

March 17, 2011

Regulatory Affairs Correspondence  
Email: [gas.regulatory.affairs@fortisbc.com](mailto:gas.regulatory.affairs@fortisbc.com)

British Columbia Utilities Commission  
Sixth Floor  
900 Howe Street  
Vancouver, B.C.  
V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

**Re: FortisBC Energy Inc.<sup>1</sup> ("FEI")  
Application for Approval of a Service Agreement for Compressed Natural Gas  
("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs")  
for CNG and Liquefied Natural Gas ("LNG") Service (the "Application")**

**Response to the British Columbia Utilities Commission ("BCUC" or the  
"Commission") Information Request ("IR") No. 3**

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On December 1, 2010, FEI filed the Application as referenced above. In accordance with Commission Order No. G-181-10 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCUC IR No. 3.

If you have any questions or require further information related to this Application, please do not hesitate to contact Shawn Hill at (604) 592-7840.

Yours very truly,

**FORTISBC ENERGY INC.**

***Original signed by Shawn Hill:***

**For:** Diane Roy

Attachment

cc (e-mail only): Registered Parties

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<sup>1</sup> Formerly Terasen Gas Inc.



FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquified Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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## 1.0 WM AGREEMENT – CAPITAL COST ESTIMATE

**Reference: Exhibit B-6, BCUC IR 2.1.3, 2.1.5, 2.1.6, 2.1.7**

- 1.1 What is the current percent completion of the Compressed Natural Gas (CNG) Fueling Station Installation and Operating Agreement dated December 3, 2010 (WM Agreement) facility?

**Response:**

As of the week of March 14, 2011, construction of the fuelling station at WM's premise is 100% complete and the station has been fully commissioned for CNG fuelling service. The only remaining item to be completed is a final inspection by the BC Safety Authority, which is expected to occur before the end of March 2011

- 1.2 The original cost estimate for the WM Agreement facility in the Application was \$737,944. The response to British Columbia Utilities Commission (Commission or BCUC) Information Request 2.1.7 states the estimated total cost to complete the project as of the end of January 2011 was \$38,500 higher than the Application estimate and also refers to \$79,400 for additional filling and protection posts and an inductive voltage survey. It is not clear whether there is some amount of duplication between the \$38,500 and the \$79,400 figures. Please provide the most up-to-date estimate of total project cost, and itemize the items that have caused the project cost to exceed the estimate in the Application.

**Response:**

There is no duplication between the \$38,500 and the \$79,400. The cost estimates throughout this proceeding are summarized below:

- Cost estimate in the Application: \$737,944
- Cost estimate in BCUC IR 2.1.7: \$776,516 (variance of approximately \$38,500)
- Final cost as of the week of March 14, 2011: \$775,031 (variance of approximately \$37,000)

The final variance is \$37,087 or 105% of the budget. The items which caused the project cost to exceed the initial \$737,944 are described below:

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- Additional magnetic mapping of the work area to identify buried services and potential hazards.
- Elevation adjustments to the foundation pads for major equipment and re-work on the spool pieces.
- Two commercially rated protection posts in front of each filling location<sup>1</sup>, as required by the British Columbia Safety Authority ("BCSA").
- Addition of individual grounding cables and a complete vent back system for all filling locations, as required by the BCSA.

In 2011, the actual cost of service associated with the WM fueling station will be offset by any recoveries received from Waste Management, including the margin generated from the separate agreement, and collected in a non rate base deferral account attracting AFUDC. This deferral account will be transferred to rate base effective January 1, 2012. FEI has proposed to recover or refund the balance of this account to FEI non-bypass customers over a three year period beginning January 1, 2012.

As stated in BCUC 2.1.7, the \$79,400 is a separate phase of the project in which FEI will seek cost recovery of in the negotiation for future fleet expansion. As of the week of March 14, 2011, this amount has changed to \$79,701. This amount refers to additional filling and protection posts and an inductive voltage survey. These additional filling and protection posts are located on the East side of the WM facility and are not connected for service. This item differs from the centre filling posts (described in the \$37,000 variance) at the WM facility which have been connected for gas service.

The items in the \$79,701 are not captured in the \$37,000 and there is no duplication of items.

- 1.3 Terasen Gas Inc. (Terasen or TGI) states that actual project cost will include \$79,400 for additional posts and a voltage survey, and that TGI will seek recovery of this cost in future negotiations. Please clarify whether TGI will include this cost in the cost of the facility that it will add to its rate base, or alternatively provide a commitment that TGI will refrain from adding all or an identified portion of the amount to rate base after the facility is completed.

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<sup>1</sup> Located at the centre of the WM facility



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**Response:**

The \$79,400 estimate was for costs associated with installing a second set of fueling posts. This work became necessary when BC Hydro became concerned about a potential safety issue regarding location of the time fill fueling posts on BC Hydro Right of Way beneath overhead transmission lines. The concern was raised after FEI was granted approval to proceed with the station construction; hence it introduced unanticipated costs to the project.

Actual costs for the second set of fueling posts came in at \$47,201. The lower cost was achieved because FEI was able to transfer equipment such as fueling hoses from the first location to the second location.

FEI is treating this incremental cost as "work in progress" towards the future expansion of the fueling facility. It will not attract AFUDC unless the aggregate amount exceeds \$50,000. This expenditure will be added to the fueling station rate base when the next set of vehicles are added to the station and the rates are renegotiated.

- 1.4 BCUC IR 2.1.6 states that TGI contractors are completing associated work on the project that is expected to generate margin of \$141,000, which provides a level of protection for TGI customers. BCUC IR 2.1.7 states that \$113,000 generated from associated work performed for Waste Management of Canada Corporation (WM) by TGI provides a level of protection for TGI customers from budget overruns. Please reconcile the two numbers and provide a breakout by calendar year, describe the work that was done for WM and identify the group(s) at TGI that did the work.

**Response:**

The expected margin of \$141,000 was inaccurately reported in our response to BCUC IR 2.1.6.<sup>2</sup>

FEI apologizes for the error and has provided a table below to reconcile the margin associated with the additional project work completed for WM:

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<sup>2</sup> The 20% markup was inaccurately calculated as a percentage of the "invoiced" total, rather than the "total cost at completion" subtotal.



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Item	Budget in Application	Budget in BCUC IR 2.1.7	Revised Budget as of 2-Mar-2011	Actual Costs as of 2-Mar-2011
Total Cost at Completion:	\$588,688.64	\$ 566,741.85	\$ 577,241.85	\$ 474,215.79
20% Mark-Up:	\$117,737.73	\$ 113,348.37	\$ 115,448.37	
Total to be INVOICED:	<b>\$706,426.37</b>	<b>\$ 680,090.22</b>	<b>\$ 692,690.22</b>	

*Note: Tax not shown in totals*

As shown in the table, the original expected margin was approximately \$117,000 and the revised budget in BCUC IR 2.1.7 was approximately \$113,000. As of March 2, 2011 approximately 90% of the work had been completed, with approximately 82%<sup>3</sup> of the costs actualized. The margin estimate as of March 2, 2011 was approximately \$115,000.

FEI has provided a breakout of the work that was completed and by what groups in Attachment 1.4.

#### 1.5 BCUC IR 2.1.6 states:

"In 2011, the actual cost of service associated with the Waste Management fueling station will be offset by any recoveries received from Waste Management, including the margin generated from the separate agreement, and collected in a non rate base deferral account attracting AFUDC. This deferral account will be transferred to rate base effective January 1, 2012. TGI has proposed to recover or refund the balance of this account to TGI non-bypass customers over a three year period beginning January 1, 2012."

What is the name of the non rate base deferral account, what is its purpose and what Order approved it?

#### **Response:**

The name of this non-rate base deferral account is "CNG and LNG Service- Costs & Recoveries".

The purpose of this non rate base deferral account is to capture all costs incurred and recoveries received prior to January 1, 2012. This deferral account is required because the FEI delivery rates for 2011 do not include forecast costs and revenues associated with CNG and

<sup>3</sup> Calculation: \$475,224 / \$577,242 = 82.3%



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LNG Service, including the WM Agreement; therefore, a mechanism is required to capture all costs and recoveries that will occur in 2011.

FEI has requested approval of this deferral account through this Application (Section 8.4, Item c), page 70). Please refer to the Errata to the Application, filed on December 20, 2010.

- 1.6 In the normal course under a forward test year rate-setting environment, miscellaneous operating revenue typically goes to offset Operating, Maintenance and Administration expenses and so any increase in this revenue is for the account of the utility shareholder. Please explain why the revenue from performing work for WM is not recorded in this fashion, but instead will be reordered in the deferral account and refunded to customers. Is this treatment specific to revenue from WM, or typical of all miscellaneous revenue?

**Response:**

FEI agrees that miscellaneous operating revenue is typically forecast and serves to offset the forecast Operating, Maintenance and Administration expense for that year. The current requested treatment only arises because FEI will be receiving revenues in 2011 from WM, which have not been included in the forecast revenue requirements for 2011. Since rates for 2011 are already determined, FEI has proposed that, consistent with the treatment of all of the other costs and recoveries that result from the WM Agreement, the 2011 amounts be placed into a deferral account to be returned to or recovered from customers. Otherwise, the revenues from the work performed would be to the benefit of the shareholder, when FEI felt that it should be to the benefit of customers.

- 1.7 In any case, please confirm that the revenue that TGI earns doing work for WM will not directly offset in part the completed cost of the WM facility that TGI puts into rate base January 1, 2012, or explain.

**Response:**

Confirmed.

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- 1.8 Considering the information provided in response to the foregoing Information Requests, what is TGI's current best estimate of the dollar cost of the WM facility that it will put into rate base?

**Response:**

The current capital cost estimate of the WM facility, excluding AFUDC, is \$775,031. The current capital cost estimate of the WM facility including AFUDC is approximately \$788,347 and is the amount that is forecast to go into rate base.

- 1.9 Considering the experience with the cost estimates for the WM and the Liquefied Natural Gas (LNG) customer, a desire to limit the risk of cross-subsidy for other customers and administrative efficiency for these relatively small projects, please discuss the pros and cons of the Commission requiring TGI to include a standard minimum contingency amount in the cost estimates used to set rates. Would 15 to 20 percent of estimated cost be an appropriate minimum contingency?

**Response:**

FEI agrees that the addition of a minimum contingency has pros and cons. Requiring a contingency reduces the risks to non-NGV customers, however, FEI believes that such risk is already at a low level and is reasonable in consideration of the load building benefits provided to non-NGV customers. The addition of a contingency has the potential to lead to overcharging customers for the CNG/LNG fueling service. Adding a significant contingency to a low risk project could unnecessarily inflate the cost of service to be recovered from the CNG/LNG customer and discourage adoption of NGVs to the detriment of all customers.

FEI also believes that the need for a contingency is highly project specific and should be left to the discretion of the parties developing the agreement. For example FEI will be including a contingency on its first projects for LNG stations as the experience base on such projects is more limited than on CNG stations. The complexity of a project and site location should also factor in. The Commission will be reviewing each agreement and can assess the reasonableness of the approach taken in the circumstances

In the event that a minimum contingency is necessary, FEI believes it should not exceed 10% as this is consistent with the experience gained on the WM build which was a complicated project. As discussed in BCUC IR 3.1.2, the final construction budget came in at 5% over budget.



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In addition, FEI should retain the flexibility to be able to negotiate agreements which include higher contingencies where warranted by the specific project characteristics. FEI should also retain the ability to negotiate agreements where the final rate is determined on actual costs incurred for those customers that would prefer rates based on this approach rather than projected costs that include a contingency that may or may not be used.



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## 2.0 STANDARD PRO-FORMA CONTRACT

**Reference: Exhibit B-6, BCUC IR 2.2.1, 2.2.2, 2.9.3**

- 2.1 The responses to BCUC IR 2.2.1 and 2.2.2 state that the use of a standard form contract for Natural Gas Vehicle (NGV) customers would not be appropriate as TGI needs to be able to negotiate terms and conditions to accommodate the unique needs of a particular customer. The facilities that a specific customer needs and the cost recovery rate that applies would be unique to the customer. Recognizing this, why would it not be convenient to use a standard pro-forma contract that defines the routine conditions of service, with the description of the details of the facility, the cost estimate and the calculation of the rate for that customer set out in appendixes to the contract?

### **Response:**

As discussed in BCUC IR's 2.2.1 and 2.2.2 referenced above, the Company has proposed in the GT&Cs that the core terms of the agreements such as the take-and-pay provision and the cost of service based rate will remain consistent to ensure consistent and fair treatment of all customers and to minimize financial impact on ratepayers as a whole. In respect of those key terms included in the GT&Cs there is very little practical difference between having the key terms in GT&Cs, with the calculated rate in an agreement that becomes a Tariff Supplement, and having those same terms appear in a pro-forma agreement that is filed as a Tariff Supplement with the calculated rate in an appendix to the agreement. The difference in approach is really most relevant to the terms other than the calculated rate (for which the method of calculation is specified). FEI believes that it is desirable at this stage to retain some flexibility to negotiate with potential customers to ensure that beneficial and cost effective load is captured. The GT&Cs retain that flexibility for TGI to negotiate some of the other potential terms and conditions of service depending on the particular or unique nature of the customer's business and situation such as; term of the agreement, termination, minimum volumes, public refuelling access, price adjustments etc. As discussed in BCUC 3.2.6 a standard pro-forma that fixes some of these provisions as well may be something FEI can move to in the future, once a trend is established in the requirements from the customers. However, given there are only a relatively small number of NGV contracts there is limited efficiency gain at this time from adopting a pro-forma tariff to justify the risk of deterring customers by limiting FEI's flexibility to respond to the customer's commercial realities.



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- 2.2 Please confirm that the Rate Schedule 22 and 22A Tariff Supplements for Bypass Customers are generally structured as described above, or explain.

**Response:**

Confirmed. Please also refer to responses to BCUC IR 3.2.1 and 3.2.6.

- 2.3 Please compare the approach outlined above to the essential terms General Terms and Conditions (GT&C) approach proposed by TGI, from the perspective of TGI's administrative effort and the Commission regulatory efficiency when it reviews each NGV service contract to confirm that it is just, reasonable and not unduly discriminatory.

**Response:**

The Company understands and shares the Commission's desire to have the CNG/LNG service offering be administered in an efficient manner. FEI considered the approach of using a pro-forma contract in developing the rate design for CNG/LNG Service, as a workable pro-forma contract can be a very efficient model. However, FEI concluded that it would be more difficult at this time to develop a "one size fits all" agreement that successfully anticipates varied customer needs than to include the critical terms in straightforward GT&Cs and negotiate the other provisions that might tip the balance to secure cost effective load. FEI expects that a pro-forma contract may become a viable option once FEI has some experience with a number of agreements, and FEI gets a better feel for what customers will require to proceed.

Although some additional review on the part of the Commission is necessary when agreements differ, given the finite number of contracts that will be brought forth on an annual basis, the Company does not feel this approach will be burdensome at this time. The Company will attempt to standardize future contracts as much as possible and will follow the COS principles for all contracts as outlined in the GT&Cs. This would allow a pro-forma contract to develop more organically.

Please also refer to BCUC IR 3.2.1.

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- 2.4 Please confirm that each NGV contract will be filed with the Commission as a rate on a non-confidential basis, or explain.

**Response:**

In order to obtain interim approval, the Company agreed to file the WM agreement non-confidential with respect to decision Order No G-6-11. FEI understands the Commission's views on the issue of confidentiality as expressed in the decision on the WM Agreement and will respect whatever orders are made. FEI continues to believe, however, that there are compelling reasons to maintain confidentiality over future agreements or at least over certain provisions of further agreements even after they are filed as rate schedules. See the responses to BCUC IR's 1.3.1 through 1.3.3 and BCSEA 2.21.4.

FEI believes that the Commission should establish rules as permitted under section 62 of the Act in respect of publically filed rate schedules as it is permitted to do under the UCA to preserve confidentiality over key terms that will be commercially sensitive to the customer and the utility. This could be handled as follows:

- A redacted version should be filed publically; and
- A complete, non-redacted version should be made available to any party with a legitimate interest upon execution of the Commission's standard-form undertaking.

These rules would parallel the Commission's existing guidelines as they relate to documents filed during a proceeding.

FEI is hoping that other intervenors will speak to this proposal in final submissions, as the Company believes its request for confidentiality is ultimately for the benefit of all customers.

- 2.5 Further to the response to BCUC IR 2.9.3, please confirm that a Bypass Customer with a Rate Schedule 22 and 22A Tariff Supplement for Bypass Customers had some ability to select the initial term of the contract, and that the rate in the Tariff Supplement was then based on the initial term of the contract.

**Response:**

Confirmed. FEI's Bypass Tariff Supplements contain details that are unique to each customer. They have evolved over time through several iterations to become more standard. FEI believes that through time the NGV agreements may be able to follow a similar path, but it is not appropriate at this time to start with a standard pro-forma approach.

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- 2.6 TGI notes in response to BCUC IR 2.2.2 that "as more experience is developed, TGI may determine that a more generic offering can service a significant segment of the market, but this approach is not optimal in the initial stages of market development for the NGV market." Would TGI consider it appropriate and workable with regard to the development of the NGV market, if the Commission approved an initial pilot period for CNG and LNG Service in which TGI could negotiate unique non-standard agreements with customers beyond which time TGI would be directed to file an application with a more generic standard form contract or menu of standard form contracts?

**Response:**

This also responds to BCUC IR 3.2.6.1.

As discussed in BCUC IR 3.2.1, considering there are only a relatively small number of NGV contracts there is limited efficiency to be gained at this time from adopting a pro-forma contract to justify the risk of deterring customers by limiting FEI's flexibility to respond to the customer's commercial realities. FEI is not incurring a lot of risk or putting other areas of business in potential conflict and therefore does not feel there should be a timeline or criteria imposed when a generic pro-forma tariff supplement could be used and the business should be allowed to evolve organically to meet the changing needs of the program. However, if the Commission is minded to take the approach of requiring FEI to return with a pro forma agreement in the future, that requirement should be imposed going forward without referring to the present model as a "pilot" and in a way that preserves contractual relationships. FEI's experience with the LNG rate pilot is that designating a service as a "pilot" deters adoption because it implies that customers who take the service could be subject to having the service revoked.

- 2.6.1 What criteria would be applicable in determining that the NGV market had developed to the extent that generic pro-forma tariffs could now be used?

**Response:**

Please refer to BCUC IR 3.2.6.

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### 3.0 CNG & LNG SERVICE FOR VEHICLES – ORDERS SOUGHT

**Reference: Exhibit B-1, Section 8.4, pp. 70-71**

"1. An order pursuant to sections 59-61 of the Act approving:

- a) Depreciation rates applicable to NGV refueling assets as identified in Section 4.6.3.2;
- b) A non-rate base deferral account attracting AFUDC to capture the NGV Fueling Service Application costs incurred in 2010 and 2011 and to recover these costs from all nonbypass customers by amortizing them through delivery rates commencing January 1, 2012 over a three year period."

3.1 There is no Section 4.6.3.2 in the Application; is TGI seeking approval of the depreciation rates identified in Section 5.1.2.3 Depreciation Expense?

**Response:**

Yes, the reference to Section 4.6.3.2 was in error and FEI is seeking approval of the depreciation rates identified in Section 5.1.2.3 Depreciation Expense.

As discussed in the response to BCUC IR 3.3.2, FEI is not seeking approval for the depreciation rate identified for the capitalized overhead component. The depreciation rate of 2.7% is used for financial analysis purposes only.

3.2 Please provide the IFRS and US GAAP support for depreciating capitalized overhead over 37 years (2.7 percent per year) when the majority of the CNG/LNG assets are amortized over 20 years (5 percent per year).

**Response:**

In this Application, FEI has requested approval of the depreciation rates for the NGV refuelling assets, not for approval of the amortization rate for capitalized overhead of 2.7%. The sentence on Page 57 of the Application (Section 5.1.2.3 Depreciation Expense), referring to Table 5-1 which stated "At this time, Terasen Gas is seeking Commission approval for the use of the depreciation rates identified in the table below," should have included the phrase "except for Capitalized Overhead".

For purposes of preparing this application, FEI had used the currently approved average depreciation rate of the gas plant to which overheads capitalized are charged. The incremental

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operating and maintenance expense from the CNG/LNG service will be netted by the 14% overhead capitalization and will be applied to all the Gas Plant in Service additions except for additions subject to CPCN applications, meters and general plant. By including the depreciation on the overhead capitalized this cost is recovered in rates from CNG/LNG customers rather than from all other customers. This average depreciation rate is approximately 2.7%.

The differences between current regulatory treatment of depreciation expense, and treatment under IFRS and US GAAP, will be summarized in FEI's upcoming 2012-2013 Revenue Requirements Application.

- 3.3 Please provide actual the NGV Fuelling Service Application costs incurred in 2010 and the estimated costs to be incurred 2011.

**Response:**

As described in our response to CEC IR 2.15.1, FEI forecasts that total costs will be between \$150,000 and \$200,000. In 2010 total costs were \$29,632.10 and were primarily made up of legal costs for application development. Costs for 2011 thus far are \$40,818.70 in legal costs, \$9,609.25 in costs of advertising as required by the Commission and \$355.78 in courier costs. These amounts total \$80,415.83. FEI expects that there will be additional legal costs, courier costs and cost assessments from the Commission in 2011. FEI forecasts that total costs of this Application will be similar to those forecast in our response to CEC IR 2.15.1. This cost estimate does not include any internal labour costs for the time that has been spent developing the business model, application, and sales activities associated with NGV. These costs are part of FEI existing O&M that was accounted for in the 2010-2011 RRA NSA.

- 3.4 For 2010 and 2011, please provide the number of NGV Fuelling Service applications per year and the average cost of each application.

- 3.4.1 Provide a breakdown of the average application cost by resource by year.

**Response:**

To clarify, the intent of the non-rate base deferral account discussed in the preamble to the IR is to capture costs related to the Application currently before Commission and other projects that may occur in 2011 as it occurs during the term of the current RRA NSA. This was identified in



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the Errata filing submitted on December 20<sup>th</sup>, 2010 and in the record as Exhibit B-1-3. It is not FEI's intent to utilise the deferral account for any future NGV Fuelling Station Applications beyond 2011(for example, a request for a new CNG fueling station and rate approval). For future NGV projects (January 1, 2012 and beyond) the project and their cost will be forecasted as part of Revenue Requirement Applications.

For our response on the costs of this Application please refer to our response to BCUC IR 3.3.4, for our response regarding other NGV-related overheads during the referenced period please refer to our response to BCUC IR 3.5.2.

- 3.5 Please explain why TGI considers the three year amortization of NGV Fuelling Service Application costs incurred in 2010 and 2011, commencing January 1, 2012, appropriate?

**Response:**

Please see the response to CEC IR 2.15.1.

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#### 4.0 CNG & LNG SERVICE FOR VEHICLES – ORDERS SOUGHT

**Reference:** Exhibit B-1-3, p. 1

"Terasen inadvertently excluded item c) and d) from Section 8 Approvals Sought; a request for a non-rate base deferral account to capture all costs incurred and recoveries received prior to January 1, 2012 and an ongoing rate base deferral account to capture CNG and LNG recoveries received from volume in excess of minimum contract demand:

c) a non-rate base deferral account attracting AFUDC to capture the O&M costs and cost of service associated with the capital additions to the delivery system incurred and the CNG and LNG Service recoveries received prior to January 1, 2012, and to recover or refund the balance to all non-bypass customers by amortizing the balance through delivery rates commencing January 1, 2012 over a three year period."

4.1 Please provide CNG and LNG AFUDC, O&M costs and cost of service incurred prior to January 1, 2012 by year, project and resource.

#### **Response:**

The forecast AFUDC, O&M and cost of service incurred prior to January 1, 2012 reflect the forecast 2011 costs associated with the WM agreement and are as follows:

O&M	\$ 18,381
Other Cost of Service	98,803
	<hr/> 117,184
AFUDC	4,004
Total Costs	<hr/> \$ 121,188 <hr/>

It is likely that costs from additional CNG and LNG Service agreements will be incurred in 2011, along with recoveries, and will be included in the non-rate base deferral account. The final agreement terms and contract rates for additional CNG and LNG Service agreements are still unknown and as a result, the costs and recoveries cannot be included in this analysis. In all cases, FEI will seek BCUC approval for the recovery of forecast costs in the rates that are charged to new customers that sign a contract for CNG or LNG Service.

4.2 For 2010 and 2011, please provide the number of CNG and LNG applications per year and the average cost of each application.



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**Response:**

For 2010 there was only one NGV application - this Application - relating to the specific fueling station project that was the Waste Management station and the amendments to our General Terms and Conditions required in order to offer such services. FEI is as yet uncertain of the number of applications related to NGV refueling that will come forward in 2011. There are seven potential refueling projects presently identified as potential future customer contracts for which FEI will seek approval from the BCUC. The most likely next refueling project is the Vedder Transport agreement currently being negotiated and previously detailed in our response to BCUC IR 2.25.1.

FEI envisions that the process involved in obtaining approval for future agreements like that with Vedder Transport will be considerably simplified in comparison to the current process, as the agreements will be following the methodology in approved GT&Cs and there will be no need to repeat the public interest review because future fueling station expenditures will typically be addressed in a future RRA. The inquiry on future agreements should be focussed on (a) ensuring that the rate follows the cost of service and "take or pay" principles articulated in the GT&Cs, and (b) that other terms such as the length of the contract and cost recovery provisions allocate risk and reward appropriately. The nature of the regulatory process adopted by the Commission will be one of the key drivers of the costs. Provided that the above approach is taken, and the regulatory process is kept to a minimum commensurate with the modest size of the investment, the costs of each application might be expected to be well below \$20,000.

- 4.3 Please provide CNG and LNG recoveries received prior to January 1, 2012 by year and project.

**Response:**

The forecast recoveries received prior to January 1, 2012 reflect the forecast 2011 recoveries associated with the WM agreement and are as follows:

Compression Agreement	\$ 100,906
Service Contract Revenue	\$ 115,000
Forecast Recoveries	\$ 215,906

It is likely that recoveries will be received from additional CNG and LNG Service agreements in 2011; however, the final agreement terms and contract rates are still unknown and cannot be included in this analysis as a result. FEI will seek BCUC approval for the rate that is charged to new customers that sign a contract in 2011 for CNG or LNG Service.

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"d) effective January 1, 2012, an ongoing rate base deferral account to capture incremental CNG and LNG recoveries received from actual volume in excess of minimum contract demand, to be refunded to all non-bypass customers by amortizing the balance through delivery rates over a one year period, commencing the following year."

- 4.4 Please explain why the volumes in excess of minimum contract demand, should be refunded to all non-bypass customers by amortizing the balance through delivery rates over a one year period, rather than two or three years.

**Response:**

FEI has proposed that, commencing January 1, 2012, recoveries associated with volumes in excess of minimum contract demand are refunded to all non-bypass customers over a one year period to pass on the delivery rate benefit as soon as possible.

- 4.5 Please provide the accounting treatment for CNG and LNG AFUDC, O&M costs and cost for projects after approved after January 1, 2012.

**Response:**

The costs and recoveries associated with CNG and LNG Service after January 1, 2012 will be addressed and embedded in FEI's future Revenue Requirement Applications, as a result AFUDC, O&M and project costs as well as contract revenue and other recoveries will be embedded in FEI non-bypass delivery rates.

- 4.5.1 Will this issue be addressed in Terasen 2012-2013 Revenue Requirements Application?

**Response:**

Yes, please see the response to BCUC IR 3.4.5.1.

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## 5.0 CNG & LNG SERVICE FOR VEHICLES – FINANCIAL ANALYSIS

**Reference: TGI 2010-2011 Revenue Requirements Application (TGI 2010-2011 RRA), PART III: SECTION C – TAB 11: ACCOUNTING AND OTHER POLICIES, pp. 491-492**

### "2) HIGHLIGHTS

In evaluating cost drivers and methodologies to consider in allocating costs, Terasen Gas used the following criteria:

- Direct causal link of overhead costs to capital activity;
- Overhead costs must be distinguished from those that are directly charged to capital;
- Are the costs to be included in overhead incremental in nature (i.e. would not be incurred if the capital program were not required);

...For departments where there are identifiable, direct activities in support of capital activity (Distribution, Transmission, Marketing, Business Services, Regulatory and Finance), managers of the department were asked to conduct a detailed analysis to estimate the portion their employees' time related to capital activity but not being charged to capital directly. For these employees, a proportionate share of all their costs excluding labour time already directly charged to capital was then allocated to the capitalized overhead pool." (TGI 2010-2011 RRA, pp. 491-492)

5.1 Please discuss the direct causal link of overhead costs to capital activity for the NGV CNG, and LNG O&M costs capitalized.

### **Response:**

Overhead capitalized is a pool of costs that represents costs that have not been charged directly to the direct costs of capital activities but are incremental in nature and incurred in support of the capital activities. To account for all costs associated with capital activities, in addition to the direct costs such as engineering planning and design and construction crews' time and vehicles, the overhead capitalized costs are also allocated to all the Gas Plant in Service additions including NGV, CNG and LNG but exclude CPCN additions, meters and general plant.

For purposes of preparing this application and determining the contract rates, FEI used the currently approved method for overhead capitalization. The incremental operating and maintenance expense from the CNG/LNG service will be netted by the approved 14% overhead capitalization rate that is applied to all FEI operating and maintenance expenses. By including

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the capitalized overhead in the determination of the contract rates, the associated costs are recovered in rates from CNG/LNG customers rather than from all other customers.

To clarify, a direct causal link does not however exist between the NGV, CNG and LNG capital costs from the ongoing operating and maintenance costs of the capital assets.

- 5.2 Please provide the number of Terasen employees directly involved in NGV, CNG and LNG programs in 2010 and 2011.

**Response:**

This response will also address BCUC IRs 3.5.2.1, 3.17.2 and 3.20.3.

FEI does not track the labour hours of FEI staff engaged in the NGV program, as staff costs to develop and administer programs like the NGV program are already provided for in the existing allowed FEI O&M budgets. However, the number of employees dedicated to developing NGV refueling service is relatively small. Only one FEI salesperson is assigned to the file full time and that FTE is supported by employees in the Market Development group who work on a large number of varied projects at any given time. During the course of preparation of this Application and the regulatory proceeding, additional employees have been seconded to the NGV refueling project, as is often the case with other applications to the Commission.

In Order G-141-09, the Commission approved the NSA resulting from the 2010-2011 RRA. The below is quoted directly from the NSA that was approved by the Commission, and explains why costs in support of NGV programs and regulatory applications are correctly included in FEI's current O&M budgets and, therefore, customer rates.

*14. Natural Gas for Vehicles ("NGV")*

*The Commission Issue No. 2 in the Commission Panel's "Issues of Particular Concern to the Commission Panel" stated:*

*"Natural Gas Vehicles ("NGV") – if NGV is to proceed why should the natural gas ratepayer fund this initiative rather than Terasen's non-regulated businesses or the competitive market?"*

*The Parties agree:*

*(a) NGV Rate Schedule 26 - NGV Transportation Service should be approved as filed.*



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*(b) The marketing costs in support of NGV that are included in the revenue requirements Application are appropriately recoverable in 2010 and 2011 rates.*

*(c) Upon acceptance of this Agreement by the Commission, TGI withdraws its request in this Application for the following:*

*i. Rate Schedule 6C NGV Compression and Refueling Service and 6A NGV Refueling Service; and*

*ii. the Compression Service ("CS") Test; and*

*iii. NGV non-rate base deferral account.*

*The Parties acknowledge that these requests are being withdrawn by TGI to facilitate a settlement on other issues presented in this Application. The Parties agree that TGI's withdrawal of its requests regarding NGV is without prejudice to TGI's right to bring forward similar requests in 2010 or 2011 or otherwise in the future. The Parties acknowledge that TGI intends to develop this area of business and that TGI anticipates it will bring forward applications on NGV projects to the Commission on a case-by-case basis during the term of this Agreement and in future years. The Parties agree that TGI is at liberty to do so.*

FEI continues to believe that it is appropriate to treat the costs as part of the overall cost of providing natural gas service as all customers obtain the benefit of the load building. FEI does not break down the O&M by customer class for any other customer classes, and FEI believes that CNG/LNG Service customers should be no exception.

5.2.1 Provide the wages and benefits and the indirect cost (travel, training, meals, etc.) associated with the NGV, CNG and LNG employees by year.

**Response:**

Please see response to BCUC IR 3.5.2.

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## 6.0 DEMAND FORECAST SCENARIOS

**Reference:** Exhibit B-6, BCUC IR 2.32.1; BC Clean Air Action Plan  
<http://www.bcairsmart.ca/transportation/heavyduty.html>; **Azure**  
**Dynamics Balance™ Hybrid Electric drive**  
<http://www.azuredynamics.com/products/balance-hybrid-electric.htm>

"While biodiesel sources hold lower carbon intensity values than CNG and LNG, there are significant challenges and practicalities associated with its production and availability. At present, BC biodiesel production is highly constrained." (Exhibit B-6, BCUC IR 2.32.1)

### "BC Clean Air Action Plan

**Action #5: Retro-fit heavy-duty diesel vehicles.** The government will retrofit its own heavy-duty diesel vehicles, most of which are ambulances, and actively promote the use of biodiesel wherever possible. New requirements will be introduced to make mandatory retrofits of all commercial on-road heavy-duty diesel vehicles by 2009. Retro-fits involve the installation of diesel oxidation catalyst (DOC) filters or any equally effective technology.

**Action #11: Use biodiesel in government diesel vehicles.** Biodiesel is a renewable fuel made from plant or animal-based fats and oils. It is most often blended with diesel fuel and can be used wherever diesel is used, with few or no equipment modifications. Communities with a biodiesel supply have the opportunity to divert waste from businesses such as restaurants and rendering plants away from sewers and landfills.

**Action #12: B.C. Buys Green.** The government has tremendous purchasing power in the marketplace and uses that power to influence development of more environmentally friendly choices. The government will implement its own environmentally responsible procurement strategy. For example, by requiring the use of biodiesel in government vehicles, the government supports ongoing efforts to make biodiesel more commercially available." (BC Clean Air Action Plan)

### "Balance™ Hybrid Electric drive

AZD has developed the Balance™ Hybrid Electric drive system for Ford's E450 Cutaway and Strip Chassis trucks. The Balance™ hybrid electric drive system manages the conventional 5.4 litre Triton gasoline engine and the 5-speed automatic TorqShift transmission to produce a cleaner, more fuel efficient vehicle for your business needs. The hybrid features electric-launch assist, engine-off at idle and regenerative braking which combine to improve fuel economy and reduce greenhouse gas emissions." (Azure Dynamics Balance™ Hybrid Electric drive)

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- 6.1 Please discuss short-term and long-term risks to Terasen's CNG/LNG program from competing technologies such as biodiesel and electric hybrids (reduced demand and stranded assets).

**Response:**

This will also respond to BCUC IR 3.6.2.

A variety of alternative technologies have been proposed for transportation markets. In the present environment two categories of technologies - Biofuels and Hybrid Vehicles - are emerging as viable competitive alternatives. In terms of stranded assets, it is worth distinguishing between the stranding risk associated with the FEI delivery system as a whole, and the risk associated with the specific assets required to provide an individual customer with CNG/LNG Service. The presence of alternatives such as Biofuels and Hybrid Vehicles does not affect the stranding risk associated with an individual CNG/LNG fueling station project, as that risk is defined by contractual terms with the individual customer (such as the term of the agreement, rate, and "take or pay" requirement), and the reusable nature of significant portions of the station assets. The presence of the alternatives such as Biofuels and Hybrid Vehicles tends to increase the long-term stranding risk for the distribution system assets as a whole because it might limit the ability of FEI to penetrate the NGV market over time, thus limiting the amount of cost-effective gas load that can be added to reduce delivery rates for existing and future customers.

Below, FEI addresses the nature of the competition from Biofuels and Hybrid Vehicles, which serves as part of the context for why it is important for FEI to be investing in efforts designed to capture NGV load.

Fuel made from biogenic sources is commonly termed a "Biofuel". The market for Biofuels has established a strong niche position in the transportation market. The main fuels are ethanol and biodiesel, substitutes respectively for gasoline and diesel. The strategy employed in marketing these fuels is to position them primarily as a partial substitute for conventional fuels through blend programs. In the case of ethanol, the target is displacement of gasoline in the light duty vehicle segment and the prevalent approach is to provide a blend of up to 10% ethanol at the pump. In the local BC market an example of this strategy is provided by Husky/Mohawk which has made ethanol blends a key element of their marketing program<sup>4</sup>.

In the case of biodiesel, the target is displacement of diesel primarily in the heavy duty vehicle segment and the prevalent approach is to provide blends of 5% biodiesel with 95% conventional diesel. BC Transit and the City of Vancouver are examples of customers presently using this 5% blend.

<sup>4</sup> [http://www.myhusky.ca/you/fuel/ethanol\\_blended\\_fuel.html](http://www.myhusky.ca/you/fuel/ethanol_blended_fuel.html)



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The blending strategy has so far been fairly successful for the following reasons:

- It allows users to use the new fuel in conventional vehicles;
- It piggybacks on existing fuel infrastructure with only minor capital additions required;
- It leverages limited supply of the Biofuel so that operators can claim to be environmentally responsible with minimal commitments; and
- It allows introduction of higher lifecycle cost Biofuel products at modest blended pricing premium.

The major disadvantage of the blend approach to introducing Biofuels is that the penetration level is limited. Higher level blends are possible but as the percentage of Biofuel is increased operability issues arise such as cold temperature reliability and maintenance issues.<sup>5</sup> In addition as the blend percentage increases, issues with respect to OEM warranties become more complex and challenging because of the increasing challenges with respect to operability and maintenance. Furthermore, the lifecycle cost premium increases as the blend increases.

The introduction of Biofuels in the Canadian environment has been greatly assisted by government programs. These include production cost incentives and market requirements such as Renewable Fuel Standards which require minimum levels of renewable fuels. Legislation in BC drove a minimum of 5% renewable content in motor fuels by 2010.<sup>6</sup> (Subsequently reduced to 3%)

FEI expects that the market for Biofuels in BC will continue to grow, but that penetration will be limited by the economics of Biofuel production and emerging awareness of certain limitations with respect to the life cycle impact of Biofuels. Emerging issues include the widely differing GHG impact of Biofuels depending on the source of feedstock and the land use impact of using agricultural resources (land) for fuel production rather than food production.

Not unlike biodiesel, biomethane supply is presently constrained in BC; however, TGI's Biomethane service offering aims to develop supply in the near term. Biomethane as a transportation fuel could be implemented over the long term. As shown in the table from BCUC IR 2.32.1, biomethane from landfills and anaerobic digestion (delivered as CNG), on a life cycle basis, hold carbon intensity values equivalent or lower than biodiesel and can be 100% substituted for natural gas.

<sup>5</sup> [http://www.biodiesel.org/pdf\\_files/B5\\_warranty\\_statement\\_32206.pdf](http://www.biodiesel.org/pdf_files/B5_warranty_statement_32206.pdf),  
[http://www.mbusha.com/vcm/MB/DigitalAssets/pdfmb/serviceandparts/biodiesel\\_Brochure5.pdf](http://www.mbusha.com/vcm/MB/DigitalAssets/pdfmb/serviceandparts/biodiesel_Brochure5.pdf)

<sup>6</sup> <http://www.empr.gov.bc.ca/RET/RLCFRR/Pages/default.aspx>



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The Company's conclusion is that Biofuel products will be a useful and productive component serving the transportation market but that other solutions are needed, particularly ones that can deliver environmental benefits at lower cost to the end user.

Vehicles that combine a conventional power source such as a gasoline engine with an on-board battery system that can also deliver propulsion through an electric motor are known as ("Hybrid") vehicles. The battery system can generally be charged from the gasoline engine and/or from energy recovered from applying the brakes.

The first Hybrid introduced to the North American market was the Honda Insight which was first offered for sale in 1999.<sup>7</sup> Cumulative North American sales have now reached over 1.5 million units.<sup>8</sup> Hybrid sales peaked at 350,000 units in 2007 and have not increased largely due to poor economic conditions. Sales are expected to increase and may reach 3 to 4% of the new passenger vehicle market within the next few years.<sup>9</sup>

FEI expects that Hybrids will continue to grow in the passenger vehicle market and may emerge to take a significant share of the market as battery technologies improve and cost premiums decline. This growth will not significantly affect the Company's planned NGV strategy which focuses on heavy duty fleet market segments as Hybrids are almost entirely aimed at the passenger vehicle market. There has been limited introduction of Hybrid vehicles into certain heavy duty applications such as transit markets. In general these fleet tests have had mixed results as reported in an assessment published by Transport Canada titles the "Canadian Experience".<sup>10</sup> The Transport Canada assessment also provides the following summary of the advantages and disadvantages of Hybrid buses:<sup>11</sup>

### **Advantages and Disadvantages of Hybrid buses**

Hybrid buses offer the following advantages compared to conventional diesel buses:

- Reduced fuel consumption in the range of 10% to 40%.
- Reduced noise level due to either a smaller internal combustion engine or lower engine rotations per minute
- Extended brake life due to regenerative braking
- Potential for reduced maintenance such as fewer oil changes and less engine wear
- Better acceleration from a stop

<sup>7</sup> <http://www.honda.com/newsandviews/article.aspx?id=5904-en>

<sup>8</sup> HybridCars.com, "2010 Hybrid Cars - The Year Ahead" DECEMBER 31, 2009

<sup>9</sup> HybridCars.com, "2010 Hybrid Cars - The Year Ahead" DECEMBER 31, 2009

<sup>10</sup> <http://www.tc.gc.ca/eng/programs/environment-utsp-casestudy-cs71e-hybridbuses-272.htm#link6>

<sup>11</sup> <http://www.tc.gc.ca/eng/programs/environment-utsp-casestudy-cs71e-hybridbuses-272.htm>

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- Passenger acceptance due to smooth ride and environmental friendliness
- Reduced emissions of GHGs and other pollutants

There are several disadvantages to Hybrid buses:

- The capital cost for Hybrid buses is 50% to 70% more than comparable diesel buses, depending on the options ordered and the order size. It remains to be seen how much the price difference will close as Hybrid buses gain wider usage.
- Battery life has been a significant cost and operational factor. There are three types of batteries typically used for Hybrid buses and they offer different costs, advantages, and disadvantages.

FEI believes that CNG vehicles provide a better overall value proposition to the heavy duty market for the following reasons:

- CNG vehicles are available at a cost premium of 15% versus the 50% to 70% premium for Hybrids.<sup>12</sup>
- Fuel cost savings from CNG vehicles are substantially larger. CNG provides a fuel cost savings of approximately 40% versus the 10% to 40% range claimed for Hybrids.<sup>13</sup>
- CNG vehicles have greater market share and have been proved to be reliable in long term service trials.<sup>14</sup> (18% share in US market and 50% share in European market)
- Environmental emission reductions are superior from CNG technology.<sup>15</sup>

Vehicles which run entirely on electricity, ("EV"), have recently garnered a great deal of attention recently as a potential alternative for clean transportation. At the present time mass market vehicle offerings are not available within the BC market other than electric trolley buses. The advantages of EVs are:

- Zero vehicle based emissions at tailpipe – lifecycle emissions depend on how and where the electricity was generated
- Potential for ubiquitous charging through the electric grid
- Performance comparable to conventional vehicles (passenger market only)

<sup>12</sup> Bid proposal for 25 CNG buses for BC Transit (January 2010)

<sup>13</sup> Based on business case proposal developed jointly with BC Transit (January 2010)

<sup>14</sup> Ealey, Lance A. and Andrew C. Gross. (2008). "The Global Market for Buses, 2000-2010". *Business Economics* (April 2008): 69-76.

<sup>15</sup> GHGenius Model – Heavy Duty Vehicle Emissions

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The disadvantages of EVs are the following:

- The capital cost of the vehicle is generally twice the cost of conventional vehicles. For example the cost of a Ford Transit Connect is approximately \$30,000, while the electric equivalent that was shown at the 2010 Alternative Fuels and Vehicles Conference in Las Vegas had a list price of \$60,000.
- Vehicle charging typically takes up to 8 hours (110 volt service) or 3-4 hours on a 220 volt service. Level 3 "Rapid" charging systems are proposed for commercial operations. Such stations have a capital cost (excluding site costs) of \$64,000 for a 2 outlet station. Such a station would have very limited capacity as it would provide a 50% charge in 10 to 15 minutes.<sup>16</sup>
- Rapid charging infrastructure is not available in British Columbia today.
- Limited range – the range of the vehicle is limited to the charge carried in the battery pack. (2kg battery required for each km of range<sup>17</sup>)
- Environmental performance depends on the source of the electricity used. The current marginal source of electricity in the Pacific Northwest region is thermal energy, which limits the environmental benefits of EVs when viewed on a life cycle perspective. FEI believes that EVs might prove to be a useful long term alternative for passenger vehicle markets, particularly for short commuter vehicle applications. At the present time, however, FEI believes that EVs do not provide a credible alternative for the heavy duty market that comprises our targeted customers for the following reasons:
  - Lack of vehicle availability;
  - Uncertain impact on the electrical grid (assuming more than very minor market share); and
  - Lack of charging infrastructure.

## Summary

In summary, FEI believes there is no single solution for the future transportation market and there will be continued adoption of biodiesel, ethanol as well as natural gas and electric vehicles. FEI's demand forecast detailed in Appendix A-1, takes into consideration the value proposition of natural gas within that segment versus competitive options. If the economics and availability of these other alternatives increases dramatically and reduces demand for the CNG /

<sup>16</sup> Electric Transportation Engineering Corporation, "Electric Vehicle Charging Infrastructure Deployment Guidelines British Columbia, 2009  
[http://www.bchydro.com/etc/medialib/internet/documents/environment/EVcharging\\_infrastructure\\_guidelines09.Pa r.0001.File.EV%20Charging%20Infrastructure%20Guidelines-BC-Aug09.pdf](http://www.bchydro.com/etc/medialib/internet/documents/environment/EVcharging_infrastructure_guidelines09.Pa r.0001.File.EV%20Charging%20Infrastructure%20Guidelines-BC-Aug09.pdf)

<sup>17</sup> NGVA Europe, "The future role of biomethane as a vehicle fuel", P, Boisen, Oct, 2008



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LNG target market FEI has identified in this Application, then the growth demand forecast could be closer to the Low Demand forecast as discussed in Appendix A-1. This may place upward greater upward pressure on delivery rates than would otherwise have been the case were FEI successful in capturing a larger share of that transportation market. However, the Company believes CNG and LNG adoption has strong market potential and the proposed CNG and LNG Service business models mitigate the risk of stranded assets by backing refuelling infrastructure with long-term "take or pay" agreements.

- 6.2 If the availability of biodiesel increases are the "return to base" customers targeted by the CNG/LNG program less likely to convert to CNG/LNG? Please explain.

**Response:**

Please refer to BCUC IR 3.6.1.

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## 7.0 DEMAND FORECAST SCENARIOS

**Reference: Exhibit B-1, Section 2.1.1, p. 10 and Section 3.1.3.2, p. 25; Appendix A1**

"Terasen Gas believes the decline in consumption from light duty vehicles over the past ten years is due a number of reasons:

- Discontinuation of government incentive programs such as the Natural Resources Canada matching grant program in 2006;<sup>7</sup>
- Introduction of hybrid electric vehicles as competitors within the passenger and light duty segments despite uncertainty surrounding the technology; and"

"The assumptions underlying this scenario are:

2. Incentive funding<sup>19</sup> will continue to be a driver to reduce the initial incremental capital cost across the entire target market segments excluding passenger cars;
4. Public policy will continue to support the use of natural gas as a transportation fuel to meet climate action legislative targets;" (Exhibit B-1, p. 25)

7.1 Please discuss the short-term and long-term risks of government incentive funding for CNG/LNG vehicles being discontinued.

### **Response:**

As stated in the question, FEI believes the discontinuation of government incentive program under NRCAN in 2006 contributed to the decline in NGV consumption in the light duty vehicle segment. FEI expects a similar impact on the heavy duty vehicle segment in our NGV Demand Forecast presented in Appendix A-1. At present, there are no government incentives for NGVs in BC outside of small grants available for light duty vehicles through FEI's Rate Schedule 6. The Reference case scenario (quoted as items 2 and 4 in the question) represents the potential demand should incentive funding be available for return-to-base, heavy duty vehicles.

If government funding is not available, FEI expects:

### **In the short-term:**

NGV adoption will only occur if non-government incentive funding (such as EEC funding provided by FEI) is available to reduce the high upfront capital cost barrier of heavy duty NGVs. Despite the fuel savings benefits of natural gas versus diesel, most fleet operators are not a position of excess cash flow to invest in upfront vehicle premiums. If vehicle incentives from any source are not available, FEI expects NGV adoption will not occur in the short-term. If

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multiple sources of funding are available, the market for NGVs could grow at a faster rate than anticipated in the NGV Demand Forecast.

Over the long-term:

NGV adoption may occur if non-government incentive funding is available. Similar to the short-term outlook, if multiple sources of funding are available, the market for NGVs could grow at a faster rate than anticipated in the NGV Demand Forecast.

NGV adoption may also occur if incremental vehicle costs decrease over the long-term. NGV equipment manufacturers may sell engine technology at lower costs to fleet operators if heavy duty vehicle adoption occurs on a global scale (outside of BC), all else equal. Engine manufacturers such as Westport Innovations would benefit from increased volumes through economies of scale, theoretically passing savings to consumers. This is, however, only speculative at this time.

- 7.2 Discuss the short-term and long-term impacts of the elimination of incentive funding for CNG/LNG vehicles on Terasen's Demand Forecast Scenarios. Update the Reference Case, Low Growth and Reference Case Plus Passenger Growth Demand Forecast Scenarios to reflect the elimination incentive funding for CNG/LNG vehicles.

**Response:**

All three demand forecast scenarios consider incentive funding is provided. As such, if no incentive funding for vehicles is available through government or other sources, NGV adoption under all three scenarios will be insignificant over the short and long term. As described in BCUC IR 3.7.1, FEI does not expect NGV adoption will occur in the short term without incentive funding (via Government or 3<sup>rd</sup> parties) for NGVs. Incremental vehicle costs could decrease over the long term that would negate the need for incentive funding; however, such events are only speculative at this time. Thus, FEI considers incentive funding in all three forecast scenarios.

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## 8.0 CAPITAL COST ESTIMATE

**Reference: Exhibit B-6, BCUC IR 2.1.1; Terasen Gas General Terms and Conditions (GT&C), p. 12-1; 2007 TGVl and TGI System Extension and Customer Connection Policies Review Decision (2007 MX Decision), p. 36**

"The costs of providing CNG or LNG service that are used in determining the CNG/LNG rate under the proposed Section 12B are forecasted in the same manner as for an MX test, the volume is predetermined by a "take or pay" provision required by Section 12B, and construction cost variances are capable of being reviewed in a future revenue requirements process in the normal course. Thus, while TGI customers bear cost risk under both the MX and cost of service test for CNG/LNG facilities, the latter reduces volume risk that is present in the case of main extensions.<sup>2</sup> (Exhibit B-6, BCUC IR 2.1.1)

### "Profitability Index

The revenue to cost ratio comparing the revenues expected from a Main Extension project to the expected costs over a set period of time."

(Terasen GT&C, p. D-4)

**"12.3 Economic Test** - All applications to extend the Gas distribution system to one or more new Customers will be subject to an economic test approved by the British Columbia Utilities Commission. The economic test will be a discounted cash flow analysis of the projected revenue and costs associated with the Main Extension. The Main Extension will be deemed to be economic and will be constructed if the results of the economic test indicate a Profitability Index of 0.8 or greater for an individual main extension. (Terasen GT&C, p. 12-1)

The Commission Panel finds such a proposal to be in the public interest and to conform with its Guidelines and approves the proposal to establish a new threshold PI of 0.80 for individual main extensions, and to establish an aggregate PI of 1.10 as the threshold for all main extensions completed on an annual basis. (2007 MX Decision, p. 36)

8.1 Terasen states that a CNG/LNG contract with a "take or pay" provision over the term of the contract (5 years – 10 years) as a lower volume risk than a main extension, but this is only one type of risk. On an overall basis are main extensions a lower risk than CNG/LNG projects due to the requirement for an "aggregate PI of 1.10 as the threshold for all main extensions completed on an annual basis" for each utility? Please explain and include a discussion of risk associated with the "single capital investment" CNG/LNG projects compared to the aggregation of hundreds of main extensions completed on an annual basis.



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**Response:**

FEI understands this question to be referring to the risk to existing customers in both scenarios, and we have answered on that basis.

FEI agrees that volume risk is only one type of risk, but in the case of NGV refueling station assets it is the main risk to existing customers. So long as volume is present, there will be no appreciable stranding risk. It was lost volume, for instance, that resulted in the stranding of NGV assets in the prior initiative, and that is why FEI has developed a rate design that allocates volume risk to an NGV customer through long-term "take-or-pay" agreements. Construction cost risk (i.e. variance from forecast), which is another type of risk to existing customers, is modest with refueling station assets because the majority of assets are acquired through fixed price contracts. .

The MX Test volume risk relates to the forecast attachments and consumption of each project individually and collectively over a twenty year period that is used the determination of the Profitability Index (PI). This volume risk is borne by existing customers in the case of the MX Test. Construction cost risk is similar in both NGV projects and main extensions because forecasts are used in both the MX Test and the proposed GT&Cs. As such, FEI believes the overall risk to existing customers is lower for the construction of an NGV fueling station than for an individual main extension due to the allocation of volume risk to the "take-or-pay" customer.

The MX Test has an individual and an aggregate PI threshold, which calls into question the characterization of the comparison as being between a "single capital investment" NGV refueling projects versus an aggregation of hundreds of main extensions completed on an annual basis. FEI's experience with a significant number of main extensions does, however, provide a good source of information in developing future main extensions. The number of main extensions also requires a streamlined approach to customer additions in the form of the MX Test. A similar track record with NGVs would facilitate the move to a more MX Test-style rate design, rather than requiring the additional protection for existing customers that comes with the "take-or-pay" contractual model FEI has proposed in this Application.

8.1.1 Should CNG/LNG projects also be required to have an aggregate PI of 1.10 on an annual basis for each utility? If not, why not.

**Response:**

No, NGV refueling projects should not be required to have an aggregate PI of 1.10 on an annual basis for each utility. There are a couple of reasons for this.



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First, The MX Test is employed to provide existing customers with some comfort that a main extension will be cost effective from the perspective of the utility. The "take-or-pay" contractual model being proposed for CNG/LNG Service extensions provides a higher level of confidence in recovery of the forecast costs of service than a purpose-specific extension test. FEI considers that requiring additional contractual requirements that shift risk to the NGV customer and reduce the risk to existing customers is a preferable approach to protect existing customers at this time. The contractual approach, while more onerous on the new customer than would be the case applying an MX-type test, makes sense at this time to give existing customers comfort that this offering will be successful. Employing an MX-type test to the CNG/LNG Service facilities would be redundant. Further discussion on the need for the proposed model as opposed to an MX Test model is provided in our response to BCUC IR 3.8.2.

Second, even if an MX-type test were adopted, it would be inappropriate to apply those same PI values to a test adopted for CNG/LNG Service extensions. The FEI and FEVI aggregate PI values of 1.10 were derived from historical main extension data and is specific to these types of projects.

In summary, the cost of service approach taken with individual NGV refueling projects whereby forecast costs are recovered through a contract rate applied to forecast volumes provides the requisite comfort to existing customers without being unduly onerous on potential NGV customers.

- 8.2 The initial CNG/LNG contract is equivalent to the vehicle life (5 -10 years) and the customer may continue with the CNG/LNG vehicles or switch to a different fuel source at the end of the initial contract. Please compare the fuel switching risks of CNG/LNG projects compared to main extensions.

**Response:**

FEI believes that the fuel switching risks are greater with main extensions that employ the MX Test than the proposed CNG/LNG projects.

The MX Test employs forecast load in the calculation of the Profitability Index (PI), which determines the cost effectiveness of an extension. The forecast is based on the best information available at the time, but neither the developer nor FEI controls how the occupants of a subdivision ultimately use the natural gas. For example, some of the homes in a subdivision for which load was forecasted may become occupied by people who do not use their furnaces as much as others, others by people who travel more than average and thus do not have significant energy requirements, and still other homes may become occupied by

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people who prefer other sources of energy despite their pre-installed natural gas appliances and service. FEI then has no recourse against the developer in the event that the actual volumes on that main extension are lower than the developer's forecast and make it ultimately unprofitable.

By contrast, a NGV customer that has signed on to a "take or pay" contract will be obligated to pay into the FEI distribution system for the forecast cost of service of the refuelling assets occurring during the contract, regardless of whether or not they use those assets. Thus, there is protection from fuel switching risk for the entire initial term of a CNG/LNG Service agreement, during which time there will be a significant contribution to cost recovery.

There will be an unrecovered balance at the end of the initial CNG/LNG Service agreement term; however, there are practical factors at play that reduce the risk that fuel switching will occur at the end of the initial term. While a residential or commercial customer might be able to turn down the heat and reduce natural gas consumption at any time, a heavy duty fleet operator will require a consistent amount of some form of fuel so long as the company business remains strong. FEI believes that the prospects of the customer continuing to choose natural gas after the initial term are good because (a) there are the economic and environmental savings associated with displacement of conventional fuels with natural gas; and (b) a customer that has invested in additional vehicles after the installation of the fueling station to enlarge their receipt of these benefits will be highly motivated to renew their contact for refueling services as these latter-acquired vehicles will still have remaining useful life.

The MX Test offers the most practical and efficient method of assessing the large number of main extensions handled by the Company each year, while providing reasonable comfort to existing customers based on a long track record of main extensions. FEI had previously put forward a test similar to the MX Test, without a "take-or-pay" rate, to allow the development of a NGV refueling program in our 2010 – 2011 RRA. FEI believes that such an approach could be workable in light of the barriers to fuel switching that would exist with NGV customers in the absence of a "take-or-pay" rate structure. After concerns from some stakeholders regarding the potential risk to existing customers under such a model, FEI withdrew that proposal "without prejudice" in the NSA and instead developed the model proposed in this Application. This model mitigates against risk to a much greater extent than an MX Test style of model would because of the revenue certainty offered through the "take-or-pay" contract. The MX Test will continue to apply to the extensions required to bring natural gas on the distribution system to the fueling facility, and adding an additional MX Test on top of this and the "take-or-pay" contract that would apply to the CNG/LNG fueling station assets would be redundant. In the future, as the NGV refueling business grows, FEI may revisit its original proposal to adopt an MX-like test for CNG/LNG Service in place of the "take-or-pay" rate structure proposed in this Application.

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## 9.0 CUSTOMER AWARENESS AND EDUCATION

### Reference: Exhibit B-6, BCUC IR 2.1.8

"In general, the customers that TGI will be dealing with for NGV fueling stations will have no expertise or experience with the challenges associated with building an NGV fueling station. TGI has experience in this area and will generate more experience as additional stations are installed. Customers will look to TGI to provide expertise with respect to the design and construction of NGV fueling infrastructure."

- 9.1 Please discuss the possible conflict of interest between Terasen's interest in making a return for its investors and its interest in providing NGV/CNG/LNG customers with beneficial opportunities to reduce their costs.

### Response:

The term "conflict of interest" is a misnomer, as it implies that the utility has a duty to act selflessly to the benefit of potential NGV customers, when in fact this is a circumstance where both parties are driven by different commercial interests to arrive at a mutually beneficial outcome. The interest of the utility, the existing customers and the shareholder are aligned in the cause of maintaining a viable and prosperous utility. FEI believes that this interest requires pursuing NGV customers because this is one of the few opportunities to combat declining use.. FEI, by explaining the benefits of NGV service to NGV customers, helps to promote a viable utility that can continue to serve all customers and provide a return on investment. FEI, existing customers and the shareholder collectively have an interest in serving other new customers, but only to the extent that it aligns with the objective of maintaining a viable and prosperous utility. FEI believes that it is evident to any potential NGV customer that FEI will only add them as a customer if it is cost effective to do so from the perspective of existing customers and the utility. That is what the GT&Cs accomplish, and what formed the foundation of our negotiations with WM. Potential NGV customers have a different commercial interest in reducing their own costs, but it can and frequently will align with the interest of the utility and existing customers. FEI believes that, as with any commercial arrangement, a CNG/LNG Service agreement must be mutually beneficial to proceed.

- 9.2 Given the NGV fuelling station customers' lack of expertise, has Terasen adopted any policies or procedures (i.e. advise the customer to seek third party advice) to ensure that customers make an informed decision regarding NGV/CNG/LNG investments? If not, why not?

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**Response:**

While customers may have no expertise with operating NGV fueling stations, these customers tend to be sophisticated commercial parties. FEI considers that its role is to make the service known to customers and to persuade them of the potential benefits of the offering. FEI has not been directing potential NGV customers to other third parties regarding advice on owning and operating NGV fueling stations (FEI is not aware of such expertise residing within the BC market in any event). FEI has directed potential customers to suppliers of specific equipment such as natural gas compressors (e.g. IMW) and natural gas engines (e.g. Westport and Cummins Westport) where the experience base is known. FEI must take care not to incur potential liability through endorsements of third party service providers who have limited experience in this market. FEI's approach is the same as with any customer addition, and potential customers ultimately have responsibility for their decisions.

9.3 Please discuss the activities that Terasen has undertaken to educate and inform customers regarding NGV/CNG/LNG investments.

**Response:**

FEI's approach to this market is targeted discussions directly with potential NGV accounts. In face to face discussions with potential customers FEI's general approach involves breaking down the supply equation into the following elements:

- Commodity supply
- Delivery of commodity
- Fueling Service

When discussing commodity supply we advise that the customer has various rate options under the various approved FEI tariffs. We also point out that the customer may elect to purchase commodity from a marketer.

When discussing delivery we provide information on the various potential delivery options available under FEI tariffs.

When discussing fueling service, we describe the rate model proposed in this Application. This includes discussion of our requirement for a "take or pay" commitment and the required rate of return built into the service rate. This generally leads into a discussion of the merits of FEI providing this service versus the customer doing it themselves or trying to contract for service.



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The final point of discussion is the value proposition of the complete NGV service offering versus conventional fuel. This generally includes the economics, the environmental benefits and the experience base.

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## 10.0 FINANCIAL ANALYSIS

**Reference: Exhibit B-6, BCUC IR 2.7.3, BCUC IR 2.7.3 Attachment; TGI 2010-2011 RRA, Part III, Appendix D Gas Sales and Transportation Demand, p. 1**

"Effective rate calculation assumes an annual consumption of 95 GJs per year." (Exhibit B-6, BCUC IR 2.7.3)

- 10.1 Please explain why an annual consumption of 95 GJs per year is used, given that actual Rate 1, Residential, consumption has declined from 121.9 GJ per year in 1999 to 99.5 GJ per year in 2008?

**Response:**

An annual consumption of 95 GJs per year was used for a Lower Mainland Rate Schedule 1 Residential customer as this represents a "typical" customer. FEI has experienced a decline in actual consumption levels throughout the last decade, and effective January 1, 2009, FEI adjusted its typical use rates, which are used to represent the "average" consumption levels for different rate classes, in different territories. The typical use rate for a Lower Mainland Rate Schedule 1 Residential customer was decreased from 110 GJs per year to 95 GJs per year January 1, 2009, and FEI believes this is the best representation of Residential consumption.

- 10.2 Please recalculate the response to BCUC IR 2.7.3 using the actual annual consumption for 1991-2010.

**Response:**

Please refer to the response to BCUC IR 3.10.1.

The following table provides delivery charge changes by year for 1994-2010 for a Lower Mainland Rate Schedule 1 Residential customer, both including and excluding delivery rate riders and assuming the normalized actual use rate for each year. Information for 1991-1993 is not readily available.

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<b>TGI Effective Delivery Rate, Lower Mainland Residential Customer (Rate Schedule 1), 1994-2010</b>				
Year	Excluding Delivery Rate Riders		Including Delivery Rate Riders	
	Effective Delivery Rate	% Change from Previous	Effective Delivery Rate	% Change from Previous
1994	2.230	0.0%	2.251	0.0%
1995	2.558	14.7%	2.558	13.7%
1996	2.710	5.9%	2.733	6.8%
1997	2.914	7.5%	2.894	5.9%
1998	2.970	1.9%	2.938	1.5%
1999	2.983	0.4%	3.053	3.9%
2000	3.113	4.4%	3.092	1.3%
2001	3.620	16.3%	3.399	9.9%
2002	3.564	-1.5%	3.653	7.5%
2003	3.688	3.5%	3.865	5.8%
2004	3.865	4.8%	4.060	5.0%
2005	3.916	1.3%	4.061	0.0%
2006	4.089	4.4%	4.202	3.5%
2007	4.016	-1.8%	4.053	-3.5%
2008	4.125	2.7%	4.075	0.5%
2009	4.392	6.5%	4.229	3.8%
2010	4.675	6.4%	4.645	9.8%
<p>*Effective rate calculation assumes the actual normalized use rate for a lower mainland residential customer. This use rate varies year over year.</p>				

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## 11.0 FINANCIAL ANALYSIS

**Reference: Exhibit B-6, BCUC IR 2.7.3 and BCUC IR 2.7.3 Attachment; Exhibit B-10, Appendix E**

### TGI Delivery Rate Change Analysis

Average Delivery Rate Increase (1994-2000)	5.5%
Average Delivery Rate Increase (2001-2010)	3.6%
Average Delivery Rate Increase, Including Riders (1994-2000)	5.2%
Average Delivery Rate Increase, Including Riders (2001-2010)	3.6%

- 11.1 To provide a better understanding of the Undepreciated Capital Cost/Stranded Asset and Revenue Deficiency risks due to higher than forecast O&M inflation, please complete the table below using the data in Appendix E.

### CNG – O&M Inflation and Revenue Deficiency Risk

Inflation Rate	2.0%	3.6%	5.5%
Revenue Deficiency Present Value	XXXX	XXXX	XXXX
Incremental Delivery Margin Benefit	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>
Net Benefit (Cost) to Existing Customers	XXXX	XXXX	XXXX
Undepreciated Capital Cost/Stranded Assets	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>
Net Benefit (Cost) less Stranded Assets	XXXX	XXXX	XXXX

### **Response:**

As discussed in the response to Confidential BCUC IR 1.18.4, the risk of stranded assets associated with the WM agreement is effectively eliminated by clause 9(c) of the agreement which requires WM to purchase the related assets from FEI at their remaining book value in the event that the contract is not renewed at the conclusion of the predefined contract term.

A variation in the actual inflation of O&M expenses has a minimal impact on the revenue deficiency over the contract term as demonstrated below:





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<b>CNG- O&amp;M Inflation and Revenue Deficiency Risk</b>			
<b>O&amp;M Inflation</b>	<b>2.0%</b>	<b>3.6%</b>	<b>5.5%</b>
Revenue Deficiency, Present Value	-	(12)	(28)
Delivery Margin Benefit, Present Value	294	294	294
Net Benefit (Cost) to Existing Customers	294	281	265
Undepreciated Capital Cost/Stranded Assets, Present Value	(194)	(194)	(194)
Net Benefit (Cost) less Stranded Assets	100	88	72

The results shown in the table above have been determined using the following assumptions:

1. The revenue deficiency has been calculated by comparing the present value of the cost of service embedded in the contract rate to the present value of the cost of service under each O&M scenario
2. A discount rate of 6.84%, representing the FEI forecast after tax weighted average cost of capital
3. Incremental delivery margin benefit determined in the response to BCUC IR 1.7.3 (Revised)
4. Undepreciated capital cost equal to the forecast net book value of the NGV refuelling assets as at December 31, 2020 as provided in Appendix E and is discounted at 6.84%

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## 12.0 FINANCIAL ANALYSIS – Operating and Maintenance Costs

**Reference:** Exhibit B-1, Section 5.1.3.1, p.61; Exhibit B-6, BCUC IR 2.10.2, 2.10.4

"In this illustrative model, TGI assumed an O&M cost equivalent to 2% of the fueling system component with the annual O&M cost escalating at 2% per year over the term of the agreement. Subsequent conversations with the manufacturer indicate a range of 3 to 6 % is more reasonable. TGI will adjust its O&M estimates to reflect this." (Exhibit B-6, BCUC IR 2.10.2)

- 12.1 Given the range of uncertainty TGI now sees in the O&M costs associated with the LNG fueling station example, does TGI still consider it appropriate for the LNG fueling station model to incorporate a fixed escalation factor for O&M costs for the term of the agreement? If so, how will TGI determine the appropriate escalation factor?

### **Response:**

The adjustment in the provision for O&M referred to in this question is for the base annual charge, not for the escalation factor. For each project, FEI will determine an estimate of the annual O&M budget based on the equipment that is installed. This is then escalated to reflect inflation in O&M costs at a rate of 2% per year and this is factored into the calculation of the COS.

Note that the rate escalator is a different element unrelated to the O&M cost escalation estimate that was put into the cost of service model. The rate escalator simply adjusts the COS collected over time so that it escalates according to a set rate – in this case 2%. The rate escalator does not change the overall COS collected over time – it just redistributes it over time.

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### 13.0 FINANCIAL ANALYSIS

#### Reference: Exhibit B-6, BCUC IR 2.10.1

13.1 Please update the table below to include the Undepreciated Capital Cost at the end of the 10 year contract.

#### Actual LNG capital costs exceeding forecasts capital costs by 20 percent

	(\$000s)
Revenue Deficiency Present Value	(122.3)
Incremental Delivery Margin Benefit	466.8
Gross Benefit (Cost) to Existing Customers	<u>344.5</u>
Undepreciated Capital Cost/Stranded Assets	

#### Response:

On a present value basis, existing FEI customers continue to benefit in the situation where actual capital costs exceed forecast capital costs by 20 percent and the undepreciated capital cost of the refuelling station assets are considered.

Actual LNG capital costs exceeding forecast 20%	(\$000s)
Revenue Deficiency (present value)	(122.3)
Present Value of Incremental Delivery Margin Benefit	<u>466.8</u>
Net Benefit (Cost) to Existing Customers	<u>344.5</u>
Present Value, Undepreciated Capital Costs/Stranded Assets	208.0
Undepreciated Capital Costs/Stranded Assets	402.8

Note that the undepreciated capital costs are not synonymous with stranded assets, as might be suggested by the labelling used in the above table. FEI believes that the cost recovery risk associated with the long life of the assets can be mitigated in various ways. As stated on page 65 of the Application, the Company estimates that approximately 50% - 70% of the plant costs are portable and can be removed and relocated. Furthermore, the Company may negotiate contractual terms that mitigate the risk of stranded assets, such as those employed in Section 9 of the WM Agreement.



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## 14.0 FINANCIAL ANALYSIS

### Reference: Exhibit B-6, BCUC IR 2.3.1; Exhibit B-10, Appendix E

"No, TGI expects that the initial term of future contracts will vary. TGI will, in general, attempt to maximize the term of the agreement to minimize the risk of stranded assets at the completion of the initial term. For most customers, we expect that the initial term of the contract will be matched with the expected lifetime of the NGVs that are being purchased for that facility. In most cases Terasen Gas anticipates this will be 5 to 10 years." (Exhibit B-6, BCUC IR 2.3.1)

- 14.1 To provide a better understanding of the Undepreciated Capital Cost/Stranded Asset and Revenue Deficiency risks due to contracts being terminated after 5 years, 10 years, 15 years, and 20 years, please complete the table below using the data in Appendix E.

### CNG - Undepreciated Capital Cost/Stranded Asset and Revenue Deficiency Risk

Contract Termination	5 Years	10 Years	15 Years	20 Years
Revenue Deficiency Present Value	XXXX	XXXX	XXXX	XXXX
Incremental Delivery Margin Benefit	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>
Net Benefit (Cost) to Existing Customers	XXXX	XXXX	XXXX	XXXX
Undepreciated Capital Cost/Stranded Assets	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>
Net Benefit (Cost) less Stranded Assets	XXXX	XXXX	XXXX	XXXX
Stranded Assets as a % of Capital Investment	XXX%	XXX%	XXX%	XXX%



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**Response:**

<b>CNG- Undepreciated Capital Cost/Stranded Asset and Revenue Deficiency Risk</b>				
	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>Contract Termination</b>	<b>Years</b>	<b>Years</b>	<b>Years</b>	<b>Years</b>
Revenue Deficiency, Present Value	(12)	0	0	0
Delivery Margin Benefit, Present Value	170	294	382	445
Net Benefit (Cost) to Existing Customers	158	294	382	445
Undepreciated Capital Cost/Stranded Assets, Present Value	405	194	70	0
Net Benefit (Cost) less Stranded Assets, Present Value	(246)	100	312	445
Original Capital Investment (including AFUDC)	751			
Undepreciated Capital Cost/Stranded Assets	563	375	188	0
Stranded Assets as a % of Capital Investment	75.0%	50.0%	25.0%	0.0%

As discussed in Section 6.3 of the Application, FEI believes that the risk of stranded assets associated with the CNG and LNG Service is mitigated by two key factors:

1. Stations are mobile and portable, making relocation to another suitable project a realistic option
2. FEI will seek to negotiate contractual terms that mitigate stranded asset risk, as is the case in the WM Agreement (clause 9(c)).

- 14.2 Should a premium be charged to customers with 5 year contracts to reflect the higher percent of Undepreciated Capital Cost/Stranded Assets at the end of 5 years compared to 10 years? If not, why not.

**Response:**

FEI does not believe it is appropriate to charge a premium for customers that commit to 5 year contracts versus those that may sign up to longer terms for the following reasons:

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- The requirement for a take or pay commitment on the NGV customer class is already more onerous than on other new customer additions in other customer classes which also have issues with respect to potential risk of stranded assets.
- A requirement for a premium would lead to a situation where rates charged result in FEI collecting more than the COS for the time period of the contract. This would lead to cross subsidization of general customers from the NGV customer pool.
- FEI believes it will be difficult to get customers to commit on a take or pay basis to payments that extend beyond the life of the fleet of vehicles they are purchasing. A requirement for a premium would increase costs to NGV customers and this would slow the rate of market transformation.
- FEI is, where possible in the negotiation, attempting to obtain buy out provisions that require a payment from the customer to cover remaining capital on the assets if the fueling agreement is not renewed.
- In general, vehicles that only last 5 years are very high annual mileage vehicles that consume large quantities of fuel (e.g. Class 8 tractor trailers). Therefore, the load building benefits of adding such vehicles are higher. FEI feels that it would be counter-productive to set up a barrier that would make it more difficult to bring NGVs into this sort of service.

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## 15.0 FINANCIAL ANALYSIS

**Reference:** Exhibit B-10, Appendix E; 24th World Gas Conference, F I N A L R E  
P O R T, Study Group 5.3, Utilization of natural gas in transport  
sector, p. 13  
<http://www.viridistech.com/userfiles/International%20Gas%20Union%20NGV%20Presenation.pdf>

"\*There has been a dramatic increase in the numbers of OEM NGV models in the worldwide vehicle market

\*New developments such as high pressure direct injection and turbo charging should increase efficiency, vehicle range, and reduce emissions"

15.1 Please update the analysis in Appendix E and the table below to reflect reductions of 10 percent, 15 percent and 20 percent annual volumes due to improvements in CNG vehicle efficiency when the contract is renewed at the end of initial 10 year term. Provide fully functional electronic spread sheets showing the calculations.

### Improvements in CNG Vehicle Efficiency

(\$000s)			
Improvements in CNG Vehicle Efficiency	10%	15%	20%
Revenue Deficiency Present Value	XXXX	XXXX	XXXX
Incremental Delivery Margin Benefit	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>
Net Benefit (Cost) to Existing Customers	XXXX	XXXX	XXXX
Undepreciated Capital Cost/Stranded Assets	<u>XXXX</u>	<u>XXXX</u>	<u>XXXX</u>
Net Benefit (Cost) less Stranded Assets	XXXX	XXXX	XXXX

### Response:

The table below reflects the renewal term beginning in 2021 and ending in 2030. The source for the incremental delivery margin benefit for the first term of the contract can be found in the response to BCUC IR 3.14.1. The undepreciated capital cost/stranded asset row is zero because the refuelling assets (excluding capitalized overhead) are fully depreciated by the December 31, 2030.



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	(\$000s)			
Improvements in CNG Vehicle Efficiency	10%	15%	20%	
Revenue Deficiency Present Value	(0)	(0)	(0)	
Incremental Delivery Margin Benefit (2011-2020), PV	294	294	294	
Incremental Delivery Margin Benefit (2021- 2030), PV	131	129	126	
Net Benefit (Cost) to Existing Customers	425	422	420	
Undepreciated Capital Cost/Stranded Assets, Present Value	-	-	-	
Net Benefit (Cost) less Stranded Assets, Present Value	425	422	420	

Please refer to Attachment 15.1 for the fully functional electronic spread sheets showing the calculations.

- 15.2 Please update the analysis in BCUC IR 2.8.1 and the table below to reflect reductions of 10 percent, 15 percent and 20 percent annual volumes due to improvements in LNG vehicle efficiency when the contract is renewed at the end of initial 10 year term. Provide fully functional electronic spread sheets showing the calculations.

Improvements in LNG Vehicle Efficiency			
(\$000s)			
Improvements in LNG Vehicle Efficiency	10%	15%	20%
Revenue Deficiency Present Value	XXXX	XXXX	XXXX
Incremental Delivery Margin Benefit	XXXX	XXXX	XXXX
Net Benefit (Cost) to Existing Customers	XXXX	XXXX	XXXX
Undepreciated Capital Cost/Stranded Assets	XXXX	XXXX	XXXX
Net Benefit (Cost) less Stranded Assets	XXXX	XXXX	XXXX





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### **Response:**

The table below reflects the renewal term beginning in 2021 and ending in 2030. The source for the incremental delivery margin benefit for the first term of the contract can be found in the response to BCUC IR 2.10.1. The undepreciated capital cost/stranded asset row is close to zero because the refuelling assets (excluding capitalized overhead) are nearly fully depreciated by the December 31, 2030.

	(\$000s)		
<b>Improvements in LNG Vehicle Efficiency</b>	<b>10%</b>	<b>15%</b>	<b>20%</b>
Revenue Deficiency Present Value	0	0	0
Incremental Delivery Margin Benefit (2011-2020), PV	467	467	467
Incremental Delivery Margin Benefit (2021- 2030), PV	216	204	192
Net Benefit (Cost) to Existing Customers	682	670	658
Undepreciated Capital Cost/Stranded Assets, Present Value	1	1	1
Net Benefit (Cost) less Stranded Assets, Present Value	683	671	659

Please refer to Attachment 15.2 for the fully functional electronic spread sheets showing the calculations.



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## 16.0 FINANCIAL ANALYSIS

### Reference: Exhibit B-6, BCUC IR 2.26.1

"The above NGV customers can expect to save an estimated \$2.1 million per year in fuel costs. In addition these projects are expected to generate incremental revenues under existing TGI tariffs totalling approximately \$596,616/year to the benefit of all TGI customers.

Customer	Estimated Revenue/year
WM Delivery revenue under Rate Schedule 25 <sup>1</sup>	\$38,142
Vedder revenue Rate Schedule 16 (excluding commodity) <sup>2</sup>	\$536,820
Kelowna revenue Rate Schedule 6 (6000 GJ @ \$3.609/gj)	\$21,654
TOTAL	<u>\$596,616</u>

For the Vedder project approximately 52% of the incremental revenue is offset by incremental O&M costs. As detailed in the response to BCUC IR 2.25.2, the remaining \$258k per year is a net incremental benefit that flows through to the benefit of all customers." (Exhibit B-6, BCUC IR 2.26.1)

16.1 Please update the table in BCUC IR 2.26.1 to reflect that for the Vedder project approximately 52 percent of the incremental revenue is offset by incremental O&M costs.

### Response:

The updated table from BCUC IR 2.26.1 is shown below:

Customer	Estimated Revenue/year	Incremental Benefits/year
WM Delivery revenue under Rate Schedule 25	\$ 38,142	\$ 38,142
Vedder under Rate Schedule 16 (excluding commodity)	\$ 536,820	\$ 257,674
Kelowna under Rate Schedule 6 (6000 GJ @ 3.609/gj)	\$ 21,654	\$ 21,654
TOTAL	<u>\$ 596,616</u>	<u>\$ 317,470</u>

The estimates for both Vedder and Kelowna are subject to change pending a final negotiated contract rate with the customer. Fueling service agreements must be reached with each customer and then filed and approved by the Commission before revenue and benefits could be realized.



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Revenue benefits under Rate Schedule 16 are partially offset by incremental O&M costs. As previously stated, if approved, the Vedder project would generate approximately \$258K per year in net incremental benefits that flow through to the benefit of all customers.

- 16.2 Please confirm that the calculation of revenue from the Vedder project assumes a Rate Schedule 16 Variable Charge per Gigajoule of \$3.89. If this is not the Variable Charge used, please indicate the Variable Charge that was used.

**Response:**

Confirmed. The revenue calculation used the Rate Schedule 16 Variable Charge of \$3.89/GJ, which was multiplied by a fuel consumption estimate of 138,000 GJ per year from Vedder.

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## 17.0 FINANCIAL ANALYSIS

**Reference: Order G-141-09, pp. 106-107**

### **"2. Item 13-Alternative Energy Solutions**

Terasen Gas added 9 enhanced sales and business development staff in 2009 estimated to cost \$1.35 million and proposes increases of \$3.0 million in 2010 for an additional 10 enhanced sales and business development staff including \$1.1 million for consultants and studies and a further \$0.6 million in 2011 for 4 enhanced sales and business development staff (BCUC IR 1.72.2 and IR 2.96.2 to 2.96.4; IR 1.114.7). The number of customers are expected to increase between 1.0 to 1.1 percent from 2009 to 2011, but the level of spending in Customer Solutions and Services increases by 17 percent, 27 percent and 8 percent respectively from 2009 to 2011 (BCUC IR 1.96.3)...

### **3. Item 14-Natural Gas for Vehicles ("NGV")**

Terasen Gas proposes to treat as general O&M, rather than track separately, NGV marketing and project development costs incurred prior to signing a contract with a customer for compression and refuelling service (BCUC IR 1.21.1).

Commission staff attempted to obtain information on the NGV marketing costs that are currently incurred through information requests, but were unsuccessful. In Commission staff's view, information on the incremental marketing costs being incurred will be required if Terasen Gas, during 2010 and 2011, applies for approval of Rate Schedule 6 C NGV Compression and Refuelling Service and 6A NGV Refuelling Service, including recovery of the incremental marketing costs, and the Commission is to review the applications on a case-by-case basis as contemplated in the Settlement Agreement." (Order G- 141-09, p. 106-107)

17.1 For 2010 and 2011 please provide the cost of Alternative Energy resources related to NGV/CNG/LNG marketing by year and resource.

### **Response:**

Delivery of natural gas (compressed or liquid natural gas) is part of FEI's natural gas business, not part of the Alternative Energy line of business. CNG/LNG Service benefits flow to natural gas customers, and natural gas resources are used to promote it. No Alternative Energy resources have been used in developing or providing NGV service. This approach is consistent with the Negotiated Settlement Agreement that resulted from TGI's 2010-2011 Revenue Requirements Application, approved by Commission Order G-141-09. In that agreement, the



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following definition was provided: "Alternative Energy Solutions ("AES") mean Geo-exchange, Solar-thermal and District Energy Systems<sup>18</sup>".

- 17.2 Please provide the incremental NGV/CNG/LNG marketing costs for 2010 and 2011 by year and resource.

**Response:**

Please see our response to BCUC IR 3.5.2.

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<sup>18</sup> Commission Order G-141-09, Appendix A, Page 9



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## 18.0 LNG SUPPLY – RATE SCHEDULE 16

**Reference: Exhibit B-1, Appendix C: Exhibit B-6, BCUC IR 2.25.2; Order G-65-09**

- 18.1 Please confirm that the components listed in Table 1 – Rate Breakdown are those used to determine the Variable Charge per Gigajoule for Rate Schedule 16 as originally approved under Order G-65-09.

**Response:**

Confirmed.

- 18.2 Please describe the factors that are used to adjust each of these components on an annual basis. How are they determined and what is the source of the factors?

**Response:**

On June 4, 2009, the British Columbia Utilities Commission issued Order no. G-65-09, approving Liquefied Natural Gas Dispensing Rate Schedule 16 as filed. In the Application, FEI stated that the rate structure of Rate Schedule 16 includes two components:

1. A variable charge with a monthly take-or-pay volume for the liquefaction, storage, transportation and dispensing of LNG; and
2. A cost of gas or commodity charge which will be based on the Sumas monthly Index Price

Furthermore, the variable charge is to be broken down into the following four components, three of which is to be adjusted by the consumer price index on an annual basis to reflect general inflation or deflation in costs. The remaining Transportation from Huntingdon to Tilbury component will be adjusted in accordance with Commission approved changes to the Rate Schedule 22 Delivery Charge, which is likely to occur in conjunction with Revenue Requirement Applications.

Variable Charge Component	Timing of Rate Change(s)	Source for Change
O&M Charge (Liquefaction, Storage & Dispensing)	Annually, January 1	BC CPI, All Items, Monthly Index
Capital Recovery	Annually, January 1	BC CPI, All Items, Monthly Index
Transportation from Huntingdon to Tilbury	As needed	Change in Rate Schedule 22 Delivery Rate
Peaking Arrangement Cost	Annually, January 1	BC CPI, All Items, Monthly Index



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The source for CPI used in the determination of the annual rate schedule 16 change is the Province of British Columbia. Specifically, the British Columbia Consumer Price Index for all items, monthly (2002 = 100). This report is produced by BC Stats on a monthly basis and is sourced from Statistics Canada. The change in CPI is to be applied as follows, using 2011 as an example: January 1, 2011 Variable Charge Component = January 1, 2010 Variable Charge Component x (1 + % Change in BC CPI). If the actual BC CPI is not available at the time the rate change is to be determined, the forecast BC CPI (all items) is used. When the variable charge components change as a result of CPI, FEI will include a copy of the CPI reference as an attachment to the tariff update filing. The most recent website address for the BC CPI (all items) report is: [http://www.bcstats.gov.bc.ca/data/bus\\_stat/econ\\_stat.asp](http://www.bcstats.gov.bc.ca/data/bus_stat/econ_stat.asp).

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## 19.0 LNG SUPPLY – RATE SCHEDULE 16

### Reference: Exhibit B-6, BCUC IR 2.19.1

"In the event that the customer was prevented from purchasing LNG under Rate Schedule 16 due to interruption of Rate Schedule 16 service, the customer would be given temporary relief from the take or pay commitment in the fueling station service agreement for the duration of the supply interruption to the extent that the interruption prevented them from achieving their take or pay commitment in the fueling station service agreement."

- 19.1 Please provide the number of interruptions per year for 2005-2009 by year. Also provide the average duration of an interruption by year.

### **Response:**

Rate Schedule 16 was not in place during this time frame hence there is no historical base to evaluate.

Inventory records at Tilbury show that LNG was available for shipment during the 2005 – 2009 time-frame. This would indicate that interruption would not have been necessary at all during that timeframe had the service existed.

- 19.2 In the event that the Tilbury LNG supply was needed for the core customers during a peak demand period to the extent that the Tilbury LNG supply was fully exhausted, what priority would Rate Schedule 16 customers have in relation to the core customers during the refill period ? Please address various scenarios regarding the timing of the peak demand event including early winter, mid winter and late winter.

### **Response:**

Prior to evaluating this scenario, it is useful to look at the past track record with respect to the Tilbury facility. The facility has been in operation since 1971. Over the past 40 years of service it has been never been fully depleted to service send-out demand in a peak supply period. One reason for this is because if some portion of the LNG supply has been used, it more than likely will be replaced once the event is over. In others words, FEI will begin to refill the facility.

Beginning in 2011, FEI will also have the Mt. Hayes facility in place to service peak requirements. The Mt. Hayes facility adds 1500 MMscf of storage capacity which is 2.5 times the size of the Tilbury capacity. Combining the previous operating history with the addition of





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capacity at Mt. Hayes, FEI believes that the probability of the scenario described in the question is very low.

In the event that such a scenario did occur, FEI's Gas Supply personnel would have to determine the gas supply resources available, which includes acting upon supply provisions within our existing tariff schedules, at the point in time that the tank was depleted, as well as demand and weather conditions at that point in time and prioritize the demand accordingly.

Rate Schedule 16 is an interruptible tariff so it would be prioritized behind the needs for firm service under other rate schedules. The key part of the question is whether Rate Schedule 16 demand should be prioritized ahead of or behind the inventory rebuild activity. This is a decision that is best made in light of the specific gas supply situations in place at that time. Refill of the tank is currently not always initiated after a send-out event. For example, if the tank is emptied in early winter and replacement gas supply is not available and cold weather conditions are projected to continue, Rate Schedule 16 demand would likely continue to be interrupted fully or partially as LNG inventory is rebuilt to some minimum level. On the other hand if the send-out event emptied the tank in later in the winter, gas supply may determine that tank refill is not required and therefore Rate Schedule 16 service would not be interrupted.

At some point as Rate Schedule 16 demand grows and extends beyond the Pilot program, it may be necessary to add additional storage to the Tilbury facility specifically to cover a potential supply disruption scenario. The addition of the Mt. Hayes capacity also needs to be factored into this decision. FEI is at the early stages of determining when and how best to add such additional storage. In the event that storage is added the COS associated with the new assets would be recovered from the new LNG load that is added and this may or may not require an adjustment to the capital contribution component of the Rate Schedule 16 rate. The capital component of Rate Schedule 16 rate is \$0.97/GJ which provides a revenue stream which can be used to justify the incremental investment.

While the RS 16 customers will likely bear the bulk of the costs of adding storage at Tilbury, addition of storage for NGV load may also provide benefits to core customers as this additional capacity would be available in peak load periods hence it may be appropriate to have all customers share in funding a portion of the incremental investment. The specifics of such an addition, how it should be justified, and how the costs should be allocated, would be addressed in detail as part of a CPCN related to the project if applicable. As discussed in the response to BCUC IR 3.21.3 the magnitude of the potential investment in additional storage is relatively minor in comparison to the benefits associated with addition of the NGV load as described in Section 3.1 of the Application.



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19.2.1 To what level would the LNG supply at Tilbury need to be replenished before LNG Service under Rate Schedule 16 could resume? How many days of liquefaction would it take to reach this level?

**Response:**

Please refer to the response to BCUC IR 3.19.2 for the first part of this question.

With respect to the second part of the question, liquefaction capacity at Tilbury is 5.4 MMscfd (5900 GJ/day) and maximum sales under Rate Schedule 16 is 1040 GJ/day. The question assumes that a specific minimum tank level would be established to further restrict Rate Schedule 16 sales. This is not consistent with the present authorized tariff or with the response to BCUC IR 3.19.2. It should be noted, however, that the production rate is 5.7 times the maximum rate of sale permitted under Rate Schedule 16.

19.2.2 What is the maximum length of time that the Rate Schedule 16 customers could expect to be interrupted in the event the Tilbury LNG facility was exhausted?

**Response:**

As stated in the response to BCUC IR 3.19.2, FEI believes the probability of this occurrence would be very low. In the event that the LNG inventory were exhausted, the length of time of Rate Schedule 16 interruption would depend on the gas supply circumstances in place at the time of the interruption and the prioritization decisions made in light of these circumstances by FEI's Gas Supply group.



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## 20.0 LNG SUPPLY - RATE SCHEDULE 16

**Reference: Exhibit B-1, Appendix C; Exhibit B-6, BCUC IR 2.20.2; Order G-65-09**

"The categorization of Rate Schedule 16 as a "pilot" and the expiry of Rate Schedule 16 effective on December 31, 2014 is a factor that limits the ability to sell LNG for transportation applications.

...To date there has been no customer demand for LNG under this Rate Schedule, which reflects that customers are not comfortable purchasing LNG by the truckload and having to invest in and develop their own LNG storage and dispensing systems." (Exhibit B-6, BCUC IR 2.20.2)

"1. Rate Schedule 16 – Interruptible LNG Sales and Dispensing Service is approved as filed, effective June 15, 2009, as an approximately five-year pilot for the period ending December 31, 2014." (Order G-65-09)

20.1 Given the expiration of the five-year pilot on December 31, 2014 will Terasen be applying for an extension of the pilot period? If not, why not?

**Response:**

FEI intends to make an application to the Commission in regards to the future of Rate Schedule 16 at a later date. Given that the pilot program has yet to yield a LNG customer despite significant market and government interest in LNG for transportation applications, FEI believes that approval of our proposed model for offering LNG refueling services in this Application will finally allow the LNG refueling market to develop in British Columbia, and as such, will likely necessitate a possible expansion and/or a permanence to the services offered under Rate Schedule 16.

20.2 For 2009-2010, please provide a summary of TGI's efforts to develop LNG market as a transportation fuel.

**Response:**

In the period from 2009-2010, FEI sales and business development staff had discussions with various parties in the BC transportation market regarding use of LNG as a transportation fuel in various market segments. Our LNG related discussions were concentrated on the following specific sectors:

FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquified Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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1. Heavy Duty Trucking (Class 8 Tractors) – In this sector we engaged in discussions with parties such as Trimac Transportation and Vedder Transportation to try to develop interest in using LNG fuelled tractors. We also engaged in discussions with key companies involved in the distribution channels for such equipment, such as Inland Kenworth to promote interest in the technology. Another area of engagement was with technology vendors such as Westport Innovations to collaborate on the development of the BC market.
2. Marine Applications (Ferries) – In the marine sector we engaged in discussions with BC Ferries and Seaspan regarding conversion of ferries to utilize LNG. We also engaged in discussions with Rolls Royce as a supplier of engine technology to this field.

In addition we promoted the use of LNG for transportation to associations such as the BC Trucking Association.

- 20.3 Please provide a breakdown of the cost of developing the LNG market as a transportation fuel by year and resource (labour, training, travel, and contractor) by year.

**Response:**

Please see our response to BCUC IR 3.5.2.

- 20.4 Given that there has been no customer demand for LNG to date under Rate Schedule 16, please discuss the impact that having less than five years experience with this rate schedule might have on the ability to determine if the current terms and conditions are appropriate for a permanent version of Rate Schedule 16. In particular, describe the specific data and evaluation criteria that TGI believes would be desired and/or required to support approving a permanent version of Rate Schedule 16.



FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquified Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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**Response:**

FEI believes that this discussion is best held as part of a specific application to amend or extend Rate Schedule 16. FEI believes that approval of fueling service as requested in this application will enable experience to be gained under the Pilot that can then be used to determine the merits of amending or extending Rate Schedule 16 service.



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## 21.0 LNG SUPPLY - RATE SCHEDULE 16

**Reference:** Exhibit B-1, Section 3.1.3.1; Exhibit B-6, BCUC IR 2.19.1

"Looking forward, TGI anticipates that additional investment in LNG storage for the transportation market may be required to achieve the growth targets specified in the LNG Application in Section 3.1.3.1. Such additional investment in LNG assets would need to be justified by the additional revenue generated through LNG sales. TGI plans to make the case for such incremental investment once sufficient demand for Rate Schedule 16 sales has been demonstrated and the business has grown to the point where the 1,040 supply limitation associated with Rate Schedule 16 has become a limiting factor to the growth of the business."

21.1 When does Terasen expect to reach the 1,040 GJ/day supply limitation?

### **Response:**

Based on the NGV Demand Forecast presented in Appendix A-1 of the Application, FEI expects to reach the 1,040 GJ/day supply limitation in 2015. The volumes in the table below are based on the Reference Case scenario and include only NGV LNG customers expected under Rate Schedule 16.

Rate Schedule 16 Customers	Total Annual Volume (GJ)				
	2011	2012	2013	2014	2015
Heavy Duty Trucks (ie. Class 8)	22,500	102,500	182,500	262,500	500,000
Marine Vessels	-	-	-	-	92,000

If FEI contracts 1,040 GJ for 365 days, a volume of 379,600 GJ per year would be reached. Based on the above table, FEI's fuel demand estimate would surpass the 379,600 GJ level sometime during 2015, necessitating supply beyond the 1,040 GJ/day limitation. Since Rate Schedule 16 is set to expire at the end of 2014, FEI would be required to submit an application prior to expiry in order for the forecast volumes in the above table to be achieved. Please see our response to BCUC IR 3.20.1 for an additional discussion.

FEI will refine and update this forecast to include new customers such as Vedder Transport, which might cause the supply limitation to be reached earlier than 2015. An updated NGV volume forecast will be included as part of the upcoming 2012/13 Revenue Requirements Application to be filed with the BCUC in May of 2011.

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- 21.2 If additional investment in LNG storage for the transportation market are required, will the incremental cost be allocated to the customers responsible for the additional load (similar to a specific main extension), or allocated to all customers in the Rate Schedule 16 rate class? Please explain.

**Response:**

For clarity, under the MX test, all customers share in the costs of putting the main extension in provided the Profitability Index (PI) threshold is passed (i.e. the forecast new load provides sufficient forecast revenues to offset the costs of the main extension that all customers pay). If the PI is not passed, then the customer requesting the extension is required to make a contribution to the cost of the extension.

The case for incremental investment in LNG storage would be justified by the benefits provided by such investment and these benefits may not be restricted just to Rate Schedule 16 customers. Incremental investment in LNG storage will directly benefit all NGV customers who use LNG under Rate Schedule 16, hence all members of this customer class should participate in bearing some or all of the costs associated with such investment. However, FEI also notes that incremental storage may also increase the capacity available to service peak load requirements, thereby providing a benefit to all customers. In addition as demonstrated in BCUC IR 2.25.2 and BCUC IR 2.26.1, addition of NGV load also provides load building benefits to all customers. Hence FEI does not rule out the possibility of presenting a case where all customers who benefit from the additional storage participate in sharing the costs.

FEI has not made an application for additional investment in storage as part of this application and FEI believes that the best place to address the justification for incremental investment and how the costs will be recovered will be through a CPCN specifically addressing the project if appropriate.

- 21.3 Provide an estimate of the additional investment in LNG storage facilities for the transportation market required to achieve the growth targets specified in the LNG Application.

**Response:**

FEI has conducted a pre-feasibility budget estimate of the costs associated with adding two 1,000m<sup>3</sup> LNG storage tanks to the Tilbury facility. This would add 6% incremental storage to Tilbury at a cost estimated at \$7.25 million (includes a 25% contingency).

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- 21.4 Describe the nature of the facilities expansion that TGI would invest in to meet increased demand for LNG as a transportation fuel as the demand increased to the growth target levels outlined in the Application. To what extent would the facilities include additional LNG storage capacity or additional liquefaction capability or some combination?

**Response:**

FEI believes it is premature to define the extent and nature of the incremental investments in LNG assets that may be required over the next 20 years as part of this application. Please refer to the response to BCUC IR 3.21.3 for a discussion of the mid- term investment that may be required for additional LNG storage at Tilbury. The precise nature and timing of such investments will be developed as the LNG business is grown and this will depend on the rate of market transformation. FEI will apply to the Commission as required for specific approvals for such investments as they become needed and notes that the need for such investments will only come about as a result of successful implementation of the transportation market business plan and will have to be cost effective.

- 21.5 In the event that TGI made additional investments in LNG storage for the NGV market to achieve the growth targets specified in Section 3.1.3.1 of the Application, please describe the costs and benefits this additional capacity would result in for core customers.

**Response:**

This response addresses all questions in the 21.5 series (21.5.1 through 21.5.4)

Please also see the response to BCUC IR 3.21.4.

FEI believes that it is premature to define the impact the incremental assets that would have on core customers, however, given the cost estimate provided in BCUC IR 3.21.3, and the load building benefits described in BCUC IR 2.26.1, there is expected to be a net benefit to core customers. Similarly, the questions with respect to access to proposed storage and rate design are premature and are best answered as part of the regulatory process that will be followed to justify future investments if and when they become necessary. FEI also notes that the need to address such issues will only arise upon successful execution of the initial years of the transportation market business plan and will need to be cost effective.



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21.5.1 What priority would core customers have for access to this incremental LNG capacity relative to Rate Schedule 16 customers?

**Response:**

Please see response to BCUC IR 3.21.5.

21.5.2 Would the design of the Variable Charge for the incremental LNG supply be structured differently from the current rate structure in Rate Schedule 16? Please explain.

**Response:**

Please see response to BCUC IR 3.21.5

21.5.3 Would any of the components of the Rate Schedule 16 Variable Charge be calculated differently for the incremental LNG supply? Please explain.

**Response:**

Please see response to BCUC IR3.21.5.

21.5.4 Would the core customers bear any incremental costs associated with the incremental LNG capacity?

**Response:**

Please see response to BCUC IR 3. 21.5.



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- 21.6 Please confirm that the Rate Schedule 16 Variable Charge is a stand-alone rate that is independent of the overall Revenue Requirement process other than the link to Rate Schedule 22 through the "Transportation from Huntingdon to Tilbury" component.

**Response:**

Confirmed.

Please refer to the response to BCUC IR 3.18.2 for a description of the various components of the Rate Schedule 16 Variable Charge and the source for any changes to those components.



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## **22.0 POTENTIAL DELIVERY RATE BENEFIT TO EXISTING NATURAL GAS CUSTOMERS**

**Reference: Exhibit B-1, Appendix A-1, p. 34**

- 22.1 Please confirm that the potential delivery rate benefit for existing natural gas customers as projected in Section 4 of Appendix A-1 of the Application assumes that the Variable Charge in Rate Schedule 16 remains unchanged over the time frame of the scenarios explored.

**Response:**

Confirmed.

- 22.1.1 Also please confirm that, in the Reference Case, 78% of the potential Total Incremental Margin on line 20 on page 34 of Appendix A-1 is attributable to additional load growth provided specifically by LNG growth by the year 2030.

**Response:**

Confirmed.

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## 23.0 POTENTIAL DELIVERY RATE BENEFIT TO EXISTING NATURAL GAS CUSTOMERS

### Reference: Exhibit B-1, Section 3.1.3.2

"Under the Reference Case, existing natural gas customers benefit with a significant 15.2% reduction, or \$82.5 million, in delivery rates in 2030." Exhibit B-1, Section 3.1.3.2

23.1 Please provide a revised version of Table 3-1 in Section 3.1.3.2 of the Application including only the impact to existing natural gas customers due to the components of the forecast related solely to the projected LNG Refueling Service load.

### Response:

Under the Reference Case, existing natural gas customers will experience a significant 12.3% reduction, or \$66.7 million, in delivery rates in 2030 as a result of the forecast increase in throughput related to the LNG service.

<b><i>Impact to Existing Natural Gas Customers: LNG Service</i></b>	<b>2012</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Forecast Revenue Requirement Reduction (Increase), \$000's</b>					
Reference Case	315	1,991	9,608	32,384	66,725
Low Growth	339	773	4,083	13,083	26,895
Plus Passenger	318	2,010	9,903	33,103	67,765
<b>Approximate Annual Delivery Rate (Decrease) Increase, %</b>					
Reference Case	-0.06%	-0.37%	-1.78%	-5.99%	-12.33%
Low Growth	-0.06%	-0.14%	-0.75%	-2.42%	-4.97%
Plus Passenger	-0.06%	-0.37%	-1.83%	-6.12%	-12.53%

23.2 For the Reference Case, please quantify the benefit, in terms of percentage rate change and total dollars, to existing natural gas customers in terms of delivery rates in 2030 related to the increased throughput arising solely from the projected LNG Fueling Service load?

### Response:

Under the Reference Case, existing natural gas customers experience a 12.3% reduction, or \$66.7 million, in delivery rates in 2030 from the increased throughput arising from the projected



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LNG Fueling Service load. In today's dollars, this is an approximate revenue requirement reduction of \$17.8 million.

Please refer to the response to BCUC IR 3.23.1.



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## 24.0 USE OF BIOMETHANE AS VEHICLE FUEL

**Reference: Exhibit B-6, BCUC IR 2.22.1**

- 24.1 In the event that a biomethane project supplied a NGV station directly without entering TGI's system and a separate rate was developed as suggested in TGI's response to BCUC IR 2.22.1, please describe how the additional load attributed to this project would benefit the core customers.

### **Response:**

In the event that a biomethane project supplied a NGV station directly without entering FEI's system and there is a separate rate that does not include delivery and midstream charges, there wouldn't be a direct load benefit or risk to core customers. However, this scenario is unlikely as NGV demand and biomethane production are unlikely to match up exactly and distribution infrastructure and/ or storage will need to be utilized. The benefit of the Biomethane business model that was approved by the BCUC is that once the gas enters FEI's distribution system, customers may notionally purchase the gas from anywhere on the distribution network and are not limited to have to match up biomethane production with NGV demand.

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## 25.0 OBLIGATION TO SERVE

### Reference: Exhibit B-9, CEC IR 2.1.3

- 25.1 TGI notes that once the Commission approves a tariff offering for CNG and LNG service that TGI is subject to the statutory framework regarding the obligation to serve. Given TGI's proposed approach of negotiating a unique non-standard contract with each customer, please comment on the impact TGI's obligation to serve might have on TGI's ability to negotiate acceptable terms and conditions that appropriately balance the risks between the CNG/LNG customer and the core customers?

### Response:

FEI believes that the obligation to serve under sections 28 and 29 of the UCA in accordance with approved GT&Cs will have only a positive impact on negotiations from the perspective of FEI. Currently, in the absence of any approved rate for CNG/LNG Service there is commercial uncertainty about whether NGVs are a viable option for fleet owners in British Columbia. Having approved GT&Cs in place, with the knowledge that FEI cannot decline to provide service simply because an extension is required or on some basis that contradicts the public interest, will help development of the service. This is key to attracting customers that will contribute throughput to the FEI system.

FEI believes that the obligation to service will have no adverse impact on negotiations with potential CNG/LNG Customers in terms of arriving at an appropriate balance of risk and reward. The obligation to serve is intended to prevent a public utility from refusing to extend service to customers where there is no financial or public interest basis to do so. The obligation is not synonymous with providing service *on any terms the customer wishes*. The UCA sections dealing with an obligation to provide service make it clear that the customer is governed by appropriate terms established by the Commission to address the cost of extending service. Significant aspects of potential agreements will be dictated by the GT&Cs, including the cost of service based rate. In areas where FEI retains some flexibility to negotiate, the requirement that rates must be "just and reasonable" in the circumstances provides a check on unreasonable demands by the customer and provides guidance for FEI in negotiating contracts.

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## 26.0 LNG TRANSPORTATION TO CUSTOMER LNG FUELING STATION

### Reference: Exhibit B-6, BCUC IR 2.21.1

- 26.1 TGI notes that it proposes to create either a flat rate per delivery or charge per GJ for transportation of LNG via tanker to the customer's LNG Service site. Will this rate or charge be incorporated into the LNG Service agreement with the customer or will this transportation service be offered via a separate agreement or rate schedule?

#### **Response:**

The Company intends to offer the rate or delivery charge for transportation of LNG via tanker as an optional clause contained within the LNG Service Agreement. The customer will have the option to select this service or provide their own transportation and delivery.

- 26.1.1 Is approval of the LNG transportation service part of the approvals sought in the Application?

#### **Response:**

It would be more accurate to say the Company is seeking approval of the proposed GT&Cs as described in Section 2 and attached in Appendix B of the Application, which incorporates providing LNG transportation service as part of the LNG Service offering. The GT&Cs explain that the LNG Service will typically consist of transportation and delivery of the LNG from TGI's LNG facilities to the Customer premise by LNG tankers, installing and maintaining LNG fueling station equipment and dispensing of liquefied natural gas.

- 26.2 Please update the table below to show the Gross Benefit (Cost) to Existing Customers and Net Benefit (Cost) to Existing Customers at the end of the 10 year contract. Provide fully functional electronic spread sheets showing the calculations.



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### LNG Tanker Transportation Example

LNG Tanker Transportation Example (\$000s)	
Revenue Deficiency Present Value	(15.4)
Incremental Delivery Margin Benefit	XXXX
Net Benefit (Cost) to Existing Customers	XXXX
Undepreciated Capital Cost/Stranded Assets	XXXXX
Net Benefit (Cost) less Stranded Assets	XXXXX

#### Response:

The identification of a revenue deficiency and undepreciated capital costs are not relevant to the LNG Tanker Transportation Charge. This is because of the following:

- In the response to BCUC IR 2.21.1, the LNG transportation charge is set on an annual basis to recover the annual cost of service which means that on a forecast basis, a revenue deficiency will not occur.
- The delivery charge determined for the transportation of LNG to the customer's fueling station is not designed to recover the capital costs associated with the tanker. This is because the capital costs associated with the tanker are recovered through FEI's non-bypass customer delivery rates. A capital component has been included in the LNG transportation charge to provide a comprehensive rate that represents the total cost of service associated with the tanker and its transportation.

Therefore, because the capital related costs are already recovered through non-bypass delivery rates, the delivery margin benefit to existing customers is the total forecast recovery each year less the O&M costs (which is largely the third party costs from the transport carrier).

LNG Tanker Transportation Example (\$000s)	
Revenue Deficiency, Present Value	-
Delivery Margin Benefit, Present Value	302
Net Benefit (Cost) to Existing Customers	302
Undepreciated Capital Cost/Stranded Assets , Present Value	(22)
Net Benefit (Cost) less Stranded Assets	280

Please refer to Attachment 26.2 for the fully functional electronic spread sheet.

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## 27.0 LNG SERVICE FOR VEHICLES – CODES AND STANDARDS

### Reference: Exhibit B-6, BCUC IR 2.17.6

27.1 TGI notes that work is proceeding on development of a stakeholder code for Canada for the design, construction, operation and maintenance of LNG stations. Please provide an estimate of the stage of completion of this work and the projected date of completion.

27.1.1 Please discuss the potential for codes and standards, in general, and the Canadian codes and standards that are currently under development, in particular, to impact operating and maintenance costs for LNG fueling stations. What actions are typically required for existing facilities when codes and standards are changed or new ones are introduced?

### **Response:**

In March 2010, Natural Resources Canada convened a group of senior stakeholders to launch a development plan for increasing the use of natural gas in Canada's transportation sector. The community of stakeholders expanded to include contributors from virtually every sector. The Natural Gas Use in Transportation Deployment Roadmap is intended to address knowledge gaps, inform decision making, and define government, industry, and stakeholder roles moving forward with specific emphasis on heavy vehicle deployment. There are six working groups, one of which is focused on codes and standards related to compressed natural gas (CNG) and liquefied natural gas (LNG) vehicles, re-fuelling stations, and fuel quality.

The "Codes and Standards" working group immediately identified that Canada does not have codes and standards for LNG vehicles and re-fuelling stations or for LNG as a vehicle fuel. Experience was gained in Canada in 2003-06 with LNG truck demonstration projects in Ontario and British Columbia. (Challenger and Bobel Trucking) The Ontario Technical Standards and British Columbia Safety Authority reviewed and approved the project as the authority having jurisdiction over fuels and pressure vessels. As mentioned in other parts of this report the LNG stations and vehicle equipment were primarily designed and tested to the established NFPA code system.

CSA Z276, *LNG Production, Storage & Handling*, is an existing Canadian code that makes limited reference to LNG for vehicles, but this code is primarily focused on industrial LNG facilities such as LNG import terminals and peakshaving facilities.

Long term objective of developing a Natural Gas Fuelling Code:

- Developing a natural gas vehicle fuelling code that is comprehensive in nature and includes CNG, LNG, LCNG, and renewable natural gas (RNG)

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- Code could be patterned on NFPA 52 but without the hydrogen part as Canada already has a standalone hydrogen fuelling code
- Ultimate objective would be a single North American fuelling code

Developing an all-encompassing natural gas fuelling code will be a lengthy, time intensive process. As all LNG projects are customised, Regulatory authorities will continue to take the approach of referencing the most applicable code in relation to the application. It is not uncommon for regulators to choose to not to adopt a specific code even if it is a Canadian version. This gives them the ability to reference the most applicable code or standard, this is presently the case with the CNG B-108 code. If a code is adopted existing projects are grandfathered and are not required to meet the new code. Upgrades to the facilities will be required to meet the latest adopted code on record.

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## 28.0 LIFECYCLE GHG BENEFIT – LNG FUELLED TRUCK

### Reference: Exhibit B-1, Section 3.3.2, BCUC IR 2.18.1

28.1 In the calculation of the lifecycle GHG benefits for a LNG fuelled truck, the calculation referenced in Figure 3-7 of the Application refers to a component for "fueling, transportation and storage". Does this component include liquefaction, storage, transportation to customer refuelling station, storage and dispensing at the customer site?

#### **Response:**

Yes, this component does include liquefaction, storage, transportation to customer refuelling station, storage and dispensing at the customer site.

The GHGenius model has default assumptions built into the model for such activities. For example, it assumes an LNG tanker truck would travel 161 kilometres from the LNG production facility to the customer refuelling station.

Upon executing actual projects, FEI will adjust these default values for greater accuracy, but for the purposes of a high-level GHG assessment, FEI believes its current approach is appropriate.

28.1.1 Does the calculation used in Figure 3-7 specifically use TGI's Tilbury facility as the basis for the calculation of the "fueling, transportation and storage" component of 131 g/km? If not, how would a "fueling, transportation and storage" component based on the current Tilbury facility compare to the one used in the illustration?

#### **Response:**

Yes, the calculation is reflective of the Tilbury facility. The illustration has used data from GHGenius version 3.18. The default region has been adjusted to BC, meaning the fuel pathways in the lifecycle assessment are BC-specific. Therefore, the values reported in the model are representative of the Tilbury facility as it is presently the only LNG production facility in BC.

28.1.2 What assumptions are made regarding the GHG emissions for the electricity source for the liquefaction component?

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**Response:**

As stated in BCUC IR 28.1.1, the GHGenius model has been adjusted to reflect fuel pathways in the BC region. Therefore the electricity source for the liquefaction component is reasonably representative of BC's present electricity supply mix. The model assumes a generic power mix of approximately 90% hydro, 6% biomass, 4% gas boiler and 1% wind (using rounded numbers).

The GHG emissions associated with the liquefaction component are rather complex and can be found in the GHGenius model version 3.18.

28.1.3 How might the GHG emissions component for "fueling, transportation and storage" change if the Tilbury facility was expanded to support TGI's growth projections for LNG?

**Response:**

The GHG emissions in the GHGenius model based on are values collected by Natural Resource Canada in their survey of Canadian utilities. The "fueling, transportation and storage" component is a calculation performed by the GHGenius model. Therefore FEI is not in a position to speculate on its impact from potential future facility expansions at Tilbury.

28.1.4 Does this calculation assume a "large" customer installation or a "smaller" customer installation as defined in the context of TGI's response to BCUC IR 2.18.0? What is the expected impact on the calculated 131g/km component if the customer was "large" rather than "smaller" and vice versa?

**Response:**

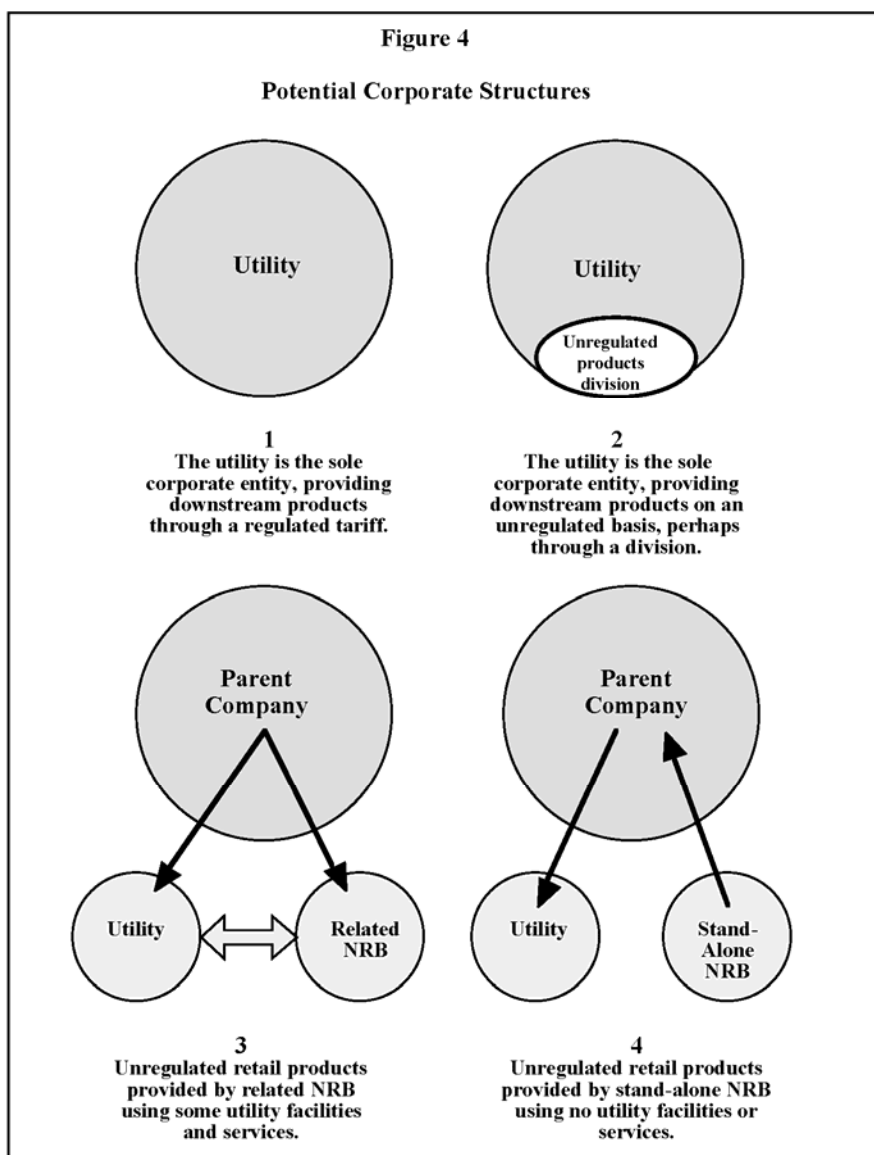
FEI's current understanding of the GHGenius model is that it considers "large" customer installations in its calculations. Upon executing actual projects, FEI will adjust the model's default values to account for each customer size. But for the purposes of a high-level GHG assessment, FEI believes its current approach is appropriate.

FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquified Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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## 29.0 CNG AND LNG FUELING AS A NON-REGULATED SERVICE OFFERING

**Reference: Exhibit B-6, BCUC IR 2.29.0; Retail Markets Downstream of the Utility Meter Guidelines report dated April 1997**

In the Retail Markets Downstream of the Utility Meter Guidelines report of April 1997, the Commission described four potential corporate structures and established principles as follows regarding the choice of corporate structure when utilities expand the services they offer.



(Retail Markets Downstream of the Utility Meter report dated April 1997, p. 4)

FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquefied Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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"Accordingly, the Commission accepts that the following principles should govern the choice of corporate structure.

- (i) If a natural monopoly exists for the good or service, it should be provided as a regulated tariff item (Corporate Structure 1 in Figure 4).
- (ii) Utility participation in the unregulated downstream market by completely stand-alone NRBs using no utility resources is the preferred option since it provides the maximum protection to utility ratepayers (Corporate Structure 4 in Figure 4). Variations from this option should be undertaken only when it can be shown that this option would result in substantial stranded costs for the utility and/or that a transfer pricing policy mechanism will act to provide sufficient protection for ratepayers.
- (iii) The onus should always be on the utility to prove that the benefits associated with use of utility resources are sufficient to warrant the changed structure and that the transfer pricing policy mechanism will provide sufficient protection to ratepayers.
- (iv) If the Commission decides to allow the use of utility resources in the provision of the unregulated good or service, the preferred option is through a related-NRB (Corporate Structure 3 in Figure 4).
- (v) Direct participation by the utility in the provision of an unregulated good or service should be allowed only when the costs associated with forcing the provision through the related-NRB structure would significantly offset the benefits associated with the use of the utility's resources and it can be shown that a transfer pricing policy mechanism will provide sufficient protection for ratepayers (Corporate Structure 2 in Figure 4).
- (vi) Utilities and their related-NRBs will be encouraged to move unregulated products which use utility resources into stand-alone NRBs as soon as market conditions warrant (Corporate Structure 4 in Figure 4). When a utility-provided product is moved to an NRB, the NRB will be required to pay fair market value to the utility for the assets, including goodwill, associated with the product. In addition, utilities will be required to provide periodic proof that the benefits associated with the use of utility services continue to exist and that ratepayers continue to be sufficiently protected. The Commission will make directions to prohibit the use of utility assets and services in the provision of goods and services downstream of the retail market at any time that it finds it in the interests of ratepayers to do so."

(Retail Markets Downstream of the Utility Meter report dated April 1997, p. 24)



FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquified Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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- 29.1 Please describe the pros and cons of each of the four potential corporate structures with respect to the costs and benefits to the ratepayers in the specific case of providing CNG and LNG fueling service.

**Response:**

There is an implicit assumption in BCUC 3.29.1 and 3.29.2 that the provision of CNG/LNG Service is a retail service downstream of the meter to which RMDM Guidelines would apply. FEI believes that this assumption is incorrect, making RMDM inapplicable.

**RMDM Principles**

The following three considerations demonstrate that the RMDM principles outlined in the preamble are inapplicable.

First, the RMDM Guidelines were established in the context of FEI's predecessor company expanding in to the area of selling and servicing domestic furnaces. In other words, the services were related to end uses, rather than [per the definition of "public utility"] the "production, generation, storage, transmission, sale, delivery or provision of...natural gas..." to the end user. The analogy in the current circumstances would be if FEI was proposing to sell and service garbage trucks, which FEI is not proposing to do. FEI's CNG/LNG Service involves the provision of natural gas services upstream of a meter, in this case the meter at the fueling station. The proposed service is allowing the delivery of the natural gas in usable form, such that it can be used in a garbage truck etc.

Second, with the above context in mind, it is actually a misnomer to say that the utility is expanding the service it offers in the way it was when the RMDM came about. FEI has previously offered CNG service and has an approved pilot for LNG. What really differentiates this proposed offering from the past NGV offering is the *proposed rate design* (i.e. "take-or-pay", cost of service rate etc.), not FEI's decision to offer CNG and LNG. FEI's previous regulated offering of CNG service was a tariff offering and coexisted with the RMDM Guidelines until 2000 when the Commission approved the sale of the related assets and ordered FEI to amend the rate schedules to indicate that the Company no longer provided a regulated compression and dispensing service<sup>19</sup>.

Third, unlike the circumstances where FEI's predecessor company was entering the business of selling and servicing furnaces, there is explicit recognition in the UCA for a regulated entity providing CNG and LNG services as *regulated* public utility services. This is because CNG and

<sup>19</sup> Order G-143-99, January 6, 2000



FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquefied Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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LNG involves the "production, generation, storage, transmission, sale, delivery or provision of...natural gas..." to the public for compensation, and the definition of "public utility" only excludes the "petroleum industry" (defined as including CNG and LNG) from regulation to the extent that the "petroleum industry" entity providing the service is "not otherwise a public utility" ["public utility", s.1, (e)]. The consideration of whether FEI has a natural monopoly over a service (reflected in principle #1 in RMDM) is a backdrop to the justification for regulation of public utilities, but the Commission's jurisdiction must first and foremost be defined by reference to the express wording of the UCA. In light of the definition of "public utility", the availability of alternative providers of CNG/LNG, assuming there are any currently, cannot be a legitimate basis to preclude FEI from offering CNG/LNG service.

Thus, CNG/LNG Service, when offered by FEI, is a service that is upstream of the utility meter. The principles outlined in the preamble are thus inapplicable. Even if the RMDM provisions were to apply, the Commission stated that "the Commission has jurisdiction to prohibit a public utility from participating in RMDM if prohibition is the only reasonable and effective means by which the Commission can mitigate or alleviate any negative effects on ratepayers." (RMDM, p.8) Regardless of how the CNG/LNG Service is characterized (upstream vs. downstream), the rate design proposed sufficiently protects existing ratepayers and the residual risk is modest in light of the potential benefits.

## Corporate Structure

In terms of corporate structure, the UCA would preclude FEI from providing CNG/LNG Service on an unregulated basis (i.e. having unregulated CNG/LNG division, which is the second possible corporate structure outlined in the RMDM Guidelines). Thus, the alternative to FEI's offering of the service as a regulated service (model 1) is to require non-regulated entities to provide that service (models 3 and 4). In theory, Fortis Inc. could establish a new, non-regulated entity to engage in CNG/LNG services. Since model 4 is unlikely to be cost effective, the only feasible alternative is model 3, which would use the same utility services and facilities and employ transfer pricing.

The "pros" of this approach from the perspective of existing ratepayers is that some modest stranding risk and construction cost risk is avoided. The risk is shifted entirely to the shareholder, which leads to an inequitable scenario where the most significant benefits from the shareholder's investment are obtained by the customer of the regulated utility, and the risks are being borne exclusively by the shareholder. In the end, customers' avoidance of this modest risk is likely to be an illusory benefit because there will not be the same number of projects coming forward for the benefit of existing customers. Fortis Inc. is unlikely to invest in CNG/LNG through an unregulated corporate vehicle. Existing FEI customers would still obtain any benefits from other market participants proposing projects that take natural gas load, but there is little doubt that customers would be much further behind than if FEI was actively



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promoting the market. Delays in adding cost effective load will leave declining use rates unchecked for now, and will contribute to a higher risk profile for the utility (with an associated higher cost of capital, all else equal). Potential NGV customers would also have fewer options available to them, and thus be worse off.

FEI believes that NGV is one of the few viable ways to combat declining use rates and the utility will ultimately have to be fully engaged in the NGV business. FEI believes that doing something now is preferable from the perspective of all stakeholders than doing nothing and waiting until the problem becomes more critical. FEI is convinced that the real issue should be one of arriving at the right rate design to allocate risks and benefits appropriately, not whether the investment makes sense at all. FEI believes that the proposal to invest in CNG/LNG assets, backed by contractual commitments that minimize risk to existing ratepayers, is in the public interest.

- 29.2 Please address how TGI's choice to provide a regulated service offering for CNG and LNG fueling aligns and meets the criteria for each of the Principles set out above.

**Response:**

Please see the response to BCUC IR 3.29.1.

FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquefied Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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### 30.0 NET ENERGY EFFICIENCY

#### Reference: Exhibit B-1, Section 3.2

30.1 Please provide in table format the net energy efficiency of the delivered fuel taking into account processing energy losses (e.g. due to compression, liquefaction, storage) from the point of delivery off the utility distribution system, the typical vehicle range in kilometres and the cost of the fuel delivered in dollars per GJ for each of the following vehicle categories:

- Light duty trucks (CNG)
- Medium duty trucks (CNG)
- Heavy vocational trucks (CNG)
- Heavy duty trucks (LNG)
- Buses (CNG)
- Marine vessels (LNG)

#### **Response:**

FEI does not have data providing net wells-to-wheels net engine efficiency of fuels corresponding to the vehicle classes defined above. FEI relies on the wells-to-wheels fuel efficiencies that have been determined in the GHGenius model developed for Natural Resources Canada. This model provides a detailed evaluation of all elements of a fuel supply chain from the point of production through to end use in a vehicle. This includes elements such as the chemistry and combustion by-products of the fuel, CO<sub>2</sub> emissions associated with production of the fuel, energy used to transport the fuel to market and energy used to prepare the fuel for use in a vehicle (e.g. compression or liquefaction of NG). The model has also been adopted for use by the BC Provincial Government in setting its Carbon Intensity values by fuel type for the Low Carbon Fuel Requirements Regulation ("LCFRR"). Key values for CNG and LNG in comparison to other fuels are provided below.<sup>20</sup>

As shown in the table above, the Carbon Intensities are then adjusted by the Energy Effectiveness Ratio. This value reflects the relative efficiency associated with use of the fuel in a particular engine and drive train. The end result is an adjusted carbon efficiency that reflects all efficiency losses from wells-to-wheels. As can be seen in the table, both CNG and LNG forms have a substantial advantage over gasoline and diesel.

<sup>20</sup> <http://www.empr.gov.bc.ca/RET/RLCFRR/Documents/ENER%20Carbon%20Intensity%20Determination.pdf>



FortisBC Energy Inc. (formerly Terasen Gas Inc) ("FEI" or the "Company") Application for Approval of a Service Agreement for Compressed Natural Gas ("CNG") Service and for Approval of General Terms and Conditions ("GT&Cs") for CNG and Liquified Natural Gas ("LNG") Service (the "Application")	Submission Date: March 17, 2011
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With respect to the vehicle range aspect of the question, range depends on the size and number of tanks installed on the vehicle, and the type of service. For example, Class 8 LNG tractors equipped with two fuel tanks have a range of approximately 700 to 800 kilometres. A light duty pickup truck with an NGV conversion kit and two 80 litre CNG tanks has a range of approximately 200 kilometres.

With respect to the cost elements of the question, please see the table provided below:

Category	Rate Schedule	Cost of Fuel (per GJ)			
		Commodity	Delivery	Demand	Fueling Service
Light Duty trucks (CNG)	6	\$ 4.92	\$ 3.61	\$ -	\$5 - \$10
Medium Duty trucks (CNG)	6	\$ 4.92	\$ 3.61	\$ -	\$5 - \$10
Heavy vocational trucks (CNG)	25	\$ 4.36	\$ 0.62	\$ 15.93	\$5 - \$7
Heavy duty trucks (LNG)	16	\$ 4.36	\$ 3.89	\$ -	\$4 - \$6
Buses (CNG)	25	\$ 4.36	\$ 0.62	\$ 15.93	\$5 - \$7
Marine Vessels (LNG)	16	\$ 4.36	\$ 3.89	\$ -	\$4 - \$6

The underlying assumptions for this table are as follows:

- Cost of Fuel amount is expressed as commodity, delivery/demand charges, and fueling service charge (i.e. Contract rate).
- Delivery and Demand charges based on FEI's January 1, 2011 rates (Fixed Monthly Charges not shown in table).
- Commodity cost of \$4.36 is an average Sumas Monthly Index for the past 12 months.
- Fueling Service charge is based on initial cost of service estimates for FEI fleet customers.

**Attachment 1.4**

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				REVISED BUDGET Jan 31-11				ACTUAL				INVOICE RECEIVED						REMAINING TO BE INVOICED																								
Item	Description	Qty	UOM	Cost	Subtotal	Current PO	Additional PO	Total	Variance	#1	#2	#3	#4	#5	#6	To Date	Original Budget	PO Budget	SO#	VENDOR	Notes3	Notes2	Notes1																			
Civil Work																																										
1	Supply/install 34 concrete barriers	1	lot	\$ 21,000.00	\$ 21,000.00	\$ 21,000.00	\$ -	\$ 21,000.00	\$ -	\$ -	\$ 21,000.00	\$ -	\$ -			\$ 21,000.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
2	Supply/install 5 concrete pit boxes	1	lot	\$ 10,775.00	\$ 10,775.00	\$ 10,775.00	\$ -	\$ 10,775.00	\$ -	\$ 6,880.00	\$ 3,895.00	\$ -	\$ -			\$ 10,775.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
3	Supply/install 6 bollards (6" pipe size)	1	lot	\$ 3,270.00	\$ 3,270.00	\$ 3,270.00	\$ -	\$ 3,270.00	\$ -	\$ 1,635.00	\$ 1,635.00	\$ -	\$ -			\$ 3,270.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
4	Remove existing curb island, prepare and asphalt patch	1	lot	\$ 14,850.00	\$ 14,850.00	\$ 14,850.00	\$ -	\$ 14,850.00	\$ -	\$ 10,950.00	\$ 3,900.00	\$ -	\$ -			\$ 14,850.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
5	Demolish 6 light pedestals/prepare and asphalt patch – remove lights	1	lot	\$ 4,750.00	\$ 4,750.00	\$ 4,750.00	\$ -	\$ 4,750.00	\$ -	\$ -	\$ 4,750.00	\$ -	\$ -			\$ 4,750.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
6	Pour 7 new light pedestals – install 7 lights (supplied by others)	1	lot	\$ 10,850.00	\$ 10,850.00	\$ 10,850.00	\$ -	\$ 10,850.00	\$ -	\$ -	\$ 10,850.00	\$ -	\$ -			\$ 10,850.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
7	Install 8" drain and 4 drain grates, backfill and asphalt patch	1	lot	\$ 16,478.00	\$ 16,478.00	\$ 16,478.00	\$ -	\$ 16,478.00	\$ -	\$ -	\$ -	\$ 14,830.00	\$ 1,648.00			\$ 16,478.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
8	Repair and seal coat parking lot – 13770 m2	1	lot	\$ 52,380.00	\$ 52,380.00	\$ 52,380.00	\$ -	\$ 52,380.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ 52,380.00	\$ 52,380.00	30382389	AVANTE	Services Underway	PO Issued																				
9	Line Painting	1	lot	\$ 14,400.00	\$ 14,400.00	\$ 14,400.00	\$ -	\$ 14,400.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ 14,400.00	\$ 14,400.00	30382389	AVANTE	Services Underway	PO Issued																				
10	95 ft of trenching x 3' dp - cardlock/gate power	1	lot	\$ 14,107.00	\$ 14,107.00	\$ 14,107.00	\$ -	\$ 14,107.00	\$ -	\$ 1,980.00	\$ -	\$ 12,127.00	\$ -			\$ 14,107.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
11	504 ft of trenching – 3' deep - lighting	1	lot	\$ 74,844.00	\$ 74,844.00	\$ 74,844.00	\$ -	\$ 74,844.00	\$ -	\$ 8,878.32	\$ 28,543.68	\$ 37,422.00	\$ -			\$ 74,844.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
12	Concrete slab - 19'-4" x 7'-4" x 8"	1	lot	\$ 4,850.00	\$ 4,850.00	\$ 4,850.00	\$ -	\$ 4,850.00	\$ -	\$ 2,930.00	\$ 1,920.00	\$ -	\$ -			\$ 4,850.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
13	Supply/install 4 bollards (6" pipe size) at substation	1	lot	\$ 2,180.00	\$ 2,180.00	\$ 2,180.00	\$ -	\$ 2,180.00	\$ -	\$ 1,090.00	\$ 1,090.00	\$ -	\$ -			\$ 2,180.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
14	Supply/install 24 wheel stops	1	lot	\$ 3,180.00	\$ 3,180.00	\$ 3,180.00	\$ -	\$ 3,180.00	\$ -	\$ -	\$ 3,180.00	\$ -	\$ -			\$ 3,180.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
15	Chain link 7' high fence c/w roller gate and two pedestrian gates	1	lot	\$ 14,950.00	\$ 14,950.00	\$ 14,950.00	\$ -	\$ 14,950.00	\$ -		\$ 14,950.00	\$ -	\$ -			\$ 14,950.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued																				
16	Civil work for 100 ft trench - pinch pt to front building	1	lot	\$ 14,850.00	\$ 14,850.00	\$ 14,850.00	\$ -	\$ 14,850.00	\$ -	\$ 1,700.00	\$ -	\$ 13,150.00	\$ -			\$ 14,850.00	\$ -	\$ -	30382389	AVANTE	COMPLETE	PO Issued	Estimate based on \$148.50 per ft																			
					Subtotal:	\$ 277,714.00	\$ 277,714.00	\$ -	\$ 277,714.00	\$ -						\$ 210,934.00	\$ 66,780.00	\$ 66,780.00																								
Electrical Work - Part A																																										
1	Supply 1 new yard light poles to match existing poles as follows: □ Quad 4 x 400W MH light pole -Qty 1 Photographs of the current lights are provided for reference. The contractor shall select the lights and obtain approval from Terasen gas prior to purchase. Mounting of the light will be by others. Contractor to provide conduit runs, wire and final tie-in as per drawing TG-0022-00. Power for lights will come from the electrical kiosk. For conduit length, refer to drawing no. TG-0031-00. Supply and install lighting disconnects/panel as required.	1	lot	\$ 45,265.86	\$ 45,265.86	\$ 45,265.86	\$ -	\$ 45,265.86	\$ -	\$ -	\$ 30,000.00	\$ 10,265.86	\$ -			\$ 40,265.86	\$ 5,000.00	\$ 5,000.00	30382389	Ross Morrison	Services Underway	PO Issued																				
2	Supply and install conduits for future cardlock communication and power for two entrance gates. Location of conduit termination is shown on drawing no. TG-0031-00.	1	lot	\$ 4,754.90	\$ 4,754.90	\$ 4,754.90	\$ -	\$ 4,754.90	\$ -	\$ -	\$ 4,754.90	\$ -				\$ 4,754.90	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
3	Supply and install conduit/Teck to fast fill post from kiosk for future point of sale (POS) system	1	lot	\$ 930.05	\$ 930.05	\$ 930.05	\$ -	\$ 930.05	\$ -	\$ -	\$ 930.05	\$ -				\$ 930.05	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
4	Supply and install buried conduit - future 120V at 3 time fill locations	1	lot	\$ 1,433.50	\$ 1,433.50	\$ 1,433.50	\$ -	\$ 1,433.50	\$ -	\$ -	\$ -	\$ 1,433.50				\$ 1,433.50	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
5	Supply and install 1 ESD (ESD-8) on light pole at pinch point. Refer to Drawing No. TG-0023-00.	1	lot	\$ 5,005.54	\$ 5,005.54	\$ 5,005.54	\$ -	\$ 5,005.54	\$ -	\$ -	\$ -	\$ 5,005.54				\$ 5,005.54	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
6	Installation of fiber optic camera wiring	1	lot	\$ 30,917.00	\$ 30,917.00	\$ 30,917.00	\$ -	\$ 30,917.00	\$ -	\$ -	\$ -	\$ 19,917.00	\$ -			\$ 19,917.00	\$ 11,000.00	\$ 11,000.00	30382389	Ross Morrison	Services Underway	PO Issued																				
7	deleted	1	lot	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -							\$ -	\$ -	\$ -	30382389	Ross Morrison	Services Underway	PO Issued																				
					Subtotal:	\$ 88,306.85	\$ 88,306.85	\$ -	\$ 88,306.85	\$ -						\$ 72,306.85	\$ 16,000.00	\$ 16,000.00																								
Electrical Work - Part B																																										
1	The supplier shall coordinate and manage the supply and installation of a BC Hydro 500 KVA transformer. Terasen Gas will provide a separate purchase order to BC Hydro for the transformer once the cost is established.	1	lot	\$ 33,385.00	\$ 33,385.00	\$ 33,385.00	\$ -	\$ 33,385.00	\$ -	\$ 33,385.00						\$ 33,385.00	\$ -	\$ -	30382389	BC Hydro	COMPLETE	PO Issued																				
2	Perform all civil work required for electrical service installation. This includes trenching from power pole on Rogers street to substation, installation of duct boxes, conduit, backfilling and asphalt patch; trenching from substation slab to within 1 meter of electrical kiosk, installation of counterpoise cable and secondary ducts; installation of concrete slab for substation mount and installation of substation.	1	lot	\$ 30,756.00	\$ 30,756.00	\$ 30,756.00	\$ -	\$ 30,756.00	\$ -	\$ 30,756.00						\$ 30,756.00	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
3	Supply and install an electrical kiosk. This kiosk shall house the switch gear/distribution hardware, one compressor control panels, space for future compressor MCC, transfer switch and other related hardware.	1	lot	\$ 32,200.00	\$ 32,200.00	\$ 28,750.00	\$ 3,450.00	\$ 32,200.00	\$ -	\$ 32,200.00						\$ 32,200.00	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
4	Supply and install 600 amp service switchgear c/w added transfer switch and equipment distribution	1	lot	\$ 25,132.00	\$ 25,132.00	\$ 25,132.00	\$ -	\$ 25,132.00	\$ -	\$ 25,132.00						\$ 25,132.00	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
5	Supply and install heating and lights as required in the electrical kiosk	1	lot	\$ 24,665.00	\$ 24,665.00	\$ 24,665.00	\$ -	\$ 24,665.00	\$ -	\$ 12,665.00	\$ 12,000.00					\$ 24,665.00	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
6	Supply and install distribution hardware/switchgear and genset transfer switch.	1	lot	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -						\$ -	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
7	Supply and install wire, conduit and fittings as required from the 500 kVA substation to the electrical kiosk and make final tie-ins	1	lot	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -						\$ -	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
8	Supply and install a power meter	1	lot	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -						\$ -	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
9	Distribution wiring feeders to compressor control panels, lighting panel and tie-ins, BC Hydro conduits to property line, secondary feeder to load center, BC Hydro approval on transfer switch, 30 KVA lighting transformer, panel for future loads	1	lot	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -						\$ -	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
10	Electrical Permit	1	lot	\$ 1,150.00	\$ 1,150.00	\$ 1,150.00	\$ -	\$ 1,150.00	\$ -	\$ 1,150.00						\$ 1,150.00	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
11	Freight costs, misc tool rentals	1	lot	\$ 1,093.00	\$ 1,093.00	\$ 1,093.00	\$ -	\$ 1,093.00	\$ -	\$ -	\$ 500.00	\$ 593.00				\$ 1,093.00	\$ -	\$ -	30382389	Ross Morrison	COMPLETE	PO Issued																				
12																																										

## **Attachment 15.1**

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### **REFER TO LIVE SPREADSHEET**

Provided in electronic format only

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## **Attachment 15.2**

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### **REFER TO LIVE SPREADSHEET**

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## **Attachment 26.2**

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### **REFER TO LIVE SPREADSHEET**

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