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**VIA E-MAIL**

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July 25, 2008

**TGI-TGVI\_Energy Efficiency and  
Conservation Programs Exhibit A-4**

Mr. Tom Loski  
Chief Regulatory Officer  
Terasen Gas Inc.  
16705 Fraser Highway  
Surrey, B.C. V4N 0E8

Dear Mr. Loski:

Re: Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc.  
Project No. 3698512/Order No. G-102-08  
2008 Energy Efficiency and Conservation Programs Application

Further to your May 28, 2008 filing of the above noted Application, enclosed is Commission Information Request No. 2. Pursuant to Commission Order G-102-08, and please reply to the Commission with an electronic copy and 20 hard copies of your responses by Friday, August 15, 2008.

Yours truly,

*Original signed by:*

Erica M. Hamilton

JWF/cms  
Enclosure

cc: Registered Intervenors (*TGI-TGVI-EECP-RI*)

**Terasen Gas Inc. (“TGI”) and Terasen Gas (Vancouver Island) Inc. (“TGVI”)  
(collectively “Terasen” or “the Companies”)  
Energy Efficiency and Conservation Programs Application (“Application” or “Exhibit B-1”)**

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**1.0 Reference: Exhibit B-2, BCUC IR#1 1.2 and Exhibit B-2-1, Duration of Energy Savings**

- 1.1 It appears that energy savings are assumed to be credited to each program for the life of the measure implemented, and that this time span is not adjusted for the natural adoption rate of the technology that would have occurred in the absence of the program. Please comment. Was the age and remaining life of the existing appliance stock considered?
- 1.2 Has Terasen considered both measure and claim persistence in calculating the savings attributed to the programs? If so, please explain in detail.

**2.0 Reference: Exhibit B-2, BCUC IR#1 2.1 and 2.2, and Attachment 71.4**

- 2.1 In its response to question 2.1 Terasen states that the Overall EEC Portfolio means the entire slate of EEC Activity including various activities which it then lists. Please provide a calculation of the Total Resource Cost (“TRC”) assuming the Overall EEC Portfolio minus all residential fuel switching and innovative technologies.
- 2.2 Terasen states in its response to question 2.2 that the Companies are not making any proposal with respect to threshold values for the Utility Cost Test or RIM.
  - 2.2.1 Are the Companies proposing, or making a recommendation with respect to criteria about accessibility of programs to low-income customers?
  - 2.2.2 What percentage of residential programs (a) by level of anticipated savings and (b) by expenditure level, are aimed at low income customers?
  - 2.2.3 Does Terasen consider it useful to consider rate impact (i.e. the RIM) of programs in the absence of any other measures to assess the accessibility of programs to low-income consumers? Please explain your answer.
- 2.3 The OEB decision (Attachment 71.4, page 33) concludes that the utilities should allocate a proportion of their DSM budgets to low income households. Does Terasen support that approach, or an approach in which no funding is allocated to low-income customers, or one in which low-income funding is provided by another entity (e.g.

government)? Please explain your answer.

**3.0 Reference: Exhibit B-2, BCUC IR#1 2.4 and 18.2**

On page 4 of its responses to BCUC Information Requests, Terasen states that the Companies included the avoided Carbon Tax in the participant benefits, "...as can be noted in Appendices 11A and 11B..." A copy of the Ministry of Small Business and Revenue Carbon Tax Rates by Fuel Tax is attached as Attachment 1 to this Information Request.

- 3.1 Has Terasen included the tax on natural gas in the same amounts, escalated at the same rates over time, as the tax rates established by the Ministry of Small Business and Revenue document? What value has Terasen assumed for the Carbon Tax in the years after 2012?
- 3.2 On page 45 of its response to BCUC IR#1 18.2, Terasen states that the BC Carbon tax is a further mechanism being adopted to reduce fossil fuel (i.e. gasoline) usage. Can Terasen confirm that natural gas is being taxed in the same manner as gasoline (although in a different amount) and therefore that the BC Carbon tax is a further mechanism being adopted to reduce fossil fuel (i.e. natural gas) usage?

**4.0 Reference: Exhibit B-2, BCUC IR#1 3.3 and 3.1, Free Ridership**

- 4.1 Question 3.3 asked if the Companies have any evidence that forecasts of free ridership were any more or less uncertain than forecasts of (say) penetration rates. The answer referred to BCUC IR#1 3.1, which submits that free rider estimates are based more on art than on science, and quotes from the U.S. National Action Plan for Energy Efficiency's Model Energy Efficiency Program Evaluation Guide which states that the analysis of spillover and free ridership is complicated by "market noise".

Do the Companies have any evidence of the relative uncertainty of free ridership estimates versus other inputs and forecasts used in designing and evaluating EEC programs? If so, please provide it.

- 4.2 Does Habart and Associates usually produce free ridership and net to gross estimates when it evaluates programs? If so please summarize the results for all Terasen programs reviewed by Habart.

**5.0 Reference: Exhibit B-2, BCUC IR#1 3.1**

- 5.1 Do the Companies agree that netting out energy savings resulting from the participation of "free riders" in cost-benefit analyses produces the same result as if free-ridership is included as an input in the calculation but the rate of free-ridership is assumed to be zero? If not, why not?

**6.0 Reference: Exhibit B-2, BCUC IR#1 1.1 & 9.1, and Exhibit B-1, Application, Section 3.2 History of Demand Side Management Programs, pp. 22-25, Energy Star Heating System Upgrade**

Table 3.2.1 on page 24 of the Application shows the savings per participant for the Energy Star Heating System Upgrade Program to be 14 GJ in 2005, 14 GJ in 2006, and 13.8 GJ in 2007.

- 6.1 Please explain the 0.2 GJ change from the 14 GJ to the 13.8 GJ in 2007.
- 6.2 The spreadsheet contained in Attachment 1.1 shows for TGI Residential Retrofit Furnace DSM annual savings of 13.8 GJ. However, the TGVI Residential Retrofit Furnace DSM is 10.8 GJ.
  - 6.2.1 Please provide the source calculation of the 10.8 GJ TGVI savings.
  - 6.2.2 Please explain why the TGVI savings are different from the TGI savings. Please reconcile the difference.
- 6.3 Terasen's response to IR#1 9.1 states that the Energy Star Heating Upgrade program induced participants to install a new furnace 2.3 years earlier than would otherwise be the case and explains the calculation. Please explain the basis on which Terasen calculates that the savings going from a standard to high efficiency furnace are the result of the program and that it persists for 25 years.

**7.0 Reference: Exhibit B-2, BCUC IR#1 9.4, Sales of mid and high efficiency furnaces**

The response to BCUC IR#1 9.4 from the table for British Columbia appears to indicate that approximate sales in 2005 for mid-efficiency furnaces were 5,000 (113,000 – 108,000) and high efficiency furnaces were 10,000 (94,000 – 84,000) by calculating the change between the balances of housing stock for each kind of furnace. Apparently, twice as many high efficiency furnaces may have been sold than mid-efficiency furnaces.

The response to BCUC IR#1 9.3.1 indicates that the installed incremental cost of a high-efficiency furnace compared to a mid-efficiency furnace is \$756 with a simple payback of 7.8 years.

- 7.1 Are the 5,000 sales of mid-efficiency furnaces and 10,000 sales of high-efficiency furnaces sold in BC in 2005 a reasonable conclusion?
- 7.2 In 2005 how many high-efficiency furnace rebates/grants did TGI and TGVI provide to its customers?

- 7.3 Does Terasen have further information (possibly anecdotal) from furnace suppliers on the recent mid-efficiency and high-efficiency furnace sales in the last year or the relative proportion of recent sales for mid-efficiency and high-efficiency furnaces? If so, please elaborate.
- 7.4 Please elaborate on why Terasen should continue to offer rebates for a high-efficiency furnace when the payback to the customer is favourable and there is apparent success in high-efficiency furnaces outselling mid-efficiency furnaces?

**8.0 Reference: Exhibit B-2, BCUC IR#1 10.2 and 43.1.2**

The response to question 10.2 states that: “The present value of the revenue requirements from the rate base approach is lower for customers assuming customers have a time value of money preference based on a higher discount rate than the utility’s after-tax cost of capital.”

- 8.1 Please provide any evidence Terasen has that customers have a time value of money preference based on a higher discount rate than the utility’s after-tax cost of capital.
- 8.2 Please provide a comparison of the cumulative rate impact to customers and the NPV of the rate impact, if an annual expenditure of \$1.6 million is made every year for the next 20 years and in one case the annual expenditures are expensed and in the other case the annual expenditures are capitalized and amortized over twenty years as proposed by the Companies. Please use a discount rate equal to TGI’s after-tax cost of capital.
- 8.3 Please provide the same comparison as in the immediately preceding question but using a discount rate 1 percent higher than TGI’s after-tax cost of capital.
- 8.4 Further to the response to question 43.1.2, please also provide a comparison of the cumulative and NPV of the return to the shareholder under the scenarios outlined in part 1 of this set of questions.

**9.0 Reference: Exhibit B-2, BCUC IR#1 13.1, and BC Energy Plan, Policy Action #10**

- 9.1 The real and nominal prices in the table are exactly the same throughout. Please confirm whether this is in error and if so provide a corrected table. If a corrected table is provided, please state what year the dollars of the real prices are stated in.
- 9.2 Are the price figures in the response to IR#1 13.1 premised on British Columbia remaining a net exporter of natural gas for the years listed?
- 9.3 Please provide the natural gas price forecast that forms the basis for the response to IR#1 13.1, along with the high and low forecasts for the same time period.

**10.0 Reference: Exhibit B-2, BCUC IR#1 1.1 and 14.1, and Attachment 1.1, and Exhibit B-1, Tables 7.1.2.2 and 7.1.2.3**

- 10.1 What reductions in Residential consumption would be realised if Terasen increased natural gas rates by the amounts shown in Tables 7.1.2.2 and 7.1.2.3, Line 34?
- 10.2 How would those compare to the expected Residential consumption reductions shown in Exhibit B-2, Attachment 1.1?

**11.0 Reference: Exhibit B-2, BCUC IR#1 14.2, Price Elasticity**

The response to BCUC IR#1 14.2 indicates the price elasticity for residential customers is 21% and for commercial customers is 17%.

- 11.1 If TGI revenue requirements increased by \$10.0 million and it caused a corresponding increase in delivery rates, assuming a price elasticity of demand for residential customers at 21% and commercial customers at 17%, what would be the total corresponding change in consumption volumes in GJ? Please show the calculations.

**12.0 Reference: Exhibit B-2, BCUC IR#1 15.2.3**

The Companies' response to question 15.2.3 states that "It is the Companies' view that consumers will still want to buy fireplaces, even in a carbon-constrained world, and that the Terasen Utilities should encourage the use of the most efficient gas appliances available."

- 12.1 Can the companies confirm that an incentive to purchase efficient gas fireplaces may not only encourage some customers to purchase an efficient gas fireplace rather than an inefficient gas fireplace, but also to encourage some customers to purchase an efficient gas fireplace rather than no fireplace at all? If so, does this make the efficient gas fireplace program, in part, a load building program? If not, why not?
- 12.2 Can the companies confirm that a regulation, restricting the market to only efficient gas fireplaces, would have purely a conservation effect? If not, why not?

**13.0 Reference: Exhibit B-2, BCUC IR#1 16.2**

- 13.1 With respect to the Table on page 39 and note 1 on page 40, please confirm that the revised table calculates the DSM per customer based on the total DSM budget of \$279 million for both gas and electric initiatives and the number of gas customers.
- 13.2 Further please confirm that if the percentage of the DSM budget allocated to the natural gas line of business is used (14 percent of the total, per note 1), the DSM per customer falls to \$9.3/customer.

**14.0 Reference: Exhibit B-2, BCUC IR#1 24.4**

The Companies state that one potential reason for the gain in participation in the Energy Star Heating Upgrade Program is an increase in general awareness about energy, costs, and the value of conservation.

- 14.1 What is the current proportion of Energy Star furnaces being sold (irrespective of program participation) relative to standard or mid-efficiency furnaces?
- 14.2 Are Terasen rebates for high-efficiency appliances available year-round or only on a seasonal basis? If they are not available throughout the year, why not?

**15.0 Reference: Exhibit B-2, BCUC IR#1 26.1, and BC Energy Plan, Policy Action #1**

- 15.1 If the electric-gas fuel substitution measures proposed in the Application are approved and are successful, what proportion of BC Hydro's incremental resource needs does Terasen believe that the measures proposed in the Application can be achieved by 2020?
- 15.2 Would the achievement of that proportion be possible given Terasen's existing transmission, storage, and distribution assets?

**16.0 Reference: Exhibit B-2, BCUC IR#1 32.3 and 33.3**

The Application states that the \$500,000 for Trade relations includes the cost of a staff member plus the activities outlined on pages 68 and 69 of the Application. The activities outlined on page 68 and 69 of the Application appear to identify the activities of such a staff member, but the Companies do not identify the incremental cost associated with those activities. The response to question 33.3 identifies the fully loaded cost of a staff member in the Innovative Technologies, NGV and Measurement area as approximately \$100,000.

- 16.1 Is that estimate reasonable for the fully loaded cost of the Trade Relations staff member as well? If not, please provide an estimate and the reasons for the difference.



**17.0 Reference: Exhibit B-2, BCUC IR#1 33.5**

The Companies propose that the Commission approve an overall expenditure by utility rather than approving funding by program area or individual program initiative. To ensure that programs developed have value for ratepayers, the Companies propose to report on EEC activity yearly and to engage an EEC Stakeholder group; "...one of the roles for that group would be to ensure that programs that are developed have value for ratepayers."

- 17.1 Please describe in detail the authority the Stakeholder group would have to direct Terasen to amend or terminate unproductive programs.

**18.0 Reference: Exhibit B-2, BCUC IR#1 37.3, and Terasen Thermal Metering Annual Report, 2007/08, p. 2**

- 18.1 The 2007/08 Thermal Metering Report describes the first pilot project for the program. It states that the developer decided not to go with a hydronic heating system due to project costs exceeding budget.

Can Terasen confirm that the reference to project costs in the report refers to overall project costs for the development rather than the costs related specifically to the hydronic heating system?

**19.0 Reference: Exhibit B-1, Section 6.13. Portfolio Approach to EEC Programs, and Alignment of Program Cost/Benefit Analysis Practices Across the Terasen Utilities, pp. 82-83**

Page 83 of the Application states: "The energy efficiency and fuel switching programs would be planned and evaluated on the TRC, the RIM test, the Utility Cost ("UC") test and the Participant test, and the overall portfolio TRC test results would have to be greater than 1.0 to proceed."

- 19.1 What would be the thresholds for the scores on the RIM test, UC test and the Participant test for an individual program not to proceed? If an activity had a relatively low RIM test, UC test and Participant test but a favourable TRC, would that be sufficient to proceed? Please explain.

**20.0 Reference: Exhibit B-2, BCUC IR#1 41.1 and 41.2, Spreadsheet for proposed amortization**

- 20.1 The spreadsheet for the responses to BCUC IR#1 questions 41.1 and 41.2 does not appear to be in the referred Attachment to BCUC IR#1 41.1. Please file the 20 year model.

**21.0 Reference: Exhibit B-2, BCUC IR#1 41.3, Intergenerational Equity**

The response to BCUC IR#1 41.3 states:

“The Companies do not believe that there would be any intergenerational inequity created for future customers by contributing to the recovery of DSM expenditures as proposed in this Application. On the contrary, intergenerational inequity is more likely to be a concern if DSM expenditures were expensed in the year incurred...”

- 21.1 If a new customer with a new house connects to the natural gas system in 2015, would the new customer’s rates include the amortized cost of past accumulated DSM expenditures of which the new customer does not receive any benefit?

**22.0 Reference: Exhibit B-2, BCUC IR#1 42.1 and Attachment 40.2**

Terasen’s response to question 42.1 states that “The Terasen Utilities are proposing an amortization period of 20 years, based on a weighted average of the proposed measure lives. (It should be noted that the range of measure lives outlined in the Application range from 13 to 25 years).”

- 22.1 Attachment 40.2 shows that some programs have a Measure Life of 10 years. Please confirm that the response to question 42.1 should have stated that the range of measure lives is “...from 10 to 25 years.” If not, please explain why 13 years is appropriate.
- 22.2 Is the estimate of the measure life in the Application the same as the expected equipment life? If so, please explain the basis for the estimate of the expected equipment life. If not, please explain how the measure life is different than the expected equipment life, and what adjustments were made to the expected equipment life to estimate the measure life.
- 22.3 Would Terasen agree that the economic life of a piece of equipment may be significantly shorter than its useful life? If not, why not?

**23.0 Reference: Exhibit B-2, BCUC IR#1 42.2**

The response to BCUC IR#1 42.2 states:

“The Companies propose that should the Application be approved as outlined, expenditures associated with cancelled programs would be treated the same as other expenditures in order to reduce the administrative burden and would be amortized over 20 years.”

- 23.1 Please explain further why the Companies should earn a return through rate base on cancelled program costs that have no future benefit.
- 23.2 If either TGI or TGVI incurs expenses of \$1 million to undertake an energy efficiency program and the program results in no savings, what are the financial impacts resulting from this treatment of the costs on:
- (a) Rate base
  - (b) Terasen and its shareholders
  - (c) TGI or TGVI customers
- 23.3 If a Shared Savings Program similar to that used in Ontario (and discussed in Terasen's response to IR#1 43.2.4.6) was in place for the Companies and either TGI or TGVI incurs expenses of \$1 million to undertake an energy efficiency program and the program results in no savings, what are the financial impacts resulting from this treatment of the costs on:
- (d) Rate base
  - (e) Terasen and its shareholders
  - (f) TGI or TGVI customers

**24.0 Reference: Exhibit B-1, Appendix 4, DSM Activity of Other Utilities, pp. 15-19;  
Exhibit B-2, BCUC IR#1 43.2.4, Ontario Utilities Regulatory Environment**

The Application in Appendix 4, page 15 with regard to Enbridge Gas Distribution and Union Gas states: "For both utilities, all DSM costs are recovered through the rate base."

The response to BCUC IR#1 43.2.4.2 states in regards to Union Gas and Enbridge Gas Distribution:

"Both include costs in their rate base, but do not capitalize the expenditure. Uses a Variance Account to reconcile expenditure and revenue at the end of each financial year; neither company earns on the DSM revenue but rather through the SSM mechanism."

On September 1, 2007 Union Gas filed an update to its "Multi-Year Incentive Rate Regulation for Natural Gas Utilities EB-2007-0606" by updating Exhibit D.

In the Union Gas Exhibit D, Tab 1, page 3 of 10 it states:

*Treatment of Demand Side Management ("DSM") Costs*

In accordance with the Board's EB-2006-0021 Decision, Union will increase its 2007 DSM budget by 10% per year for each of 2008 and 2009 to \$18.7 million and \$20.6 million, respectively. Union is proposing to treat the costs associated with DSM as a Y-factor.

Accordingly, Union will remove the DSM costs currently in rates by rate class prior to applying the price cap index. After the price cap adjustment has been determined, Union will add back the DSM costs by rate class plus 10%. The result is that the increase in the 2008 and 2009 DSM budgets will be allocated in proportion to how the 2007 DSM budget was included in rates.

Consistent with the Board's EB-2007-0598 Decision, Union will true-up for differences between the DSM costs included in rates and the actual amount spent on DSM programs on a rate class basis as part of the disposition of the DSMVA.

The Union Gas Exhibit D, Tab 3, Schedules 1 to 3 pages appears to indicate that the \$17.0 million of DSM expenditures are removed from rates and then \$18.7 million is then added back into the 2008 rates.

24.1 Please confirm that Union Gas currently expenses DSM costs fully into 2008 rates (\$18.7 million of 2008 DSM expenditures).

24.1.1 If so, does Enbridge Gas Distribution also fully expense its DSM expenditures into rates similar to Union Gas?

**25.0 Reference: Exhibit B-2, Response to BCUC IR#1 43.2.4.3  
DSM Amortization – Nevada Administrative Code**

The Terasen Utilities response to BCUC IR#1 43.2.4.3 states: "Similarly, the Nevada Administrative Code, NAC 704.9523, charges the Public Utility Commission with determining an amortization period that is "consistent with the life of the investment.""

Adopted Regulation of the Public Utilities Commission of Nevada in LCB File No. R162-07, effective June 17, 2008, in Sec. 2 states "NAC 74.9523 is hereby amended to read as follows:" then for 3(e) (1) it states:

(1) The Commission will adjust the rate to amortize the balance over a *3-year* period

~~{determined}~~, *unless otherwise specified* by the Commission. ~~{to be appropriate for clearing the account and consistent with the life of the investment.}~~

Source: [http://www.leg.state.nv.us/register/RegsReviewed/\\$R162-07A.pdf](http://www.leg.state.nv.us/register/RegsReviewed/$R162-07A.pdf)

- 25.1 Please confirm that the Public Utilities Commission of Nevada presently amortizes DSM expenditure balances over a 3 year period. If not, what is the amortization period for DSM expenditures?
- 25.2 From the research conducted by the Terasen Utilities are there other jurisdictions that allow utilities to amortize DSM balances over the life of the investment? If so, please provide the information.

**26.0 Reference: Exhibit B-2, BCUC IR#1 43.2.4.4, Public Purpose Funds**

- 26.1 Please explain whether in the Companies' view, it would be more efficient in British Columbia to have DSM programs administered by one body, rather than three or four separate utilities each potentially with significant DSM programs.

**27.0 Reference: Exhibit B-2, BCUC IR#1 43.2.4.5**

- 27.1 Please confirm that the issue of rate volatility with respect to expensing DSM expenditures can be avoided by placing the DSM in a deferral account and expensing them over a number of years. If not, why not?

**28.0 Reference: Exhibit B-2, BCUC IR#1 43.2.4.6  
DSM in Ontario**

Ontario Energy Board issued its Decision with Reasons on August 25, 2006 for EB-2006-0021.

On page 36 the Decision it states:

*The Board was presented with a partial settlement. All parties except SEC agreed as follows:*

*"The general principle is that all measures and programs should exceed a benefit to cost ratio of 1.0 to be included in the portfolio, but exceptions are reasonable where other benefits are apparent (e.g., pilot programs)."*

On page 37 the Decision it states:

*However, the Board notes that the partial settlement refers to pilot programs as an example of programs where an exception to the threshold of 1.0 may be permitted. The implication is that there may be other types of programs. No other examples were provided. The Board prefers more certainty as to the exceptions in these circumstances. The Board therefore finds that the exception to the TRC threshold should be restricted to pilot programs at this time.*

- 28.1 Can the Terasen Utilities provide other examples of a measure with a TRC less than one where the benefits are apparent? If so, please provide the other examples.

**29.0 Reference: Exhibit B-2, BCUC IR#1 43.2.4.6; and Exhibit B-1, Appendix 4, p. 29**

The response to BCUC IR#1 43.2.4.6 states: “The OEB has mandated an incentive mechanism, the Shared Savings Mechanism (“SSM”). This incentive mechanism rewards the utility for success in DSM.” The incentive is based on a sliding scale where higher performance is rewarded with a higher payout.

- 29.1 Do the Terasen Utilities consider the SSM as an acceptable incentive to align both shareholder and ratepayer interests in achieving the maximum TRC result for the DSM spend?
- 29.2 Would the SSM be better than capitalizing to rate base, in terms of aligning the shareholder incentive to maximize TRC results for the ultimate goal of energy conservation? Please discuss.
- 29.3 If the Commission determined that an incentive mechanism would be a superior method of rewarding the utilities for promoting and undertaking cost-effective DSM, what form of incentive mechanism would the Companies propose? Please provide a detailed description of the type of mechanism.
- 29.4 FortisBC’s current DSM incentive mechanism is described in Exhibit B-1, Appendix 4, at pages 8 and 9. Please provide the results in terms of target and actual savings, target and actual costs, and incentive received, for the most recent five years available. Please comment on whether Terasen would consider such a mechanism to be acceptable in its case? If not, why not?
- 29.5 The Performance Incentive Mechanism (PIM) and the Global Energy Efficiency plan Performance Incentive (GEEP) is described for Gaz Metro in Exhibit B-1, Appendix 4, at pages 20-22. Please comment on whether Terasen would consider such a mechanism to be acceptable in its case? If not, why not?
- 29.6 Appendix 4 (page 29) of Exhibit B-1 states that the incentive mechanism in place “...ensures that program savings are real and verified and imposes penalties for sub-standard performance....”

Does Terasen support an approach that ensures that program savings are real and verified and imposes penalties for sub-standard performance? Why or why not?

**30.0 Reference: Exhibit B-2, BCUC IR#1 46.1, Free Riders**

- 30.1 Please prepare a summary table showing, for each program, the net to gross ratio, the period over which savings were calculated, and an explanatory column showing whether the ratio was derived from empirical studies, market surveys, or judgment. If the latter please describe whose judgment was involved.

**31.0 Reference: Exhibit B-2, BCUC IR#1 48.1, RIM**

- 31.1 Please provide the "Revenue Impact" with and without free riders, by customer class.
- 31.2 Since it appears that Terasen has modeled the results assuming that the market price of natural gas is, for residential and commercial customers, less than the rate charged customers, does this result in a RIM that must always be less than one?
- 31.3 Why is it correct to model the results assuming the market price of the commodity, as opposed to market price of the commodity plus an allowance for the long run incremental cost of the "pipes"? Does Terasen have an estimate of this LRIC, and if so what impact would it have on the results?

**32.0 Reference: Exhibit B-2, BCUC IR#1 52.2.1**

- 32.1 Please provide the number of accounts associated with the figures shown in the table for BCUC IR#1 52.2.1.
- 32.2 Please explain how the proposed DSM programs are expected to affect the number of Residential accounts, and the proportion of households choosing natural gas.

**33.0 Reference: Exhibit B-2, BCUC IR#1, pp. 121-127**

- 33.1 Using for TGI the expenditure schedule set out for the response to question 52.4, and a schedule based on similar assumptions for TGI, please provide tables showing the cost of service and cost/GJ (similar to those on pages 121 and 123 of the responses). Please also provide tables in a similar format showing the cost of service and cost/GJ if the costs are expensed and amortized over 20 years.
- 33.2 Please provide a set of tables showing the same information as in the immediately preceding question, except assuming that costs (whether expensed or amortized) are amortized over 10 years.

**34.0 Reference: Exhibit B-2, BCUC IR#1 53.2, Attachment 53.2, and Exhibit B-1, Tables 6.13, 6.13a, and 7.2**

- 34.1 The BC Hydro Conservation Potential Review, filed as an attachment to the response to BCUC IR#1 53.2, uses a GHG emissions factor for post-2016 of zero. Given this approach, does Terasen agree that any fuel switching benefits in the Application (from electricity to natural gas) should only be credited to the end of F2016? If not, why not?
- 34.2 Assuming that fuel switching benefits are limited to the end of F2016, please show how that would affect the estimates shown in Exhibit B-1, Tables 6.13, 6.13a, and 7.2.

**35.0 Reference: Exhibit B-2, BCUC IR#1 55.7**

- 35.1 In what years did the Yank the Tank and Think Grand programs begin and end?
- 35.2 Are any of the currently proposed programs effectively continuations of the Yank the Tank and Think Grand programs?

**36.0 Reference: Exhibit B-2, BCUC IR#1 56.2 and Attachments 56.2A**

- 36.1 Please provided a somewhat expanded description of each program listed in the Table of Contents of Attachment 56.2A.
- 36.2 What determines whether or not an incentive is 50 percent of incremental measure cost (for instance for TGI New EE E\* fireplaces the incentive is 100 percent)?

**37.0 Reference: Exhibit B-2, BCUC IR#1 56.2, Program Summaries Table 56.2 B 1 TGI Commercial Excluding Free Riders**

- 37.1 Please provide this and related tables including columns AE through AK and any other missing columns.

**38.0 Reference: Exhibit B-2, BCUC IR#1 57.2, Use Rates**

- 38.1 Please explain why the use rate for residential customers is over 25 percent higher in the Lower Mainland than in the interior.
- 38.2 Looking at the residential data for TGI, does Terasen agree that the use rates appear to have stabilized after dropping sharply?



- 38.3 Please state whether the figures shown in the tables in response to BCUC IR#1 57.2 are in current or constant dollars. If the latter, please state the year applicable. Please also state whether the figures shown in response to BCUC IR#1 57.2 are weather normalized.

**39.0 Reference: Exhibit B-2, BCUC IR#1 60.1, Funding Requested**

Terasen states: "This is in the Joint Initiatives program area, and it should be noted that the Companies are seeking high-level approval of the total amount to be expended not to exceed \$56.6 million by 2010, rather than funding for specific initiatives such as a building labeling pilot."

- 39.1 Is it Terasen's position that only the success of that total EEC package should be monitored or that of the individual programs? If there is to be no program by program budget, how will the success of a program be determined?

**40.0 Reference: Exhibit B-2, BCUC IR#1 62.1**

- 40.1 During the BC Hydro Residential Inclining Block Rate Hearing, BC Hydro stated that "There is a lack of policy direction from government on fuel switching at this point in time...." (Transcript Vol. 5, p. 731)

Can Terasen confirm that BC Hydro made that statement during the RIB hearing?

- 40.2 Is Terasen aware of any BC Government policy that specifically directs or supports electricity to natural gas fuel switching programs? If so please provide the supporting documents.

**41.0 Reference: Exhibit B-2, BCUC IR#1 64.1 Assumption on Appliance Usage**

- 41.1 Terasen states that Marbek estimated natural conservation based on assumptions around the modest continuation of appliance penetration trends. Please provide a summary table of the 20 year forecast of natural conservation by sector and appliance or asset, and the annual GJ usage forecast for each sector for the period and include the estimated real retail price for each sector in each year.

**42.0 Reference: Exhibit B-2, BCUC IR#1 67.1, Changing End Uses**

- 42.1 Information Request 67.1 asked for a summary of the use data for major appliances from 1980 to the present in support of the assumption that further appliance efficiencies will be relatively minor, and asked for similar information for furnaces. The attached response was a 190 page document.

Please provide the summary requested, or describe the specific sections in Attachment 67.1 relied upon by Terasen for that assumption.

**43.0 Reference: Exhibit B-2, BCUC IR#1 68.1, Windows**

- 43.1 Please provide specific support provided by Marbek that indicates that windows have a thirty year life, and in particular, that the sealed glass units have a thirty year life. Please list the warranties of surveyed manufacturers for both glass and frame.

**44.0 Reference: Exhibit B-2, BCUC IR#1 69.1, Heat Pumps**

- 44.1 The question asked for the payback for a heat pump along with efficiency assumptions and the calculation. It is not clear that this response pertains to a heat pump relative to a gas furnace with AC. Please respond to the original question in detail.

**45.0 Reference: Exhibit B-2, Response to BCUC IR#1 71.1, "Impact of Terasen Gas / Energy Star Heating System Upgrade (2003) Program," August 2004 Habart Report**

In Attachment 71.1, page 12 of the August 2004 Habart Report it shows the calculation of the direct annual energy savings to calculate the 12.6 GJ of energy savings based on 92% AFUE for a typical high efficiency gas furnace and the differential from the 78% AFUE minimum regulations of the Energy Efficiency Act.

- 45.1 Please identify the purchase availability of mid-efficiency furnaces at 78% AFUE.
- 45.2 Do purchasers of mid-efficiency purchases typically purchase an 80% AFUE furnace? If so, should the 12.6 GJ of incremental energy savings be calculated based on 80% AFUE since that is the base technology choice that the furnace buying customer makes?

**46.0 Reference: Exhibit B-2, BCUC IR#1 71.3**

The table of Terasen's past programs suggests that the programs have existed for time periods ranging from a few months to a few years.

- 46.1 Have the Companies studied the potential impact of program length on the spillover effect? If so what were the findings? To what extent do the Companies believe that a program length of a few months can restrict the opportunity for spillover effects and therefore the potential benefit of the programs?

The current Application is requesting program funding for three years, but the Companies have indicated that several program areas have not been designed in detail (e.g. Energy efficiency for commercial retrofits [IR#1 25.2]; Innovative Technologies, NGV and Measurement [IR#1 33.1]; Trades Training [IR#1 63.1]).

46.2 Can Terasen confirm that because programs that have not been planned in detail, the resulting time frame could be relatively short? To what extent, in Terasen's view might the potential short time frame of planned programs restrict spillover effects? To what extent has Terasen considered allowing an extended time frame for programs?

**47.0 Reference: Exhibit B-2, BCUC IR#1 71.4, and Exhibit B-1, Appendix 10, pp. 44-48**

"Developing a monitoring and verification plan during the program design phase is critical as it ensures that the success of the program can be effectively measured. Frequently monitoring and assessing the progress of programs is also a best practice as it allows for mid-course changes to the programs if needed. (Ex. B-1, App.10, p. 45)"

47.1 Please explain whether Terasen would be able to satisfy all of the best practices described in Exhibit B-1, Appendix 10, pp.44-48, for monitoring, evaluation, and reporting, prior to an eventual proposal being brought forward by the BCPECE Evaluation working group.

**48.0 Reference: Exhibit B-2, BCUC IR#1 73.4**

48.1 Terasen states that: "Crossover effects from the impact of E\* dishwashers on furnace loads were not considered, as the reduction in heat output from an E\* dishwasher is unlikely to be of a sufficient magnitude to affect the thermostat controlling the furnace."

48.1.1 For gas hot water what is the monthly reduction in GJ and kW.h use for the efficient dishwasher?

48.1.2 Does Terasen know if BC Hydro adjusts for cross over effects, and can it provide any quantification of these effects from BC Hydro?

48.2 The Companies' response to question 73.4 states that "HOT2000 indicates that internal heat gains offset primary space heating by a factor of 0.4."

By way of illustrating what it means to say that "internal heat gains (from the fireplace) offset primary space heating by a factor of 0.4," can Terasen provide an example using a 70% efficient fireplace and a 90% efficient furnace to show the incremental energy use arising from a 1 GJ input into the fireplace on an average heating season day.

48.3 Does Terasen have any evidence of the percentage of average fireplace use that occurs in the heating season versus the non-heating season? If so, what is that percentage?

**49.0 Reference: Exhibit B-2, BCUC IR#1 73.1, 74.1, and 75.1**

49.1 Please provide working Excel spreadsheets versions of the tables provided in response to Information Request No. 1 questions 73.1, 74.1 and 75.1.

**50.0 Reference: Exhibit B-2, BCUC IR#1 75.5, Cross Over Impacts with Power Smart**

50.1 Terasen acknowledges that there will be crossover effects when (for instance) a Power Smart lighting program causes the natural gas heat source to provide more output, but that this is exogenous to the Conservation programs. Does Terasen know if BC Hydro accounts for these effects when designing its programs?

**51.0 Reference: Exhibit B-2, BCUC IR#1 77.1, Overlap**

51.1 Terasen states that the BCPECE will ensure that there is no program overlap and that that this should provide reasonable assurance to the Commission. If the BCPECE does not provide guidance prior to a decision being rendered in this matter, how should the Commission proceed?

51.2 Will the BCPECE have enforcement powers?

51.3 Will the BCPECE make rules on inter-utility cross over effects?

**52.0 Reference: Exhibit B-2, BCUC IR#1 78.3, Incentives**

Terasen states:

Basic economics would suggest that, if the incentive was higher, more customers are likely to participate. While the higher incentive does not affect the TRC (as the incentive is a transfer payment between the utility and the program participant), it does increase the cost to the utility, and hence would affect the RIM test. For example, if the incentive for the furnace retrofit program is increased from 50% to 100%, the RIM drops from 0.5 to 0.4. Similarly, if the Commercial near condensing boiler program incentive is similarly increased, the RIM drops from 0.6 to 0.5.

52.1 Isn't it likely that when the incentive increases more customers will participate and since there are likely economies of scale in administration that the TRC will actually improve?

- 52.2 Since the TRC will stay the same or increase as incentives increase, and higher incentives will result in higher DSM, and the Province wishes to pursue all cost effective DSM, and Terasen states cost effectiveness is driven by the resource cost, why hasn't Terasen suggested incentive levels of 100 percent of incremental cost, or even the full capital cost of the EEC measure?

**53.0 Reference: Exhibit B-2, BCUC IR#1 79.1, Participant Benefits**

- 53.1 What is the participant benefit ratio (1) assuming the fuel substitution program exists and (2) in the absence of the program and its incentives (i.e. what would be the benefits and cost to the customer without receiving any incentives)?

**54.0 Reference: Exhibit B-2, BCUC IR#1 80.1, TRC**

- 54.1 Please demonstrate the response to your question by preparing in a table by program, the costs and benefits that comprise the TRC calculation, the ratios for the program components and the sectors, and in total. Indicate how each total and subtotal is calculated.

**55.0 Reference: Exhibit B-2, BCUC IR#1 82.1, RIM**

- 55.1 Please provide the studies upon which your expert consultant relied in order to conclude that a RIM of 0.6 is typical. What RIM is typical for BC Hydro and FortisBC DSM programs?

**56.0 Reference: Exhibits E-1 to E-3; E-6 to E-11, E-13**

- 56.1 Please provide copies of communications to stakeholders requesting support of the application including copies of any letter 'templates' provided to stakeholders.
- 56.2 Does Terasen provide financial support or sponsorship to any of those stakeholders commenting on the Application? If so which ones?

## Attachment 1:

**Ministry of Small Business  
and Revenue**

[www.gov.bc.ca/sbr](http://www.gov.bc.ca/sbr)

June 20, 2008

**Carbon Tax Rates by Fuel Type**

	Units for Tax Rates	July 1 2008	July 1 2009	July 1 2010	July 1 2011	July 1 2012
<b>Liquid Fuels</b>						
Gasoline	¢/Litre	2.34	3.51	4.68	5.85	7.02
Light Fuel Oil *	¢/Litre	2.69	4.04	5.38	6.73	8.07
Heavy Fuel Oil	¢/Litre	3.15	4.73	6.30	7.88	9.45
Aviation Fuel	¢/Litre	2.46	3.69	4.92	6.15	7.38
Jet Fuel	¢/Litre	2.61	3.92	5.22	6.53	7.83
Kerosene	¢/Litre	2.54	3.81	5.08	6.35	7.62
Naphtha	¢/Litre	2.55	3.83	5.10	6.38	7.65
Methanol	¢/Litre	1.09	1.64	2.18	2.73	3.27
<b>Gaseous Fuel</b>						
Marketable Natural Gas	¢/GJ** or ¢/M <sup>3</sup> ***	49.66 1.90	74.49 2.85	99.32 3.80	124.15 4.75	148.98 5.70
Raw Natural Gas	¢/M <sup>3</sup> ***	1.90	2.85	3.80	4.75	5.70
Propane	¢/Litre	1.54	2.31	3.08	3.85	4.62
Butane	¢/Litre	1.76	2.64	3.52	4.40	5.28
Ethane	¢/Litre	0.98	1.47	1.96	2.45	2.94
Refinery Gas	¢/M <sup>3</sup> ***	1.76	2.64	3.52	4.40	5.28
Coke Oven Gas	¢/M <sup>3</sup> ***	1.61	2.42	3.22	4.03	4.83
<b>Solid Fuels</b>						
Low Heat Value Coal	\$/Tonne	17.77	26.66	35.54	44.43	53.31
High Heat Value Coal	\$/Tonne	20.77	31.16	41.54	51.93	62.31
Coke	\$/Tonne	24.87	37.31	49.74	62.18	74.61
Petroleum Coke	¢/Litre	3.67	5.51	7.34	9.18	11.01
<b>Combustibles</b>						
Tires – shredded	\$/Tonne	23.91	35.87	47.82	59.78	71.73
Tires - whole tires	\$/Tonne	20.80	31.20	41.60	52.00	62.40
Peat	\$/Tonne	10.22	15.33	20.44	25.55	30.66

\* Light fuel oil – subcategories of light fuel oil include:

- diesel,
- locomotive fuel, and
- heating oil.

\*\* GJ = Gigajoule

\*\*\* M<sup>3</sup> = cubic meters