also report infractions to [Erik Kaye](#), Ministry of Energy, Mines and Petroleum Resources at 250-356-1507 or Erik.Kaye@gov.bc.ca.

For more information on B.C.'s Energy Efficiency Act:
www.empr.gov.bc.ca/EEC/Strategy/EEA/Pages/default.aspx

Appendix D
PROGRAM DETAILS

OVERVIEW AND INTRODUCTION

This appendix includes further details not included in Sections 4 and 5 regarding the Companies 2009 and 2010 EEC Portfolio of programs and associated activities. Only when additional details are available, are the programs and associated activities included in this appendix. These details are organized into sections, outlined below:

- Residential Energy Efficiency Programs
- High Carbon Fuel Switching
- Commercial Energy Efficiency Programs
- Conservation, Education, and Outreach Programs
- Enabling Activities
- Pilot Studies (2009)
- Pilot Studies (2010)

The function of this appendix is to provide the reader with information pertaining but not limited to program background, objectives, target market, research methodology, detailed findings, etc.

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RESIDENTIAL ENERGY EFFICIENCY PROGRAMS

Details of the Residential Energy Efficiency Programs are described in this section. These programs include:

- ENERGY STAR® Heating System Upgrade Program
- EnerChoice Fireplace Program
- ENERGY STAR® Domestic Hot Water Heaters Program

PROGRAM: ENERGY STAR® HEATING SYSTEM UPGRADE PROGRAM

Program Area: Residential Energy Efficiency

Target Market: Retrofit

Duration: TGI: September 1, 2008 through December 31, 2009
TGOVI: April 16, 2009 through December 31, 2009

Incentive: \$250 bill credit

Program Objectives:

- Prepare market for adoption of ENERGY STAR® provincial furnace regulations for retrofit market, January 1, 2010
- Upgrade a minimum of 8,180 heating systems
- Educate trades community about upcoming regulations
- Educate consumers about the advantages of energy efficient furnaces and boilers and provide an incentive that promotes a proactive replacement decision
- Engage manufacturers by distributing coupons for ENERGY STAR® furnaces and boilers and providing funds for co-marketing opportunities
- Develop a cost effective program with TRC > 1.0 and optimize the proportion of incentives over administration and marketing costs

Partner: LiveSmart BC Residential Retrofit Incentive Initiative

Communications Plan:

The following initiatives were implemented to provide consumer awareness and engagement by the trades community and manufacturers.

- www.terasengas.com – included program information, application forms and program terms and conditions. The site included manufacturer coupons for download from September through December 2008, and September through December 2009.
- Bill inserts with program information and instructions for downloading coupons
- Contractor brochures, Point of Sale information, distributed to BC Safety Authority registered gas contractors
- Information distributed to all customer touch points including call centres and sales and service staff
- Co-op advertising funds reimbursed participating manufacturers' or their dealers 50 per cent of their media print advertising costs to support their ENERGY STAR® heating systems advertisements
- Program information was distributed at all trade shows and Team Terasen events

Program Administration:

Program administration was handled by Accenture Utilities Business Process Outsourcing Services ("ABSU"), a subsidiary of Accenture Inc., through a subcontracting arrangement with CustomerWorks LP. The program administration costs invoiced in 2009 were \$60,000. ABSU handled data entry for applications, validation of ENERGY STAR® rated heating systems, the batch process that administered the \$250 bill credit, customer support, and reporting. To receive the bill credit, customers were required to submit their completed application and a photocopy of the furnace invoice, including the installation date, the contractor's BC Safety Authority registration number, and the gas permit installation number.

LiveSmart BC Partnership:

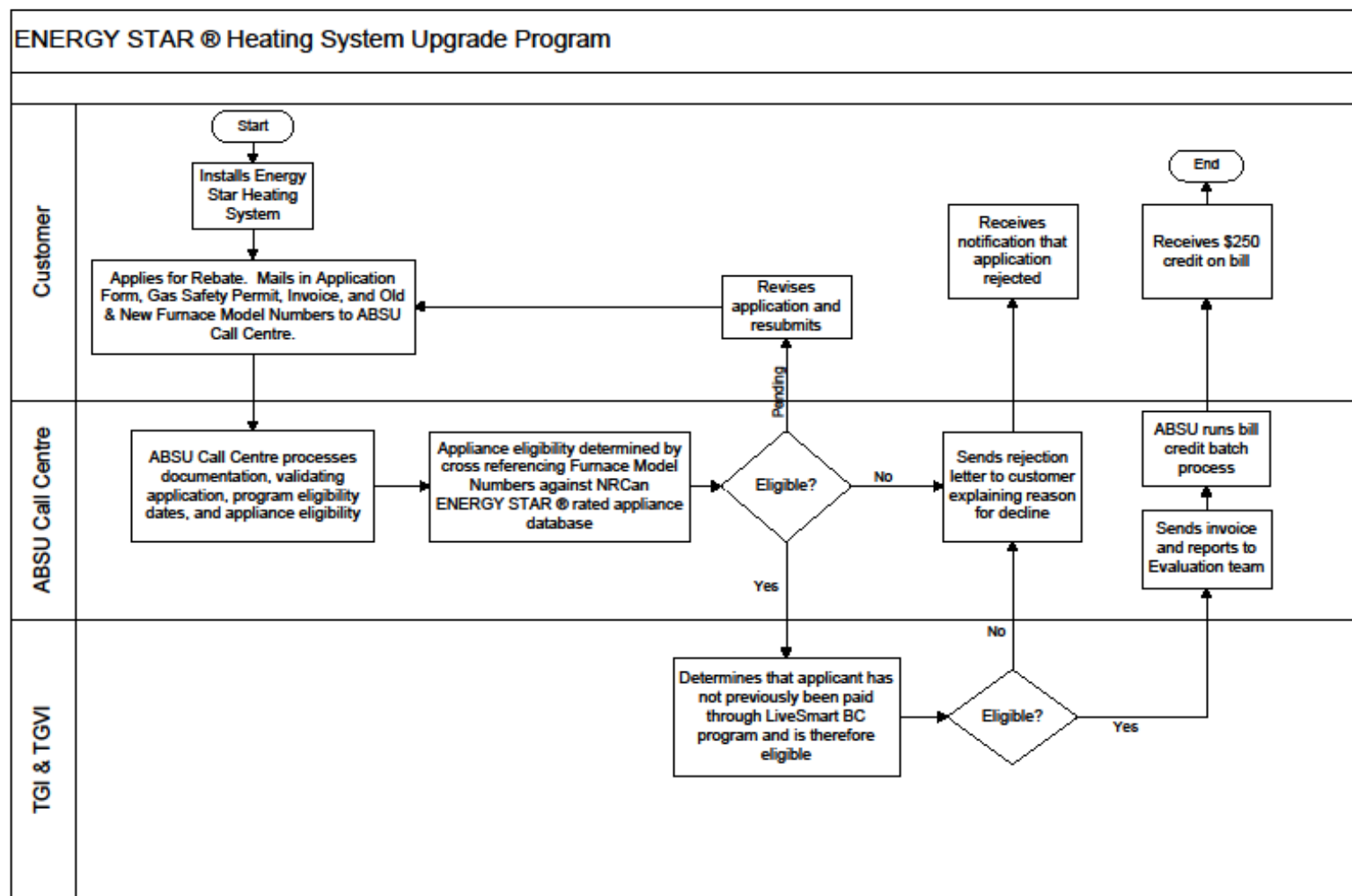
There were two channels for customers to receive the Companies' \$250 ENERGY STAR® Heating System incentive. TGI and TGVI customers could apply directly to the Companies for the incentive or alternatively complete a home energy assessment through the LiveSmart BC program to receive the \$250 incentive paid out through a cheque from LiveSmart BC.

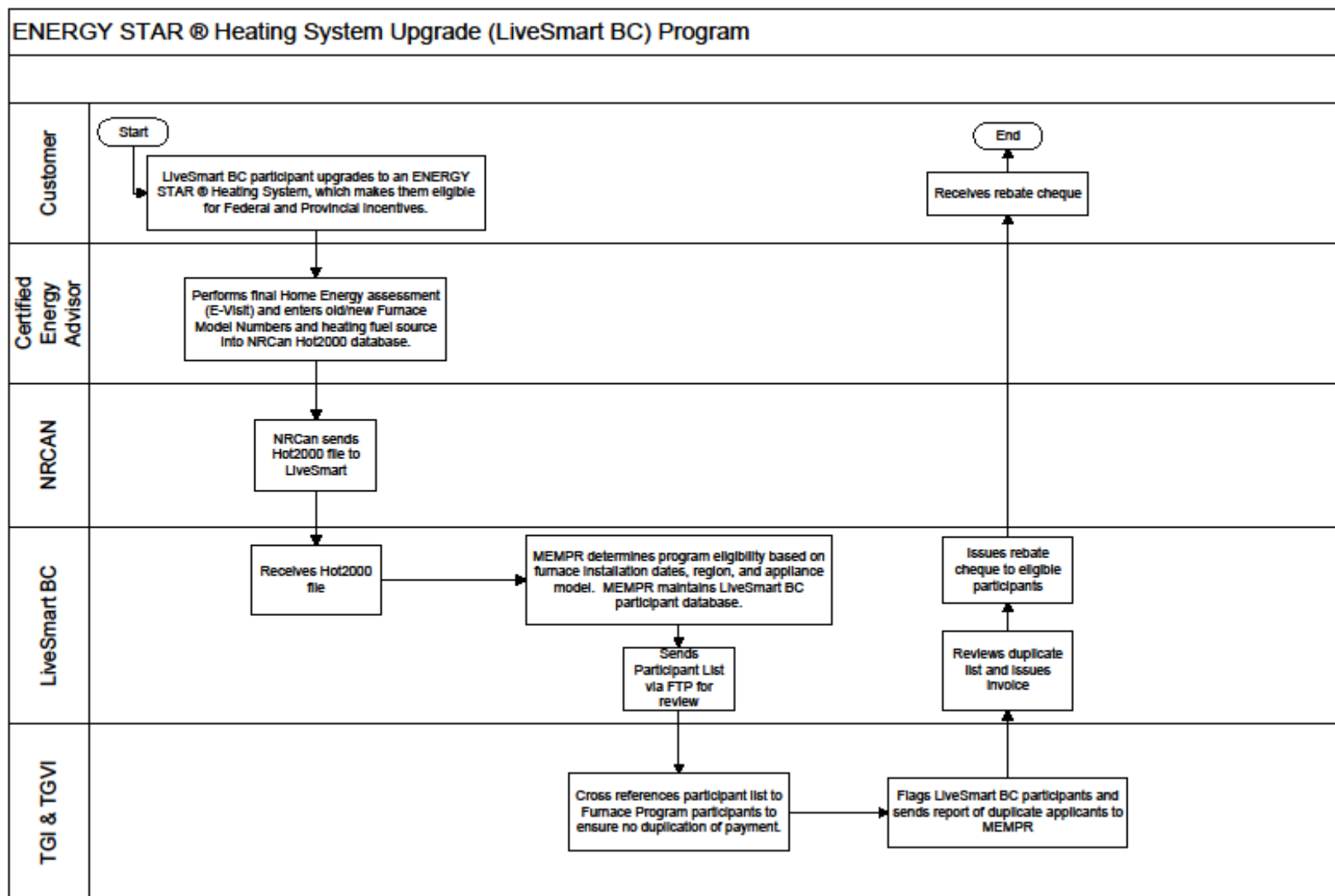
The LiveSmart BC Residential Retrofit Incentive Initiative, launched in May 2008 by the Provincial government, provided incentives to reward residential retrofits that saved energy and reduced GHGs. As part of the Energy Efficient Buildings Strategy, the goal was to create a one-stop shop to provide homeowners with coordinated, easy access to utility, provincial, and federal incentives. Data-gathering for the LiveSmart partnership was completed through NRCan ecoENERGY Home Renovation program. In order to receive these incentives, homeowners had to complete both a pre (D-visit) and post-retrofit (E-Visit) home energy assessment with a Certified Energy Advisor, licensed by NRCan¹. At the time of the Home Energy Assessment, Certified Energy Advisors input data into NRCan's Hot 2000 software, and data files are transferred from NRCan to LiveSmart BC for program administration.

The LiveSmart BC portfolio matched or exceeded federal incentives with the inclusion of funding from BC utility partners, TGI, TGVI, BC Hydro and FortisBC. LiveSmart BC participants who upgraded their heating systems could receive up to \$790 in federal funding and \$1130 in provincial funding for select ENERGY STAR® heating systems. Of the \$1130 in provincial funding, \$250 was provided by the Companies, through an August 2008 agreement with MEMPR to include the \$250 ENERGY STAR® Heating System incentive within the LiveSmart BC portfolio.

To ensure that customers received only one \$250 furnace incentive payment, the Companies developed a cross-checking process between LiveSmart BC participants and the Companies' Heating System Upgrade participants. LiveSmart BC participant lists were sent bi-monthly via a secure file transfer protocol. The LiveSmart BC list was cross-referenced with program to date participants prior to authorizing payment by LiveSmart BC. LiveSmart BC participants were then flagged within the Companies' customer database to eliminate duplicate payment through the bill credit process.

¹ Home Energy Assessments for existing homes are provided by NRCan-certified Home Energy Advisors. The initial assessment is referred to as the D-visit and includes a detailed evaluation of the home's energy efficiency levels, as well as various tests to determine air leaks and recommendations for retrofits that will improve the home's energy efficiency rating. The second visit, referred to as the E-visit, measures energy performance after the recommended retrofits have been completed.





PROGRAM: ENERCHOICE FIREPLACE PROGRAM

Program Area: Residential Energy Efficiency

Target Market: Retrofit

Duration: TGI and TGV: Sep 1, 2009 through Dec 31, 2009

Incentive:

- Dealer - \$50 SPIFF for each fireplace sold
- Manufacturer Coupons

Program Objectives:

- Encourage the sale and installation of energy efficient heater style fireplaces to reap the associated energy savings.
- Further the education and awareness of the EnerChoice label to consumers and industry.
- Further relationships with manufacturers and distributors of natural gas fireplaces, through the Hearth, Patio & Barbecue Association of Canada.
- Engage manufacturers by distributing coupons for EnerChoice fireplaces
- Develop a cost effective program with TRC > 1.0 and optimize the proportion of incentives over administration and marketing costs

Partner: Hearth Patio and Barbecue Association of Canada ("HPBAC")

Communications Plan:

The 2009 EnerChoice Fireplace program had two marketing components:

- promoting manufacturer coupons to residential customers,
- providing a \$50 SPIFF to retail sales personnel for each EnerChoice Fireplace they sold between September 1, 2009 and December 31, 2009.

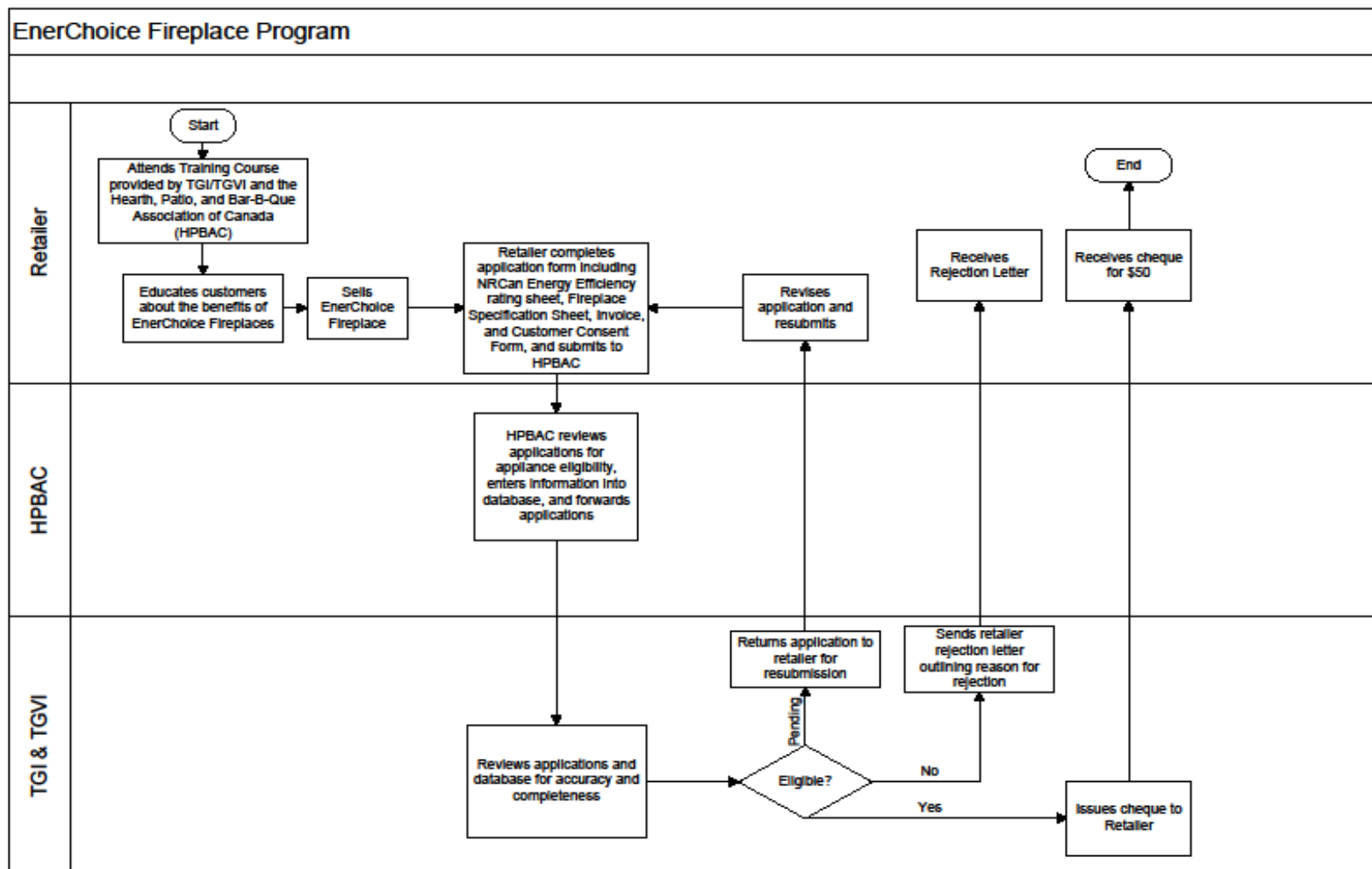
The following initiatives were implemented to provide consumer awareness and engagement by fireplace dealers and manufacturers.

- www.terasengas.com – The site included manufacturer coupons for download from September through October 2008 and September through October 2009
- Bill inserts with program information and instructions for downloading coupons
- Contractor brochures, Point of Sale information, distributed to HPBAC members
- Information distributed to all customer touch points including call centres and sales and service staff
- Community newspaper ads for x weeks in September
- Program information was distributed at all trade shows and Team Terasen events

Program Administration:

The HPBAC provided program administration services for SPIFFS including data entry and validation of supporting documentation including Natural Resource Canada Energy Efficiency Ratings for the fireplace model sold. The EEC team reviewed all documentation and approved applicants for payment.

To be eligible for the \$50 SPIFF, retailers were required to attend an online training course on EnerChoice fireplaces, provided by the Companies. In addition, breakfast meetings for fireplace dealers were held on TGVI in August 2009.



PROGRAM: ENERGY STAR® DOMESTIC HOT WATER HEATERS PROGRAM

Program Area: Residential Energy Efficiency

Target Market: Retrofit

Duration: TGI & TGV: May 1, 2010 through April 1, 2011

Incentive:

- \$50 rebate cheque for consumer
- \$50 rebate cheque for contractor

Program Objectives:

- Educate the market about the introduction of provincial regulations on September 1, 2010
- Educate consumers about ENERGY STAR® water heaters and the importance of hot water conservation
- Upgrade a minimum of 3600 Hot Water Heaters
- Promote contractor relations between the Companies and contractors, as well as between contractors and customers
- Engage manufacturers and distributors through co-marketing opportunities
- Engage manufacturers in labeling tanks for Efficiency Factor

Communications Plan:

The following initiatives will be implemented to provide consumer awareness and engagement by the trades community and manufacturers.

- www.terasengas.com – will include tile ads and program information, application form for downloading, and program terms and conditions
- Online Manufacturer-driven directory of eligible ENERGY STAR® (or equivalent) hot water tank models
- Bill inserts with program information and instructions for downloading application forms
- Brochure: 3 panel brochure with application form/terms and conditions
- Contractor brochures, point of sale information, distributed to BC Safety Authority registered contractors
- Information distributed to all customer touch points including call centres and sales and service staff
- Tile ads for third party websites and other online opportunities
- Rebate cheque insert with energy saving tips.

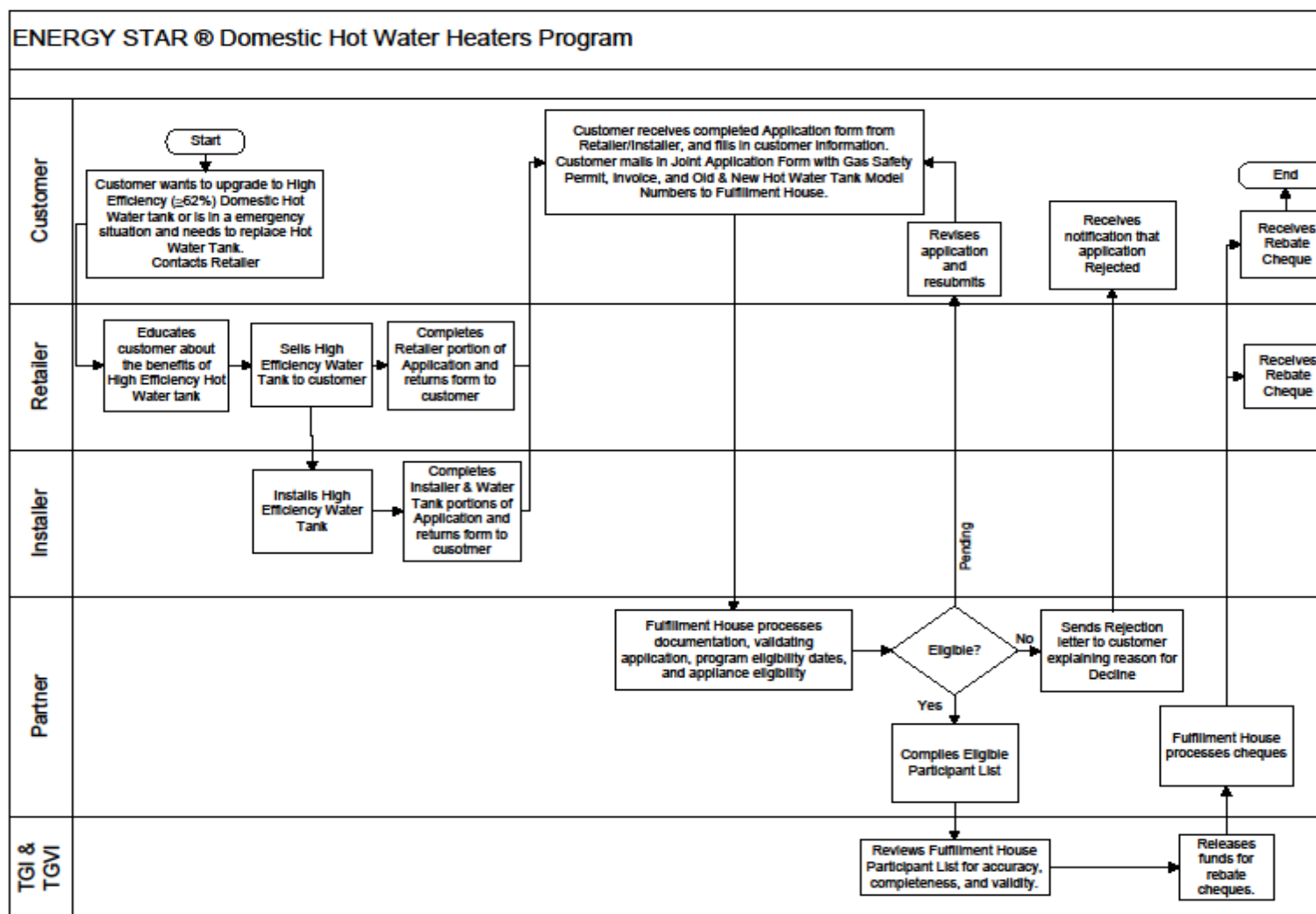
Program Administration:

Program administration will be handled by Consumer-Response Marketing Ltd (CRM). CRM will complete data entry for applications, validation of ENERGY STAR® (or equivalent) hot water tanks, cheque cutting, customer support, and reporting.

The \$100 rebate will be split into two incentives:

- a \$50 direct to consumer incentive
- a \$50 Point of Sale Incentive Fund ("SPIFF") distributed to the sales person who has had contact with the customer to influence the purchase of High Efficiency water tanks

Using a combined incentive application form, consumers will apply for the \$50 consumer incentive and at the same time the point of sale contact can apply for their \$50. This will help drive the relationship between consumers, trades and retailers. The combined incentive will help streamline the administrative process and eliminate fraud from SPIFF applications.



HIGH CARBON FUEL SWITCHING PROGRAM

Details of the High Carbon Fuel Switching Program is described in this section. This includes:

- Switch 'N' Shrink Program

PROGRAM: SWITCH 'N' SHRINK PROGRAM – OIL CONVERSIONS TO NATURAL GAS
ENERGY STAR® HEATING SYSTEM UPGRADES

Program Area: Residential Energy Efficiency Program

Target Market: Retrofit

Duration: January 1, 2010 to December 31, 2010 with possible extension

Consumer Incentive:

- \$1,000 rebate cheque for oil or propane conversion
- \$50 rebate cheque for Electronically Commutated Motors ("ECM") from BC Hydro or FortisBC

Objectives:

Provide a \$1,000 incentive to encourage homeowners to convert their primary heating system from higher carbon oil or propane to a high efficiency natural gas heating system

Upgrade a minimum of 750 homes

Develop relationships with associations for co-marketing opportunities, for example; BC Insurance Brokers Association, real estate associations, environmental groups

Work with MEMPR to include this program as part of the provincial greenhouse gas reduction strategy

Develop a cost effective program with TRC > 1 and maximize the proportion of incentives over administration and marketing costs

Communications Plan:

Promotional initiatives and budget will be focused on the TGVI service area, representing 70 per cent of the projected conversions. The Companies will adopt an integrated marketing approach with program-specific media communications initiatives, contractor communications, co-marketing, and promotion by internal stakeholders such as the customer service centre and TGI/TGVI sales and service staff. Media initiatives include print ads in select trade publications in early 2010 with a summer launch prior to the fall furnace installation peak period.

The following initiatives were implemented to provide consumer awareness and engagement by the trades community and manufacturers.

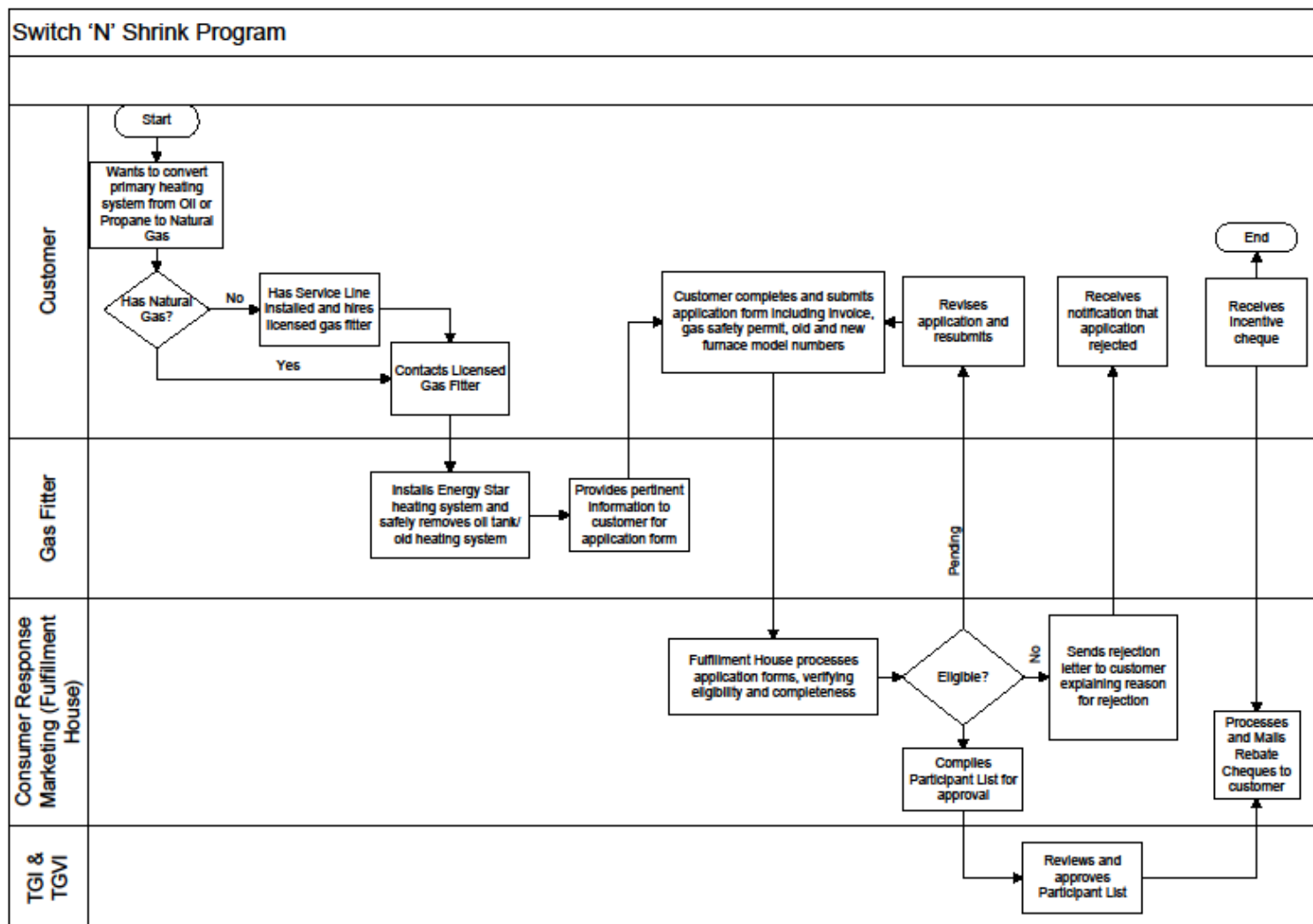
- www.terasengas.com – included program information, application forms and program terms and conditions.
- Contractor Frequently Asked Questions "FAQ's" and application forms were distributed to BC Safety Authority registered gas contractors.
- Information distributed to all customer touch points including call centres and sales and service staff.
- Program information will be distributed at all trade shows and Team Terasen events.

- TGVI Print and radio ads in the summer of 2010 to coincide with conversions prior to the fall peak furnace installation period.
- Print and online ads in trade magazines and building association newsletters.

Co-marketing opportunities with associations include reaching out to associations that are affected by the environmental hazards associated with oil tanks. TGVI is working on developing a promotion with Vancouver Island Insurance Brokers Association to brokers and a DM piece to their customers who heat with oil. Real estate associations and environmental organizations will be contacted to help promote this program.

Program Administration:

Program administration is being outsourced to Consumer Response Marketing ("CRM"), a Surrey-based fulfillment house with extensive experience in rebate administration for DSM programs. CRM will manage data entry of applications, validation of ENERGY STAR® rated heating systems and eligibility for the \$50 ECM program (BC Hydro / FortisBC), cheque fulfillment, customer support, and monthly program performance reporting. To receive the incentive, customers are required to submit their completed rebate application, and a photocopy of the furnace invoice, including the installation date, the contractor's BC Safety Authority registration number, and the gas permit installation number.



COMMERCIAL ENERGY EFFICIENCY PROGRAMS

Details of the Commercial Energy Efficiency Programs are described in this section. These programs include:

- Efficient Boiler Program
- Light Commercial ENERGY STAR® Boiler Program
- Energy Assessment Program
- Efficient Water Heater Program

PROGRAM: EFFICIENT BOILER PROGRAM

Program Area: Commercial Energy Efficiency

Target Market: New Construction / Retrofit

Duration: TGI: 2005 – December 31, 2011
TGI: 2005 – December 31, 2011

Incentive:

Participants are incented to purchase high efficiency boilers by a purchase price rebate. This rebate is designed to offset a significant portion of the incremental cost premium associated with purchasing high vs. standard efficiency equipment. Purchase price incentives are:

- Near-condensing boilers: \$4,000 per boiler plus \$3 per MBH² plant input
- Condensing boilers: \$6,000 per boiler plus \$9 per MBH plant input

For new construction participants the program offers:

1. A maximum incentive payment (calculated as noted above) of up to 75 per cent of the incremental purchase price of higher efficiency boilers. The purchase price of a standard-efficiency boiler is estimated using \$7 per MBH of input.
2. An incentive payment of 50 per cent of a consultant's fees to a maximum \$1500 to offset the cost of analyzing the annual gas usage for space heating using a standard-efficiency boiler system versus a higher efficiency boiler system.

For retrofit participants the program offers:

1. A maximum incentive payment (calculated as noted above) of up to 50 per cent of the incremental purchase price of higher efficiency boilers. The purchase price of a standard-efficiency boiler is estimated using \$7 per MBH of input.
2. An incentive payment of \$400 to help offset the cost of engaging a contractor to accurately estimate the peak space-heating load.
3. Where stainless steel venting is installed, an incentive of 50 per cent of the cost up to \$2000.
4. For participants who so choose, a monitoring incentive of \$1,500 plus \$1 per gigajoule (GJ) of energy saved for closely monitoring and reporting on boiler operation and efficiency during the first year of operation.

Program Objectives:

- Reduce commercial sector gas consumption by encouraging the installation and use of high as opposed to standard efficiency boilers for space heating.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate medium to large commercial customers about the advantages of high efficiency boilers and provide an incentive to facilitate the purchase of high efficiency technology.

² Note: 1 MBH = 1000 BTU/hr (BTU = British Thermal Unit = the heat energy required to raise 1 pound of water by 1 degree Fahrenheit)

- Maintain a program TRC > 1.0 and optimize the proportion of incentives over administration and marketing costs.
- Support and prepare the way for any provincial regulation requiring increased boiler efficiency.

Communications Plan:

2009 saw the following communications initiatives aimed at raising customer awareness and encouraging program participation.

- www.terasengas.com – All program information, application forms and program terms and conditions were maintained on the Efficient Boiler Program web page.
- Program brochures describing the program specifics and how to apply were handed out at tradeshows.
- Contractor information / presentation sessions put on in August of 2009 in Victoria, Nanaimo and Courtney on Vancouver Island. The EBP was presented and program collateral made available.
- Speaking engagements / presentations describing the program at events such as:
 - BC Apartment Owners and Managers Association Semi-Annual trade show
 - Two (2) NRCan “Spot the energy savings” workshops
 - BC Hydro Power Smart forum
 - BH Hydro Energy managers training session
 - Vancouver Coastal Health and Fraser Valley Health Authority session on energy efficiency and incentive opportunities
- Information distributed to all customer touch points including call centres and sales and service staff.

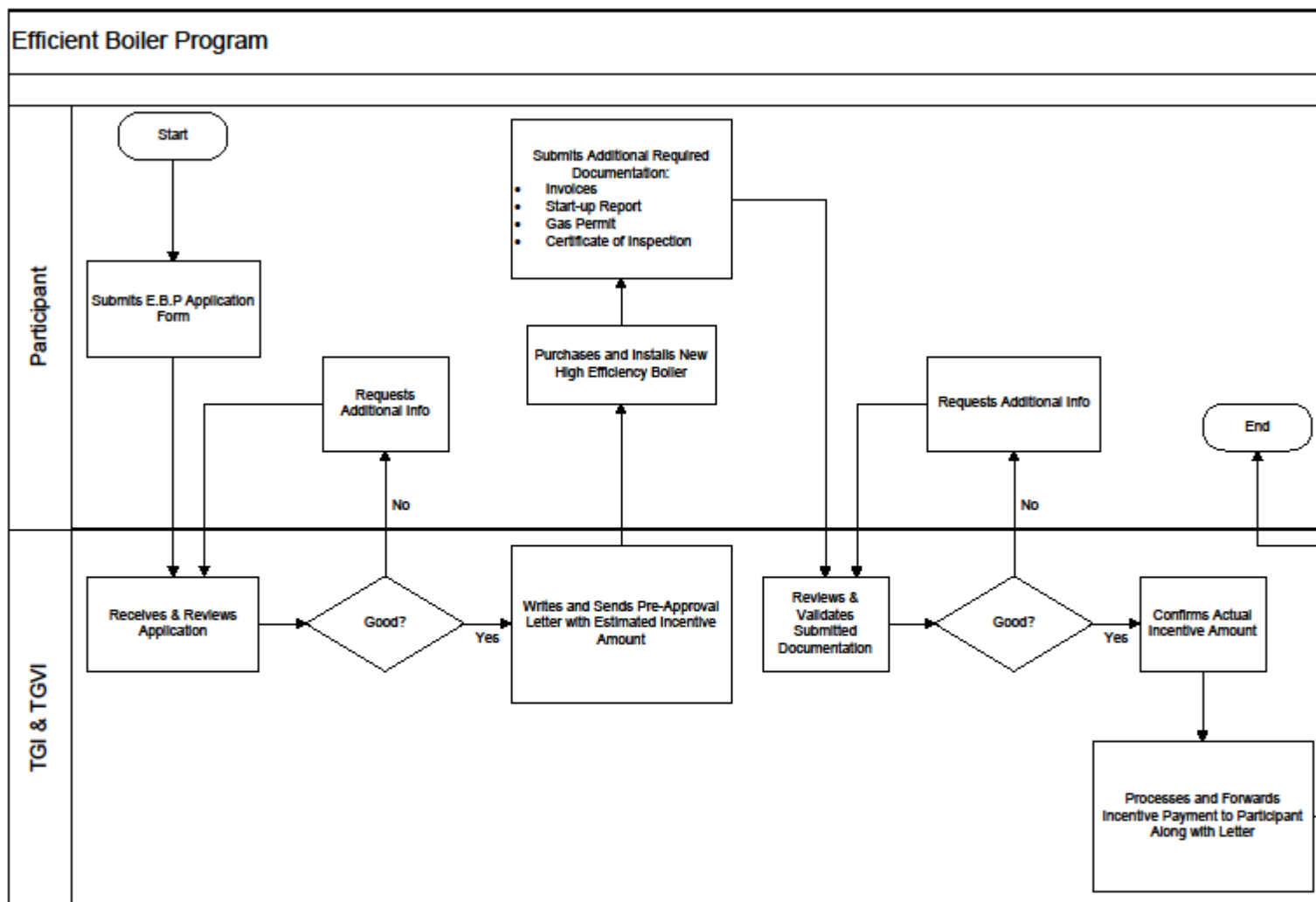
The communications plan for 2010 will reflect what the Companies have learned in 2009, specifically, that additional effort must be expended on both Vancouver Island and in the New Construction arena. The Companies plan on holding a stakeholder focus group and feedback session in late April or early May to gain insight as to how the program may be updated to serve the market better. A full scale communications plan for the Efficient Boiler Program will be developed subsequently.

Program Administration:

Administration of the Efficient Boiler Program is handled entirely in-house by the Companies’ EEC Staff as of January 1, 2010.

For new participants, the Companies’ EEC staff receive applications, input data for program tracking, validate submitted information, ensure all boilers listed on applications are eligible for an incentive, prepare an incentive estimate, process and forward incentive cheques, and guide participants through the application process via on-going telephone support where / when necessary.

Additionally the Companies’ EEC staff responds to all phone or email enquires about the program from potential applicants.



PROGRAM: LIGHT COMMERCIAL ENERGY STAR® BOILER PROGRAM

Program Area: Commercial Energy Efficiency

Target Market: New Construction / Retrofit

Duration: TGI: August, 2009 – December 31, 2011
TGV: August, 2009 – December 31, 2011

Consumer Incentive:

Boilers must be ENERGY STAR® rated near-condensing or condensing gas boilers sized up to a maximum size of 299 MBH input, and be used primarily for hydronic space and water heating. The incentive is calculated based on the quantity, size and type of boiler as follows:

- Condensing boilers: \$5 per MBH, provided that the condensing boiler is used for radiant heat, fan coils and/or domestic water heating (in combination with space heating)
- Near condensing boilers: \$3 per MBH
- Sample calculation: 1 MBH is equal to 1,000 BTU's per hour, therefore a 299 MBH or 299,000 Btu/hr condensing boiler would be eligible for a \$1495 rebate (299 MBH x \$5 = \$1,495)

The incentive is independent of the price of boilers or the total cost of the mechanical system. The program does not include any additional rebate or incentive for labour, vent modifications, piping changes, design calculations, or other equipment.

Program Objectives:

- Reduce commercial sector gas consumption by encouraging the installation and use of high efficiency (ENERGY STAR® rated) as opposed to standard efficiency boilers for space heating.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate small to medium commercial customers about the advantages of energy efficient appliances and provide incentives for their adoption when necessary.
- Engage the trades community and manufacturers by supporting new, energy efficient technologies.
- Maintain a program TRC > 1.0 and optimize the proportion of incentives over administration and marketing costs.
- Support and prepare the way for any provincial regulation requiring increased boiler efficiency.

Communications Plan:

2009 saw the following communications initiatives aimed at raising customer awareness and encouraging program participation.

- www.terasengas.com – All program information, application forms and program terms and conditions were maintained on the Light Commercial ENERGY STAR® Boiler Program web page.
- Program brochures describing the program specifics and how to apply were handed out at tradeshows.
- Program brochures and cards describing the program specifics and how to apply were distributed to regional sales / operations centres and sales and service staff.
- Approximate combined total of 2000 pieces of cardstock / brochures distributed.
- Contractor information / presentation sessions put on in August of 2009 in Victoria, Nanaimo and Courtney on Vancouver Island. The Light Commercial ENERGY STAR® Boiler Program was presented and program collateral made available.
- Speaking engagements / presentations describing the program at events such as:
 - BC Apartment Owners and Managers Association Semi-Annual trade show
 - Two (2) NRCan “Spot the energy savings” workshops
 - BC Hydro Power Smart forum
 - BC Hydro Energy managers training session
 - Vancouver Coastal Health and Fraser Valley Health Authority session on energy efficiency and incentive opportunities
- The program was advertised in ASHRAE BC’s November 2009 edition of its “Totem” magazine.

2010 will see a sustained and enhanced effort at program promotion. The Companies are currently in the process of developing a strategic communication plan for the Light Commercial ENERGY STAR® Boiler Program which, over and above the activities of 2009, should include:

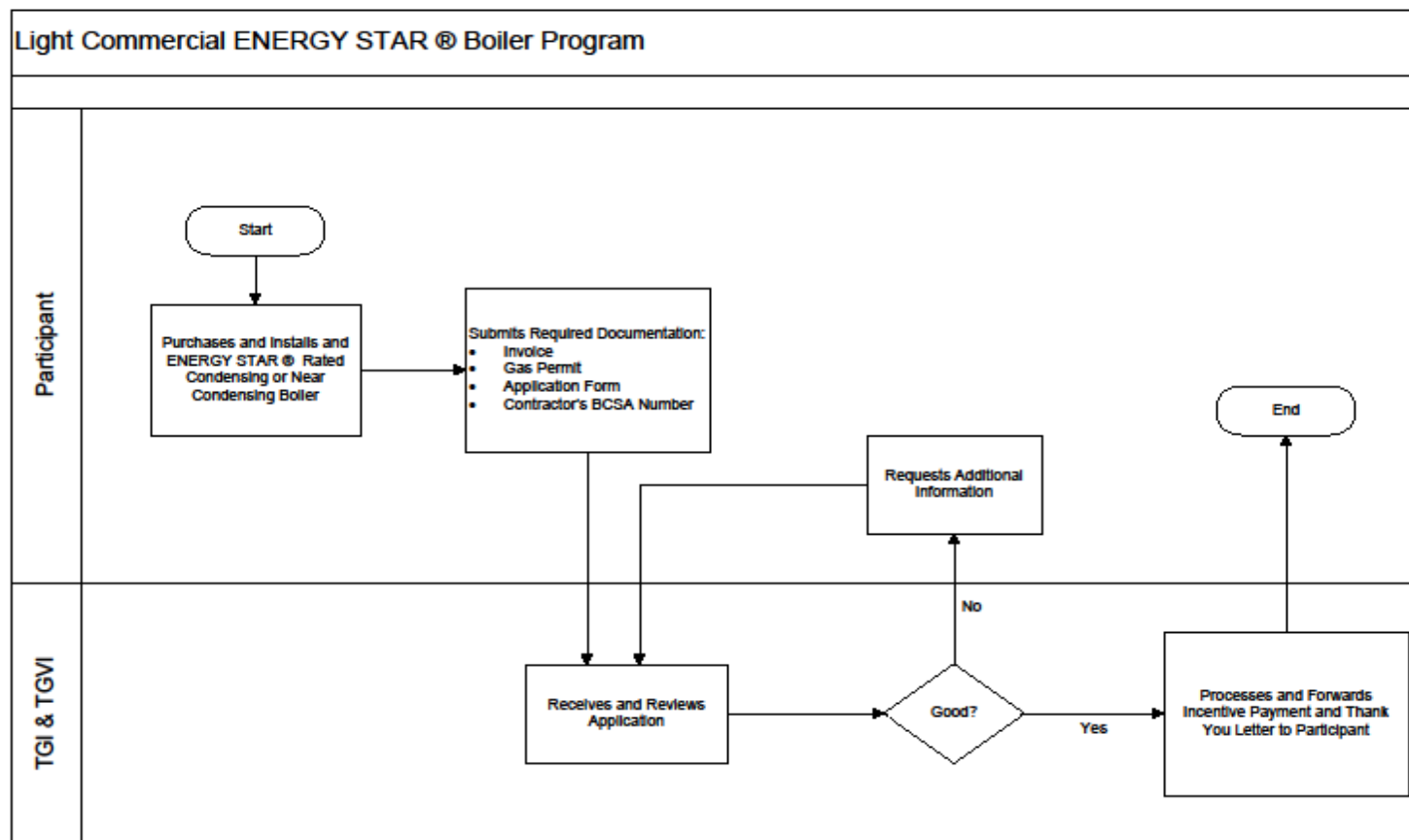
- Direct email advertising
- Additional, targeted magazine/newsletter advertising
- On-bill advertising to rate 2 and rate 3 customers
- Contractor and engineer information sessions
- Additional information sessions on Vancouver Island.
- More leveraging of industry partner relationships
- A program feedback session with key stakeholders

Program Administration:

Administration of the Light Commercial ENERGY STAR® Boiler Program is handled entirely in-house by the Companies’ DSM Staff.

For new participants, the Companies’ DSM staff receive applications, input data for program tracking, validate submitted information, ensure all boilers listed on applications are ENERGY STAR® rated, process and forward incentive cheques, and guide participants through the application process via on-going telephone support where / when necessary.

Additionally the Companies’ DSM staff also responds to all phone or email enquires about the program from potential applicants.



PROGRAM: ENERGY ASSESSMENT PROGRAM

Program Area: Commercial Energy Efficiency

Target Market: Retrofit

Duration: TGI: 2001 – December 31, 2011
TGVI: 2001 – December 31, 2011

Incentive:

For customers who consume in excess of 2000 GJ per year the Companies, will provide a free, walkthrough energy assessment – a \$1200 value.

The walkthrough assessment is performed by a third party energy efficiency consultant retained by Terasen Gas. The consultant visits the participant's facility in order to review current sources of energy consumption and propose measures to reduce consumption. Results are provided to the participant and Terasen Gas in report form, and generally include the following information:

- Historic annual gas usage breakdown by type, i.e., space heating, water heating, process heat
- Readily implemented recommendations such as: using electronic controls to operate boilers and ventilation fans only when needed; insulating all bare heating pipes, valves and flanges in mechanical rooms and unheated areas
- Recommendations regarding upgrades to space, domestic water and process equipment
- Tables to illustrate monthly gas consumption over a one-year period, against monthly gas consumption projections if recommended upgrades are implemented
- Estimated payback periods for each implemented measure
- Information about available rebates or incentives

Program Objectives:

- Enable and encourage commercial customers to reduce gas consumption by identifying sources of high gas consumption within their facilities and proposing measures to reduce consumption.
- Educate commercial customers about gas use within their own facilities and the steps they can take to minimize consumption.
- Foster a culture of conservation among commercial sector customers (including MURBs, institutional and manufacturing customers) by assisting them to review their energy consumption critically.
- Where applicable, direct participants to available incentive programs including Terasen's existing boiler programs.
- Maintain a program TRC > 1.0 and optimize the proportion of incentives over administration and marketing costs

Communications Plan:

2009 saw the following communications initiatives:

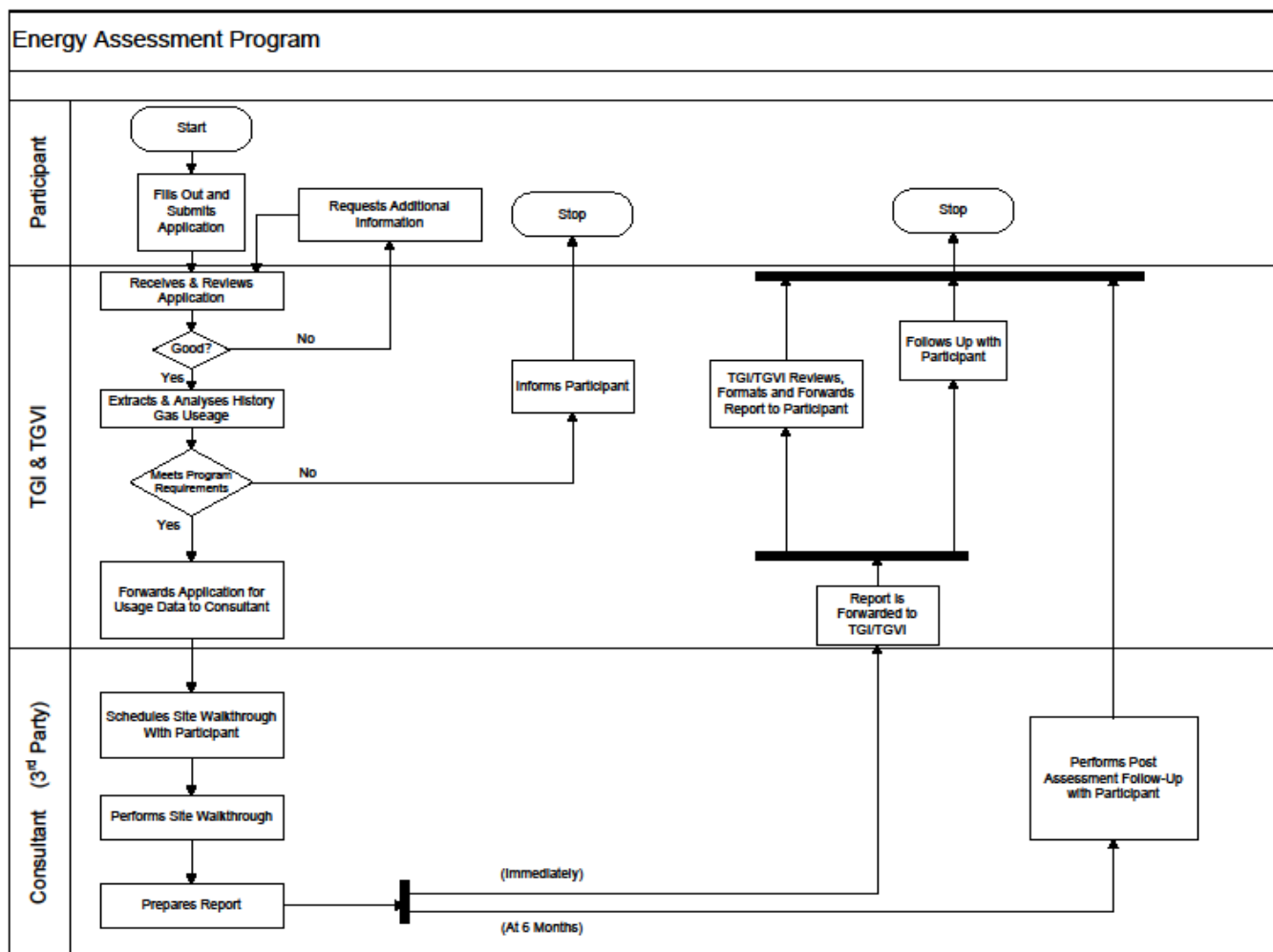
- www.terasengas.com – The Companies maintained a webpage dedicated to the program which included program information, application forms and program terms and conditions.
- Brochure: 3 panel brochure with program information and terms and conditions for hand out at tradeshow, and use by the Companies' sales and Key Accounts staff.
- Direct promotion of the program by the Companies' Key Accounts staff.

Program Administration:

Administration of the Energy Assessment Program is handled entirely in-house by the Companies' DSM Staff as of November 2009.

For new participants, the Companies' DSM staff receive applications, input data for program tracking, validate submitted information, ensure all boilers listed on applications are eligible for an incentive, prepare an incentive estimate, process and forward incentive cheques, and guide participants through the application process via on-going telephone support where / when necessary.

Additionally the Companies' DSM staff also responds to all phone or email enquires about the program from potential applicants.



PROGRAM: EFFICIENT COMMERCIAL WATER HEATER PROGRAM

Program Area: Commercial Energy Efficiency

Target Market: New Construction / Retrofit

Duration: TGI: April, 2010 – December 31, 2011
TGV: April, 2010 – December 31, 2011

Incentive:

The incentive amount is calculated based on the quantity, size and type of water heating appliance installed, which must have a thermal efficiency rating great than 84 per cent for storage or hot water supply boilers, or 90 per cent for On-demand water heaters.

The structure for this program is similar to that of the Light Commercial ENERGY STAR® Boiler Program, with identical incentive amounts per input MBH for storage and boiler type water heaters. On-demand water heaters are provided with a reduced incentive due to a generally lower purchase price.

Rebates are available for multiple water heaters in a single facility and will be calculated per water heater as follows:

Storage water heaters / Hot water supply boilers

- \$5 per MBH for water heaters with a thermal efficiency of 90 per cent or higher
- \$3 per MBH for water heaters with a thermal efficiency of 84 per cent to 89.9 per cent

On-demand water heaters

- \$2.50 per MBH for water heaters with a thermal efficiency of 90 per cent or higher

Sample calculation: 1 MBH is equal to 1,000 BTU's per hour, therefore a 199 MBH or 199,000 Btu/hr storage water heater, rated at 96 per cent thermal efficiency would be eligible for a 5 \$/MBH x 199 MBH = \$995 rebate.

The rebate is independent of the price of water heaters or the total cost of the water heating system. The program does not include any additional rebate or incentive for labour, vent modifications, piping changes, design calculations, or other equipment.

Program Objectives:

- Reduce commercial sector gas consumption by encouraging the installation and use of high as opposed to standard efficiency water heaters for domestic hot water heating.
- Increase year over year participation rates in view of maximizing gas savings.
- Educate commercial customers about the advantages of high efficiency water heaters and provide an incentive to facilitate the purchase of high efficiency technology.
- Maintain a program TRC > 1.0 and optimize the proportion of incentives over administration and marketing costs.

- Prepare the way for and support any provincial regulation requiring increased water heater efficiency.

Communications Plan:

The following initiatives will be implemented to generate consumer awareness and engagement by the trades community and manufacturers.

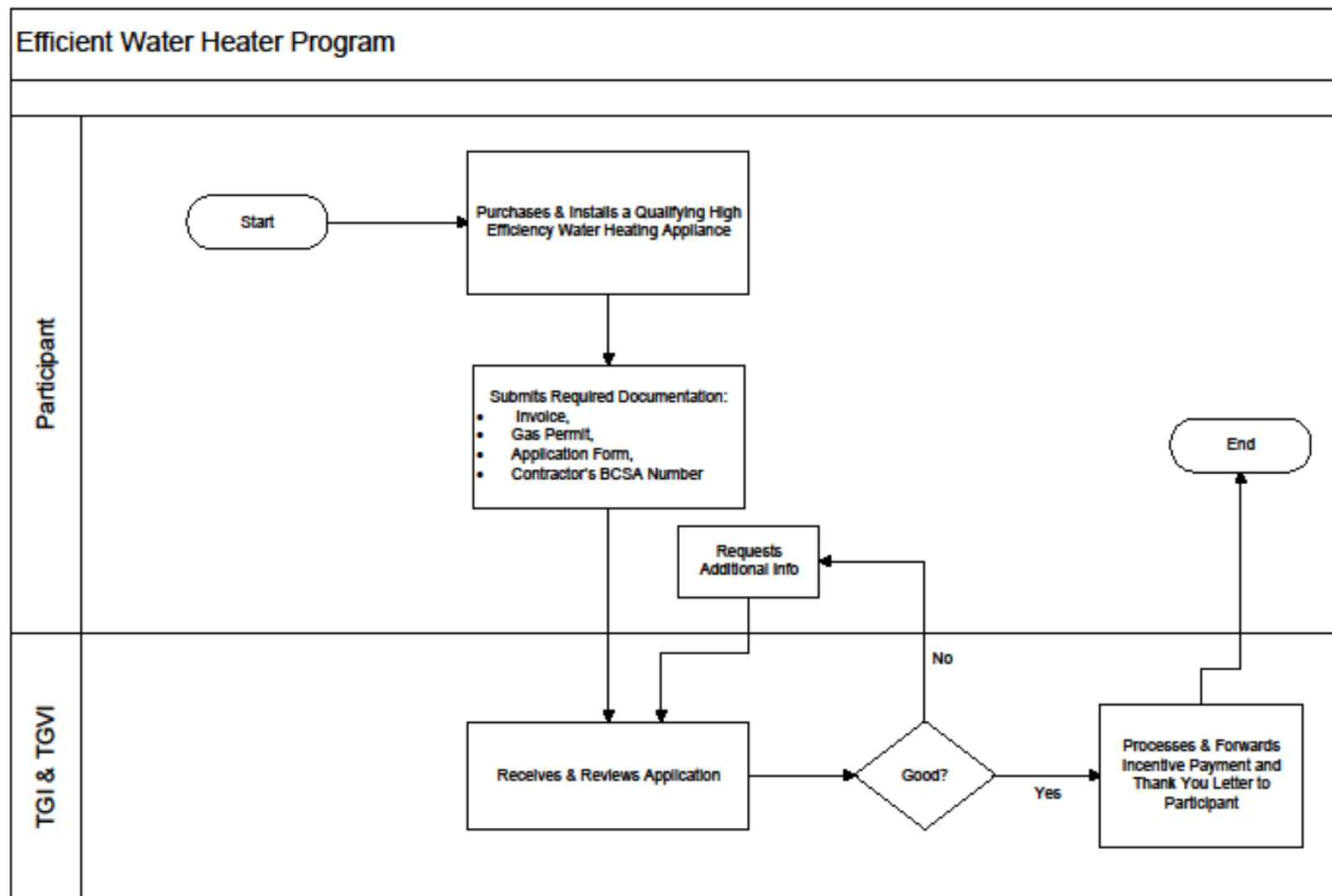
- www.terasengas.com – will include a web page with program information, application form for downloading, and program terms and conditions.
- Web tile ads will be developed for use on partner (industry association, municipalities, advocacy groups, etc) websites.
- Online directory of qualifying hot water heaters to make selection of a high efficiency water heater as simple as possible.
- Brochure: 3 panel brochure with application form/terms and conditions for hand out at tradeshow, and delivery to the Companies sales staff.
- Engagement of suppliers and manufacturer's representatives via information sessions designed to instill awareness of, and answer questions about the program.
- Lunch and learn sessions with relevant engineering firms, plumbers and gas fitters. Relevant being those who deal most often with the target customer groups.
- Speaking engagements and web page advertisements with target organizations such as:
 - British Columbia Restaurant and Food Services Association
 - British Columbia Hotel Association
 - Tourism Vancouver
 - Vancouver Hotel Association
 - Mechanical Contractor's Association of British Columbia
 - Building Operators and Managers Association
 - BC Apartment Owners and Managers Association
- Magazine Advertisement with publications such as:
 - HPAC Magazine
 - APEGBC / Innovation magazine
 - ASHRAE Newsletter
- Direct contact with target customer, as well as their attendant suppliers, engineers and O&M service providers is essential in the initial stages of the program.
- Information distributed to all customer touch points including call centres and sales and service staff

Program Administration:

Administration of the Efficient Water Heater Program will be handled entirely in-house by the Companies' EEC Staff.

For new participants, the Companies' EEC staff will receive applications, input data for program tracking, validate submitted information, ensure all water heaters listed on applications are eligible for an incentive, process and forward incentive cheques, and guide participants through the application process via on-going telephone support where / when necessary.

Additionally the Companies' EEC staff will also respond to all phone or email enquires about the program from potential applicants.



CONSERVATION, EDUCATION, AND OUTREACH (CEO) PROGRAMS

Details of the Conservation, Education, and Outreach programs are described in this section. These programs include:

- Ethnic Outreach
- Trade Shows and Events
- Students and School Outreach
 - Destination Conservation
 - Beyond Recycling school program
 - BC Green Games
- School Assembly Presentations
- Energy Champion
- Team Terasen

PROGRAM ACTIVITY: ETHNIC OUTREACH

Program Area: Conservation, Education, and Outreach

Target Market: Punjabi and Chinese audiences, residential and small commercial customers

Duration: Begins March 2010

Program Objectives: The objective is to ensure conservation information is accessible and understood by all customers.

Methodology/Communication Plan:

The Companies are planning to conduct a qualitative and quantitative research study within the Punjabi, Cantonese, and Mandarin speaking audiences, which are the top visible minority ethnic groups in the Lower Mainland, to identify their attitudes and behaviours as they relate to conservation. Some proposed initiatives for the ethnic outreach campaign include print and online translations of the printed "Hot Tips" booklet, and event sponsorships, such as S.U.C.C.E.S.S. Foundation's Walk with the Dragon fundraising event.

PROGRAM ACTIVITY: TRADE SHOWS AND EVENTS - HOME SHOWS, INDUSTRY TRADE SHOWS, AND OTHER SPECIAL EVENTS

Program Area: Conservation, Education, and Outreach

Target Market: residential and commercial

Duration: year round

Program Objectives:

The objective is to reach out to customers that are more inclined to home/business renovations and/or equipment upgrades and seeking information on methods to reduce energy costs.

Methodology/Communication Plan:

The Companies usually participate with a booth exhibit and/or sponsorship of a section or specific show at the event.

List of Home and Trade Show Activities for 2009

Show	Location	Residential	Commercial	Consumers Reached
BC Spring Home and Garden Show	Vancouver	x		700
CHBA Central Interior House and Home Residential Construction Trade Show	Kamloops	x		250
CHBA Central Vancouver Island Renovation Tradeshow	Nanaimo	x		250
CHBA Victoria Spring Home Show	Victoria	x		400
EPIC Sustainable Living Expo	Vancouver	x		500
GVHBA Home Renovation Seminars	Vancouver	x		300
Kelowna Spring Home Show	Kelowna	x		400
Organic Islands Festival	Victoria	x		400
Vancouver Home and Interior Design Show	Vancouver	x		800
BC Association of School Business Officials	Penticton		x	50
BC Hydro Power Smart Forum	Vancouver		x	100
British Columbia Recreation and Parks Association Symposium	Penticton		x	50
Buildex Vancouver	Vancouver		x	300
Pacific Agricultural Show	Abbotsford		x	300
Recreation Facilities Association of British Columbia Annual Conference	Oliver		x	50
Sustainabuild	Vancouver		x	50
Union of BC Municipalities Conference	Vancouver		x	200
Total Reach				5100

Proposed List of Home and Trade Show Activity for 2010

Show	Location	Residential	Commercial
CHBA Central Interior House and Home Residential Construction Trade Show	Kamloops	x	
CHBA Central Vancouver Island Renovation Tradeshow	Nanaimo	x	
CHBA Northern BC Home Show	Prince George	x	
EPIC Sustainable Living Expo	Vancouver	x	
GVHBA Home Renovation Seminars	Vancouver	x	
Kamloops Energy Fair	Kamloops	x	
Kelowna Music & Arts Festival	Kelowna	x	
Kelowna Spring Home Show	Kelowna	x	
Organic Islands Festival	Victoria	x	
Pacific National Exhibition – Prize Home	Vancouver	x	
Vancouver Home and Interior Design Show	Vancouver	x	
Victoria Home and Garden Show	Victoria	x	
BC Association of School Business Officials	Penticton		x
BC Food Service Expo	Vancouver		x
BC Hydro Power Smart Forum	Vancouver		x
British Columbia Recreation and Parks Association Symposium	Penticton		x
Buildex Vancouver	Vancouver		x
Canadian Federation of Apartments Association	Vancouver		x
Downtown Maple Ridge BIA meeting	Maple Ridge		x
Downtown Victoria BIA meeting	Victoria		x
Kamloops Central BIA meeting	Kamloops		x
Pacific Agricultural Show	Abbotsford		x
Recreation Facilities Association of British Columbia Annual Conference	Oliver		x
Strathcona BIA Sustainability 3.0 Expo	Vancouver		x
Sustainabuild	Vancouver		x
Union of BC Municipalities Conference	Whistler		x

PROGRAM ACTIVITY: STUDENTS AND SCHOOL OUTREACH - DESTINATION CONSERVATION

Program Area: Conservation, Education, and Outreach

Target Market: elementary and high schools throughout BC

Duration: September to June (school year)

Program Objectives:

The goal of the program is to bring in additional school districts that would not have otherwise participated had funding not been available.

Methodology/Communication Plan:

Destination Conservation delivers education programs to students and building operators on energy, waste, and water, and assist in developing student projects for the school.

Funding:

The Companies fund the first year, and for most districts, years 2 and 3 are funded by the school district from energy savings generated from changes in facility operations prompted by the program. The exceptions to this are Okanagan Skaha and Kootenay Lake School Districts, where year 2 is funded by FortisBC, and North Vancouver School District, where years 2 and 3 are funded by the City of North Vancouver.

Destination Conservation School Sponsorship 2007 - 2009

Year	School District	Number of Sponsored Schools
2007 - 2008	Central Okanagan	7
	Okanagan Skaha	9
	Vancouver	12
2008 - 2009	Kootenay Lake	11
	Fraser Cascade	7
2009 - 2010	North Vancouver	11
	Sooke	16
	Powell River	7
Total Schools:		80

For the 2010-2011 school year, Destination Conservation is currently in discussion with 5 new school districts, and 2 renewals (Kelowna and Vancouver).

PROGRAM ACTIVITY: STUDENTS AND SCHOOL OUTREACH - BEYOND RECYCLING SCHOOL PROGRAM

Program Area: Conservation, Education, and Outreach

Target Market: elementary schools in the West and East Kootenays region

Duration: September to June (school year)

Program Objectives:

The goal is to ensure conservation outreach to schools that may not have been able to participate had funding not been available.

Results:

For the 2009-2010 school year, 10 schools had signed on, reaching at least 3000 students. See table below for the list of schools.

Funding:

Additional funders of the program include Environment Canada's EcoAction Community Funding Program and FortisBC.

Schools Participating in Beyond Recycling Program 2009-2010

School	Location
Erickson Elementary School	Erickson
Canyon-Lister Elementary School	Lister
Winlaw Elementary School	Winlaw
Rosemont Elementary School	Nelson
JV Humphries School	Kaslo
Twin Rivers School	Castlegar
Glenmerry Elementary School	Trail
McKim Middle School	Kimberley
Gordon Terrace Elementary	Cranbrook
Jaffray Elementary School	Jaffray
Isabella Dicken Elementary	Fernie

PROGRAM ACTIVITY: STUDENTS AND SCHOOL OUTREACH - BC GREEN GAMES

Program Area: Conservation, Education, and Outreach

Target Market: elementary and high schools throughout BC

Duration: September 2009-June 2012

Methodology/Communication Plan:

The goal of the Companies' involvement in BC Green Games is to introduce the concept of natural gas as a resource and the need for energy conservation into the students' environmental projects. The competition allows students to learn about sustainable initiatives in other schools, learn from their peers, and build on their existing or new projects for the next year. The program is hosted by Science World who has hired a project coordinator to promote the contest to schools, organize the submissions, recruit and train the judging panel, and organize prizing.

Results:

To date, for the 2009-2010 school year, at least 94 teams have registered from 32 school districts

Funding:

The program is being co-funded with BC Hydro for 3 school years.

PROGRAM ACTIVITY: 2009 SCHOOL ASSEMBLY PRESENTATIONS

Program Area: Conservation, Education, and Outreach

Target Market: students and teachers

Duration: Spring 2009 of 2008-2009 (school year)

Program Objectives:

The goal of this initiative was to launch a program that interacted with students and brought conservation education directly into the schools. See below for a list of schools attended.

Methodology/Communication Plan:

The assembly presentation featured B.C. Lions players talking to students about environmental responsibility and then engaging with them in competitive games that focused on recycling, water, and energy conservation. After the assembly, the players visited a Grade 5 class for a more in-depth lesson.

Funding:

The program was co-funded with Livesmart BC, including both the Ministry of Education and the Ministry of the Environment, and Plutonic Power.

School Assembly Presentations, 2009 Spring

School	Location
Aubrey Elementary	Burnaby
Austin road Elementary	Prince George
Blundell Elementary	Richmond
Bowser Elementary	Bowser
Captain James Cook Elementary	Vancouver
Chalmers Elementary	Delta
Cherry Hill Elementary	Mission
Cindrich Elementary	Surrey
Clearbrook Elementary	Abbotsford
Cloverdale Catholic Elementary	Surrey
Delta Manor Elementary	Ladner
Dickens Elementary	Vancouver
Dixon Elementary (French)	Richmond
Eagle Ridge Elementary	Coquitlam
Ecole Simon Cunningham	Surrey
Erma Stephenson Elementary	Surrey
False Creek Elementary	Vancouver

School Assembly Presentations, 2009 Spring

School	Location
Foothills Elementary	Prince George
Forsythe Elementary	Surrey
Frost Road Elementary	Surrey
General Brock Elementary	Vancouver
Georgia Park Elementary	Campbell River
Glenmore Elementary	Kelowna
Glenview Elementary	Prince George
Grief Point Elementary	Powell River
Harold Bishop Elementary	Surrey
Heart Highland Elementary	Prince George
Heilings Elementary	Delta
Henry Anderson Elementary	Richmond
Hjorth Road Elementary	Surrey
Holly Elementary	Delta
Holly Elementary	Surrey
Holy Cross Elementary	Burnaby
James Thompson Elementary	Powell River
John Henderson Elementary	Vancouver
Maple Grove Elementary	Vancouver
McGirr Elementary	Nanaimo
Mundy Road Elementary	Coquitlam
Nicomekl Elementary	Langley
North Glenmore Elementary	Kelowna
Qualicum Beach Elementary	Qualicum Beach
Raymer Elementary	Kelowna
Ripple Rock Elementary	Campbell River
Riverdale Elementary	Surrey
Rutland Elementary	Kelowna
Sexsmith Elementary	Vancouver
Seymour Heights Elementary	North Vancouver
Tyee Elementary	Vancouver
W.E. Kinvig Elementary	Surrey
Walter Moberly Elementary	Vancouver

PROGRAM ACTIVITY: ENERGY CHAMPION

Program Area: Conservation, Education and Outreach

Target Market: kids, youth, and families

Duration: varies with the specific sports teams' season

Program Objectives:

The goal of the program is to educate children and youth on energy conservation behaviour in a fun and rewarding manner.

Methodology/Communication Plan:

The Energy Champion program is usually implemented in the form of a contest. An example of a contest would require kids under 12 years of age to answer the following question, "What are 3 things you can do around your home to conserve energy?" Where they would then be entered into a draw to win tickets to a game. With each sports club partnership, there are slight modifications to the program to be able to adapt to each team's delivery, but where possible, the program includes a combination of print advertising, web banner advertising, an online contest, use of social media, electronic newsletters, in-game announcements, concourse activity, and in-game activity, all to promote energy conservation.

PROGRAM ACTIVITY: TEAM TERASEN - OUTREACH TEAM AT VARIOUS COMMUNITY AND BUSINESS EVENTS

Program Area: Conservation, Education and Outreach

Target Market: residential and commercial customers

Duration: year round

Program Objectives:

The objective is to reach out to customers in their own communities (or workplace) to educate on energy conservation.

Methodology/Communication Plan:

Outreach team will usually setup a table of literature, bring an interactive game (eg. Spinning wheel) to quiz participants, and also hold a prize draw.

List of Team Terasen Events for 2009

Event	Location	Residential	Commercial	Consumers Reached
Abbotsford Air Show	Abbotsford	x		1,500
Accenture Lunch'n'Learn	Vancouver	x	x	200
BC Lions home games	Vancouver	x		900
BerryBeat Festival	Abbotsford	x		1,500
Burnaby Hospital	Burnaby	x	x	50
Burnaby Safety Event	Burnaby	x		50
Capilano University	North Vancouver	x	x	250
Chilliwack General Hospital	Chilliwack	x	x	50
Coquitlam Energy Awareness Day	Coquitlam	x	x	100
Delta Hospital	Delta	x	x	50
Dunbar Village Festival	Vancouver	x		100
Eagle Ridge Hospital	Coquitlam	x	x	50
Fort Langley BC Day	Fort Langley	x		300
Greek Day	Vancouver	x		1,500
HR MacMillan Space Centre Energy Day	Vancouver	x		100
Kelowna Music & Arts Festival	Kelowna	x		100
Langley Memorial Hospital	Langley	x	x	50
Mission Memorial Hospital	Mission	x	x	50
Moody Elementary Fun Fair	Port Moody	x		250
North Delta Lions Family Day	Delta	x		200
Ocean Park Day	Surrey	x		150
Pacific Blue Cross	Burnaby	x		100
Peach Arch Hospital	Surrey	x	x	50

Event	Location	Residential	Commercial	Consumers Reached
Pitt Meadows Day	Pitt Meadows	x		350
Play On! Vancouver	Vancouver	x		500
PricewaterhouseCoopers Eco Fair	Vancouver	x	x	60
Queens Park Care Centre	New Westminster	x	x	50
Richmond Maritime Festival	Richmond	x		700
Ridge Meadows Hospital	Maple Ridge	x	x	50
Royal Columbian Hospital	New Westminster	x	x	50
Royal Jubilee Hospital Energy Fair	Victoria	x	x	50
S.U.C.C.E.S.S. Walk with the Dragon	Vancouver	x		400
Spirit of the Sea	White Rock	x		500
Surrey Canada Day	Surrey	x		1,000
Surrey Fusion Festival	Surrey	x		1,500
Surrey Memorial Hospital	Surrey	x	x	500
Teddy Bear Picnic	Coquitlam	x		1,000
Vancouver International Airport Green Fair	Richmond	x	x	300
Vancouver International Children's Festival	Vancouver	x		20,000
Whalley Community Festival	Surrey	x		500
Strathcona BIA Sustainability 2.0 Expo	Vancouver		x	50
West End BIA Sustainability Fair	Vancouver		x	50
Total Reach				35,210

Proposed List of Team Terasen Events for 2010

Event	Location	Residential	Commercial
Abbotsford Air Show	Abbotsford	x	
BC Hockey League games	various	x	
BC Lions street party	Vancouver	x	
BerryBeat Festival	Abbotsford	x	
Greek Day	Vancouver	x	
North Delta Lions Family Day	Delta	x	
Pacific National Exhibition Fair	Vancouver	x	
Pitt Meadows Day	Pitt Meadows	x	
Play On! Kelowna	Kelowna	x	
Play On! Vancouver	Vancouver	x	
Port Moody Fingerling Festival	Port Moody	x	
Richmond Maritime Festival	Richmond	x	
S.U.C.C.E.S.S. Walk with the Dragon	Vancouver	x	
Spirit of the Sea	White Rock	x	
Strathcona BIA Sustainability 3.0 Expo	Vancouver		x
Teddy Bear Picnic	Coquitlam	x	
Vancouver Giants	Langley/Vancouver	x	
Vancouver International Children's Festival	Vancouver	x	
Whalley Community Festival	Surrey	x	

ENABLING ACTIVITIES

Details of the enabling activities programs are described in this section. These activities include:

- Research and Evaluation
 - Residential End Use Study (REUS)
 - Sustainability and Social Responsibility Attitudes Study Report
 - Residential Retrofit Market Evaluation for Terasen Gas
 - ENERGY STAR® Heating System Upgrade Evaluation
 - Efficient Boiler Program Evaluation
 - Okanagan Spray Saver Pilot Program Evaluation
 - Conservation Education and Outreach 2010 Evaluation
- Efficiency Partners Program
 - Contractor Program (2009)
 - New Contractor Program (2010)
- Pilot Programs (2009)
 - Okanagan Spray Saver Pilot Program
 - Furnace Servicing Pilot – “Give Your Furnace Some TLC” Campaign
- Pilot Programs (2010)
 - Behaviour Change - Vancouver Coastal Health Authority and Providence Health Care staff engagement
 - Behaviour Change - Destination Conservation for Public Buildings Pilot Program
 - Domestic Hot Water Tier Three Technologies pilot
 - EnerGuide 80 Program

RESEARCH & EVALUATION: RESIDENTIAL END USE STUDY (REUS)

Program Area: Residential Energy Efficiency Programs

Methodology:

Due to complexity of the REUS, the final results were completed and compiled towards the end of 2009. Prior to the 2008 REUS, two REUS studies were conducted by TGI (formally BC Gas), one in 1993 and a second one in 2002. Neither of these prior studies included TGVI. The 2008 REUS study sought to understand what factors impacted residential gas usage across TGI and TGVI. These included appliance efficiency, changes in housing construction and customer behaviours and attitudes. The study was jointly funded by several departments within the Companies, including the EEC group. The overall cost of the project was \$213,000 which included EEC's contribution of \$20,000.

Planning for the study was started in spring 2008 with an RFP issued in summer 2008. Sampson Research was selected to conduct the research in conjunction with Habart & Associates Consulting Inc., NRG Research Group, InterVISTAS Consulting Inc. and Innes Hood Consulting Inc. The fieldwork was undertaken in December 2008, and it took about twelve months to complete the research due to the complexity of the project. The study included TGI and TGVI residential customers from each of the following five regions: Lower Mainland, Interior, Vancouver Island/Sunshine Coast, Whistler and Fort Nelson. The fieldwork consisted of a survey questionnaire which was mailed to respondents; however, they had the option of completing and mailing the paper survey or completing online. Over 2,200 surveys were completed. The analysis was completed by May 2009 and the final report was completed by November 2009. In addition a Conditional Demand Analysis and a Segmentation Analysis were completed to complement the REUS. The highlights of this extensive study are outlined in the below.

Findings:

Trend Analysis

Declines in weather normalized use rates (i.e., gas consumption per household) have been experienced in four of the five Terasen Gas Inc regions between 1999 and 2008. Overall, the Companies' use rates are down 15.5 per cent since 2002 and 20.7 per cent since 1999. Whistler was the only region experiencing an increase in its residential use rate since 2002 (+6.4 per cent).

Declines in natural gas use rates are primarily attributed to the following factors and trends:

- Construction of smaller, less energy-intensive multifamily dwellings including townhouses, and apartments.
- Improvements in the thermal envelope of homes (improved insulation, energy efficient windows, etc.).

- Improvements in the efficiency of gas end uses including furnaces, water heaters, and fireplaces.
- Improvements in the efficiency of hot water-using appliances, including front loading clothes washers, and dishwashers.
- The long-term decline in the average number of people per-household.
- Reduced hot water demand stemming from the aging of the population and proportionately fewer households with young families.
- Increases in the price of natural gas. The inflation-adjusted variable rate portion of natural gas prices in the Lower Mainland region, for example, increased by 10 per cent between January 2002 and December 2002, and 78 per cent since January 1999.

Trends countering the decline in use rates include:

- Increased space heating requirements of newer single family detached homes due to increased interior volumes (increased ceiling height and increased floor area), i.e. takes more energy to heat houses with high ceilings (10 or 12 feet) as opposed to regular height of 9 feet)

Building Envelope & Renovations

- Eighty-three percent (83 per cent) of respondents to the 2008 REUS live in single family detached (SFD) dwellings, 13 per cent in duplexes or townhouses, one per cent in apartments or condominiums, and 3 per cent in mobile homes or other dwelling type.
- Individually metered suites within a multi-storey building, also described as vertical subdivisions (VSDs), are home to higher proportion of younger residents (under the age of 44) compared to SFDs and other multifamily dwellings (MFDs).
- The average length of residence (years living in the same premise) is increasing, presently 15 years, up from 10 years in 1993. The frequency of changes in residence decreases as people age.
- Average size (floor space) varies by building type and dwelling vintage. SFDs averaged 2,263 ft², compared to 1,672 ft² for MFDs, and 1,291 ft² for VSDs. SFDs built after 1985 tend to be larger (up to 24 per cent larger), on average, than those built earlier.
- The incidence of partially or completely finished basements is increasing, up from 62 per cent in 1993 to 68 per cent in 2008.
- Nearly three quarters (74 per cent) of basements and crawlspaces are heated during the winter season.
- Homes built after 1985 are increasingly likely to have nine or ten foot ceilings, compared to the traditional eight foot ceiling of homes of older homes. VSDs are more likely than SFDs and MFDs to have nine or ten foot ceilings (average of 60 per cent versus 23 per cent and 35 per cent respectively). The majority (81 per cent) of VSDs were built since 1995.
- Consistent with trends in housing construction and changes in building codes, newer homes are more likely to have average or above average insulation, high efficiency windows, and insulated outside doors.

Renovation Activities – Past and Planned

- The top three renovations undertaken in the last five years include purchasing energy efficient appliances (37 per cent of customers), installing weather stripping or caulking (21 per cent), and installing a low flow showerhead (19 per cent). These are also the top three activities expected to occur during the next two years. A comparison of stated intentions from the 2002 REUS with renovations undertaken during the past five years by 2008 REUS respondents suggests that, with a few exceptions, stated intentions are a good predictor of future actions.
- Eleven percent (11 per cent) of customers made changes involving fireplaces or heating stoves during the last five years, and 8 per cent plan to undertake similar renovations in the next two years.

Space Heating

- Nine-in-every-ten customers use natural gas as their primary space heating fuel; a proportion that has remained stable since 1993.
- Fifty-six percent (56 per cent) of customers use a supplementary fuel to heat their home. Electricity is the predominant supplementary space heating fuel, used by 67 per cent of these customers. Wood is the second most common supplementary space heating fuel (14 per cent).
- Compared to 2002, the use of electricity as a supplementary space heating fuel has increased from 58 per cent to 73 per cent of TGI households that use supplementary space heating fuel.
- Three percent (3 per cent) of customers switched their main space heating fuel in the last five years, with a net shift being from natural gas to electricity. This shift is most evident in the Lower Mainland, Interior and TGV regions.
- Regardless of main heating method, gas fireplaces are the most commonly used secondary method of heating among customers (29 per cent of TG customers). Wired-in and portable electric heaters are the second and third most common methods (11 per cent and 10 per cent respectively).
- VSDs are significantly more likely than SFDs or MFDs to use a gas fireplace as either the main or secondary heating method.
- Interior and Fort Nelson customers are significantly more likely than households in other regions to use a wood stove as their secondary heating method.
- On average, 22 per cent of customers have installed a new gas furnace or boiler in the last five years, primarily because of equipment failure (anticipated or actual). High efficiency furnaces were chosen by 40 per cent of those installing a furnace.
- Seventy-three percent (73 per cent) of customers with a standard efficiency furnace leave their furnace's pilot light on for 12 months of the year.

Fireplaces and Heating Stoves

- Eighty-five percent (85 per cent) of customers have at least one fireplace and/or free standing heating stove.
- The top three most popular fireplace types are heater type gas fireplaces (50 per cent of customers), wood burning fireplaces (28 per cent), and decorative gas fireplaces (22 per cent).
- Penetration of fireplaces and heating stoves is highest in TGW (98 per cent of customers) and TGVV (90 per cent), and lowest in the Fort Nelson region (47 per cent).
- Twenty-eight percent (28 per cent) of respondents with a gas fireplace that uses a pilot light, never turn off the pilot light.
- Fireplace operating hours are highest in the Fort Nelson and TGVV regions (766 and 702 hours per year, respectively), and lowest in the Lower Mainland region (393 hours). Average wintertime usage by region is correlated with the regional climate (e.g., number of heating degree days).
- Average annual use of fireplaces and heating stoves is significantly higher for VSDs (697 hours per year) than SFDs (459 hours) and MFDs (387 hours). This is consistent with the greater tendency of customers living in VSDs to use their fireplace as either a primary or secondary space heating method.

Water Heating

- The penetration rate of gas-fired hot water tanks among Companies' customers is 89 per cent, up from 85 per cent in 2002.
- Whistler households are significantly more likely than any other region to have two or more hot water heaters. This is consistent with the high incidence of secondary suites in the resort community.
- Storage-type hot water tanks (any fuel) continue to make up the vast majority of hot water heaters. One percent (1 per cent) of customers have condensing style hot water heaters and 3 per cent have an instantaneous hot water heater.
- Thirty-eight percent (38 per cent) of customers have replaced their hot water heater during the last five years. This is on par with the findings from the 2002 REUS.
- The penetration of hot water heater blankets is 6 per cent of households, down from 15 per cent in 2002. Improvements in the tank wall insulation of new hot water heaters has reduced the cost-effectiveness of hot water heater blankets.
- Eighty-one percent (81 per cent) of customers use either piped gas or propane for both their main space heating fuel and their water heating fuel.
- Only one percent (1 per cent) of respondents use solar energy to pre-warm or supplement water heating.

Appliances

- The penetration of gas ranges has increased from 9 per cent of TGI households in 1993, to 17 per cent of households in 2008.
- Front loading clothes washers have increased their penetration from 9 per cent of TGI households in 2002 to 27 per cent in 2008, largely at the expense of the lesser-efficient top-loading models.
- The proportion of home appliances rated ENERGY STAR® varies from a low of 2 per cent for air conditioners to a high of 53 per cent for refrigerators.

Pools and Hot Tubs

- Six percent (6 per cent) of households have a swimming pool that is for their exclusive use only (i.e., not shared with other residences, as is the case in multifamily complexes).
- Forty-three percent (43 per cent) of swimming pools are heated with natural gas. The next most commonly used fuels are solar (15 per cent) and electricity (5 per cent). Thirty-six percent (36 per cent) of pools are not heated.
- Thirteen percent (13 per cent) of households have an exclusive use only hot tub.
- Electricity is the predominant fuel used to heat hot tubs (83 per cent of all households with an exclusive use hot tub). Only 15 per cent of households with a hot tub use piped gas or propane to heat the water.
- Ninety-five percent (95 per cent) of hot tub owners use a hot tub cover. Sixty-nine percent (69 per cent) of pool owners use a pool cover.

Behaviours

- Fifty-five percent (55 per cent) of Companies' customers use at least one programmable thermostat to control temperature in their home.
- Eighty-three percent (83 per cent) of customers with thermostats (programmable or otherwise) always or usually set back the temperature at night, and 70 per cent of them so during the day when no one is at home.
- Customers in electrically heated homes are more likely than those in gas heated homes to keep unoccupied parts of the house cooler than the rest of the home (77 per cent versus 64 per cent, respectively). Customers living in VSDs have a lower share of their rooms that are always heated than do those living in SFDs (52 per cent versus 79 per cent respectively).
- Forty-one percent (41 per cent) of respondents said their home is either always or somewhat drafty. Efforts at draft proofing were unsuccessful for 26 per cent of respondents.
- The use of window coverings (storm windows or plastic sheeting) is highest in the Fort Nelson region, and is more common among rental properties and homes with single pane windows.

- The number of showers, laundry loads, dishwashing loads, and baths decrease as the number of people in the home decrease. A household that decreases in size from four members to two (e.g., the typical situation when grown-up children leave home) will see, on average, a 36 per cent decline in the number of dishwasher loads, a 43 per cent decline in the number of laundry loads, a 30 per cent decline in the number of baths, and a 53 per cent drop in the number of showers.
- Thirty percent (30 per cent) of respondents, on average, turn down, turn off, or use the vacation setting on their hot water heater when away from home for more than a few days.
- On average, 58 per cent of laundry is washed using cold water.

Programs and Services

- Eleven percent (11 per cent) of respondents have participated in a program to reduce energy use in the last five years, with the program sponsored by either Terasen, a government agency, or some other organization or company.
- Interest was highest for a furnace tune-up program, home energy audits, and a do-it-yourself online energy audit.
- Eighty-five percent (85 per cent) of customers claimed they were at least somewhat knowledgeable about ways to save energy. Only 13 per cent categorized themselves as very knowledgeable.
- Seventy-eight percent (78 per cent) of respondents to the 2008 REUS agreed that natural gas is a clean and efficient energy source, unchanged from the 2002 REUS.
- Seventy-four percent (74 per cent) agreed with the statement “natural gas is a safe energy source”. Regional results did not differ significantly with the exception of Interior residents who were somewhat more in agreement with the statement than residents in the other regions.

Conditional Demand Analysis

A conditional demand analysis (“CDA”) was conducted using data from the 2008 REUS, billing records, and regional weather stations to estimate unit energy consumption (“UEC”) estimates for each of the major gas end uses including main and secondary space heating, water heaters, fireplaces, cook tops, pools, hot tubs, and barbeques. Estimates were generated for the five TG regions and TGI. Highlights include:

- Primary and secondary space heating are the two largest gas end uses, consuming 58 GJ/year and 23 GJ/year, respectively.
- Other major gas end uses are water heating (20 GJ/year), decorative fireplaces (21 GJ/year), and heater type fireplaces (17 GJ/year).
- Consistent with their tendency towards smaller household sizes (i.e., number of people per home), UECs for gas water heating for VSDs and MFDs are lower than SFDs.

RESEARCH & EVALUATION: SUSTAINABILITY AND SOCIAL RESPONSIBILITY ATTITUDES STUDY REPORT

Program Area: Residential Energy Efficiency Programs

Methodology:

Produced by Conscientious Innovation ("CI"), a Vancouver-based market research firm, the Sustainability and Social Responsibility Attitudes Study ("SHIFT") report is a market research tool comprised of qualitative and quantitative research, cultural reporting and trend analysis. Since Companies' financial commitment to the report was made before the research went into the field, the Companies were offered an opportunity to insert a number of questions related to media brands, lifestyle activities and consumption behavior.

The methodology of the SHIFT report includes both qualitative and quantitative data. The former is based on the results of over 32 focus groups conducted in Canada and the US as well as secondary market research analysis. The latter is based on 5,000 responses from the general North American population conducted through an online panel. Terasen Gas provided input specific to home energy and energy efficiency in mid-2009 during the design stage of the study. The analysis was completed by December 2009 and the final report was completed by January 2010.

Findings:

The results of the SHIFT report home energy consumer study is a resource for Terasen Gas staff to assist them in designing and implementing EEC programs. It summarizes detailed findings on consumers who are making sustainable choices related to home energy. The key findings of the report are:

- 60 per cent of North Americans say they have already made sustainable and socially responsible choices related to Home Energy
- 69 per cent of Canadians say they have already made sustainable and socially responsible choices related to Home Energy
- 64 per cent of Home owners versus 56 per cent of Home Renters say they have made sustainable and socially responsible choices related to Home Energy
- Food, Home Cleaning and Gardening/Yard Work are the top three other areas they say they have made sustainable lifestyle choices & purchase decisions
- Lighting and Home Heating are the top two areas they say they have made sustainable lifestyle choices & purchase decisions related to Home Energy
- 65 per cent are concerned about the health and environmental toxins in products today
- 61per cent rate Global Warming as important
- 33 per cent rate Organic Products as important

The top 5 sustainability issues (in terms of importance) are:

- Feeling connected to my friends, family & community (90 per cent)
- Balanced life (90 per cent)
- Being paid a living wage (88 per cent)
- How employees are treated at companies (86 per cent)
- Nurtured personal relationships versus material possessions (83 per cent)

RESEARCH & EVALUATION: RESIDENTIAL RETROFIT MARKET EVALUATION FOR TERASEN GAS

Program Area: Residential Energy Efficiency Programs

Methodology:

The LiveSmart BC Residential Retrofit Incentive Initiative launched in May 2008, by the Provincial government, provided incentives to reward residential retrofits that saved energy and reduced GHGs. As part of the Energy Efficient Buildings Strategy, the goal was to create a one-stop shop to provide homeowners with coordinated, easy access to utility, provincial, and federal incentives. Data-gathering for the LiveSmart partnership was done through NRCan ecoENERGY Home Renovation program. The first phase of the LiveSmart BC Residential Retrofit Incentive Initiative was initially set for a three-year period, however it was fully subscribed with over 40,000 participants within the first 15 months. With the provincial funding fully utilized, the first phase of LiveSmart BC expired on August 16, 2009.

With the end of this first phase, the utility partners in LiveSmart BC (the Companies, BC Hydro and Fortis BC) are actively working on rolling out a new version of a collaborative residential retrofit incentive program. Utilities-driven DSM programs are required to adhere to strict cost-benefit analysis that is focused on the overall societal benefits and have an established outreach and cost-effective channels for their target customers. Government-driven programs can contribute by supporting new technologies and providing subsidies for measures such as home energy audit assessments where there is zero savings.

In November 2009, Terasen commissioned Angus Reid Strategies to evaluate awareness levels among members of the general population regarding energy efficiency programs, rebates and incentives. The study was designed to provide insight into the various factors that motivate homeowners to participate in incentive programs, as well as to determine awareness of existing programs and brands.

The fieldwork was undertaken in December 2009; the cost of the study (\$17,800) was covered by The Companies³. The sample size consists of over 840 of BC homeowners who are responsible for directly paying their utility bills. The analysis was completed in early January 2010, and the final report was delivered in late January 2010.

Findings:

- The type of energy used to heat the home has a significant impact on the monthly energy bill. Those using natural gas as their primary heating source report paying a higher monthly bill. Those with higher monthly bills are more likely to participate in energy efficiency incentive programs.

³ Note that the final report was delivered in January 2010, and the full payment was made then; therefore, the cost of the study is not reflected in the 2009 budget but rather in 2010.

- BC homeowners say it is important to reduce their energy use, the majority because it will save money. Of the one-third of homeowners have participated in an energy efficiency incentive program, the most common reasons are to save money, take advantage of incentives and to improve the comfort of their home.
- Eight brands were evaluated for awareness and participation. As to be expected due to budget levels and time-to-market, BC Hydro's Power Smart program has the highest awareness and participation among homeowners, followed by ENERGY STAR®. LiveSmart BC is in the middle of the pack with three-in-five homeowners aware of the program but only one-in-five participating in the program.

RESEARCH & EVALUATION: 2005-2007 ENERGY STAR® HEATING SYSTEM UPGRADE
EVALUATION

Program Area: Residential Energy Efficiency Programs

Methodology:

The ENERGY STAR® Heating System Upgrade Evaluation was commissioned in the summer of 2007; the first phase was completed in early 2008. The second phase was completed in late 2008 with final results delivered in early 2009. The ENERGY STAR® Heating System Upgrade Evaluation was performed by Sampson Research, a BC-based market research firm, with Habart serving as advisors to the study.

The Program offered residential customers a financial incentive of \$250 towards the purchase of an ENERGY STAR® qualified High Efficiency Natural Gas Furnace (“HEF”) or boiler. There was an additional incentive when the qualifying furnace was equipped with a Variable Speed Motor (“VSM”). The primary objectives of the program were to reduce energy consumption, peak demand, and GHGs for residential customers by increasing the energy efficiency of their home heating systems. A total of 8,652 residential customers participated in the program for the timeframe of September 2005 to March 2007. Rebates and incentives totalled \$2.73 million. Funding for the incentives was provided by Terasen, with co-funding from MEMPR, BC Hydro, FortisBC, and NRCan.

The objectives for the first phase of the study were:

- Assessing factors influencing program participation, the effectiveness of program marketing / advertising, free ridership, reasons for non-participation, and overall customer and trade ally satisfaction with the program.
- Assessing program impact on sales of qualifying HEF’s, and VSM, for both participating and non-participating customers
- Documenting and assessing program impact on furnace and secondary heating operating behaviours that affect energy use, with particular emphasis on hours of operation
- Determining the status of market transformation for HEF’s, and furnaces with variable speed drive blower motors in the British Columbia market
- Developing preliminary estimates of program impact on natural gas sales and carbon dioxide emissions.

The completed report of phase one of this study was filed in the response to EEC Application BCUC IR 1.71.2.1, filed on July 11, 2008.

The primary objective of the second phase of the evaluation was to update estimates of program energy and demand savings using a comparison of weather normalized billing histories for participants, and a comparative sample of non-participants (billing analysis). The estimate of gross program savings derived from the billing analysis would be adjusted for free riders and program spillover to determine net program energy and peak demand savings.

Findings:

First Phase

- 57 per cent of participants in the Terasen program credited the program with influencing their decision to purchase a high efficiency furnace, meaning that 43 per cent of participants were free-riders and would have selected a high efficiency furnace without the incentive.

Second Phase (Including updated first phase results):

- Based on net 9.6 GJ per annum savings per high efficiency furnace, the program generated 78.8 terajoules ("TJ") in annual savings for the first 2.3 years and 47.4 TJ of annual savings in subsequent years.
- The gross energy savings per-participant from retrofitting to a high efficiency furnace were estimated at 9.6 GJ per year—this number is lower than the Phase I engineering estimate of 13.4 GJ per year.
 - One possible explanation for the decrease in estimated savings for retrofitting with a high efficiency furnace is that non-participants tended to replace furnaces that had a lower AFUE rating relative to that of participants.
- Based on the evaluation results, Terasen's 2005-07 Heating System Upgrade Program will reduce Carbon Dioxide ("CO₂") emissions by 3.940 kilotonnes annually for the first 2.3 years and 2.370 kilotonnes annually for subsequent years.
 - CO₂ reduction estimates are based on Terasen's emissions reduction factor of 50 tonnes carbon dioxide per TJ of energy saved.

The Table below summarizes the energy savings attributable to Terasen's 2005-07 residential Heating System Upgrade Program based upon billing analysis results, a net-to-gross ratio of 0.57 and a spillover of 2.3 years.

Energy Savings Estimates – September 2005-March 2007

Impact Component	Unit Savings (GJ)	Gross Participants	Gross Savings (TG)	Net to Gross Ratio	Net Savings (TJ)
Direct	9.6	8,652	83.1	0.57	47.4
Spillover	12.1	2,596	31.4	-	31.4
Annual - first 2.3 years	-	-	-	-	78.8
Annual - subsequent years	-	-	-	-	47.4

RESEARCH & EVALUATION: EFFICIENT BOILER PROGRAM EVALUATION

Program Area: Commercial Energy Efficiency Programs

Methodology:

TGI and TGVV will select a sample of approximately 30 previous participants who have successfully installed high efficiency boilers in order to perform a billing analysis. TGI and TGVV will compare the participating buildings' weather normalized, pre-installation gas consumption, to its weather normalized post installation gas consumption in order to assess the impact of the boiler installation. The difference between the two, absent the presence of any other measure significantly impacting gas consumption, will be attributable to the boilers. Other measures which may have impacted gas consumption will be identified via an interview with the building owner/participant.

The sample group selected for the billing analysis will be from those participants who have successfully completed their boiler installation prior to 2009. Thus the new boilers will have operated for at least one (1) full heating season prior to the analysis of the consumption data.

Note that while the billing analysis will necessarily focus on participants with a previous billing history (ie retrofits as opposed to new construction) the findings will be applicable to both retrofit and new construction participants for the purposes of tracking energy savings. This is because the end result of the analysis will be a percentage reduction factor to energy consumption attributable to high efficiency versus standard efficiency boilers. Thus the reduction factor applies to new construction participants since the baseline case against which their high efficiency boiler(s) derives energy savings is a standard efficiency boiler.

RESEARCH & EVALUATION: EVALUATION OF OKANAGAN SPRAY N' SAVE PILOT PROGRAM

Program Area: Commercial Energy Efficiency Programs

Methodology:

The following methodology is proposed for the second round of the Okanagan Spray N' Save Pilot Program Evaluation

Further to the initial arithmetic analysis, a number of participants will be included for metering of their actual hot water consumption in order to empirically confirm the gas savings associated with the spray valves. First a sample consisting of approximately 30 willing participants will be identified. TGI will then have water meters will be installed by a licensed plumber as follows:

1. Flow meters for the hot water line serving the spray valve.
2. Temperature meters on the inlet and outlet water pipes of the hot water heaters.
3. A data logger will be installed to record the water flow and temperature information for the length of the metering period.

Usage data will be collected from the data logger at 2 week intervals for a period of 1 month. Subsequently the new low flow spray valve will be removed and the old, standard flow rate spray valve will be reinstalled. Once again usage data will be collected from the data logger at 2 week intervals for a period of 1 month. After completion of the data collection the new, low flow spray valve will be reinstalled. The collected data will be reviewed to establish actual energy savings.

Subsequent to all data collection/processing the results will be compared and used to establish a reasonable and prudent estimate of the gas savings attributable to the program.

RESEARCH & EVALUATION: CONSERVATION EDUCATION AND OUTREACH 2010 EVALUATION

Program Area: Conservation Education and Outreach Programs

The benefits of CEO initiatives are also not currently translated directly into energy savings; however, the costs are included in the Portfolio Level analysis, and the overall portfolio TRC test results still have to be greater than 1.0. Historically, CEO initiatives were limited to print and online publications, trade shows, and limited school programs.

Advertising Tracking

Advertising tracking, as discussed in the Companies' response to EEC Application's BCUC IR 1.47.1, can be used to investigate the effectiveness of specific commercials or ad campaigns in terms of the recall of specific messages, changes in people's perceptions, and behavioural changes in the target audience. Tracking research generally consists of telephone interviews with homeowners (gas and non-gas customers). This would be conducted with a representative sample of target-audience consumers from the TGI and TGVI service areas. It can investigate the effectiveness of specific commercials or campaigns in terms of the recall of specific messages, changes in people's perceptions, and behavioural changes in the target audience. It answers questions like the following:

- What messages and ideas from the advertising do consumers remember?
- Do the remembered messages correspond to the advertising messages that the advertising was intended to communicate?
- Did the messages and ideas translate into action?

Process Evaluations

Process evaluations typically measure the effectiveness of the program by assessing how well the program met a set of goals or metrics defined by the program administrators. This method has been used by other utilities and American state agencies, such as Southern California Edison, and Pacific Gas & Electric.

Examples of goals/metrics for educational and communication programs include:

- What messages and ideas from the advertising do consumers remember?
- Do the remembered messages correspond to the advertising messages that the advertising was intended to communicate?
- Did the messages and ideas translate into action?

Process evaluations typically measure the effectiveness of the program by assessing how well the program met a set of goals or metrics defined by the program administrators. This method has been used by other utilities and American state agencies, such as Southern California Edison, and Pacific Gas & Electric.

Examples of goals/metrics for educational and communication programs include:

- Increase awareness of the relationship between energy and the environment among students
- Deliver at least two special events annually during which the public is exposed to specific key messages and provide with information and materials

Examples of techniques used to assess whether goals/metrics are met include:

- In-depth interviews with program staff
- Survey of program participants, and qualitative analysis of responses
- Focus groups of program participants

Web Analytics

Web analytics is the measurement of the behaviour of visitors to a website. Simply put, web analytics is the process of understanding the Companies' online presence so that it can be optimized. The Companies work with Omniture SiteCatalyst, a remotely hosted, subscription-based solution for real-time web site reporting and analysis. Codes are placed on the Companies' webpages that execute when the page loads. As the page loads and the code on the page executes, it sends a request to the SiteCatalyst server for a web beacon, a two-by-two transparent pixel image. Along with this image request, the code collects and sends additional information to Omniture data centres. The data centres then populate a report with the collected data, which can be accessed by the Companies' web team, to allow them analyze the web activity related to a specific CEO initiative.

EFFICIENCY PARTNERS PROGRAM: CONTRACTOR PROGRAM (2009)

Program Area(s): Commercial and Residential Energy Efficiency Programs

Target Market: Majority Residential & Minority Commercial

Duration: Summer 2007 through April 30th 2010

Objectives:

- Provide customers with accurate energy efficiency cost versus benefit options through industry partner groups.
- Encourage contractors to educate and nurture a change in customers' daily energy use habits by providing EEC program information, general efficiency advice and supporting collateral publications such as Hot Tips.
- Through the partner groups, promote EEC programs utilizing energy efficient appliances and services such as ENERGY STAR® and Enerchoice.
- Promote the best use of Provincial energy resources.
- Help to provide contractors with education on new energy efficient technologies
- Achieve a higher level of customer confidence in the quality of services rendered by contractors (safe and fairly priced).
- Improve the overall quality of installers through cooperative BC Safety Authority and supplier workshops educating the methods to properly install and maintain more complex energy systems.
- Improve communication between Terasen's EEC department and the Energy Efficiency Industry stakeholder groups through quarterly information news letters.

Background:

In 2007, TGV's Qualified Dealer Program ("QDP") was reintroduced in the TGV service territory, with an emphasis on further upgrading the quality of the participating gas contractors, in order to ensure that customers had access to highly qualified gas contractors. Contractors were required to re-register for the QDP which now had more stringent guidelines as follows:

- Better Business Bureau reference
- BC Safety Authority Registration
- Business supplier referral
- Customer referral
- Business license
- Worksafe BC coverage
- Two million dollar minimum liability insurance
- Business credit check

Since the re-launch of the program in 2007, and until the increased EEC funding was approved in April of 2009, limited resources were devoted to the QDP and essentially no incentive

program offers for the TGVl market area were provided. There are currently only about 75 QDs registered in the TGVl area out of a total market of approximately 350 gas contractors located in the TGVl service area.

The marketplace has changed significantly since the QDP was first launched. Since the QDP was focused on TGVl, customers were looking primarily for a gas contractor to convert them to natural gas and service their natural gas products. Today's energy consumer is looking for a wide range of services that include reliable information sources and manufacturers, installers and service contractors who will provide energy efficiency recommendations for their entire house. This will require expanding the scope of the QDP to eventually include additional groups such as A and C ticket contractors. The QDP will also need to include new Energy Efficiency service groups such as EcoEnergy Home Assessment auditors and draft-proofers. The large number of gas contractors located in the Lower Mainland, the Interior, and Vancouver Island represent an excellent opportunity for Terasen to promote a "whole-house" energy concept to customers. A whole-house system approach considers the interaction between the building site, regional climate, energy consumption habits, appliance efficiency and other elements or components in the home. Reduction of appliance energy utilization alone will not achieve the total provincial BC Energy Plan targets. The B-ticket gas contractors are one of the largest industry groups that influence end use customers. Domestic/commercial BC Safety Authority licensed B-ticket gasfitters install, test, maintain and repair propane and/or natural gas lines, appliances, equipment and accessories in residential and commercial premises up to 75,000 BTU. Industrial A-Ticket gasfitters perform the same tasks as B plus unlimited BTU range in industrial settings. They may work in new construction, or be installing systems in existing buildings that are being upgraded. C-tickets are limited to residential gas appliance servicing only. The company's overall objective for this market sector is to expand and rebrand the existing TGVl Qualified Dealer Program (B-ticket contractors) in breadth and scope and to open the new contractor program to include the Lower Mainland and the Interior.

The new contractor program will also eventually include efficiency service groups that have been previously excluded from the QDP. The program should be structured to be able to eventually include the following Efficiency Partners over time:

- appliance installation contractor (A&B ticket)
- gas appliance service groups (C ticket)
- suppliers & distributors
- big box retailers
- residential and commercial energy auditors
- weatherization services (draft proofers)
- support groups, i.e. regulators, colleges
- associations

The rationale behind this expansion is that the current QDP has limited capabilities with the majority of the participating TGVl contractors being small, "mom and pop" types of businesses. With an expansion to the Lower Mainland and Interior service areas, there is a concentration of much larger companies that will involve working with supplier and distribution groups. This will be especially true with big box stores. With the inclusion of a comprehensive group of service providers in a Terasen contractor program, customers will have access to a reliable network of

energy efficient service providers with the ability to assist them with a wider range of efficiency services.

New Contractor Program Development Milestones:

In the third quarter of 2009 the efficiency partners program was established with a focus on evaluating and expanding the existing contractor program. The following is a list of the 2009 contractor program development milestones:

- Internal QDP program review of existing procedures and participation (complete)
- Connect with industry stakeholders for feedback and opportunities for collaboration (complete)
 - i. Representatives of existing Qualified dealers on TGV
 - ii. Contractor supplier groups
 - iii. Manufacturers and Distributors
 - iv. Contractor Associations
 - v. Trades Training Groups
 - vi. BC Safety Authority
 - vii. Thermal Environmental Comfort Association (TECA)
 - viii. Mechanical Contractors Association (MCA)
- Conduct TGV gas contractor survey (complete)
- Facilitate three contractor focus groups on Vancouver Island (complete)
- Initiate the rebranding of the program (ongoing)

Feedback from all groups surveyed was very positive. All groups are looking forward to participating in the new Efficiency Partner Contractor program and recognize the need for Companies' participation to achieve transformation of the energy efficient equipment marketplace. A summary of feedback specifically from the Vancouver Island Contractor Focus Groups can be found below:

- The face of the contractor is changing and many are moving away from mail and fax machines to e-mail communication.
- The concept of quarterly newsletters and cooperative workshops with supplier groups was well received.
- Emphasis was placed on the timing of introducing programs with the fall and spring being the busy periods for contractors. There were many requests to have advance notice of new programs and information on new emerging efficiency technologies.
- 75 per cent of water heater replacements take place in emergency situations, after the appliance fails and the rest are planned replacement units. Ninety five per cent responded positively to promoting ENERGY STAR® furnaces. As well, most agreed that customers were asking about high efficiency.
- Keep programs simple avoiding extra paperwork for Contractors feel the utility needs more face to face connection with customers. The EEC department should attend smaller home shows alongside local gas contractors and suppliers.

The findings from the Vancouver Island Contractor Focus Group informed the Companies that customers are asking about energy efficiency and contractors can only work with the information they have from specific suppliers. The focus groups were very well attended and

contractors were positive and looking forward to participating in the new program. Focus Groups will be held in the Lower Mainland and Interior in 2010. Results from the TGVI focus groups will allow for a possible link up with BC Safety Authority B-149 Training sessions.

Co-Op Advertising:

To help promote energy efficient natural gas products and services, a Co-op Advertising program is available for existing Qualified Dealers on TGVI, for those that choose to participate. Co-op Advertising dollars are provided for the following media:

- Print (**Note: Print ads in the Yellow Pages of a telephone directory are not eligible for co-op advertising.*)
- Radio
- Television
- Direct mail (i.e. flyers)
- Home show displays (*promoting natural gas fired equipment only*)

In order to qualify for co-op advertising dollars, the advertisement produced must include the following:

- Qualified Dealer logo (if print ad or flyer)
- Promotion of natural gas and natural gas operated equipment only

Once all required conditions are satisfied, reimbursement is provided to the applicant for 50 per cent of the media insertion costs of advertising. Home Show booths are reimbursed for 50 per cent of their cost up to a maximum of \$100.

There was a moderate uptake of participation in 2009 for the Co-op advertising program. The Companies are currently reviewing the structure and effectiveness of this program and will be making adjustments in 2010.

EFFICIENCY PARTNERS PROGRAM: NEW CONTRACTOR PROGRAM (2010)

Program Area(s): Residential and Commercial Energy Efficiency Programs

Target Market: Majority Residential & Minority Commercial

Duration: May 1st 2010 through April 1st 2011 (likely to be extended)

Objectives:

- Focus on the core of the contractor work force: licensed Gas Safety Branch B-ticket contractors serving residential and commercial end users
- TGI contractor Focus groups
- Develop new program

Program Details:

The first and second quarter program tasks include:

- Organize meetings in Vancouver, North Vancouver, Burnaby, Surrey, Kelowna, Kamloops and Prince George
- Compile feedback
- Plan program framework
- Determine qualification process
- Develop application forms
- Develop logo and brand
- Develop collateral such as brochures, advertisements, and web tile
- Facilitate outreach such as lunch and learns, speaking engagements and web ads
- Start New program registration

The third and fourth quarter program tasks include:

- Continue outreach to contractor associations
- Complete contractor registration
- EEC contractor workshops with Suppliers

Contractor program promotional activities will include:

- Direct contact with key individuals among target stakeholder groups (e.g. manufacturers, BC Safety Authority, etc).
- Engagement of suppliers and manufacturer's representatives via information sessions designed to instill awareness of, and answer questions about equipment options and our EEC programs.
- Lunch and learn sessions with plumbers and gas fitters.
- Speaking engagements and web page advertisements with target organizations such as:
 - BC Safety Authority (BCSA)

- Thermal Environmental Comfort Association (TECA)
 - Mechanical Contractors Association (MCA)
- Magazine Advertisement with publications such as:
 - Hearth Patio Barbeque Association Canada (HPBAC) Magazine
 - Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) Innovation magazine
 - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Newsletter
- Upgrade the Terasen WEB search tool to enable customers to connect with service contractors in their service area.
- Bill insert promoting the new program service group

As identified in the contractor focus groups sessions of 2009, quarterly newsletters and cooperative supplier workshops will be the first steps taken to educating contractors about EEC program offers and the benefits of promoting energy efficiency.

PILOT STUDIES (2009)

Details of the 2009 Pilot Studies are described in this section. This includes:

- Okanagan Spray N' Save Pilot Program
- Furnace Servicing Pilot – “Give Your Furnace Some TLC” Campaign

PILOT PROGRAM: OKANAGAN SPRAY N' SAVE PILOT PROGRAM

Program Area: Commercial Energy Efficiency Program

Target Market: Commercial Retrofit

Duration: May - August 2009

Objective:

Run throughout summer 2009, in the Okanagan region, the Spray N' Save Pilot Program sought to achieve a reduction in natural gas consumption associated with the production of hot water by reducing hot water use in commercial kitchens.

Methodology:

TGI installed free of charge, new low-flow pre-rinse spray valves in willing food service facilities (i.e. restaurants, coffee shops, delis, groceries, etc.) in order to reduce the volume of hot water used in dishwashing.

TGI's program operator contacted food service operations, either by letter, in person or by telephone. Appointments were set up for the program operator to visit the establishment, and directly install, free of charge a new, low flow pre-rinse spray valve. The existing spray valve (s) were tagged and stored for six months, in case the establishment was not ultimately happy with the new valve. While on site, the program operator recorded site information such as flow rates before and after the installation, the water supply temperatures, business hours and the fuel source.

The program operator followed up with the food service operation after a certain period of time to determine the level of satisfaction with the new low flow pre-rinse spray valve. All recorded data was collected by TGI and a final report detailing the program operator's observations was produced.

PILOT PROGRAM: FURNACE SERVICING PILOT – “GIVE YOUR FURNACE SOME TLC”
CAMPAIGN

Program Area: Residential Energy Efficiency Program

Target Market: TGVI Residential Retrofit

Duration: January 15, 2010 to June 30, 2010

Objectives:

- Educate customers about the importance of annual furnace servicing in terms of energy savings and reduced gas bills
- Promote contractor relations between TGVI and contractors, as well as between contractors and customers
- Promote appliance and equipment maintenance
- Determine how many participants require a furnace upgrade
- Provide an opportunity for contractors to identify further energy savings opportunities that customer could take advantage of
- Increase awareness of provincial and federal regulations regarding furnaces
- Determine the effectiveness of furnace servicing programs as a tool for educating residential customers about the need for maintaining appliances for optimal efficiency. Also engages contractors in dialogues about safety and the need to upgrade to high efficiency models.

Methodology/Communications Plan

Consumer-Response Marketing (“CRM”) is handling program administration for the Furnace Servicing pilot. To receive the gift card, customers are required to submit their completed application, including the contractor’s BC Safety Authority registration number and pertinent information about the furnace, along with a photocopy of the furnace servicing invoice.

Data gathered for the pilot is based on application form responses, and will be entered into the CRM database as applications are processed. CRM will provide bi-weekly program status reports, and will present a full report at the close of the program.

The TGVI furnace servicing pilot was promoted through the Terasen Gas website, bill inserts, radio, print advertisements in community newspapers, trade publications and contractor communications. The program was announced at the TGVI Contractors breakfast meetings in the first week of December 2010.

PILOT STUDIES (2010)

Details of the 2010 Pilot Studies are described in this section. This includes:

- Behaviour Change – Vancouver Coastal Health Authority and Providence Health Care staff engagement
- Behaviour Change – Destination Conservation for Public Buildings Pilot Program
- Domestic Hot Water Tier Three Technologies pilot
- Furnace Servicing Pilot – “Give Your Furnace Some TLC” Campaign
- EnerGuide 80 Pilot (Program in Development)

PILOT PROGRAM: BEHAVIOUR CHANGE - VANCOUVER COASTAL HEALTH AUTHORITY AND
PROVIDENCE HEALTH CARE STAFF ENGAGEMENT

Program Area: Conservation Education and Outreach

Target Market: Approximately 28,000 staff members

Duration: September 2010 – August 2011

Program Objectives:

The goal of the program will be to pilot an online community site and develop an extensive employee engagement strategy that can eventually be implemented to other health authorities and/or large institutional customers. The focus of the campaign will be to promote and lead VCHA/PHC staff to participate in an online community site where opportunities will be available to learn about energy conservation, and make social commitments towards behavioural changes and GHG reducing actions. With this tool, the Companies hope to be able to investigate the attribution of energy savings to this behavioural program thus potentially providing a benchmark for capturing energy savings from our other education and outreach activities.

Methodology/Communication Plan:

The online tool will allow for staff to share ideas, compare usage with other coworkers, and focus on commitments at home and work, and will be promoted through lunch and learns, posters, contests both within and between facilities, e-newsletters and other methods. Costs associated with the initiative include the tool's licensing fees, consultant fees for development of the website, energy-related content and an engagement plan, and contest prizes. The website, content and engagement plan costs are a "one-time" cost, and once developed, the Companies intend to promote the program to additional Health Authorities and other large institutional clients, as well as our own employees.

PILOT PROGRAM: BEHAVIOUR CHANGE - DESTINATION CONSERVATION FOR PUBLIC
BUILDINGS PILOT PROGRAM

Program Area: Conservation Education and Outreach

Target Market: Regional District Okanagan Similkameen, City of Penticton, District of
Summerland, Town of Oliver, and Okanagan College Penticton Campus

Duration: March 2010 to February 2011

Program Objectives:

The goal of the project will be to find out if the combination of both low cost/no cost efficiency improvements and staff engagement in behavioural change will bring about energy reductions in municipal office facilities, and if energy saving reductions is achieved, the Companies will implement this program in other municipal customers.

Methodology/Communication Plan:

The project will include a strategy and training session, attitudinal and behavioural surveys of the staff before the project is implemented, energy assessments of the participating facilities, development of baseline energy consumption data for each facility, and a review of the empirical savings data at the end of the project.

Funding:

Project is jointly co-funded with FortisBC.

PILOT PROGRAM: DOMESTIC HOT WATER TIER THREE TECHNOLOGIES PILOT

Program Area: Residential Energy Efficiency Program

Target Market: Residential

Duration: April 1, 2010 through April 1, 2011

Objectives:

- Verify the actual energy savings associated with the Tier 3 technologies, as applicable to the Companies' service territory,
- Gather exhaust emission data and inlet gas flow rates,
- Determine GJ consumption relative to heated water volume,
- Identify water usage difference and introduce behaviour changes, while documenting results,
- Identify barriers to the installation and marketing of Tier 3 Technologies,
- Determine actual costs associated with the installation of condensing hot water tanks,
- Obtain feedback from a variety of stakeholders, including manufacturers, installers and end users, regarding the performance of Tier 3 Technologies,
- Determine if Meter changes are required with the higher demand loads, and
- Determine if incentive programs would be viable

The budget for the Tier 3 technologies pilot program is expected to be approximately \$250,000 to cover the purchase and installation of 20 Tier 3 tanks, the purchase and installation of sub-metering devices for gas and water flow, and pilot program evaluation.

Background:

Tier 3 technologies are varied, but two important methods for achieving Tier 3 efficiency levels (EF 0.80 or greater) are condensing hot water tanks and tankless water heaters.

- A condensing water heater is similar to a standard efficiency gas storage water heater but has an improved heat exchanger that allows thermal efficiency ratings as high as 96 per cent and recovery rates as much as four gallons per minute. Condensing water heaters can deliver continuous hot water in high demand households. There are no residential condensing water heaters currently available for sale to consumers; however, GSW/John Wood has models that are appropriate for residential applications. It is estimated that the condensing water heaters will cost three to four times as much as standard efficiency water heaters.
- On-demand or "tankless" water heaters heat water only as it is needed and used. This equipment may incorporate condensing technology with resulting efficiencies higher than 90 per cent. The reports and supplier testing information in other jurisdictions regarding the energy savings for tankless or On-Demand Domestic Hot water systems are incomplete and lacking in value when comparing benefits over conventional hot water tank use.

Working with a variety of manufacturers, the Companies will measure the gas and water consumption in approximately 20 homes for 6 months, installing the Tier 3 technologies after 3 months, and measure the difference in energy consumption between the 3 months prior to installation and the 3 months following the installation of the Tier 3 tanks. The Tier 3 Technologies pilot program is in the early design stages and the structure of the program is subject to change, based on feedback from industry, manufacturers, and contractors.

PILOT PROGRAM: ENERGUIDE 80 PILOT

Program Area: Residential Energy Efficiency Program

Target Market: Residential Retrofit and New Construction

Duration: January 2010 through April 1, 2011

Objectives:

- Support early adoption of new building code standards which would move the current EnerGuide 77 efficiency rating to a new target of EnerGuide 80 for new home construction
- Provide existing gas heated homeowners with incentives to perform efficiency upgrades that result in EnerGuide rating improvements

Methodology:

The following quarterly milestones outline the pathway to assessing and developing the EnerGuide 80 Retrofit and New Home Construction program.

The following are activities for Q1 & Q2 of 2010:

- Review and evaluation of Home Energy Assessment process with Service Organizations, NRCAN and MEMPR.
- Review verification testing of random assessments performed by NRCAN.
- Work with Certified Energy Advisors (Service Organizations) to upgrade delivery of Assessment services.
- Work with NRCAN and ENERGY STAR® to establish rating levels for BC zones.
- Undertake Hot 2000 Modeling to establish correlations that relate, comparative GJ savings, guidelines for a prescriptive upgrade, and resultant target EnerGuide ratings
- Evaluate results and develop incentive program based upon results of California Standard Practice tests.

The following are activities for Q3 and Q4 of 2010:

- Introduction of Whole Home Labeling and possibly ENERGY STAR® levels.
- Run pilot with that validates EnerGuide rating increments with each step outlined in the prescriptive path guidelines.
- Based on results of modeling, pilot, and stakeholder feedback, rollout Residential EnerGuide Home Retrofit and New Construction Program

Incentives for retrofits in the EnerGuide 80 program will focus on moving older houses up the EnerGuide scale. Each time a home energy assessment is conducted, the home is given an EnerGuide rating. Rebate programs related to home energy assessments, such as Natural

Resource Canada's ecoEnergy program, require an assessment both before and after retrofits have been completed. The EnerGuide 80 program would assign incentives based on the number of points a house moves up the EnerGuide scale. For example, if a home begins at EnerGuide 66 and after the various energy efficient upgrades have been completed it moves to EnerGuide 76, the customer would receive an incentive for having increased their EnerGuide rating by 10 points.

Given that this program is in the early stages of development, it requires discussions with a large number of stakeholders. The Companies are evaluating available market and technical data to establish a sound business case and cost benefit analysis. Therefore, performance metrics for this program are not available at this time

Background:

EnerGuide home efficiency performance levels are determined by performing Home Energy Assessments. The Energy Assessment process, software and quality of audit results are managed by Natural Resources Canada and the Ministry of Energy Mines and Petroleum Resources. A home's energy efficiency level is rated on a scale of 0 to 100. A rating of 0 represents a home with major air leakage, no insulation and extremely high energy consumption. A rating of 100 represents a house that is airtight, well insulated, sufficiently ventilated and requires no purchased energy on an annual basis.

Older homes need periodic renewal of major energy efficiency components including windows, heating, and fresh air ventilation systems, so the actual score of a 20-year-old home will depend in large part on whether these systems have been updated or are original.

As new building codes will not take effect until mid 2011, now is the time to encourage builders and developers, through incentives, to begin building homes to the EnerGuide 80 standards. Ideally, incentives will help builders and developers define the prescriptive measures that will achieve EnerGuide 80 standards, and prepare the market for the new building code changes.

Appendix E

CONSERVATION FOR AFFORDABLE HOUSING

Conservation for Affordable Housing

The following section includes details relating to activities within the Conservation for Affordable Housing programs area. This includes:

- LiveSmart Carry Over Buildings and Measures
- Members of the BC Working Group for Energy Efficiency for Affordable Housing
- Members of the Affordable Energy Conservation Task Force
- Attendees at the 2009 Affordable Energy Conservation Forum

LiveSmart Carry Over Buildings and Measures

The LiveSmart Carry Over project included complete energy efficiency retrofits in five affordable housing complexes throughout Metro Vancouver. The buildings and efficiency measures for this program are shown below.

SOCIAL HOUSING PROVIDER	Address	# of Units	Energy Assess.	Installs	Total	Measures
MVHC Meridian Village town homes	3156 Coast Meridian Rd, PoCo	129	\$ 17,415	\$ 219,300	\$ 236,715	For each unit: showerheads, kitchen aerators, programmable thermostat, weather-stripping, draft-proofing, ventilation and attic insulation
Hoy Creek MURB	2905 Glen Dr V3B6E5 & 1205 Johnson, Coq	97	\$ -	\$ 150,341	\$ 150,341	For each unit: showerheads, kitchen aerators, programmable thermostat, weather-stripping, draft-proofing, ventilation and attic insulation
Collingwood Village Co-op MURB	5398 Tyne Street, Vancouver	79	\$ 12,713	\$ 134,300	\$ 147,013	High-efficiency gas boiler and multiple other measures as funds allow.
Kilarney Gardens Co-op MURB	2998 East 54th Ave, Vancouver	227	\$ -	\$ 382,021	\$ 382,021	For each unit: showerheads, kitchen aerators, programmable thermostat, weather-stripping, draft-proofing, ventilation and attic insulation
Burlington Heights MURB	1865 E 10th Ave, Vancouver, V5N 1X8	25	\$ 7,213	\$ 42,500	\$ 49,713	High-efficiency gas boiler and multiple other measures as funds allow.
Totals		557	\$ 37,341	\$ 928,462	\$ 965,803	

Members of the BC Working Group for Energy Efficiency for Affordable Housing

The following is a list of the organizations that are represented on the BC Working Group for Energy Efficiency for Affordable Housing. Each of these organizations have at least one person representing their organization. There are a total of 29 individuals on the Working Group and no more than two people from any one organization.

	Company
1	Active Support Against Poverty
2	BC Housing
3	BC Hydro
4	BC Non-Profit Housing Association
5	BC Public Interest Advocacy Centre
6	BC Sustainable Energy Association
7	City Green Solutions
8	City of Vancouver Sustainability Division
9	CMHC
10	Co-operative Housing Federation of BC
11	EAGA Canada
12	FortisBC
13	Fraser Basin Council
14	Indian and Northern Affairs Canada
15	Ministry of Energy, Mines & Petroleum Resources
16	Northern Resources Canada
17	Tenant Resource & Advisory Centre
18	Terasen Gas
19	TRAC Tenant Resource & Advisory Centre
20	Vancity

Members of the Affordable Energy Conservation Task Force

The following is a list of the organizations that are represented on the Affordable Energy Conservation Task Force. Each of these organizations have at least one person representing their organization. There are a total of 10 individuals on the Task Force and no more than two people from any one organization.

	Organization
1	BC Hydro
2	BC Non-Profit Housing Association
3	BC Public Interest Advocacy Centre
4	City Green Solutions

	Organization
5	Eaga Canada
6	Fraser Basin Council
7	Ministry of Energy, Mines and Petroleum Resources
8	Terasen Gas

Attendees at the 2009 Affordable Energy Conservation Forum

The Affordable Energy Conservation Forum hosted a total of 83 people from the following 47 organizations.

Organization
Active Support Against Poverty
Adams Lake Indian Band
BC Citizens for Public Power
BC Housing
BC Hydro
BC Non-Profit Housing Association
BC Public Interest Advocacy Centre
BCIT student
BCSEA
British Columbia Utilities Commission
Canadian Centre for Policy Alternatives
Canim Lake Band
Capital Region Housing Corporation
Carrier Chilcotin Tribal Council
Carrier Sekani Tribal Council
City Green Solutions
City of North Vancouver
CMHC
Concert Properties (speaker)
Cooperative Housing Federation of BC
Council of Senior Citizens' Organizations of BC (COSCO)
eaga Canada
Earth Festival Society

Organization
ENVIRON
Family Services of Greater Vancouver
FortisBC Inc.
Fraser Basin Council
Fraserside Community Services Society
Gwawaenuk Tribe
Kibo Ventures Inc.
Lonsdale Energy Corp
Metro Vancouver
MOSAIC
Nicomen Band
OnPoint Consulting Inc.
Pacific Northern Gas Ltd.
RESORT MUNICIPALITY OF WHISTLER
Simon Fraser University
Skeetchestn Indian Band
Social Planning and Research Council of BC
Terasen Gas
The Elizabeth Fry Society
Tla-o-qui-aht First Nation
TRAC Tenant Resource & Advisory Centre
T'SOU-KE NATION
Vancity
Whistler Housing Authority

Appendix F

EEC STAKEHOLDER GROUP

EEC STAKEHOLDER GROUP

As discussed in Section 4.9, the Companies recognized the need for accountability in the EEC Application and proposed to form and engage an EEC Stakeholder Group. The objectives of the EEC Stakeholder Group are to guide and provide input on EEC activity. The corresponding invitation, agenda, priorities, and minutes from both the December 9, 2009 and March 11, 2010 meetings are included in the Appendix.

LIST OF EEC STAKEHOLDER MEMBERS (AS OF MARCH 11, 2010)

Member	Organization	Title
Marg Gordon	B.C. Apartment Owners and Managers Association	Chief Executive Officer
Steve Hobson	BC Hydro	Director Power Smart
Rob Noel	BC Mechanical Contractors Assoc	Commercial contractors
Eugene Kung	BC Public Interest Advocacy Centre	Barrister & Solicitor
Wayne Lock	BC Safety Authority	Operations Manager
Alison Richter	BC Utilities Commission	Regulatory Analyst - First Nations and Sustainability
Tammy Jackson	Canadian Home Builders' Association Central Okanagan	Executive Officer
Vanessa Joehl	Canadian Home Builders' Association of BC	Built Green™ BC Program Administrator
Marni Vistisen	City of Prince George	Energy Coordinator
Mark Hartman	City of Vancouver	Buildings Energy Programs Manager
David Craig	Consolidated Management Consultants	President
Joan Huzar	Consumers Council of Canada	
Dan Pasacreta	Crosby Property Managements, Ltd	Licensed Strata Agent
Keith Veerman	FortisBC	Manager-Energy Efficiency
Bob Purdy	Fraser Basin Council	Director, External Relations & Corporate Development
Amy Spencer-Chubey	Greater Vancouver Home Builders' Association	Director of Government Relations
Bruce Macgowan	IBC Technologies Inc.	President
Erik Kaye	Ministry of Energy, Mines and Petroleum Resources	Acting Manager, Energy Efficiency Policy
Nir Kushnir	National Energy Equipment	General Manager, Trane
John Cockburn	Natural Resources Canada	Senior Chief, Equipment Standards and Labelling Housing, Building and Regulations
Elizabeth Westbrook	Natural Resources Canada	Senior Officer, Stakeholder Relations
Nina Winham	New Climate Strategies	Consultant and Rate 1 customer
Al Kemp	Rental Owners and Managers Society of BC	CEO
Cindy Stern	Tseshat First Nation	Chief Operating Officer
Jeff Fischer	Urban Development Institute	Deputy Executive Director

November 13, 2009

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Dear Stakeholders and Interested Parties:

Re: Terasen Gas - Energy Efficiency & Conservation Stakeholder Group

This year Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc. (collectively "Terasen Gas") received approval from the British Columbia Utilities Commission ("BCUC") for an expanded Energy Efficiency and Conservation ("EEC") portfolio to provide customers with enhanced tools and incentives to manage their natural gas consumption, reduce their energy costs, and lower their greenhouse gas emissions. The newly approved \$41.5 million portfolio includes rebates and incentives on a number of energy efficient appliances, equipment and systems, as well as educational and outreach initiatives for residential and commercial customers, and those customers in the affordable housing sector.

Terasen Gas recognizes the need for accountability for the approved funds and believes that engaging an EEC stakeholder group would be beneficial to guide and inform EEC activity. We are seeking representation from the following areas:

- Provincial, municipal, and First Nation governments
- Non-Governmental Organizations
- Consumer advocates, representing residential customers
- Affordable housing advocates
- Commercial customers
- Trade organizations
- Equipment manufacturers
- Other utilities

To add transparency and accountability to our EEC portfolio, we intend to hold bi-annual EEC workshops with stakeholders, at which we will present updates on program progress and monies allocated. The one-day workshops would also act as a forum for stakeholder input on developing new programs and refining existing programs.

The first stakeholder meeting proposed will be either **Tuesday December 8** or **Wednesday December 9, 2009** in Vancouver.

We respectfully invite your participation in Terasen's EEC Stakeholder Group. Please contact me via email at jenny.chia@terasengas.com or via phone 604.592.7645 if you are interested in joining the Terasen EEC Stakeholder Group or if you have any questions. If you require financial and booking assistance with travel arrangements from outside the Lower Mainland, we would be pleased to assist you with those. Please confirm your participation in the Terasen EEC Stakeholder Group by **Monday November 23, 2009**.

Regards,

A handwritten signature in black ink, appearing to read "Jenny Chia".

Jenny Chia

Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc.

Agenda
EEC Stakeholder Meeting
December 9, 2009
Sheraton Wall Centre, Port Alberni Room
1088 Burrard St, Vancouver

8.30 – 9.00 *Registration and Breakfast*

9.00 – 9.15 Welcome from Terasen

9.15 – 9.30 Roundtable Introductions of Stakeholder Group

9.30 - 10.00 What is Demand Side Management (DSM)

10.00 – 10.30 Integrated Resource Planning and DSM

10.30 – 10.45 *Break*

10.45 – 11.30 Terasen's EEC Application

11.30 – 12.00 Terasen's Historical DSM Program Results and DSMS

12.00 – 12.45 *Lunch*

12.45 – 13.15 Government Regulations

13.15 – 13.30 Introduction to New EEC Programs

13.30 – 14.00 Post-EEC Residential Programs

14.00 – 14.30 Post-EEC Commercial Programs

14:30 -14:45 *Break*

14.45 – 15.15 Post-EEC Affordable Housing Programs

15.15 – 15.30 Contractor Program

15.30 – 15.45 Conservation Education and Outreach

15.45 – 16.15 Wrap-up

TERASEN GAS ENERGY EFFICIENCY & CONSERVATION STAKEHOLDER MEETING MINUTES

DECEMBER 9, 2009

Attendees

Alison Richter, British Columbia Utilities Commission, Regulatory Analyst – First Nations and Sustainability

Amy Spencer-Chubey – Greater Vancouver Home Builders' Association, Director of Government Relations

Bridget Macgowan - IBC Technologies, CFO

Casey Edge - CHBA Victoria, Executive Director

Cindy Stern – Tseshah First Nation, CEO

Dan Pasacreta – Crosby Property Management, Licensed Strata Agent

David Craig- Consolidated Management Consultants, President

Erik Kaye – Ministry of Energy, Mines, and Petroleum Resources, Acting Manager, Energy Efficiency Policy

Jen Richards – City of Vancouver, Sustainability, Program Assistant

Keith Veerman – FortisBC, Manager – Energy Efficiency

Kevin Kwok – City of Vancouver, Manager, Environmental Services

Marni Vistisen, City of Prince George, Energy Manager

Nir Kushnir – National Energy Equipment, General Manager (Trane)

Rob Noel – BC Mechanical Contractors Association, Commercial Contractors

Steve Hobson – BC Hydro, Director Power Smart

Vanessa Joehl – CHBA-BC, Built Green BC Program Administrator

Terasen Gas Staff

Beth Ringdahl

Dave Bennett

Doug Stout

Jenny Chia

Ken Ross

Gary Lengle

Lee Robson

Michelle Petrusevich

Ned Georgy
Negar Ghavami
Paola Blendl
Ramsay Cook
Samuel Nyabando
Sarah Smith
Shawn Hill

Regrets

Al Kemp, Rental Owners and Managers Society of BC
Angela Reid, City of Kelowna, Councillor
Eugene Kung, BC Public Interest Advocacy Centre, Barrister & Solicitor
Jeff Fischer, Urban Development Institute, Deputy Executive Director
John Cockburn, Natural Resources of Canada, Senior Chief, Equipment Standards and Labeling Housing, Building and Regulations
Mark Hartman, City of Vancouver Sustainability, Building Energy Programs Manager
Sharon Slager, CHBA Northern BC, Executive Director
Tammy Jackson, CHBA Central Okanagan, Executive Director

Shawn Hill, Manager Regulatory Affairs

Why is DSM Important

- 1) Does the recession have an impact on the price?
 - a. The supply is there to meet demand
- 2) Is natural gas priced on a national (Canadian) or global basis?
 - a. Historically (early 2000's), oil and natural gas were substitutes→ global and interchangeable
 - b. As the price of natural gas decouples from that of oil, gas has become a North American market
 - c. AECO is priced on Canadian price for GJs
 - d. Long term, resources are there to produce gas
 - e. Is there a demand to justify further extraction? It is a very efficient market

Ken Ross, Resource Planning Analyst

Integrated Resource Planning

- 1) How does the Integrated Resource Planning stakeholder group compare and contrast with other stakeholder groups that Terasen might be convening?

- a. EEC group is designed to give us feedback about the overall EEC portfolio and input as to whether we are moving in the right direction with the programs we are putting together
- b. The Integrated Resource Planning stakeholder group: Are our assumptions in the planning environment the same as what our stakeholders see?

Sarah Smith, Manager, Marketing & Energy Efficiency

EEC Overview

- 1) Does the EEC Application incorporate LiveSmart BC?
 - a. No. We were contributing \$250 to the LiveSmart furnace incentive, but we also offer the furnace incentive separate from LiveSmart
- 2) On what basis did the BC Utilities Commission scale back the request?
 - a. In regulatory processes, there are a number of people that intervene.
 - b. Certain customers do not want their money spent on EEC activities, because the funding comes from rate increases.
- 3) Innovative technologies and trade relations was denied
 - a. There are certain benefit/cost thresholds that have to pass
 - b. Innovative technologies have very long paybacks
 - c. Trade relations: funding was included in the non-incentive budgets that were put forward
 - d. We have incorporated trade relations in other areas of our EEC budget

Michelle Petrushevich, DSM Program Development Lead

Historical Program Results and DSMS

- 1) How were the Destination Conservation savings projected?
 - a. Evaluation report conducted by a consultant suggests that each school saves 113 GJs per year
 - b. No savings attribution to behavior changes as a result of the program
 - c. Behavioural change brought about through education
- 2) What have you learned about incentives regarding DSM? What motivates/ drives EEC/DSM decisions?
 - a. Residential: biggest reason for change in consumption is financial incentive, environment is far down the list (from Residential End Use Study)
 - b. Communications is key
 - c. Commercial: we don't have a lot of research in that area yet
- 3) How do you broaden conservation and sustainability and make the messaging appealing to different audiences?
 - a. Take other factors into consideration, besides financial
 - b. Health and environmental benefits
 - c. Have not yet promoted health benefits and used illness to pitch the case

- d. Our experience in commercial efficiency, we concentrate on investment and payback → Reference BC Hydro lighting program
- 4) Will a new tracking system be able to provide feedback to contractors and manufacturers?
 - a. We have the ability to do so today, but need feedback on whether or not to do it share that information with manufacturers (eg. Market share of furnaces by manufacturer)
- 5) Will there be a financing program for customers (residential?)
 - a. We don't have the capability to do it with our current Customer Information System
 - b. The new Customer Information System, which we are including in the current Customer Care Enhancement Application, can do it
 - c. Terasen asked in application for an extra body to research and design a financing program
 - d. Terasen could see that as an extension of our business
 - i. E.g. Terasen Energy Systems: we own the system and make them pay back over bills (strata example of extending gas lines into homes)
 - e. Government looking at options where homeowners moving can get their home labeled (Prince George labeling pilot)
 - f. Recognized need for financing, but the question is whether or not the utility should be involved
 - g. Manitoba Hydro example

Erik Kaye, Acting Manager, Energy Efficiency Policy

Government Regulation

- 1) Post 2012, where is government policy going regarding carbon tax and regulation? Is there room for discussion and negotiation between Terasen and gov't to map that out?
 - a. Absolutely. Government meets with utilities frequently to discuss policy initiatives like fuel choice, role of NGVs, DES, etc.
- 2) What messaging does the government want contractors to convey when talking to homeowners? This is a sensitive question: customers see BC Hydro and Terasen Gas as one bill. Heat pumps are the most common installation, should customers be going electric?
 - a. We want to convey energy efficiency and conservation
 - b. Reducing greenhouse gas is the imperative, so we don't want people to switch to higher carbon fuels. However, we don't want everyone going electric.
- 3) There is a concern about increasing the efficiency of homes through retrofits without due diligence (no educational or financial considerations).
 - a. Homeowners are taking permits, and not knowing what they're doing
 - b. Professional builders sometimes don't have the appropriate training
 - c. Renovators are not properly educated or licensed
 - d. Government is working on a comprehensive strategy on building capacity to make sure workmanship aligns with code
 - e. Terasen also has a concern about training, which is why we're engaging with the housing branch and supporting Energy Efficient Building Strategy, and building capacity
- 4) There is a shift to electric technology and the government seems to be supporting that.
 - a. e.g. LiveSmart heat pump has a larger incentive
 - b. Manufacturers are confused on what to recommend to customers

- c. Natural gas and electricity markets operate differently and market prices do not normally reflect what is best

Beth Ringdahl, EEC Program Manager, Residential

Residential Programs

- 1) Who is eligible for the furnace scrap it program (e.g. what about firehalls? residential or commercial?)
 - a. We may not have to limit it to one market
- 2) Discuss SPIFF (ie. sales person incentive) process with BC Hydro
 - a. Pat Mathot has had success with SPIFF uptakes
- 3) Dishwasher program:
 - a. Similar to Powersmart incentives but for customers with gas hot water
- 4) Consumer awareness and demand for tankless heaters increasing, so why don't we have an incentive for them?
 - a. We have not found any independent third party evidence suggesting they save energy/money
 - b. North America is the only place that still sell hot water tanks
 - c. Potential for TG to partner up with manufacturers to find conclusive data
- 5) Audit (Eco-energy) project:
 - a. NRCan putting in \$225 million for project
 - b. Cost of the audit process is unnecessary. Some customers just want to purchase a new appliance and the government is spending all this money on an audit unnecessarily
 - i. The idea is that customers get the benefit of a 'whole home' audit. They will maybe upgrade other parts of their home.
- 6) Furnace scrap it- why do you need incentives?
 - a. We want to encourage early retirement.
 - i. Need to do market research prior to starting program design – what do folks plan to do in the face of the introduction of the EE regulations
 - ii. Anecdotally we are hearing about stock piling of mid efficient furnaces
 - iii. Lots of people do not know about the regulation: we need to build awareness
 - b. Fundamental economics: to stop them from coming back into the market. Issue→ what is the curve/ resistance look like?
 - i. How long are the units going to be there?
 - ii. Portfolio level TRC
 - iii. Average furnace is in for 13 years
 - iv. Can we provide incentive for upgrading the infrastructure since new venting sometimes needs to be put in?
- 7) Scrap it program
 - a. How are the old furnaces disposed? Are they recycled? Will be investigated as part of program design.
 - b. Scrap it for boilers as well? Yes
 - c. Replace furnace→ very complex process
 - i. Need a consumer portal: average customer can get info easily
 - d. Many of the program application processes are also too complex and admin heavy for contractors (too much bureaucracy)
 - e. Lighting program has been successful but struggled at the beginning

- i. There is a balance between simplicity and due diligence (spending money wisely)

Ramsay Cook, EEC Program Manager, Commercial

Commercial Programs

- 1) What is the market momentum with efficient hot water heaters?
 - a. Biggest barrier is the upfront capital cost
 - b. Lack of awareness that there is an economic Net Present Value
 - c. Tankless water heaters are covered as long as they are energy efficient (94%)
 - d. Incentives are significant enough to consider uptake
 - e. Working on simplifying process
- 2) Commissioning- some LEED buildings are using more energy as a result of operations
 - a. LEED study- some LEED buildings are using up to 27% more energy than standard buildings
 - b. There is a current misconception of what LEEDS is→ LEED ≠ energy efficient. Building may be LEED for proximity to transportation, building materials, etc.
- 3) What about a Pre Rinse Spray Valve program for restaurants?
 - a. Terasen Gas ran a Pilot Program in the Interior and Okanagan in 2009
 - b. Best run in geographic pockets
 - c. Currently are running some measurement and verification tests for the Okanagan spray valve program

Ned Georgy, EEC Program Manager, Conservation for Affordable Housing

Conservation for Affordable Housing Programs

- 1) What are the opportunities in First Nation new housing?
 - a. Terasen's focus has been retrofits in current housing due to high energy savings
 - b. Build housing through Canada Mortgage and Housing Corp on tight budgets (\$40K)
 - c. Usually multiple homes, which has economies of scale
 - d. But contractors are forced to choose cheapest routes
- 2) First Nations talk to each other, work with administrator
- 3) How do you get program participation in First Nations?
 - a. Lots of forums
 - b. Lots of social marketing and word-of-mouth
- 4) Many manufacturers have programs tailored to low income households→ the problem is clarifying what project qualifies
 - a. There is a potential for partnership with Terasen
 - b. The larger the savings, the more willing manufacturers are to participate
- 5) Good idea to let administrators know about programs because they hire contractors
- 6) Criteria for programs
 - a. Need regulatory reform on new projects
 - b. Gear programs to zoning/regulation change
 - c. e.g. Habitat for humanity in Saanich
 - d. caution of stepping into world of social policy tools because we are an investor-owned utility
- 7) Who is the target audience in conservation for affordable housing?
 - a. Certain percentage are provided by public housing and social conscience or are renters

- b. Energy Savings Kits → not expensive for us to produce
 - c. Energy Conservation Assistance Program → some mechanisms in place for landlord to sign contract to not increase rent
 - d. Problem → slum landlords
 - i. Get landlord advisory (residential tenancy branch) involved
 - ii. Rent controls provide some incentive (increase margins).
 - e. There are many associations out there: Rental Owners and Managers Society of BC, BC Hydro split incentives group
-

Gary Lengle, EEC Program Manager, Qualified Dealer Program

Efficiency Partners Program

- 1) Challenges in up-selling energy efficient appliances:
 - a. Consumers feel the contractor is trying to up-sell them
 - b. Consumers have more info thanks to the internet and are educated
 - c. Customers trust utilities. Having the Terasen brand will give some credibility
 - 2) Can we roll out programs earlier than Q4? Even if it's not perfect?
-

Jenny Chia, EEC Communications, Education & Outreach Manager

Conservation Education, and Outreach

- 1) Can Terasen attend Victoria Spring Home Show?
 - a. Not this year. Simply a matter of lack of resources and Olympic timing (hard to commute)
-

EEC Stakeholder Meeting Agenda

March 11, 2010

Hyatt Hotel

655 Burrard St, Vancouver – Stanley Room

9:30 - 9:45	Registration (coffee served)
9:45 - 10:00	Welcome and Agenda
10:00 - 10:15	Roundtable Introduction
10:15 -11:15	Stakeholder Workshop: Sharing goals and priorities
11:15 – 11.30	TG topic: Alternative Energies Solutions
11:30 – 12:00	TG topic: Innovative Technologies
12.00 – 12.45	Lunch
12.45 – 14:00	2009 Annual report review and 2010 Update
14:00 -14:15	Break
14:15-15:00	Stakeholder Dialogue: Setting Action
15:00-15:15	Closing

Terasen Gas Energy Efficiency & Conservation Stakeholder Meeting
March 11, 2010

Attendees

Al Kemp, Rental Owners and Managers Society of BC
Alison Richter, British Columbia Utilities Commission, Regulatory Analyst – First Nations and Sustainability
Amy Spencer-Chubey – Greater Vancouver Home Builders' Association, Director of Government Relations
Bob Purdy, Fraser Basin Council
Bruce Macgowan - IBC Technologies
Cindy Stern – Tseshah First Nation, CEO
Dan Pasacreta – Crosby Property Management, Licensed Strata Agent
David Craig- Consolidated Management Consultants, President
Elizabeth Westbrook-Trenholm, Natural Resources Canada, Office of Energy Efficiency, Stakeholder Relations
Erik Kaye – Ministry of Energy, Mines, and Petroleum Resources, Acting Manager, Energy Efficiency Policy
Jeff Fischer, Urban Development Institute, Deputy Executive Director
Jen Richards – City of Vancouver, Sustainability, Program Assistant
Joan Huzar, Consumers Council of Canada
Marg Gordon, BC Apartment Owners and Managers' Association
Mark Warren – FortisBC
Nina Winham, New Climate Strategies; Terasen Gas rate 1 customers
Nir Kushnir – National Energy Equipment, General Manager (Trane)
Steve Hobson – BC Hydro, Director Power Smart
Wayne Lock, BC Safety Authority, Gas Operations Manager

Regrets

Eugene Kung, BC Public Interest Advocacy Centre, Barrister & Solicitor
Mark Hartman, City of Vancouver Sustainability, Building Energy Programs Manager
Marni Vistisen, City of Prince George, Energy Manager
Rob Noel – BC Mechanical Contractors Association, Commercial Contractors
Vanessa Joehl – CHBA-BC, Built Green BC Program Administrator

Terasen Gas Staff

Beth Ringdahl	Ned Georgy
Jenny Chia	Ramsay Cook
Ken Ross	Sarah Smith
Gary Lengle	John Turner
Michelle Petrusevich	Doug Tufts
Arvind Ramakrishnan	Mark Grist
Shawn Hill	

John Turner
Alternative Energy Solutions

(no questions)

Doug Tufts
Arvind Ramakrishnan
Innovative Technologies

Q: Do programs have to be for upgrading?

: Solar can be for new or retrofit; hydronic, new; NGVs can be converted

Q: Why is there less money for TGVI?

a. Dollars is proportionally based on the # of customers we have on TGVI

Q: Referring to the City of Vancouver example, if I understand correctly, if solar is required in regulation, then Terasen is not going to fund it, is that the position?

a. The new buildings just have to be solar ready (ie. Piping), but don't have to have the solar system installed

b. Utilities cannot provide incentive if it is regulated

Discussion on free riders

Q: What about municipal regulations?

- a. Utilities still might advance adoption of regulation but if customer had to put one in, it would be hard to argue that utility incentive had any help with that.
- b. Provincially, government is also trying to raise the bar to meet municipal regulations and not have widely diverse buildings. It's a whole market transformation and not just in isolation.
- c. Terasen can comment on municipal policies and how affect programs

Michelle Petrusевич
Structure and Overview of EEC report

(no questions)

Beth Ringdahl
Residential Programs

Scrap It Furnace – need to get stakeholder feedback on program and need to see what market is like for mid-efficient furnaces

Switch 'n' Shrink – under Fuel Switching in the report. 70% of the participants are from TGVI

Whole Home program – under joint initiatives in the report.

Hot water tank program – hard to get industry information, such as list of eligible models from manufacturers. Terasen would like to put on directory on the website of eligible models.

Ministry policy on storage tanks have to be 80%; currently condensing storage tanks do not exist in the market today.

Q: in regulation, is BC unique?

- a. First in North America; NRCan will be joining in later on. We have ambitious targets. How do we move manufacturers move this along, so need to work with utilities. We don't have the option of waiting.
- b. There is a 6-12 month delay product delay from US to Canada.
- c. There is a caution in mixing storage and non storage tank issues (are apples vs. oranges)

Q: What is the definition of residential customer?

- a. SFDs, mobile homes, and townhomes; multi-family is considered commercial customer
- b. There is multi-family homes on oil in Vancouver Island – can apply for Switch 'n' Shrink?
- c. Maybe those home can apply for Efficient Boiler Program

Ramsay Cook Commercial Programs

Q: Are there any absolute caps on funding on custom design program? How are savings measured?

- a. About \$3/GJ, but will not pay 100%
- b. Each project will have to pass a TRC test
- c. Will benchmark against energy study, then look at meter and energy consumption

Q: Will the study capture waste heat?

- a. Terasen is open to study, we are just trying to get GJ savings

Q: have you looked at purchasing managers as a key audience, they are very risk adverse people and only look at costs involved?

- a. Terasen can do education with purchasing managers.

Ned Georgy Conservation for Affordable Housing

Q: In regards to ReNEW, is there continued training past 2010?

- a. Looking to work with some groups on Vancouver Island.

Q: How do you choose participants for the program?

- a. Partners choose because they know their audience.

Q: Who is doing the SEMP study? BC Non Profit or City Green?

- a. BC Non Profit Housing Association; City Green is involved in all 3 studies. Studies have partners in sharing the cost.

Gary Lengle
Efficiency Partners Program

(no questions)

Jenny Chia
Conservation Education & Outreach

Q: Co-op on tradeshow?

- a. Possibly, Terasen has to look it over.

Q: Is there a possibility of using the Pembina tool to train sales associates (ie. At big box stores)?

- a. Yes

Stakeholder Action List (roundtable around the room)

Jeff at UDI – look at educating members on incentives and regulation

Al at ROMS BC – look at manufacturer home parks – they are out of the loops. Possibly have a joint Terasen and BC Hydro info session for ROMS for their board/industry

Marg at BCAMOA – provide info in newsletters to members, and include info at board meeting on Wed Mar 17.

Bob at Fraser Basin Council – get in touch with Terasen manager on NGVs

Joan at Consumers Council of Canada – likes the home (energy) labeling idea because it's a good way of letting consumers know

Amy at GVHBA – get together with Beth, Ned, and Jenny and discuss GVHBA opportunities. GVHBA also has a monthly newsletter where info can be placed.

Cindy at Tseshah First Nation – go back to the community, communicate about Terasen programs for people that are not in social housing; will be speaking about Terasen at national Aboriginal Housing Forum in Calgary

Wayne at BC Safety Authority – is concerned about contractors not having the skill set to install the new technology/equipment; have to look at training and if need to upgrade training, perhaps suppliers should provide training for installers

Terasen Gas EEC Stakeholder Meeting – Stakeholder 2010 Priorities
March 11, 2010

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
Greater Vancouver Home Builders' Association	<ul style="list-style-type: none"> -protecting interests of new home buyers -housing affordability and choice -education -marketing and networking 	700+ members Builders Developers Trades Suppliers Architects & designers → Voice of residential construction industry	<ul style="list-style-type: none"> -reduce/prevent downloading of charges to the price of new homes -promote voluntary market driven green building -underground economy that do not get a permit for renovations 	<ul style="list-style-type: none"> -programs for new home buyers, specifically first – timers -invest in innovative/alternative energy solutions 	<ul style="list-style-type: none"> -continue green incentive programs -educating trades -reno program -consumer behaviour cultural shift -investment for alternative energy solutions
BC Apartment Owners and Managers' Association	<ul style="list-style-type: none"> -sector sustainability through offering lobbying, education, partnerships with affiliates and associates (price points) -member strength through retention and growth 	3000 members Apartment owners & managers (landlords) + associates (suppliers) + affiliates -sustainability	<ul style="list-style-type: none"> -member education -member retention -member growth -partnership programs to assist members -energy savings; renovations and greener technology -find landlords and how to reach them 	<ul style="list-style-type: none"> -partnership in education, affiliation, sponsorship -news posts on web, magazine & newsletter -info on present & future opportunities -incentives/split 	<ul style="list-style-type: none"> -workshops and tailor to high rise members, medium buildings, and low rise members -news blasts -intro of new programs -change behavior → how do we make the new “bling” energy efficiency?

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
National Energy Equipment (distributor of Trane)	-increase market creation of home comfort systems for retrofit market -incorporate “clean air” offering into heating and cooling products	-(52) HVAC dealers -homeowners that purchase Trane equipment	-improve quality of installation of Energy Star products -clarify the energy saving message with homeowners	-Terasen dealer (contractor) program -promotions planned outside of the “high season” (Sept –Nov) because impacts quality of installation	-consider “Terasen partners” program on the distribution level (eg. advertising) -work with the NRCan -align upcoming programs with homeowners’ needs and understand consumer mindset
BC Utilities Commission	-increase stakeholder engagement -increase knowledge and capacity in new areas of responsibility, not just an economic regulator		-build capacity/knowledge in commissioners and staff on DSM/energy efficiency best practices from other jurisdictions	-EEC meetings continue -provide updates, feedback and engage with Commission -keep doing what you’re doing	
Consumers Council of Canada	-consumers more aware of energy efficiency options -consumers knowledgeable about the costs/payback/justification of energy efficient purchases -ensure the consumer voice is at the policy table	-residential consumers of energy	-energy efficiency adopted as an objective in building codes -understand consumer attitude to energy efficiency -consumer protection available + accessible to consumers (remedies)	-perhaps a partnership to enable us to get consumers’ opinion/feedback on energy issues + housing issues -access to info on the residential consumer + their preferences & actions (take up of incentives?) -get info to customers	-meet with appropriate Terasen reps to talk about possible options

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
Urban Development Institute	<ul style="list-style-type: none"> -to connect our industry with governments and the public -improve our industry through professional development and education -having a reasonable cost of & regulatory environment for our members 	Developers & professionals that support them. -500 corporate members (architects, engineers, banks)	<ul style="list-style-type: none"> - housing affordability -reducing cost (fees, charges imposed by government -greenbuilding sustainability 	<ul style="list-style-type: none"> -research/education on cost effective green build, energy efficiency, sustainable tools, technologies (how much customers value/do not value on e.e. to potentially support a salesperson education initiative -need consistent approach; various Lower Mainland municipalities are too diverse in policies on sustainable buildings -incentives for our members (green technologies have high upfront costs) 	<ul style="list-style-type: none"> -information -education
Crosby Property Management	<ul style="list-style-type: none"> -energy savings -green technology 	25,000 residential strata owners	<ul style="list-style-type: none"> -hold costs or do better -looking for incentives -HRTC did a lot in 2009 	-information to customers	-timers for fireplaces for strata owners (program)
IBC Technologies	<ul style="list-style-type: none"> -expand condensing boiler product offering into commercial sizes/markets -more residential market choices with different price points/affordability 	<ul style="list-style-type: none"> -IBC -Canadian Hydronics Council (BC rep) -CSA TC on energy efficiency 	<ul style="list-style-type: none"> -see goals -evolve commercial boiler efficiency measurement standards 	<ul style="list-style-type: none"> -provide clarity on DSM programs and changes thereto -host local roundtable meeting of stakeholders to commercial boiler efficiency issues to take to the national meeting 	

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
Natural Resources Canada	-improve Canadians' energy consumption practices in commercial and institutional buildings to the end of reduced GHGs (17% by 2020)	Government of Canada	-encourage energy efficiency retrofits and new building design -commissioning and re-commissioning -update energy code -develop bench marketing-data for buildings (offices and schools) -position for transition to post 2011 (funding ending) -build capacity among energy professionals -update the Model National Energy Code for Buildings for release 2012	-information sharing -partnerships/cooperation on optimizing resources in program design/delivery -liaise with regional stakeholders (oversee all of Western Canada)	-develop working groups?
Consolidated Management Consultants	-fair and cost effective supply	-represent commercial energy consumers	-continue to consult with BC Hydro and Terasen Gas -challenge anything that is less than cost effective -success in meeting government's goals-see utilities in succeeding	-consultation on EEC -interested in alternative energy -long term plan for reducing GHGs (by 2050) -interested in cost effective management in utility -continued engagement	
Rate 1 customer/landlord/ New Climate Strategies consultant	-improve energy efficiency infrastructure in my home	-rate 1 customers across BC	-learn about insulation options (for old home) -improve hot water systems - too much waste	-help me assess opportunities in a comprehensive way (not one-off technologies) -expertise for hire, who can assess my options?	-work with BC Hydro to give me coordinated picture of my energy and GHG issues

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
Rental Owners and Managers Society of BC	-continue growth to 2400 members -achieve changes to residential tenancy act -increase recognition of rental industry as provider of homes to 1/3 of British Columbian	-2200 residential owners and managers -50,000 rental homes	-increase awareness of ROMS BC among BC's landlords	-recognize distinctiveness & size of residential rental industry +/- 600,000 rental homes -apartment buildings are different from condos or SFDs	-tenants consume, landlords pay??
City of Vancouver	-reduce GHGs -meet community based action goals	-municipality and Vancouver residents	-MURBs and small – businesses -retrofit program (under consideration, require at least 10% of the cost of any permitted renovation to be allocated to e.e. upgrades using prescriptive measures)	-for SFDs – prescribed measures, or Energuide rating -COV support by having green renovation guides online	-example of laneway house with computer interface that indicated energy usage
Ministry of Energy, Mines and Petroleum Resources	-energy efficiency -reducing GHG emissions -develop a culture of conservation		-Energy Plan -Climate action -Clean energy economy	-support for codes and standards -integration with LivesmartBC -innovation with gas (NG vehicles) -communicate with Energuide 80 -go beyond code, maybe home labeling	

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
Tseshah First Nation	<ul style="list-style-type: none"> -expand economic development and diversification -expand member employment opportunities -improve quality of life-industry housing -building relationships with Alberni Valley Community 	1000 members 750 on reserve	<ul style="list-style-type: none"> -building 14 new houses (need for 80 families housing—multigenerational, increased growth in community with declining growth in neighbouring community) -7 new RAPS (renovations) -develop partnerships for tourism projects -encourage entrepreneurship -support building of new athletic hall in Port Alberni -new ventures + construction eg. greenhouse 	<ul style="list-style-type: none"> -partnerships for training and mentoring -grants for new athletic hall (gas powered new construction) -seeking appliance bundles for energy efficiency in new houses -cost efficiency and energy efficiency 	-do not understand using natural gas on reserve, mainly BC Hydro
Fraser Basin Council	<p>Vision: strong communities, healthy ecosystems and vibrant economies in the Basin and beyond</p> <p>Goals: climate change mitigation/adaptation (reducing GHGs/energy efficiency)</p> <ul style="list-style-type: none"> -smart planning for communities -regional and sub-regional (local) issue resolution -aboriginal engagement 	-all form orders of Canadian government including First Nations + private sector + community/civil society interests	<ul style="list-style-type: none"> -continue to build on successes: -green fleets BC initiative, transportation -energy solutions for remote communities -supporting community energy planning though BC –demand side management -supply chain Buymost program 	<ul style="list-style-type: none"> -harness power of strategic relationships; facilitate and bring together unlikely parties -multi-interest board 	-continuing to build bridges between people, organizations, regions – and action items together

Organization	Goals	Members represented	Priorities for 2010	How Terasen can help organization (2-3 ways)	Action Item
City of Prince George	-climate change goals & objectives that relate to participation in the Partners for Climate Protection Program (PCP). -the goal is a 10% reduction in greenhouse gas emissions from 2012, from a benchmark year of 2002. actively involved in meeting a target of carbon neutral operations by 2012 under the Province's Community Action Charter -20% reduction in overall energy intensity (electricity & natural gas) by 2015 (5 years) -5% reduction in overall energy intensity (electricity & natural gas) for each facility in 2010	-citizens of Prince George	-5% reduction in energy intensity for 2010 -carbon neutral by 2012 -10% Reduction in GHG emissions by 2012	-GHG emissions and energy consumption: easily accessible programs to help decrease GHG emissions, and funding that is available to retrofit old equipment, or implement a project that will decrease natural gas consumption would be appreciated.	

Note: priorities missing from BC Hydro, FortisBC, BC Public Interest Advocacy Centre, Canadian Home Builders' Association of BC, BC Mechanical Contractors Association,, and BC Safety Authority.

Appendix G

EFFICIENT BOILER PROGRAM TERMS AND CONDITIONS

Efficient boiler program

Terms and conditions



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The incentives

Efficient boiler incentives are made up of two parts: a purchase incentive which is based on the type of boiler purchased, plus either; a new construction incentive; or a retrofit incentive.

Purchase incentive

For all participants, the incentive applies to the incremental purchase price of a natural gas near-condensing or condensing boiler over the purchase price of a standard-efficiency boiler. The purchase price incentive is based on space heating and ventilating load. They will be calculated as follows:

- near-condensing boilers: \$4,000 per boiler plus \$3 per MBH plant input
- condensing boilers: \$6,000 per boiler plus \$9 per MBH plant input

The purchase price of a standard-efficiency boiler will be estimated using \$7 per MBH of the input required to meet the space heating load.

In addition to the purchase price incentives above, Terasen Gas will also contribute additional incentives to your upgrade project as outlined below.

New construction

Terasen Gas will contribute 50 per cent of engineering fees to a maximum of \$1,500 toward the cost of estimating the annual gas usage for space heating using a standard-efficiency boiler system versus a higher efficiency boiler system. Purchase price

incentive payments are limited to a maximum of 75 per cent of the purchase price premium over a standard boiler.

Retrofit of existing buildings

The program will pay your contractor up to a maximum of \$400 for performing an estimate of the peak space heating load. It will also pay 50 per cent of the cost of necessary venting modifications up to a maximum of \$2,000. During the first year of operation you are also entitled to a monitoring incentive of \$1,500 plus \$1 per gigajoule of total natural gas saved. Purchase price incentive payments are limited to a maximum of 50 per cent of the purchase price premium over a standard-efficiency boiler.

The benefits

Ongoing savings of up to 40 per cent

- operating savings from lower natural gas expenditures
- greater potential savings if boilers are also used for domestic hot water heating

Higher performance

- improved operating efficiency through correct boiler sizing
- improved reliability if a modular boiler system with multiple boilers is used

Energy efficiency assistance

- assistance in determining your facility's potential for energy improvements
- help in finding ways to save money and improve your facility's operation

Space efficiency and comfort

- requirement for less space in mechanical rooms
- excellent opportunity to increase occupant comfort and reduce building maintenance and operating costs to end buyers

Increased marketability

- improved efficiency appealing to customers who recognize the value it adds to their investment
- increased value of your development
- competitive advantage over other projects

Environmental benefits

- fewer CO, CO₂ and NO_x emissions into the atmosphere
- responsible use of a clean burning natural resource

Program terms and conditions

Note: Subject to change without notice.

1.0 Overview

- 1.1 The Efficient Boiler Program (the program) from Terasen Gas Inc. (Terasen Gas) is designed to stimulate investment in appropriately sized energy-efficient space heating boilers that will reduce natural gas usage and associated operating costs. The program is targeted to both new construction and replacement markets.
- 1.2 The program offers all market participants an incentive payment to partially offset the higher purchase price of higher efficiency boilers, a contribution to the cost of accurately estimating the building's space heating load.
- 1.3 In new construction, the program contributes to the engineering fees for estimating the building's annual natural gas usage for space heating with a standard efficiency boiler and comparing it to that with a higher efficiency boiler. It also partially offsets the higher boiler purchase price incurred by a developer, builder or owner. Terasen Gas will also recognize the developer's, builder's or owner's commitment to energy efficiency on behalf of tenants, end users and subsequent owners.
- 1.4 In the replacement market, the program compensates a mechanical contractor to accurately estimate the peak space-heating load. It also reduces the building owner's higher purchase price for an energy-efficient boiler, including an allowance for required venting upgrade modifications. It also promotes proper ongoing operation and maintenance of the heating plant to reduce annual space heating costs, maintain efficiency and lower life cycle costs by paying building owners a monitoring incentive and a natural gas-saving bonus.
- 1.5 By taking part in this offer, your boiler may use less natural gas and produce fewer emissions. You agree Terasen Gas Inc. may record any resulting emission reductions you have along with those of other participating customers and credit them to our Greenhouse Gas Management Program.

2.0 Participant eligibility criteria

- 2.1 The applicant must be a building developer, builder, building owner or owner's designated representative.
- 2.2 The facility where the boiler is installed must be in the Terasen Gas service territory in the Lower Mainland, Vancouver Island, Sunshine Coast, or the Interior of BC. (Not available in Whistler).
- 2.3 The facility where the boiler is installed must use natural gas purchased according to one of the following Terasen Gas Rate Schedules: 2, 2U, 3, 3U, 23, 5, 25, AGS, SCS-1, SCS-2, LCS-1, LCS-2 or LCS-3.
- 2.4 Only eligible boilers under the program qualify for the incentive (see section 4.0 for the boiler eligibility criteria).
- 2.5 The incentive will only be paid for space heating boilers. When the boiler is used for space heating as well as other applications such as domestic hot water and pool heating, the domestic hot water load and the pool heating load will be subtracted from the boiler input to determine the space heating load for incentive calculations.
- 2.6 Standby or backup space heating boiler plants will not normally qualify under this program. Standby or backup boilers are defined as boilers that normally only operate during peak heating load. However, a boiler plant that is not the primary source (i.e. does not provide over 50 per cent) of space heating for the facility, can qualify if the facility uses natural gas for domestic hot water and make-up air units.

3.0 Program process

All market participants

- 3.1 Applicant's contractor or qualified professional determines the capacity of the space heating plant, type of boiler (i.e. condensing or near-condensing), capacity and number of boilers required to meet the space-heating requirements of the building.
- 3.2 Applicant completes Efficient Boiler Program Application Form and submits it along with required documentation (7.0) to Terasen Gas.
- 3.3 Terasen Gas reviews application for completeness.
 - (i) If application is complete, Terasen Gas estimates the incentive that is payable to the applicant.
 - (ii) If application is incomplete, Terasen Gas will ask applicant for additional information.
 - (iii) If required documents are not completed and submitted within one month of the application date the application may be cancelled.
- 3.4 Applicant receives a letter from Terasen Gas stating whether the application was approved or rejected. If approved, an estimate of the incentive(s) payable to the applicant will be attached to the letter.
- 3.5 Applicant purchases and installs the boiler within 12 months from the date of approval (3.4) by Terasen Gas.
- 3.6 Applicant submits required documentation to Terasen Gas within one month of boiler installation. (See Section 7.0 for documentation).
- 3.7 Terasen Gas reviews documents for completeness.
 - (i) If all documents are in order and the applicant has met all the requirements of the program and the boiler capacity has not changed from original application, Terasen Gas issues a boiler incentive cheque to the applicant.
 - (ii) If all documents are in order and the applicant has met all the requirements of the program, but the installed boiler capacity and/or purchase price has changed since the application was first submitted, Terasen Gas recalculates the incentive and issues a cheque for the revised boiler incentive.

New construction market participants

- 3.8 The contribution of Terasen Gas to the engineering fees required to estimate annual gas usage will be included in the boiler incentive cheque issued to the applicant.

Replacement market participants

- 3.9 The contributions of Terasen Gas to the contractor's cost to estimate the peak space heating load, and to the cost of the required venting upgrades, will be included in the boiler incentive cheque issued to the applicant.
- 3.10 Terasen Gas will send the reporting requirements for the monitoring incentive and gas-saving bonus to the applicant with the incentive cheque.
- 3.11 Applicant prepares the reports that are required for the monitoring incentive and gas-saving bonus.
- 3.12 Applicant submits the reports to Terasen Gas. One report is submitted six months after boiler installation; the second report is submitted 12 months after boiler installation.
- 3.13 Terasen Gas reviews the reports for completeness.
 - (i) If applicant meets the reporting requirements, Terasen Gas calculates the monitoring incentive and gas-saving bonus and issues a cheque. Cheque is issued after Terasen Gas receives the two complete sequential six month reports.
 - (ii) If applicant has not met the reporting requirements, Terasen Gas advises applicant that reporting requirements have not been met and applicant does not qualify for monitoring incentive and gas-saving bonus.

4.0 Eligible boilers

All boilers

- 4.1 Must be a natural gas space heating boiler system (propane boilers in Revelstoke can also qualify). Multiple boiler modules housed in a single jacket constitute one boiler.
- 4.2 The minimum boiler input rating is 300,000 Btu/hr.
- 4.3 The maximum boiler input rating is 5,000,000 Btu/hr.
- 4.4 The minimum space heating plant input rating is 300,000 Btu/hr.
- 4.5 The maximum space heating plant input rating is 10,000,000 Btu/hr.
- 4.6 The incentive will only be paid for space heating boilers. (see section 2.5 for details).
- 4.7 Boiler efficiency ratings must be independently tested in accordance with BTS-2000 Testing Standard for Efficiency of Commercial Space Heating Boilers from the Hydronics Institute Division of GAMA (www.gamanet.org) or CSA 4.9 Gas-Fired Low Pressure Steam and Hot Water Boilers.
- 4.8 Third party documentation of boiler combustion efficiencies must be provided for boiler eligibility. Acceptable documentation includes either
 - (i) combustion efficiency test reports from testing laboratories accredited by the Canadian Standards Association (CSA International) or the American National Standards Institute or from the Hydronics Institute Division of GAMA;
 - (ii) a combustion efficiency certification letter from CSA International; or
 - (iii) inclusion in the I=B=R Ratings for Boilers, Baseboard Radiation and Finned Tube (Commercial) Radiation Directory, January 2008 Edition, with the steady state combustion efficiency rating published in the directory (www.gamanet.org).
- 4.9 Boiler must be installed in accordance with the manufacturer's specification and must comply with applicable laws, codes, standards and ordinances.
- 4.10 The boiler must be new. Used or rebuilt boilers do not qualify for the incentive.
- 4.11 Boilers must be covered by a standard or optional minimum two-year parts and labour warranty.

Near-condensing boilers

4.12 Definition of near-condensing boiler:

- (i) has a minimum steady state combustion efficiency of 85 per cent as tested throughout the turn down range in accordance with BTS-2000ⁱ or CSA 4.9ⁱⁱ
- (ii) has a factory installed intermittent ignition
- (iii) has a forced draft or induced draft burner that properly controls excess air
- (iv) conforming boilers will have continuous capacity modulation (not staged burner output control) to enable operation at reduced output down to 50 per cent or less of maximum continuous output. This turndown will be achieved by continuously varying fuel and air input quantities

Condensing boilers

4.13 Definition of condensing boiler:

- (i) has a minimum steady state combustion efficiency of 88 per cent throughout the turn down range as tested in accordance with BTS-2000ⁱ or CSA 4.9ⁱⁱ
- (ii) a Category IV boiler that vents through a Class II Type BH stack or a stack that complies with the manufacturer's recommendations
- (iii) conforming boilers will have continuous capacity modulation (not staged burner output control) to enable operation at reduced output down to 50 per cent or less of maximum continuous output. This turndown will be achieved by continuously varying fuel and air input quantities
- (iv) the boiler can continuously withstand heating system return water temperatures that do not exceed 49°C

List of eligible boilers

- 4.14 A list of eligible boilers is available on our website at terasengas.com. This list may be updated during the course of the program.

i - BTS 2000 Testing Standard for Efficiency of Commercial Space Heating Boilers, Hydronics Institute Division of GAMA - 2000

ii - Gas-Fired Low Pressure Steam and Hot Water Boilers, Canadian Standards Association

5.0 Incentives

All market participants

- 5.1 Boiler purchase price incentives will be calculated as follows:
- (i) near-condensing boilers: \$4,000 per boiler plus \$3.00 per MBH plant input for space heating load
 - (ii) condensing boilers: \$6,000 per boiler plus \$9.00 per MBH plant input for space heating load
- 5.2 The purchase price of a standard efficiency boiler will be estimated using \$7.00 per MBH of input for space heating load.
- 5.3 The boiler purchase price is the applicant's purchase price of the boiler net of any vendor rebates excluding installation labour, venting and accessories.
- 5.4 Terasen Gas reserves the right to limit the number of incentive payments it provides for the program.

New construction market participants

- 5.5 In new construction, Terasen Gas will pay 50 per cent of a qualified professional's fees to compare the estimated annual natural gas usage for space heating using a standard efficiency boiler to that with a higher efficiency boiler to a maximum of \$1,500. This will be payable to the applicant at the time the boiler purchase price rebate is paid to the applicant and will not be paid unless an eligible boiler is actually installed. Proof of payment must be submitted with the application. The energy modelling must be completed by a qualified professional using DOE, EE4, TRACE, HAP or equivalent program and must compare the space heating energy use of the building using a standard efficiency boiler and a higher efficiency boiler.
- 5.6 In new construction, boiler purchase price incentive payments are limited to a maximum of 75 per cent of the premium over a standard efficiency boiler.

Replacement market participants

- 5.7 In replacement applications, Terasen Gas will pay a maximum \$400 of the cost incurred to estimate the peak space heating load. This will be payable to the applicant at the time the purchase price incentive is paid and will not be paid unless an eligible boiler is actually installed. Proof of payment must be submitted with the application.
- 5.8 In replacement applications, boiler purchase price incentive payments are limited to a maximum of 50 per cent of the premium over a standard efficiency boiler.
- 5.9 In replacement applications, the total amount of the boiler purchase price incentive and the venting replacement incentive is subject to a maximum limit equal to the price of the installed boiler.
- 5.10 In replacement applications, Terasen Gas will pay a monitoring incentive of \$1,500 plus \$1/GJ of gas-saving bonus for each GJ of annual weather-normalized reduction in total natural gas consumption. The weather-normalized gas consumption in the 12-month period following the boiler installation will be compared to the weather-normalized gas consumption during the 12-month period prior to the boiler installation. The applicant must report the data from the following inspections:
- (i) perform combustion analysis and record combustion efficiency, %CO₂, %O₂, ppm NO_x and flue gas temperature every six months
 - (ii) perform a diagnostic check of the controls weekly
 - (iii) perform visual check of system components weekly
 - (iv) record boiler water outlet temperature weekly
 - (v) record boiler water inlet temperature weekly
 - (vi) record boiler room temperature weekly
- 5.11 Applicant must submit reports that include the data listed above to Terasen Gas six months and 12 months after the boiler installation to qualify for the monitoring incentive and gas-saving bonus.

6.0 Additional terms and conditions

All market participants

- 6.1 One application form must be submitted per each gas account (gas meter) in your facility, that serves the qualifying boiler plant or plants you want to apply for.
- 6.2 The building's heat load must be calculated and the heating plant must be sized in accordance with ASHRAE Standard 90.1 to ensure the heating plant is not oversized.

Equipment requirements

- 6.3 HVAC systems must be sized to meet the needs of the conditioned spaces.
- 6.4 Equipment installed outdoors or in unconditioned spaces must be designed by the manufacturer for such installation.
- 6.5 HVAC equipment and components included in the scope of Model National Energy Code for Buildings (MNECB) Table 5.2.13.1 must comply with the relevant local appliance/equipment energy efficiency act or the relevant standard listed.

Hydronic systems

- 6.6 All hydronic systems must be designed so they can be balanced.
- 6.7 Multiple boiler systems must prevent heat loss through boilers when they are not in operation through the use of such items as draft dampers or shut-off valves interlocked with burners.
- 6.8 Pipes containing fluids with design operating temperatures outside the 13°C to 40°C range must be insulated as per MNECB Table 5.4.2.3. Some exemptions apply.
- 6.9 Boiler hot water distribution piping outside the building envelope must be insulated to the maximum requirements as per MNECB Table 5.4.2.3. Insulation must be protected where it may be subjected to mechanical damage, weathering or condensation.
- 6.10 Seasonal pumping systems, such as heated and chilled water pumping systems, must have automatic controls or readily accessible and clearly labelled manual controls to shut down the pumps when they are not required.

Additional requirements

- 6.11 All boiler installations with a maximum rated input of 400,000 BTU/hr or higher must be approved by the BC Safety Authority. (See 7.2 (ii))
- 6.12 The manufacturer or an authorized factory representative must either perform or supervise equipment start up and provide a written report to Terasen Gas indicating that the installation meets manufacturer's requirements. The report must include:
 - (i) boiler inlet return water temperature °C
 - (ii) boiler outlet supply water temperature °C
 - (iii) boiler room temperature °C
 - (iv) exhaust gas temperature °C
 - (v) %CO₂ in the exhaust
 - (vi) %O₂ in the exhaust
 - (vii) % steady state combustion efficiency
 - (viii) boiler clocked firing rate (Btu/hr)
- 6.13 The applicant agrees to periodic inspections of the applicant's premises by Terasen Gas or its representative to verify that the boiler has been installed and is in operation, and to cooperate with Terasen Gas thereafter to gather information necessary to assess the success of the program.
- 6.14 Applicant agrees to allow Terasen Gas to publish their business name, a general description of the system upgrade undertaken and resulting energy performance and payback period.

New construction market participants

- 6.15 In new construction, a qualified professional must be retained to estimate:
 - (i) the facility's peak space heating load based upon the January 2.5 per cent °C winter design temperature for your location (reference Table C-2 National Building Code)
 - (ii) a standard efficiency boiler's peak annual gas consumption (GJ)
 - (iii) the higher efficiency boiler's annual gas consumption (GJ)

Replacement market participants

- 6.16 In replacement markets, the contractor must prepare an estimate of the facility peak space heating load based upon the January 2.5 per cent °C winter design temperature for your location (reference Table C-2 National Building Code).

Program deadlines

- 6.17 The program, including the eligible boiler criteria and eligible boiler list, may be amended or modified at any time without notice and the program may be terminated at any time without notice.
- 6.18 Funding for this program is limited. Terasen Gas may, in its sole discretion, determine how this funding will be shared between the new construction market and the replacement market. This may mean that Terasen Gas will continue to accept new construction market applications after the program has been terminated for the replacement market or the converse.
- 6.19 Applications must be submitted to Terasen Gas and pre-approved by Terasen Gas prior to the purchase and installation of the boiler.
- 6.20 Final documents must be submitted within one month of boiler installation.
- 6.21 If Terasen Gas amends or modifies the program after an application is received and pre-approved by Terasen Gas, the applicant cannot resubmit an application for the same boiler plant under the amended or modified program.

Representations and warranties

- 6.22 Applicant acknowledges the program eligibility criteria and warrants that it fully qualifies and will comply with such criteria.
- 6.23 Applicant warrants that all information contained in the application and the information attached thereto is true and correct.
- 6.24 Applicant covenants that it will notify Terasen Gas immediately if there is any material change in the application and information attached thereto after it is approved by Terasen Gas.
- 6.25 Applicant acknowledges that by taking part in the program, their boiler may use less natural gas and produce fewer emissions. Applicant agrees that Terasen Gas may record any resulting reductions in emissions along with those of participating customers and credit them to the Terasen Gas Greenhouse Gas Management Program.

Default or fraud

- 6.26 The incentive approved is based on the information in the application documents. If there are any changes to the information in the application documents after it is approved, Terasen Gas in its sole discretion may void the application documents and Terasen Gas will be released from any and all obligations under the program.
- 6.27 Applicant agrees to the terms and conditions of the program. If the applicant fails to perform according to these terms and conditions, then upon notice of default from Terasen Gas, the applicant shall refund the full amount of the incentive upon request from Terasen Gas.

Liability

- 6.28 Terasen Gas shall have no ownership interest in the boiler.
- 6.29 Terasen Gas, not being the designer or manufacturer of the boiler, makes no representation or warranty, express or implied as to the fitness, design or capability of the material, equipment or workmanship in the boiler, nor any warranty that the boiler will satisfy the requirements of any law, specification, or contract, which may be made against or incurred by Terasen Gas, its contractors, agents and employees in any way relating to, or arising out of, the program.
- 6.30 Applicant indemnifies and saves harmless Terasen Gas, its contractors, agents, and employees from all liability and all claims, damages, expenses and costs.
- 6.31 Terasen Gas does not endorse any particular manufacturer, product, system, design, supplier or installer in promoting the program.

Tax implication

- 6.32 Terasen Gas will not be responsible for any tax liability imposed on the applicant as a result of payments of the incentive. For GST Registrants, incentives received by the applicant include GST which must be remitted by the applicant to the Receiver General of Canada.

7.0 Documentation

All market participants

- 7.1 Terasen Gas is not responsible for lost, delayed, damaged, illegible or incomplete applications.
- 7.2 The following documents must be submitted to Terasen Gas:
- (i) prior to approval:
 - completed application form
 - (ii) after boiler installation:
 - a confirmation letter must be submitted stating that the boiler(s) have been installed
 - the following documents must be submitted with the confirmation letter:
 - gas permit and, if applicable, an approval certificate with a Certificate of Inspection from the BC Safety Authority
 - copy of the start up report by the manufacturer or an authorized factory representative
 - copy of boiler and vent material sales invoice

New construction market participants

- 7.3 The following documents from a qualified professional must also be submitted within one month of the date of application prior to approval otherwise the application may be cancelled.
- (i) estimate of the peak space heating load
 - (ii) report on projected natural gas usage for space heating
 - (iii) invoice for completing the report on projected natural gas usage for space heating
 - (iv) proof the invoice has been paid

Replacement market participants

- 7.4 The following documents from the contractor must also be submitted within one month of the date of application prior to approval otherwise the application may be cancelled.
- (i) estimate of the peak space heating load
 - (ii) invoice for completing the estimate of the peak space heating load
 - (iii) proof the invoice has been paid
- 7.5 The following documents must also be submitted after boiler installation:
- (i) confirmation letter must be submitted indicating the interest to participate with the monitoring phase of the program
 - (ii) first report with the data from Section 5.10 above must be submitted 6 months after boiler installation
 - (ii) second report with the data from Section 5.10 above must be submitted 12 months after boiler installation

8.0 Contact information

Toll-free: 1-888-477-0777

Fax: 1-604-576-7122

E-mail: rebates@terasengas.com

Mail: Efficient Boiler Program
Technical Sales Support
Terasen Gas
16705 Fraser Highway,
Surrey BC V4N 0E8

Appendix H

INTERNAL AUDIT SERVICES EEC PROCESS AND INTERNAL CONTROL REVIEW



Terasen Gas Inc. & Terasen Gas (Vancouver Island) Inc. Energy Efficiency and Conservation Program - Process and Internal Control Review

Notice:

This report has been prepared by Internal Audit Services of Terasen Inc. for the Directors and Management of the Terasen group of companies. Its contents are confidential and copies of this report shall not be distributed to anyone outside of the Terasen group of companies without prior consent of the Manager, Internal Audit Services.

Distribution to:

- Randy Jespersen, President & Chief Executive Officer
- Scott Thomson, VP, Regulatory Affairs & Chief Financial Officer
- David Bennett, VP, General Counsel & Corporate Secretary
- Doug Stout, VP, Marketing & Business Development

**Internal Audit Services
Terasen Inc.
March 1, 2010**



Executive Summary

Background

Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc. (“The Companies”) Energy Efficiency and Conservation Program (“The Program” or “EEC”) is designed to provide customers tools and incentives to manage their natural gas consumption, reduce their energy costs, and lower their greenhouse gas emissions.

In April 2009, the British Columbia Utilities Commission (“BCUC” or “Commission”) granted the Companies approval for the Program expenditure of \$41.5 million for the period 2008 to 2010. This is a significant expansion from the Companies’ previous EEC activities which had remained largely unchanged since the late 1990’s at the incentives and non-incentive expenses level of approximately \$1.50 million and \$1.624 million respectively for TGI and \$650k and \$500k respectively for TGVI. The Program includes rebates and incentives on a number of energy efficient appliances, equipment and systems as well as education and outreach initiatives to increase awareness of the energy efficiency and environmental benefits that can be achieved by using clean burning natural gas in high efficiency appliances.

Review Scope and Objectives

Given the recent expansion of the EEC activities, the review provides a timely opportunity to assess the effectiveness of current processes and controls and to recommend improvements during the transitional period of the Program.

The objective is to evaluate the design effectiveness of the project management processes and controls as established for the facilitation of the Program. The following will be evaluated as part of the review:

- Identify key risks and determine whether risks are appropriately managed;
- Review existing policies, procedures and practices with reference to best practices;
- Review the level of adherence to and compliance with existing policies and procedures;
- Develop recommendations and potential action plans to address any significant issues or opportunities for improvement that are identified; and
- Review for compliance with the BCUC Decision.

Project Risks

IAS developed a risk-based audit approach to review key processes and evaluate internal controls for the Project. The following risks that may result in cost overruns and jeopardize the success of the project were considered:

- *Cost Monitoring:* Program costs are not monitored and analyzed on a timely basis resulting in cost overruns with the amount not recoverable;





Executive Summary

- *Scheduling:* Program is not delivered on time; program objectives are not met; changes to schedules are not properly communicated;
- *Authorization:* Improper authorizations resulting in program delays and/or overcharges or improper charges for program costs;
- *Invoice Payments:* Invoice payments are not in accordance with contract terms and do not match contracted deliverables;
- *Program administration:* Administration of various EEC programs are not monitored for accuracy and efficiency as well as adherence to terms and conditions of the program resulting in program cost overruns, administrative inefficiencies and participant ill will; and
- *Reporting:* Project reporting fails to supply appropriate measurement for management of cost, scope and schedule to ensure proper management oversight.

Summary of Observations

The EEC Team has demonstrated good project commitment with the common goal of achieving the Program's objectives in the most cost effective and efficient manner. As this is a significant increase in funding for the EEC program, internal controls need to be robust to ensure the program is managed effectively.

Certain internal controls for the Program were established and implemented but, IAS has determined that there are opportunities to improve processes or internal controls. The details are reported to management in a list of observations and recommendations attached to this report. The summary of the significant opportunities are as follows:

- ***Process and Control Documentation:*** Process and internal control documentation for various EEC programs was not readily available. Timely communication of process and controls is critical to achievement of program objectives, especially given that a significant number of the EEC team consist of new employees.
- ***Third-Party Program Administration:*** Some of the EEC programs are administered by third-parties; however, their performance was not often monitored by Terasen. Based on IAS' sample testing, some instances of exceptions in program administration were noted. A periodic review of the effectiveness of third party administrators is recommended to ensure that quality of the program administration is acceptable. Also noted was that one EEC program did not have a statement of work in place with one third-party program administrator. Each EEC program should have a statement of work in place with any third party administrators prior to program commencement to establish terms and conditions in administering the program.
- ***Internal Program Administration:*** Based on IAS' sample testing, one incident was noted where an application approved did not follow terms and conditions of the program. Also, for one of the EEC programs there was no clear evidence of review performed on applications and the review did not consider all areas of potential risk. Adherence to program terms and conditions, documentation of evidence of review and consideration of all risk areas when performing review are recommended.





Executive Summary

- **Program Status Reporting:** Currently there is no formal reporting on the EEC program progress in place. It is recommended that regular update of program progress is reported to the appropriate level of management and personnel for timely monitoring of the programs.

Our findings have been presented to management and we are satisfied with their response to improve processes and internal control.

Opinion

In my opinion, the processes and the design of internal controls surrounding the Program receives an assessment of **Yellow¹**. We found no major weaknesses in the process and control environment, but there were sufficient minor weaknesses requiring prompt management action to address the recommendations made to adequately mitigate the associated risks being managed.

Andrew Lee CA-CIA
Manager, Internal Audit Services
Terasen Inc.
March 15, 2010
Burnaby, BC

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Green	We found no/very few weaknesses and we recommended no (or only minor) improvements.
Yellow	We found no major weaknesses in the control environment, but there were sufficient minor weaknesses requiring prompt management action to address the recommendations made.
Red	We found a major weakness (or several minor weaknesses combined) in an operation or process in which the control environment (or lack of) and/or testing results indicate a significant risk or exposure to the company.





Observations and Recommendations

#	Observations	Risk	Recommendations	Management Response
1.	<p>Process and Control Documentation</p> <p>Process documentation for various EEC programs was not readily available. The approved business case cannot be relied upon for details of internal control within the process.</p>	Internal controls that are not established may impede achievement of program objectives.	Communication of process and controls prior to the program commencement is critical to achievement of program objectives. This is especially true as a significant number of the EEC team consist of new employees.	<p>Process and control documentation will be updated and provided to personnel. Internal control documentation will be incorporated into the business case for programs on a go forward basis with assistance from IA on a program by program basis.</p> <p>Management Accountability: Sarah Smith, Manager, EEC</p> <p>Estimated Timing: on-going</p>
2.	<p>Third-Party Program Administration</p> <p>A significant number of EEC programs are administered by third-parties.</p> <p>A review of various programs and related applications resulted in the following exceptions:</p> <p>a) Energy Star Heating System Upgrade – Terasen</p> <p>Accenture Business Services for Utilities (ABSU) had the following exceptions:</p> <ul style="list-style-type: none"> Of 24 sample application forms requested, 5 were not available 6 did not contain evidence of review performed by ABSU Through discussion, it was noted that the Statement of Work (SOW) Agreement expired in 2007 and has not been renewed <p>b) Energy Star Heating System Upgrade – LiveSmart</p> <ul style="list-style-type: none"> Ministry of Energy Mines and Petroleum Resources (MEMPR) does 	Payments made to ineligible participants	<p>A periodic review of the effectiveness of third party administrators to ensure accurate and efficient program administration should be performed. Terasen is ultimately responsible for all EEC programs and should be diligent in ensuring that quality of third-party program administration is acceptable.</p> <p>A statement of work should be established with each third-party to outline terms and conditions in administering programs. A right to audit clause should be part of the contract.</p>	<p>This will be implemented for all third party administrator contracts entered into on a go forward basis.</p> <p>Management Accountability: Sarah Smith, Manager, EEC Beth Ringdahl, EEC Program Manager (Residential) Ramsay Cook, EEC Program Manager (Commercial)</p> <p>Estimated Timing: March 15, 2010</p>



Observations and Recommendations

#	Observations	Risk	Recommendations	Management Response
	<p>not provide application documentation</p> <p>c) EnerChoice Fireplace</p> <ul style="list-style-type: none">One incident was noted where there were two consecutive application reference numbers assigned to the same participant but only one invoice with one fireplace purchase was available for both applications. Since both applications were approved and paid, duplicate payment is suspected. <p>d) EcoEnergy Home Energy Assessment (D-Visits) Program – LiveSmart BC</p> <ul style="list-style-type: none">MEMPR does not provide application documentation			
3.	<p>Internal Program Administration</p> <p>A review of various programs and related applications resulted in the following exceptions:</p> <p>a) Efficient Boiler Program (EBP)</p> <ul style="list-style-type: none">One incident was noted where an applicant had installed a boiler prior to obtaining pre-approval to be eligible for the rebate application. This is not in accordance with the Program's terms and conditions, which states the pre-approval must be obtained prior to boiler installation. Per discussion there have been a few other cases where applicants installed boilers prior to obtaining pre-approval and accepted to the program. Reasons included a need for a new boiler due to an emergency or learning about the program after installing the boilers. <p>b) Light Commercial Energy Star Boiler Program</p> <ul style="list-style-type: none">There was no clear indication a review	<p>Ineffective application evaluation process can result in payments to ineligible participants.</p>	<p>a) Adherence to program terms and conditions should be followed.</p> <p>b) It is recommended that evidence of review should be documented. While the risk of duplicate applications was low based on the small number of participants in 2009, management should consider its implication on a go forward basis as more participants are expected.</p>	<p>a) Terms and conditions for the pre-approval requirement has been modified and eliminated for new applicants</p> <p>b) All internal reviewers are now required to initial applications as evidence of review.</p> <p>Management Accountability: Sarah Smith, Manager, EEC Beth Ringdahl, EEC Program Manager (Residential) Ramsay Cook, EEC Program Manager (Commercial)</p> <p>Estimated Timing: March 2, 2010</p>





Observations and Recommendations

#	Observations	Risk	Recommendations	Management Response
	<p>was performed on the application (e.g. initials).</p> <ul style="list-style-type: none"> Based on discussion, it was noted that the current application evaluation process did not include a process to detect any duplicate applications. 			
4.	<p>Participant Database Management – Efficient Boiler Program (EBP)</p> <p>It was noted that the current participant database contained a number of inactive accounts - some dating back to 2005. Prior to October 2008 the program allowed participants up to 2 years from the application pre-approval date to install boilers. This resulted in administrative difficulties in keeping up-to-date with status of some accounts. The program terms and conditions have been revised since to allow participants 1 year to install boilers. However, the database has not been updated to remove inactive participants.</p>	<p>Database containing inactive participants can result in inaccurate reflection of program performance as well as impede the effectiveness of program management</p>	<p>The program database should be updated to reflect the accurate status of accounts participating in programs.</p>	<p>EBP administration has been re-patriated to the EEC Dept, and the Database will be updated.</p> <p>Management Accountability: Sarah Smith, Manager, EEC Ramsay Cook, EEC Program Manager (Commercial)</p> <p>Estimated Timing: March 31, 2010</p>
5.	<p>Demand Side Management (DSM) Cost-Benefit Model</p> <p>There are two sets of DSM Cost-Benefit models that are used by the EEC team. One is a “program planning” model that is used by EEC Program Managers during program development for scenarios planning and supports the Business Case that is eventually signed by Management in accordance with the Signing Authority protocols established within the Company. The other is the Total Resource Cost (TRC) reporting spreadsheet that is used by the Business Development Analyst to create large-scale spreadsheets that support Annual Reporting to external stakeholders and the BCUC.</p> <ul style="list-style-type: none"> In both cases, input cells that are constant formulated cells are not protected For the “program planning” model, there is no controls process to check accuracy of formula on a regular basis. 	<p>There is risk that the Models can be accessed and modified by unauthorized individuals.</p>	<p>Implementation of the following controls into the Models are recommended:</p> <ul style="list-style-type: none"> Cells that are constant in the “program planning” model should be protected to prevent unauthorized modifications Access to the large-scale spreadsheet that is used for external reporting should be password protected and restricted to the Manager, EEC and the Business Development Analyst 	<p>Administration of the spreadsheets will incorporate the recommendations.</p> <p>Management Accountability: Sarah Smith, Manager, EEC Arvind Ramakrishnan, Business Development Analyst</p> <p>Estimated Timing: March 31, 2010</p>





Observations and Recommendations

#	Observations	Risk	Recommendations	Management Response
	<p>This is not the case for the large-scale spreadsheet that is used for Annual Reporting, which is checked over by an external consultant prior for use to support Annual Reporting.</p> <ul style="list-style-type: none">All EEC staff have access to shared folders containing the models			
6.	<p>Approval Process for Research Studies</p> <p>From the resource allocation perspective, all expenditures (i.e. programs or research studies) are competing against the same pool of finite EEC resources. Therefore, the same level of rigor should be exercised in approving both types of expenditures given significant costs generally associated with such types of expenditures.</p> <p>Currently, the EEC program approval process requires that a business case be submitted and approved prior to the commencement of a new EEC program. However, there is no standard process for the approval of research studies and the evaluation process does not appear to require the same level of rigor.</p>	<p>Inconsistent approval process for EEC programs and research studies can result in ineffective use of EEC resources.</p>	<p>It is recommended that uniform approval processes are applied to both EEC programs and research studies.</p>	<p>Each research study over \$10K is now required to have its own business case before proceeding.</p> <p>Management Accountability: Sarah Smith, Manager, EEC David Bennett, Director, Resource Planning & Market Development Doug Stout, VP, Marketing & Business Development</p> <p>Estimated Timing: Mar 2, 2010</p>
7.	<p>Program Status Reporting</p> <p>It was noted that currently there is no regular reporting to management (i.e. Utility Operating Committee (UOC)) on the EEC program including program development and financial information. While the ELT and Board of Directors is informed on a quarterly basis, it is management that is responsible for administrating and managing the program.</p> <p>Also, until program managers implement regular tracking of program information, there is no regular status reporting to Manager of EEC.</p>	<p>Regular monitoring and tracking of program performance can help with more effective use of the EEC resources and assist to achieve program objectives.</p>	<p>It is recommended that regular updates of program progress are reported to the appropriate level of management and personnel for timely monitoring of the programs.</p>	<p>The first regular quarterly report to UOC on EEC activity is scheduled for April 2010 and then subsequent quarters thereafter. The implementation of the Demand Side Management System (DSMS), which will be used to manage various aspects of EEC program administration and performance measurement, will provide regular status reporting to the Manager, EEC.</p> <p>Management Accountability: Sarah Smith, Manager, EEC Beth Ringdahl, EEC Program Manager (Residential)</p>





Observations and Recommendations

#	Observations	Risk	Recommendations	Management Response
				<p>Ramsay Cook, EEC Program Manager (Commercial)</p> <p>Ned Georgy, EEC Program Manager (Affordable Housing)</p> <p>Jenny Chia, EEC Program Manager (Community Education & Outreach)</p> <p>Gary Lengle, EEC Program Manager (Enabling & Trades Relations)</p> <p>Estimated Timing: April 2010 for reporting to UOC</p> <p>Q4 2010 for implementation of DSMS and regular status reporting to the Manager, EEC</p>



Appendix I

**HABART & ASSOCIATES CONSULTING INC.
CONDENSING DOMESTIC HOT WATER HEATERS
MARKET TRANSFORMATION**

Condensing DHW

Prepared for: Terasen Gas

Prepared by:



March 22 2010

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1. Introduction

1.1 Background

The British Columbia Provincial Government introduced the Energy Plan in 2007 and the BC Climate Action Plan in 2008. The Action Plan set the objective of reducing green house gas emissions by 33% by 2020. Major activities to date have focused on the appliances and the building shell of buildings. Hot water represents the second largest household energy usage (approximately 20% of the total). However this share will increase over time as building envelope construction, space heating appliances and HVAC improve in efficiency.

This has led the Ministry of Energy, Mines and Petroleum Resources (MEMPR) to establish a plan to significantly raise minimum efficiency levels over the next five years. As a result, MEMPR has passed a regulation to increase efficiency levels of residential storage water heaters through a series of steps.

On September 1, 2010, the standard for a 40 USG tank will increase to EF 0.62.

For 2011, the requirement for replacement tanks will increase to EF 0.67 while the requirement for new construction will increase to EF 0.80 for storage water heaters.

For 2013, the requirement will move to EF 0.80 for both new construction and the replacement market.

In the USA the Department of Energy (DOE) sets performance standards for a range of appliances, including Domestic Water Heaters (DWH). The current minimum efficiency level is EF 0.59 which has been in place since 2004. The DOE has now proposed setting the minimum level at EF 0.63 in 2015.

In addition to the minimum energy efficiencies, the ENERGY STAR program defines higher performance levels for water heaters. Prior to August 31, 2010, the standard for a conventional storage water tank is EF 0.62. As of September 1, 2010, this standard will increase to EF 0.67¹. In addition to the standards for conventional water heaters, ENERGY STAR defines a standard of EF 0.82 for tankless water heaters, and an EF of 0.80 for Condensing water tanks.

At the present time, there are no condensing water tanks specifically for the residential market. Some manufacturers, such as Polaris, do make condensing tanks for Commercial use, but the cost is considered to be too high for widespread residential usage.

Condensing water heaters targeted at the residential sector are expected to be available by mid-2010.

¹ Conversation with DOE staff suggest that this implementation data may be delayed.

1.2 Report Objectives

The purpose of this project is to outline a strategy by which Terasen Gas can support the commercialization of residential condensing water heaters in conjunction with the Ministry of Energy, Mines and Petroleum Resources (MEMPR) of the B C Government.

The paper provides: a conceptual framework for transforming the market; technical information on condensing water heaters; and background on the expected size of the DWH market in B.C.. Then an implementation plan and a business case are provided.

2. Market Transformation

The concept of market transformation gained popularity during the late 1990's in part to respond to a concern that many Demand Side Management programs were dependent on subsidies in order to move more efficient products into the marketplace. The broad thrust of market transformation was to find ways to take advantage of the "natural working" of the market in order to move efficient products from relatively low volume, speciality products into the mainstream so that they displaced the less efficient products. Much of the activity (thought) focused on understanding the barriers that prevent these products from obtaining larger market shares.

2.1 Diffusion theory

The way in which new ideas and technologies are adopted by a society is covered under the broad title of "Diffusion of Innovation" theory. Everett Rogers² built on existing thought and wrote the most commonly referenced work on the topic. Briefly, he espoused the concept that, on an individual basis, innovation occurs in a 5 stage process. This includes: awareness; persuasion; decision; implementation; and confirmation.

At the awareness stage, the individual is first exposed to the innovation. In the persuasion stage the individual becomes interested and obtains more information, which leads to the decision point. Once the decision is made (assuming the innovation is not rejected), the implementation stage begins when the innovation is used and experience gained. At the confirmation stage the individual decides either to continue using the innovation or to discard it.

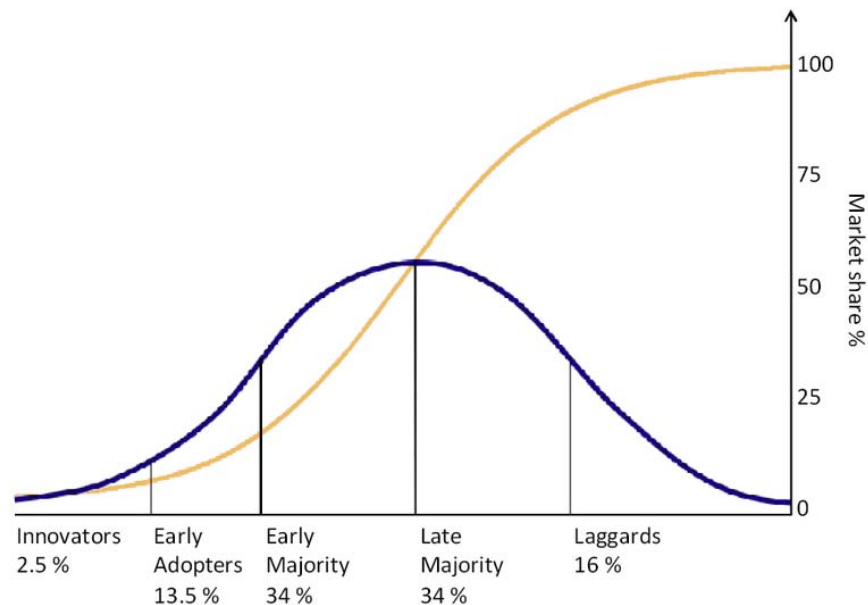
Not all individuals will adopt innovations at the same rate. Rogers defined five categories of individuals based on their tendency to adopt new products. These categories include:

- Innovators. These are the first people to adopt a new product – the first person on the block with the HD TV and Blue Ray disk player. They are willing to take risks, tend to be younger with reasonable incomes.
- Early adopters. These are the second category to adopt new products. They tend to be opinion leaders and again tend to be younger, well educated, have a high social status and reasonable incomes.
- Early majority. These people have a longer time of adoption, and are less of risk takers. Products need to be mature and well proven before this group will adopt them.
- Late majority. These people tend to adopt after the majority of society. They approach new products with a high degree of scepticism. They also tend to have lower social status, less financial flexibility and are followers rather than opinion leaders.
- Laggards. These are the last group to adopt technologies. They tend to be older and high a high resistance to change.

² Rogers, E. (1962) *Diffusion of innovations*. Free Press, London, NY, USA

Exhibit 1 shows the approximate size of these five groups. The exhibit also shows the “S” curve of adoption of new technology. The shape of the curve is driven by the relative speed with which each of the five segments adopt new technology.

Exhibit 1: Product Diffusion Curve



The product diffusion curve also provides some insights about the types of marketing program activities that are appropriate at each stage of adoption.

When introducing a new product, the market is primarily the innovators and early adopters. These people need to become aware of the technology, and require good information to help them evaluate and make the decision. Appropriate utility activities include demonstration projects to build experience with the product and to develop credible data on its performance. Utilities also have a strong role to play in raising awareness of the product, especially as they are often considered a more credible source of information than the vendors.

At the early majority stage, incentives are added as a key element to speed the adoption of the technology. The incentives serve to improve the economics of the decision, but they also are a very powerful way to raise awareness of the product, and provide credibility (if the utility is willing to help fund this product, it must perform).

At the late majority, labelling (including “premium labels” such as ENERGY STAR) are important as well as ongoing marketing and public education.

Finally, the laggards are not likely to make decisions to adopt the new technology on their own. Codes and Standards become the most effective tool as they take the older technologies off the market.

2.2 Market Barriers

Diffusion theory provides the “big picture” of the process to transform the market for a specific product, and it also provides general guidance of the types of utility activities that are appropriate at each stage of transformation.

The second conceptual model more specifically addresses market barriers, and again is useful to help in development of utility DSM programs. This approach is referred to as the “Five A’s”, and has been used by Natural Resources Canada and B.C. Hydro to aid in the development of program strategies and tactics.³ The Five As are:

Availability. Is the product or technology readily available on the market? This includes not only the availability of the physical product, but also information such as performance, reliability and etc. This should consist of more than just manufacturers information, and includes third party evaluations and case studies, test standards and etc. The utility can play a key role by undertaking demonstration and pilot projects, and providing a third party case study to document the performance of the product under actual conditions.

Awareness. Is the market aware of the product? The market includes both the end users of the technology and the distribution channels. Awareness includes the benefits and costs of the product, Again the utility can play a strong role in the introduction of a new product by providing training for the distribution channels, sales aids such as POP materials, and advertising and promotion to the end user.

Accessibility. Is the product easily accessible to the customer? In the retail distribution channel, is the product and its benefits prominently displayed, and is the product available throughout the province. In the case of the plumber distribution channel, is the product stocked by the plumber and “on the truck”. A large component of the replacement market occurs on product failure, and speed of replacement is paramount. For new construction, is the product available in sufficient quantity, and are there sufficient trained trades to install the product.

Affordability. Is the product affordable? Affordability includes not only the payback to the customer, but also the incremental cost, as many customers are “cash strapped” and will choose the lowest cost product regardless of the expected payback on the additional expense.

Acceptability. Does the product meet the needs of both the end user and the distribution channels? For the customer, this includes not only achieving the expected energy savings, but also the performance and reliability of the product. For the distribution channels, acceptability includes meeting the profitability expectations, and well as the ease of installation and a reasonable level of “call-backs” to resolve customer issues.

³ To the best of the author’s knowledge, this framework was developed by the US consulting firm A.D. Little.

2.3 Regulations

Regulations are an important tool in Market Transformation. They are likely the only tool to address the “laggards”, but if regulations can be introduced into the product diffusion process earlier, they can significantly speed the transformation.

In British Columbia, the legislative framework for regulating appliance and water heater efficiency already exists. What is required is the development of new regulations to increase the minimum efficiency level of the product. The Ministry of Energy, Mines and Petroleum Resources (MEMPR) takes the lead and typically forms a Technical Advisory Group (TAG) to assist it in the development of the regulations. The TAG will typically include: representatives of the manufacturers, representatives of the distribution channels and relevant trades, and the affected utilities’.

As this is a consensus process, it is necessary to have all major parties agree with the regulations before MEMPR will move forward. Typically the following conditions must be met before new regulations can be considered:

- All major manufacturers can provide the product;
- The major distributors carry the product;
- All distribution channels have experience delivering the product;
- The necessary trades have experience with the product, and support its sale;
- The product performs to the appropriate level, including providing the expected energy reductions, service levels and reliability; and
- There is a valid benefit for customers.

3. Condensing Water Heaters

3.1 Description

A condensing water heater is similar to a standard efficiency gas storage water heater but has an improved heat exchanger that allows the latent heat to be extracted from the flue gas and provides a thermal “steady state” efficiency of up to 96%. However, as these are storage water tanks, and when stand-by losses, and possible flue losses are included, the effective EF will be lower. As residential condensing water heater products are not yet available on the market, there are no measured EF ratings available. For the purpose of this document, it is assumed that the effective ratings will be EF 0.80, which is the current ENERGY STAR standard for condensing water tanks.

There are condensing water tanks available for Commercial use. They appear to function well, but are relatively expensive for residential usage.

3.2 Benefit / Cost

For the purpose of this study, it has been assumed that the incremental cost to move from a conventional DWH storage tank to a condensing unit will be about \$1,750. However it is anticipated that the incremental cost of the condensing tank will decrease as these tanks becomes predominant in the marketplace.

Assuming the baseline water heater has an EF of 0.57, the condensing tank is assumed to reduce natural gas consumption by 7 GJ⁴ per year.

At the projected incremental cost this product is not cost effective to the customer. The B / C ratio is about 0.33. Without a decrease in the incremental cost, this technology does not provide a payback for the customer.

However, it is reasonable to expect the incremental cost to decrease. When a new, efficient product appears on the market, it is typically priced as a premium product. There are a number of costs associated with new products that must be recovered. These include:

- R&D and design costs;
- New tooling costs, especially for the heat exchangers;
- More, and more expensive materials for the tank / heat exchanger;
- Lack of manufacturing economies of scale due to low volumes; and
- Lack of distribution channel economies of scale.

As the product moves into volume production, costs tend to drop as the development costs are recovered or amortized over a larger volume of sales. Incremental material costs may remain, but often these will also decrease as product designs are refined with experience. Finally, the manufacturing and distribution costs will drop with volume production.

⁴ The savings have been estimated using HOT2000. The archetype is for an EGH80 natural gas heated dwelling.

There is no data available on how the incremental costs might drop over time for the condensing water tanks. However, if we look at the furnace market, some analogies may be possible. At the time mid efficiency furnaces were last sold in B.C., the incremental cost to move from a mid efficiency furnace to a high efficiency furnace was approximately \$600. The differences between a mid efficiency furnace and a high efficiency furnace appear to be more complex than for a condensing water heater. For the purpose of this study, it is assumed that the incremental cost will decrease from the current \$1,750 to \$500. For the business case analysis, it is assumed that the incremental cost declines at a rate of 10% per year until it reaches \$500 and then remains constant for the balance of the analysis.

4. DWH Market

There are two major components to the market place for condensing water heaters, the new construction market and the replacement market.

4.1 New Construction Market

The market model for the new construction market is summarized in Exhibit 4.1 below. It is predicated on the assumption that an average level of new construction starts will be about 22,800 per year across B.C. This is the average number of completions per year from 2000 to 2008 as reported by CMHC. The share of starts by detachment is based on the actual shares of completions in 2008. The penetration of natural gas water heaters is based on research undertaken by the author on shares in New Construction. It is assumed that there are no natural gas DWH in the apartment sector. While this is not strictly correct as there may be some in Vertical Subdivisions, the number is small and will not affect the analysis. There was no data on new mobile home installations, and this market has not been included.

Exhibit 4.1: Domestic Water Heater Market – New Construction

Forecast Starts	Detachment	Detachment Shares	Detachment Number	N. G DWH Shares	Est. DWH Sales
22,800	SFD	29%	6,612	83%	5,488
	Duplex	5%	1,140	14%	160
	RH	11%	2,508	1%	25
	Apartment	55%	na	na	na
	Total				5,673

4.2 Replacement Market

The size of the replacement market was estimated by using a capital stock turnover model. A capital stock turnover model works by estimating the population of water heaters in existing customers, and then using the average life of a water heater to estimate how many water heaters are expected to fail each year. A separate estimate was made for TGI and TGVI as the shares of natural gas water heater are different between the two companies. Exhibit 4.2 shows the data used to estimate the eligible population.

Exhibit 4.1: Domestic Water Heater Market – Replacement

Customer Base		TGI		TGVI		Population
		Det. Shr.	DWH Shr.	Det. Shr.	DWH Shr.	
TGI - 755,660 TGVI - 88,321	SFD	83.7%	90.6%	83.8%	83.0%	634,464
	Duplex	4.8%	89.9%	6.0%	83.8%	37,049
	RH	8.1%	86.2%	6.8%	6.0%	53,122
	Apartment	0.7%	66.9%	1.2%	6.8%	3,661
	Mobile	2.1%	47.0%	2.2%	5.0%	7,556
	Total					735,002

Based on a expected life of 13 years, then about 7% will be replaced each year. The replacement market is expected to be about 49,242 units per year. In total the market is estimated at approximately 55,000 water heaters per year.

5. Implementation Plan

Section 2 of this report outlined the basic concepts of Market Transformation. This section develops a plan to move Condensing Water Heaters from initial introduction through to regulation.

5.1 Pilot / Demonstration Projects and Market Preparation

As condensing residential water heaters are a new product, the first step is to determine and demonstrate the performance of the product in actual use, rather than in laboratory testing conditions. Issues of concern include: installation procedures; energy savings performance; and product reliability.

The approach suggested in this study is to develop 20 test installations. These installations should include metering and recording the natural gas usage for the existing water heater before the condensing tank is installed, and then further metering with the new tank to establish the change in consumption. If the test metering is done for a short period of time, it may also be necessary to meter the hot water usage before and after the tank change. It may be desirable to have a different plumbing firm do each installation so that a range of installation experience can be collected.

Once the pilot demonstration projects are under way, case study materials should be developed. One set of materials should be sales tools that can be used by both plumbers and retail to provide valid information on the performance of the product. Another set should cover off any installation issues to guide plumbers as they install the new technology tanks.

Finally training should be developed for the plumbing community and for retailers. For the plumbing community this may take the form of seminars (often breakfast meetings) to raise awareness, discuss installation, and provide a forum for questions and answers to understand the issues in the trade's minds about these products. The business case assumes a small "spiff" for sales of these tanks, and this will help to increase enthusiasm.

Training will also be required for the retail distribution channel. This can often be arranged by first getting support from the head offices, and then conducting some training in the stores. It is common for retailers to hold staff meetings before the store opens, and for utility staff to provide updates as part of these meetings. A determination will have to be made if spiff's will be offered to the retail chain. The key element of using the spiffs is likely to be the existence of dedicated sales staff who are on commission.

In parallel with the development of these pilot / demonstration projects, utility staff should be working with the water tank manufacturers, the major distributors and major plumbing companies to ensure that the product will move smoothly through their organizations. The expectation of promotional advertising and customer rebates provide a strong incentive for these businesses to work with the utility.

The focus of these activities is to prepare the ground for the Innovators and Early Adopters. They address the barriers of: availability and especially the knowledge aspects of availability; awareness in the distribution channels; and accessibility in the distribution channels.

5.2 Product Marketing

Once the basic performance data for the products has been ascertained and the distribution channels have been primed, the next step is to accelerate the marketing of the product. The business case assumes a three pronged approach for the replacement market: advertising likely including bill inserts, home shows, possible mall displays as well as media advertising; sales "spiffs" to encourage sales staff to promote the product and encourage plumbers to have condensing tanks "on the truck" so that they can sell and provide the product when responding to tank failures; and customer incentives to both raise awareness of the product; and to provide a positive benefit / cost ratio to the consumer.

A separate set of initiatives will be required for the new construction market, which is likely much more "first cost" oriented than the replacement market. For the business case, it is assumed that the utility will be operating a new construction program, and the condensing water heaters will be included in that program.

These actions will address the barriers of accessibility awareness and affordability. It is also expected that the market development activities outlined here will ensure that the major water tank manufacturers will have product, that the distribution channels will stock the product, that the trades will know how to sell and install the product, and that customers are both aware of the product and have sufficient valid information to make the decision to adopt it.

5.3 Program Timing

The current schedule from MEMPR envisions regulations for Condensing Water heaters by 2013. This is a very aggressive time-table as condensing residential hot water tanks are not yet available on the market. This study assumes a longer implementation period will be required for two basic reasons:

1. For a product to be regulated, it will require a performance and reliability track record; and
2. With an expected incremental cost of \$1,750 and a 10% annual price decrease, the product will not provide a positive payback to the consumer until about 2016.

For these reasons, a 7 year program is used to move the product to Market Transformation.

Following is the schedule anticipated in this study.

Year 1: Program development and twenty pilot / demonstration projects. There is a requirement for some time to perform both "pre" and "post" metering of the tanks and to develop the necessary support material. Support material includes: case studies; installation instructions; and trade training. During this year it will

also be necessary to start work with the manufacturers and distribution channels to ensure that product is available.

Year 2: This is the launch and execution of the marketing program, and on-going relations with the manufacturers and distribution channels to resolve any problems. It is assumed that about 300 tanks will be installed during the first year.

Year 3 - 7: This is the continuation of the marketing program. The assumptions are that sales will be ramp up from about 750 to 12,000 in year 7. A volume of 12,000 per year represents about 20% of the total DWH market in BC. It is thought that a 20% market share, while still quite low, will be adequate when supporting MEMPR regulations. This level of sales should ensure that the manufacturers and distributors have experience with, and have accepted the product.

It should be noted that, based on the initial cost estimate and the 10% per annum cost reduction, the product will not provide a benefit to the customer until year 8, the year that regulations are assumed to come into force. Prior to this year, the utility incentive is required to make the product financially viable to the customer.

Year 8: It is assumed that the MEMPR regulations come into effect at this year, and that all program activities will cease.

6. Business Case

The business case detail analysis is included in a separate spreadsheet in Appendix 1.

Exhibit 6.1 summarizes the sales ramp up for the condensing water heaters, and summarizes the associated costs. The total cost of the program over the 7 years is \$26.1 million. The program is based on an incentive of \$1,000 to the customer for each unit sold, and an additional incentive of \$50 to the sales person (retail or plumber).

Exhibit 6.1: Program Sales and Costs (\$ in '000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sales (units)	10	300	750	1,500	3,000	6,000	12,000
Pgm Dev /Pilot (\$)	150						
Train / Retail (\$)		25	25	25	25	25	25
Advertising (\$)		100	100	100	100	100	100
Incentive admin (\$)		6	15	30	60	120	240
Incentive (\$)		315	788	1,575	3,150	6,300	12,600
Total (\$)	150	446	928	1,730	3,335	6,545	12,965

Exhibit 6.2 summarizes the Benefit / Cost tests associated with the 13 years of the program (7 years of program activity and 6 years of "credit" for the market transformation). With 6 years credit, the program achieves a Total Resource Cost benefit / cost ratio of just over 1. The Utility Cost is strong at a 6.8 while the RIM is reasonable for a residential program of 0.71.

Exhibit 6.2: Program B / C

	Benefit / Cost
TRC	1.01
UTC	6.77
RIM	0.71

By way of comparison, Exhibit 6.3 shows the benefit / cost tests if no credit was given for additional savings, and also shows the impact of a 20 year analysis of costs and benefits. The second column shows that, if no credit is provided, or if regulation is not achieved and condensing water heater sales drop, the program fails on all tests. The third column shows the impact of the program over a 20 year period, and shows the foregone benefit from the perspective of condensing water heaters (or an equivalent technology) not taking over during the 20 year period without a program.

Exhibit 6.3: Program B / C

	Benefit / Cost (no credit)	Benefit / Cost (20 yr)
TRC	0.59	1.22
UTC	0.55	12.01
RIM	0.32	0.76

6.1 Critical Assumptions / Success Factors:

Following are the critical assumptions necessary for the success of this program.

- Incremental cost of Condensing Water Heaters decreases. At the projected incremental cost, the product is not cost effective to the end user. The study assumes a 10% per annum cost reduction from the manufacturers / distributors. If this does not materialize, the probability of the program failing the overall benefit cost test increases.
- The business case assumes that the utility can take sole credit for moving regulations forward by 6 years. This was the minimum period that would provide a TRC of greater than 1.0 for the program. This period of credit would seem reasonable when compared instantaneous water heaters. They have been available for at least 20 years, and have major market shares in some European countries. However these products are only now gaining traction in the B.C. market. Moving a new product from commercializing to regulation over a period of 7 years would not be possible without strong support from the utility.

6.2 Business Case Summary

The business case assumes a seven year program by the utility which includes both incentives and marketing. The total cost of the program over 7 years is \$26.1 million with a net present value of these costs of approximately \$18.25 million. The savings in natural gas over the 13 years of analysis (for which the utility would receive credit) is 32 million GJ of natural gas. The net present value of these savings is \$124 million while the net present value of the costs, including both customer costs and utility costs) is \$122 million. The TRC Benefit Cost ratio of the program to society is 1.01.

The program will not be cost effective unless the utility receives credit for savings after the regulations are passed. This analysis shows that the TRC would be only 0.59 and the Benefit / Cost to the utility would be 0.55.

7. Summary

This paper outlines a strategy to move a new technology, condensing residential water heaters, from product introduction to regulation.

The strategy includes a preliminary year of pilot projects to obtain actual field experience with the technology, including installation experience, product performance, and energy savings. Data from these pilot projects will be used to develop customer, marketing and trades training materials. The second year will include a full program launch with customer and trade incentives and strong advertising and awareness promotion. It is thought that after 6 years of marketing promotion and incentives, condensing water heaters will have about a 20% market share which will be sufficient to support MEMPR developed regulations to remove less efficient products from the market.

This program will not be cost effective unless Terasen Gas is provided with credit for load reduction that occurs after the water heater regulations come into effect. The business case shows that, without this credit, the TRC is only 0.59, and the Utility Cost benefit is 0.55. This is not a viable investment for Terasen Gas's DSM program.

Further analysis determined that Terasen Gas would need to receive credit for an additional 6 years of savings. This additional savings results in a TRC of 1.01 and a UTC of 6.77, which makes the program viable from the perspective of both the utility and society.

Providing 6 years of post regulation credit for the program appears reasonable. This essentially assumes that, without the support of this marketing program, MEMPR would not be able to pass regulations until some date after year 13. Considering the example of instantaneous water heaters. They have been available for over 20 years, but are just now starting to gain traction in the marketplace. There is no reason to think that condensing water heaters will gain market share any faster without strong utility support.

The total cost of this program to Terasen Gas is estimated at \$26.1 million, and it is expected to reduce natural gas requirements by 32 TJ over the 13 year life of this analysis.

The two critical success factors for this program are:

- the incremental cost of the Condensing water heater decreases as forecast in the business case: and
- the utility obtains credit for savings that occur after the enactment of regulations by MEMPR .

8. Appendix 1

Water Heater Market Transformation Strategy - Feb 23 2009															
Market Transformation Model															
Assumptions			Scenario 2 - 7 year program												
DWH Market			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
	Number	Share	Year	1	2	3	4	5	6	7	8	9	10	11	
New	5,673	10.3%	Unit Cost	\$1,750	1,575	1,418	1,276	1,148	1,033	930	837	753	678	610	
Replace	49,242	89.7%	Tariff (Arvind)	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	\$9.80	
Total	54,915		Tariff (Jack)	\$10.99	\$11.75	\$12.18	\$12.63	\$13.14	\$13.43	\$13.67	\$13.90	\$14.14	\$14.38	\$14.62	
			Avoided Cost	\$ 7.85	\$ 8.61	\$ 9.04	\$ 9.49	\$ 10.00	\$ 10.30	\$ 10.53	\$ 10.76	\$ 11.00	\$ 11.24	\$ 11.48	
Technology															
EF	0.8		NPV (Tariff-Arvind)	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	\$561.19	
Incr. Cost	\$2,000		NPV (Tariff-Jack)	\$751.67	\$772.83	\$790.95	\$808.16	\$824.25	\$838.73	\$852.89	\$867.28	\$881.90	\$896.75	\$911.91	
Ener. Red.	7 GJ		NPV (Avoided cost)	\$571.95	\$593.11	\$611.23	\$628.44	\$644.53	\$659.00	\$673.17	\$687.56	\$702.18	\$717.03	\$732.19	
Life	13 yr.														
Program			Sales	10	300	750	1,500	3,000	6,000	12,000	54,915	54,915	54,915	54,915	
			Terasen Program (2022)												
Activity	Number	Cost	Total Avoid Gas (NPV)	\$123,533,042	\$5,719	\$177,932	\$458,423	\$942,657	\$1,933,595	\$3,954,028	\$8,078,032	\$37,757,056	\$38,559,885	\$39,375,270	\$40,208,095
Pgm Dev.	1	\$40,000	Total Lost Rev - A(NPV)	\$96,788,865	\$5,612	\$168,356	\$420,890	\$841,780	\$1,683,561	\$3,367,121	\$6,734,242	\$30,817,441	\$30,817,441	\$30,817,441	\$30,817,441
Demo	20	\$5,000	Total Lost Rev - J(NPV)	\$154,530,118	\$7,517	\$231,848	\$593,215	\$1,212,241	\$2,472,763	\$5,032,364	\$10,234,704	\$47,626,482	\$48,429,312	\$49,244,697	\$50,077,521
Case Study	20	\$500	Total Equip Costs (NPV)	\$121,051,096	\$17,500	\$472,500	\$1,063,125	\$1,913,625	\$3,444,525	\$6,200,145	\$11,160,261	\$45,964,729	\$41,368,256	\$37,231,431	\$33,508,288
Training*	5	\$5,000	20 Year Perspective			7 year Perspective									
Cont. Mail	Annual	\$20,000	Total Avoid Gas (NPV)	\$219,138,883				\$10,079,894							
Spif	Sales	\$50	Total Lost Rev - A(NPV)	\$161,740,678				\$8,590,979							
Incentive	Sales	\$1,000	Total Lost Rev - J(NPV)	\$270,937,074				\$12,831,195							
Admin	Sales	\$20	Total Costs (NPV)	\$178,921,138				\$15,960,986							
Adv.	Annual	\$100,000													
* Includes retail support															
Regulation eff. date			Program Costs												
2017			Program Dev.	\$40,000											
			Demo / case stdy	\$110,000											
Technology Cost			Training / Retail		\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000					
Price Red.	10%	/yr	Advertising		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000					
			Administration		\$6,000	\$15,000	\$30,000	\$60,000	\$120,000	\$240,000					
Financial			Program Costs (NPV)	\$994,095	\$150,000	\$131,000	\$140,000	\$155,000	\$185,000	\$245,000	\$365,000				
TGI	7.38%		NPV (Pgm w/out inc)												
Inflation	0.00%		Incentives / Spif (NPV)	\$17,249,781		\$315,000	\$787,500	\$1,575,000	\$3,150,000	\$6,300,000	\$12,600,000				
Disc. rate	7.38%														
Tariff	\$12			7 yr	13 year	20 Year									
Incr. (real)	0.50%		(no MT credit)	(T.Gas Pgm)	(Society)										
			TRC (T. Gas Program)	0.59	1.01	1.22									
			UTC	0.55	6.77	12.01									
			RIM	0.38	1.07	1.22									
			RIM (alternative)	0.32	0.71	0.76									

[illegible]

Appendix J

COST BENEFIT ANALYSIS

	PROGRAM								ALTERNATE		NET PRESENT VALUE										Benefit/cost test						
	COSTS (\$000)							SAVINGS (GJ)		Impact		Levelized Cost (\$/GJ)	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings				Participant					
	Utility			Participant	Total	% Utility	% Participant	Gross	Net	Energy	Capacity		Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Natural Gas	Total Costs	Total Benefits	Benefit/Co st	Natural Gas	TRC Net Benefits	
	Incentives	Administrat ion	Total																								Rate Impact
2009 TGI Programs Actuals										MWh	kW																
2009 Residential Energy Efficiency Programs: Retrofit																											
Energy Efficiency	1,975	138	2,113	2,729	4,842	44%	56%	91,279	52,901	0	-	4	5,682	0	5,575	806	0	553,543	-	-	2.7	2,729	6,381	2.3	0.7	1.2	840
Subtotals																											
Residential Energy Efficiency	1,975	138	2,113	2,729	4,842	44%	56%	91,279	52,901	0	-	4	5,682	-	5,575	806	-	553,543	-	-	3	2,729	6,381	2.3	0.7	1.2	840
2008 Residential Total	1,975	138	2,113	2,729	4,842	44%	56%	91,279	52,901	0	-	4	5,682	-	5,575	806	-	553,543	-	-							
Commercial Energy Efficiency Programs: Retrofit																											
Energy Efficiency	874	140	1,014	2,322	3,336	30%	70%	84,917	70,804	0	-	2	6,893	0	6,195	911	0	653,874	-	-	6.8	2,322	7,105	3.1	1.0	2.1	3,557
2008 Total Commercial	874	140	1,014	2,322	3,336	30%	70%	84,917	70,804	0	-	2	6,893	0	6,195	911	0	653,874	0	-	6.8	2,322.3	7,105.2	3.1	1.0	2.1	3,557
Joint Initiatives																											
2009 Joint Initiatives	7	0	7	19	25	26%	74%	368	210	0	0	3	19	0	19	3	0	1,905	0	0	2.9	19	22	1.2	1	0.8	-6
Conservation for Affordable Housing Programs *																											
Retrofit	390	0	390	229	620	63%	37%	1,352	1,352	138	0	16	189	233	143	21	123	14,236	1,492	0	0.6	229.4	288	1.3	0.4	0.7	-197
Portfolio level expenditure																											
Conservation Education & Outreach		530																									
Joint Initiatives		405																									
Enabling activites		59																									
DSMS consultant costs		9																									
Research & evaluation		12																									
consultant fees		69																									
Non Program admin		1135																									
TGI Portfolio level total		2220																									
2009 Total	3,245	2,498	5,743	5,299	11,042	52%	48%	177,916	125,267	138	-	4.7	12,783	233	11,932	1,740	123	1,223,559	1,492	0	2.2	5,299	13,796	2.6	0.7	1.2	1,973

2009 TGVI Programs Actuals	PROGRAM									ALTERNATE		NET	BENEFIT/COST														
	COSTS (\$000)							SAVINGS (GJ)		Impact		Levelized Cost (\$/GJ)	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings			Natural Gas Utility	Participant			Natural Gas Rate Impact	Total Resource	
	Utility				Total	% Utility	% Participant	Gross	Net	Energy MWh	Capacity kW		Program (\$'000s)	Alternate (\$'000s)	Program (\$'000s)	Carbon Tax (\$'000s)	Alternate (\$'000s)	Natural Gas (GJ)	Alternate Energy (MWh)	Alternate Capacity (kW)		Total Costs (\$'000s)	Total Benefits (\$'000s)	Benefit/Cost			
	Incentives	Administration	Total																								
2009 Residential Energy Efficiency Programs: Retrofit																											
Energy Efficiency																											
Subtotals																											
2009 Residential Total																											
Commercial Energy Efficiency Programs:																											
New Construction																											
Retrofit																											
2008 Total Commercial																											
Portfolio level expenditure																											
Conservation Education & Outreach																											
Joint Initiatives																											
Enabling activities																											
DSMS consultant costs																											
Research & evaluation consultant fees																											
Non Program admin																											
2009 Total																											

TERASEN GAS INC		PROGRAM														ALTERNATE		NET	BENEFIT/COST															
2009 Commercial Energy Efficiency Programs												SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits		Participant Benefits (Costs)			Program Net Savings				Participant						
		Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross		Net	Energy		Capacity	(\$/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy		Alternate Capacity	Natural Gas	Total Costs	Total Benefits	Benefit/Cost	Natural Gas
		Incentives	Administration	Total	Incentives	Administration	Total																					MWh						
		Label		B	C	D	E	F	G	H	I	J	K	L		M	N		O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
		Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + R x B)	PV(ALP,-O)	PV(AK,P,-QxN)	PV(AK,P,-R)	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2009 Commercial Energy Efficiency Program																																		
Retrofit																																		
Retrofit Efficient Boiler Program		783	101	885	-	-	-	2,260	3,145	28%	-	72%	66,368	82%	54,422	20	-	-	1	6,337	N/A	5,743	860	N/A	605,888	-	-	7.2	2,260	6,603	2.9	1.0	2.0	3,193
Retrofit Light Comm ENERGY STAR® Boiler Program		32	20	52	-	-	-	62	114	46%	-	54%	3,898	82%	3,197	20	-	-	1	372	N/A	337	51	N/A	35,589	-	-	7.15346345	62.31918	388	6.2	1.0	3.3	258
Retrofit Energy Assessment Program		59	18	77	-	-	-	0	77	100%	-	0%	14,651	90%	13,186	1	-	-	6	183	N/A	114	N/A	N/A	12,396	-	-	2.4	-	114	N/A	1.0	2.4	106
Total Commercial		874	140	1,014	-	-	-	2,322	3,336	30%	-	70%	84,917		70,804		-	-	2	6,893	0	6,195	911	0	653,874	0	0	6.8	2,322	7,105	3.1	1.0	2.1	3,557

2009 Commercial Energy Efficiency Programs		PROGRAM														ALTERNATE		NET										BENEFIT/COST																											
		COSTS (\$000)											SAVINGS (GJ)			LIFE Years	Impact		Levelized Cost (\$/GJ)	Utility Benefits		Participant Benefits (Costs)			Program Net Savings				Participant																										
		Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net		Energy	Capacity		Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Natural Gas	Total Costs	Total Benefits		Benefit/Cost	Natural Gas																								
		Incentives	Administration	Total	Incentives	Administration	Total																													Input	J	K	MWh	kW	(\$'000s)	(\$'000s)	(\$'000s)	(\$'000s)	(\$'000s)	(GJ)	(MWh)	(kW)	Utility	(\$'000s)	(\$'000s)	(\$'000s)	Rate Impact	Total Resource	TRC Net Benefits
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD																										
	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	IxJ	Program	Program	D/U	KxAF	M x J x AH	J x I x AJ	J x I x AK	J x (MxAL + NxAM)	PV(AE,L,-K)	PV(AG,L,-M)	PV(AG,L,-N)	P/D	E>0, (R+S)<0	E<0, (R+S)>0, T	Z/Y	P/(R+D)	(P+Q)/F	(P+Q)-F																							
2009 Commercial Energy Efficiency Programs New Construction																																																							
Efficient boiler Program		13	2	15	-	-	-	37	52	28%	-	72%	1,088	1	892	20	-	-	1	103	N/A	163	14.1	N/A	9,869	-	-	7.1	37	177	4.8	0.6	2.0	52																					
Retrofit																																																							
Retrofit Efficient Boiler Prog		39	5	44	-	-	-	111	155	28%	-	72%	3,264	82%	2,676	20	-	-	1	309	N/A	488	42.3	N/A	29,608	-	-	7.1	111	530	4.8	0.6	2.0	155																					
Total Commercial		51	7	58	-	-	-	148	206				4,352		3,569		0	-	1	412	0	651	56	0	39,478	-	-	7.1	148	707	4.8	0.6	2.0	206																					

		PROGRAM														ALTERNATE		NET	BENEFIT/COST																			
2009 Residential Energy Efficiency Programs		COSTS (\$000)										SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings				Participant										
		Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net	Years	Energy	Capacity	(\$/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Natural Gas	Total Costs	Total Benefits	Benefit/Cost	Natural Gas	Total	TRC Net Benefits				
		Incentives	Administration	Total	Incentives	Administration	Total																												Program	Net-to-Gross	Net	MWh
		Label	B	C	D	E	F													G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + RxAQ)	PV(AI,P,-O)	PV(AK,P,-Q*N)	PV(AK,P,-R)	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I					
2009 RESIDENTIAL Energy Efficiency Programs																																						
Retrofit																																						
ENERGY STAR Heating System Upgrade-Terasen (Retrofit)		1,098	101	1,199	-	-	-	1,502	2,700	44%	-	56%	48,916	57%	27,882	18	-	-	4	3,020	N/A	2,959	428	N/A	293,682	-	-	2.5191049	1501.722	3,386	2.3	0.7	1.1	319				
EnerChoice Fireplaces (Retrofit)		30	31	60	-	-	-	67	128	47%	-	53%	4,588	76%	3,487	15	-	-	2	330	N/A	332	48	N/A	33,062	0	-	5.5	67	380	5.6	0.8	2.6	203				
ENERGY STAR Heating System Upgrade -Livesmart BC (Retrofit)		848	7	854	-	-	-	1,160	2,014	42%	-	58%	37,776	57%	21,532	18	-	-	4	2,332	N/A	2,285	330	N/A	226,799	0	-	2.7	1,160	2,615	2.3	0.7	1.2	318				
Total Residential		1,975	138	2,113	-	-	-	2,729	4,842	44%	-	56%	91,279		52,901		0	0	4	5,682	0	5,575	806	0	553,543	0	0	2.7	2,729	6,381	2.3	0.7	1.2	840				

2009 Residential Energy Efficiency Programs	PROGRAM															ALTERNATE		NET	BENEFIT/COST																
	COSTS (\$000)												SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits		Participant Benefits (Costs)			Program Net Savings				Participant						
	Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net	Years	Energy	Capacity	(\$/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Natural Gas	Total Costs	Total Benefits	Benefit/Cost	Natural Gas	TRC Net Benefits			
	Incentives	Administration	Total	Incentives	Administration	Total																											MWh	kW	(\$'000s)
	Label	B	C	D	E	F	G	H	I	J	K	L	Input (program)	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	
	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	IxJ	Program	Program	Program	D/U	KxAF	M x J x AH	J x I x AJ	J x I x AK	J x (MxAL + NxAM)	PV(AE,I,-K)	PV(AG,I,-M)	PV(AG,I,-N)	P/D	E>0, (R+S)<0	E<0, (R+S)>0, T	Z/Y	P/(R+D)	(P+Q)/F	(P+Q)-F		
2009 Residential Energy Efficiency Programs: Retrofit																																			
ENERGY STAR Heating System Upgrade-Live Smart BC (Retrofit)	16	0	16	-	-	-	22	38	42%	-	58%	724	57%	413	18	-	-	4	44	N/A	64	6	N/A	4,322	-	-	2.7	22	70	3.2	0.6	1.2	6		
EnerChoice Fireplaces (Retrofit)	10	14	24	-	-	-	23	47	51%	-	49%	1,566	76%	1,190	15	-	-	2	112	N/A	166	16	N/A	11,223	-	-	4.6	23	182	7.9	0.6	2.4	65		
ENERGY STAR Heating System Upgrade -Terasen (Retrofit)	21	14	35	-	-	-	28	63	55%	-	45%	925	57%	527	18	-	-	6	57	N/A	82	8	N/A	5,519	-	-	1.62116526	28.386	90	3.2	0.5	0.9	(7)		
Total Residential	47		28	75	-	-	-	74	149	51%	-	49%	3,214		2,130		-	-	4	213	0	311	31	0	21,063	0	0	2.8	74	342	4.6	0.6	1.4	64	

2009 Conservation for Affordable Housing project	PROGRAM															ALTERNATE		NET	BENEFIT/COST																	
	COSTS (\$000)											SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings				Participant					TRC			
	Utility			Partners																											Without 30% adder		UCA Demand-side Measures Regulation (Benefit @ 130%)			
	Incentives	Administration	Total	Incentives	Administration	Total																									Total Resource	(\$'000s)	Total Resource	TRC Net Benefits (\$'000s)		
	Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + RxAQ)	PV(AI,P,-O)	PV(AK,P,-Q*N)	PV(AK,P,-R)	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I	(T+U)*1.3 /I	((T+U)*1.3) I	
2009																																				
RESIDENTIAL: Retrofit																																				
Meridian Village Furnace Upgrade	229	0	230	161	-	161	229	620	37%	26%	37%	1,352	100%	1,352	18	138	-	16	146	179	143	21	123	14,236	1,492	-	0.6	229	288	1.3	0.4	0.5	(295)	0.7	(197.3)	
2009 Total Residential	229	0	230	161	-	161	229	620	37%	26%	37%	1,352		1,352		138	0	16	146	179	143	21	123	14,236	1,492	0	0.6371717	229.4	288	1.3	0.4	0.5	(295)	0.7	(197.3)	

TERASEN GAS INC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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2009 Joint Initiatives		COSTS (\$000)											SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings				Participant																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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		Incentives	Administration	Total	Incentives	Administration	Total									Gross	Net-to-Gross	Net																							Energy	Capacity	(\$/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Natural Gas	Total Costs	Total Benefits	Benefit/Cost	Natural Gas	Rate Impact	Total Resource	TRC Net Benefits																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

2010 DSM PLAN																												
2010 DSM PLAN TGI and TGV1		PROGRAM								ALTERNATE		NET PRESENT VALUE										BENEFIT/COST						
		COSTS (\$000)						SAVINGS (GJ)		Impact		Levelized Cost (\$/GJ)	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings			Natural Gas Utility	Participant			Natural Gas Rate Impact	Total Resource	TRC Net Benefits (\$'000s)	
		Utility					% Utility	% Participant	Gross	Net	Energy Mwh		Capacity kW	Program (\$'000s)	Alternate (\$'000s)	Program (\$'000s)	Carbon Tax (\$'000s)	Alternate (\$'000s)	Natural Gas (GJ)	Alternate Energy Mwh		Alternate Capacity (kW)	Total Costs (\$'000s)	Total Benefits (\$'000s)				Benefit/Cost
		Incentives	Administration	Total																								
2010																												
Residential Energy Efficiency Programs																												
Retrofit		2,791	220	3,011	2,868	5,879	51%	49%	119,210	74,906	0	-	4	7,980	0	7,898	1,149	0	755,601	-	-	2.7	2,868	9,048	3.2	0.7	1.4	2,101
2010 Total Residential		2,791	220	3,011	2,868	5,879	51%	49%	119,210	74,906	0	-	4	7,980	0	7,898	1,149	0	755,601	0	-	2.7	2,868	9,048	3.2	0.7	1.4	2,101
Commercial Energy Efficiency Programs																												
New Construction		221	55	278	518	794	35%	65%	16,291	13,694	0	-	2	1,571	0	1,606	216	0	146,214	-	-	5.6	518	1,822	3.5	0.8	2.0	777
Retrofit		1,305	292	1,619	3,228	4,826	34%	67%	118,150	98,868	0	-	2	10,317	0	9,921	1,412	0	960,490	-	-	6.4	3,228	11,332	3.5	0.9	2.1	5,491
2010 Total Commercial		1,527	346	1,898	3,746	5,620	34%	67%	134,441	112,562	0	-	2	11,887	0	11,526	1,628	0	1,106,704	-	-	6.3	3,746	13,154	3.5	0.9	2.1	6,267
High carbon fuel switching																												
High carbon fuel switching		750	225	975	0	975	100%	0%	-32,250	-16,125	9,583		FS	-1,799	4,071	-2,264	122	4,264	(169,145)	50,173	-	FS	2,142	4,264	2.0	0.8	1.5	1,298
Conservation for Affordable Housing																												
		5,661	567	6,229	0	6,229	100%	0%	39,163	37,382	698	0	18	5,151	1,015	3,659	490	538	337,855	6,507	0	0.8	-	4,688	N/A	0.5	1.0	(63)
SUBTOTALS:																												
Program Subtotal		10,729	1,358	12,113	6,614	18,702	65%	35%	260,563	208,725	10,281	0	6.0	23,220	5,086	20,820	3,390	4,802	2,031,015	56,680	0	1.9	6,614	29,012	4.4	0.7	1.5	9,604
Portfolio Level Expenditures																												
Conservation Education & Outreach		1,775																										
Joint Initiatives		717																										
Energy efficiency partners and codes & standards		439																										
Conservation Potential Review		500																										
Research, Evalution & Training		907																										
Consultant		100																										
DSMS System		704																										
Interruptible Industrial DSM		435																										
Pilot Studies		1,433																										
Non program admin		1,545																										
Total		8,553																										
2010 Planned Total		10,729	9,912	20,640	6,614	27,254	76%	24%	260,563	208,725	10,281	0	10	23,220	5,086	20,820	3,390	4,802	2,031,015	56,680	0	1.1	6,614	29,012	4.4	0.6	1.0	1,052

TERASEN GAS INC

2010 DSM PLAN

2010 TGI Planned Programs	PROGRAM								ALTERNATE		NET PRESENT VALUE									BENEFIT/COST								
	COSTS (\$000)							SAVINGS (GJ)		Impact		Levelized Cost (\$/GJ)	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings			Natural Gas Utility	Participant			Natural Gas Rate Impact	Total Resource	TRC Net Benefits (\$'000s)	
	Utility			Participant	Total	% Utility	% Participant	Gross	Net	Energy MWH	Capacity kW		Program (\$'000s)	Alternate (\$'000s)	Program (\$'000s)	Carbon Tax (\$'000s)	Alternate (\$'000s)	Natural Gas (GJ)	Alternate Energy Mwh	Alternate Capacity (kW)		Total Costs (\$'000s)	Total Benefits (\$'000s)	Benefit/Cost				
	Incentives	Administration	Total																									
2010 Residential Energy Efficiency Programs Retrofit																												
Energy Efficiency		2,561	180	2,741	2,711	5,452	50%	50%	109,803	68,385	0	-	4	7,324	0	6,970	1,053	0	692,757	-	-	2.7	2,711	8,024	3.0	0.8	1.3	1,871
2010 Residential Total		2,561	180	2,741	2,711	5,452	50%	50%	109,803	68,385	0	-	10	7,324	0	6,970	1,053	0	692,757	0	0	2.7	2,711	8,024	3.0	0.8	1.3	1,871
High Carbon Fuel Substitution																												
		225	25	250	0	250	100%	0%	-9,675	-4,838	2,875	-	FS	-540	1,226	-513	52	1,261	-50,954	15,052	-	FS	461	1,261	2.7	0.7	1.6	437
Commercial Energy Efficiency Programs																												
New Construction		179	39	221	416	635	35%	65%	12,776	10,775	0	-	2	1,230	0	1,084	169	0	114,570	-	-	5.6	416	1,253	3.0	0.9	1.9	595
Retrofit		1,153	238	1,413	2,854	4,245	33%	67%	103,855	86,955	0	-	2	9,048	0	7,976	1,237	0	842,412	-	-	6.4	2,854	9,213	3.2	1.0	2.1	4,803
2010 Total Commercial		1,332	277	1,634	3,269	4,879	33%	67%	116,631	97,730	0	0	2	10,277	0	9,060	1,406	0	956,981	-	-	6.3	3,269	10,466	3.2	1.0	2.1	5,398
Conservation for Affordable Housing																												
		4,529	454	4,983	0	4,983	56%		31,330	29,905	558		10	4124.9	812.0	2,711	392	430	270,285	5,205		1	-	3,533	0	0.6	1.0	-46
portfolio level expenditure																												
Conservation Education & Outreach		1,420																										
Joint Initiatives		573																										
Energy efficiency partners and codes & standards		351																										
Conservation Potential Review		400																										
Research, Evaluation & Training		777																										
Consultant		80																										
DSMS System		563																										
Interruptible Industrial DSM		435																										
Pilot Studies		1,146																										
Non program admin		1,236																										
total		6,981																										
2010 Planned Total		8,647	7,917	16,565	5,981	22,546	73%	27%	248,089	191,183	3,433	0	8.9	21,186	2,038	18,228	2,903	1,691	1,869,069	20,257	0	1.3	5,981	22,823	3.8	0.6	1.0	679

TERASEN GAS VANCOUVER ISLAND

2010 DSM PLAN

2010 TGVI Planned Programs	PROGRAM								ALTERNATE		NET PRESENT VALUE									BENEFIT/COST							
	COSTS (\$000)							SAVINGS (GJ)		Impact		Levelized Cost (\$/GJ)	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings			Natural Gas Utility	Participant			Natural Gas Rate Impact	Total Resource	TRC Net Benefits (\$'000s)
	Utility			Participant	Total	% Utility	% Participant	Gross	Net	Energy MWH	Capacity kW		Program (\$'000s)	Alternate (\$'000s)	Program (\$'000s)	Carbon Tax (\$'000s)	Alternate (\$'000s)	Natural Gas (GJ)	Alternate Energy MWH	Alternate Capacity (kW)		Total Costs (\$'000s)	Total Benefits (\$'000s)	Benefit/Cost			
2010 Residential Energy Efficiency Programs																											
Retrofit																											
Energy Efficiency	230	40	270	156	426	63%	37%	9,407	6,521	0	-	4	656	0	928	96	0	62,844	-	-	2.4	156	1,024	6.6	0.5	1.5	230
2010 Residential Total	230	40	270	156	426	63%	37%	9,407	6,521	0	0	4	656	0	928	96	0	62,844	0	0	2	156	1,024	7	1	1.5	230
High Carbon fuel switching																											
High Carbon fuel switching	525	200	725	0	725	100%	0%	-22,575	-11,288	6,708	-	FS	-1,259	2,845	-1,751	70	3,003	-118,191	35,121	-	FS	1,680	3,003	1.8	0.9	1.4	861
Commercial Energy Efficiency Programs																											
New Construction	42	16	57	102	159	36%	64%	3,515	2,918	0	-	2	341	0	521	47	0	31,645	-	-	5.8	102	568	5.6	0.6	2.1	182
Retrofit	152	54	206	375	581	36%	64%	14,295	11,913	0	-	2	1,269	0	1,945	175	0	118,078	-	-	6.0	375	2,119	5.7	0.6	2.2	688
2010 Total Commercial	194	69	264	477	741	36%	64%	17,810	14,832	0	-	2	1,610	0	2,466	222	0	149,722	-	-	6.0	477	2,688	5.6	0.6	2.2	870
Conservation for Affordable Housing																											
	1132	113	1246	0	1246	56%	44%	7832	7476	140		10	1026	203	948	98	108	67571	1,301	-	1	0	1154	0	0	1.0	-17
portfolio level expenditure																											
Conservation Education & Outreach	355																										
Joint Initiatives	143																										
Energy efficiency partners and codes & standards	88																										
Conservation Potential Review	100																										
Research, Evaluation & Training	130																										
Consultant	20																										
DSMS System	141																										
Pilot Studies	287																										
Non program admin	309																										
2010 Planned Total	2,081	1,994	4,076	633	4,709	87%	13%	12,474	17,542	6,848	0	25	2,033	3,048	2,592	486	3,111	161,946	36,423	0	0.5	633	6,189	9.8	0.3	1.1	373

		PROGRAM														ALTERNATE		NET PRESENT VALUE									BENEFIT/COST																	
2010 planned commercial energy efficiency programs		COSTS (\$000)														SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits		Participant Benefits (Costs)			Program Net Savings			Natural Gas	Participant			Natural Gas	TRC Net Benefits								
		Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net	Energy	Capacity	(\$/GJ)		Program	Alternate		Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Total Costs	Total Benefits		Benefit/Cost												
		Incentives	Administration	Total	Incentives	Administration	Total																										MWh	kW			(\$'000s)	(\$'000s)	(\$'000s)	(\$'000s)	(\$'000s)	(GJ)	MWh	(kW)
TGI		B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH										
Label		Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + RxAQ)	PV(ALP,-O)	PV(AK,P,-QxN)	PV(AK,P,-R)	T/D	H=0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I											
2010																																												
Commercial Energy Efficiency Programs																																												
New Construction																																												
Efficient Boiler Program		103	13	116	-	-	-	296	412	28%	-	72%	8,704	82%	7,137	20	-	-	1	861	N/A	753	118	N/A	79,461	-	-	7.4	296	871	2.9	1.0	2.1	449										
Light Comm. ENERGY STAR® Boiler Program		14	9	24	-	-	-	28	52	46%	-	54%	1,772	82%	1,453	20	-	-	1	175	N/A	153	24	N/A	16,177	-	-	7.4	28	177	6.3	1.0	3.4	123										
Efficient Commercial Water Heater		62	17	79	-	-	-	91	170	46%	-	54%	2,300	95%	2,185	13	-	-	4	193	N/A	178	27	N/A	18,932	-	-	2.4	91	205	2.3	0.8	1.1	23										
Retrofit																																												
Retrofit Efficient Boiler Program		835	107	942	-	-	-	2,408	3,350	28%	-	72%	70,720	82%	57,990	20	-	-	1	6,998	N/A	6,119	955	N/A	645,619	-	-	7.4	2,408	7,074	2.9	1.0	2.1	3,648										
Retrofit Light Comm. ENERGY STAR® Boiler Program		115	75	190	-	-	-	227	416	46%	-	54%	14,160	82%	11,611	20	-	-	1	1,401	N/A	1,225	191	N/A	129,270	-	-	7.4	227	1,417	6.3	1.0	3.4	985										
Retrofit Efficient Commercial Water Heater		149	41	190	-	-	-	219	409	46%	-	54%	5,520	95%	5,244	13	-	-	4	463	N/A	427	66	N/A	45,436	-	-	2.4	219	493	2.3	0.8	1.1	54										
Retrofit Energy Assessment		54	16	70	-	-	-	0	70	100%	-	0%	13,455	90%	12,110	2	-	-	3	185	N/A	204	25	N/A	22,087	-	-	2.6	-	229	N/A	0.7	2.6	115										
2010																																												
Total Commercial		1,332	278	1,610	-	-	-	3,269	4,879	33%	-	67%	116,631		97,730	108	-	-	2	10,277	0	9,060	1,406	0	956,981	-	-	6.4	3,269	10,466	3.2	1.0	2.1	5,398										
Retrofit & New Construction																																												
Efficient Boiler Program		938	120	1058	0	0	0	2705	3762	0	0	1	79424	1	65128	20	-	-	1	7860		6872	1073		725,080			7	2705	7945	2.9	1.0	2.1	4097										
Light Comm. ENERGY STAR® Boiler Program		129	84	213	0	0	0	255	468	0	0	1	15932	1	13064	20	-	-	1	1577		1379	215		145,447			7	255	1594	6.3	1.0	3.4	1108										
Efficient Commercial Water Heater		211	58	269	0	0	0	310	579	0	0	1	7820	1	7429	13	-	-	4	656		605	93		64,368			2	310	698	2.3	0.8	1.1	77										

TERASEN GAS VANCOUVER ISLAND				PROGRAM													ALTERNATE		NET PRESENT VALUE									BENEFIT/COST								
2010 planned Commercial energy efficiency programs				COSTS (\$000)											SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits		Participant Benefits (Costs)			Program Net Savings			Natural Gas	Participant			Natural Gas	Total Resource	TRC Net Benefits
				Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net		Energy	Capacity		Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity		Total Costs	Total Benefits	Benefit/Cost			
				Incentives	Administration	Total	Incentives	Administration	Total																											
Label				B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD				
				Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	I/J	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program			
2010 Commercial Energy Efficiency Programs																																				
New Construction																																				
Efficient Boiler Program				26	6	32	-	-	-	74	106	30%	-	70%	2,176	82%	1,784	20	-	-	2	214	N/A	325	29.4	N/A	19,739	-	-	6.7	74	355	4.8	0.6	2.0	108
Light Comm. ENERGY STAR® Boiler Program				9	5	13	-	-	-	17	30	44%	-	56%	1,063	82%	872	20	-	-	1	104	N/A	159	14.4	N/A	9,644	-	-	7.7	17	173	10.2	0.6	3.4	74
Efficient Commercial Water Heater				7	5	12	-	-	-	11	23	53%	-	47%	276	95%	262	13	-	-	5	23	N/A	37	3.3	N/A	2,261	-	-	1.9	11	40	3.7	0.5	1.0	(0)
Retrofit																																				
Efficient Boiler Program				103	24	127	-	-	-	296	423	30%	-	70%	8,704	82%	7,137	20	-	-	2	855	N/A	1,302	117.6	N/A	78,955	-	-	6.7	296	1,419	4.8	0.6	2.0	431
Light Comm. ENERGY STAR® Boiler Program				29	16	45	-	-	-	57	102	44%	-	56%	3,544	82%	2,906	20	-	-	1	348	N/A	530	47.9	N/A	32,148	-	-	7.7	57	578	10.2	0.6	3.4	246
Retrofit Efficient Commercial Water Heater Program				15	10	25	-	-	-	22	46	53%	-	47%	552	95%	524	13	-	-	5	46	N/A	74	6.6	N/A	4,523	-	-	1.9	22	80	3.7	0.5	1.0	(0)
Retrofit Energy Assesment Program				6	4	10	-	-	-	-	10	100%	-	0%	1,495	90%	1,346	2	-	-	4	21	N/A	39	2.8	N/A	2,451	-	-	2.1	-	42	N/A	0.4	2.1	11
Total Commercial				194	69	264	-	-	-	477	741				17,810		14,832		0	-	2	1,610	0	2,466	222	0	149,722	-	-	6.1	477	2,688	5.6	0.6	2.2	870
New Construction and Retrofit Combined																																				
Efficient Boiler Program				128	30	158	-	-	-	370	529	30%	-	70%	10,880	82%	8,922	20	-	-	2	1,068		1,627	147		98,694			6.7	370	1,774	4.8	0.6	2.0	539
Light Comm. ENERGY STAR® Boiler Program				37	21	58	-	-	-	74	132	44%	-	56%	4,607	82%	3,778	20	-	-	1	452		689	62		41,793			7.7	74	751	10.2	0.6	3.4	320
Efficient Commercial Water Heater				22	14	37	-	-	-	33	70	53%	-	47%	828	95%	787	13	-	-	5	69		111	10		6,784			1.9	33	121	3.7	0.5	1.0	(1)

		PROGRAM														ALTERNATE		NET PRESENT VALUE									BENEFIT/COST							
2010 planned Residential Energy Efficiency Programs		COSTS (\$000)										SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings			Natural Gas	Participant			Natural Gas			
		Utility			Partners																													
		Incentives	Administration	Total	Incentives	Administration	Total								Participant																			
Label		B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
		Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + RxAQ)	PV(ΔP,-O)	PV(ΔK,P,-Q*N)	PV(ΔK,P,-R)	T/D	H>0, (V+W)>0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2010 Residential Energy Efficiency Programs																																		
Retrofit																																		
Energy Efficiency																																		
ENERGY STAR Heating System Upgrade_Terasen (Retrofit)		902	40	942	-	-	-	1,234	2,177	43%	-	57%	40,204	57%	22,916	18	-	-	3.90	2,575	N/A	2,432	367	N/A	241,380	-	-	2.7	1,234	2,798	2.3	0.8	1.2	398
EnerChoice Fireplaces (Retrofit)		450	50	500	-	-	-	114	614	81%	-	19%	23,250	76%	17,670	15	-	-	3	1,741	N/A	1,682	255	N/A	167,542	-	-	3.5	114	1,937	17.0	0.8	2.8	1,127
ENERGY STAR Hot Water Heaters (Retrofit)		300	80	380	-	-	-	120	500	76%	-	24%	6,000	80%	4,800	13	-	-	9	424	N/A	416	63	N/A	41,589	-	-	1.1	120	480	4.0	0.5	0.8	(76)
ENERGY STAR Heating System Upgrade_Live Smart BC (Retrofit)		909	10	919	-	-	-	1,243	2,162	42%	-	58%	40,349	57%	22,999	18	-	-	4	2,584	N/A	2,440	368	N/A	242,246	-	-	2.8	1,243	2,808	2.3	0.8	1.2	422
High Carbon Fuel Switching																																		
Switch 'N' Shrink High Carbon Fuel Switching		225	25	250				0	250	100%	-	0%	-9,675	50%	-4,838	18	2,875	-	FS	(540)	1,226	(513)	52	1,261	(50,954)	15,052	-	FS	461	1,261	2.7	0.7	1.6	437
2010 Total Residential		2,786	205	2,991	-	-	-	2,711	5,702	52%	-	48%	100,128		63,548		0	-	5	6,784	1,226	6,457	1,105	0	641,803	-	-	2.3	2,711	7,562	2.8	0.7	1.4	2,308

TERSEN GAS VANCOUVER ISLAND																																					
		PROGRAM													ALTERNATE		NET PRESENT VALUE									BENEFIT/COST											
2010 planned Residential energy efficiency programs		COSTS (\$000)										SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits		Participant Benefits (Costs)			Program Net Savings			Natural Gas	Participant			Natural Gas	TRC Net Benefits					
TGVI		Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross		Net	Energy		Capacity	(\$/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas		Alternate Energy	Alternate Capacity	Total Costs			Total Benefits	Benefit/Cost			
		Incentives	Administration	Total	Incentives	Administration	Total																												Mwh	kW	(\$'000s)
Label		B	C	D	E	F	G	H	I	J	K	L	Input (zeroed)	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD			
		Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	I+J	Program	Program	Program	Program	D/U	KxAF	M x J x AH	J x I x AJ	J x I x AK	J x (MxAL + NxAM)	PV(AE,I, K)	PV(AG,I, M)	PV(AG,L, N)	P/D	E>0, (R+S)<0	E<0, (R+S)>0, T	Z/Y	P/(R+D)	(P+Q)/F	(P+Q)-F		
2010																																					
RESIDENTIAL:																																					
High carbon Fuel Switching																																					
Switch 'N' Shrink High Carbon Fuel Switching		525	200	725	-	-	-	0	725	100%	-	0%	-22,575	50%	-11,288	18	6,708	-	FS	(1,259)	2,845	(1,751)	70	3,003	(118,191)	35,121	-	FS	1,680	3,003	1.8	0.9	1.4	861			
Energy Efficiency																																					
ENERGY STAR Domestic Hot Water Heaters (Retrofit)		60	20	80	-	-	-	24	104	77%	-	23%	1,200	80%	960	13	-	-	10	84	N/A	122	13	N/A	8,280	-	-	1.1	24	134	5.6	0.4	0.8	(20)			
EnerChoice Fireplaces (Retrofit)		90	10	100	-	-	-	23	123	81%	-	19%	4,650	76%	3,534	15	-	-	3	346	N/A	492	51	N/A	33,336	-	-	3.5	23	543	23.8	0.6	2.8	223			
ENERGY STAR Heating System Upgrade - Terasen (Retrofit)		30	5	35	-	-	-	41	76	46%	-	54%	1,337	57%	762	18	-	-	4	85	N/A	118	12	N/A	7,979	-	-	2.4	41	130	3.2	0.6	1.1	9			
ENERGY STAR Heating System Upgrade_LiveSmart BC (Retrofit)		50	5	55	-	-	-	68	123	45%	-	55%	2,220	57%	1,265	18	-	-	4	141	N/A	196	20	N/A	13,250	-	-	2.6	68	217	3.2	0.6	1.1	18			
Total Residential		755	240	995	-	-	-	156	1,151	86%	-	14%	-13,168		-4,766		6,708	-	FS	-603	2,845	-823	166	3,003	(55,347)	35,121	-	FS	813	3,003	3.7	0.5	1.6	1,091			

2010 planned Conservation for Affordable Housing Programs	PROGRAM														ALTERNATE		NET PRESENT VALUE									BENEFIT/COST																									
	COSTS (\$000)											SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings			Natural Gas	Participant			Natural Gas	TRC																			
	Utility			Partners			Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net		Energy	Capacity		(\$/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy		Alternate Capacity	Total Costs	Total Benefits		Benefit/Cost	Natural Gas	Without 30% adder		UCA Demand-side Measures Regulation (Benefit @ 130%)															
	Incentives	Administration	Total	Incentives	Administration	Total																												MWh	kW	(\$'000s)	(\$'000s)	(\$'000s)	(\$'000s)	(\$'000s)	(GJ)	(MWh)	(kW)	Utility	(\$'000s)	(\$'000s)	Rate Impact	Total Resource	(\$'000s)	Total Resource	TRC Net Benefits (\$'000s)
TGI	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ																
	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + RxAQ)	PV(AL,P,-O)	PV(AK,P,-Q*N)	PV(AK,P,-R)	T/D	H>0, (V+W)>0	H<0, (V+W)<0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I	(T+U)*1.3 /I	((T+U)*1.3 -I)																
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ																
	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program	D/Y	OxAJ	Q x N x AL	M x N x AN	M x N x AO	N x (QxAP + RxAQ)	PV(AL,P,-O)	PV(AK,P,-Q*N)	PV(AK,P,-R)	T/D	H>0, (V+W)>0	H<0, (V+W)<0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I	(T+U)*1.3 /I	((T+U)*1.3 -I)																
RESIDENTIAL- Retrofit																																																			
Energy Savings Kits	130	150	280	-	-	-	0	280	100%	-	0%	4,290	92%	3,947	8	-	-	12	265	N/A	240	35	N/A	24,155	-	-	0.9	-	275	N/A	0.5	0.9	(14)	1.2	65																
Energy Conservation Assistance Program	2,200	304	2,504	2,200	-	2,200	0	4,703	53%	0	0%	27,040	96%	25,958	15	558	-	10	2,908	625	2,471	357	430	246,130	5,205	-	1.2	-	3,258	N/A	0.6	0.8	(1,171)	1.0	(111)																
Total Residential	2,329	454	2,784	2,200	-	2,200	0	4,983	56%	0	0%	31,330		29,905		558	0	10	3,173	625	2,711	392	430	270,285	5,205	0	1.1	-	3,533	N/A	0.6	0.8	(1,186)	1.0	(46)																



**BRITISH COLUMBIA
UTILITIES COMMISSION**

**ORDER
NUMBER G-XX-XX**

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DRAFT ORDER

IN THE MATTER OF
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473

and

Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc.
2009 Annual Energy Efficiency and Conservation Report

BEFORE:

(Date)

WHEREAS:

"Companies")

- A. On May 28, 2008, Terasen Gas Inc. ("TGI") and Terasen Gas (Vancouver Island) Inc. ("TGVI") (collectively the "Companies") filed their application for Energy Efficiency and Conservation ("EEC") for 2008-2010; and
- B. On April 16, 2009, the Commission issued Order No. G-36-09 and Decision (the "EEC Decision") approving EEC funding for TGI and TGVI for 2009 and 2010; and
- C. On November 26, 2009, the Commission issued Order No. G-141-09 approving the TGI 2010-2011 Negotiated Settlement Agreement and Order No. G-140-09 TGVI 2010-2011 Negotiated Settlement Agreement approving further EEC funding for 2011 for both Companies; and
- D. The EEC Decision on page 42 directed the Companies to file annual EEC Reports on all EEC initiatives and activities, expenditures and results by the end of the first quarter of the following year-end and for each year of the funding period; and
- E. On March 31, 2010, the Companies filed their 2009 EEC Annual Report; and
- F. The Companies seek Commission acceptance of their 2009 EEC Annual Report; and
- G. The Companies request approval for the attribution of savings from regulation to be on a case-by-case basis; and

**BRITISH COLUMBIA
UTILITIES COMMISSION**

**ORDER
NUMBER G-XX-XX**

2

H. The Companies also seek approval for the attribution of 6 years of post-regulation savings to a Condensing Water Heater Initiative to support government's proposed minimum efficiency threshold of 0.80 EF for residential water heaters; and

I. The Commission has reviewed the 2009 EEC Annual Report and orders the following.

NOW THEREFORE the Commission orders as follows:

1. The 2009 EEC Report is accepted.
2. The attribution of savings from regulation to be on a case-by-case basis is approved.
3. The attribution of 6 years of post-regulation savings to a Condensing Water Heater Initiative is approved.

DATED at the City of Vancouver, In the Province of British Columbia, this day of <MONTH>, 20XX.

BY ORDER