September 4, 2015

Via Email
Original via Mail

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

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

Re: Creative Energy Vancouver Platforms Inc. (Creative Energy)
Application for a Certificate of Public Convenience and Necessity (CPCN) for a Low Carbon Neighbourhood Energy System (NES) for Northeast False Creek and Chinatown (NEFCC) Neighbourhoods of Vancouver

FortisBC Alternative Energy Services Inc. (FAES) Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1 on FAES Evidence

In accordance with Commission Order G-119-15, attached is FAES’ response to BCUC IR1 on FAES Evidence in the above noted proceeding.

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 Manager, Alternative Energy Solutions

Attachments

cc (email only): Registered Parties
1.0 Reference: EXISTING LOW-CARBON STREAM A TES

Exhibit C4-7-1, Table 1, pp. 4, 11

Effective rate

In Table 1, FortisBC Alternative Energy Services Inc. (FAES) provides rates for certain FAES Stream A projects under the heading “Thermal (Effective) Rate (2015 dollars).” [Emphasis added]

1.1 Please explain what FAES means when it refers to these rates as “effective” rates.

Response:

FAES uses the term “Effective Rate” to refer to the cost per MWh 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.

In the case of FAES, the actual rate paid by the customer is equal to its Effective Rate as FAES sells thermal energy at a rate that is 100 per cent variable.

In contrast, Creative proposes a two part tariff comprised of a fixed charge based on floor area ($4.65/m²), and a variable energy charge per MWh ($28.97/MWh in 2016)¹. To illustrate this difference FAES has produced a comparison between a variable rate and two part tariff based on the evidence filed in this proceeding. In Exhibit B-24, FAES IR 2.9.2, Creative has provided the floor area of its anticipated load:

<table>
<thead>
<tr>
<th>Customer</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concord 5B</td>
<td>36,400 m²</td>
</tr>
<tr>
<td>Aquilini</td>
<td>15,400 m²</td>
</tr>
</tbody>
</table>

Applying the fixed charge of $4.65 per m² to the respective floor areas above results in the following total fixed charges:

- Concord 5B: $169,260
- Aquilini: $71,610

The effect of the distinction between a variable rate and two part tariff is illustrated in the Graph below. The effective rate per MWh for Concord 5B and Aquilini is plotted on the graph.

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¹ Exhibit B-1, Table 27: Indicative NES Rates, 2016-2020.
identifying that for each level of annual thermal energy demand, the effective rates for customers differ due to differing floor areas connected to the NES. The only instance where the effective rates for the Concord 5B and Aquilini customers would be equal is if their respective actual energy demand turned out to be exactly equal to their expected load. If the actual demand differs from forecast, then their effective rates will differ too. For comparison, the graph also includes FAES' effective rate of $112/MWh, which is the effective rate for most FAES TES projects.  

![Effective Rate Comparison Graph](image)

1.2 For each of the approved/registered Stream A projects listed in Table 1, please provide the specific reference/source to support the rates shown in Table 1.

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2 Exhibit C4-7-1, Table 1.
## Response:

<table>
<thead>
<tr>
<th>Approved/Registered Stream A TES</th>
<th>Reference</th>
<th>Rate Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TELUS Garden</strong></td>
<td>FAES 2015 TELUS Garden Rates proceeding: Exhibit B-1 (Appendices A1 to A3). The rates, rate design and fuel deferral account were approved in Order G-2-15 (Directive 1).</td>
<td></td>
</tr>
<tr>
<td><strong>SOLO I</strong></td>
<td>FAES Stream A Registration SOLO Phase 1 TES: Order G-129-15A (Directive 1)</td>
<td></td>
</tr>
<tr>
<td><strong>Sovereign</strong></td>
<td>FAES 2014 Sovereign CPCN and Rates proceeding: Exhibit B-1 (Appendices A1 to A3). The rate, rate design and fuel deferral account were approved in Order C-10-14 (Directive 3)</td>
<td>Initial rate approved: $0.110/kWh in 2014, escalated by 2% results in $0.112/kWh in 2015</td>
</tr>
<tr>
<td><strong>Seylynn I</strong></td>
<td>FAES Seylynn I Stream A Registration: Order G-74-15(^3)</td>
<td></td>
</tr>
<tr>
<td><strong>Marine Gateway</strong></td>
<td>FAES PCI Marine Gateway TES CPCN proceeding, Exhibit B-1, page 51</td>
<td></td>
</tr>
<tr>
<td><strong>Artemisia</strong></td>
<td>FAES 2014 Rate Approvals TES Artemisia CPCN proceeding: Exhibit B-1 (Application, Appendix A). The rate, rate design and fuel deferral account were approved in Order C-9-14 (Directive 3)</td>
<td>Initial rate approved: $0.095/kWh in 2014, escalated by 2% results in $0.0969/kWh in 2015</td>
</tr>
</tbody>
</table>

Table 1 shows a 2015 thermal rate for PCI Marine Gateway of $109 per MWh and references the FAES PCI Marine Gateway TES Certificate of Public Convenience and Necessity (CPCN) application, page 51 as the source for this rate.

Directive 4 of British Columbia Utilities Commission (Commission) Order C-10-12, which accompanies the Commission decision on the FAES PCI Marine Gateway TES CPCN application, states: “The rate design and rates as proposed pursuant to sections 59-61 of the Act and established by the Service Agreements filed with the Application in Appendix

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V, and described in Section 6 of the Cost of Service and Rate Design of the Application, are denied.”

1.3 Please explain the relevance of the $109 per MWh rate for the PCI Marine Gateway project, given that this rate was denied by the Commission.

Response:

FAES referred to the rate included in its CPCN application for the PCI Marine Gateway project as it is the only rate for this project currently on the public record, notwithstanding the fact that its Cost of Service Rate Design was denied.

FAES notes, however that in Letter Log No. 48026 to FAES, dated June 26, 2014, the Commission stated that it “does not intend to review the rates for TES Systems that are “in progress” – i.e. that have a Certificate of Public Convenience and Necessity issued but are not yet in service – and that otherwise comply with Stream A requirements.” The Commission specifically named the Marine Gateway TES as one such project, which the Commission expects FAES to register for Stream A exemption.

FAES expects to register the Marine Gateway TES under the TES Guidelines in Q3 2015. As Table 1 demonstrates, FAES has been working to standardize its rate design and rates across its TES projects.

FAES states on page 11:

Given that FAES’ rate design results in a single fully variable rate to all customers of a project, the FAES thermal energy rate is in effect the same as the effective rate. In contrast, customers facing a fixed/variable rate design, such as that proposed by Creative for the NEFC NES, may pay different effective rates rendering the NEFC NES effective rate meaningless for individual buildings in the franchise area.

1.4 In consideration of FAES’ definition of effective rates and based on the information presented by Creative Energy in this proceeding regarding the Northeast False Creek (NEFC) Neighbourhood Energy System (NES), what does FAES consider the NEFC NES effective rate to be and why?
Response:

An effective rate that a customer pays is calculated as the total cost of energy divided by the total energy consumed in a given time period. Unless all customers in the NEFC have identical energy use relative to floor space (a very unlikely scenario), the different customers of the NEFC NES will each pay different effective rates that may vary significantly from the “Proposed Average Rate”. It’s therefore not possible to provide the NEFC Effective Rate.

To illustrate this issue, FAES has provided calculations based on the loads and floor area of the TELUS Garden project in an effort to illustrate the resulting differences that customers might experience in their “effective rates” with Creative’s two part tariff.

As the graph below illustrates, the NEFC rate design produces large differences in effective rates for each different customer in that development.

Please also refer to the response to BCUC-FAES IR 1.1.1.
2.0 Reference: COMPARISON OF THERMAL RATES

Exhibit C4-7-1, pp. 10–11

Levelized rate

On page 10, FAES states: “In the case of SOLO I, for example, Creative has characterized the thermal rate, which includes heating, cooling and DHW, as $123/MWh on a levelized basis.”

FAES states on page 11:

The actual rates for SOLO I start at $112/MWh in 2015 escalating at 2 per cent annually. This means that FAES rates for SOLO I are level in real dollars, creating intergenerational equity characteristics and stability of costs in real dollars for customers for the entire 20-year term of the contract. Creative has similarly overstated the levelized rates for TELUS Garden and Marine Gateway in response to BCUC IR 2.19.2 as well.

When levelizing a rate, or cost, the objective is to establish what rate in real dollars is necessary to create a present value that is being targeted...Neither of the Creative formulas provided in its late filing of the working Excel Spreadsheet response for BCUC IR 2.19.2 for levelized rates or levelized costs do this inflation adjustment in the weights. [Emphasis added]

2.1 Based on FAES’ explanation above of the appropriate method for calculating levelized rates, please re-calculate the levelized rates for each of the FAES Stream A projects referenced in BCUC IR 2.19.2 as well as the levelized rate for the Creative Energy NEFC NES. Please provide all supporting calculations in a working excel spreadsheet and explain all assumptions.

Response:

FAES has adjusted the spreadsheet provided as exhibit B-22-2 (Creative response to BCUC IR 2.19.2) which is provided in Attachment 2.1A. Changes are marked in Red in each worksheet in the excel workbook. FAES notes as per the preamble above, that while the formulas have been corrected, the NEFC NES levelized rate is over a shorter term than the comparable services in the table and FAES is unable to correct this for NEFC because no information has been provided on the cost of service beyond the 15-year initial period. However, the levelized rates for the other services have been updated to reflect the full 20 years. FAES believes that it is inappropriate to truncate the calculation for the other services simply because Creative has chosen not to provide any information beyond “Energy Supply Phase 1”. 
For greater clarity, FAES would like to provide a further breakdown of how the levelization of rates is performed in an effort to facilitate a common understanding of the measure and its use. Attachment 2.1B includes a working spreadsheet with these calculations included.

**Levelized Rate Formula**

As noted by Creative, revenues are a weighted measure (price multiplied by quantity) so the discount factor (weighted average cost of capital, or “WACC”) must be applied to either prices, quantities or split between both. The proper formula is:

Levelized Rates are the present value of customer costs using the nominal discount rate (WACC), divided by the present value of the stream of energy provided using the real discount rate (((1+WACC) / (1+inflation)))-1).

The Table Below provides the proper levelized rate calculation using the thermal energy sales and Revenue Requirement from Exhibit B-6-1. The levelized rate in real dollars is $84.99 (column F)\(^4\). This can be expressed in nominal dollars in each year by inflation adjusting to the desired year (column D).

<table>
<thead>
<tr>
<th>TES</th>
<th>Time Series</th>
<th>Levelized Rate in 2015 Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEFC Energy Supply Phase 1</td>
<td>15 years</td>
<td>$84</td>
</tr>
<tr>
<td>NEFC Low Carbon, Low</td>
<td>15 years</td>
<td>$87</td>
</tr>
<tr>
<td>NEFC Low Carbon, High</td>
<td>15 years</td>
<td>$107</td>
</tr>
<tr>
<td>CE Steam</td>
<td>15 years</td>
<td>$59</td>
</tr>
<tr>
<td>100% Electricity Version A</td>
<td>15 years</td>
<td>$107</td>
</tr>
<tr>
<td>100% Electricity Version B</td>
<td>15 years</td>
<td>$103</td>
</tr>
<tr>
<td>100% Electricity Version C</td>
<td>15 years</td>
<td>$113</td>
</tr>
<tr>
<td>100% Electricity Version D</td>
<td>15 years</td>
<td>$106</td>
</tr>
<tr>
<td>Gas/Electric Mix</td>
<td>15 years</td>
<td>$78</td>
</tr>
<tr>
<td>100% Natural Gas</td>
<td>15 years</td>
<td>$58</td>
</tr>
<tr>
<td>SEFC</td>
<td>20 years</td>
<td>$112</td>
</tr>
<tr>
<td>UBC</td>
<td>20 years</td>
<td>$108</td>
</tr>
<tr>
<td>RDE</td>
<td>20 years</td>
<td>$126</td>
</tr>
<tr>
<td>Marine Gateway</td>
<td>20 years</td>
<td>$128</td>
</tr>
<tr>
<td>Solo</td>
<td>20 years</td>
<td>$112</td>
</tr>
<tr>
<td>Telus Gardens</td>
<td>20 years</td>
<td>$112</td>
</tr>
</tbody>
</table>

\(^4\) The levelized rate of $85/MWh using the Revenue Requirement is higher than the calculation of $84/MWh which uses Creative’s Proposed Average Rate – FAES observes that the NPV from the Forecast Revenues at the
FAES also notes that the NEFC is proposing a cost of service rate-setting methodology, such that the present value of the costs over the 15 years should equal the present value of the revenues over the 15 years, therefore the use of the Revenue Requirement is the appropriate starting point for the NEFC.

Note that the present value using the nominal discount rate (WACC), of the customer costs ($31,723, column B) is equal to the present value of the nominal revenues at the nominal discount rate ($31,723, column E), or the present value of the real revenues at the real discount rate (((1+WACC)/(1+Inflation))-1) assuming inflation is 2% ($31,723, column G). This demonstrates that the levelization calculation has been properly done. In addition, the result is a rate that is the same in real dollars over the time series and increasing in nominal dollars at the rate of inflation. Therefore customers are paying the same rates in real dollars through the times series and the rate can be said to be level.

FAES also notes that the NEFC is proposing a cost of service rate-setting methodology, such that the present value of the costs over the 15 years should equal the present value of the revenues over the 15 years, therefore the use of the Revenue Requirement is the appropriate starting point for the NEFC.

Proposed Average Rate is lower at $31.2M compared to the NPV of the Revenue Requirement at $31.7M suggesting that there will be a deferral account balance at the end of 15 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>NES Sales [MWh]</th>
<th>Revenue Requirement [000's]</th>
<th>Unit Cost [$/MWh]</th>
<th>Levelized Rate [[$/MWh]</th>
<th>Revenues at Levelized Rate [$000's]</th>
<th>Levelized Rate [[$/MWh]</th>
<th>Revenues at Levelized Rate [$000's]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1,715</td>
<td>$276.81</td>
<td>$86.69</td>
<td>149</td>
<td>$84.99</td>
<td>146</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>9,450</td>
<td>$132.84</td>
<td>$88.42</td>
<td>836</td>
<td>$84.99</td>
<td>803</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>21,295</td>
<td>$101.54</td>
<td>$90.19</td>
<td>1,921</td>
<td>$84.99</td>
<td>1,810</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>27,600</td>
<td>$96.33</td>
<td>$91.99</td>
<td>2,539</td>
<td>$84.99</td>
<td>2,346</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>31,555</td>
<td>$99.46</td>
<td>$93.83</td>
<td>2,961</td>
<td>$84.99</td>
<td>2,682</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>38,900</td>
<td>$95.74</td>
<td>$95.71</td>
<td>3,723</td>
<td>$84.99</td>
<td>3,306</td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>40,650</td>
<td>$96.47</td>
<td>$97.62</td>
<td>3,968</td>
<td>$84.99</td>
<td>3,455</td>
<td></td>
</tr>
<tr>
<td>2023</td>
<td>43,900</td>
<td>$95.28</td>
<td>$99.57</td>
<td>4,371</td>
<td>$84.99</td>
<td>3,731</td>
<td></td>
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<tr>
<td>2024</td>
<td>45,370</td>
<td>$97.54</td>
<td>$101.57</td>
<td>4,608</td>
<td>$84.99</td>
<td>3,856</td>
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<tr>
<td>2025</td>
<td>48,100</td>
<td>$99.57</td>
<td>$103.60</td>
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<td>$84.99</td>
<td>4,088</td>
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</tr>
<tr>
<td>2026</td>
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<tr>
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<tr>
<td>2028</td>
<td>48,100</td>
<td>$102.98</td>
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<td>48,100</td>
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<td>$105.14</td>
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<td>5,502</td>
<td>$84.99</td>
<td>4,088</td>
<td></td>
</tr>
</tbody>
</table>

| SUM  | 549,035         | 55,494                      | 56,509           | 46,660                   |
| Discount Rate | 4.25%        | 6.34%                      | 6.34%            | 4.25%                   |
| Present Value | 373,279       | 31,723                      | 31,723           | 31,723                  |
**Creative Energy Levelized Rate Formula**

Creative Energy has stated that the levelized rate should be calculated as follows in Responses to BCUC IR 2.19.2:

“Levelized rates are the present value of the stream of rates in $ per MWh, divided by the present value of a stream of 1 MWh of energy. It is not weighted for changes in consumption levels overtime.”

Using the thermal energy sales and Forecast Revenue from Creative’s Exhibit B-6-1, FAES has been able to reproduce Creative’s levelized rate using the formula referenced in BCUC IR 2.19.2 and copied above for reference.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1,715</td>
<td>1</td>
<td>144</td>
<td>$84.24</td>
<td>$96.24</td>
<td>165</td>
<td>$94.35</td>
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<tr>
<td>2017</td>
<td>9,450</td>
<td>1</td>
<td>813</td>
<td>$86.04</td>
<td>$96.24</td>
<td>909</td>
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</tr>
<tr>
<td>2018</td>
<td>21,295</td>
<td>1</td>
<td>1,910</td>
<td>$89.71</td>
<td>$96.24</td>
<td>2,049</td>
<td>$90.69</td>
</tr>
<tr>
<td>2019</td>
<td>27,600</td>
<td>1</td>
<td>2,580</td>
<td>$93.46</td>
<td>$96.24</td>
<td>2,656</td>
<td>$88.91</td>
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<td>31,555</td>
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<td>$96.24</td>
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<td>$96.24</td>
<td>4,225</td>
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</tr>
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<tr>
<td>2025</td>
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<td>$78.95</td>
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<td>$77.40</td>
</tr>
<tr>
<td>2027</td>
<td>48,100</td>
<td>1</td>
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<td>$105.05</td>
<td>$96.24</td>
<td>4,629</td>
<td>$75.89</td>
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<td>2028</td>
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<td>48,100</td>
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<td>$110.26</td>
<td>$96.24</td>
<td>4,629</td>
<td>$71.51</td>
</tr>
<tr>
<td><strong>SUM</strong></td>
<td><strong>549,035</strong></td>
<td><strong>15.0</strong></td>
<td><strong>55,494</strong></td>
<td><strong>$96.24</strong></td>
<td><strong>30,153</strong></td>
<td><strong>30,153</strong></td>
<td><strong>$82,837</strong></td>
</tr>
</tbody>
</table>

Note that the present value using the nominal discount rate (WACC), of the forecast revenue from proposed rates ($31,235, column C) is not equal to the present value of the nominal revenues at the nominal discount rate ($30,153, column E), or the present value of the revenues at the real discount rate (((1+WACC)/(1+Inflation))-1) assuming inflation is 2% ($30,153, column G).

Also FAES notes that this “levelized rate” calculated using the formula Creative has provided, while level in nominal dollars, is declining in real dollars. Therefore it is not a level rate but rather...
a declining rate, meaning future customers would pay less, even though their nominal rates are the same throughout the time series, raising issues of intergenerational inequity.

**Creative Energy Levelized Cost Formula**

Creative Energy has stated that the levelized cost should be calculated as follows in Responses to BCUC IR 2.19.2:

“Levelized costs are the present value of customer costs, divided by the present value of the stream of energy provided. It is weighted for changes in consumption levels over time.”

Using the thermal energy sales and Forecast Revenue from Creative’s Exhibit B-6-1, FAES has been able to reproduce Creative’s levelized cost using the formula referenced in BCUC IR 2.19.2 and copied above for reference.

### Creative Levelized Cost calculation

<table>
<thead>
<tr>
<th>Year</th>
<th>[A] NES Sales [MWh]</th>
<th>[B] Forecast Revenue [$000's]</th>
<th>[C] Proposed Rate [$/MWh]</th>
<th>[D] Weighted Average Rate [$/MWh]</th>
<th>[E] Revenues at Weighted Average Rate [$000's]</th>
<th>[F] Weighted Average Rate [$/MWh]</th>
<th>[G] Revenues at Weighted Average Rate [$000's]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1,715</td>
<td>144</td>
<td>$84.24</td>
<td>$99.69</td>
<td>$97.74</td>
<td>171</td>
<td>$97.74</td>
</tr>
<tr>
<td>2017</td>
<td>9,450</td>
<td>813</td>
<td>$86.04</td>
<td>$99.69</td>
<td>$95.82</td>
<td>942</td>
<td>$93.94</td>
</tr>
<tr>
<td>2018</td>
<td>21,295</td>
<td>1,910</td>
<td>$89.71</td>
<td>$99.69</td>
<td>$92.10</td>
<td>2,123</td>
<td>$89.20</td>
</tr>
<tr>
<td>2019</td>
<td>27,600</td>
<td>2,580</td>
<td>$93.46</td>
<td>$99.69</td>
<td>$86.79</td>
<td>2,751</td>
<td>$85.82</td>
</tr>
<tr>
<td>2020</td>
<td>31,555</td>
<td>2,960</td>
<td>$93.80</td>
<td>$99.69</td>
<td>$82.99</td>
<td>3,146</td>
<td>$82.10</td>
</tr>
<tr>
<td>2021</td>
<td>38,900</td>
<td>3,708</td>
<td>$95.32</td>
<td>$99.69</td>
<td>$79.07</td>
<td>3,878</td>
<td>$78.52</td>
</tr>
<tr>
<td>2022</td>
<td>40,650</td>
<td>3,938</td>
<td>$96.89</td>
<td>$99.69</td>
<td>$75.79</td>
<td>4,052</td>
<td>$75.28</td>
</tr>
<tr>
<td>2023</td>
<td>43,900</td>
<td>4,324</td>
<td>$98.49</td>
<td>$99.69</td>
<td>$72.59</td>
<td>4,376</td>
<td>$73.55</td>
</tr>
<tr>
<td>2024</td>
<td>45,370</td>
<td>4,541</td>
<td>$100.09</td>
<td>$99.69</td>
<td>$70.14</td>
<td>4,523</td>
<td>$73.78</td>
</tr>
<tr>
<td>2025</td>
<td>48,100</td>
<td>4,893</td>
<td>$101.72</td>
<td>$99.69</td>
<td>$68.72</td>
<td>4,795</td>
<td>$73.34</td>
</tr>
<tr>
<td>2026</td>
<td>48,100</td>
<td>4,972</td>
<td>$103.37</td>
<td>$99.69</td>
<td>$67.36</td>
<td>4,795</td>
<td>$74.07</td>
</tr>
<tr>
<td>2027</td>
<td>48,100</td>
<td>5,053</td>
<td>$105.05</td>
<td>$99.69</td>
<td>$66.02</td>
<td>4,795</td>
<td>$74.80</td>
</tr>
<tr>
<td>2028</td>
<td>48,100</td>
<td>5,135</td>
<td>$106.76</td>
<td>$99.69</td>
<td>$64.76</td>
<td>4,795</td>
<td>$75.55</td>
</tr>
<tr>
<td>2029</td>
<td>48,100</td>
<td>5,219</td>
<td>$108.50</td>
<td>$99.69</td>
<td>$63.50</td>
<td>4,795</td>
<td>$76.30</td>
</tr>
<tr>
<td>2030</td>
<td>48,100</td>
<td>5,304</td>
<td>$110.26</td>
<td>$99.69</td>
<td>$62.25</td>
<td>4,795</td>
<td>$77.07</td>
</tr>
</tbody>
</table>

| SUM | 549,035            | 55,494                       |                           |                                  |                                           |                                 |                                           |
| DISCOUNT RATE | 6.34%               | 6.34%                        |                           |                                  |                                           |                                 |                                           |
| PRESENT VALUE | 313,321            | 31,235                       | $99.69                    |                                  |                                           |                                 |                                           |
Present values of the Revenues (columns [C], [E] and [G]) are equal, it is a declining rate, not a level rate.

Creative also states in response to BCUC IR 2.19.2:

“Levelized cost is not as appropriate a benchmark for comparing between district energy systems so Creative Energy has excluded it for other district energy / TES benchmarks.”

FAES agrees that levelized costs are not appropriate for the comparison between district energy system as well as other TES systems because rate designs may not all be based on cost of service, rendering the levelized cost meaningless as a comparator.

However, in Creative’s case, as a cost of service rate design with a revenue deficiency deferral account, the present values of revenue requirement ($31,723,000) and present value of rate revenues ($31,235,000) do not equate, indicating there is either an error in the “proposed average rate” of Creative, or Creative will be carrying a deferral account balance at the end of the 15-year term.

In many cases, analysts use levelized rates to compare alternatives for a given project and therefore use this measure as a means of establishing the financial impact of each feasible technical alternative. In this case, if the analysis is not being used to set actual rates, then the results of the alternatives analysis are unlikely to suffer from the use of a declining rate calculation instead of a levelized rate calculation. This is provided that the analysis is restricted to the comparison of alternatives within the project that uses a cost of service rate design, and not, as Creative indicates for comparing between TES systems.

---

5 The Marine Gateway levelized rate calculation has been corrected in this spreadsheet (using data from the CPCN application, which may be outdated as it assumes that the application had proposed a cost of service rate design that was denied by the BCUC) and an example of the declining rate calculation showing $149/MWh is also included for reference. The Marine Gateway TES does not have an approved rate design at this time.
3.0 Reference: TES IN BRITISH COLUMBIA

Exhibit C4-7-1, Table 1

FAES low carbon Stream A TES

3.1 In a separate table, please include a column showing the greenhouse gas (GHG) intensity targets in each of the projects identified in Table 1 and a column specifying FAES’ commitments/guarantees to the customers in delivering those GHG reduction/intensity targets.

Response:

<table>
<thead>
<tr>
<th>FAES Low-Carbon Stream A TES</th>
<th>GHG Intensity Target</th>
<th>Commitment / Guarantee</th>
<th>20-Year Levelized Rate (2015$/MWh)</th>
<th>15-Year Levelized Rate (2015$/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELUS Garden</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>SOLO I</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Sovereign</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Seylynn I</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Marine Gateway</td>
<td>No target</td>
<td>No guarantee</td>
<td>See BCUC IR 1.1.3</td>
<td>See BCUC IR 1.1.3</td>
</tr>
<tr>
<td>Artemisia</td>
<td>No target</td>
<td>Not applicable</td>
<td>96.9</td>
<td>96.9</td>
</tr>
<tr>
<td>Project A</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Project B</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Project C</td>
<td>No target</td>
<td>Not applicable</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Project D</td>
<td>No target</td>
<td>Not applicable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While the City of Vancouver (COV) did not impose a GHG intensity target measured in tonnes of CO2e per MWh for the Marine Gateway TES, the COV required the following two requirements be met as a condition of rezoning:

1. 50 per cent GHG reduction compared to business as usual (BAU), where

   BAU is defined as:

   - electric baseboard for residential suite heating
   - natural gas for non-residential heating, common spaces, ventilation air and DHW
   - all spaces cooled by a chiller and cooling towers
2. 70% of annual space heating and DHW energy requirements provided by renewables

In the original CPCN application for Marine Gateway, FAES stated at page 14:

“The CoV’s Director of Planning provided a report on the rezoning application to CoV Council dated June 24, 2011. The Report noted that the conditions of rezoning regarding a renewable energy system consistent with the CoV’s wider objectives were still under consideration at the time the report was completed. The Report stated that if the application was referred to a public hearing, the renewable energy system conditions would be brought forward by way of a memorandum prior to the hearing. The CoV’s Assistant Director of Planning issued this memorandum on July 14, 2011. The memorandum contained a number of proposed conditions for the approval of the rezoning regarding renewable energy. The memorandum is attached as Appendix K. The key conditions were that 70% of the annual space heating and domestic hot water energy requirements for the development would be provided through renewable energy sources, and that the system shall reduce the GHG emissions by a minimum of 50% relative to business as usual (“BAU”).

At a CoV Council meeting on June 28, 2011, PCI’s development plan was reviewed and referred to a public hearing on July 19, 2011. On July 19, 2011, PCI’s rezoning application was approved by CoV Council at a public hearing, and on February 28, 2012, the CoV enacted Bylaw No. 10432, which amended the zoning accordingly. The CoV’s approval of the rezoning application includes a number of requirements relating to the energy system that PCI utilizes at the Development. FAES described these requirements further above in Section 3.3 City of Vancouver’s Zoning Requirements.”

3.2 In the same table, please include a column showing the 20-year levelized rate for each project, using the same assumptions for each project. Please repeat the exercise with another column showing the 15-year levelized rate. How does this compare to the NEFC project?

Response:

Please refer to the response to BCUC-FAES IR 1.3.1 for the 20-year and 15-year levelized rates for each project in Table 1 and the response to BCUC-FAES IR 1.2.1 for the 15 year levelized rate for NEFC at $84 in 2015 dollars (Cell D10 on the Summary tab in the BCUC-FAES IR 2.19.2 Corrected workbook when cell F7 is set to the year 2015). FAES notes that these rates are not readily comparable to each other as the rate for NEFC is neither for low carbon nor inclusive of any cooling.
There is insufficient data available to calculate a 20-year levelized rate for the NEFC NES project.

3.3 Given that each of the projects in Table 1 are Stream A (on-site) TES projects, please discuss the comparability of these FAES projects to the current Application for a district/neighbourhood energy system. Would it be more appropriate to draw some comparisons between the NEFC project and other greenfield and/or brownfield district energy system (DES) development (as opposed to Stream A projects)? For example, what are the carbon intensity targets and actual results for PCI Marine and Kelowna District Energy System (KDES)? Please provide the carbon intensity targets and actual results for Surrey City Energy, Lonsdale Energy Corp., and Southeast False Creek Neighborhood Energy Utility. How do these DES targets and results compare to the NEFC project?

Response:

It is relevant to compare on-site Stream A TES projects to the proposed NEFC NES in the context provided by FAES as this comparison clearly illustrates the viability of an alternative available in the market today that would be precluded from implementation in the NEFC and Chinatown areas if Creative’s Application is approved.

FAES’ Evidence demonstrates that Stream A TES constitutes a feasible alternative to meeting an annual energy demand similar to the NEFC NES’ while simultaneously delivering low-carbon results immediately at the start of the service. FAES views this comparison neither more nor less appropriate than a comparison between the NEFC NES and other greenfield and/or brownfield DES.

FAES’ Stream A projects, like all viable competing alternatives, should be considered in the Commission’s analysis of whether Creative has satisfied the CPCN requirements related to the identification and comparison of feasible alternatives to its proposal (Section 2 of the 2015 CPCN Guidelines).

Given that a fundamental goal of the COV is to reduce community GHG emissions, of particular relevance in the alternatives analysis are projects that achieve that goal from the start of service. FAES believes that comparisons to existing DES are relevant, but notes that several other Commission-regulated DES, though purported to be implemented to meet sustainable
objectives and reduce GHG emissions, are actually fueled by natural gas, as is the case with Energy Supply Phase 1 of Creative’s application.

For example, Dockside Green Energy (DGE), which received a CPCN from the Commission in 2008, was expected to deliver hot water service from a wood residue gasification system from the start of service; however this has not materialized. As noted in “The Regulation of District Energy Systems”: “DGE has experienced several challenges in its first few years of operation. Soft market conditions slowed construction, resulting in lower than forecast loads and revenues. The original provider of biomass failed to deliver. DGE continues to seek alternative supply sources, with moisture content, foreign objects, and contaminants (e.g. nails, glue) providing challenges. With a much smaller load factor, running the biomass plant was not practical, and the plant has been using the natural gas boilers to supply customers. (At 60-65%, gas conversion efficiencies are low: in 2010 DGE bought 9,828 GJ of gas and sold 5,997 GJ of energy.)”

An important element of the comparison between Creative’s proposal and existing DES is the fact that should Energy Supply Phase 2 does not materialize, as contemplated in Creative’s Application, the proposed NEFC NES project could experience similar efficiency and performance issues as the DGE project.

The Marine Gateway project, which is an on-site Stream A TES, not a DES, has no carbon intensity target. Please also refer to the response to BCUC-FAES IR 1.3.1. There are also no actual results as the project is not in service yet. For the KDES, there is no carbon intensity target.

With respect to the municipally-owned DES listed above, FAES has gleaned the information below from materials available in the public sphere:

**Surrey City Energy:**

On the Surrey City Energy website, it is indicated that the Rize Alliance’s Wave Project is the first customer and that other developments will follow. FAES is not aware of actual results having been published respecting its GHG intensity.

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6 Dockside Green Energy (DGE), UniverCity, River District Energy and UBC NDES.
The Policy on Utility Rate Setting and Regulation document, approved by Council in December 2013 addresses the Surrey City Energy low carbon target. Appendix B to that document relates to City Policy and section 5 stipulates as follows:

5. LOW-CARBON / RENEWABLE ENERGY SOURCES

The Utility will seek to maximize the proportion of low-carbon, renewable heat sources within its energy supply mix as early as possible while ensuring that the other rate-setting principles are respected.

Lonsdale Energy Corp.:

FAES has not been able to identify whether the Lonsdale Energy Corp. is subject to carbon intensity targets, or to identify its actual GHG results. However, FAES notes that this utility has run on natural gas since its inception. The following Q&A is reproduced from the LEC FAQS section of its website:

Why does LEC use natural gas to run its mini-plants?
Natural gas is highly efficient and competitively priced. LEC recognizes that while it is relatively clean, natural gas remains a fossil fuel. As such, LEC continually looks for ways to use alternative/renewable energy sources such as the geothermal and solar energy and waste heat recovery currently used in its system. LEC systems are designed to use any variety of fuels, enabling LEC to minimize emissions by drawing from other energy sources as soon as it becomes economical to do so. In the meantime, LEC makes large-volume natural gas purchases by negotiating the best possible rates.

Southeast False Creek Neighbourhood Energy Utility:

Exhibit B-1, Schedule 2, Schedule A – Definitions provides the following definition:

"Carbon intensity Cap" means a carbon intensity level equal to 0.07 tonnes of carbon dioxide (or equivalent) per megawatt hour of sales (being the SEFC NES target carbon intensity as of the date of this Agreement) measured using provincially recognized emission intensity values for the mix of energy sources allocated to the Franchise Area NES."

In Creative Energy’s response to FAES IR 1.25.3 (Ex. B-10), Creative Energy confirmed that 0.07 tonnes CO2e per MWh of sales was the SEFC carbon intensity as of the date of the Neighbourhood Energy Agreement and it reflects the expected outcomes at full build-out of SEFC.

http://www.cnv.org/City-Services/Lonsdale-Energy/LEC-FAQs#Q5.
4.0 Reference: CARBON EMISSION RIDER

Exhibit C4-7-1, p. 7

Carbon emissions rider

FAES states that “[t]he Six Projects, which are representative of alternatives available in the competitive market, do not require customers to pay a carbon emission rider in any way.”

4.1 In each of the FAES projects referenced, if emissions targets are not met for any reasons, controllable or non-controllable, will the customers be required to purchases carbon offsets to meet their specific GHG targets?

Response:

As discussed in the response to BCUC-FAES IR 1.3.1, none of FAES’ TES projects are subject to a GHG intensity target. As a result, no customers will be required to purchase carbon offsets.

4.2 Considering the overall cost impact to the customer, would the customer’s potential carbon offset purchases be similar in concept to the carbon emissions rider that is being proposed? Please discuss.

Response:

Please also refer to the response to BCUC-FAES IR 1.4.1.

The thermal energy rate that customers of the approved/registered FAES Stream A TES listed in Table 1 are/will be paying reflects a low-carbon solution, which is implemented at the start of the service. No additional carbon offset purchases are required.

In any event, the concepts of carbon offsets and carbon emissions rider are not comparable. This is illustrated with reference to the table provided by Creative Energy in response to FAES IR 2.9.1 (Ex. B-24).
Under Creative’s proposal, in 2016, the NEFC NES is expected to emit 406 tonnes of GHGs, which is 286 tonnes in excess of the COV Cap. The Carbon Reduction Rider is set at $26.01/tonne and when this rider is applied to the 286 tonnes of GHGs in excess of the Cap, Creative will collect from customers $7,439 (this number appeared to have been rounded down in the table above), which will accumulate in a Carbon Reduction Fund. By the end of 2016, customers of the NES will have emitted an excess of 286 tonnes of GHGs above the permitted Cap, paid $7,439 into a fund for a future undefined low-carbon solution, the timing of which is highly uncertain, and the 286 tonnes of GHGs in excess of the Cap will not have been offset elsewhere in BC (as they would have been had offsets been purchased). This gives rise to intergenerational inequity, as the end-users who pay into the Carbon Reduction Fund do not enjoy the environmental benefits in the same year, and may in fact never see those benefits, if they leave the development before the Energy Supply Phase 2 is implemented.

In contrast, the purchase of carbon offsets by Creative at $25/tonne to offset the 2016 GHG emissions would cost customers of the NES only $7,150 ( $289 less than under the Carbon Reduction Rider option) and result in a timely reduction of GHG emissions elsewhere in the province, without creating an issue of intergenerational inequity.

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10 Exhibit B-10, FAES IR 1.13.5.
5.0 Reference: SOLO PHASE I RATES

Exhibit C4-7-1, p. 11

Levelized rates

FAES states that “[t]he actual rates for SOLO I start at $112/MWh in 2015 escalating at 2 per cent annually. This means that FAES rates for SOLO I are level in real dollars, creating intergenerational equity characteristics and stability of costs in real dollars for customers for the entire 20-year term of the contract.” [Emphasis added]

In its decision for the SOLO I project, the Commission acknowledged that FAES negotiated a purchase price for the assets that would allow FAES to set an initial rate for its future TES that is competitive in the market place.

Further to the annual inflation escalator, FAES will also be adjusting the rate every five years by the Performance Ratio and will include a fuel rate rider that will be adjusted positively or negatively each year based on actual fuel costs. The Performance Ratio is defined by FAES as: “The ratio of actual costs of providing the Service relative to the forecast costs of providing the Service (set out at the initiation of Service), as reasonably determined by the Utility, calculated in the fourth year of each Performance Term for the previous five years.”

5.1 Please clarify the statement that “rates for SOLO I are level in real dollars.” Is FAES suggesting that the $112/MWh is the levelized rate for SOLO I?

Response:

Yes. $112/MWh is the levelized rate for SOLO I in 2015 dollars.

5.2 Please confirm, otherwise explain, if FAES has taken into account the above rate design parameters for SOLO I into its calculation of the project levelized rate. If confirmed, what assumptions are used for each of the five year rate adjustments? Please show calculations to support your response.

---

11 FAES CPCN Application and Rate Approvals for Thermal Energy Services for the SOLO District Development, Decision, February 25, 2014, p. 3.
Response:

Confirmed.

When FAES sets the initial thermal energy rate, FAES forecasts the annual demand and the costs of providing the service for the 20-year term, and then levelizes those costs and sets them in a manner that escalates at 2 per cent (i.e., the current Bank of Canada inflation target).

If the actual thermal energy demand and costs to provide the service turned out to be equal to what FAES had forecast at the commencement of service, then there would be no adjustment through the Performance Ratio and the thermal energy rate would continue to escalate at 2 per cent.

FAES' rate design is such that it incorporates incentives for FAES to perform better than forecast in any Performance Term. Therefore, at the time of calculating the Performance Ratio to adjust the rate for the next Performance Term, if FAES performed better than originally forecast (i.e., was able to provide service at lower cost), then the rate would either: a) increase by less than 2 per cent; or b) decrease.

Please also refer to the following excerpt from the SOLO I Streamlined Review Process, from pages 45 to 48 of Transcript Volume 1:

“So the rate setting guide is a requirement for Stream A. There are some general principles that we must adhere to adopt the competitive market, the competition environment for the market, provide an equitable balance of risk and cost between the utility and the ratepayer, use the least deferral account mechanism as possible, and restrict the ability of the utility to pass excess controllable costs onto ratepayers, use the least amount of regulatory oversight to protect the ratepayer, and avoid rate shock.

So, we believe that we have developed a rate design that benefits from the two years plus of learnings that we've all been going through on the regulatory front, with the development of the TES service, and that this service benefits from those.

We have balanced the forecasts, risks and reward between FAES and the customers using the five-year performance terms and also the flow-through of the fuel costs on an annual basis. We minimize the regulatory burden and ability for FAES to pass on costs to customers. So that's again reducing the costs for five-year periods and creating incentives for us to beat that, and then sharing those rewards with the customers and provide rate stability and predictability.

So we're using a -- and I'll go into the initial rate now because that helps explain that.
We're using what we call a real levelized rate. So, in this case we're designing the system to match the demands of the customers in Phase 1. Nonetheless, the initial capital investment is high up front, and then depreciation takes place over the life of the - or as we go through time we do have replacement capital coming in. So we find that there will be a sweet spot that occurs in the future, but it won't occur for at least ten to fifteen years from now.

So the service the customers in 20 years get is the same service that the customers of the initial service will be getting, even though some of those customers may be different. They may move out, move in, et cetera. So the real levelized rate provides, in real dollars, the same price for the service over the 20-year period, right? So we're taking a look at what the forecasts of the costs of providing the service are, so it's cost based we'll look at, and then levelizing those costs and setting them in a manner that escalates at inflation. So in nominal dollars it's going up at 2 percent, but in real dollars it's levelized and flat. And then with the five-year -- oh, sorry -- so yeah, initial rates are. So that's the levelization.

How do we establish that price then? And this is a negotiation between us and Appia, effectively, as to what a competitive price in the market would be for the service. There are a number of different ways of looking at what a competitive price might be. I think the terminology you'll hear a lot is "business as usual". I've got a saying that everybody will probably say, "Oh Grant, I can't believe you're saying that," but "a man with a watch knows what time it is, and a man with two watches is never sure," and that's what BAU is like. If you ask Commission Morton what his calculation of BAU is, it will be different than Chairman MacMurchy's calculation of BAU, and so we find that there are differences. It's not a hard and easily identifiable rule that can establish exactly what that competitive price is.

Having said that, when we look at the variety of projects that we've been involved with and the calculations that we've done on what thermal energy alternatives are out there, we do find that the ten to ten and half cent range is a competitive price for thermal energy.

COMMISSIONER MORTON: Excuse me, Grant.

MR. BIERLMEIER: Go ahead.

COMMISSIONER MORTON: I just wondered if you could please clarify. When you are talking about the initial rate, the initial rate is that the first five years?
MR. BIERLMEIER: Let me put it this way, it’s the level rate over the 20 years and if we matched our forecasts perfectly it would be that -- that rate would hold the entire period of time.

COMMISSIONER MORTON: So when you say initial rate, you mean the rate that you are assuming initially.

MR. BIERLMEIER: Yeah. So we’ll set it and -- you’re right.

COMMISSIONER MORTON: Yeah.

MR. BIERLMEIER: So for the first five years that’s what the customers will pay, escalated at 2 percent. And the in the future performance terms, we’ll get to the future rate adjustments, but that will get adjusted by performance ratio.

COMMISSIONER MORTON: And assuming it didn’t get adjusted then it would continue at 2 percent, and therefore it would be levelized over the entire term of the contract, does that summarize?

MR. BIERLMEIER: That’s correct.

COMMISSIONER MORTON: Okay, thank you.”
6.0 Reference: MANDATORY CONNECTIONS AND EXCLUSIVITY

Exhibit C4-7-1, pp. 12–13

Mandatory connections

FAES states that:

[m]andatory connections are only present in specific and unique circumstances where either a municipality owns the DES or the DES was developed as part of the master planned community whereby the developer will be served by the DES. There are no circumstances in BC where mandatory connection is present for a BCUC-regulated DES that provides service to multiple different customers on different freehold strata land across municipal thoroughfares.\(^\text{12}\)

6.1 Please clarify FAES’ position. Is FAES advocating that the Commission deny mandatory connection provisions for any BCUC-regulated DES applications that provide service to multiple different customers on different freehold lots?

Response:

Please also refer to the response to Creative-FAES IR 1.11.1.

FAES is not aware of any such instances other than this proposal, but FAES would have similar concerns if there was a request by another Commission regulated public utility for a similar degree of market protection that is being requested by Creative Energy.

There are varying degrees of market protection possible, and Creative is requesting the highest level. In order to illustrate the novelty of the relief sought in Creative’s Application and the issues raised by FAES in opposition to its approval, FAES has set out below where Creative’s request fits on the spectrum of conceivable protection they could ask for.

\(^\text{12}\) Exhibit C4-7, p. 12.
<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation/Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| 1. Traditional Utility (No exclusivity but economic barriers to entry) | • The nature of the product or commodity, the capital investment and the physical connection to the customer may act to make it impractical for another service provider to install and compete to provide the identical product or commodity once the investment has been made;  
• The provision of the product or commodity (natural gas, electricity, steam, etc.) differs from the use by which that product or commodity may be employed (the provision of light, heat, cold or power);  
• A customer remains free to: decline to connect to a Traditional Utility’s system; to take service from it; and to satisfy its needs for a particular end use from any other source. | • Natural gas distribution service provider (e.g., FEI)  
• Electricity distribution service provider (e.g., BC Hydro)  
• DES provider (e.g., Creative Energy core utility)  
• On-site TES                                                                                                                                 |
| 2. Exclusive Provider of Utility Service  | • Franchise agreements\(^{14}\) could, subject to Commission approval, establish a single utility as the exclusive provider of a utility service (a particular product or commodity, i.e., natural gas, electricity, steam, etc.) in a particular service territory;  
• The provision of the product or commodity (natural gas, electricity, steam, etc.) differs from the use by which that product or commodity may be employed (the provision of light, heat, cold or power);  
• A customer remains free to: decline to connect to an Exclusive Provider of Utility Service’s system; to take service from it; and to satisfy its needs for a particular end use from any other source. | • This is not typical in BC.  
• Creative Energy’s proposed NEFC NES would confer this protection, and others below.                                                                                                                                 |
| 3. Mandatory Connection                  | • Mandatory connection means that a customer has no choice but to connect to a utility system that provides a particular utility service;  
• Mandatory connection is not necessarily synonymous with “mandatory use”.                                                                                                                                          | • COV proposed by-law to compel new buildings, and buildings undergoing major renovations, in NEFC and Chinatown to connect to a NES.\(^{15}\)                                                                 |

\(^{13}\) Exhibit C4-7-1, Table 4, Row 7.  
\(^{14}\) Article 2.3(b) of the proposed Neighbourhood Energy Agreement provides that: “from and after the date hereof and during the Term, COV will not grant a franchise to any other Person to supply hot water or any other form of energy for the purposes of supplying the Hot Water Service to any Franchise Area Buildings or take any other action or cause any other action to be taken in furtherance of any actual or potential such grant.”  
\(^{15}\) Exhibit B-2, Administrative Report, page 1.
### Term Explanation/Description Examples

**4. Mandatory Use**
- Mandatory use obligates a customer, once connected, to also take the product or commodity from the utility;
- The proposed Neighbourhood Energy By-law provides for “compulsory use in mandatory service area” (Article 2.1) and “compulsory use in conditional service area” (Article 2.2).\(^\text{16}\)

**5. Exclusive Provider of an End Use**
- The Exclusive Provider of End Use enjoys the exclusive right to satisfy customers’ need for an end use (i.e., the provision of light, heat, cold or power);
- This differs from an Exclusive Provider of Utility Service, which enjoys the exclusive right to provide a particular product or commodity (i.e., natural gas), while customers remain free to satisfy their need for an end use from any other source;
- The concept of being the Exclusive Provider of an End Use goes beyond “mandatory connection” and “mandatory use” as it compels a customer to take service specifically from one provider in any and all circumstances to satisfy its need for an end use, to the exclusion of any alternative;
- Creative’s Application to be the Exclusive Provider of Hot Water Service in NEFC and Chinatown areas, thus eliminating competition among other utilities that provide products or commodities that serve the same end use (e.g., FEI, BC Hydro, Creative Energy core utility, FAES and any other TES Providers).\(^\text{17,18}\)

To further assist in understanding FAES’ position with respect to Creative’s application it has set out here its understanding of the effect of the approvals sought by Creative in this proceeding, utilizing the terminology defined above. In its Application, Creative proposes to:

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\(^{16}\) Exhibit B-2, Appendix A, Proposed Neighbourhood Energy By-law: Article 2.1 “Each owner of real property in a mandatory service area of: (a) … (b) … must make use of the energy utility system provided in that mandatory service area by connecting the building to that energy utility system.” Article 2.2 “Each owner of real property in a conditional service area of: (a) … (b) … must make use of the energy utility system provided in that mandatory service area by connecting the building to that energy utility system.”

\(^{17}\) Proposed NEA Article 2.3(d) states: “COV will not, directly or indirectly, supply energy for the purposes of supplying Hot Water Service to any Franchise Area Buildings, it being the intent that Utility will be the sole supplier of thermal energy for the purposes of supplying Hot Water Service to Franchise Area Buildings as long as the Franchise is in effect.”

\(^{18}\) Proposed NEFC and Chinatown Connection Agreement Article 2.2 states: “No Alternate System or Service Provider. The powers and rights granted to Creative Energy under this Agreement are exclusive to Creative Energy and, except as expressly provided hereunder or in the Design Guide, the Owner will not itself perform, provide, install or realize, nor allow any other Person to perform, provide, install or realize any other system to provide primary domestic hot water or space heating to any Building, nor use or allow or consent to any other Person supplying or distributing Thermal Energy to the Lands.”
1. Be the **Exclusive Service Provider** of DES in the Franchise Area;
2. Compel all Franchise Area Buildings to **connect** to its DES (**Mandatory Connection**);
3. Compel all Franchise Area Buildings to **take service** from its DES (**Mandatory Use**); and
4. Compel all Franchise Area Buildings to obtain heat and DHW from its DES, or other on-site solutions chosen by Creative, to the exclusion of any other alternative (**Exclusive Provider of End Use**).

These concepts impose increasing imposition and restriction on choice on customers.

FEI and Creative Energy’s steam business do not have any of the above (Creative Energy’s agreement with the COV actually expressly indicates that it does not confer exclusivity), although in practical terms there is likely to only be one natural gas or steam utility in any given area and any new entrant would need to demonstrate that it is in the public interest to have two utilities providing the same offering in the same area.

In terms of the actual restrictions identified above, the least intrusive is where a utility may be granted a right to be the **Exclusive Provider of Utility Service** for a particular product or commodity. A customer in this utility’s service territory is precluded from obtaining that product or commodity from another provider. Importantly, that customer is neither mandated to take service from that provider, nor precluded from satisfying its need for an end use from an alternative source. Simply, that customer may take, or not take, the product or commodity; and use, or not use, the product or commodity to satisfy whatever end use it chooses.

The most intrusive, and that which is sought in Creative’s Application, is the **Exclusive Provider of End Use**. A customer in this utility’s service territory is precluded from fulfilling its need for a particular end use (i.e. heat) from any other alternative available in the market. It may not elect to generate its own heat; obtain heat from a utility that provides an alternate product or commodity; nor, when an Exclusive Provider of End Use is coupled with a Mandatory Connection and Mandatory use, may it decline to take the end use at all. That customer is compelled to connect to and take service from a utility for the exclusive satisfaction of its need for heat. This is novel when it comes to Commission-regulated utilities. FAES is unaware of any investor owned utility that has been granted the benefit of such a captive customer base.

It is FAES’ view that such a “super-monopoly” is inappropriate, inconsistent with the fundamental principles of utility regulation, and detrimental to the public interest.

This IR is premised on FAES’ observation in its Evidence that: *mandatory connections are only present in specific and unique circumstances where either a municipality owns the DES or the DES was developed as part of the master planned community whereby the developer will be served by the DES.*

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19 As defined in the NEA (Exhibit B-1, Schedule 2, Schedule A – Definitions).
This fact reflects the importance of ownership and the inherent allocation of risk in developing a DES. A “master” developer of a Stream B TES that may utilize mandatory connection (or similar policies) must accept the risk that its decision to advance DES in that manner may not be acceptable to the market. In contrast, in this Application there is a transfer of risk from Creative to the ultimate developer of sites in the Franchise Area, respecting the acceptability of the DES. This transfer of risk means that Creative effectively has much less “skin in the game” than any other TES proponent that has been before this Commission, while being positioned to benefit from the most intrusive regulatory levers (exclusive service provider, mandatory connection, mandatory use and being the exclusive provider of an end use) conceivable to secure a customer base.

6.1.1 If confirmed, please explain under what section of the Utilities Commission Act is FAES asking the Commission to make a determination on?

Response:

Please refer to the response to BCUC-FAES IR 1.6.1.

6.2 FAES’ Kelowna District Energy System (KDES) project was approved under Commission Order C 8-13. Please discuss the current status of this project. Are the projections of customer connections and conversions on target with FAES’ CPCN forecast?

Response:

The KDES remains in development.

FAES does not yet have an agreement in place to recover the waste heat from the flue gas expelled from the sawmill operations to supply low carbon energy to the KDES, as contemplated in the CPCN application for this project.

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20 That the legislative scheme precludes other arrangements (including that contemplated in Creative’s Application) from enjoying mandatory connection / exclusivity over the provision of end use will be discussed in detail in Final Argument.
FAES is of the view that constructing the KDES and operating it on natural gas until a low carbon energy supply can be secured at competitive prices is not appropriate in this situation. Further, FAES does not have an approved rate design and rates for the KDES as Commission Order C-8-13 denied the proposed rate design and rates while granting the CPCN. For these reasons, FAES has not pursued customer connections and conversions as planned in the CPCN Application. As a result, the “projections of customer connections and conversions” (FAES understands this to mean signed service contracts with customers) are not on target with the forecast in the CPCN.

6.2.1 Does FAES consider that the absence of a mandatory connection requirement has impacted these results? Why or why not?

Response:
A mandatory connection requirement would not have impacted the present status of the KDES project. Please also refer to the response to BCUC-FAES IR 1.6.2.

6.3 What is FAES’ view on whether mandatory connections are attributable to the success rate of a DES (as measured by the alignment of actual connections and conversions compared to its forecast connections and conversions)?

Response:
FAES understands the question to be whether the success of a DES is attributable to mandatory connections.

As FAES noted in its Evidence, there are two fundamental risks any project developer or owner faces with respect to district energy: (1) the level of customer demand; and (2) the security of energy supply. A DES will need to resolve both to be successful.

21 Exhibit C4-7-1, pages 2-3.
While “exclusive service provider”, “mandatory connection”, “mandatory use” or being the “exclusive provider of heat and DHW” (as those terms are used in BCUC_FAES IR 6.1) would reduce the risk related to the acquisition of customers in a competitive market, that can only be achieved (in the present context) at the expense of customer choice and by transferring risk to developers, as discussed in response to BCUC-FAES IR 1.6.1.

In any event, however, such policies do not address the challenge of securing a supply of low carbon energy. Without this, although a DES may connect and serve customers; it will remain a high-carbon energy solution until a low carbon energy supply can be secured at competitive prices.

Until both issues are overcome, the DES would remain “unsuccessful”.

### 6.4

Given that there are no mandatory connections at KDES and Dockside Green Energy, does FAES have any observations on the success rate of these two particular DES? (success rate as measured by the alignment of actual connections and conversions to its forecast connections and conversions).

**Response:**

Please refer to the responses to BCUC-FAES IRs 1.6.2 and 1.6.2.1 regarding the KDES.

FAES is approaching the development of the KDES with a plan to advance construction after a low carbon supply is contractually secured and sufficient customer load is certain.

With respect to Dockside Green Energy (DGE), FAES makes the following observations about its success:

First, as noted in the preamble to BCUC-FAES IR 1.6.5 below, and in FAES Evidence, “each new building within the Dockside Green Development will be connected to the Utility distribution system”. This “Mandatory Connection” provision does not, however, solve construction risk. The “master” developer of the lands is taking the overall risk of the success of the development and, as part owner of the DES, is also taking risk on the development of DGE. The delay/lack of construction in the Dockside Green Development relative to the forecast has had considerable impact on the customer demand and revenues. This also translates to ongoing challenges for the “master” developer because it still holds the risk of development: (a) the risk that “sub”-developers may not want to purchase and develop individual land parcels (which may be

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22 Exhibit C4-7-1, Table 4, Row 6.
attributable in part to the mandatory connection requirements), or (b) the risk that end users may not want to purchase units due to the mandatory connection to the DGE.

In addition, securing low carbon fuel at Dockside Green suitable for operating the biomass boiler at competitive prices has been a significant challenge. DGE primarily operates on the natural gas backup boiler which has a capacity designed to meet the entire peak loads of the system at full buildout. The biomass fired boiler at DGE is designed to meet baseload of the entire system at buildout, which is much higher than the actual peak loads at DGE currently. The cause of this is the lack of development relative to the development’s original plan. The result is that the biomass boiler cannot turn down enough to operate efficiently to serve the lower energy needs and, consequently, the system operates solely on the natural gas backup boiler. Given the massive disparity between the capacity of the natural gas boiler and the actual loads, the overall efficiency of the operations suffers dramatically as the natural gas boiler cannot achieve operations within its designed operating range for most if not all of the year. Further, the reliance on the backup natural gas boiler as the primary thermal energy source due to the inability to operate the biomass boiler means that there is no backup system or redundancy for the DGE customers, unless they provide their own in-building systems. As such, the overall efficiency and security of thermal energy supply is lower than the plan for the DES and exposes the entire customer load of the DES to the same reliability risk overall.

FAES states that Dockside Green Energy, River District Energy and the University of British Columbia Neighbourhood District Energy System are three examples of DES where the land owner and/or developer required that buildings on their lands, when constructed, would be connected to the DES. 23

6.5 Are there any comparisons that can be drawn with the above three DES examples and the NEFC project? For example, at NEFC there is no single landowner but arguably, a single developer (the City of Vancouver) who has mandated connections. Similarly, for each of the four projects there is a single developer that has made the decision to mandate connections for the buildings in each DES. Please discuss.

Response:

Please refer to the response to BCUC-FAES IR 1.6.1.

23 Exhibit C4-7, p. 13.
Attachment 2.1

REFER TO LIVE SPREADSHEET MODEL
Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)