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FAES Regulatory Affairs Correspondence
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June 25, 2016

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

Attention: Ms. Laurel Ross, Acting Commission Secretary and Director

Dear Ms. Ross:

Re: Shannon Wall Centre Rental Apartments Limited Partnership Rate Application for the Shannon Estates Thermal Energy System

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In accordance with the Regulatory Timetable established in British Columbia Utilities Commission Order G-77-16, please find attached FortisBC Alternative Energy Services Inc. (FAES) Information Requests No. 1.

If you require further information or have any questions regarding this submission, please contact Julie Tran at (604) 443-6567.

Sincerely,

FORTISBC ALTERNATIVE ENERGY SERVICES INC.

Original signed:

Julie Tran
Senior Business Development and Regulatory Affairs Manager

Attachment

cc (email only): Registered Parties

1.0 Exhibit B-1, Sections 3 – Proposed Rate Schedule and Section 5 – Rates Justification, pages 5 and 7

Fixed/Variable Rate Design

Shannon Estate Thermal Energy System (SETES) proposes a rate design consisting of a fixed and variable component. SETES explains that such rate design has been selected because "TES costs included variable components based on the intensity of usage and fixed costs to recuperate initial investments and ongoing costs".

1.1 Please indicate the proportion (in percentage) of annual revenues that SETES expects to recover through: 1) the fixed charges, consisting of the monthly capacity levy and the monthly metering charge; and 2) the variable charges, consisting of the space cooling charge, space heating charges and domestic hot water heating charge. Please provide the supporting calculations.

1.1.1 Does SETES expect that the share of revenues it will receive respectively from the fixed and variable charges will remain the same each year? If not, why not?

1.2 How does the split above (i.e., share of revenues from the fixed charges versus share of revenues from the variable charges) compare to the underlying cost structure of the SETES?

2.0 Exhibit B-1, Section 5 – Rates Justification, page 7

Future Rate Increases

The SETES is requesting that the Commission approve the variable component of the rate to be pegged to BC Hydro's rate and the fixed components of the rate to be pegged to SEFC's rates. This will ensure regulatory efficiency and reduce the need to apply to the Commission for future rate increases.

2.1 Please confirm that SETES fixed component of the rate is proposed to be pegged to the SEFC's <u>fixed component</u> of the rate.

2.2 Please provide the SETES' forecast of the SEFC's rates over the next 20 years, but at minimum for the next five years.

2.3 Please provide the SETES' forecast of the Step 1 and Step 2 of BC Hydro's residential rate schedule 1101 over the next 20 years, but at minimum for the next five years.

2.4 If future increases of the BC Hydro's residential rate and the SEFC's rate were not sufficient for the SETES rates to cover the costs of the SETES, would the SETES apply to the Commission for approval of a change of rate-setting methodology? Please explain.

3.0 Exhibit B-1, Section 5 – Rates Justification, page 8

On page 8, SETES states that "electric resistance coefficient-of-performance approaches unity. As such, the energy component cost of creating the heat is approximately equal to the end-usage delivered heat. On the basis of providing an equal scenario to what is typically available to customers, the electric cost has not been adjusted for a different coefficient-of-performance. Additionally, providing a price advantage based on the efficiency of the plan would be inconsistent with the SEFC's concept of an energy conservation price signal."

Footnote 4 states: "An energy conservation price signal has no correlation to operational costs but reflects societal intent".

3.1 Please provide the coefficient of performance (COP) for the SETES. Please provide the supporting calculations and assumptions used to derive this COP.

4.0 Commission's Decision in BC Hydro's 2008 Residential Inclining Block Rate Application, Reasons for Decisions to Order G-124-08, page 79[1]

*"The Commission Panel notes that the RIB rate structure proposal is anticipated to be the first of a series of "conservation rate" applications BC Hydro will be bringing to the Commission over the next few years. It is also mindful of the importance of customer understanding and acceptance**. The Commission Panel is persuaded by the rationale for simplicity put forward by BC Hydro and accordingly accepts a simple two-step inclining block rate structure as an appropriate initial design for a residential conservation rate."*** (Emphasis in the original)

4.1 Please confirm SETES's understanding that BC Hydro's residential rate schedule 1101 itself provides an energy conservation price signal.

[1] http://www.bcuc.com/Documents/Proceedings/2008/DOC_19754_BCH-RIB-Decision-WEB.pdf

5.0 Shannon Estates 2016 Thermal Energy System CPCN Application, Sections 9.11 – Identification and Mitigation of Risk Factors, pages 29-34

Exhibit B-1, Section 5, page 8

The following table provides excerpts from the SETES 2016 CPCN Application:

Risk Factor	SETES Assessment
Technology risk (section 9.11.1)	The technology considered here as conventional is deemed to be of low risk. […] Despite the TES having multiple sources of energy from unconventional sources, it is able to operate without their input and provide for full service to its end-users. The backup/underlying technologies have been proven in multiple, similar scenarios world-wide and locally which is an indicator of its suitability for this TES's purpose. […] The TES design has incorporated measures which mitigate technological risk to a level that would not entail additional risk beyond that of a common high-rise residence/hotel/commercial building in Downtown Vancouver. (p. 30) (Emphasis added)
Fuel cost and availability (section 9.11..2)	The primary energy sources used in the TES are electricity, natural gas, solar, and human metabolism. The fuel cost and availability are not anticipated to be of substantial risk to the TES. […] The TES plant design is also capable of accepting other technologies for heat addition / absorption / rejection as the need arises without interference with its existing devices due to its use of water as a heat transfer medium for space heating / space cooling / domestic hot water and the Thermenex header. The nature of the Thermenex design also allows for heat recovery and the effective use of heat at all qualities thereby minimizing the use of electricity and natural gas. The use of Thermenex mitigates the risk that the availability or cost of a fuel which limited the sustained operation of an installed technology could not be replaced. (p. 31) (Emphasis added)

In the Rates Application, the SETES states "potential coefficient-of-performance advantages of recovering waste heat or using solar thermal energy are only available on the scale of a TES but any cost savings in direct energy are balanced by an increased cost and risk due to the higher complexity of integrating multiple temperature sources / multiple energy sources for single delivery of space heating / domestic hot water / space cooling to customers."

5.1 Based on the COP of the SETES, please quantify the "cost savings in direct energy", compared to electric resistance, referenced to in the preamble above.

5.2 Please reconcile the SETES' own analysis of technology and fuel risk (summarized in the table above)with the statement that "any cost savings in direct energy are balanced by an increased cost and risk due to the higher complexity of integrating multiple temperature sources / multiple energy sources

for single delivery of space heating / domestic hot water / space cooling to customers".

The following table provides additional excerpts from the SETES 2016 CPCN Application:

Risk Factor	SETES Assessment
Customer base (section 9.11.3)	The customer base risk is mitigated through the parallel development and construction of the TES plant. The TES plant construction is on condition of the sellout of the buildings within each phase of the TES service area which reduces an opportunity for excess capacity to be constructed. (p. 32) (Emphasis added)
Property development risk (section 9.11.4)	The TES design and construction is highly associated with the property development of its anticipated service area. The TES plant construction is in phases reflecting the major phases of development of the anticipated TES service area. It is also noted that the TES plant developer and the TES service area property developer are the same. (p. 32) (Emphasis added)
Developer/customer connection risk (section 9.11.5)	The service area of the TES is required by the City of Vancouver through development conditions to use and only use the TES for provision of space heating, space cooling, and domestic hot water. The City of Vancouver has wilfully limited end-user choice for the purposes of greenhouse gas emission reduction and other social purposes. As a result, the City of Vancouver's development conditions mitigates the uptake risk from developer/customer connections. (p. 32) (Emphasis added)
Load forecast uncertainty (section 9.11.6)	The choice of design scenarios which require a confluence of unlikely events mitigates the risk of exceeding the capacity of the TES. […] The ability to operate equipment outside of its design operating points without compromising the safety or reliability of the TES mitigates the effect of infrequent, extreme climatic conditions. (p. 33)
Financial risk (section 9.11.7)	In summary, the applicant has identified various financial risks and mitigated them by choosing solutions that allow for diversity of inputs, redundancy in operation, and paralleling TES development with service area development guarantees. (p. 34)

5.3 The SETES' own risk analysis confirmed that each of the seven risk factors is low. Please explain how the proposed SETES' rate design and rates reflect the low risk nature of the project.

6.0 BCUC's Thermal Energy System Regulatory Framework and Guidelines, Section 2.4.3, page 22 of Appendix A to Order G-27-15)

One of the BCUC's rate setting principles that an Applicant for Stream B TES rates is required to consider is to provide an equitable balance of risk and cost between the utility and the ratepayer.

6.1 Please explain how the SETES' proposed rate design and rates address this requirement.

7.0 Exhibit B-1, Section 3.2 – Sample Annual Costs, Table 1, p. 6

Monthly Rates

Table 1: Sample Annual Costs for 12 Months of Usage

Charge	Cost per Unit	Sample Annual Cost
Space Cooling	$0.0518 per kWh	350 kWh -> $18.13 per annum 750 kWh -> $38.85 per annum 850 kWh -> $44.03 per annum
Space Heating	$0.1036 per kWh	3,750 kWh -> $388.50 per annum 7,900 kWh -> $818.44 per annum 12,000 kWh -> $1,243.20 per annum
Domestic Hot Water	$0.1036 per kWh & $2.584 per 623 Imperial Gallon Rainy Season / $3.239 per 623 Imperial Gallon dry season	1000 kWh -> $103.60 per annum 2,150 kWh -> $222.74 per annum 3,850 kWh -> $398.86 per annum 5,000 Imperial Gallon -> $22.50 per annum 11,000 Imperial Gallon -> $49.49 per annum 20,000 Imperial Gallon -> $89.98 per annum
Capacity Charge	$0.0489 per square foot per month	775 square feet -> $37.90 per month -> $454.77 per annum 1,300 square feet -> $63.57 per month -> $762.84 per annum 2,000 square feet -> $97.80 per month -> $1,173.60 per annum
Metering Charge	$9.50 per Month per unit	$114.00 per annum
Rate Rider	Annual limit per unit	$200.00 maximum per annum

7.1 Based on the fixed and variable charges provided in Table 1, and assuming that a 775 square feet unit consumes in a given year: 1) 350 kWh of space cooling, 2) 3,750 kWh of space heating, and 3) 1,000 kWh of domestic hot water, please confirm, or otherwise recalculate, the following calculations:

Type of charge	**Monthly cost**
Space cooling	$18.13/12 = $1.51
Space heating	$388.50/12 = $32.38
DHW	$103.60/12 = $8.63
Capacity charge	$37.90

Metering charge	$9.50
Total before Rate Rider	**$89.92**
Rate rider	$16.67
TOTAL	**$106.59**

7.2 Please confirm, or otherwise recalculate, that this is equivalent to an effective rate[2] of $0.2116/kWh before the Sustainment Capital Fund (SCF) Rate Rider ($89.92/((350+3,750+1,000)/12)) and $0.2508/kWh with inclusion of the maximum amount of SCF Rate Rider ($106.59/((350+3,750+1,000)/12)).

7.3 Based on the fixed and variable charges provided in Table 1, and assuming that a 2,000 square feet unit consumes in a given year: 1) 850 kWh of space cooling, 2) 12,000 kWh of space heating, and 3) 3,850 kWh of domestic hot water, please confirm, or otherwise recalculate, the following calculations:

Type of charge	**Monthly cost**
Space cooling	$44.03/12 = $3.67
Space heating	$1,243.20/12 = $103.60
DHW	$398.86/12 = $33.24
Capacity charge	$97.80
Metering charge	$9.50
Total before Rate Rider	**$247.81**
Rate rider	$16.67
TOTAL	**$264.48**

7.4 Please confirm, or otherwise recalculate, that this is equivalent to an effective rate of $0.1781/kWh before the SCF Rate Rider ($247.81/((850+12,000+3,850)/12)) and $0.1900/kWh with inclusion of the maximum amount of SCF Rate Rider ($264.48/((850+12,000+3,850)/12)).

At pages 7-8 of its application, the SETES explains that it selected the BC Hydro residential rate as "the standard of practice for low-carbon source(s) in Vancouver is

[2] The term "effective rate" refers to the cost per kWh that a customer will pay for thermal energy services. For each customer, an effective rate is calculated by dividing the customer's total cost for thermal energy service by its thermal load in a given time period.

electricity". On page 7, the SETES calculated the arithmetic mean of Step 1 and Step 2 to be equal to $0.1036/kWh.

7.5 Please confirm, or otherwise recalculate, that a residential unit renter or a residential condo owner of a 775-square feet unit would pay a rate that is at least 204% higher than the business-as-usual (BAU) option of electric baseboard heaters (without the SCF Rate Rider) and up to 242% higher than BAU after application of the SCF Rate Rider.

7.6 Please confirm, or otherwise recalculate, that a residential unit renter or a residential condo owner of a 2,000-square feet unit would pay a rate that is at least 172% higher than the BAU option of electric baseboard heaters (without the SCF Rate Rider) and up to 183% higher than BAU after application of the SCF Rate Rider.

8.0 City of Vancouver (CoV) Neighbourhood Energy Strategy

CoV Neighbourhood Energy Centre Guidelines, page A-4

The following snapshot has been taken from the CoV's website.[3]

Neighbourhood Energy Strategy

Developing neighbourhood renewable energy systems throughout Vancouver is a key strategy to meeting the Greenest City 2020 Action Plan and Renewable City Strategy goals to:

- Cut carbon emissions
- Reduce our dependence on fossil fuels
- Keep energy affordable in the long term
- Achieve 100% of our energy needs from renewable sources before 2050

Neighbourhood renewable energy systems supply centralized heating, hot water, and sometimes cooling for multiple buildings.

These systems use low-carbon renewable energy sources, such as sewage waste heat, to reduce the use of fossil fuels.

They also eliminate the need for boilers in individual buildings, and provide environmentally-friendly, affordable heat and hot water.

Southeast False Creek Neighbourhood Energy Utility

This system provides renewable energy for heat and hot water to buildings in the neighbourhood.

The CoV's Neighbourhood Energy Centre Guidelines[4] states at page A-4:

"<u>GHG reduction with reasonable energy rates should be the goal</u>. The City's experience has also shown that this is possible while achieving the above Guideline regarding Climate Protection.

[3] http://vancouver.ca/green-vancouver/neighbourhood-energy-strategy.aspx
[4] http://vancouver.ca/files/cov/neighbourhood-energy-centre-guidelines.pdf

Regulation of energy rates is generally the responsibility of the British Columbia Utilities Commission. The BCUC ensures that rates being charged for energy are just and reasonable for customers, while allowing energy utilities to earn a fair return." (Emphasis added)

8.1 Please discuss how the proposed SETES rates for thermal energy services meet the affordability goal of the CoV.

8.2 Please discuss how the Commission can approve the proposed SETES rate design and rates as just, fair and reasonable.

9.0 Exhibit B-1 – Tariff, Section A: Definitions

Building, Customer and Unit (billing) are defined as follows:

*"**Building**: means a residential or other building or facility or dwelling unit or service which is subject to a Customer Agreement."*

*"**Customer**: means a Person receiving Energy Services pursuant to a Customer Agreement."*

*"**Unit (Billing)**: An individually metered space or spaces that consumes at least one of the TES energy outputs."*

9.1 Given that Building refers equally to a building or a facility or a unit, please provide the number of Buildings that the SETES expects will be subject to a Customer Agreement. Please provide the breakdown by type (e.g., residential building, other building, facility, dwelling unit).

9.2 Given that both the definitions of Building and Customer are linked to a Customer Agreement, will the number of Building and Customers always be the same?

9.2.1 If not, please explain how the number of Customers could differ from the number of Building.

9.3 How many units (for billing) are expected in Phase I? In Phase 2?

9.3.1 Will there always be as many units as there are meters? If not, please explain why not.

9.4 What is the relationship between a Unit and a Customer? Between a Unit and a Building?

10.0 Exhibit B-1 – Tariff, Section B: Terms and Conditions

Section 11 (b) discusses an Economic Test to be applied to distribution extensions:

"(b) Economic Test. Applications to extend Energy Services to one or more new Customers will be subject to an economic test, a model which is accepted 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 Distribution Extension. The Distribution Extension will be deemed to be economic and constructed if the results of the economic test indicate a zero or positive net present value."

10.1 Please clarify whether the Commission has previously accepted the above economic test for the SETES.

10.2 Please provide a similar discounted cash flow analysis for the SETES, using the methodology proposed in Section (c) and (d) to calculate the revenue and costs of the project.

11.0 Shannon Estates 2016 Thermal Energy System CPCN Application, Sections 9.3 and 9.10, page 27 & 29

In the CPCN application, the SETES stated that "projections for anticipated heating/cooling demand in various build-out scenarios will be submitted in the rate filing application".

11.1 Please provide those projections, or the reference to those projections in the Rates Application.

In the CPCN application, the SETES stated that "financial projections of build-out scenarios and required levels of revenue will be submitted in a subsequent rate filing for rate approval".

Please provide those projections, or the reference to those projections in the Rates Application.