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TGI–TGVI_Energy Efficiency and Conservation Programs - Exhibit C5-6

October 16, 2008

British Columbia Utilities Commission
Sixth Floor, 900 Howe Street, Box 250
Vancouver, BC, V6Z 2N3
Attn: Erica Hamilton, Secretary
By Web Posting and courier

Dear Madam:

Re: Terasen Gas Inc. and Terasen Gas (Vancouver Island) Inc.
Energy Efficiency and Conservation Programs Application
BCUC Project No. 3698512; Order G-102-08 and G-130-08

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Please note the following *errata* regarding BCSEA-SCBC's evidence filed as Exhibit C5-5:

- Page 4 (pdf p.7) lines 19-20: The words "While not as ambitious as leading portfolios elsewhere in North America," are deleted.
- Pages 6, line 22, p.7, line 10, 20, p.8, line 3: "JJP-3" is replaced by "JJP-3".

Replacement pdf pages are attached. Hardcopy will be sent by courier.

Yours truly,

William J. Andrews

Barrister & Solicitor

cc. Distribution List by email

A: I reviewed a large number of documents, including

- Exhibit B-1, Terasen Application and Appendices,
- Exhibit B-2, Terasen's responses to BCUC staff Information Request # 1,
- Exhibit B-3, Terasen's responses to BCUC staff Information Request #2,
- Exhibit B-5, Terasen's responses to BC Hydro Information Request #1,
- Exhibit B-6, Terasen's responses to BCOAPO Information Request #1,
- Exhibit B-7, Terasen's responses to BCSEA-SCBC Information Request #1,
- Exhibit B-8, Terasen's responses to CEC Information Request #1,
- Exhibit B-9, Terasen's responses to MEMPR Information Request #1,
- Exhibit B-10, Terasen's responses to ROMS BC Information Request #1,
- Exhibit B-12, Terasen's responses to BCUC staff Information Request #3,
- Exhibit B-13, Terasen's responses to BCOAPO Information Request #2, and
- Exhibit B-14, Terasen's responses to BCSEA-SCBC Information Request #2.

**Q: Summarize your findings, conclusions, and recommendations.**

A: Terasen's plan to increase spending and savings on gas DSM is well-intentioned and commendable. The scale of the Terasen portfolio's spending and savings is reasonable.

I did find two flaws in Terasen's approach to program planning. The first is the economic objectives the Companies adopt in program design and implementation. Rather than maximizing net resource benefits from energy-efficiency programs as dictated by least-cost- planning principles, Terasen's more limited objective is to deliver savings whose benefits merely exceed costs

taken place anyway. I also address Terasen's proposed program design, implementation, and budgets. I present my conclusions and recommendations in Section VI.

## III. Integrating Energy-Efficiency into Gas Resource Planning

### *A. Economics of energy-efficiency resource procurement*

**Q: What is the least-cost planning objective of energy-efficiency resource procurement?**

A: The Commission is an economic regulator. From a purely microeconomic perspective, the primary objective of an economic regulator is to ensure that energy utilities provide safe, adequate and reliable service at the lowest total costs to customers at fair and reasonable rates. To the extent energy-efficiency programs can reduce gas energy requirements for less than the marginal cost of supply, they represent cost-effective supply alternatives that will lower total costs of gas energy service.

**Q: Does the amount of achievable gas efficiency potential vary with respect to cost?**

A: Yes. As with anything else, gas efficiency savings come at an ever increasing cost due to diminishing marginal returns. The next unit of gas savings eventually will have to come from a more costly efficiency measure or a harder to reach customer. Thus, gas efficiency savings potential can be viewed as an increasingly upward-sloping supply curve, as depicted in Exhibit JJP-2.

**Q: What information does Exhibit JJP-2 portray?**

A: This stylized graph plots a hypothetical marginal cost function for gas efficiency supply, with total resource costs represented by the red line. The vertical axis is

in $/GJ, and the horizontal axis is in GJ savings per year. It represents the aggregation of costs and savings from numerous efficiency measures across all participants; each individual participant would display a step function of efficiency savings opportunities in order of increasing cost. Exh. JJP-2 also plots a horizontal dotted line representing a (fixed) value of avoided marginal supply costs per GJ saved. Finally, the green line represents only the utility costs of administering the programs.

**Q: How does this exhibit demonstrate the economic objective of gas efficiency resource investment planning?**

A: Exh. JJP-2 illustrates three essential principles to efficiency program planning, design, and implementation:

1. Energy efficiency savings can be achieved at low or even negative costs for relatively little supply, but eventually should be expected to climb in specific efficiency markets and for individual customers over time as efficiency investment increases. Negative savings costs occur when non-gas "co-benefits" are worth more than the total resource costs of the efficiency measures. Typical examples include electric and/or water savings (such as high-efficiency clothes washers).
2. Least-cost resource planning should seek to maximize net benefits. In Exhibit JJP-2, the total benefits of efficiency investment are the rectangular area below the avoided cost line. The area below the red line from the origin to any amount of savings represents the total resource costs of procuring it. The area above the cost line and below the avoided cost line represents the net resource benefits from any amount of efficiency investment. This area is greatest when the next unit of savings would exceed the avoided cost of the supply it would displace.

This amount of efficiency produces the economically optimal allocation of resources toward gas efficiency procurement.

3. The green line in Exhibit JJP-2 represents the utility program cost of achieving gas efficiency savings. Observe that utilities can acquire efficiency savings by paying for less than the total resource costs of the investments by convincing participants to contribute toward investment costs. As discussed below, customized financial strategies for retrofit projects combining electricity and gas savings can secure substantial customer investment with no negative cashflow, thereby stretching program dollars to achieve greater savings.

### *B. Comparing and Selecting Between Gas Energy-Efficiency Programs*

**Q: How are cost-benefit analyses typically structured for integrated planning purposes?**

A: Best practice is for program benefit/cost analysis to take place in three stages: first at the level of individual efficiency measures likely to apply to eligible customers; the second is at the program level, involving multiple scenarios; the third and final analysis stage takes place at the portfolio level, which involves different combinations of programs.

**Q. What steps does this multi-stage cost-effectiveness analysis involve?**

A: The analysis starts by characterizing the size and composition of each of the three major efficiency markets in each sector over time: new construction; new purchases of products and equipment; and retrofit of existing building and equipment stock. Best analytical practice is to consider a range of efficiency technologies and combinations thereof to determine likely cost-effective savings for typical eligible customers in each market.