

Corix Multi-Utility Services Inc.  
Application for Disposition of Assets from the Burnaby Mountain District Energy Utility

**RESPONSE TO INFORMATION REQUEST NO. 2  
FROM THE BRITISH COLUMBIA UTILITIES COMMISSION**

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**4.0 Reference: PROPOSED ASSET DISPOSITION  
Exhibit B-2, BCUC IR 2.1, 2.5, 2.5.1, 3.9; Corix Revenue Requirements and Rates  
Application (RRA) for the Dockside Green Energy (DGE) Utility (DGE RRA) proceeding,  
Exhibit B-4, BCUC IR 2.4  
Impact on UniverCity Customers**

In response to British Columbia Utilities Commission (BCUC) information request (IR) 2.1, Corix Multi-Utility Services Inc. (Corix) stated the following:

Based on timing for projected buildout of UniverCity and actual observed coincident peak within the UniverCity side of the system Corix has determined that only the two larger 3MWt boilers from TEC2 [Temporary Energy Centre 2] will be required in combination with the biomass plant operation at this time. Corix has incorporated into the natural gas plant design the ability to add a third boiler should the actual observed coincident peak exceed the 6MWt provided by the two existing units from TEC2. In addition to this consideration, Corix has been working with BC Hydro to better understand the new Low Carbon Electrification program as it is Corix's current understanding that BC Hydro could potentially provide capital incentives to institute an electric boiler, which would replace the potential future third gas boiler.

In response to BCUC IR 2.5, Corix stated the following:

At this time there are still 11 buildings remaining to be constructed within the UniverCity community and based on empirical data collected by Corix throughout the last eight years of operations there is a possibility that Corix may need to add a third unit of production to the natural gas plant component of the CEP [Central Energy Plant] in the future. Corix is currently exploring possible alternatives to natural gas, such as electric boilers, that could provide the small incremental capacity (less than 2MWt) that may be needed around 2022 or 2023 under current forecasts.

In response to BCUC IR 3.9, Corix stated: "If the 2015 Market Value of \$325,000 is depreciated based on the estimated remaining service life (15 years) of the TEC1 [Temporary Energy Centre 1] Assets to be transferred to DGE, the estimated 2019 Market Value of the complete TEC1 system is \$238,333."

In response to BCUC IR 2.4 in the DGE RRA proceeding, Corix stated that it estimates a remaining useful life of 15 years for the TEC1 assets.

4.1 Please clarify if the estimated remaining service life of the TEC1 assets was 15 years as of 2015 or if the remaining service life is 15 years as of 2019.

**Response:**

Corix estimates a remaining useful life of 15 years for the TEC1 assets proposed to be transferred from the BMDEU as of 2019. Based on this remaining useful life and the 2015 Market Value of \$325,000 for TEC1, the updated estimated 2019 Market Value of the complete TEC1 system is \$256,579.

- 4.2 Please further elaborate on the likelihood (high, medium or low) that an additional boiler will need to be installed in 2022 or 2023 to provide incremental capacity to UniverCity if the disposition of the TEC1 assets is approved. Please fully explain all assumptions and provide a rationale for the estimated likelihood.

**Response:**

Corix estimates that the likelihood of this occurring is at a medium level. This estimate is based on two factors:

- (1) The Updated Buildout Schedule; and
- (2) the Actual Observed Coincident Peak.

If the buildout of all remaining parcels progress as outlined in the latest buildout schedule (June 2019) and the peak capacity of all new additions is as forecasted, then an additional boiler would need to be installed when the last building is connected to the system (currently forecasted in late 2022) to provide a small amount of incremental capacity to UniverCity.

Considering the development delays to date, Corix believes that there could be further development delays between now and 2022. The housing market is currently experiencing a lull resulting in increased uncertainty with the buildout schedule. In addition, the observed coincident peak demand for the completed parcels have resulted in a cumulative peak capacity demand that is lower than forecasted. Should this trend continue with the remaining parcels, this could result in the delay or complete elimination of the need for additional incremental capacity in 2022.

- 4.3 Please explain if, based on Corix's forecasts, there is a high likelihood that if the disposition of the TEC1 assets is approved, an additional boiler will need to be installed to provide incremental capacity to UniverCity within the timeframe of the remaining useful life of the TEC1 assets. Please fully explain the assumptions and rationale for this assessment.

**Response:**

Since the remaining useful life of the TEC1 assets is estimated to be 15 years as of 2019, then an additional boiler (if required) would likely be needed during the 15-year timeframe. However, the timing and incremental capacity requirements for an additional boiler is subject to the buildout schedule and the actual observed peak demand. If an additional boiler is required in the future, Corix would select the size and the most appropriate technology at that time. Keeping the flexibility in selection and sizing of any additional equipment would enable Corix to capture and support any potential future loads (e.g. a development of lands adjacent to UniverCity).

- 4.4 Please provide a breakdown and description of the forecast capital cost if Corix is required to purchase a third natural gas boiler (and any associated equipment) to serve the UniverCity customers in the future.

**Response:**

Corix estimates a third 3 MWt (or 3,000 kWt) natural gas boiler to have a capital cost within the range of \$125,000 and \$200,000. Associated equipment is estimated to cost within the range of \$15,000 and \$20,000. Estimates provided in this response are preliminary Class C estimates ( $\pm$  25 to 40%).

- 4.5 Please explain in detail the Low Carbon Electrification program based on Corix's discussions with British Columbia Hydro and Power Authority (BC Hydro) and discuss the feasibility (and likelihood) of Corix participating in this program.

**Response:**

Corix has only had preliminary discussions with BC Hydro regarding the potential applicability of the Low Carbon Electrification (LCE) program to Corix's district energy utilities. It is Corix's current understanding that BC Hydro could potentially provide capital incentives to institute an electric boiler, which could be an alternative to the potential future third natural gas boiler. BC Hydro provided funding to Thompson Rivers University to assist in the acquisition, installation, and use of electric boilers instead of natural gas boilers in a new building.<sup>1</sup> Based on the limited information available at this time, Corix cannot provide detail on the feasibility of participating in BC Hydro's LCE program. At the same time, future participation in the LCE program may be a possibility.

- 4.6 Please provide a breakdown and description of the forecast capital cost to install an electric boiler to serve UniverCity customers, inclusive of incentives from BC Hydro, and including any associated equipment needed to integrate the electric boiler with the Burnaby Mountain District Energy Utility (BMDEU) CEP.

**Response:**

Corix estimates the capital cost of a 1.75 MW electric boiler to range between \$138,000 and \$162,500. Electrical and mechanical works would have to be performed and these are estimated to range between \$156,000 and \$381,500. Estimates provided in this response are preliminary Class C estimates ( $\pm 25$  to 40%). At this time, Corix is unable to forecast any potential incentives from BC Hydro's LCE program.

In response to BCUC IR 2.5.1, Corix stated the following:

Corix would also highlight that the boilers used in TEC1 were not necessarily selected at the time they were purchased to be re-purposed into the CEP. While it could be technically possible to use these units in the CEP, the boilers in TEC1 do have working pressure limitations which would result in certain cost considerations around configuring these units into the CEP that may lead to higher costs overall when compared to a new piece of thermal generating equipment designed for this specific type of application.

- 4.7 Please describe the working pressure limitations referenced in the above preamble and how these limitations might potentially impact the TEC1 assets' functionality if integrated into the BMDEU CEP.

**Response:**

The working pressure for TEC1 boilers is no greater than 160PSI. The permanent plant is located in a lower elevation compared to current TEC1 location, which has an impact on system design pressures. The system will be 232PSI meaning that the system is now a registered pressure vessel with TSBC and all related equipment must meet or exceed the 232PSI design pressure rating. Therefore the TEC1 boilers would need to be isolated from the distribution piping system via heat exchangers which would add additional cost and reduce overall system performance and efficiency.

- 4.8 Please provide an estimate and description of the additional costs to configure the TEC1 units into the BMDEU CEP.

**Response:**

A new set of three heat exchangers would be needed to isolate the boilers. Additional costs would be estimated at a class C level between \$250,000 and \$350,000 to accommodate this change.

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<sup>1</sup> BC Hydro F20-F21 Revenue Requirements Application, Appendix Y, p. 6.

However, the original concept of using TEC1 in the BMDEU CEP as additional peaking and back-up did not contemplate removing the boilers from TEC1 and installing them as separate pieces of equipment in the new plant due to the space limitation. The entire container would have been moved, placed adjacent to the CEP and connected via one heat exchanger to accommodate different operating pressures.

Since the time this concept was considered, the detailed design of the site including the access to the site, truck turnaround, as well as the design of the building was completed, which indicated that there is limited space for the container to be placed in a close proximity of the other natural gas boilers. In addition, the stack height would need to be significantly increased to allow for a proper emission dispersion that would interfere with the walkway around the building connecting the east and west side of the CEP. All services (water, sewer, electricity and gas) would need to be extended to the TEC container. The cost estimate (class C) to extend stack heights and bring services to the TEC1 plant would be between \$250,000 and \$350,000.

- 4.9 Please explain if the working pressure limitations described by Corix in response to BCUC IR 2.5.1 will likely result in higher costs to configure the units into the DGE system and/or may result in operational issues for DGE.

**Response:**

The working pressures for the DGE system are well below the 160 PSI range and therefore there would be no cost impacts resulting in using the UniverCity TEC1 boiler assets.

- 4.9.1 As part of the above response, please explain if Corix took the working pressure limitations into consideration when deciding to sell the TEC1 assets to DGE. If yes, please explain how these limitations were taken into consideration and whether the limitations are expected to impact service to DGE.

**Response:**

As stated in the response to IR 4.9, there are no working pressure limitation considerations for the DGE system.

- 4.10 Under a hypothetical scenario where Corix is required to acquire incremental capacity in 2022 to serve the UniverCity customers, please provide both a net present value comparison and a rate impact comparison for UniverCity ratepayers of the following scenarios (assume for the purposes of this analysis that the BMDEU CEP in-service date is mid-2020). Please provide all calculations and explain all assumptions, and provide the supporting working excel spreadsheets:

- (i) **Scenario 1** - The existing TEC1 assets are not disposed of and are incorporated into the permanent BMDEU CEP system for the in-service date of mid-2020.
- (ii) **Scenario 2** - The existing TEC1 assets are approved to be disposed of and a new natural gas boiler (and any associated equipment necessary to integrate the boiler with the CEP system) is purchased and installed as part of the BMDEU CEP in 2022 (i.e. when the incremental load capacity is required).
- (iii) **Scenario 3** - The existing TEC1 assets are approved to be disposed of and an electric boiler (plus any associated equipment necessary to integrate the boiler with the CEP system) is purchased and installed as part of the BMDEU CEP in 2022 (assume that Corix is eligible for the BC Hydro Low Carbon Electrification program).

**Response:**

Table 1: Hypothetical Scenario Comparison Table

	<b>Net Present Value (30 Year Levelized Rate per MWh)</b>	<b>Rate Impact</b>
Scenario 1	\$132.99	N/A
Scenario 2	\$131.85	N/A
Scenario 3	\$132.46	N/A

There will be no impact to customer rates for any of the three hypothetical scenarios described. This is due to the use of levelized rates coupled with a Revenue Deficiency Deferral Account (RDDA) initially approved for UniverCity ratepayers through BCUC Order C-7-11. Through Order G-215-15 the BCUC approved Corix’s request to reduce the overall levelization period from 20 years to 15 years. Furthermore, this levelized rate structure for UniverCity ratepayers was included in the 2017 BMDEU CPCN approved through Order C-5-17. In the 2017 BMDEU CPCN, the deferral account was anticipated to carry a balance until 2028 when the deferral account balance would be reduced to \$0.

Scenario 1 assumes a \$550,000 capital cost in 2020 to incorporate the TEC1 boilers into the CEP. The \$550,000 was determined by taking the median cost for the set of three heat exchangers (\$250,000 to \$300,000 range) and the cost to extend stack heights and bring services (\$250,000 to \$300,000 range) to the TEC1 plant due to its location outside the CEP. These costs were discussed in response to BCUC IR 4.8 above.

Scenario 2 assumes a total sale price of \$98,005 for the three TEC1 boilers and a subsequent capital cost of \$162,500 for the new natural gas boiler in 2022 plus \$17,500 of associated equipment in 2022. The figures used in Scenario 2 were taken as the median of the ranges provided in response to BCUC IR No. 4.4 above.

Scenario 3 assumes a total sale price of \$98,005 for the three TEC1 boilers and a subsequent capital cost of \$150,250 for the new electric boiler in 2022 plus \$268,750 for electrical and mechanical works associated with the electric boiler. The amount of funding provided for each project eligible for the BC Hydro Low Carbon Electrification (LCE) program appears to be based on the circumstances of each project. Corix cannot speculate on the value of the incentives that could be provided by BC Hydro for use at BMDEU. The figures used in Scenario 3 were taken as the median of the ranges provided in response to BCUC IR No. 4.6 above.

Please see the confidential Microsoft Excel files submitted separately. There is one file for each scenario. Each scenario is based on the financial model used for the 2017 BMDEU CPCN Application.

4.11 Please explain in detail, considering both quantitative and qualitative factors, why disposing of the TEC1 assets is more beneficial to UniverCity customers than keeping the TEC1 assets.

**Response:**

As discussed in response to BCUC IR No. 2.1, 2.3 and 3.3 the TEC1 gas boilers are no longer required as part of the new central energy plant (CEP). Based on timing for projected buildout of UniverCity and actual observed coincident peak within the UniverCity side of the system, Corix has determined that only the two larger 3MWt boilers from TEC2 will be required in combination with the biomass plant operation at this time. Corix does not believe there is any significant risk of impact to Corix’s ability to serve the UniverCity customers should the BCUC approve the disposition of the TEC1 assets. By summer of 2020 when the biomass plant is scheduled for completion, the TEC 2 with two 3 MWt boilers will still be sufficient to support the projected load. With this in mind, the disposition of the TEC1 assets is more

beneficial to UniverCity customers than keeping the TEC1 assets due to the following:

- (1) The customers of the BMDEU system would receive a financial benefit of the sale of the TEC1 boilers to the DGE utility. This would result in a one-time reduction of UniverCity's portion of rate base. If the assets were kept at BMDEU CEP the UniverCity customers would not receive any such benefit associated with the disposition of the TEC1 boilers. The UniverCity customers would receive approximately \$98,005 (net book value at June 30, 2019) for the sale of the TEC1 boilers to DGE if Corix's request is approved by the BCUC.
- (2) If the TEC1 boilers were not sold, based on detailed engineering design, actual physical dimensions of the BMDEU central energy plant (CEP) and working pressure considerations, the TEC1 boilers would have to be located outside the BMDEU CEP due to the physical space constraints. Since the boilers would have to be located outside of the main CEP, incremental costs would have to be incurred to connect the TEC1 boilers to the CEP. These additional costs include, but are not limited to, the cost of piping, heat exchangers, additional stack heights, cabling, single meter and a secondary gas train. These incremental costs would eclipse the cost of purchasing a new boiler, with the appropriate working pressure, to fit inside the CEP.
- (3) Corix considers that there is only a medium level of likelihood that an additional boiler may be needed by 2022 or 2023. Should Corix dispose of the TEC1 boilers and the load buildout and peak capacity requirements necessitate an additional boiler by 2022 or 2023, Corix would have the option of considering alternatives. Keeping the flexibility in selection and sizing of any additional equipment would enable Corix to capture and support any potential future loads (e.g. a development of lands adjacent to UniverCity).