Diane Roy
Director, Regulatory Affairs - Gas
FortisBC Energy Inc.

16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 576-7349
Cell: (604) 908-2790
Fax: (604) 576-7074
Email: diane.roy@fortisbc.com
www.fortisbc.com

Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

August 19, 2011

Energy Services Association of Canada
Suite 1500, 1055 West Georgia Street
Vancouver, B.C.
V6E 4N7

Attention: Mr. Karl E. Gustafson, Q.C.

Dear Mr. Gustafson:

Re: FortisBC Energy Utilities[1] ("FEU") 2012 and 2013 Revenue Requirements and Natural Gas Rates Application

Response to the Energy Services Association of Canada ("ESAC") Information Request ("IR") No. 2

On May 4, 2011, the FEU filed the Application as referenced above. In accordance with Commission Order No. G-129-11 issuing the amended Regulatory Timetable, the FEU respectfully submit the attached response to ESAC IR No. 2.

If there are any questions regarding the attached, please contact the undersigned.

Yours very truly,

on behalf of the FORTISBC ENERGY UTILITIES

Original signed:

Diane Roy

Attachment

cc (e-mail only): Alanna Gillis, Acting Commission Secretary
Registered Parties

---

[1] Comprised of FortisBC Energy Inc. ("FEI"), FortisBC Energy Inc. Fort Nelson Service Area ("Fort Nelson"), FortisBC Energy (Whistler) Inc. ("FEW"), and FortisBC Energy (Vancouver Island) Inc. ("FEVI")

1.0 AES Project Costs

Reference: 2012/2013 RRA: Response to BCUC IR# 201.1 (Page 721)

"The numbers used in the benefit-cost test example results provided in this response are based on the Companies' experience with similar projects in the past."

Reference: 2010/2011 RRA: Response to BCUC IR# 2-12.1 (Page 35)

"TGI's long history of installing gas mains and service lines facilitates the development of standardized costs or the calculation of average installation costs relatively straightforward for the gas system, the work required and the average time to complete and installation. TGI does not have a similar basis for deriving the average cost per installation for alternative energy systems, the work required or the average time required to complete an installation as each project is unique and as such these factors will vary depending upon the installation.

As noted in the response to CEC IR 1.35.6 of the Terasen Utilities ROE application, each alternative energy installation is uniquely configured, and TGI does not have a large number of these installations from which to derive average costs."

Reference: 2010/2011 RRA: Response to BCUC IR# 2-12.2 (Page 36-37)

"Second, the economic assessment approaches are undergoing a very thorough review as part of this Application (the alternative energy solutions section of the Application has already been the subject of dozens of IRs). As such, TGI believes the Commission will be well able to assess and approve the alternative energy service economic models and tariff changes brought forward by the Company. TGI believes that the Commission should review the economic assessment models within this proceeding rather than waiting for a separate proceeding wherein TGI would be providing similar information.

Third, under the proposed approach, the Commission will review contracts entered between TGI and alternative energy customers, providing additional protection for customers."

1.1 Please confirm that the live spreadsheets provided to the Commission as part of the response to BCUC IR # 201.1 can be supplied to ESAC subject to a confidentiality undertaking.

Response:

As noted in the response to BCUC IR 2.94.4, it is the working electronic nature of the spreadsheets provided in response to BCUC IR 1.201.1 that is proprietary to FEU, and that the Companies wish to maintain as confidential. ESAC membership is comprised of some entities that are competing with FEU thermal energy services area for business and the FEU are not willing to provide working spreadsheets that are used for EEC benefit-cost analysis of programs to competitive entities. The disclosure of the working electronic spreadsheets would result in commercial harm to the FEU to the benefit of competitors.

The content of the various tabs in the spreadsheets are provided in Attachment 1.1 to this response.

1.2 Given that FEI did not have sufficient experience with alternative energy system installations at the time of the 2010/2011 RRA process from which to derive average costs, please indicate the anticipated basis for cost estimates for AES projects that will be used in the economic assessments and resultant tariff applications.

Response:

The question is concerned with thermal energy services rate design, and as such is not relevant in the context of this Revenue Requirements Application concerned with setting natural gas rates.

1.3 Please indicate whether FEI believes its shareholders should absorb the risk of the actual project cost exceeding the cost estimate used in the Economic Test and tariff submission. Does that view change depending on whether FEI obtains a specific CPCN for a particular project? If in any circumstance where FEI's shareholders should not bear this risk, how will that excess cost be recovered and by whom?

Response:

As part of the BCUC Order No. G-141-09, the project costs for all thermal energy projects will collect in the New Energy Solutions Deferral Account or now called the Thermal Energy Service Deferral Account, and will not be recoverable from natural gas customers. Where costs in the deferral account have been prudently incurred, regulatory principle dictates that they are recoverable from thermal energy service customers as a thermal energy service cost of service. This is true regardless of whether the costs are higher than originally forecast, and regardless of whether or not the capital expenditures are subject to a CPCN. The shareholder bears the risk of non-recovery for imprudently incurred costs, as is the normal regulatory principle.

The rate design currently employed to allocate the prudently incurred costs of service among specific thermal energy services customers or projects is to set rates for a particular project that recover at least the forecast costs related to that particular project over the life of the project, together with a contribution to common thermal energy services costs in the deferral account. But if there is a variance from the forecast on a particular project that is not reflected in the rate charged in relation to that project, the FEU believe that the variance should logically be captured in the deferral account and is still a cost eligible for recovery from thermal energy services customers as a whole as part of the overall revenue requirement for that class of service. How and when those costs get recovered, and from which thermal energy services customers, is ultimately a matter of future thermal energy services rate design, and not this revenue requirements application that is concerned with the determination of natural gas rates.

1.4 Please provide representative samples of sales and marketing information provided by FEI to prospective customers outlining the terms and conditions of the agreement, in particular, whether the customer bears any risk in relation to project capital cost, operating cost or project performance and whether the terms and conditions have been reviewed and approved by the Commission.

Response:

The question is concerned with the sales approach for the thermal energy services business, and is not relevant in the context of this Revenue Requirements Application concerned with setting natural gas rates.

2.0 AES Project Costs

Reference: 2012/2013 RRA: Response to CEC IR 4.2 (p. 26)

"III. Thermal Energy Solutions

As discussed in Section 5.3.18.2 of the Application (Exhibit B-1), FEI has allocated a charge, $0.5 million, from the gas business to Thermal Energy Solutions for recovery of O&M representing the administrative costs of supporting the business in both 2012 and 2013. Furthermore, all direct O&M costs (including project costs) are captured in the Thermal Energy Service Deferral Account, as discussed in Appendix G of this Application. ***These allocated and direct O&M costs will be recovered from future Thermal Energy Solutions customers****. This allocation ensures that no negative impact on natural gas delivery rates will result from the development and delivery of Thermal Energy Solutions. An increase in natural gas throughput as a result of Thermal Energy Solutions has not been forecast in this Application."* ***{Emphasis added}***

2.1 Please advise as to the basis on which:

a. future TES customers will contribute to the recovery of "allocated" and "direct O&M costs";

Response:

The costs allocated to thermal energy services will not be recovered from natural gas customers under the current structure approved in the 2010-2011 RRA NSA. The question is concerned with thermal energy services rate design, and as such is not relevant in the context of this Revenue Requirements Application concerned with setting natural gas rates.

b. FEI established the methodology of contribution allocation; and

Response:

As described in the response to ESAC IR 2.2.1c below, the direct costs associated with thermal energy services are directly charged to the thermal energy services class of service. Please see the response to Corix IR 2.3.1 for an explanation of how the FEU arrived at its methodology for allocating indirect costs to the thermal energy services class of service.

c. how these recoveries will be credited back to natural gas customers.

Response:

As contemplated in the FEI 2010-2011 RRA NSA (BCUC Order No. G-141-09), allocated O&M costs will be credited to the natural gas O&M costs, thereby reducing those O&M costs, and charged to the Thermal Energy Services Deferral Account (formerly the New Energy Solutions Deferral Account). This will generate greater efficiencies in the FEU by absorbing a portion of the overhead and common costs that FEI would not avoid if thermal energy services was not provided and that natural gas customers would otherwise be charged in their rates. The direct costs of thermal energy services projects will be charged directly against the Thermal Energy Services Deferral Account. The costs within the Thermal Energy Services Deferral Account will be recovered through the rates established for the thermal energy projects. Costs in the Thermal Energy Services Deferral Account will not be recovered from natural gas customers.

2.2 Has FEI quantified the amount to be recovered in 2012 and 2013? Is the recovery by natural gas customers limited to the $0.5 million referred to in the Application?

Response:

As indicated above, FEI will charge to the Thermal Energy Solutions Deferral Account the actual direct costs (project costs and O&M), plus the $0.5 million allocation of overhead costs from the gas class of service for each of 2012 and 2013 for recovery from customers of the thermal energy class of services.

The $0.5 million allocation of overhead costs directly reduces natural gas rates by that amount in each of 2012 and 2013, whereas, the direct costs (project costs and O&M) will not affect the rates for natural gas customers since FEI will charge them directly to the Thermal Energy Solutions Deferral Account.

The $0.5 million annual allocations are reasonable at this time for the reasons described in FEU response to BCUC IR 1.78.1 and are fixed amounts for rate setting purposes in each of 2012 and 2013.

2.3 To what extent, if any, is the amount of future recoveries beyond 2013 dependant on the number or the success of the FEI TES projects?

Response:

With respect to the allocation of administrative costs to the thermal energy class of service beyond 2013, that amount will be determined considering the activity level of the thermal energy class of services at that time. Given that the market is at an early stage of development and as the projects can vary in terms of their size and timing it is difficult to assess what future level of administrative support will be required at this time. Although the FEU will be adapting the overall level of activity according to our evolving assessment of the prospects of success in the thermal energy services development, the amount of future recoveries of the associated costs will not be directly tied to the number of successful projects because recoveries should be based on the amount of prudent activity regardless of whether particular projects succeed.

2.4 Do all TES Deferral Account balances earn AFUDC? How many years will projects be kept in the TES Deferral Account before they are deemed to be successful or unsuccessful?

Response:

This question is not relevant to the present proceeding since the deferral account in question does not affect natural gas revenue requirements or rates.

2.5 Of the $12.95 million of projected direct costs for Thermal Energy projects in development in 2010 and 2011 that were provided in Table G-2 of the 2012/2013 RRA (Appendix G, Page-4), please indicate if any of this projected amount is potentially associated with projects that may not be successful or ultimately approved by the BCUC.

Response:

Direct costs are incurred to advance projects that the FEU believe are viable. It is always possible that, in the future, one or more candidate projects may not proceed. But it is too soon to tell at this stage. FEI's thermal energy class of service is in an early stage of development and as such each project will require time to develop to ultimately determine its level of success. All thermal energy projects submitted to the BCUC will follow the requirements outlined in BCUC Order No. G-141-09. Prudently incurred costs recorded in the deferral account should ultimately be recoverable from thermal energy customers, as is the normal principle with public utility regulation.

2.6 What will ultimately happen with the accumulated costs associated with unsuccessful projects, including their direct costs, and their pro-rated portion of Sales & Marketing, Overhead and AFUDC? Who among the following will absorb these costs:

a. natural gas customer;
b. other TES customers; or
c. FEI shareholder?

Response:

The assumption of risk for non-recovery of amounts in the Thermal Energy Service Deferral Account (formerly referred to as the New Energy Solutions Deferral Account) was outlined in BCUC Order G-141-09. It states that the risk of non-recovery will not be borne by natural gas ratepayers and will not be recovered through natural gas rates. Whether or not a project proceeds, all costs related to the thermal energy services class of service within the utility including direct costs, sales and marketing O&M and business development costs, and the overhead allocation from FEI will accumulate within the Thermal Energy Service Deferral Account and will be recovered through the rates charged to thermal energy service customers established for the thermal energy projects. Thus, under the current regulatory framework, the ultimate risk of non-recovery of amounts accumulated in the Thermal Energy Service Deferral Account is with the shareholder.

3.0 Confidential Customer Information

Reference: 2012/2013 RRA Response to BCUC IR 157.1 (p. 564)

"The FEU are submitting this response on a confidential basis under separate cover as the response reveals confidential customer information related to projects currently under negotiations and would adversely affect commercial negotiations if disclosed."

3.1 Please confirm for each project listed that written approval was obtained from each customer before the release or use of the customer's billing information or other confidential information to or by employees in the thermal energy services group developing these projects. Please provide copies of those written approvals, if any.

Response:

This response also addresses the responses to ESAC IRs 2.3.2 and 2.3.3.

Historical natural gas billing data is general information of limited value when developing a thermal energy system. First, historical information does not exist for new construction. Second, the historical natural gas billing data includes the total gas consumption at the meter which may or may not be the natural gas consumption needed only for the production of the thermal energy that will be replaced by the thermal energy service. A customer's gas usage may include consumption for activities unrelated to the requirements of a thermal alternative energy system, such as for example, cooking in restaurants or institutions, or commercial process load. Third, natural gas may not be the only energy source used by a customer in the generation of thermal energy so historical natural gas consumption may be only part of the picture. Consequently, it is not possible to understand whether historical natural gas billing data equals the natural gas consumption that is necessary for thermal energy production or whether energy sources are involved, without an evaluation of the specific equipment and usage requirements of the customer at the site over time. Fourth, the type, nature, and location of the heating and cooling equipment systems in buildings may or may not be compatible with thermal energy solutions. Therefore, the FEI database of historical natural gas billing data alone is not an effective tool for identification of marketing opportunities for thermal energy service in the absence of the accompanying technical evaluation by site. As such, natural gas consumption history is not used by FEI to market thermal energy systems.

Evaluation of a thermal energy project usually requires a feasibility analysis that specialists perform. These experts may request and review historical natural gas billing information in the process of performing their technical evaluation.

In the event that FEI is not the thermal energy service provider, but is the natural gas service provider, a simple request by the customer to FEI to share the historical natural gas billing data at their site with the proponent to assist in their technical evaluation is all that is required. Alternatively, many customers keep records of their consumption data and may actually provide the information to the proponent on their own, without the assistance of FEI.

In the event that FEI is the thermal energy service provider and the natural gas service provider, no formal request is necessary on behalf of the customer for FEI personnel to utilize the historical billing data in the evaluation of the project. This is because the thermal energy service is simply another class of service within the public utility, not a separate entity. Nonetheless, since this type of information would only be useful in conjunction with the technical evaluation of the project, customers expect FEI to review their historical billing data at that stage. For expediency, many customers actually provide this information to FEI since they often have it readily at hand.

At all times, FEI maintains conformance with the *Personal Information Protection Act*.

3.2 Please confirm that (i) customer natural gas usage history data is held confidential by FEI and, other than as may be contained in an aggregation of data to which no individual customer can be identified, is not used for any purpose other than billing the customer or managing a customer's account internally at FEI, (ii) all non-FEI personnel and TES project developers are required to have, and actually have, natural gas customer's written permission prior to having access to or use of customer natural gas usage history information.

Response:

Please refer to the response to ESAC IR 2.3.1.

3.3 Please confirm that at no time has FEI, directly or indirectly, used the natural gas consumption history data of a customer to market an alternative energy system on behalf of FEI or any affiliate.

Response:

Please refer to the response to ESAC IR 2.3.1.

4.0 Thermal Energy Services for Schools

Reference: 2012/2013 RRA Appendix K Section 4.3 Page 14

"FortisBC is proposing a $22 million incentive program for geoexchange and energy efficiency retrofits in up to 260 schools over two years"

Reference: 2012/2013 RRA - Response to BCUC IR 204.3 & 204.3.1

4.1 Please indicate if, prior to the submission of the 2012/2013 RRA, any FEI staff members, including any member of the designated Thermal Energy Services Group, discussed with any School Districts the possibility of TES EEC funding being approved under the pending RRA. If so, please indicate if any of these discussions took place in the context of FEI or any affiliate developing Thermal Energy solutions for these customers whereby the EEC funding would potentially be used the improve the financial viability of TES projects that would be owned and operated by FEI. Please indicate the number of School Districts (including the total number of schools involved) where these discussions have taken place.

Response:

The FEU are assuming that the "TES" referred to in this question refers to the Companies' proposed Thermal Energy for Schools Program, for which approval has been requested in this Application (Exhibit B-1), and the response to this question is based upon that assumption.

Staff involved in discussions with School Districts do not specifically recall such discussions taking place, but it is generally the case with all of our customers that they are interested in and inquire about available incentives from all sources (whether the utility or government). The FEU sales staff recognize that they are not in a position to make any commitments about EEC funding. Each customer must qualify for EEC funding based on the terms and conditions of the EEC program to which the customer is applying. Moreover, as the proposed Thermal Energy for Schools Program has not yet been approved, the Companies' EEC team has not yet commenced program design for Thermal Energy for Schools, which would include the development of the terms and conditions for a Thermal Energy for Schools Program.

4.2 Please indicate if any of FEI's TES staff is permitted to discuss potential EEC funding that may be available for customers on FEI TES projects or if only designated EEC staff, as part of the regulated natural gas utility, are permitted to have these conversations with customers.

Response:

There are no rules that would preclude thermal energy services staff from discussing EEC funding that may be available for customers on FEI thermal energy services projects. However, as described in the responses to Corix IRs 2.4.6 and 2.5.13, there are different groups of employees that are typically involved in EEC and thermal energy services projects. In any case, EEC funds are provided to customers, not FEI. Competitors of FEI for thermal energy service are also free to discuss any EEC funding that may be available to their customers as well.

4.3 If discussions have taken place with School Districts about the possibility of using EEC funds for FEI Thermal Energy projects, please advise how the levels of EEC funding for each project were arrived at and whether or not these amounts were predicated on the approval of the Societal Test methodology that is part of this RRA.

Response:

Please refer to the response to ESAC IR 2.4.2 regarding the communication of EEC programs.

To date only the Delta School Board has applied for an EEC incentive related to an FEI thermal energy project. The Delta School District's application came through the PSECA program, details of which can be found on pages 74 to 77 of the 2010 EEC Annual Report, filed as Appendix K-4 to Exhibit B-1. The FEU have also corresponded with the Central Okanagan School District specific to one school about the provision of an EEC incentive under the Commercial Custom Design program, which program is detailed on pages 86 – 89 of the 2010 Annual Report, filed as Appendix K-4 to Exhibit B-1 and the FEU expect the School District to apply for the incentive. As the Societal Test methodology is part of the current RRA it has not been used for any calculations other than those included in this and earlier rounds of Information Requests. The proposed Thermal Energy for Schools Program is a new program proposed within this RRA and unless the Societal Test or elements thereof are approved, the proposed Thermal Energy for Schools Program will not go ahead. The EEC team's review of the Delta School District's EEC PSECA incentive application was undertaken using the TRC, as that is the benefit-cost test currently approved for use by the FEU's EEC team.

For an explanation of how the PSECA incentive for the Delta School District was calculated, please refer to the response to ESAC IR 2.6.5.

4.4 Please advise if FEI has negotiated any Thermal Energy agreements, whether or not in final form, with any School Districts that are contingent on the approval of the TES EEC funding in the 2012/2013 RRA and/or the approval of an associated Thermal Tariff by the BCUC. If so, please indicate the number of schools that would be involved in these projects.

Response:

FEI has not negotiated any thermal energy agreements with any School Districts that are contingent on the approval of the Thermal Energy for Schools EEC funding in the 2012-2013 RRA or the approval of an associated Thermal Tariff by the BCUC.

4.5 Please advise how other firms wishing to develop TES projects with School Districts would have become aware of the potential existence of EEC funds being requested for School District TES projects in the 2012/2013 RRA? Please indicate if this was marketed to other firms and, if so, please provide any relevant promotional material or letters to corroborate.

Response:

Since the EEC funds being requested in this 2012-2013 RRA proceeding for Thermal Energy for Schools Program have not yet been approved by the Commission, program design for a Thermal Energy for Schools Program has not yet commenced and there is no program for Thermal Energy for Schools as yet. Therefore, there is nothing to be communicated to School Districts and other market actors. It is the Companies' practice, that once a program is developed, such as the Efficient Boiler Program (in which BC Housing, who is a customer of a member of ESAC, participated) various communications channels are used to make program details available:

- Information about all programs, with all terms and conditions, is placed upon the Companies' website;
- Program collateral, including information brochures, is produced and made available to customers and others through the FEU website;

- The FEU staff provide program briefings to industry groups through inclusion of material in industry group newsletters and presentations to meetings of industry groups; and
- The FEU staff participate in such trade shows as the School Plant Officials' Association, Buildex, Union of British Columbia Municipalities etc. at which program information is shared.

Should the Commission approve the funding requested in this proceeding for Thermal Energy for Schools, a program will be developed. The program details will be shared through the mechanisms noted above as well as with the Companies' EEC Stakeholder Group and in the EEC Annual Report. The EEC Report is filed with the Commission by March 31 of each year. While the Companies make every effort to "push" information about programs into the public domain, it is the view of the FEU that market actors such as customers and suppliers also have some responsibility to access the information that is publicly available and inform themselves about programs that might benefit them or their customers.

5.0 Boiler Replacements – EEC Funding

Reference : 2012/2013 RRA (Appendix G Section 2.4 Page 12 Table G-1)

*"FEI has an agreement with the Delta School District for the delivery of cleaner thermal energy for 17 schools and two school district buildings through the implementation of state-of-the-art geoexchange systems and **high-efficiency condensing boiler**s, which will replace aging heating plants at school district sites. These systems provide many benefits, ranging from saving energy and improving indoor comfort to stable energy rates and a smaller carbon footprint."* ***(emphasis added)***

Reference: 2012/2013 RRA Response to BCUC IR #189.2 (page 654)

"Thermal Energy for Schools provides incentives for the installation of ground source heat pumps."

Reference: 2012/2013 RRA Response to BCUC IR #204.1.1 (page 742)

*"The Thermal Energy for schools program is anticipated to provide incentives for state-of-the-art low carbon energy systems such as geoexchange systems and **high-efficiency boiler upgrades**."* ***(emphasis added)***

Reference: 2010/2011 RRA (Part III, Section-C Tab-3, Page 261)

"For the purpose of this application, integrated and alternative energies include geo-exchange, solar thermal and District Energy systems."

Reference: 2010/2011 RRA (Part III, Section-C Tab-3, Page 263)

*"District energy systems ("DES") employ a range of energy technologies and sources to deliver piped heating (hot water) and/or cooling (ambient or chilled water) to **multiple buildings and customers within a neighbourhood** from a central plant location or locations"* ***(emphasis added)***

5.1 Given that the IR responses on pages 654 and 742 dealing with TES EEC funding conflict with each other, please indicate if the EEC funding requested for the Thermal Energy for Schools (TES) program is intended to cover high efficiency boiler replacements. If yes, please explain how this funding is different from the existing High Efficiency Boiler EEC program.

Response:

As a point of clarification, the FEU have been using TES as an acronym for "thermal energy systems" being offered under GT&C Section 12A "Alternative Energy Extensions", and thus it might lead to confusion to also use "TES" as an acronym for Thermal Energy for Schools Program.

The FEU disagree that the responses to BCUC IRs 1.189.2 and 1.204.1.1 conflict with each other. The proposed Thermal Energy for Schools Program will involve the provision of EEC funding for new thermal energy systems for schools in BC. Neither of the two IR responses lists all the possible energy solutions that might possibly be involved in this program. For instance thermal energy could be provided partly by solar thermal systems or efficiencies may be achieved through the implementation of advanced control systems.

The approval of $22 million in EEC funding is requested for an EEC program supporting Thermal Energy for Schools, to which any customer might apply if approval is granted and once a program has been designed and implemented. The $22 million of EEC funding requested for Thermal Energy for Schools does not have a specific breakdown of amounts anticipated to be allocated to boilers versus other technologies. Thus, the Thermal Energy for Schools Program could, but would not necessarily, include boiler upgrades.

The Thermal Energy for Schools Program is also different from the existing High Efficiency Boiler EEC Program in that for the existing Efficient Boiler Program, the applicant submits a request for a boiler replacement based on the requirements of one individual building. In the proposed Thermal Energy for Schools Program the equipment replacements for several schools in the school district are reviewed as a single application to the proposed Thermal Energy for Schools Program and the replacements can be comprised of boilers or other equipment such as geoexchange systems.

School districts operate in a challenging environment where they must reduce greenhouse gas emissions without increasing operating costs and in the absence of access to sufficient capital to employ lower emission technologies. It is the objective of the proposed Thermal Energy for Schools Program to enable school districts to conserve energy and improve energy efficiency in their buildings, while also reducing greenhouse gas emissions in a cost effective manner, using the best fitting technology solution by site, and to achieve these benefits within existing operating budgets and capital constraints for the entire school district. The technology options might include geoexchange, high efficiency natural gas boilers and/or other technologies such as enhanced controls.

5.2 Given that the above definitions of AES services in the 2010/2011 RRA and subsequent NSA do not include boiler replacements, please indicate whether and where FEI has received prior approval to include these types of retrofits as part of the proposed regulated AES offerings.

Response

This question relates to rate design for the thermal energy services class of service, and is not relevant to the present proceeding that is concerned with setting natural gas rates.

5.3 Please advise whether or not the thermal energy supplied by these boilers is measured for tariff purposes and whether or not the customer continues to pay the gas bill for the meter upstream of the boilers.

Response:

For the Delta Schools project the thermal energy will be measured and the customer will not continue to pay the gas bill for the meter upstream of the boiler.

5.4 If the customer continues to pay the gas bill for the upstream meter, please provide a rationale for why the installation of boiler replacements and their repayment over time should be considered a regulated service as opposed to a non-regulated financing mechanism.

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

5.5 If the customer continues to pay the gas bill for the upstream meter, please indicate why this service should not be covered under the RMDM guidelines.

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

5.6 If the customer continues to pay the gas bill for the upstream meter, please indicate if FEI is providing any efficiency performance guarantees for the new plants based on the thermal energy generated per unit of gas consumption.

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

5.7 Please indicate if FEI has been developing AES/TES projects with other school districts that include boiler replacements as part of the proposed regulated services. If so, are EEC funds included in those projects?

Response:

FEI is developing thermal energy projects with other schools districts and boiler replacements are expected to comprise a portion of the new thermal energy systems installed in these projects.

FEI expects that the customers proposing these projects will be eligible for EEC funding; however, since aspects of EEC funding are subject to the approvals being sought in this Application (such as, for example, the request to adopt the SCT as the evaluation basis for EEC programs) the final nature of the EEC evaluation framework is uncertain at this time. Also, detailed program design for Thermal Energy Service for Schools Program will only occur after Commission approval has been granted. Regardless of how the final approvals affect the Thermal Energy for Schools Program, the EEC funding will be equally available to all customers (i.e. schools and school boards, in this case) that meet the specifications of the program whether the energy systems are owned by the schools or are owned by FEI or another utility provider.

5.8 What is the estimated amount of the $22 million of EEC funding for Thermal Energy for Schools that will be used for boiler replacements?

Response:

Please also refer to the response to ESAC IR 2.5.1. The $22 million of EEC funding requested for Thermal Energy for Schools does not have a specific breakdown of estimates between the amounts anticipated to be allocated to boilers versus other technologies. Approval has not been granted for funding for this Program Area, thus program design for this initiative has not yet begun or been fully developed.

5.9 Please indicate the relationship between the FEI staff that are developing these projects with school district customers and the FEI staff responsible for approving and distributing EEC funds under the High Efficiency Boiler program.

Response:

The staff involved in developing projects for school district customers are distinct from those that distribute EEC funds under the High Efficiency Boiler program.

The FEU staff that develop the thermal energy solution projects are in the Thermal Energy Solutions group, reporting to the Director, Business Development. The FEU staff responsible for administering the Efficient Boiler Program are in the EEC group, and in the Energy Products and Services group, reporting to the Director, Resource Planning and Market Development. Once an application for participation in the Efficient Boiler Program is received from a customer, it is reviewed by the Energy Products and Services Group. Then the application is forwarded to the EEC group, which ensures that all terms and conditions for the program are met, including that qualifying equipment has been installed, and issues the rebate cheque to the customer based on the program funding formula. All program details for all programs are available on the FEU's website, www.fortisbc.com. The Thermal Energy Solutions group staff that might be involved in developing the actual thermal energy projects with a customer that would be a potential recipient of EEC incentive program funds, should that customer choose to work with the FEU, are not involved in the process of designing EEC programs including program terms and conditions, nor are they involved in approving customer incentive funding applications to EEC programs.

5.10 Please provide any examples FEI is aware of outside of B.C. in which the ownership of replacement boilers is held in a regulated utility and the costs are recovered in a regulated rate tariff approved by a regulatory commission.

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.0 Delta School District Project

Reference: 2012/2013 RRA Response to BCUC IR #213.4 (page 792)

"Also under the PSECA program, FEI is working with Delta School District to put together a thermal energy services package for this customer. EEC incentives will likely form part of this package; however the incentive amount has not yet been finalized so is not included in this table".

Reference: 2012/2013 RRA Response to BCUC IR #1.2 (page 2)

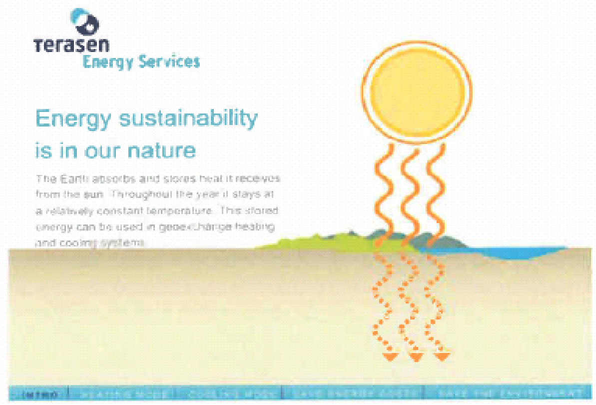
"As explained on page 15 of the Application (Exh B-1-2), FEI is expecting to bring forth individual projects with signed contracts for Commission approval later this year.

As AES Projects develop further, FEI may consider applying to the Commission for approval of AES projects on a different basis"

Reference: Press Release Data Feb 7th 2011

Thermal Energy Upgrade [see Appendix A to this ESAC IR No. 2]

Appendix A - ESAC IR#2



The Thermal Energy Upgrade Project is a unique partnership between the Delta School District and Terasen Gas Inc. (TGI) whereby TGI will undertake the work to replace and convert the heating/cooling plants of the remaining 19 sites in the District inventory not yet upgraded, assume ownership of the plants when completed, operate and maintain the plants, and then charge a tariff to the District for "thermal energy" consumed much in the same fashion Terasen charges consumers for natural gas consumption and BC Hydro charges for electricity consumption. The project also includes the work necessary to alter and connect existing mechanical systems at those buildings to accept the new technology.

This approach to purchasing thermal energy pools the costs and benefits of each building in a manner that enables the District to maximize the environmental benefits of employing alternative technologies in a timely manner (two-year implementation period) while managing capital and operating costs within existing, tight constraints.

Technologies Used

1. Open Loop Geothermal System (OLS)

   An open loop system uses groundwater from a water well tapped into the aquifer 100m or deeper below ground level as a heat source. The groundwater is pumped into the indoor ground water heat pump unit where heat is extracted and the water is disposed of by way of a return well back to the aquifer. Because groundwater is a relatively constant temperature year-round, wells are an excellent heat source. Testing for this technology was conducted in the neighbourhoods where all 19 buildings are located, and of those, eight schools were deemed to be physically and financially feasible.

2. Closed Loop Geothermal System (CLS)

   A closed loop system uses a continuous loop of buried polyethylene pipe. The pipe is connected to the indoor ground source heat pump to form a sealed, underground loop through which an environmentally friendly antifreeze-and-water solution is circulated. A closed loop system constantly re-circulates its heat-transferring solution in pressurized pipe, unlike an open loop system that consumes water from a well. Most closed loops are trenched horizontally in areas adjacent to the building and where adequate land is not available, loops are vertically bored. Typically, the cost of the closed loop system is much higher than that for an open loop system. Those sites which didn't pass the feasibility test for the open loop system were then evaluated for the closed loop system, and from these only three sites were deemed feasible,

3. Condensing Boiler Upgrade (CBU)

   In a conventional boiler, fuel is burned and the hot gases produced are passed through a heat exchanger where much of their heat is transferred to water, thus raising the water's temperature. One of the hot gases produced in the combustion process is steam, which is for all intents and purposes wasted. A condensing boiler extracts additional heat from the waste gases by condensing the steam into liquid water, thus recovering its latent heat. A typical increase of efficiency can be as much as 10-12%. This is the least expensive of all of the alternative thermal energy systems considered in this project, and also yields the least amount of energy and carbon emission reduction. The last eight buildings out of the 19 considered in this project will receive this form of retrofit.

Pertinent Project Data

1. Buildings Included:
   - Delta Secondary (OLS)
   - Delview Secondary (OLS)
   - English Bluff Elementary (OLS)
   - North Delta Secondary (OLS)
   - Pinewood Elementary (OLS)
   - Richardson Elementary (OLS)
   - South Delta Secondary (OLS)
   - South Park Elementary (OLS)
   - Delta Manor Education Centre (CLS)
   - Neilson Grove Elementary (CLS)
   - School Board Office (CLS)
   - Annieville Elementary (CBU)
   - Beach Grove Elementary (CBU)
   - Chalmers Elementary (CBU)
   - Cliff Drive Elementary (CBU)
   - Heath Elementary (CBU)
   - Holly Elementary (CBU)
   - Ladner Elementary (CBU)
   - District Maintenance Facility (CBU)
2. Project budget: $4.9 Million
3. Funding sources: Energy Efficiency & Conservation (EEC) Program ($800,000), Terasen Gas Inc. ($2.7 Million), Public Sector Energy Conservation Agreement (PSECA) Program ($1.4 Million)
4. Project Duration: 2 years, starting in Summer 2011
5. Estimated Annual Reductions:

   Total energy: 32,000 gigajoules
   Emissions: 2,000 tonnes of carbon dioxide (tCO_2e)
   Utility costs*: $100,000
   Avoided carbon tax and offsets: $50,000
   * - takes into account new TGI thermal energy tariff

Appendix A - ESAC IR#2

Printer-friendly version

BRITISH COLUMBIA
The Best Place on Earth

Terasen Gas

NEWS RELEASE

For Immediate Release
2011ENV0007-000102
Feb. 7, 2011

Ministry of Environment
Terasen Gas

SCHOOL DISTRICTS WARM TO RENEWABLE ENERGY TECHNOLOGY

VICTORIA – B.C. school districts have an interest in saving money and being conscientious about energy use – and the Delta School District is among those leading the charge by tapping into B.C.'s Public Sector Energy Conservation Agreement fund.

Terasen Gas and the B.C. Government are providing $6.9 million for 35 energy projects in ten school districts to help reduce greenhouse gas emissions, energy consumption and costs.

"By working together, we're able to realize significant savings opportunities," said John Yap, Minister of State for Climate Action. "It starts with thinking about how we use and conserve energy and then implementing renewable technologies such as geothermal exchange and solar thermal air technologies."

The projects range from energy infrastructure upgrades to solar wall installations to state-of-the-art geoexchange systems buried beneath11 Delta School District playing fields to capture the heating and cooling properties of the earth.

"Energy conservation and environmental responsibility are fundamental values for Terasen Gas. We are committed to developing innovative energy solutions to help meet the current and future energy needs of B.C. school districts," said Doug Stout, vice president, Energy Solutions and External Relations at Terasen Gas and FortisBC. "Our collaboration with the Delta School District is an excellent example of what can happen when many parties come together to find creative uses of integrated energy solutions. Through projects such as these, we can inspire students across B.C. to be conscientious about the energy they use."

"We are extremely pleased to see our project come to life," said Dale Saip, board chairperson, Delta School District. "The teamwork and shared vision of our organizations has resulted in an incredible learning opportunity for our kids and our community. We are grateful to Terasen and the Province of B.C. for their commitment to a better future in Delta and school districts throughout the province."

The combined annual energy savings from the 35 projects are estimated at nearly $720,000 and annual greenhouse gas (GHG) reductions of almost 2,800 tonnes, which is the same as removing over 600 cars from the road annually.

Appendix A - ESAC IR#2

"The teachable moments being created are an invaluable side benefit," said Minister of Education Margaret MacDiarmid. "The energy projects and the discussions I know many teachers are having in their classrooms are piquing student curiosity and sending a great message about the choices we can make for the environment and our future."

The Public Sector Energy Conservation Agreement is a provincial partnership with Terasen Gas, BC Hydro, SolarBC, and Natural Resources Canada. Partners provide capital funding and/or technical support for public sector energy proposals. Another $12 million in capital funding will be distributed later this year.

To date, the fund has helped achieve annual energy cost savings of more than $7.4 million and GHG reductions of over 18,700 tonnes.

About Terasen Gas
Terasen Gas is composed of the operations of Terasen Gas Inc., Terasen Gas (Vancouver Island) Inc., and Terasen Gas (Whistler) Inc. Terasen Gas is a leading integrated energy solutions provider, focused on the safe and reliable provision of natural gas, propane and alternative energy solutions. Terasen Gas serves approximately 939,000 residential and commercial customers in more than 125 B.C. communities. Terasen Gas employs more than 1,280 people in British Columbia and is indirectly wholly owned by Fortis Inc., the largest investor-owned distribution utility in Canada. Fortis Inc. shares are listed on the Toronto Stock Exchange and trade under the symbol FTS. Additional information can be accessed at www.fortisinc.com or www.sedar.com.

-30-

Appendix A - ESAC IR#2

BACKGROUNDER

DELTA SCHOOL DISTRICT PROJECTS

- Terasen Gas will be working with the Delta School District to replace eight conventional boilers with high efficiency, condensing boilers and install 11 state-of-the-art geoexchange systems.
- Terasen Gas estimates that the total environmental benefit of the Delta School District project would be an approximate:
    - 55 per cent reduction in energy consumption (equivalent to enough natural gas to heat about 365 homes for one year)
    - 69 per cent reduction in greenhouse gases (equivalent to the removal of almost 450 cars from the road annually)
- Terasen Gas would own, operate and maintain all of the new heat generation equipment and would charge the Delta School District a rate approved by the British Columbia Utilities Commission for the energy's delivery.
- All 19 projects would be completed in less than two years, and could eventually be expanded to take on other buildings which have already received thermal energy retrofits.
- As a leading integrated energy provider, Terasen Gas builds and operates geoexchange systems for multi-residential, commercial, and industrial developments.
    - Geoexchange systems are one of our principal integrated energy solutions and can be implemented in both new construction and retrofits.
    - Extracting energy from the earth provides a renewable source of heating and cooling.
    - Geoexchange systems provide many benefits for the public sector, developers, building owners and end users ranging from indoor comfort, to protecting the environment, to stable rates that provide a level of financial certainty regarding the price of energy.

GEOEXCHANGE PROJECTS in School District #37 (Delta):

- Delta Secondary
- Delview Secondary
- English Bluff Elementary
- Neilson Grove Elementary
- North Delta Secondary
- Pinewood Elementary
- Richardson Elementary
- South Delta Secondary
- South Park Elementary
- Board of Education Office
- Delta Manor Education Centre

Appendix A - ESAC IR#2

HIGH EFFICIENCY BOILER UPGRADES in School District #37:
- Annieville Elementary
- Beach Grove Elementary
- Chalmers Elementary
- Cliff Drive Elementary
- Heath Elementary
- Holly Elementary
- Ladner Elementary
- District Operations Centre

SOLAR AIR PROJECTS:
- J.A. Laird Elementary, School District #6 (Rocky Mountain)
- Williams Lake Secondary School, School District #27 (Cariboo-Chilcotin)
- Queen Elizabeth Secondary School District #36 (Surrey)
- Semiahmoo Secondary , School District #36 (Surrey)
- Fleetwood Park Secondary, School District #36 (Surrey)
- Elgin Park Secondary, School District #36 (Surrey)
- Smithers Secondary, School District #54 (Bulkley Valley)
- Walnut Park Elementary, School District #54 (Bulkley Valley)
- Agassiz Elementary-Secondary, School District #78 (Fraser-Cascade)

ENERGY UPGRADES:
- Edgewater Elementary, School District #6 (Rocky Mountain)
- Tatla Lake Elementary-Secondary, School District #27 (Cariboo-Chilcotin)
- Kelly Creek Community School, School District #47 (Powell River)
- Keating Elementary School, School District #63 (Saanich)
- Sidney Elementary School, School District #63 (Saanich)
- Arden Elementary, School District #71 (Comox Valley)
- Timberline Secondary School, School District #72 (Campbell River)

-30-

Contact: Colin Grewar,
Ministry of Environment
250 387-9630

Marcus Wong
Corporate Communications Manager
Terasen Gas
Phone: 778 571-3263
Email: marcus.wong@terasengas.com
Follow us at: www.twitter.com/terasengas

For more information on government services or to subscribe to the Province's news feeds using RSS, visit the Province's website at www.gov.bc.ca.

6.1 The information on FEI's website indicates that the project will result in a net annual utility savings of $100,000 per year for the Delta School District ("DSD") after accounting for the cost of the new thermal tariff. Will the tariff negotiated for this particular project be based on this financial outcome for the DSD or will the tariff be based on what is required to fully recover all of FEI's applicable costs within the term of the agreement?

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.2 Please advise whether (i) the total capital cost of $4.9 million for the project is a fixed "all in" cost, and (ii) the $4.9 million figure was in any way influenced by the $5.0 million threshold for a CPCN hearing that formed part of the 2010/2011 RRA Negotiated Settlement Agreement. Also please indicate whether or not, in FEI's opinion, a CPCN would be required if it came to the attention of FEI that the total capital cost would exceed the CPCN threshold after the Tariff had been approved by the Commission.

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.3 Which party is assuming the risk as to whether the net estimated utility cost savings will be realized? Which party is assuming the risk if the total project costs are exceeded?

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.4 Was the marginal rate for BC Hydro Large General Service electricity rates (i.e. LGS – Part 2 approved and effective January 1st, 2011) factored into the estimated impact on electricity costs for the DSD? Were forecast future increases in this rate factored into the analysis?

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.5 How was the EEC funding for this project calculated? Specifically, how much of the publicly announced $800,000 was from published incentive programs such as the Efficient Boiler Program and how much was based on project-specific or customized incentives?

Response:

The amount of EEC funding available to the Delta School District (DSD) via their application through the Public Sector Energy Conservation Agreement ("PSECA") is not yet final. The amounts that DSD references on their web site, including the reference to $800k of EEC funding, are initial estimates only. As such, the final amount of EEC funding will be determined by FEI and released to the School District upon commissioning and on-site audits of the systems. Current analysis of the project application indicates that approximately $100k of EEC funds will be available to DSD due entirely to the use of high efficiency boiler upgrades at some of the sites.

Any EEC funds that FEI provides to DSD for the thermal plant upgrades will be available through FEU's participation in the PSECA initiative, detailed on pages 74 to 77 of Appendix K-4 to Exhibit B-1. On June 8, 2010, FEI (then Terasen Gas) became a signatory to PSECA, an initiative of the provincial government aimed at reducing energy use and greenhouse gas emissions in public sector buildings. The Companies subsequently developed the PSECA Initiative, to pool investment from the various programs of members including EEC funding, and to streamline the qualification process for projects. Including the DSD, the PSECA initiative provided funding commitments to 10 different organizations for energy efficiency upgrades at 35 separate locations.

The EEC funding becomes available for PSECA applicants such as DSD in the following manner: DSD first submitted an application and detailed energy study to the Climate Action Secretariat ("CAS") for internal CAS review and prioritization. The CAS then forwarded the energy study to the utility PSECA partners (FEI and BC Hydro). FEI reviewed the study to ensure reasonableness of the conclusions, and subsequently submitted each of the proposed energy conserving measures (i.e. the proposed thermal upgrade at each school) to the PSECA Initiative's screening and funding models. Each proposed upgrade was first subjected to a Total Resource Cost (TRC) screening. A portfolio of projects which maintain a TRC score of approximately 1.0 was then selected and incentives for each project developed. Incentives were determined based on the expected stream of natural gas savings. More specifically the incentives were calculated as 5 $/GJ, on the discounted stream of the expected natural gas savings, over 50% of the measure life, up to a maximum of 10 years. This funding model also underlies the upcoming Commercial Custom Design Program, detailed on pages 86 – 89 of Appendix K-4 to Exhibit B-1, and is conceptually similar to other such dollars / GJ saved incentive programs found throughout the country.

6.6 Were the same FEI staff members involved in developing the EAS project with the DSD and determining the EEC incentive amounts?

Response:

No they were not. The project was developed by the Thermal Energy Solutions group within FEI. The Thermal Energy Solutions group at FEI has been working with the DSD for several months to develop a business model and offering that would meet the goals of the customer. Concurrent to this process, the DSD submitted an application for Public Sector Energy Conservation Agreement (PSECA) Initiative for funding for this project. As with all grants or incentives made available in the form of DSM or EEC programs, the customer has a role to play in accessing the programs and meeting the requirements of such programs to qualify for these funds, before the funds can be dispensed.

The PSECA incentive amounts for this project are determined based upon the program parameters, designed and managed by staff on the EEC Team, and described on pages 74 to 77 of Appendix K-4 to Exhibit B-1.

6.7 How much, if any, of the EEC funding for this project was expected to come from the $22 million of school TES EEC funding included in the 2012/2013 RRA?

Response:

None. EEC incentives for the Delta School District will come from funds approved in the 2010-2011 Revenue Requirements proceeding, under the FEU's PSECA initiative as described on pages 74-77 of Appendix K-4 to Exhibit B-1.

6.8 Is the DSD project one that FEI intends to bring to the Commission for "approval later this year" or is to be brought forward to the Commission "on a different basis"? What is meant by "a different basis"?

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.9 If the Commission does not approve a tariff application for this project, please indicate if FEI will still proceed with the project based on the agreed-upon tariff and, if so, whether or not FEI's shareholders will then assume the risks associated with possible non-recovery of actual costs (including capital costs).

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.10 Please describe how the benefits of having a regulated tariff for this project were explained to the DSD. In particular, what did FEI tell the DSD would happen (if anything) to its particular tariff or to the rates of other FEI rate payers if the negotiated tariff is insufficient to fully recover all of FEI's applicable costs within the term of the agreement?

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.11 Has FEI secured firm pricing from third parties for the $4.9 Million capital cost?

Response:

This question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

6.12 Assuming the tariff for this project was approved by the Commission, please indicate what would happen if the actual capital and operating costs of the project exceeded what was embedded in the tariff? In particular, please advise which of the following parties would be at risk for these additional costs:

a. the DSD, whether through an increase only in their specific tariff or otherwise,
b. FEI's other AES rate payers collectively,
c. FEI's natural gas rate payers, or
d. FEI shareholders.

Response:

The FEU's response to ESAC IR 2.2.6 addresses the fact that natural gas customers are protected under the current regulatory constructs, and that the ultimate risk of non-recovery of amounts accumulated in the Thermal Energy Services Deferral Account is with the shareholder. The other aspects of this question concern thermal energy services rate design matters and are not relevant to the present proceeding, which is concerned with setting natural gas rates.

7.0 Delta School District Project Economics

ESAC has reviewed the publicly available information from the sources it was able to find including the press release information from the FortisBC's website, the Delta School Board website and media reports related to the press release. The following is a summary and analysis prepared based on this information:

Publicly Released Information:	
Total Net Energy Savings:	32,000 GJ
Total Emissions Reduction:	2,000 Tonnes
Avoided Annual Emissions Offset Costs:	$50,000 (@ $25/Tonne)
Total Capital Cost:	$4.9 Million
PSECA Contribution	$1.4 Million
EEC Funding	$0.8 Million
Net FEI Capital Investment:	$2.7 Million
Net annual savings to the School District:	$100,000
Assumed CO2e emissions factors:	
Natural Gas:	.050 Tonnes per GJ
Electricity	.026 Tonnes per MWh
Resultant calculation of annual utility reductions:	
Natural Gas:	41,352 GJ
Electricity	-2,599,832 kWh (i.e. increase)
Marginal Utility Price Assumption Ranges	
Natural Gas (Rate 5)	$6.54 per GJ
Electricity (*)	$.080 per kWh

(*) $/kWh includes the marginal impact on peak monthly demand and new General Service Part 2 Energy Charge

Request:

7.1 Are there any incorrect assumptions in the above information?

Response:

The Delta School District Project will be submitted for acceptance as a rate in accordance with the requirements outlined in BCUC Order No. G-141-09. With the exception of accuracy of the amount of EEC funding, this question is not relevant to the present proceeding, which is concerned with setting natural gas rates.

With regards to the EEC funding amount noted above please refer to the response to ESAC IR 2.6.5.

7.2 In response to BCUC IR 1.87.1, it was noted that the Lower Mainland/Inland after-tax weighted average cost of capital (WACC) was 6.76%. Please confirm what this equals for a pre-tax WACC? In FEI's view, are these the appropriate WACCs for a project like the DSD?

Response:

Please refer to the response to ESAC IR 2.7.1.

The pre-tax WACC of 9.01% for 2013 can be calculated as follows:

= (2013 after tax WACC) / (1 – Tax Rate)

= 6.76% / (1 – 25.0%)

= 9.01%

7.3 What is the appropriate depreciation rate for the assets used in the DSD project? What is the approximate average depreciation rate for these assets?

Response:

Please refer to the response to ESAC IR 2.7.1.

8.0 Pre-Existing Geo-Exchange Assets

Reference: FortisBC Presentation CDEA-IDEA Conference,

June 2011, Toronto, Ontario

"Existing FortisBC discrete assets:

•Approx 60 geo-exchange systems

•Operating since 2007; approx $8 million assets"

Reference: Response to CEC IR 1.4.1 & BCUC IR 1.78.1

8.1 How many of the above noted systems would fall under FEI's current definition of Alternative Energy Systems (or Thermal Energy Services) requiring regulated tariffs as per the 2010/2011 RRA and NSA?

Response:

This response deals with the responses to ESAC IRs 2.8.1 to 2.8.7.

These questions are not relevant to the present proceeding, which is concerned with setting natural gas rates.

8.2 How many of these systems were submitted to the BCUC for tariff approval at the time they were acquired or developed? Please provide any Commission Order numbers in relation to these approvals.

Response:

Please refer to the response to ESAC IR 2.8.1.

8.3 Have any of these systems or related assets been transferred to FEI? If not, is this being contemplated in the foreseeable future?

Response:

Please refer to the response to ESAC IR 2.8.1.

8.4 Which of these systems received a CPCN from the Commission? Please provide the applicable Commission orders granting each such CPCN.

Response:

Please refer to the response to ESAC IR 2.8.1.

8.5 Please provide the applicable approved Schedule 12A for each of these systems. If there is no Schedule 12A applicable to any of these systems, please explain why such schedules do not exist.

Response:

Please refer to the response to ESAC IR 2.8.1.

8.6 Have there been any amendments to the ***Utilities Commissions Act*** (the "UCA") since these system were acquired or developed that have caused FEI to change its opinion as to whether or not these systems should be characterized as "public utilities" under the UCA requiring regulated tariffs.

Response:

Please refer to the response to ESAC IR 2.8.1.

8.7 Where in the 2012-13 RRA are the revenues and expenditures for these systems set forth?

Response:

Please refer to the response to ESAC IR 2.8.1.

8.8 Do these systems make a specific contribution to the natural gas cost of service in excess of the $0.5 million referred to in the IR responses referenced above?

Response:

Yes, in excess of the $0.5 million from the Thermal Energy Services Deferral Account, under the continuing services arrangement between FEI and FortisBC Alternative Energy Services Inc. (formerly Terasen Energy Services Inc.), the FEI have forecast an estimated recovery of $200 thousand for 2012 and $206 thousand for 2013 for operation and administration of the assets owned by FortisBC Alternative Energy Services Inc.

Attachment 1.1

(Provided in electronic format only due to
document size and in order to conserve paper)

FORTIS BC

New Initiative programs - Geoexchange Average SCT	PROGRAM														
	COSTS ($000)											SAVINGS (GJ)			LIFE
FEI	Utility			Partners											Years
	Incentives	Administration	Total	Incentives	Administration	Total	Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net	
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Geoexchange - Average	0	30	30	0	0	0	310	340	9%	0%	91%	3,330	100%	3,330	20
Total Residential	0	30	30	0	0	0	310	340	9%	-	91%	3,330		3,330	

New Initiative programs - Geoexchange Average SCT	ALTERNATE		NET PRESENT VALUE								
	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings		
FEI	Energy	Capacity	($/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity
	MWh	kW		($'000s)	($'000s)	($'000s)	($'000s)	($'000s)	(GJ)	(MWh)	(kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
RESIDENTIAL:											
Geoexchange - Average	-260	-	1	1,030	(603)	495	74	(319)	49,543	-3,862	-
Total Residential	-260	0	1	1,030	(603)	495	74	(319)	49,543	(3,862)	N/A

New Initiative programs - Geoexchange Average SCT	BENEFIT/COST						
		Participant					
FEI	Natural Gas	Total Costs	Total Benefits	Benefit/Cost	Natural Gas		TRC Net Benefits
	Utility	($'000s)	($'000s)		Rate Impact	SCT	($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
RESIDENTIAL:							
Geoexchange - Average	34.3	310	250	0.8	2.0	1.3	88
Total Residential	34.3	310	250	0.8	2.0	1.3	88

New Initiative programs - Geoexchange Average SCT	PARAMETERS											
	UTILITY				PARTICIPANT							
FEI	Natural Gas Utility Discount Rate	Natural Gas Supply	Alternate Discount Rate	Alternate Supply	Discount Rate	Natural Gas NPV	Carbon Tax NPV	Alternate Energy NPV	Alternate Capacity NPV	Natural Gas Tariff	Energy Tariff	Capacity Tariff
		$/GJ		$/kWh		$/GJ	$/GJ	$/kWh	$/kW/a	$/GJ	$/kWh	$/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Geoexchange - Average	3.00%	238.01	3%	1.79	3.0%	148.76	22.35	1.23	0.00	9.999	0.083	-
Total Residential	1.6	217										

	A	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
1	UTILITY		FORTIS BC																																
2																																			
3																																			
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
5			Units																																
6		NATURAL GAS																																	
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9		carbon tax	$ per GJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11		Total incremental cost of gas including carbon		15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.28
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
17																																			
18																																			
19		ELECTRICITY																																	
20		Incremental Cost of Elec	$ Per kWh	$0.12																															
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00																															
22																																			
23																																			
24																																			
25	RETAIL																																		
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI																								
27		Residential Retail			000's																														
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC																											
29		TGVI	$ Per MJ	$0.0143	72																														
30		Electricity	$ Per MJ	$0.0230																															
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%																							
32		Electricity	$ per kW per year																																
33		Commercial Retail																																	
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC																											
35		TGVI	$ Per MJ	$0.0169	8																														
36		Electricity	$ Per MJ	$0.0214																															
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC																											
38		Electricity	$ per kW per year	$52.0000	15																														
39																																			
40	TAX																																		
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18	$15.19	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60	$14.65	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76	$13.85	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71
50																																			
51		Discount Rate (real)[1]																																	
52		TERASEN GAS																																	
53		Rate of Inflation	1.90%																																
54		TGI	3.00%																																
55		TGVI	3.00%																																
56		BC HYDRO																																	
57		Rate of Inflation	2.00%																																
58		BC Hydro	3.00%																																
59		Customer	3.00%																																
60		Footnote 1: Source LR 070531																																	
61																																			
62				SHEET LABELS																															
63	New Construction																																		
64		Geoexchange - Average		BASEBOARD																															
65		0		HEATPUMP																															
66																																			

only enter in boxes marked in blue

FORTIS BC
Schools
NEW

Measure Data for Geoexchange - Average

PER MEASURE

			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 309,667			
Total Incentive				$ -
Participant	$ 309,667			

Annual Impact Per Measure

Energy Savings per installation	3330.1	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00			Net-to-Gross
Alternate Energy Impact	-935	GJ	-259,611		kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	20	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	3,139	3,330	0	3,330	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	3,139	3,330	0	3,330	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	-244,708	-259,611	0	-259,611	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$238.01	$238.01	$238.01	
Energy Purchases	$ 792,590	$ 792,590	$ -	$ 792,590	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 30,000	$ -	$ 30,000		
Subtotal	$ 28,278	$ 30,000	$ -	$ 30,000	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 309,667	$ -	$ 309,667	$ -	
Subtotal	$ 291,891	$ 309,667	$ -	$ 309,667	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ (463,483)	$ -	$ (463,483)	$ -	$1.785 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ (463,483)	$ (463,483)	$ -	$ (463,483)	$ -	
Total Resource Net Benefit (Cost)	$ 8,939		$ -	$ (10,560)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	**$ 6.9**		**$ -**	**$ 6.9**	**$ -**	Informational (for comparison with supply options)

Fortis BC

New Initiative Programs - Geoexchange Average TRC

	PROGRAM										
	COSTS ($000)										
	Utility			Partners							
	Incentives	Administration	Total	Incentives	Administration	Total	Participant	Total	% Utility	% Partner	% Participant
Label	B	C	D	E	F	G	H	I	J	K	L
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I
2011											
Schools											
Geoexchange- Average	0	30	30	0	0	0	310	340	9%	0%	91%

	PROGRAM				ALTERNATE		NET PRESENT VALUE								
	SAVINGS (GJ)			LIFE	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings		
	Gross	Net-to-Gross	Net	Years	Energy MWh	Capacity kW	($/GJ)	Program ($'000s)	Alternate ($'000s)	Program ($'000s)	Carbon Tax ($'000s)	Alternate ($'000s)	Natural Gas (GJ)	Alternate Energy (MWh)	Alternate Capacity (kW)
Label	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011															
Schools															
Geoexchange- Average	3,330	100%	3,330	20	(260)	-	1	372	(326)	349	53	(225)	34,872	(2,719)	-

	BENEFIT/COST							PARAMETERS											
		Participant						UTILITY				PARTICIPANT							
	Natural Gas Utility	Total Costs ($'000s)	Total Benefits ($'000s)	Benefit/Cost	Natural Gas Rate Impact	Total Resource	TRC Net Benefits ($'000s)	Natural Gas Utility Discount Rate	Natural Gas Supply $/GJ	Alternate Discount Rate	Alternate Supply $/kWh	Discount Rate	Natural Gas NPV $/GJ	Carbon Tax NPV $/GJ	Alternate Energy NPV $/kWh	Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011																			
Schools																			
Geoexchange- Average	12.4	310	176	0.6	1.0	0.1	(293)	7.15%	111.84	7%	1.26	7.2%	104.71	15.79	0.87	0.00	9.999	0.083	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	UTILITY		Fortis BC														
2																	
3																	
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
5			Units														
6		NATURAL GAS															
7		Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81	$10.03
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13
9		carbon tax	$ per GJ	0.75	1.00	1.25	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
11		Total incremental cost of gas including carbon		6.41	7.32	8.21	9.01	9.52	9.92	10.22	10.43	10.64	10.85	11.05	11.26	11.47	11.68
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47	$11.68
14	4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39	$81.83
15	5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51	$81.27
16	6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66	$79.76
17																	
18																	
19		ELECTRICITY															
20		Incremental Cost of Elec	$ Per kWh	$0.12													
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00													
22																	
23																	
24																	
25	RETAIL																
26				Rate													
27		Residential Retail															
28		TGI	$ Per MJ	$0.0100													
29		TGVI	$ Per MJ	$0.0143													
30		Electricity	$ Per MJ	$0.0230													
31		Electricity	$ per kWh	$0.0827													
32		Electricity	$ per kW per year														
33		Commercial Retail															
34		TGI	$ Per MJ	$0.0094													
35		TGVI	$ Per MJ	$0.0169													
36		Electricity	$ Per MJ	$0.0214													
37		Electricity	$ per kWh	$0.0769													
38		Electricity	$ per kW per year	$52.0000													
39																	
40	TAX																
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11	12
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11	$11.72
48	7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90	$11.56
49	8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44	$11.14
50																	
51		Discount Rate (real)[1]															
52		TERASEN GAS															
53		Rate of Inflation	1.90%														
54		TGI	7.15%														
55		TGVI	7.15%														
56		BC HYDRO															
57		Rate of Inflation	2.00%														
58		BC Hydro	7.15%														
59		Customer	7.15%														
60		Footnote 1: Source LR 070531															
61																	
62																	
63																	
64																	
65																	
66																	

	E	F	G	H	I	J	K	L
26	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI	
27	000's							
28	640		712,304	Total Residential Customers in BC				
29	72							
31	1,511		1,511,435	Total BCH Residential Customers in BC				89%
34	78		77,624	Total Commercial Customers in BC				
35	8							
37	190		189,764	Total Light Industrial and Commercial Customers in BC				
38	15							

	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
7	$10.25	$10.47	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
8	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11	11.90	12.13	12.35	12.59	12.83	13.07	13.32	13.58	13.84	14.11	14.38	14.66	14.95	15.24	15.54	15.84	16.15	16.31
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	$11.90	$12.13	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
14	$86.05	$90.07	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
15	$85.80	$90.10	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
16	$84.61	$89.22	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70
41	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	$12.29	$12.82	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
48	$12.17	$12.74	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
49	$11.79	$12.40	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10

Fortis BC
Schools
NEW

only enter in boxes marked in blue

Measure Data for Geoexchange- Average

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 309,667			
Total Incentive	$ -			
Participant	**$ 309,667**			

Annual Impact Per Measure

Energy Savings per installation	3330.1	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00			Net-to-Gross
Alternate Energy Impact	-935	GJ		-259,611	kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	20	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	3,108	3,330	0	3,330	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	3,108	3,330	0	3,330	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	(242,288)	(259,611)	0	(259,611)	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$107.39	$111.84	$115.76	
Energy Purchases	$ 372,443	$ 372,443	$ -	$ 372,443	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 30,000	$ -	$ 30,000		
Subtotal	$ 27,998	$ 30,000	$ -	$ 30,000	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 309,667	$ -	$ 309,667	$ -	
Subtotal	$ 289,003	$ 309,667	$ -	$ 309,667	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ (326,226)	$ -	$ (326,226)	$ -	$1.257 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ (326,226)	$ (326,226)	$ -	$ (326,226)	$ -	
Total Resource Net Benefit (Cost)	$ (270,784)		$ -	$ (293,450)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	**$ 9.7**		**$ -**	**$ 9.7**	**$ -**	Informational (for comparison with supply options)

FORTIS BC

New Initiative Programs - Geoexchange Elementary SCT / FEI	PROGRAM – COSTS ($000) – Utility – Incentives	Utility – Administration	Utility – Total	Partners – Incentives	Partners – Administration	Partners – Total	Participant	Total	% Utility	% Partner	% Participant
Label	B	C	D	E	F	G	H	I	J	K	L
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I
2011											
RESIDENTIAL:											
Geoexchange - Elementary	0	30	30	0	0	0	167	197	15%	0%	85%
Total	0	30	30	0	0	0	167	197	15%	-	85%

FEI	PROGRAM – SAVINGS (GJ) – Gross	Net-to-Gross	Net	LIFE – Years	ALTERNATE – Impact – Energy (MWh)	Impact – Capacity (kW)	Levelized Cost ($/GJ)
Label	M	N	O	P	Q	R	S
Source Sheet or Calculation	Program	Program	MxN	Program	Program	Program	D/Y
2011							
RESIDENTIAL:							
Geoexchange - Elementary	1,402	100%	1,402	20	(153)	-	1
Total	1,402		1,402		(153)	0	1

FEI	NET PRESENT VALUE – Utility Benefits (Costs) – Program ($'000s)	Utility Benefits (Costs) – Alternate ($'000s)	Participant Benefits (Costs) – Program ($'000s)	Participant Benefits (Costs) – Carbon Tax ($'000s)	Participant Benefits (Costs) – Alternate ($'000s)	Program Net Savings – Natural Gas (GJ)	Program Net Savings – Alternate Energy (MWh)	Program Net Savings – Alternate Capacity (kW)
Label	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011								
RESIDENTIAL:								
Geoexchange - Elementary	434	(356)	209	31	(189)	20,858	(2,281)	-
Total	434	(356)	209	31	(189)	20,858	(2,281)	N/A

FEI	BENEFIT/COST – Natural Gas Utility	Participant – Total Costs ($'000s)	Participant – Total Benefits ($'000s)	Participant – Benefit/Cost	Natural Gas Rate Impact	SCT	TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
RESIDENTIAL:							
Geoexchange - Elementary	14.5	167	51	0.3	1.8	0.4	(119)
Total	14.5	167	51	0.3	1.8	0.4	(119)

FEI	PARAMETERS – UTILITY – Natural Gas Utility Discount Rate	UTILITY – Natural Gas Supply $/GJ	UTILITY – Alternate Discount Rate	UTILITY – Alternate Supply $/kWh	PARTICIPANT – Discount Rate	PARTICIPANT – Natural Gas NPV $/GJ	PARTICIPANT – Carbon Tax NPV $/GJ	PARTICIPANT – Alternate Energy NPV $/kWh	PARTICIPANT – Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Geoexchange - Elementary	3.00%	238.01	3%	1.79	3.0%	148.76	22.35	1.23	0.00	9.999	0.083	-
Total	0.5	(95)										

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**UTILITY**		**FORTIS BC**													
2																
3																
4			**Year**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
5			Units													
6		**NATURAL GAS**														
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		*Year*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
9		carbon tax	$ per GJ	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
10		Distribution adder	$ per GJ	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*
11		Total incremental cost of gas including carbon		*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86
17																
18																
19		**ELECTRICITY**														
20		Incremental Cost of Elec	$ Per kWh	$0.12												
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00												
22																
23																
24																
25	**RETAIL**															
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI					
27		Residential Retail			*000's*											
28		**TGI**	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC								
29		**TGVI**	$ Per MJ	$0.0143	72											
30		**Electricity**	$ Per MJ	$0.0230												
31		**Electricity**	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%				
32		**Electricity**	$ per kW per year													
33		Commercial Retail														
34		**TGI**	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC								
35		**TGVI**	$ Per MJ	$0.0169	8											
36		**Electricity**	$ Per MJ	$0.0214												
37		**Electricity**	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC								
38		**Electricity**	$ per kW per year	$52.0000	15											
39																
40	**TAX**															
41			**Year**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
42	1		*Year*		*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76
50																
51		**Discount Rate (real)[1]**														
52		**TERASEN GAS**														
53		**Rate of Inflation**	1.90%													
54		**TGI**	3.00%													
55		**TGVI**	3.00%													
56		**BC HYDRO**														
57		**Rate of Inflation**	2.00%													
58		**BC Hydro**	3.00%													
59		**Customer**	3.00%													
60		*Footnote 1: Source LR 070531*														
61																
62				**SHEET LABELS**												
63	**New Construction**															
64		Geoexchange - Elementary		**BASEBOARD**												
65		0		**HEATPUMP**												
66																

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**
7	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
9	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
10	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	
11	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.28*
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
41	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
42	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
43	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	$15.19	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	$14.65	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	$13.85	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71

only enter in boxes marked in blue

FORTIS BC
Schools
NEW

Measure Data for Geoexchange - Elementary

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 166,631			
Total Incentive				$ -
Participant	$ 166,631			

Annual Impact Per Measure

Energy Savings per installation	1402.0	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00			Net-to-Gross
Alternate Energy Impact	-552	GJ	-153,333		kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	20	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	1,322	1,402	0	1,402	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	1,322	1,402	0	1,402	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	(144,531)	(153,333)	0	(153,333)	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$238.01	$238.01	$238.01	
Energy Purchases	$ 333,687	$ 333,687	$ -	$ 333,687	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 30,000	$ -	$ 30,000		
Subtotal	$ 28,278	$ 30,000	$ -	$ 30,000	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 166,631	$ -	$ 166,631	$ -	
Subtotal	$ 157,066	$ 166,631	$ -	$ 166,631	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ (273,746)	$ -	$ (273,746)	$ -	$1.785 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ (273,746)	$ (273,746)	$ -	$ (273,746)	$ -	
Total Resource Net Benefit (Cost)	$ (125,402)		$ -	$ (136,689)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 9.4		$ -	$ 9.4	$ -	Informational (for comparison with supply options)

Fortis BC

	PROGRAM - COSTS ($000) - Utility - Incentives	PROGRAM - COSTS ($000) - Utility - Administration	PROGRAM - COSTS ($000) - Utility - Total	PROGRAM - COSTS ($000) - Partners - Incentives	PROGRAM - COSTS ($000) - Partners - Administration	PROGRAM - COSTS ($000) - Partners - Total	PROGRAM - COSTS ($000) - Participant	PROGRAM - COSTS ($000) - Total	PROGRAM - COSTS ($000) - % Utility	PROGRAM - COSTS ($000) - % Partner	PROGRAM - COSTS ($000) - % Participant	PROGRAM - SAVINGS (GJ) - Gross	PROGRAM - SAVINGS (GJ) - Net-to-Gross	PROGRAM - SAVINGS (GJ) - Net	PROGRAM - LIFE - Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
Schools															
Geoexchange - Elementary	0	30	30	0	0	0	167	197	15%	0%	85%	1,011	100%	1,011	20

	ALTERNATE - Impact - Energy MWh	ALTERNATE - Impact - Capacity kW	NET PRESENT VALUE - Levelized Cost ($/GJ)	NET PRESENT VALUE - Utility Benefits (Costs) - Program ($'000s)	NET PRESENT VALUE - Utility Benefits (Costs) - Alternate ($'000s)	NET PRESENT VALUE - Participant Benefits (Costs) - Program ($'000s)	NET PRESENT VALUE - Participant Benefits (Costs) - Carbon Tax ($'000s)	NET PRESENT VALUE - Participant Benefits (Costs) - Alternate ($'000s)	NET PRESENT VALUE - Program Net Savings - Natural Gas (GJ)	NET PRESENT VALUE - Program Net Savings - Alternate Energy (MWh)	NET PRESENT VALUE - Program Net Savings - Alternate Capacity (kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
Schools											
Geoexchange - Elementary	(153)	-	3	113	(193)	106	16	(133)	10,587	(1,606)	-

	BENEFIT/COST - Natural Gas Utility	BENEFIT/COST - Participant - Total Costs ($'000s)	BENEFIT/COST - Participant - Total Benefits ($'000s)	BENEFIT/COST - Participant - Benefit/Cost	BENEFIT/COST - Natural Gas Rate Impact	BENEFIT/COST - Total Resource	BENEFIT/COST - TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
Schools							
Geoexchange - Elementary	3.8	167	(11)	(0.1)	0.8	(0.2)	(276)

	PARAMETERS - UTILITY - Natural Gas Utility Discount Rate	PARAMETERS - UTILITY - Natural Gas Supply $/GJ	PARAMETERS - UTILITY - Alternate Discount Rate	PARAMETERS - UTILITY - Alternate Supply $/kWh	PARAMETERS - PARTICIPANT - Discount Rate	PARAMETERS - PARTICIPANT - Natural Gas NPV $/GJ	PARAMETERS - PARTICIPANT - Carbon Tax NPV $/GJ	PARAMETERS - PARTICIPANT - Alternate Energy NPV $/kWh	PARAMETERS - PARTICIPANT - Alternate Capacity NPV $/kW/a	PARAMETERS - PARTICIPANT - Natural Gas Tariff $/GJ	PARAMETERS - PARTICIPANT - Energy Tariff $/kWh	PARAMETERS - PARTICIPANT - Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
Schools												
Geoexchange - Elementary	7.15%	111.84	7%	1.26	7.2%	104.71	15.79	0.87	0.00	9.999	0.083	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	UTILITY		Fortis BC													
2																
3																
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
5			Units													
6		NATURAL GAS														
7		Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12
9		carbon tax	$ per GJ	0.75	1.00	1.25	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
11		Total incremental cost of gas including carbon		6.41	7.32	8.21	9.01	9.52	9.92	10.22	10.43	10.64	10.85	11.05	11.26	11.47
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47
14	4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39
15	5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51
16	6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66
17																
18																
19		ELECTRICITY														
20		Incremental Cost of Elec	$ Per kWh	$0.12												
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00												
22																
23																
24																
25	RETAIL															
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI					
27		Residential Retail			000's											
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC								
29		TGVI	$ Per MJ	$0.0143	72											
30		Electricity	$ Per MJ	$0.0230												
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%				
32		Electricity	$ per kW per year													
33		Commercial Retail														
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC								
35		TGVI	$ Per MJ	$0.0169	8											
36		Electricity	$ Per MJ	$0.0214												
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC								
38		Electricity	$ per kW per year	$52.0000	15											
39																
40	TAX															
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11
48	7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90
49	8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44
50																
51		Discount Rate (real)[1]														
52		TERASEN GAS														
53		Rate of Inflation	1.90%													
54		TGI	7.15%													
55		TGVI	7.15%													
56		BC HYDRO														
57		Rate of Inflation	2.00%													
58		BC Hydro	7.15%													
59		Customer	7.15%													
60		Footnote 1: Source LR 070531														
61																
62																
63																
64																
65																
66																

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
7	$10.03	$10.25	$10.47	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
8	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11	11.68	11.90	12.13	12.35	12.59	12.83	13.07	13.32	13.58	13.84	14.11	14.38	14.66	14.95	15.24	15.54	15.84	16.15	16.31
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	$11.68	$11.90	$12.13	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
14	$81.83	$86.05	$90.07	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
15	$81.27	$85.80	$90.10	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
16	$79.76	$84.61	$89.22	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70
41	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	$11.72	$12.29	$12.82	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
48	$11.56	$12.17	$12.74	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
49	$11.14	$11.79	$12.40	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10

Fortis BC
Schools
NEW

only enter in boxes marked in blue

Measure Data for Geoexchange - Elementary

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 166,631			
Total Incentive	$ -			
Participant	$ 166,631			

Annual Impact Per Measure				
Energy Savings per installation	1011.0	GJ		Average Annmual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00		Net-to-Gross
Alternate Energy Impact	-552	GJ	-153,333	kWh
Alternate Capacity Impact		kW/a		
Measure Lifetime	20	Years	Estimated lifespan of measure	

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	944	1,011	0	1,011	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	944	1,011	0	1,011	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	(143,102)	(153,333)	0	(153,333)	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$107.39	$111.84	$115.76	
Energy Purchases	$ 113,072	$ 113,072	$ -	$ 113,072	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 30,000	$ -	$ 30,000		
Subtotal	$ 27,998	$ 30,000	$ -	$ 30,000	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 166,631	$ -	$ 166,631	$ -	
Subtotal	$ 155,512	$ 166,631	$ -	$ 166,631	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ (192,678)	$ -	$ (192,678)	$ -	$1.257 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ (192,678)	$ (192,678)	$ -	$ (192,678)	$ -	
Total Resource Net Benefit (Cost)	$ (263,116)		$ -	$ (276,237)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 18.6		$ -	$ 18.6	$ -	Informational (for comparison with supply options)

FORTIS BC

New Initiative Programs - Geoexchange Secondary SCT / FEI	PROGRAM – COSTS ($000) – Utility – Incentives	Utility – Administration	Utility – Total	Partners – Incentives	Partners – Administration	Partners – Total	Participant	Total	% Utility	% Partner	% Participant	SAVINGS (GJ) – Gross	Net-to-Gross	Net	LIFE – Years	ALTERNATE – Impact – Energy (MWh)	Impact – Capacity (kW)
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program
2011																	
RESIDENTIAL:																	
Geoexchange - Secondary	0	30	30	0	0	0	524	554	5%	0%	95%	6,223	100%	6,223	20	(419)	-
Total	0	30	30	0	0	0	524	554	5%	-	95%	6,223		6,223		(419)	0

New Initiative Programs - Geoexchange Secondary SCT / FEI	NET PRESENT VALUE – Levelized Cost ($/GJ)	Utility Benefits (Costs) – Program ($'000s)	Utility Benefits (Costs) – Alternate ($'000s)	Participant Benefits (Costs) – Program ($'000s)	Participant Benefits (Costs) – Carbon Tax ($'000s)	Participant Benefits (Costs) – Alternate ($'000s)	Program Net Savings – Natural Gas (GJ)	Program Net Savings – Alternate Energy (MWh)	Program Net Savings – Alternate Capacity (kW)	BENEFIT/COST – Natural Gas Utility	Participant – Total Costs ($'000s)	Participant – Total Benefits ($'000s)	Participant – Benefit/Cost	Natural Gas Rate Impact	SCT	TRC Net Benefits ($'000s)
Label	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	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
2011																
RESIDENTIAL:																
Geoexchange - Secondary	0	1,925	(973)	926	139	(516)	92,583	(6,236)	-	64.2	524	549	1.0	2.0	1.7	398
Total	0	1,925	(973)	926	139	(516)	92,583	(6,236)	N/A	64.2	524	549	1.0	2.0	1.7	398

New Initiative Programs - Geoexchange Secondary SCT / FEI	PARAMETERS – UTILITY – Natural Gas Utility Discount Rate	UTILITY – Natural Gas Supply $/GJ	UTILITY – Alternate Discount Rate	UTILITY – Alternate Supply $/kWh	PARTICIPANT – Discount Rate	PARTICIPANT – Natural Gas NPV $/GJ	PARTICIPANT – Carbon Tax NPV $/GJ	PARTICIPANT – Alternate Energy NPV $/kWh	PARTICIPANT – Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Geoexchange - Secondary	3.00%	238.01	3%	1.79	3.0%	148.76	22.35	1.23	0.00	9.999	0.083	-
Total	2.2	684										

1

	A	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
1	UTILITY		FORTIS BC																																
2																																			
3																																			
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
5			Units																																
6		NATURAL GAS																																	
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9		carbon tax	$ per GJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11		Total incremental cost of gas including carbon		15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.28
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
17																																			
18																																			
19		ELECTRICITY																																	
20		Incremental Cost of Elec	$ Per kWh	$0.12																															
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00																															
22																																			
23																																			
24																																			
25	RETAIL																																		
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI																								
27		Residential Retail			000's																														
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC																											
29		TGVI	$ Per MJ	$0.0143	72																														
30		Electricity	$ Per MJ	$0.0230																															
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%																							
32		Electricity	$ per kW per year																																
33		Commercial Retail																																	
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC																											
35		TGVI	$ Per MJ	$0.0169	8																														
36		Electricity	$ Per MJ	$0.0214																															
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC																											
38		Electricity	$ per kW per year	$52.0000	15																														
39																																			
40	TAX																																		
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18	$15.19	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60	$14.65	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76	$13.85	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71
50																																			
51		Discount Rate (real)[1]																																	
52		TERASEN GAS																																	
53		Rate of Inflation	1.90%																																
54		TGI	3.00%																																
55		TGVI	3.00%																																
56		BC HYDRO																																	
57		Rate of Inflation	2.00%																																
58		BC Hydro	3.00%																																
59		Customer	3.00%																																
60		Footnote 1: Source LR 070531																																	
61																																			
62				SHEET LABELS																															
63	New Construction																																		
64		Geoexchange - Secondary		BASEBOARD																															
65		0		HEATPUMP																															
66																																			

FORTIS BC
Schools
NEW

only enter in boxes marked in blue

Measure Data for Geoexchange - Secondary

PER MEASURE			Utility Incentive to the participant	partner incentive	
Incremental Cost	$ 524,221				
Total Incentive				$ -	
Participant	$ 524,221				
Annual Impact Per Measure					
Energy Savings per installation	6223.0	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00			Net-to-Gross
Alternate Energy Impact	-1509	GJ	-419,167		kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	20	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	5,866	6,223	0	6,223	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	5,866	6,223	0	6,223	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	(395,105)	(419,167)	0	(419,167)	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$238.01	$238.01	$238.01	
Energy Purchases	$ 1,481,124	$ 1,481,124	$ -	$ 1,481,124	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 30,000	$ -	$ 30,000		
Subtotal	$ 28,278	$ 30,000	$ -	$ 30,000	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 524,221	$ -	$ 524,221	$ -	
Subtotal	$ 494,129	$ 524,221	$ -	$ 524,221	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ (748,337)	$ -	$ (748,337)	$ -	$1.785 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ (748,337)	$ (748,337)	$ -	$ (748,337)	$ -	
Total Resource Net Benefit (Cost)	$ 210,380		$ -	$ 178,566	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 6.0		$ -	$ 6.0	$ -	Informational (for comparison with supply options)

Fortis BC

New Initiative Programs - Geoexchange Secondary TRC

	PROGRAM: COSTS ($000): Utility: Incentives	PROGRAM: COSTS ($000): Utility: Administration	PROGRAM: COSTS ($000): Utility: Total	PROGRAM: COSTS ($000): Partners: Incentives	PROGRAM: COSTS ($000): Partners: Administration	PROGRAM: COSTS ($000): Partners: Total	PROGRAM: COSTS ($000): Participant	PROGRAM: COSTS ($000): Total	PROGRAM: COSTS ($000): % Utility	PROGRAM: COSTS ($000): % Partner	PROGRAM: COSTS ($000): % Participant	PROGRAM: SAVINGS (GJ): Gross	PROGRAM: SAVINGS (GJ): Net-to-Gross	PROGRAM: SAVINGS (GJ): Net	PROGRAM: LIFE: Years	ALTERNATE: Impact: Energy MWh	ALTERNATE: Impact: Capacity kW
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program	Program	Program
2011																	
Schools																	
Geoexchange - Secondary	0	30	30	0	0	0	524	554	5%	0%	95%	6,223	100%	6,223	20	(419)	-

	NET PRESENT VALUE: Levelized Cost ($/GJ)	NET PRESENT VALUE: Utility Benefits (Costs): Program ($'000s)	NET PRESENT VALUE: Utility Benefits (Costs): Alternate ($'000s)	NET PRESENT VALUE: Participant Benefits (Costs): Program ($'000s)	NET PRESENT VALUE: Participant Benefits (Costs): Carbon Tax ($'000s)	NET PRESENT VALUE: Participant Benefits (Costs): Alternate ($'000s)	NET PRESENT VALUE: Program Net Savings: Natural Gas (GJ)	NET PRESENT VALUE: Program Net Savings: Alternate Energy (MWh)	NET PRESENT VALUE: Program Net Savings: Alternate Capacity (kW)	BENEFIT/COST: Natural Gas Utility	BENEFIT/COST: Participant: Total Costs ($'000s)	BENEFIT/COST: Participant: Total Benefits ($'000s)	BENEFIT/COST: Participant: Benefit/Cost	BENEFIT/COST: Natural Gas Rate Impact	BENEFIT/COST: Total Resource	BENEFIT/COST: TRC Net Benefits ($'000s)
Label	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	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
2011																
Schools																
Geoexchange - Secondary	0	#N/A	N/A	N/A	#N/A	N/A	124,460	(8,383)	-	#N/A	524	#N/A	#N/A	#N/A	#N/A	#N/A

	PARAMETERS: UTILITY: Natural Gas Utility Discount Rate	PARAMETERS: UTILITY: Natural Gas Supply $/GJ	PARAMETERS: UTILITY: Alternate Discount Rate	PARAMETERS: UTILITY: Alternate Supply $/kWh	PARAMETERS: PARTICIPANT: Discount Rate	PARAMETERS: PARTICIPANT: Natural Gas NPV $/GJ	PARAMETERS: PARTICIPANT: Carbon Tax NPV $/GJ	PARAMETERS: PARTICIPANT: Alternate Energy NPV $/kWh	PARAMETERS: PARTICIPANT: Alternate Capacity NPV $/kW/a	PARAMETERS: PARTICIPANT: Natural Gas Tariff $/GJ	PARAMETERS: PARTICIPANT: Energy Tariff $/kWh	PARAMETERS: PARTICIPANT: Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
Schools												
Geoexchange - Secondary	0.00%	#N/A	0%	0.00	0.0%	0.00	#N/A	0.00	0.00	0.000	0.000	-

1

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	**UTILITY**		**Fortis BC**																
2																			
3																			
4			**Year**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
5			Units																
6		**NATURAL GAS**																	
7		Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81	$10.03	$10.25	$10.47
8	1		*Year*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
9		carbon tax	$ per GJ	*0.75*	*1.00*	*1.25*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*
10		Distribution adder	$ per GJ	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*
11		Total incremental cost of gas including carbon		*6.41*	*7.32*	*8.21*	*9.01*	*9.52*	*9.92*	*10.22*	*10.43*	*10.64*	*10.85*	*11.05*	*11.26*	*11.47*	*11.68*	*11.90*	*12.13*
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47	$11.68	$11.90	$12.13
14	4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39	$81.83	$86.05	$90.07
15	5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51	$81.27	$85.80	$90.10
16	6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66	$79.76	$84.61	$89.22

Row	B	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4		**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**
7	Incremental Cost of Gas (nominal)	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
8		*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
9	carbon tax	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*
10	Distribution adder	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	
11	Total incremental cost of gas including carbon	*12.35*	*12.59*	*12.83*	*13.07*	*13.32*	*13.58*	*13.84*	*14.11*	*14.38*	*14.66*	*14.95*	*15.24*	*15.54*	*15.84*	*16.15*	*16.31*
12	GDP Deflator	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	Incremental Cost of Gas (Real)	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
14	Net Present Value -2010	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
15	Net Present Value -2011	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
16	Net Present Value -2012	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70

Row	A	B	C	D	E	F	G	H	I	J	K	L
17												
18												
19		**ELECTRICITY**										
20		Incremental Cost of Elec	$ Per kWh	$0.12								
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00								
22												
23												
24												
25	**RETAIL**											
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI	
27		Residential Retail			*000's*							
28		**TGI**	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC				
29		**TGVI**	$ Per MJ	$0.0143	72							
30		**Electricity**	$ Per MJ	$0.0230								
31		**Electricity**	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%
32		**Electricity**	$ per kW per year									
33		Commercial Retail										
34		**TGI**	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC				
35		**TGVI**	$ Per MJ	$0.0169	8							
36		**Electricity**	$ Per MJ	$0.0214								
37		**Electricity**	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC				
38		**Electricity**	$ per kW per year	$52.0000	15							
39												

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
40	**TAX**																		
41			**Year**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
42	1		*Year*		*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11	$11.72	$12.29	$12.82
48	7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90	$11.56	$12.17	$12.74
49	8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44	$11.14	$11.79	$12.40

Row	B	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
41		**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
42		*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
43	Carbon	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	Carbon	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	GDP Deflator	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	Carbon (Real)	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	Net Present Value -2010	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
48	Net Present Value -2011	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
49	Net Present Value -2012	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10

Row	B	C
50		
51	**Discount Rate (real)[1]**	
52	**TERASEN GAS**	
53	**Rate of Inflation**	1.90%
54	**TGI**	7.15%
55	**TGVI**	7.15%
56	**BC HYDRO**	
57	**Rate of Inflation**	2.00%
58	**BC Hydro**	7.15%
59	**Customer**	7.15%
60	*Footnote 1: Source LR 070531*	

Fortis BC
Schools
NEW

only enter in boxes marked in blue

Measure Data for Geoexchange - Secondary

PER MEASURE			Utility Incentive to the participant	partner incentive	
Incremental Cost	$ 524,221				
Total Incentive	$ -				
Participant	**$ 524,221**				
Annual Impact Per Measure					
Energy Savings per installation	6223.0	GJ		Average Annnual Energy Savings per Measure	
Free Rider Rate / Net-to-Gross	0%	1.00		Net-to-Gross	
Alternate Energy Impact	-1509	GJ	-419,167	kWh	
Alternate Capacity Impact		kW/a			
Measure Lifetime	20	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	6,223	6,223	0	6,223	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	6,223	6,223	0	6,223	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	(419,167)	(419,167)	0	(419,167)	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			#N/A	#N/A	#N/A	
Energy Purchases	#N/A	#N/A	#N/A	#N/A	#N/A	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 30,000	$ -	$ 30,000		
Subtotal	$ 30,000	$ 30,000	$ -	$ 30,000	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 524,221	$ -	$ 524,221	$ -	
Subtotal	$ 524,221	$ 524,221	$ -	$ 524,221	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$0.000 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	#N/A		#N/A	#N/A	#N/A	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 4.5		$ -	$ 4.5	$ -	Informational (for comparison with supply options)

FORTIS BC

New Initiative Programs - Solar Residential SCT / FEI	PROGRAM: COSTS ($000) Utility Incentives	Utility Administration	Utility Total	Partners Incentives	Partners Administration	Partners Total	Participant	Total	% Utility	% Partner	% Participant	SAVINGS (GJ) Gross	Net-to-Gross	Net	LIFE Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Res Solar	0	1	1	0	0	0	8	8	8%	0%	92%	12	100%	12	25
Total Residential	0	1	1	0	0	0	8	8	8%	-	92%	12		12	

New Initiative Programs - Solar Residential SCT / FEI	ALTERNATE: Impact Energy MWh	Impact Capacity kW	NET PRESENT VALUE: Levelized Cost ($/GJ)	Utility Benefits (Costs) Program ($'000s)	Utility Benefits (Costs) Alternate ($'000s)	Participant Benefits (Costs) Program ($'000s)	Participant Benefits (Costs) Carbon Tax ($'000s)	Participant Benefits (Costs) Alternate ($'000s)	Program Net Savings Natural Gas (GJ)	Program Net Savings Alternate Energy (MWh)	Program Net Savings Alternate Capacity (kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
RESIDENTIAL:											
Res Solar	0	-	3	4	N/A	2	0	N/A	209	0	-
Total Residential	0	0	3	4	N/A	2	0	N/A	209	N/A	N/A

New Initiative Programs - Solar Residential SCT / FEI	BENEFIT/COST: Natural Gas Utility	Participant Total Costs ($'000s)	Participant Total Benefits ($'000s)	Participant Benefit/Cost	Natural Gas Rate Impact	SCT	TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
RESIDENTIAL:							
Res Solar	6.9	8	2	0.3	1.6	0.5	(4)
Total Residential	6.9	8	2	0.3	1.6	0.5	(4)

New Initiative Programs - Solar Residential SCT / FEI	PARAMETERS: UTILITY Natural Gas Utility Discount Rate	UTILITY Natural Gas Supply $/GJ	UTILITY Alternate Discount Rate	UTILITY Alternate Supply $/kWh	PARTICIPANT Discount Rate	PARTICIPANT Natural Gas NPV $/GJ	PARTICIPANT Carbon Tax NPV $/GJ	PARTICIPANT Alternate Energy NPV $/kWh	PARTICIPANT Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Res Solar	3.00%	276.02	3%	2.09	3.0%	174.11	26.03	1.44	0.00	9.999	0.083	-
Total Residential	0.7	(3)										

1

	A	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
1	UTILITY		FORTIS BC																																
2																																			
3																																			
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
5			Units																																
6		NATURAL GAS																																	
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9		carbon tax	$ per GJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11		Total incremental cost of gas including carbon		15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.28
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
17																																			
18																																			
19		ELECTRICITY																																	
20		Incremental Cost of Elec	$ Per kWh	$0.12																															
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00																															
22																																			
23																																			
24																																			
25	RETAIL																																		
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI																								
27		Residential Retail			000's																														
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC																											
29		TGVI	$ Per MJ	$0.0143	72																														
30		Electricity	$ Per MJ	$0.0230																															
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%																							
32		Electricity	$ per kW per year																																
33		Commercial Retail																																	
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC																											
35		TGVI	$ Per MJ	$0.0169	8																														
36		Electricity	$ Per MJ	$0.0214																															
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC																											
38		Electricity	$ per kW per year	$52.0000	15																														
39																																			
40	TAX																																		
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18	$15.19	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60	$14.65	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76	$13.85	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71
50																																			
51		Discount Rate (real)[1]																																	
52		TERASEN GAS																																	
53		Rate of Inflation	1.90%																																
54		TGI	3.00%																																
55		TGVI	3.00%																																
56		BC HYDRO																																	
57		Rate of Inflation	2.00%																																
58		BC Hydro	3.00%																																
59		Customer	3.00%																																
60		Footnote 1: Source LR 070531																																	
61																																			
62				SHEET LABELS																															
63	New Construction																																		
64		Res Solar		BASEBOARD																															
65		0		HEATPUMP																															
66																																			

only enter in boxes marked in blue

FORTIS BC
RESIDENTIAL
NEW

Measure Data for Res Solar

PER MEASURE			Utility Incentive to the participant	partner incentive	
Incremental Cost	$ 7,500				
Total Incentive				$ -	
Participant	$ 7,500				
Annual Impact Per Measure					
Energy Savings per installation	12.0	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00			Net-to-Gross
Alternate Energy Impact		GJ	0		kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	25	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	11	12	0	12	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	11	12	0	12	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	0	0	0	0	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$276.02	$276.02	$276.02	
Energy Purchases	$ 3,312	$ 3,312	$ -	$ 3,312	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 625	$ -	$ 625		
Subtotal	$ 589	$ 625	$ -	$ 625	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 7,500	$ -	$ 7,500	$ -	
Subtotal	$ 7,069	$ 7,500	$ -	$ 7,500	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$2.090 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	$ (4,346)		$ -	$ (4,813)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 38.9		$ -	$ 38.9	$ -	Informational (for comparison with supply options)

Fortis BC

New Initiative Programs - Solar Residential TRC

	PROGRAM – COSTS ($000) – Utility – Incentives	PROGRAM – COSTS ($000) – Utility – Administration	PROGRAM – COSTS ($000) – Utility – Total	PROGRAM – COSTS ($000) – Partners – Incentives	PROGRAM – COSTS ($000) – Partners – Administration	PROGRAM – COSTS ($000) – Partners – Total	PROGRAM – COSTS ($000) – Participant	PROGRAM – COSTS ($000) – Total	PROGRAM – COSTS ($000) – % Utility	PROGRAM – COSTS ($000) – % Partner	PROGRAM – COSTS ($000) – % Participant	PROGRAM – SAVINGS (GJ) – Gross	PROGRAM – SAVINGS (GJ) – Net-to-Gross	PROGRAM – SAVINGS (GJ) – Net	PROGRAM – LIFE – Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Solar Residential Hot Water Pilot Program	0	1	1	0	0	0	8	8	8%	0%	92%	12	100%	12	25

	ALTERNATE – Impact – Energy MWh	ALTERNATE – Impact – Capacity kW	NET PRESENT VALUE – Levelized Cost ($/GJ)	NET PRESENT VALUE – Utility Benefits (Costs) – Program ($'000s)	NET PRESENT VALUE – Utility Benefits (Costs) – Alternate ($'000s)	NET PRESENT VALUE – Participant Benefits (Costs) – Program ($'000s)	NET PRESENT VALUE – Participant Benefits (Costs) – Carbon Tax ($'000s)	NET PRESENT VALUE – Participant Benefits (Costs) – Alternate ($'000s)	NET PRESENT VALUE – Program Net Savings – Natural Gas (GJ)	NET PRESENT VALUE – Program Net Savings – Alternate Energy (MWh)	NET PRESENT VALUE – Program Net Savings – Alternate Capacity (kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
RESIDENTIAL:											
Solar Residential Hot Water Pilot Program	0	-	5	2	N/A	2	0	N/A	138	-	-

	BENEFIT/COST – Natural Gas Utility	BENEFIT/COST – Participant – Total Costs ($'000s)	BENEFIT/COST – Participant – Total Benefits ($'000s)	BENEFIT/COST – Participant – Benefit/Cost	BENEFIT/COST – Natural Gas Rate Impact	BENEFIT/COST – Total Resource	BENEFIT/COST – TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
RESIDENTIAL:							
Solar Residential Hot Water Pilot Program	2.4	8	2	0.2	0.7	0.2	(7)

	PARAMETERS – UTILITY – Natural Gas Utility Discount Rate	PARAMETERS – UTILITY – Natural Gas Supply $/GJ	PARAMETERS – UTILITY – Alternate Discount Rate	PARAMETERS – UTILITY – Alternate Supply $/kWh	PARAMETERS – PARTICIPANT – Discount Rate	PARAMETERS – PARTICIPANT – Natural Gas NPV $/GJ	PARAMETERS – PARTICIPANT – Carbon Tax NPV $/GJ	PARAMETERS – PARTICIPANT – Alternate Energy NPV $/kWh	PARAMETERS – PARTICIPANT – Alternate Capacity NPV $/kW/a	PARAMETERS – PARTICIPANT – Natural Gas Tariff $/GJ	PARAMETERS – PARTICIPANT – Energy Tariff $/kWh	PARAMETERS – PARTICIPANT – Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Solar Residential Hot Water Pilot Program	7.15%	125.59	6%	1.53	6.0%	127.82	17.22	1.06	0.00	9.999	0.083	-

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**UTILITY**		**Fortis BC**													
2																
3																
4			**Year**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
5			Units													
6		**NATURAL GAS**														
7		Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81
8	1		*Year*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
9		carbon tax	$ per GJ	*0.75*	*1.00*	*1.25*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*
10		Distribution adder	$ per GJ	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*
11		Total incremental cost of gas including carbon		*6.41*	*7.32*	*8.21*	*9.01*	*9.52*	*9.92*	*10.22*	*10.43*	*10.64*	*10.85*	*11.05*	*11.26*	*11.47*
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47
14	4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39
15	5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51
16	6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66

Row	A	B	C	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4			**Year**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**
7		Incremental Cost of Gas (nominal)	$ Per GJ	$10.03	$10.25	$10.47	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
8	1		*Year*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
9		carbon tax	$ per GJ	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*
10		Distribution adder	$ per GJ	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	
11		Total incremental cost of gas including carbon		*11.68*	*11.90*	*12.13*	*12.35*	*12.59*	*12.83*	*13.07*	*13.32*	*13.58*	*13.84*	*14.11*	*14.38*	*14.66*	*14.95*	*15.24*	*15.54*	*15.84*	*16.15*	*16.31*
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$11.68	$11.90	$12.13	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
14	4	Net Present Value -2010		$81.83	$86.05	$90.07	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
15	5	Net Present Value -2011		$81.27	$85.80	$90.10	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
16	6	Net Present Value -2012		$79.76	$84.61	$89.22	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70

Row	A	B	C	D	E	F	G	H	I	J	K	L
17												
18												
19		**ELECTRICITY**										
20		Incremental Cost of Elec	$ Per kWh	$0.12								
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00								
22												
23												
24												
25	**RETAIL**											
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI	
27		Residential Retail			*000's*							
28		**TGI**	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC				
29		**TGVI**	$ Per MJ	$0.0143	72							
30		**Electricity**	$ Per MJ	$0.0230								
31		**Electricity**	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%
32		**Electricity**	$ per kW per year									
33		Commercial Retail										
34		**TGI**	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC				
35		**TGVI**	$ Per MJ	$0.0169	8							
36		**Electricity**	$ Per MJ	$0.0214								
37		**Electricity**	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC				
38		**Electricity**	$ per kW per year	$52.0000	15							
39												

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
40	**TAX**															
41			**Year**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
42	1		*Year*		*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11
48	7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90
49	8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44

Row	A	B	C	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
41			**Year**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
42	1		*Year*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
43	2	Carbon	$ Per tonne	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)		$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010		$11.72	$12.29	$12.82	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
48	7	Net Present Value -2011		$11.56	$12.17	$12.74	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
49	8	Net Present Value -2012		$11.14	$11.79	$12.40	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10

Row	A	B	C
50			
51		**Discount Rate (real)[1]**	
52		**TERASEN GAS**	
53		**Rate of Inflation**	1.90%
54		**TGI**	7.15%
55		**TGVI**	6.89%
56		**BC HYDRO**	
57		**Rate of Inflation**	2.00%
58		**BC Hydro**	6.00%
59		**Customer**	6.00%
60		*Footnote 1: Source LR 070531*	
61			
62			
63			
64			
65			
66			

only enter in boxes marked in blue

Fortis BC
RESIDENTIAL
NEW

Measure Data for Solar Residential Hot Water Pilot Program

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 7,500			
Total Incentive	$ -			
Participant	**$ 7,500**			

Annual Impact Per Measure

Energy Savings per installation	**12.0**	GJ		Average Annual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	**0%**	1.00		Net-to-Gross
Alternate Energy Impact		GJ	0	kWh
Alternate Capacity Impact		kW/a		
Measure Lifetime	**25**	Years	Estimated lifespan of measure	

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	**0**	**1**		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	11	12	0	12	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	11	12	0	12	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	0	0	0	0	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$120.87	$125.59	$129.77	
Energy Purchases	$ 1,507	$ 1,507	$ -	$ 1,507	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 625	**$ -**	**$ 625**		
Subtotal	$ 583	$ 625	$ -	$ 625	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	**$ -**	**$ -**	**$ -**	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 7,500	$ -	$ 7,500	$ -	
Subtotal	$ 7,000	$ 7,500	$ -	$ 7,500	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$1.534 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	$ (6,076)		$ -	$ (6,618)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	**$ 58.9**		**$ -**	**$ 58.9**	**$ -**	Informational (for comparison with supply options)

FORTIS BC

New Initiative Program - Furnace Scrap it Program SCT

PROGRAM

FEI	COSTS ($000) Utility Incentives	Utility Administration	Utility Total	Partners Incentives	Partners Administration	Partners Total	Participant	Total	% Utility	% Partner	% Participant	SAVINGS (GJ) Gross	Net-to-Gross	Net	LIFE Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Scrap It	0	0	0	0	0	0	4	4	4%	0%	96%	9	100%	9	18
Total Residential	0	0	0	0	0	0	4	4	4%	-	96%	9		9	

ALTERNATE / **NET PRESENT VALUE**

FEI	Impact Energy MWh	Impact Capacity kW	Levelized Cost ($/GJ)	Utility Benefits (Costs) Program ($'000s)	Utility Benefits (Costs) Alternate ($'000s)	Participant Benefits (Costs) Program ($'000s)	Participant Benefits (Costs) Carbon Tax ($'000s)	Participant Benefits (Costs) Alternate ($'000s)	Program Net Savings Natural Gas (GJ)	Program Net Savings Alternate Energy (MWh)	Program Net Savings Alternate Capacity (kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
RESIDENTIAL:											
Scrap It	1	-	1	2	2	1	0	1	119	13	-
Total Residential	1	0	1	2	2	1	0	1	119	13	N/A

BENEFIT/COST

FEI	Natural Gas Utility	Participant Total Costs ($'000s)	Participant Total Benefits ($'000s)	Participant Benefit/Cost	Natural Gas Rate Impact	SCT	TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
RESIDENTIAL:							
Scrap It	15.3	4	2	0.7	1.8	1.2	1
Total Residential	15.3	4	2	0.7	1.8	1.2	1

PARAMETERS

FEI	UTILITY Natural Gas Utility Discount Rate	UTILITY Natural Gas Supply $/GJ	UTILITY Alternate Discount Rate	UTILITY Alternate Supply $/kWh	PARTICIPANT Discount Rate	PARTICIPANT Natural Gas NPV $/GJ	PARTICIPANT Carbon Tax NPV $/GJ	PARTICIPANT Alternate Energy NPV $/kWh	PARTICIPANT Alternate Capacity NPV $/kW/a	PARTICIPANT Natural Gas Tariff $/GJ	PARTICIPANT Energy Tariff $/kWh	PARTICIPANT Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Scrap It	3.00%	221.16	3%	1.65	3.0%	137.52	20.71	1.14	0.00	9.999	0.083	-
Total Residential	1.5	2										

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	**UTILITY**		**FORTIS BC**														
2																	
3																	
4			**Year**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
5			Units														
6		**NATURAL GAS**															
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		*Year*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
9		carbon tax	$ per GJ	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
10		Distribution adder	$ per GJ	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*
11		Total incremental cost of gas including carbon		*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20	$174.41
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69
17																	
18																	
19		**ELECTRICITY**															
20		Incremental Cost of Elec	$ Per kWh	$0.12													
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00													
22																	
23																	
24																	
25	**RETAIL**																
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI						
27		Residential Retail			*000's*												
28		**TGI**	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC									
29		**TGVI**	$ Per MJ	$0.0143	72												
30		**Electricity**	$ Per MJ	$0.0230													
31		**Electricity**	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%					
32		**Electricity**	$ per kW per year														
33		Commercial Retail															
34		**TGI**	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC									
35		**TGVI**	$ Per MJ	$0.0169	8												
36		**Electricity**	$ Per MJ	$0.0214													
37		**Electricity**	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC									
38		**Electricity**	$ per kW per year	$52.0000	15												
39																	
40	**TAX**																
41			**Year**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
42	1		*Year*		*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18	$15.19
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60	$14.65
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76	$13.85
50																	
51		**Discount Rate (real)[1]**															
52		**TERASEN GAS**															
53		**Rate of Inflation**	1.90%														
54		**TGI**	3.00%														
55		**TGVI**	3.00%														
56		**BC HYDRO**															
57		**Rate of Inflation**	2.00%														
58		**BC Hydro**	3.00%														
59		**Customer**	3.00%														
60		*Footnote 1: Source LR 070531*															
61																	
62				**SHEET LABELS**													
63	**New Construction**																
64		Scrap It		**BASEBOARD**													
65		0		**HEATPUMP**													
66																	

	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**
7	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
9	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
10	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	
11	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.44*	*15.28*
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
41	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
42	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
43	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71

FORTIS BC
Residential
NEW

only enter in boxes marked in blue

Measure Data for Scrap It

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 3,708			
Total Incentive				$ -
Participant	$ 3,708			

Annual Impact Per Measure					
Energy Savings per installation	8.6	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	0%	1.00			Net-to-Gross
Alternate Energy Impact	4	GJ		976	kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	18	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	8	9	0	9	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	8	9	0	9	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	920	976	0	976	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	$ Total	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$221.16	$221.16	$221.16	
Energy Purchases	$ 1,907	$ 1,907	$ -	$ 1,907	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 162	$ -	$ 162		
Subtotal	$ 153	$ 162	$ -	$ 162	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 3,708	$ -	$ 3,708	$ -	
Subtotal	$ 3,495	$ 3,708	$ -	$ 3,708	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ 1,611	$ -	$ 1,611	$ -	$1.650 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ 1,611	$ 1,611	$ -	$ 1,611	$ -	
Total Resource Net Benefit (Cost)	$ (129)		$ -	$ (352)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 32.6		$ -	$ 32.6	$ -	Informational (for comparison with supply options)

Fortis BC

New Initiative Programs - Funace Scrap it program - TRC

	PROGRAM: COSTS ($000) Utility Incentives	Utility Administration	Utility Total	Partners Incentives	Partners Administration	Partners Total	Participant	Total	% Utility	% Partner	% Participant	SAVINGS (GJ) Gross	Net-to-Gross	Net	LIFE Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Scrap It	0	0	0	0	0	0	4	4	4%	0%	96%	9	100%	9	18

	ALTERNATE Impact Energy MWh	Capacity kW	NET PRESENT VALUE Levelized Cost ($/GJ)	Utility Benefits (Costs) Program ($'000s)	Alternate ($'000s)	Participant Benefits (Costs) Program ($'000s)	Carbon Tax ($'000s)	Alternate ($'000s)	Program Net Savings Natural Gas (GJ)	Alternate Energy (MWh)	Alternate Capacity (kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
RESIDENTIAL:											
Scrap It	1	-	2	1	1	1	0	1	86	11	-

	BENEFIT/COST Natural Gas Utility	Participant Total Costs ($'000s)	Participant Total Benefits ($'000s)	Participant Benefit/Cost	Natural Gas Rate Impact	Total Resource	TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
RESIDENTIAL:							
Scrap It	5.6	4	2	0.5	0.8	0.6	(2)

	PARAMETERS: UTILITY Natural Gas Utility Discount Rate	Natural Gas Supply $/GJ	Alternate Discount Rate	Alternate Supply $/kWh	PARTICIPANT Discount Rate	Natural Gas NPV $/GJ	Carbon Tax NPV $/GJ	Alternate Energy NPV $/kWh	Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Scrap It	7.15%	105.31	6%	1.30	6.0%	108.27	15.06	0.90	0.00	9.999	0.083	-

	A	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
1	UTILITY		Fortis BC																																
2																																			
3																																			
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
5			Units																																
6		NATURAL GAS																																	
7		Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81	$10.03	$10.25	$10.47	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
8	1		*Year*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
9		carbon tax	$ per GJ	*0.75*	*1.00*	*1.25*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*	*1.50*
10		Distribution adder	$ per GJ	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	*0.16*	
11		Total incremental cost of gas including carbon		*6.41*	*7.32*	*8.21*	*9.01*	*9.52*	*9.92*	*10.22*	*10.43*	*10.64*	*10.85*	*11.05*	*11.26*	*11.47*	*11.68*	*11.90*	*12.13*	*12.35*	*12.59*	*12.83*	*13.07*	*13.32*	*13.58*	*13.84*	*14.11*	*14.38*	*14.66*	*14.95*	*15.24*	*15.54*	*15.84*	*16.15*	*16.31*
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47	$11.68	$11.90	$12.13	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
14	4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39	$81.83	$86.05	$90.07	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
15	5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51	$81.27	$85.80	$90.10	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
16	6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66	$79.76	$84.61	$89.22	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70
17																																			
18																																			
19		ELECTRICITY																																	
20		Incremental Cost of Elec	$ Per kWh	$0.12																															
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00																															
22																																			
23																																			
24																																			
25	RETAIL																																		
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI																								
27		Residential Retail			*000's*																														
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC																											
29		TGVI	$ Per MJ	$0.0143	72																														
30		Electricity	$ Per MJ	$0.0230																															
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%																							
32		Electricity	$ per kW per year																																
33		Commercial Retail																																	
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC																											
35		TGVI	$ Per MJ	$0.0169	8																														
36		Electricity	$ Per MJ	$0.0214																															
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC																											
38		Electricity	$ per kW per year	$52.0000	15																														
39																																			
40	TAX																																		
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	1		*Year*		*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11	$11.72	$12.29	$12.82	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
48	7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90	$11.56	$12.17	$12.74	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
49	8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44	$11.14	$11.79	$12.40	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10
50																																			
51		**Discount Rate (real)[1]**																																	
52		**TERASEN GAS**																																	
53		**Rate of Inflation**	1.90%																																
54		**TGI**	7.15%																																
55		**TGVI**	6.89%																																
56		**BC HYDRO**																																	
57		**Rate of Inflation**	2.00%																																
58		**BC Hydro**	6.00%																																
59		**Customer**	6.00%																																
60		*Footnote 1: Source LR 070531*																																	
61																																			
62																																			
63																																			
64																																			
65																																			
66																																			

Fortis BC
RESIDENTIAL
NEW

only enter in boxes marked in blue

Measure Data for Scrap It

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 3,708			
Total Incentive	$ -			
Participant	**$ 3,708**			

Annual Impact Per Measure				
Energy Savings per installation	**8.6**	GJ		Average Annual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	**0%**	1.00		Net-to-Gross
Alternate Energy Impact	**4**	GJ	976	kWh
Alternate Capacity Impact		kW/a		
Measure Lifetime	**18**	Years	Estimated lifespan of measure	

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	**0**	**1**		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	8	9	0	9	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	8	9	0	9	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	921	976	0	976	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$100.98	$105.31	$109.10	
Energy Purchases	$ 908	$ 908	$ -	$ 908	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 162	**$ -**	**$ 162**		
Subtotal	$ 151	$ 162	$ -	$ 162	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	**$ -**	**$ -**	**$ -**	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 3,708	$ -	$ 3,708	$ -	
Subtotal	$ 3,460	$ 3,708	$ -	$ 3,708	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ 1,268	$ -	$ 1,268	$ -	$1.299 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ 1,268	$ 1,268	$ -	$ 1,268	$ -	
Total Resource Net Benefit (Cost)	$ (1,435)		$ -	$ (1,693)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	**$ 45.1**		**$ -**	**$ 45.1**	**$ -**	Informational (for comparison with supply options)

FORTIS BC

New Initiative Programs - Solar Air SCT

FEI	PROGRAM – COSTS ($000) – Utility – Incentives	Utility – Administration	Utility – Total	Partners – Incentives	Partners – Administration	Partners – Total	Participant	Total	% Utility	% Partner	% Participant	SAVINGS (GJ) – Gross	Net-to-Gross	Net	LIFE – Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Solar Air	0	5	5	0	0	0	39	45	12%	0%	88%	48	100%	48	25
Total Residential	0	5	5	0	0	0	39	45	12%	-	88%	48		48	

FEI	ALTERNATE – Impact – Energy MWh	Impact – Capacity kW	NET PRESENT VALUE – Levelized Cost ($/GJ)	Utility Benefits (Costs) – Program ($'000s)	Utility Benefits (Costs) – Alternate ($'000s)	Participant Benefits (Costs) – Program ($'000s)	Participant Benefits (Costs) – Carbon Tax ($'000s)	Participant Benefits (Costs) – Alternate ($'000s)	Program Net Savings – Natural Gas (GJ)	Program Net Savings – Alternate Energy (MWh)	Program Net Savings – Alternate Capacity (kW)	BENEFIT/COST – Natural Gas Utility	Participant – Total Costs ($'000s)	Participant – Total Benefits ($'000s)	Participant – Benefit/Cost	Natural Gas Rate Impact	SCT	TRC Net Benefits ($'000s)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	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
2011																		
RESIDENTIAL:																		
Solar Air	0	-	6	17	N/A	8	1	N/A	832	0	-	3.3	39	10	0.2	1.3	0.4	(28)
Total Residential	0	0	6	17	N/A	8	1	N/A	832	N/A	N/A	3.3	39	10	0.2	1.3	0.4	(28)

FEI	PARAMETERS – UTILITY – Natural Gas Utility Discount Rate	Natural Gas Supply $/GJ	Alternate Discount Rate	Alternate Supply $/kWh	PARTICIPANT – Discount Rate	Natural Gas NPV $/GJ	Carbon Tax NPV $/GJ	Alternate Energy NPV $/kWh	Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Solar Air	3.00%	276.02	3%	2.09	3.0%	174.11	26.03	1.44	0.00	9.999	0.083	-
Total Residential	0.5	(22)										

1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	UTILITY		FORTIS BC													
2																
3																
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
5			Units													
6		NATURAL GAS														
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12
9		carbon tax	$ per GJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
11		Total incremental cost of gas including carbon		15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86
17																
18																
19		ELECTRICITY														
20		Incremental Cost of Elec	$ Per kWh	$0.12												
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00												
22																
23																
24																
25	RETAIL															
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI					
27		Residential Retail			000's											
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC								
29		TGVI	$ Per MJ	$0.0143	72											
30		Electricity	$ Per MJ	$0.0230												
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%				
32		Electricity	$ per kW per year													
33		Commercial Retail														
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC								
35		TGVI	$ Per MJ	$0.0169	8											
36		Electricity	$ Per MJ	$0.0214												
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC								
38		Electricity	$ per kW per year	$52.0000	15											
39																
40	TAX															
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76
50																
51		Discount Rate (real)[1]														
52		TERASEN GAS														
53		Rate of Inflation	1.90%													
54		TGI	3.00%													
55		TGVI	3.00%													
56		BC HYDRO														
57		Rate of Inflation	2.00%													
58		BC Hydro	3.00%													
59		Customer	3.00%													
60		Footnote 1: Source LR 070531														
61																
62				SHEET LABELS												
63	New Construction															
64		Solar Air		BASEBOARD												
65		0		HEATPUMP												
66																

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
7	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.28
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
41	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	$15.19	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	$14.65	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	$13.85	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71

FORTIS BC
Commercial
NEW

only enter in boxes marked in blue

Measure Data for Solar Air

PER MEASURE			Utility Incentive to the participant	partner incentive	
Incremental Cost	$ 39,400				
Total Incentive				$ -	
Participant	$ 39,400				

Annual Impact Per Measure					
Energy Savings per installation	47.8	GJ		Average Annnual Energy Savings per Measure	
Free Rider Rate / Net-to-Gross	0%	1.00		Net-to-Gross	
Alternate Energy Impact		GJ	0	kWh	
Alternate Capacity Impact		kW/a			
Measure Lifetime	25	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	45	48	0	48	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	45	48	0	48	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	0	0	0	0	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$276.02	$276.02	$276.02	
Energy Purchases	$ 13,185	$ 13,185	$ -	$ 13,185	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 5,250	$ -	$ 5,250		
Subtotal	$ 4,949	$ 5,250	$ -	$ 5,250	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 39,400	$ -	$ 39,400	$ -	
Subtotal	$ 37,138	$ 39,400	$ -	$ 39,400	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$2.090 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	$ (28,902)		$ -	$ (31,465)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 53.7		$ -	$ 53.7	$ -	Informational (for comparison with supply options)

Fortis BC

New Initiative Programs - Solar AirTRC

	PROGRAM										
	COSTS ($000)										
	Utility			Partners							
	Incentives	Administration	Total	Incentives	Administration	Total	Participant	Total	% Utility	% Partner	% Participant
Label	B	C	D	E	F	G	H	I	J	K	L
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I
2011											
Schools											
Solar Air	0	5	5	0	0	0	39	45	12%	0%	88%

	PROGRAM				ALTERNATE	
	SAVINGS (GJ)			LIFE	Impact	
	Gross	Net-to-Gross	Net	Years	Energy MWh	Capacity kW
Label	M	N	O	P	Q	R
Source Sheet or Calculation	Program	Program	MxN	Program	Program	Program
2011						
Schools						
Solar Air	48	100%	48	25	0	-

	NET PRESENT VALUE								
	Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings		
	($/GJ)	Program ($'000s)	Alternate ($'000s)	Program ($'000s)	Carbon Tax ($'000s)	Alternate ($'000s)	Natural Gas (GJ)	Alternate Energy (MWh)	Alternate Capacity (kW)
Label	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011									
Schools									
Solar Air	10	6	N/A	6	1	N/A	549	-	-

	BENEFIT/COST						
		Participant					
	Natural Gas Utility	Total Costs ($'000s)	Total Benefits ($'000s)	Benefit/Cost	Natural Gas Rate Impact	Total Resource	TRC Net Benefits ($'000s)
Label	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I
2011							
Schools							
Solar Air	1.1	39	7	0.2	0.5	0.1	(39)

	PARAMETERS											
	UTILITY				PARTICIPANT							
	Natural Gas Utility Discount Rate	Natural Gas Supply $/GJ	Alternate Discount Rate	Alternate Supply $/kWh	Discount Rate	Natural Gas NPV $/GJ	Carbon Tax NPV $/GJ	Alternate Energy NPV $/kWh	Alternate Capacity NPV $/kW/a	Natural Gas Tariff $/GJ	Energy Tariff $/kWh	Capacity Tariff $/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
Schools												
Solar Air	7.15%	125.59	6%	1.53	6.0%	127.82	17.22	1.06	0.00	9.999	0.083	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	UTILITY		Fortis BC														
2																	
3																	
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
5			Units														
6		NATURAL GAS															
7		Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81	$10.03
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13
9		carbon tax	$ per GJ	0.75	1.00	1.25	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
11		Total incremental cost of gas including carbon		6.41	7.32	8.21	9.01	9.52	9.92	10.22	10.43	10.64	10.85	11.05	11.26	11.47	11.68
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47	$11.68
14	4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39	$81.83
15	5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51	$81.27
16	6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66	$79.76
17																	
18																	
19		ELECTRICITY															
20		Incremental Cost of Elec	$ Per kWh	$0.12													
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00													
22																	
23																	
24																	

	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
7	Incremental Cost of Gas (nominal)	$10.25	$10.47	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
8		14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9	carbon tax	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10	Distribution adder	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11	Total incremental cost of gas including carbon	11.90	12.13	12.35	12.59	12.83	13.07	13.32	13.58	13.84	14.11	14.38	14.66	14.95	15.24	15.54	15.84	16.15	16.31
12	GDP Deflator	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	Incremental Cost of Gas (Real)	$11.90	$12.13	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
14	Net Present Value -2010	$86.05	$90.07	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
15	Net Present Value -2011	$85.80	$90.10	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
16	Net Present Value -2012	$84.61	$89.22	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70

	A	B	C	D	E	F	G	H	I	J	K	L
25	RETAIL											
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI	
27		Residential Retail			000's							
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC				
29		TGVI	$ Per MJ	$0.0143	72							
30		Electricity	$ Per MJ	$0.0230								
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%
32		Electricity	$ per kW per year									
33		Commercial Retail										
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC				
35		TGVI	$ Per MJ	$0.0169	8							
36		Electricity	$ Per MJ	$0.0214								
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC				
38		Electricity	$ per kW per year	$52.0000	15							
39												

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
40	TAX																
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11	12
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11	$11.72
48	7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90	$11.56
49	8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44	$11.14

	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
41		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42		13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	Carbon	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	Carbon	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	GDP Deflator	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	Carbon (Real)	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	Net Present Value -2010	$12.29	$12.82	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
48	Net Present Value -2011	$12.17	$12.74	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
49	Net Present Value -2012	$11.79	$12.40	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10

	A	B	C
50			
51		Discount Rate (real)[1]	
52		TERASEN GAS	
53		Rate of Inflation	1.90%
54		TGI	7.15%
55		TGVI	6.89%
56		BC HYDRO	
57		Rate of Inflation	2.00%
58		BC Hydro	6.00%
59		Customer	6.00%
60		*Footnote 1: Source LR 070531*	
61			
62			
63			
64			
65			
66			

Fortis BC
Commercial
NEW

only enter in boxes marked in blue

Measure Data for Solar Air

PER MEASURE

			Utility Incentive to the participant	partner incentive
Incremental Cost	$	39,400		
Total Incentive	$	-		
Participant	$	**39,400**		

Annual Impact Per Measure

Energy Savings per installation	**47.8**	GJ			Average Annual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	**0%**	1.00			Net-to-Gross
Alternate Energy Impact		GJ		0	kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	**25**	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	**0**	**1**		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	45	48	0	48	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	45	48	0	48	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	0	0	0	0	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$120.87	$125.59	$129.77	
Energy Purchases	$ 5,999	$ 5,999	$ -	$ 5,999	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 5,250	**$ -**	**$ 5,250**		
Subtotal	$ 4,900	$ 5,250	$ -	$ 5,250	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	**$ -**	**$ -**	**$ -**	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 39,400	$ -	$ 39,400	$ -	
Subtotal	$ 36,771	$ 39,400	$ -	$ 39,400	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$1.534 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	$ (35,672)		$ -	$ (38,651)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	**$ 81.3**		**$ -**	**$ 81.3**	**$ -**	Informational (for comparison with supply options)

FORTIS BC

	PROGRAM														
New Initiative Programs - Solar Commercial SCT	COSTS ($000)											SAVINGS (GJ)			LIFE
FEI	Utility			Partners											Years
	Incentives	Administration	Total	Incentives	Administration	Total	Participant	Total	% Utility	% Partner	% Participant	Gross	Net-to-Gross	Net	
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
RESIDENTIAL:															
Solar Com	0	4	4	0	0	0	55	59	6%	0%	94%	76	100%	76	25
Total Residential	0	4	4	0	0	0	55	59	6%	-	94%	76		76	

	ALTERNATE		NET PRESENT VALUE										BENEFIT/COST						
New Initiative Programs - Solar Commercial SCT	Impact		Levelized Cost	Utility Benefits (Costs)		Participant Benefits (Costs)			Program Net Savings				Participant					
FEI	Energy	Capacity	($/GJ)	Program	Alternate	Program	Carbon Tax	Alternate	Natural Gas	Alternate Energy	Alternate Capacity	Natural Gas	Total Costs	Total Benefits	Benefit/Cost	Natural Gas		TRC Net Benefits
	MWh	kW		($'000s)	($'000s)	($'000s)	($'000s)	($'000s)	(GJ)	(MWh)	(kW)	Utility	($'000s)	($'000s)		Rate Impact	SCT	($'000s)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
Source Sheet or Calculation	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
2011																		
RESIDENTIAL:																		
Solar Com	0	-	3	27	N/A	13	2	N/A	1,331	0	-	7.3	55	15	0.3	1.6	0.5	(31)
Total Residential	0	0	3	27	N/A	13	2	N/A	1,331	N/A	N/A	7.3	55	15	0.3	1.6	0.5	(31)

	PARAMETERS											
New Initiative Programs - Solar Commercial SCT	UTILITY				PARTICIPANT							
FEI	Natural Gas Utility Discount Rate	Natural Gas Supply	Alternate Discount Rate	Alternate Supply	Discount Rate	Natural Gas NPV	Carbon Tax NPV	Alternate Energy NPV	Alternate Capacity NPV	Natural Gas Tariff	Energy Tariff	Capacity Tariff
		$/GJ		$/kWh		$/GJ	$/GJ	$/kWh	$/kW/a	$/GJ	$/kWh	$/kW/a
Label	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011												
RESIDENTIAL:												
Solar Com	3.00%	276.02	3%	2.09	3.0%	174.11	26.03	1.44	0.00	9.999	0.083	-
Total Residential	0.6	(23)										

1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	UTILITY		FORTIS BC													
2																
3																
4			Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
5			Units													
6		NATURAL GAS														
7		Incremental Cost of Gas (nominal)	$ Per GJ	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12
9		carbon tax	$ per GJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10		Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
11		Total incremental cost of gas including carbon		15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44
12	2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	3	Incremental Cost of Gas (Real)		$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44
14	4	Net Present Value -2010			$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69	$164.20
15	5	Net Present Value -2011				$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86	$153.69
16	6	Net Present Value -2012					$29.54	$43.67	$57.39	$70.71	$83.64	$96.20	$108.38	$120.22	$131.71	$142.86
17																
18																
19		ELECTRICITY														
20		Incremental Cost of Elec	$ Per kWh	$0.12												
21		Incremental Cost of E Capacity	$ Per kW/a	$170.00												
22																
23																
24																
25	RETAIL															
26				Rate	Customers		789,928	Total Customers in BC		80,000	Total Residential and Commercial Customers on VI					
27		Residential Retail			000's											
28		TGI	$ Per MJ	$0.0100	640		712,304	Total Residential Customers in BC								
29		TGVI	$ Per MJ	$0.0143	72											
30		Electricity	$ Per MJ	$0.0230												
31		Electricity	$ per kWh	$0.0827	1,511		1,511,435	Total BCH Residential Customers in BC				89%				
32		Electricity	$ per kW per year													
33		Commercial Retail														
34		TGI	$ Per MJ	$0.0094	78		77,624	Total Commercial Customers in BC								
35		TGVI	$ Per MJ	$0.0169	8											
36		Electricity	$ Per MJ	$0.0214												
37		Electricity	$ per kWh	$0.0769	190		189,764	Total Light Industrial and Commercial Customers in BC								
38		Electricity	$ per kW per year	$52.0000	15											
39																
40	TAX															
41			Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
42	1		Year		0	1	2	3	4	5	6	7	8	9	10	11
43	2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	6	Net Present Value -2010				$2.14	$3.51	$4.84	$6.13	$7.39	$8.60	$9.78	$10.93	$12.05	$13.13	$14.18
48	7	Net Present Value -2011					$2.62	$3.99	$5.32	$6.61	$7.86	$9.08	$10.26	$11.41	$12.52	$13.60
49	8	Net Present Value -2012						$2.86	$4.23	$5.56	$6.85	$8.11	$9.32	$10.50	$11.65	$12.76
50																
51		Discount Rate (real)[1]														
52		TERASEN GAS														
53		Rate of Inflation	1.90%													
54		TGI	3.00%													
55		TGVI	3.00%													
56		BC HYDRO														
57		Rate of Inflation	2.00%													
58		BC Hydro	3.00%													
59		Customer	3.00%													
60		Footnote 1: Source LR 070531														
61																
62				SHEET LABELS												
63	New Construction															
64		Solar Com		BASEBOARD												
65		0		HEATPUMP												
66																

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
4	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
7	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28	$15.28
8	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
11	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.44	15.28
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.44	$15.28
14	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.81	$314.74
15	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.63	$308.74
16	$153.69	$164.20	$174.41	$184.32	$193.94	$203.28	$212.35	$221.16	$229.71	$238.01	$246.07	$253.89	$261.48	$268.86	$276.02	$282.97	$289.72	$296.27	$302.56
41	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
42	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
43	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
44	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
47	$15.19	$16.18	$17.14	$18.08	$18.98	$19.86	$20.71	$21.54	$22.35	$23.13	$23.89	$24.62	$25.34	$26.03	$26.71	$27.36	$27.99	$28.61	$29.21
48	$14.65	$15.67	$16.66	$17.62	$18.55	$19.46	$20.34	$21.19	$22.02	$22.82	$23.61	$24.36	$25.10	$25.81	$26.51	$27.18	$27.84	$28.47	$29.09
49	$13.85	$14.90	$15.91	$16.90	$17.86	$18.80	$19.70	$20.58	$21.43	$22.26	$23.07	$23.85	$24.61	$25.34	$26.06	$26.75	$27.42	$28.08	$28.71

only enter in boxes marked in blue

FORTIS BC
Commercial
NEW

Measure Data for Solar Com

PER MEASURE			Utility Incentive to the participant	partner incentive
Incremental Cost	$ 54,772			
Total Incentive				$ -
Participant	$ 54,772			
Annual Impact Per Measure				
Energy Savings per installation	76.4	GJ		Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	-	1.00		Net-to-Gross
Alternate Energy Impact		GJ	0	kWh
Alternate Capacity Impact		kW/a		
Measure Lifetime	25	Years	Estimated lifespan of measure	

ANNUAL ACTIVITY	2009 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	0	1		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	72	76	0	76	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	72	76	0	76	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	0	0	0	0	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2009 NPV	$ Total	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$276.02	$276.02	$276.02	
Energy Purchases	$ 21,094	$ 21,094	$ -	$ 21,094	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 3,750	$ -	$3,750.00		
Subtotal	$ 3,535	$ 3,750	$ -	$ 3,750	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	$ -	$ -	$ -	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 54,772	$ -	$ 54,772	$ -	
Subtotal	$ 51,628	$ 54,772	$ -	$ 54,772	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$2.090 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	$ (34,068)		$ -	$ (37,428)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	$ 44.0		$ -	$ 44.0	$ -	Informational (for comparison with supply options)

Fortis BC

New Initiative Programs - Solar Commercial TRC

	PROGRAM: COSTS ($000) – Utility: Incentives	PROGRAM: COSTS ($000) – Utility: Administration	PROGRAM: COSTS ($000) – Utility: Total	PROGRAM: COSTS ($000) – Partners: Incentives	PROGRAM: COSTS ($000) – Partners: Administration	PROGRAM: COSTS ($000) – Partners: Total	PROGRAM: COSTS ($000) – Participant	PROGRAM: COSTS ($000) – Total	PROGRAM: COSTS ($000) – % Utility	PROGRAM: COSTS ($000) – % Partner	PROGRAM: COSTS ($000) – % Participant	PROGRAM: SAVINGS (GJ) – Gross	PROGRAM: SAVINGS (GJ) – Net-to-Gross	PROGRAM: SAVINGS (GJ) – Net	PROGRAM: LIFE – Years
Label	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Source Sheet or Calculation	Program	Program	B+C	Program	Program	E+F	Program	D+G+H	D/I	G/I	H/I	Program	Program	MxN	Program
2011															
Schools															
Solar Com	0	4	4	0	0	0	55	59	6%	0%	94%	76	100%	76	25

	ALTERNATE: Impact – Energy MWh	ALTERNATE: Impact – Capacity kW	NET PRESENT VALUE: Levelized Cost ($/GJ)	NET PRESENT VALUE: Utility Benefits (Costs) – Program ($'000s)	NET PRESENT VALUE: Utility Benefits (Costs) – Alternate ($'000s)	NET PRESENT VALUE: Participant Benefits (Costs) – Program ($'000s)	NET PRESENT VALUE: Participant Benefits (Costs) – Carbon Tax ($'000s)	NET PRESENT VALUE: Participant Benefits (Costs) – Alternate ($'000s)	NET PRESENT VALUE: Program Net Savings – Natural Gas (GJ)	NET PRESENT VALUE: Program Net Savings – Alternate Energy (MWh)	NET PRESENT VALUE: Program Net Savings – Alternate Capacity (kW)
Label	Q	R	S	T	U	V	W	X	Y	Z	AA
Source Sheet or Calculation	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)
2011											
Schools											
Solar Com	0	-	4	10	N/A	10	1	N/A	879	-	-

	BENEFIT/COST: Natural Gas – Utility	BENEFIT/COST: Participant – Total Costs ($'000s)	BENEFIT/COST: Participant – Total Benefits ($'000s)	BENEFIT/COST: Participant – Benefit/Cost	BENEFIT/COST: Natural Gas – Rate Impact	BENEFIT/COST: Total Resource	BENEFIT/COST: TRC Net Benefits ($'000s)	PARAMETERS: UTILITY – Natural Gas Utility Discount Rate	PARAMETERS: UTILITY – Natural Gas Supply $/GJ	PARAMETERS: UTILITY – Alternate Discount Rate	PARAMETERS: UTILITY – Alternate Supply $/kWh	PARAMETERS: PARTICIPANT – Discount Rate	PARAMETERS: PARTICIPANT – Natural Gas NPV $/GJ	PARAMETERS: PARTICIPANT – Carbon Tax NPV $/GJ	PARAMETERS: PARTICIPANT – Alternate Energy NPV $/kWh	PARAMETERS: PARTICIPANT – Alternate Capacity NPV $/kW/a	PARAMETERS: PARTICIPANT – Natural Gas Tariff $/GJ	PARAMETERS: PARTICIPANT – Energy Tariff $/kWh	PARAMETERS: PARTICIPANT – Capacity Tariff $/kW/a
Label	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
Source Sheet or Calculation	T/D	H>0, (V+W)<0	H<0, (V+W)>0, X	AD/AC	T/(V+D)	(T+U)/I	(T+U)-I	Input	Program	Input	Input	Input	PV(AM,P,-InputD25)	Input	PV(AM,P,-InputD28)	PV(AM,P,-InputD29)	Input	Input	Input
2011																			
Schools																			
Solar Com	2.6	55	11	0.2	0.7	0.2	(49)	7.15%	125.59	6%	1.53	6.0%	127.82	17.22	1.06	0.00	9.999	0.083	-

UTILITY

Fortis BC

NATURAL GAS

		Year Units	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	Incremental Cost of Gas (nominal)	$ Per GJ	$5.50	$6.17	$6.81	$7.35	$7.87	$8.26	$8.56	$8.78	$8.99	$9.19	$9.40	$9.60	$9.81	$10.03	$10.25	$10.47	$10.70	$10.93	$11.17	$11.42	$11.67	$11.92	$12.19	$12.45	$12.73	$13.01	$13.29	$13.58	$13.88	$14.19	$14.50	$14.82
1		Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	carbon tax	$ per GJ	0.75	1.00	1.25	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
	Distribution adder	$ per GJ	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
	Total incremental cost of gas including carbon		6.41	7.32	8.21	9.01	9.52	9.92	10.22	10.43	10.64	10.85	11.05	11.26	11.47	11.68	11.90	12.13	12.35	12.59	12.83	13.07	13.32	13.58	13.84	14.11	14.38	14.66	14.95	15.24	15.54	15.84	16.15	16.31
2	GDP Deflator		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	Incremental Cost of Gas (Real)		$6.41	$7.32	$8.21	$9.01	$9.52	$9.92	$10.22	$10.43	$10.64	$10.85	$11.05	$11.26	$11.47	$11.68	$11.90	$12.13	$12.35	$12.59	$12.83	$13.07	$13.32	$13.58	$13.84	$14.11	$14.38	$14.66	$14.95	$15.24	$15.54	$15.84	$16.15	$16.31
4	Net Present Value -2010			$12.36	$19.03	$25.87	$32.61	$39.16	$45.47	$51.47	$57.19	$62.63	$67.80	$72.71	$77.39	$81.83	$86.05	$90.07	$93.89	$97.52	$100.98	$104.26	$107.39	$110.36	$113.19	$115.88	$118.43	$120.87	$123.18	$125.39	$127.49	$129.48	$131.38	$133.17
5	Net Present Value -2011				$13.99	$21.31	$28.54	$35.56	$42.31	$48.75	$54.87	$60.70	$66.24	$71.51	$76.51	$81.27	$85.80	$90.10	$94.20	$98.09	$101.79	$105.31	$108.66	$111.84	$114.87	$117.75	$120.49	$123.10	$125.59	$127.95	$130.19	$132.33	$134.37	$136.28
6	Net Present Value -2012					$15.51	$23.25	$30.78	$38.01	$44.91	$51.47	$57.71	$63.65	$69.29	$74.66	$79.76	$84.61	$89.22	$93.61	$97.78	$101.74	$105.51	$109.10	$112.51	$115.76	$118.85	$121.79	$124.58	$127.24	$129.77	$132.18	$134.47	$136.65	$138.70

ELECTRICITY		
Incremental Cost of Elec	$ Per kWh	$0.12
Incremental Cost of E Capacity	$ Per kW/a	$170.00

RETAIL

		Rate	Customers					
				789,928	Total Customers in BC	80,000	Total Residential and Commercial Customers on VI	
Residential Retail			000's					
TGI	$ Per MJ	$0.0100	640	712,304	Total Residential Customers in BC			
TGVI	$ Per MJ	$0.0143	72					
Electricity	$ Per MJ	$0.0230						
Electricity	$ per kWh	$0.0827	1,511	1,511,435	Total BCH Residential Customers in BC			89%
Electricity	$ per kW per year							
Commercial Retail								
TGI	$ Per MJ	$0.0094	78	77,624	Total Commercial Customers in BC			
TGVI	$ Per MJ	$0.0169	8					
Electricity	$ Per MJ	$0.0214						
Electricity	$ per kWh	$0.0769	190	189,764	Total Light Industrial and Commercial Customers in BC			
Electricity	$ per kW per year	$52.0000	15					

TAX

		Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
1		Year		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	Carbon	$ Per tonne		$20.00	$25.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
3	Carbon	$ Per GJ		$0.9976	$1.2470	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964	$1.4964
4	GDP Deflator			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	Carbon (Real)			$1.00	$1.25	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
6	Net Present Value -2010				$2.02	$3.23	$4.37	$5.43	$6.42	$7.34	$8.20	$9.00	$9.75	$10.45	$11.11	$11.72	$12.29	$12.82	$13.31	$13.78	$14.21	$14.61	$14.99	$15.34	$15.67	$15.97	$16.26	$16.52	$16.77	$17.00	$17.22	$17.42	$17.61	$17.79
7	Net Present Value -2011					$2.47	$3.68	$4.82	$5.88	$6.87	$7.79	$8.65	$9.45	$10.20	$10.90	$11.56	$12.17	$12.74	$13.27	$13.76	$14.23	$14.66	$15.06	$15.44	$15.79	$16.12	$16.42	$16.71	$16.97	$17.22	$17.45	$17.67	$17.87	$18.06
8	Net Present Value -2012						$2.70	$3.92	$5.05	$6.11	$7.10	$8.02	$8.88	$9.69	$10.44	$11.14	$11.79	$12.40	$12.97	$13.50	$14.00	$14.46	$14.89	$15.29	$15.67	$16.02	$16.35	$16.65	$16.94	$17.21	$17.45	$17.69	$17.90	$18.10

Discount Rate (real)[1]	
TERASEN GAS	
Rate of Inflation	1.90%
TGI	7.15%
TGVI	6.89%
BC HYDRO	
Rate of Inflation	2.00%
BC Hydro	6.00%
Customer	6.00%

Footnote 1: Source LR 070531

Fortis BC
Commercial
NEW

only enter in boxes marked in blue

Measure Data for Solar Com

PER MEASURE

Utility Incentive to the participant **partner incentive**

Incremental Cost	$	54,772
Total Incentive	$	-
Participant	**$**	**54,772**

Annual Impact Per Measure

Energy Savings per installation	**76.4**	GJ			Average Annnual Energy Savings per Measure
Free Rider Rate / Net-to-Gross	**0%**	1.00			Net-to-Gross
Alternate Energy Impact		GJ	0		kWh
Alternate Capacity Impact		kW/a			
Measure Lifetime	**25**	Years	Estimated lifespan of measure		

ANNUAL ACTIVITY	2010 NPV	Total	2010	2011	2012	Explanatory Notes
Number of Installations	1	1	**0**	**1**		Estimated Participatation
Impact						
Gross Energy Savings (GJ)	71	76	0	76	0	Extension of Unit Savings x No. of Upgrades
Net Energy Savings (GJ)	71	76	0	76	0	Gross Energy Savings less Free Riders
Alternate Energy Impact (Increase) (kWh)	0	0	0	0	0	Other Utility Billed energy impact
Alternate Capacity Impact (Increase) (kW/a)	$0.00	-				Other Utility Billed capacity impact

Benefit Cost Summary

	2010 NPV	*$ Total*	2010	2011	2012	
Avoided Revenue Requirements						
PV $ per GJ			$120.87	$125.59	$129.77	
Energy Purchases	$ 9,598	$ 9,598	$ -	$ 9,598	$ -	
Utility Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ 3,750	**$ -**	**$ 3,750**		
Subtotal	$ 3,500	$ 3,750	$ -	$ 3,750	$ -	
Partner Program Costs						
DSM Incentives		$ -	$ -	$ -	$ -	
Administration		$ -	**$ -**	**$ -**	**$ -**	
Subtotal	$ -	$ -	$ -	$ -	$ -	
Participants' Net Costs						
Incremental Cost		$ 54,772	$ -	$ 54,772	$ -	
Subtotal	$ 51,117	$ 54,772	$ -	$ 54,772	$ -	
Alternate Savings - Net						
Energy (Purchases)		$ -	$ -	$ -	$ -	$1.534 PV $ per kWh
Capacity (Purchases)		$ -	$ -	$ -	$ -	PV$ per kW/a
Subtotal	$ -	$ -	$ -	$ -	$ -	
Total Resource Net Benefit (Cost)	$ (45,019)		$ -	$ (48,924)	$ -	Avoided Revenue Requirement less Utility less Partners less Participant Costs plus Alternate Savings
Utility Levelized Cost per GJ (Lifetime)	**$ 66.6**		**$ -**	**$ 66.6**	**$ -**	Informational (for comparison with supply options)