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Corix Multi-Utility Services Inc.

Application for a Certificate of Public Convenience and Necessity for the Burnaby Mountain District Energy Utility

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Decision
and Order C-5-17

September 15, 2017

Before:
D. A. Cote, Panel Chair
D. J. Enns, Commissioner
W. M. Everett, QC, Commissioner
B. A. Magnan, Commissioner

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Executive summary

Corix Multi-Utility Services Inc. (Corix) is the owner and operator of the UniverCity Neighbourhood Utility Service (NUS), providing thermal energy services to its UniverCity customers on Burnaby Mountain. Corix was granted Certificate of Public Convenience and Necessity (CPCN) approvals by the British Columbia Utilities Commission (Commission) under Order C-7-11 dated May 6, 2011, with further approvals granted in Order G-48-16A dated April 11, 2016. The UniverCity NUS has been operating since its inception, serving the initial phases of the UniverCity developments by using temporary energy centres (TECs) reliant upon natural gas boilers designed to be replaced with a permanent low-carbon energy facility when there was sufficient demand to make such a facility economic.

On February 20, 2017, Corix filed a CPCN application with the Commission for approval to develop the next stage of its NUS on Burnaby Mountain, now referred to as the Burnaby Mountain District Energy Utility (DEU) (Application). The DEU is designed to provide low-carbon energy service to Phases 3 and 4 and a portion of Phase 2 of the UniverCity development. When complete in 2022, a total of 23 strata customers and 2 commercial customers from the UniverCity development will be connected to the Burnaby Mountain DEU. Baseload low-carbon service will be provided to the Simon Fraser University (SFU) campus through an interconnection to the existing SFU district energy system.

In the Application, Corix seeks Commission approval for:

- A CPCN pursuant to section 45 of the *Utilities Commission Act* (UCA) authorizing the construction and operation of a biomass central energy plant and the associated facilities; and
- Approval, pursuant to sections 60 and 61 of the UCA, of the amended and restated Thermal Energy Services Agreement (TESA) dated as of January 27, 2017 between Corix and SFU, including the cost of service, cost allocation and rate design principles set out in Schedule 1 (Cost of Service Parameters) and Schedule 2 (Cost Allocation and Rate Design Principles).

While Corix provides indicative rates as part of the TESA, it does not seek Commission review or approval of these rates at this time. Corix will apply to the Commission for rates approval prior to the in-service date with a recalculation based on actual costs and forecasts at that time.

Taking part in the proceeding were four intervener groups, each with varying interests. The Commission's review of the Application included two rounds of information requests followed by final and reply arguments from the parties and applicant.

The Panel's approach to this decision involved a review of the Application and evidence and identified four main areas of concern: project justification, details of the project description, the Thermal Energy Services Agreement between Corix and SFU, and the financial inputs in the rate model.

In reviewing Corix's justification for the project, the Panel finds the project needs were established given that the long-term plan for the UniverCity development, as outlined in its 2010 Application for a CPCN for the NUS at UniverCity, Burnaby, has been to convert to a low-carbon energy solution and is a requirement of the SFU Trust. The proposed biomass facility meets the requirements of SFU and the SFU Trust in respect of their GHG

emissions reduction obligations and sustainability objectives under applicable legislation and guidelines. It is also supported by government policy and government funding. The Commission finds that utilizing a combined central biomass facility is the most viable alternative for supplying low-carbon energy in a cost-effective and sustainable manner and therefore would also address the SFU Trust's objectives for transitioning the UniverCity NUS to low-carbon energy.

The Panel is satisfied that Corix's consultation has been appropriately undertaken with a thorough and open consultation process with stakeholders and the public and all affected parties were afforded the opportunity to raise concerns with the developer.

Although a number of the risks associated with the project were identified by Corix, the Panel is satisfied with Corix's explanations and risk mitigation strategies. Some interveners raised the issue of carbon neutrality with respect to the use of biomass. However, the Commission finds that the issue is not about carbon neutrality or the speed of the replacement of forests but rather, whether the burning of clean biomass is in accordance with standards as reflected in the *Clean Energy Act* (CEA). The Panel determines the reduction of 11,600 tonnes of CO_2 at full build-out, as stated by Corix, to be reasonable and that the proposed DEU is aligned with various provincial Energy Objectives as outlined in the CEA. Furthermore, the Panel is satisfied with Corix's biomass delivery plan but directs Corix to refrain from the use of treated railway ties as a biomass fuel source as a condition of the CPCN approval.

With respect to the TESA, the Panel accepts Corix's assessment of minimal risk to UniverCity ratepayers in the event of an early termination of the TESA by SFU. The Panel accepts Corix's assertions that based on the proposed rate structures for SFU and for UniverCity, there would not be an increased allocation of costs to UniverCity ratepayers if SFU elected not to take energy from the combined biomass facility. Furthermore, where a rate change for any of the parties occurs as a result of a change in nominated capacity, Corix is required to file an application with the Commission in accordance with section 61 of the UCA.

The Panel also finds the various financial parameters to be appropriate. This includes the methodologies employed to allocate costs among the parties, the rate design principles, the cost of service parameters and the two deferral accounts with amendments to the TESA to reflect certain revised deferral account wording. Other acceptances by the Commission include Corix annual load demand and energy forecast, capital and operating costs, as many of these costs and assumptions have been reviewed and tested in the 2015 Corix UniverCity NUS CPCN proceeding. The forecast costs and escalation assumptions are also reasonable and based on the best information available to Corix at this time.

Overall, the Panel finds the Burnaby Mountain DEU project to be in the public interest and grants a CPCN to Corix for its construction. The CPCN Guidelines have been met and approval is warranted.

The Commission also approves the amended and restated TESA dated as of January 27, 2017 between Corix and SFU subject to those revisions discussed in Section 4.1.5 of the decision.

In terms of future reporting, Corix is directed to file semi-annual progress reports within 45 days of the end of each reporting period with the first report due December 31, 2017, along with a Final Report within six months following the completion of the Project. Specific details of these reports are as outlined in Section 7.0 of the

decision. Additionally, Corix is directed to provide Material Change Reports on an exception basis, identifying deviations from forecasts that could affect costs and rates.

1.0 Introduction

1.1 Background

Corix Multi-Utility Services Inc. (Corix) filed an application with the British Columbia Utilities Commission (Commission) for approval to develop the next stage of its UniverCity Neighbourhood Utility Service (NUS) on Burnaby Mountain, now referred to as the Burnaby Mountain District Energy Utility (DEU) (Application).

Corix is the owner and operator of the UniverCity NUS, providing thermal energy services to its UniverCity customers in accordance with approvals sought in its 2010 Application for a Certificate of Public Convenience and Necessity (CPCN) for the NUS at UniverCity, Burnaby (2010 CPCN Application) and granted by the Commission under Order C-7-11 dated May 6, 2011. Further approvals were granted by the Commission in Order G-48-16A dated April 11, 2016. The UniverCity NUS has been operating since its inception with temporary energy centres (TECs) reliant upon natural gas boilers that were designed to be replaced with a permanent low-carbon energy facility when there was sufficient demand to make such a facility economic. Corix states that once the 2010 CPCN Application was approved, it entered into discussions with Simon Fraser University (SFU) to combine the longer term objectives for transitioning the UniverCity NUS to low-carbon energy with SFU's requirements to meet the province's mandates for the mitigation of greenhouse gas (GHG) emissions. After undertaking a detailed technical and financial analysis of various alternative low-carbon energy technologies, Corix concluded that biomass technology was most suitable. Based on this analysis, Corix and SFU reached two agreements to develop a biomass central energy plant (CEP) to provide energy to the SFU campus and the UniverCity community.[1]

The Burnaby Mountain DEU is being designed to provide low-carbon energy service to Phases 3 and 4 and a portion of Phase 2 of the UniverCity development and when complete in 2022, a total of 23 strata customers and 2 commercial customers from the UniverCity development will be connected to the Burnaby Mountain DEU. Additionally, baseload low-carbon service will be provided to the SFU campus through interconnection to the existing SFU district energy system (DES). The expanded DEU at Burnaby Mountain, in addition to existing and previously approved facilities, will consist of the following:

- A 13.5 megawatt (MW) output capacity biomass module plus a 8.3 MW output capacity natural gas module and related equipment which will be located in the CEP;
- An energy transfer station (ETS) for SFU (Campus ETS) that will serve as the interconnection point between the Burnaby Mountain DEU and the SFU DES; and
- A distribution piping system (DPS) with a connection pipeline between the Campus ETS and the CEP and another connecting the existing UniverCity DPS to the CEP.[2]

1.2 The applicant and partner

Corix is partnering with SFU in the development of the project and will be the owner and operator of the Burnaby Mountain DEU once complete. Corix is part of the privately held Corix Group of Companies (Corix

[1] Exhibit B-1, p. 1.
[2] Exhibit B-1, p. 2.

Group) that is principally owned by the British Columbia Investment Management Corporation (bcIMC), a large Canadian institutional investor.

Corix describes the Corix Group as "a leading provider of fully integrated utility infrastructure solutions including energy, water, and waste water projects" with extensive expertise and experience in developing sustainable district energy utilities locally and across North America. The Corix Group and its predecessor companies have more than 70 years combined experience in the design, build, finance and management of utility infrastructure systems and its experience with development and operation of district energy systems has undergone significant growth over the past 10 years. The Corix Group has over 2,200 employees with 2015 revenues of $786 million and assets of $2.2 billion. Corix describes the group's borrowing capacity of $200 million through a revolving credit facility with access to interim financing as required through its shareholders and external partners.[3]

SFU established the SFU Community Trust (SFU Trust) with the purpose of developing a new sustainable residential community with the lands off the east side of the university campus. SFU with its primary campus atop Burnaby Mountain in Burnaby, BC, is described as a leading Canadian university with an enrollment of over 30,000 students and 6,500 faculty and staff. As part of its vision, SFU is committed to reducing GHG emissions while creating institutional energy savings.[4]

1.3 Approvals sought

Corix seeks approval for the construction and future operation of project facilities constituting the next stage of the UniverCity NUS development with extended service to the SFU campus. Specifically, Corix is applying to the Commission for the following:

- A CPCN pursuant to section 45 of the *Utilities Commission Act* (UCA) authorizing the construction and operation by Corix of a biomass central energy plant and the associated facilities.
- Approval, pursuant to sections 60 and 61 of the UCA, of the amended and restated Thermal Energy Services Agreement (TESA) dated as of January 27, 2017 between Corix and Simon Fraser University, including the cost of service, cost allocation and rate design principles set out in Schedule 1 (Cost of Service Parameters) and Schedule 2 (Cost Allocation and Rate Design Principles) attached to the Application.

Corix points out that while it has provided indicative rates as part of the TESA, it is not requesting Commission review or approval of these rates. Its intention is to apply to the Commission for approval of rates prior to the in-service date and base the rates on the actual costs to date and a forecast at that time.[5]

1.4 Provincial government energy objectives and policy considerations

Corix's submits that the Burnaby Mountain DEU is in alignment with several of the objectives as outlined in the 2007 BC Energy Plan, the *Clean Energy Act* (CEA), and the *Greenhouse Gas Reduction Targets Act*. Specifically, Corix provides the following table as evidence of how the Burnaby Mountain DEU addresses the BC Energy Objectives:

[3] Exhibit B-1, pp. 4–5.
[4] Exhibit B-1, p. 8.
[5] Exhibit B-1, p. 3.

Table 1: Addressing BC Energy Objectives[6]

OBJECTIVE	PROJECT ALIGNMENT WITH OBJECTIVES
To encourage the switching from one kind of energy source or use to another that decreases GHG emissions in British Columbia. To encourage communities to reduce GHG emissions and use energy efficiently.	The Burnaby Mountain DEU was initially designed and developed to use natural gas to supply the first customers connected to the district energy system. The load development and Campus Connection to the Burnaby Mountain DEU enables transition from a traditional fuel source to a renewable energy source (biomass).

OBJECTIVE	PROJECT ALIGNMENT WITH OBJECTIVES
To reduce BC GHG emissions: • By 2020 and for each subsequent calendar year to at least 33% less than the level of those emissions in 2007 • By 2050 and for each subsequent calendar year to at least 80% less than the level of those emissions in 2007 • By such other amounts as determined under the *Greenhouse Gas Reduction Targets Act*	By utilizing the biomass CEP, the implementation of the Burnaby Mountain DEU will result in an estimated reduction in overall GHG emissions of 11,600 tonnes / year.
To reduce waste by encouraging the use of waste heat, biogas, and biomass.	The project will use local wood waste (biomass) that could include urban wood waste from tree cuttings and trimmings, uncontaminated wood waste such as wood chips from sawmills, shavings, hog fuel (an unprocessed mix of bark and wood fiber), and clean construction wood waste.
To use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources.	The centralized Burnaby Mountain DEU operates with higher efficiencies compared to standalone building systems. This is achieved through load diversification requiring less infrastructure capacity and better utilization of the infrastructure resulting in higher operating efficiencies. In addition, the central heating system is flexible to incorporate various renewable energy sources as they become available or financial viable. The Burnaby Mountain DEU will utilize biomass to produce energy.
To reduce BC Hydro's expected increase in demand by 66% through demand-side measures by 2020.	Implementing a hydronic heating system in the residential buildings at UniverCity results in a reduction of the direct use of electricity for space heating. At full build-out the Burnaby Mountain DEU will save approximately 11,330 MWh of annually compared to the benchmark (electric baseboards for space heating, domestic hot water provided by natural gas).
Targets for carbon-neutral public sector: • Each public sector organization must be carbon-neutral for the 2010 calendar year and for each subsequent calendar year.	The supply of thermal energy to SFU produced from biomass will result in reducing the GHG emissions at the SFU Campus by 80%.

[6] Exhibit B-1, pp. 12–13.

Panel discussion

The Panel considers the following sections from the BC Energy Objectives in the CEA to be most relevant to this Application:

(g)(iii) to reduce BC greenhouse gas emissions by 2020 and for each subsequent calendar year to at least 33% less than the level of those emissions in 2007;

(h) to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia;

(i) to encourage communities to reduce greenhouse gas emissions and use energy efficiently; and

(j) to reduce waste by encouraging the use of waste heat, biogas and biomass;[7]

Each of these objectives relates directly to Corix's proposal to move from natural gas energy generation to a DEU fueled by biomass, which is a renewable energy source that will serve the needs of the SFU campus in addition to UniverCity residents while repositioning the existing UniverCity natural gas facilities to serve as peaking and backup energy generation. It is Corix's position that making this change will result in a significant reduction in GHG emissions.

1.5 Regulatory process

By Order G-40-17 on March 20, 2017, the Commission established a written hearing process consisting of two rounds of information requests (IRs), final arguments by the applicant and the interveners and the opportunity for the applicant to reply.

Taking part in the proceeding were the following interveners:

- The British Columbia Old Age Pensioners' Organization, Council of Senior Citizens' Organization of BC, Disability Alliance of BC, and the Tenant Resource and Advisory Centre (BCOAPO);
- BC Sustainable Energy Association and Sierra Club BC (BCSEA-SCBC);
- Simon Fraser University; and
- FortisBC Energy Inc.

2.0 Project justification

2.1 Project need

Development of the UniverCity community started in 2002, with a planned build-out over 4 phases. The SFU Trust was established to develop sustainable development guidelines, liaise with the City of Burnaby and to oversee the overall development on behalf of SFU. The lands are legally owned by SFU and are leased to developers on a 99-year pre-paid term.[8]

[7] *Clean Energy Act*, SBC 2010, Chapter 22, section 2, British Columbia's Energy Objectives.
[8] Exhibit B-1, p. 9.

Corix, as the owner and operator of the UniverCity NUS, has been providing service to UniverCity customers utilizing TECs fired by natural gas boilers in order to provide a cost-effective form of energy service to customers in the early stages of development. However, as contemplated in the 2010 CPCN Application, the long-term plan for the UniverCity NUS was to transition to a permanent low-carbon energy facility once there was sufficient build-out and energy demand. The existing TECs would then be re-positioned to the permanent facility to provide peaking and backup to UniverCity. Corix states that the transition to a low-carbon energy facility aligns with the sustainability objectives established by the SFU Trust for developing UniverCity and the BC Energy Objectives.[9]

In June 2016, and amended and restated on January 27, 2017, Corix and SFU entered into an infrastructure agreement (SFU Infrastructure Agreement) and a thermal energy services agreement (TESA), whereby Corix, subject to BCUC approval, would construct and operate a biomass central energy plant using locally sourced wood fuel to provide low-carbon energy to the SFU campus and to the UniverCity community as it builds out. Under the provincial government mandate, as an academic entity, SFU is required to be carbon-neutral.[10]

Corix asserts there is an opportunity to capture economies of scale through utilization of a combined biomass plant by partnering with SFU and states this plant would meet SFU's requirements for a reduced carbon footprint in a cost-effective manner. Corix further states that it "believes this is an opportune time to develop a cost-effective, low-carbon energy facility that meets the sustainability design objectives of the SFU Trust for the UniverCity community and the carbon reduction requirements for the SFU Campus."[11]

As outlined in the Application, the intent of Corix and the SFU Trust was to transition from the current natural gas temporary energy centres to a permanent central energy facility supplied by a low-carbon energy source when sufficient load supported the development of such a facility.[12]

Intervener submissions

BCOAPO has no major concerns with the project need and BCSEA-SCBC and SFU both support the project.[13]

Panel discussion

The Panel finds that the need for the project has been established. The long-term plan for the UniverCity development, as outlined in the 2010 CPCN Application, has always been to convert to a low-carbon energy solution and is a requirement of the SFU Trust. The proposed biomass facility meets the requirements of SFU and the SFU Trust in respect of their GHG emissions reduction obligations and sustainability objectives under applicable legislation and guidelines, and supported by government policy and government funding. It will also address the SFU Trust's objectives for transitioning the UniverCity NUS to low-carbon energy.

2.2 Project alternatives

As part of Corix's 2010 CPCN Application, it performed detailed technical and financial analyses on various alternative low-carbon energy technologies, including the following:

- High-efficiency natural gas boilers;

[9] Ibid., p. 1.
[10] Ibid.
[11] Ibid., pp. 9–10.
[12] Exhibit B-1, p. 9.
[13] BCOAPO Final Argument, p. 5; BCSEA Final Argument, para. 3; SFU Final Argument, para. 5.

- Sewer heat recovery and ground source heat pumps;
- Waste heat recovery from the proposed SFU data centre;
- Combined heat and power based on natural gas and biogas;
- Solar and wind applications; and
- Biomass.[14]

Corix states that of the various technologies evaluated, waste heat recovery from the proposed SFU data centre and biomass were the two most viable solutions. However, due to uncertainty with development of the data centre, biomass was determined to be the preferred technology. Corix also states that the data centre would not provide sufficient energy to meet the baseload demand of both UniverCity and SFU, and that the lower grade energy available from the data centre would limit its use to supplying the UniverCity portion of the Burnaby Mountain DEU, as the UniverCity system is designed to operate under lower temperatures than the SFU DES.[15]

Corix noted in response to BCUC IR 2.1 that the alternative technologies evaluated in 2010 were based on the assumption that Corix would be serving only the UniverCity NUS; thus, the technologies were evaluated to serve an alternative energy baseload of 2.1 MW. Under the current combined biomass CEP proposal, the new baseload requirement is 13.5 MW (3.5 MW attributable to UniverCity and 10 MW attributable to SFU). Corix submitted the only low-carbon technology identified able to supply this load requirement is biomass technology. Further, Corix stated "the higher operating temperatures of SFU's distribution system also limits the amount of energy demand that could be captured by low-grade energy sources such as sewer heat, geoexchange and waste heat."[16]

Corix explained in response to BCUC IR 30.2 that it did not directly assess alternatives for SFU's 10 MW baseload because the most promising alternative to biomass on Burnaby Mountain is waste heat from a potential university data centre. However, this resource does not have sufficient capacity to satisfy the SFU baseload. Moreover, construction of a data centre is uncertain. In the absence of a joint biomass plant, there would be no combined system and Corix would be left exploring alternatives for UniverCity only. Corix submitted there was no evidence that the increase in UniverCity baseload from 2.1 MW to 3.5 MW would alter the ranking of stand-alone alternatives provided in the 2010 CPCN Application, and none of the alternatives would be less costly than the proposed combined system given the large economies of scale.[17] Additionally, since 2010, several factors have further confirmed Corix's resource selection. Included among these are: (i) the cost of electricity associated with the use of heat pump technology has increased; and (ii) Metro Vancouver has banned wood waste from landfills pursuant to the 2015 Clean Wood Disposal Ban.[18]

With regard to UniverCity customers, Corix undertook a cost analysis of supplying energy to UniverCity customers from a permanent natural gas plant. Corix submits that compared to the proposed biomass solution, a permanent natural gas solution would have slightly lower levelized costs under current natural gas price forecasts and carbon prices; however, this option does not meet the intent of the infrastructure agreement

[14] Ibid., p. 10.
[15] Ibid.
[16] Exhibit B-2, BCUC IR 2.1.
[17] Exhibit B-6, BCUC IR 30.2.
[18] Ibid., BCUC IR 30.3.

entered into between Corix and the SFU Trust or meet the BC Energy Objectives.[19] Further, although there is no formal requirement for GHG emission reductions by the UniverCity community, the implementation of the alternative energy as a heating source was identified by the SFU Trust as one of the measures to support the community's sustainability objectives and green building outcomes.[20]

Corix performed a cost analysis comparing the cost of utilizing a dedicated biomass facility serving only the UniverCity customers to the proposed combined facility. Under the UniverCity standalone biomass scenario, the capital cost would be approximately $3 million higher than under the combined biomass scenario and the annual operating costs would be approximately $247 thousand higher.[21]

Intervener submissions

BCSEA-SCBC states it is satisfied that the evidence establishes that waste heat recovery from a future SFU data centre is not "in and of itself" a viable alternative to biomass technology assuming the low-carbon energy centre is designed to meet the primary heating energy needs of both UniverCity and SFU, or of UniverCity alone.[22]

SFU fully supports the Application[23] and submits that Corix's evidence in the proceeding demonstrates that the Burnaby Mountain DEU will supply low-carbon energy to UniverCity customers at a lower cost than if a separate energy plant and associated facilities were built to serve only UniverCity.[24]

BCOAPO did not specifically address the various technical alternatives in its final argument.

Panel discussion

The Panel is satisfied with Corix's explanation of its proposed combined central biomass facility and finds it is the most viable alternative for supplying low-carbon energy in a cost-effective and sustainable manner, at the load of 10 MW required by SFU and 3.5 MW required by the SFU Trust, in its objective to develop UniverCity.

With respect to the other potential low-carbon technologies, the only other alternative receiving consideration is waste heat from a proposed SFU data centre. However, it is uncertain whether the data centre will be developed and, in any case, the low grade energy sourced from a proposed data centre would not provide sufficient energy (due to the higher temperature requirements of the SFU distribution system) to meet the load demands of both SFU and UniverCity. Because of this, the Panel agrees waste heat from a proposed data centre is not a viable alternative in these circumstances.

Further, the Panel accepts that natural gas is not a viable alternative as the main source of energy for the permanent facility as it does not meet the terms of the SFU Infrastructure Agreement, SFU's own low-carbon energy requirements, or the requirements established by the SFU Trust for the UniverCity development.

The proposed combined central biomass alternative has the benefit of repurposing the gas boilers currently used in the UniverCity TECs to the CEP to provide peaking and backup energy to UniverCity. In addition, it also results in economies of scale for the existing UniverCity development and SFU as well as reducing the risk

[19] Exhibit B-1, p. 11.
[20] Exhibit B-2, BCUC IR 2.3.1.
[21] Exhibit B-2, BCUC IR 2.4.
[22] BCSEA-SCBC Final Argument, p. 11.
[23] SFU Final Argument, para. 5.
[24] SFU Final Argument, p. 4.

associated with volatile natural gas commodity costs. Moreover, this alternative will provide low-carbon energy to UniverCity at a lower cost than if a separate energy plant and facilities were built to serve only UniverCity.

A key advantage of the proposed combined central biomass facility is that it aligns with the sustainability objectives of the SFU Trust, SFU's objective to use innovative technology to significantly reduce GHG emissions as part of its commitment to be carbon neutral, and the provincial energy and climate action policy objectives.

Corix estimates the use of biomass as a fuel source will reduce GHG emissions by approximately 11,600 tonnes per year, a conservative estimate that takes into account the total emissions from transporting the fuel to the CEP but excludes the emission savings from alternate disposal methods.[25]

2.3 Agreements with SFU

Corix and SFU have entered into two agreements: (i) the SFU Infrastructure Agreement; and (ii) the TESA. Redacted versions of these agreements were filed as Appendices I and II to the Application.

Corix submits that the SFU Infrastructure Agreement, which is a development agreement between Corix and SFU, is not a "privilege, concession, or franchise" as described in the UCA; therefore, the agreement does not require Commission approval under the UCA.[26]

The TESA sets out the terms and conditions under which Corix will be providing thermal energy service to SFU. Corix is therefore requesting approval of the TESA under sections 60 and 61 of the UCA.[27]

Panel discussion

The Panel agrees there is no need to approve the SFU Infrastructure Agreement. The TESA is discussed in detail in Section 4.0 of this decision.

2.4 Consultation

Corix states that public consultation has been an important component of the planning and development of its service on Burnaby Mountain. In preparation for the current phase of the UniverCity NUS project (i.e. the Application), Corix, SFU and the SFU Trust undertook a third public consultation process which consisted of two open house sessions and a small stakeholder meeting. The events took place from November 14–28, 2016. Corix states that residents and stakeholders were encouraged to participate in the events, seek information about the project, and provide their input online, through the open house sessions or the small stakeholder meeting. The "stakeholders" identified were students, residents of UniverCity, residents of neighbouring cities (i.e. Burnaby, Port Moody, Coquitlam and Port Coquitlam) and local environmental groups.[28]

Corix reports that 20 individuals and groups were invited to attend the stakeholder meeting held on November 15, 2016, and that five invitees attended. On November 16, 2016, two public open house sessions were held at the SFU campus with material provided via presentation boards and hand-out brochures. Feedback forms were also distributed. Corix reports that four people attended the open house sessions. Notification of the events and

[25] Exhibit B-2, BCUC IR 3.1.
[26] Exhibit B-1, p. 11.
[27] Ibid.
[28] Ibid., p. 14.

consultation period was provided through print advertisements and online channels. As part of the online consultation, Corix and SFU's VP Finance and Administration websites provided an overview of the project, a schedule of the consultation events and an online feedback form.[29]

On November 8, 2016, Corix attended a meeting with the City of Burnaby planning staff to present an overview of the project including the projected timeline and proposed design and landscaping concepts for initial feedback. The information was well-received, with a request to continue to provide updates as the project progresses.[30]

Corix provided copies of all public consultation material as Appendix III to the Application.

Intervener submissions

BCOAPO and BCSEA-SCBC made no submissions on the public consultation component of Corix's planning and development of the project.

SFU did not specifically address the issue of public consultation, but submits that community impacts on Burnaby Mountain are very important to SFU, both with regard to the university campus and the adjacent UniverCity community. Potential community and environmental impacts have been addressed in the SFU Infrastructure Agreement. These include appropriate siting of the CEP away from the central campus and the UniverCity residential and commercial buildings, stringent biomass quality specifications, stringent air quality and emission monitoring requirements, noise control requirements and the requirement for a traffic management plan to minimize traffic impacts.[31]

Panel discussion

The Panel is satisfied that public consultation was an important component of Corix's planning and development of the proposed project and that it has undertaken a thorough and open consultation process with stakeholders and the public. Based on the information provided by Corix in the Application, we are satisfied and find that all affected parties were afforded the opportunity to raise concerns with the developer. While attendance at the stakeholders' meeting and two open houses was light, the Panel interprets this as a measure of the public's lack of concern and its acceptance of the proposed project.

The Panel also notes Corix's statements that it responded to and answered all questions and requests for information from stakeholders and the public. In addition, prior to the Commission's approval of the 2010 CPCN Application, a first round of public consultation was held in 2009 to introduce the preliminary design for the project and a second round was held in 2010 regarding proposed energy sources.[32]

2.5 Project risks

Corix identifies and describes the following project risks, which have been listed according to risk level:

- Construction risk (DPS, ETS) – Risk level of Moderate/High;
- Public acceptance – Risk level of Moderate;

[29] Ibid.
[30] Exhibit B-1, p. 15.
[31] SFU Final Argument, para. 12(b).
[32] Exhibit B-1, p. 13.

- Permitting – Risk level of Moderate;
- Construction risk biomass facility – Risk level of Low/Moderate;
- Biomass fuel price/quality/supply shortage – Risk level of Low/Moderate;
- Development risk (UniverCity) – Risk level of Low;
- Performance risk – Risk level of Low; and
- SFU early termination – Risk level of Low.[33]

The project risks identified as being moderate or moderate to high are discussed briefly below.

Construction risk

Corix considers the risk that DPS and ETS construction and equipment costs will be higher than projected to be moderate to high. Corix states this risk has been mitigated through the following measures: (i) the use of competitive tendering to select suppliers and contractors; (ii) standardization of material and equipment selection; (iii) preferred supplier negotiations to achieve further savings through exclusivity; and (iv) the use of innovative approaches such as packaged ETS. Corix states that if the construction costs increased by 10 percent, the overall levelized rate impact would be an increase of 1.7 percent, from $131.28 per MWh to $133.49 per MWh. If construction costs were to increase by 25 percent, the overall levelized rate impact would be an increase of 4.2 percent (i.e. $136.78 per MWh).[34]

The reasonableness of the capital costs are discussed in detail in Section 5.2 of this decision.

Public acceptance and permitting

Corix assigns a moderate level of risk to public acceptance, which it describes as the risk of public/local communities opposing the project or location. Corix describes its risk mitigation measures as being the completion of public consultation meetings and targeted smaller group stakeholder consultation (see Section 2.4 of this decision for further details), as well as the completion of an air quality assessment including impacts on the local airshed.[35]

Corix assesses permitting as having a moderate risk level. This would include delays in the project schedule due to prolonged approval processes and potential scope change requirements. This risk has been mitigated by meeting with the applicable permitting/approval authorities in advance of submitting the application. The required permits and approvals for this project are further discussed in Section 3.6 of this decision.

Biomass fuel price/quality/supply shortage and SFU early termination

While Corix has classified the biomass fuel price/quality/supply shortage as a low to moderate risk, the Panel considers biomass fuel supply to be a key issue and thus addresses it in detail in Section 3.5 of this decision.

Corix classifies the risk of SFU terminating the TESA after 20 years as low due to the mitigation strategies in place, including the requirement in the TESA that SFU provide 10-years notice of its termination. However, under a scenario where SFU elects to terminate the TESA early and no mitigation strategy is implemented by

[33] Exhibit B-1, Table 29, pp. 49–52.
[34] Ibid.
[35] Ibid., p. 50.

Corix, the impact on the levelized rate for UniverCity ratepayers would be an increase of 13 percent (i.e. $148.31 per MWh compared to $131.28 per MWh). This issue is discussed further in Section 4.1.1 of this decision.

Panel discussion

As noted, a number of the risks associated with the project are discussed in other parts of this decision. These include public acceptance and permitting (Section 3.6), biomass fuel price, quality and supply shortage (Section 3.5), and SFU's early termination of the TESA (Section 4.1.1). The Panel discusses the remaining project risk identified by Corix - construction risk - below.

Corix has identified a moderate to high risk that the DPS and ETS construction and equipment costs could be higher than budgeted. The Panel is satisfied that Corix has taken steps to mitigate the risk through the use of competitive tendering to select suppliers and contractors, standardization of material and equipment selection, preferred supplier negotiations to achieve further savings through exclusivity and the use of innovative approaches such as packaged ETS. Further, Corix has provided estimates of the impact of construction cost increases on rates and the Panel is persuaded that Corix is taking appropriate steps to manage and mitigate any potential construction cost overruns.

In its analysis of project risk, Corix has been able to draw upon its experience constructing and operating the UniverCity NUS since 2011 and its experience with other district energy infrastructure and the local construction market.[36] While the development of the biomass CEP and connection of the SFU DES to the Burnaby Mountain DEU brings added complexities to the project, Corix has been able to inform its risk analysis from feedback it has gathered from biomass district energy systems that have been developed at numerous commercial/industrial sites, as well as at other academic institutions including the University of British Columbia and the University of Northern British Columbia.[37] For the foregoing reasons and those described in other sections of this decision, the Panel finds that the project risks have been appropriately addressed and mitigated.

3.0 Project description

3.1 Project scope

As noted in Section 1.1, the Burnaby Mountain DEU is the next stage in the development of the UniverCity NUS which was established through Order C-7-11 to provide thermal energy to SFU's Community Trust UniverCity residential and commercial development.[38]

The Burnaby Mountain DEU is scheduled for completion in the spring of 2019 and combines existing natural gas fired NUS facilities with a low-carbon energy facility expanding the provision of thermal energy through the construction of a CEP located on South Campus Road. The CEP will serve a portion of Phase 2, as well as Phases 3 and 4 of the UniverCity development and "will provide baseload low-carbon service to the SFU campus through an interconnection to the existing SFU district energy system (DES)."[39]

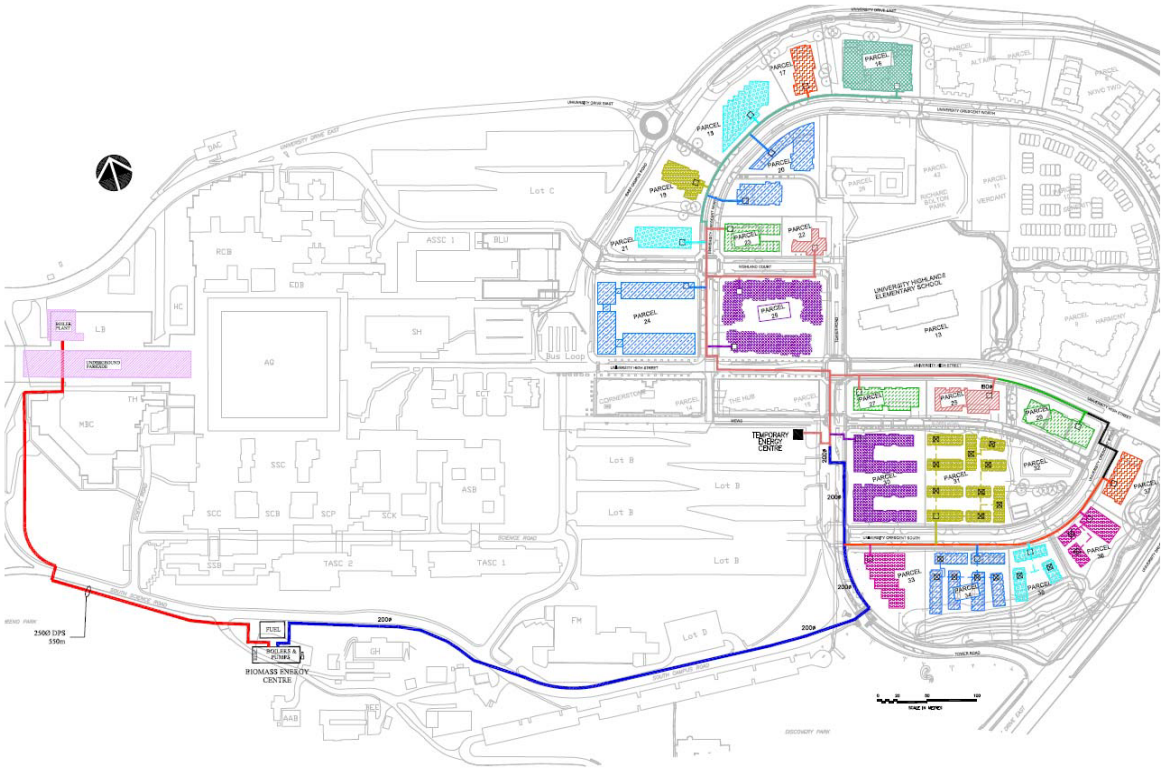
[36] Exhibit B-1, p. 48.
[37] Ibid.
[38] Exhibit B-1, p. 1.
[39] Ibid., p. 1; Exhibit B-4, BCSEA-SCBC IR 5.1.

Figure 1 outlines the location of the proposed CEP along with the build-out of the UniverCity community lands and the interconnection allowing for the provision of service to the SFU district energy system. Added to the previously approved existing facilities, the expanded Burnaby Mountain DEU will consist of:

- A 13.5 MW output capacity biomass module, a 8.3 MW output capacity natural gas module and associated equipment, all located in the CEP;
- The SFU energy transfer station (Campus ETS) serving as an interconnection point between the SFU DES and the Burnaby Mountain DEU; and
- A distribution piping system (DPS) including a pipeline to connect the Campus ETS to the CEP (Campus Connection), and a pipeline to connect the existing UniverCity DPS to the CEP (UniverCity Connection).[40]

The existing UniverCity natural gas boilers will be repurposed in the natural gas module to provide peaking and backup energy to the UniverCity NUS. SFU will continue to operate and maintain its current natural gas boiler for peaking and backup energy.

Figure 1: Burnaby Mountain DEU



Corix states that it will design, build, manage and operate the CEP, DPS and ETSs as part of the Burnaby Mountain DEU.

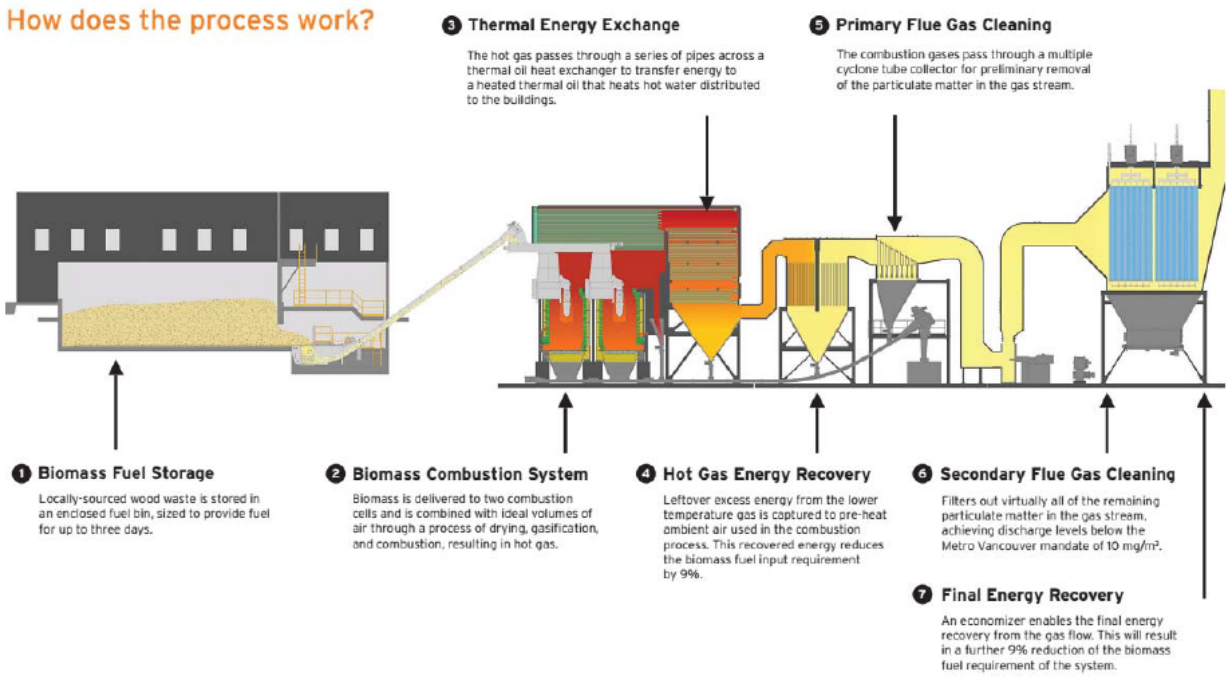
The CEP consists of three key components: the biomass module with a 13.5 MW output capacity; a natural gas module with an 8.3 MW output capacity; and thermal oil to hot water energy exchange at the CEP.[41]

[40] Exhibit B-1, p. 2.
[41] Exhibit B-1, p. 17.

Biomass module

Figure 2 outlines the biomass conversion process.

Figure 2: Biomass Conversion Process[42]



Corix has identified five key components in the biomass conversion process:

1. Fuel storage

Located at the upper part of the CEP site, the fuel bin is designed to be a fully enclosed building sitting on top of a six meter deep concrete structure and hold enough fuel to run the CEP for 50 hours at full output capacity. Fuel is moved to the combustion cells through a conveyor system.

2. Biomass combustion system

The biomass combustion system is made up of two cell combustors, seven feet in diameter with a 1700 degrees Celsius maximum temperature rating. It also includes a water-cooled rotary grate system with circulating pumps and a combustion air preheater.

3. Thermal energy exchange

This is made up of a 13.5 MW thermal oil heater with an outlet temperature of 304 degrees and one 13.5 MW thermal oil to hot water heat exchanger. The use of thermal oil allows for the future addition of power production equipment turning it into combined heat and power operation.

[42] Exhibit B-1, p. 18.

4. Flue gas heat recovery system

Corix explains that the flue gas carries excess heat which may be used to increase system efficiency. This involves preheating combusted air used in the combustion process and then capturing the excess energy from the flue gas at the flue gas economizer resulting in improved system efficiencies and reduced fuel consumption.

5. Flue gas cleaning

Corix states that the flue gas will be cleaned via a two-stage process. The system is designed to allow Metro Vancouver air emissions requirements to be met or exceeded.[43]

Natural gas module

As noted previously, the natural gas boilers from the UniverCity NUS will be relocated in the CEP to provide peaking and backup for its residential customers. Corix reports that if there is a biomass module shut down, the natural gas module will be able to provide 90 percent of UniverCity peak load demand in peak demand conditions while in non-peak conditions it will provide 100 percent. Corix explains that peak heating design conditions occur for a short period and in the case of the largest unit failure, will result in delivery temperatures being slightly lower during the outage period. Corix considers this a prudent approach but notes the plant has additional gas boiler capacity if there is a necessity in the future.[44]

Hot oil to hot water interconnection at CEP

Corix explains the heat exchange between the biomass CEP and the hot water distribution system is designed to occur at the hot water heat exchanger. Shared interconnection infrastructure between SFU and UniverCity residents includes a 300 mm hot water header connected to the SFU DES and to the UniverCity system. Additionally, dedicated SFU equipment includes distribution pumps with VFDs along with strainers, hot water piping, meters and controls. Dedicated UniverCity hot water equipment includes distribution pumps, meters, an expansion tank, heat exchangers and associated connection piping.

Energy from the CEP is distributed through 550 trench meters of piping to the SFU campus energy transfer station (ETS) and through 750 trench meters to the UniverCity ETS. The Campus ETS will be located within the existing SFU boiler plant while the ETSs for UniverCity will be located in each residential building connected to the Burnaby Mountain DEU.[45]

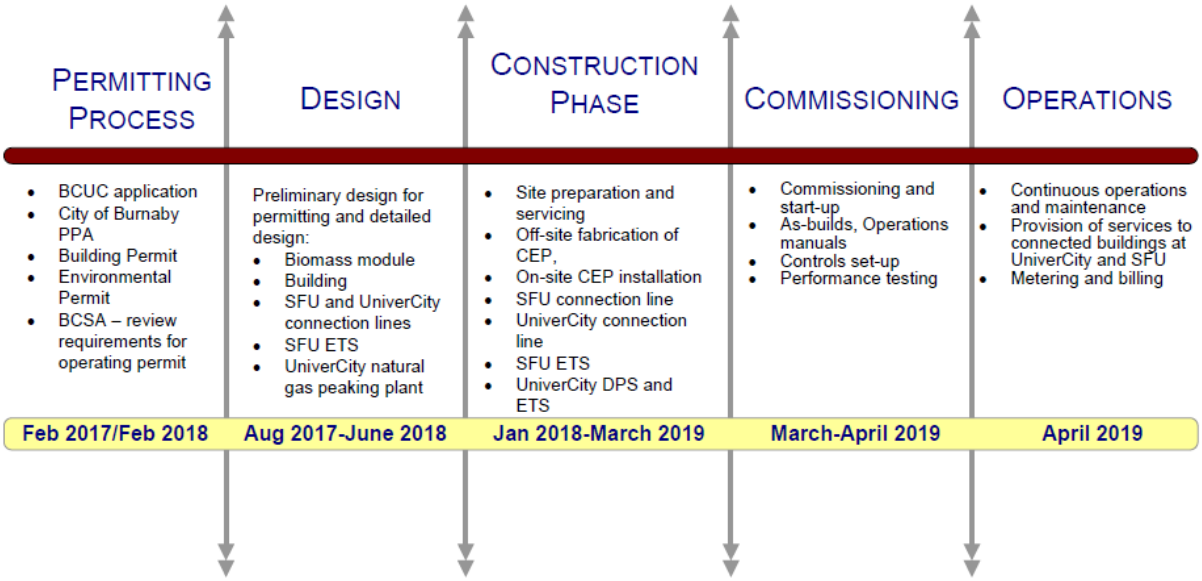
3.2 Project scheduling

Corix reports that the project scope, plan and cost estimates have been defined and system components preliminary design has been completed through the project development process. Both the Corix and SFU Boards have given approval to the project and the province has granted statutory rights of way for alignment of the infrastructure of the Burnaby Mountain DEU. The project is expected to be completed by the spring of 2019.[46]

Table 2 outlines Corix's proposed schedule for the Burnaby Mountain DEU implementation.

[43] Exhibit B-1, pp. 12, 18–19.
[44] Exhibit B-1, p. 17.
[45] Exhibit B-1, pp. 19–22.
[46] Exhibit B-1, p. 22.

Table 2: Burnaby Mountain DEU Implementation Schedule[47]



Construction will begin in January 2018 and is estimated to take 15 months. The project is expected to be commissioned over the March/April 2019 period.

Panel discussion

The Panel finds the implementation schedule proposed by Corix to be reasonable. It is expected that Corix will continue to provide updates to its proposed implementation schedule as part of its semi-annual reporting detailed in Section 7.0.

3.3 External and internal human resource requirements

Corix states its Energy Services Division, supported by corporate services including IT, Finance, Legal and Human Resources, will be responsible for internal management of the project. Much of the work required is planned to be subcontracted to firms that are familiar with this project.

The existing infrastructure design was subcontracted to an energy engineer consultant and Corix expects to continue with this practice for the Burnaby Mountain DEU design. FVB Energy is Corix's primary mechanical consultant and has been involved with the NUS at UniverCity since its inception. FVB Energy will also provide support with construction supervision. In addition, civil engineers, an architect and a landscape architect will join the engineering team.

Design, manufacture and installation of the biomass module will be a turnkey solution along with the building enclosure. Corix will be responsible for pre-installation site preparation, any site servicing, any architectural improvements and final site finishing and landscaping.

Construction of the DPS, the EPS, natural gas module and hot water connection at the CEP will be managed by the Corix energy services project team. Corix states that all construction work is to be tendered except the ETS at the UniverCity development which is to be managed by Corix affiliate, Engineered Products and Packaged

[47] Exhibit B-1, p. 23.

Systems (Engineered Products), a division of Corix Water Products. Corix confirms that the ETS construction work is being provided at competitive prices and states that it routinely runs ETS construction work through a competitive process with its affiliate securing most of the projects.[48]

When the CEP is completed in 2019, Corix estimates three and one half full-time equivalent (FTE) employees will be required to perform daily operations, such as DPS and EPS maintenance, and provide emergency on-call support. BCSA's requirements and approvals will determine the final number of FTE operators. Corix intends to achieve general supervision status under BCSA Alternative Safety Approaches and has therefore designed the operating system "with sophisticated controls, emergency response procedures, and a Safety Management Plan."[49]

Intervener submissions

BCOAPO raises concern over Corix's use of an affiliate to perform work on the ETS without a competitive process and with only Corix's unsubstantiated assertion that the price is competitive. BCOAPO argues these statements are problematic because of the lack of due diligence to support Corix's assertion that the affiliate's price was lower and the quality higher. BCOAPO proposes that it be made a condition "that all future equipment and materials purchases (including biomass fuel materials) be subject to an arm's-length competitive process to provide ratepayers with the assurance that the project or fuel costs will be the most cost effective possible." This will avoid negative perceptions that the best interests are not being served.[50]

Corix reply submission

Corix regularly performs value checks for ETS work through the issuance of competitive tenders. Corix confirms that for the Burnaby Mountain DEU and other district energy utilities it operates and owns, it "will continue to secure future construction services, equipment and materials, including biomass fuel supplies, through arm's-length competitive processes."[51]

Panel discussion

The Panel supports the competitive tendering of construction contracts as a way of doing business in a regulated environment and concurs with BCOAPO regarding future process. If done in all cases, it will serve to mitigate doubt that the ratepayer's interests are being protected and remove the potential for perceived bias.

The Panel accepts Corix's confirmation that its past experience allowed it to conclude that Engineered Products' costs are competitive in this instance but expects Corix to undertake a competitive process in awarding future contracts.

The Panel accepts that Corix's planning for its human resource requirements as being reasonable but expects Corix to provide updates on its resource requirements as part of its semi-annual reporting detailed in Section 7.0.

[48] Exhibit B-1, p. 23; Exhibit B-2, BCUC IR 4.9, 4.10, 4.11.
[49] Exhibit B-1, pp. 23–24.
[50] BCOAPO Final Argument, pp. 3–4.
[51] Corix Reply Argument, p. 3.

3.4 Environmental benefits and impacts

The issue the Panel must address is whether the proposed biomass facility for the Burnaby Mountain DEU meets the requirements of the UCA and the CEA.

Corix states that a full build-out of the CEP as compared to the status quo will result in an overall reduction of 11,600 tonnes of CO_2, or an 85 percent improvement over the current system. The biomass portion of the CEP employs a 2-stage flue gas cleaning process and a continuous emission monitoring system will be installed. This system will ensure local air emissions are being regularly reviewed and reported and meet or exceed regulatory guidance from Metro Vancouver Bylaw 1087: Boilers and Process Heaters Emission Regulation Bylaw.

Corix explains that Metro Vancouver's emission limits are meant to control the impact of facilities on local air quality and its air quality standards are among the most stringent in the world. Metro Vancouver has also established the Metro Vancouver Ambient Air Quality Objectives (AAQOs) to characterize ambient air quality and to assess air quality impacts. They are described as the "acceptable amounts of each pollutant in our region." AAQOs are set for both short and long time periods allowing the evaluation of the potential health impacts from exposure over an hour or a day as well as evaluating chronic health impacts over a year.

Corix reports that in accordance with Metro Vancouver requirements, preliminary air dispersion modelling has been conducted by a third-party environmental consultant with a summary report completed. Corix states the modelling has been conservative in that it assumes continual operation of the facility at full capacity year round, uses the regulated emission limits and takes no account of emission reductions at SFU's existing boiler plant. However, in reality, the CEP is expected to operate at full capacity only for certain hours in peak heating season. In addition, the regulated emission limits are higher than expected emissions and "the CEP will displace 85 percent of the energy produced at SFU's existing boiler plant."[52]

The primary biomass pollutants of concern are particulate matter and nitrogen dioxide (NO_2).[53] Corix reports that current air quality is better at Burnaby Mountain than Metro's AAQO levels and predicted concentrations for all air contaminants remain below these levels for all averaging periods. Further, the facility is expected to reduce the use of natural gas by 85 percent resulting in a significant saving in NO_2 emissions. Corix states that this has not been taken into consideration in the preliminary air dispersion modelling assessments because they are meant to capture the potential worst-case air quality impacts. In practice, the overall amount of pollutants would be reduced with a biomass CEP as opposed to the existing natural gas boilers at SFU.[54]

Corix states that if the university were to continue using the existing natural gas plant only, it would not achieve its GHG emission reduction targets. Thus, SFU would continue to pay for GHG offsets and it would not meet either its own institutional targets for GHG reductions nor provincial expectations for Public Sector Organization reductions. Corix points out that while there are no formal GHG reduction requirements for UniverCity, the SFU Trust identified the implementation of alternative energy as one of the measures capable of supporting the community's sustainability objectives and green energy outcomes. Moreover, there is a contractual obligation

[52] Exhibit B-1, p. 25.
[53] Ibid., p. 26.
[54] Ibid., p. 26.

for Corix to implement the central energy plant with an alternative energy source, if financially feasible, once the build-out had reached a certain level.[55]

Corix submits that CO_2 emissions from burning biomass are considered "carbon neutral" citing the BC Ministry of Environment's 2016/17 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions report (MoE document). In addition, Corix asserts that the CEA defines biomass, biogas, geothermal heat, hydro, solar, ocean wind or any other prescribed resource as a "clean or renewable resource."[56]

Intervener submissions and letters of comment

Mr. Alan James urges the Commission to reject the Application and raises two issues with regard to it:

- The high level of operational costs to run and maintain a biomass facility; and
- The high level of CO_2 emissions relative to natural gas at the time of burning.[57]

Mr. James provides no evidence to support his views concerning the operational costs. With respect to GHG emissions, he raises the issue of carbon neutrality and states that biomass emits double the CO_2 of natural gas at the time of burning for the same output. He poses the question as to whether it might make more sense to use natural gas because the project would add 11,632 tonnes of CO_2 emissions annually.[58]

BCSEA-SCBC takes issue with Corix's statement that burning biomass is considered carbon neutral, according to the MoE document, and asserts the document speaks to why biomass is often considered carbon neutral but does endorse the general conclusion of carbon neutrality. Specifically, the MoE document states:

> The CO2 released from the atmosphere during combustion of biomass is assumed to be the same quantity that had been absorbed from the atmosphere during plant growth. Because CO2 absorption from plant growth and the emissions from combustion occur within a relatively short timeframe to one another (typically 100-200 years) there is no long-term change in atmospheric CO2 levels.[59]

BCSEA-SCBC disagrees with Mr. James' premise that the proposed biomass facility would have higher emissions than a natural gas energy facility. While it concurs with Mr. James that burning wood waste is not strictly carbon neutral, it argues the choice at hand is not between a biogas facility and no gas emissions but rather, a facility fuelled by clean wood waste and a natural gas facility with known GHG emissions. BCSEA-SCBC points out that the combustion of wood waste fuel in a stationary heat plant has a zero GHG emissions factor according to the international standards applied in BC and if site-specific adjustments to emissions factors were made, they would need to be applied to both wood waste and natural gas. It argues that for natural gas, such adjustments would include consideration of additional upstream GHG emissions such as fugitive methane emissions which are currently not included in the approved emissions factor. For wood waste fuel, this would include consideration of forest management practices where BCSEA-SCBC notes the adjustment for less-than-sustainable forest practices would be limited due to waste being sourced from waste streams as opposed to direct harvesting.

[55] Exhibit B-2, BCUC IR 2.3.1.
[56] Corix Final Argument, pp. 5–6.
[57] Exhibit E-1.
[58] Exhibit E-1.
[59] BCSEA Final Argument, p. 6.

BCSEA-SCBC concludes by stating it is satisfied there will be significant GHG reductions from the proposed biomass facility over the natural gas fired alternative.[60]

SFU submits the project facilities are in alignment with provincial energy and climate action policy objectives with specific reference to GHG emissions and the use of clean wood waste biomass for fuel. SFU argues that under the CEA, biomass is recognized as a clean or renewable resource. In addition, CO_2 emissions from the burning of biomass are considered carbon neutral under the MoE document.[61]

BCOAPO accepts Corix's evidence regarding SFU needing to become carbon neutral to adhere to the government's mandate. However, it notes that GHG emissions from biomass are twice those of natural gas and it is "relevant to the question of carbon neutrality whether waste wood is being replaced at a high enough rate to offset the burning of this fuel and its higher GHG impacts." BCOAPO requests in future applications where the proposed fuel and carbon neutrality is an issue, that applicants be required to present evidence relevant to this issue.[62]

Corix reply submission

Corix disagrees with Mr. James and BCOAPO with respect to GHG emissions from biomass versus natural gas citing BCSEA-SCBC's submissions that the proposed facility will result in significant GHG reductions as it is fuelled by clean wood waste originating in a waste stream. Corix contends that biomass fuel is encouraged under the CEA as a clean renewable resource and submits that CO_2 emissions from burning biomass are treated as carbon neutral and therefore, not "subject to offset requirements under relevant legislation and regulations." Corix continues by stating that the biomass facility meets the GHG obligations and sustainability objectives requirements of SFU and the SFU Community Trust and is supported by government policy and funding.

Corix further argues that it is neither warranted nor practical to have the Commission place obligations on utility applicants in future applications to submit evidence on GHG load and proposed offset actions as proposed by BCOAPO. Corix contends that when issues have already been addressed by provincial, federal and international guidelines, legislation and regulations, they should not be subjected to additional analysis.

Panel discussion

Mr. James has raised the issue of carbon neutrality and states that biogas emits twice the CO_2 of natural gas for the same output at the time of burning, a point which is supported by BCOAPO. The Panel disagrees. In our view, the issue is not about carbon neutrality or the speed of the replacement of forests but rather whether the burning of clean biomass, as is proposed for the biomass facility at the Burnaby Mountain DEU, is in accordance with GHG considerations as reflected in the CEA.

SFU and Corix have argued that biomass is encouraged under the CEA and considered a clean renewable resource. BCSEA-SCBC has argued that in accordance with international standards, the burning of wood waste fuel in a stationary heat plant has a zero GHG emissions factor. The Panel agrees with both of these assertions. We acknowledge that reliance upon biomass as a fuel for the Burnaby Mountain DEU is not necessarily carbon neutral but notes that the legislation has no such requirement. As explained in the MoE document, the CO_2

[60] BCSEA-SCBC Final Argument, pp. 6–9.
[61] SFU Final Argument, p. 6.
[62] BCOAPO Final Argument, p. 2.

absorption from plant growth and subsequent combustion emissions occur in a relatively narrow timeframe. Because of this, the long-term change in atmospheric CO_2 levels is considered neutral and GHGs are not attributed to the combustion of clean biomass. Therefore, the Panel finds the reduction of 11,600 tonnes of CO_2 at full build-out of the CEP, as stated by Corix, to be reasonable and supported by the evidence.

As noted in Section 1.4 of this decision, the Panel cited a number of BC Energy Objectives as relevant to this Application. The Panel finds that the Burnaby Mountain DEU is clearly aligned with these Energy Objectives as outlined in the CEA and provide specific direction with respect to this Application. First, the build-out of the Burnaby Mountain DEU, as designed, will result in significant annual reduction of GHG's as compared to the natural gas status quo thereby supporting BC Energy Objectives (g) and (i). In addition, clean biomass as a fuel source is encouraged by the CEA to reduce waste. The Panel notes that the biomass for this project is being sourced from waste streams as opposed to direct harvesting, thereby supporting BC Energy Objective (j). Finally, the proposed move from a reliance on natural gas to one such as biomass, that decreases GHGs, is in accordance with BC Energy Objective (h). Given these considerations, the Panel finds that the biomass facility for the Burnaby Mountain DEU project closely aligns with the BC Energy Objectives as outlined in the CEA. Where fuel and carbon neutrality is an issue, the Panel is not persuaded there should be a requirement to present evidence relevant to this issue in future applications. Where the matter has been adequately addressed by either legislation or regulation, the Panel finds there is no need to specify additional requirements for preparation of an application. However, this does not restrict parties from raising such issues during the review of an application.

3.5 Biomass sourcing and delivery

The sourcing of biomass and its delivery to the Burnaby Mountain DEU site is an important element for this project. There are three questions raised with respect to sourcing and delivery that the Panel needs to address. They are as follows:

- Is the biomass fuel planned for the Burnaby Mountain DEU of sufficient quality to meet local emissions standards?
- Are the arrangements for supply of biomass material reasonable?
- Is Corix's approach to delivery of biomass acceptable?

Quality of biomass fuel

Corix states that the Burnaby Mountain DEU will be fueled by biomass comprised of "locally-sourced wood waste that is no longer accepted at local landfills including tree cuttings and trimmings, clean wood waste such as wood chips from sawmills, shavings, hog fuel (an unprocessed mix of bark and wood fiber), and clean construction wood waste."[63] Corix confirms that biomass fuel meets the requirements of the CEA explaining that biomass is defined as a clean and renewable resource under the CEA and confirming that only fuel that meets the definition of biomass is allowed to be burned in the CEP. Corix further explains that biomass "is treated as a carbon neutral resource in the methodology for qualifying GHG emissions and offset requirements under the Province's Greenhouse Gas Reduction"[64] which is consistent with all international standards. In addition, the

[63] Exhibit B-1, p. 27.
[64] Exhibit B-2, BCUC IR 5.6.

proposed biomass fuel also complies with the Metro Vancouver biomass fuel specifications and regional environmental regulations.[65]

Intervener submissions

Neither BCOAPO nor BCSEA-SCBC expressed concern with the proposed biomass fuel. BCSEA-SCBC states it has reviewed the Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1190, 2013 and is satisfied that "the biomass fuel for the CEP will be required to be 'uncontaminated wood waste' with appropriately stringent terms and conditions."[66] Nonetheless, BCSEA-SCBC want to emphasize that the Commission's decision be very clear in restricting Corix from using contaminated rail ties as fuel noting that Corix had no objection to a CPCN condition of the CEP being restricted from using rail ties treated with creosote or pentachlorophenol.[67] BCOAPO also raises this issue and requests the Commission make their restriction a condition for approval of the CPCN.[68]

Corix reply submission

Concerning the potential use of rail ties, Corix states that it has no objection to BCOAPO's request for a limitation on biomass fuel content.[69]

Biomass fuel supply

Corix states that a competitive bidding process to select a biomass supplier for the Burnaby Mountain DEU was completed in 2011 and Cloverdale Fuel Ltd. (Cloverdale) was selected. The criteria Corix relied upon in its selection of Cloverdale included the ability to offer the best value based on fuel quality and cost with consideration of its ability to meet delivery timelines, the conformance of the biomass fuel to specifications and pricing, as well as business reputation and experience.[70]

Corix states that Cloverdale is located in Port Kells, Surrey, BC and has over 40 years of experience providing wood residues to the Lower Mainland Market. Cloverdale conducts rigorous testing of its various wood waste sources and currently provides fuel to various farm and greenhouse biomass energy centres as well as to the University of British Columbia's Bioenergy Research and Demonstration Facility which has a much higher fuel specification than the Burnaby Mountain DEU. Given the elapsed time since 2011, Corix was asked why it did not consider reopening the selection process. Its response was that the fuel supply market is constantly evolving but, based on the various attributes of Cloverdale, it did not believe there was value in reopening the selection process.[71]

Corix reports its supply contract with Cloverdale is under negotiation and expects to complete it by the end of Quarter 3 of 2017. Corix's objectives in the negotiation of the contract include a 10-year term, fuel quality which meets Metro Vancouver emission standards, moisture levels at 50 percent or less, ability to deliver in off-peak times and performance guarantees.[72]

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[65] Ibid.
[66] BCSEA-SCBC Final Argument, pp. 12–13.
[67] Ibid.
[68] BCOAPO Final Argument, p. 5.
[69] Corix Reply Argument, p. 3.
[70] Exhibit B-2, BCUC IR 5.1, 5.2.
[71] Exhibit B-2, BCUC IR 5.3.1, 5.3.2; Exhibit B-6, BCUC IR 32.1.
[72] Exhibit B-8, FEI IR 3.2.

Corix estimates the cost for biomass fuel in 2019 will be $38.70/tonne gradually increasing to $41.89/tonne in 2023. With respect to variations in fuel cost, Corix stated that biomass, like other fuel commodities, is subject to exogenous market forces beyond its control and where such increases cannot be mitigated, they will be passed through to customers subject to Commission approval. Corix asserted that entering into a 10-year agreement will provide price certainty which exceeds that for other fuels such as natural gas.[73]

Intervener submissions

BCSEA-SCBC submits it is satisfied with Corix's intention to deliver the biomass fuel from Port Kells to the CEP.[74]

BCOAPO submits it is content for Corix to continue with its negotiations with Cloverdale. BCOAPO notes that Cloverdale is a local well-established business and believes the contract negotiated is likely to remain as competitive and cost-effective as it would have been if negotiated in 2011. It points out that having the customer bear the risk for biomass fuel costs is the accepted practice and Corix's intention to negotiate a 10-year contract will mitigate this risk to a degree.[75]

Biomass delivery

Corix expects the Burnaby Mountain DEU will require seven truckloads of fuel per day to be delivered in the winter and one truckload per day in the summer. Corix will have an onsite storage system designed to hold up to three days' supply at 70 percent average load demand rate in the event of weather-related delivery interruptions. In addition, the CEP is designed for natural gas backup to provide up to 90 percent of peak UniverCity load demand at peak design conditions. Corix states that this can be used to supplement available biomass fuel supplies as required, thereby mitigating the risk of having no fuel supply in the event the road is inaccessible for a number of days due to extreme weather.[76]

Corix notes that the proposed delivery route eliminates the need for the trucks to enter the residential community or the campus and, as a result, traffic impact and potential disruption is minimal. While there was no specific consultation with respect to the fuel truck delivery route, transportation requirements and the plant location, these topics were discussed as part of the open houses.[77]

None of the interveners made submissions with respect to biomass delivery.

Commission determination

The Panel finds that the quality of Corix's proposed biomass for use in the Burnaby Mountain DEU meets the requirements of the CEA as well as those imposed by Metro Vancouver. The evidence presented confirms that Corix has been clear in defining its requirements to Cloverdale, its biomass supplier, and it will meet all requirements. The Panel considers it reasonable for Corix to continue to negotiate its biomass supply agreement with Cloverdale which will be subject to future Commission approval.

Concerning the use of retired railway ties contaminated with creosote and pentachlorophenol, the parties are all in agreement with having a condition on the CPCN that excludes their use. **Accordingly, the Panel requires Corix**

[73] Exhibit B-2, BCUC IR 11.1; Exhibit B-8, FEI IR 3.2.2.
[74] BCSEA-SCBC Final Argument, p. 12.
[75] BCOAPO Final Argument, p. 3.
[76] Exhibit B-1, p. 27; Exhibit B-2, BCUC IR 4.3.
[77] Exhibit B-2, BCUC IR 4.2, 4.2.1.

to refrain from the use of treated railway ties as a biomass fuel source as a condition of the issuance of the CPCN.

The Panel also finds that the choice of Cloverdale to supply its biomass is reasonable. Corix used a competitive bid process relying on selection criteria that were both reasonable and appropriate in these circumstances. Cloverdale is a local supplier that has extensive experience in providing the required biomass in qualities meeting or exceeding those required by Corix and has been in business for 40 years. The Panel understands that the cost of fuel will vary over time and agrees with BCOAPO in that Corix's intention to negotiate a 10-year contract will mitigate some of the concerns with respect to short to medium term biomass price increases. Moreover, the fact that the CEP is designed for natural gas backup providing for 90 percent of UniverCity's peak load demand leaves open options in the event of unforeseen events affecting future supply.

The Panel is satisfied with the biomass delivery plan established by Corix. The location of the CEP is such that delivery trucks can have access with limited disruption and even if two trucks were to inadvertently arrive at the same time, the delivery area has been designed to accommodate the second truck while the first is unloading.[78] While there is potential for weather disruption to scheduled delivery, Corix has designed a storage bin capable of holding three days' supply and notes that this can be augmented with natural gas backup systems as necessary.

3.6 Required permits and approvals

In addition to the approval of the CPCN, the Burnaby Mountain DEU requires the following approvals:

1. Preliminary plan approval from the City of Burnaby;
2. Building permit from the City of Burnaby;
3. Environmental permit (air permit) from Metro Vancouver for the project site regarding compliance with Greater Vancouver Regional District Boilers and Process Heaters Regulation Bylaw No. 1087, 2008 and Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1190, 2013;
4. British Columbia Safety Authority (BCSA) for the general supervision status for the facility using BCSA Alternative Safety Approaches; and
5. Statutory rights of way from the Province of British Columbia for infrastructure on SFU lands, and for each developer and strata corporation relating to UniverCity.[79]

Corix provides the following update on its permit requirements:

[78] Exhibit B-2, BCUC IR 4.4.
[79] Exhibit B-1, pp. 27–28.

Table 3: Outstanding Permits and Approvals[80]

Material Permit	Authority	Date Required	Date Completed	Impact if not received	Alternative Option
Certificate of Public Convenience and Necessity	BC Utilities Commission	October 1, 2017	-	Project would cease to move forward.	No alternative option available
Preliminary Plan Approval (PPA)	City of Burnaby	February 13, 2018	-	Corix believes that it is very unlikely that a situation would exist where a PPA would not be granted so long as the application meets the requirements set forth by the City of Burnaby and their respective planning department.	No alternative option available
Building Permit, including all sub-permits (electrical, fire protection, gas, plumbing, tree cutting, etc.)	City of Burnaby	January 22, 2018	-	Corix believes that it is very unlikely that a situation would exist where a building permit and all subsequent sub-permits would not be granted to the project so long as the application(s) meet the requirements set forth by the City of Burnaby and the BC Building Code.	No alternative option available
Air Quality Permit, or registration under the Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation	Metro Vancouver	November 3, 2017	-	Corix believes that it is very unlikely that a situation would exist where an Air Quality Permit would not be granted so long as the application meets the requirements set forth by both the Province and the MetroVan bylaw/regulation.	No alternative option available
All necessary operating permits for the infrastructure issued under the *Safety Standards Act* (British Columbia)	BC Safety Authority	April 1, 2019	-	Corix believes that it is very unlikely that a situation would exist where operating permits would not be granted so long as the operation meets the requirements set forth by the Safety Standard Act (BC).	No alternative option available

Corix expects to complete the approval process in time for project completion by April 1, 2019 and believes it is very unlikely that any of the required permits would not be granted.

Panel discussion

Corix has proposed this project with a good understanding of the approval requirements and appears to have taken these into account in its project planning. The Panel has no concerns with the steps taken by Corix to date.

3.7 Issues arising

Choice of Wellons for the design, fabrication and installation of the biomass module

Corix states it is currently in the process of concluding an agreement with Wellons, a local biomass systems manufacturer for the design, fabrication and installation of the biomass module. Corix states that through a competitive process supported by SFU and the SFU Trust, Wellons was selected based on the following criteria:

- Reliability;
- Proven track record and history in building biomass systems;
- Ability to meet environmental standards;
- Local company with technical support readily available;
- Costs – capital and ongoing operations and maintenance; and
- Acceptance of broad range of biomass fuel content.[81]

Corix states that the competitive selection process was completed in 2011 following an engineering consultant's issuance of a Request for Proposal (RFP). SFU and Corix had a preference for a local supplier for two reasons: (i) availability of grants from BC Hydro and the Provincial Government favoured selection of a local supplier, and (ii) service personnel accessibility and availability of parts would be better if the supplier was local. Two companies,

[80] Exhibit B-2, Attachment II.
[81] Exhibit B-1, p. 19.

Nexterra (biomass gasification technology) and Wellons, were approached and responded to the RFP. The firms were evaluated on the basis of the criteria in Table 4.

Table 4: Evaluation Criteria[82]

Evaluation Criteria	Details
Proponent / Firm	• Relevant experience • Capacity / support (construction and on-going) • Ability to support public consultation • References
Technical proposal	• Fuel flexibility • Operability / constructability • Optionality (optimization options, ability to expand and adapt) • Emissions • System efficiency / turn down

Cost / Financial Risk (Thermal-only vs. CHP)	• Capital Costs
	• Capital Cost Risks (During Design)
	• Warranty
	• Operating and Maintenance Costs
	  • Fuel (reflects efficiency and turn down)
	  • Non-fuel

Corix reports that Wellons has either completed or currently has in development 50 biomass modules. In addition to best meeting the criteria, Wellons agrees to guarantee expected system efficiencies and Metro Vancouver emission limits as performance criteria that are part of the agreement currently being negotiated. Corix is confident that an agreement will be reached between the parties as many of the elements have already been agreed upon. In the event there are some outstanding items that delay finalization of the agreement, Corix states that an alternative form of supply agreement will be put in place so the project schedule will not be affected.[83]

Intervener submissions

BCOAPO notes that it has been six years since the competitive process took place and considers if there is need to reassess suppliers through another competitive process. However, BCOAPO states it is not asking for this exercise to be repeated, stating "the 2011 process was sufficient and to repeat it now would likely add unnecessarily to the projects costs with very little likelihood of any possible change in the outcome."[84]

Panel discussion

The Panel finds that Corix applied sufficient competitive process in 2011 in selecting Wellons as a supplier for design, fabrication and installation of the biomass module. Wellons has significant experience in the development of biomass modules and has offered additional guarantees that are material to the success of this project.

[82] Exhibit B-2, BCUC IR 4.5.
[83] Exhibit B-2, BCUC IR 4.5.2, 4.6.
[84] BCOAPO Final Argument, p. 3.

The Panel agrees with BCOAPO that there is no need to reassess suppliers through another regulatory process. Many elements of the agreement have been agreed upon and adding an additional process at this point would create delays and potentially add to the delivery cost for this project. The Panel supports Corix moving forward to complete its negotiations with Wellons.

4.0 Thermal Energy Services Agreement

Pursuant to sections 60 and 61 of the UCA, Corix seeks approval of the TESA between itself and SFU, including the cost of service, cost allocation, and rate design principles set out in various schedules of the TESA.[85] As part of its final argument, Corix states that subject to Commission approval, SFU and Corix will amend the TESA to change the wording of the fuel cost deferral account so that the mechanism for recovering annual variances in biomass and electricity costs will be through the capacity charge as opposed to the consumption charge.[86] This is discussed further in Section 4.1.5 of this decision.

While the TESA is an agreement between Corix and SFU, the terms and conditions in the agreement have potential impacts on UniverCity ratepayers. The key issues related to the TESA are discussed in detail in the following sections, with the Panel providing discussions and determinations where necessary.

4.1 Key issues with the TESA

4.1.1 Service term

The first issue is what financial risks may be faced by the UniverCity ratepayers should SFU opt for early termination of the TESA.

The term of the TESA between Corix and SFU is for 30 years from the service commencement date of the thermal energy project. SFU has two Early Termination Options as outlined in Section 3.2 of the TESA:

> SFU will have the option (the "Early Termination Option") to terminate this Agreement effective as of the date that is:
>
> (a) twenty (20) years after the Service Commencement Date by giving written notice of such termination to Corix on or before the date that is ten (10) years after the Service Commencement Date: and
>
> (b) twenty-five (25) years after the Service Commencement Date by giving written notice of such termination to Corix on or before the date that is fifteen (15) years after the Service Commencement Date.
>
> If the Early Termination Option is not exercised by SFU in accordance this Section 3.2, the Early Termination Option will expire.[87]

[85] Exhibit B-1, p. 3.
[86] Corix Final Argument, p. 4.
[87] Thermal Energy Services Agreement (TESA), Section 3.2, p. 11.

Corix identifies SFU's early termination of the TESA as a project risk but considers the risk to be "low" and cites the following risk mitigation measures:

- A long termination notice (i.e. 10 years);
- Undertaking a feasibility assessment of power generation added to the project to use excess energy in case of a SFU termination; and
- Understanding of the development plans on Burnaby Mountain for capturing new loads (i.e. future phases of UniverCity development).[88]

Corix states that it considers the risk of SFU invoking the early termination option and the utility being unable to mitigate the impact of the excess capacity within the 10-year notice requirement to be "extremely low." Corix also provides Table 5 in the Application showing that over a 30-year levelized rate period, even if SFU invokes the early termination option and cancels the TESA at the end of 20 years, the levelized rate is lower than under a scenario where Corix had built a stand-alone biomass facility for UniverCity customers only.[89]

Table 5: SFU Termination Scenarios Comparison

RESIDENTIAL RATES PER MWH	Residential Stand-alone Biomass	Biomass With SFU 30 Years	Biomass With SFU 20 Years	Residential Natural Gas
Year 1	$ 137.06	$ 119.67	$ 119.67	$ 127.66
Year 15	$ 149.07	$ 127.87	$ 161.04	$ 141.77
Year 30	$ 148.20	$ 126.60	$ 161.04	$ 151.73
30 year levelized	$ 151.41	$ 131.28	$ 148.31	$ 144.71
% change in levelized rate		-13.3%	-2.0%	-4.4%

None of the interveners commented on this aspect of the TESA.

Panel discussion

The Panel accepts Corix's assessment of a minimal risk to UniverCity ratepayers in the event of an early termination of the TESA by SFU. First, the Panel finds that the provision in the TESA which requires SFU to provide 10 years' notice if it decides to terminate the TESA early provides a reasonable time period for Corix to investigate and procure other load sources through means such as new developments on Burnaby Mountain. Second, the Panel notes that even under the "worst case scenario" of SFU's early termination and no additional sources of load being realized to absorb the additional costs of the permanent CEP facility, the 30-year levelized rate for UniverCity customers is still lower than the 30-year levelized rate under a scenario where Corix were to build a stand-alone biomass facility for UniverCity customers only. This indicates to the Panel that the economies of scale gained from a combined biomass facility are significant enough to outweigh the additional costs which would be borne by UniverCity ratepayers at the end of 20 years under the "worst case" early termination scenario.

[88] Exhibit B-1, p. 52.
[89] Exhibit B-1, Table 26, p. 47.

4.1.2 Use of thermal energy from the CEP

The terms of the TESA provide the option for SFU, under certain circumstances, to not take energy from the biomass facility. This issue was explored in Commission IRs to understand the impact, if any, on UniverCity ratepayers from either an increased allocation of shared capital and operating costs perspective or from an increased fuel cost perspective.

The biomass plant is designed to deliver 13.5 MW of energy with 10 MW the nominated capacity solely for the use of SFU. The Threshold Capacity of 3 MW is defined as the minimum level at which the plant must operate to achieve proper operating costs.

Section 2 of the TESA governs the use of thermal CEP energy by SFU and covers the load or lack of load used by SFU during any given year which in turn may have an impact on the UniverCity ratepayers.

Section 2.2(a) of the TESA states:

> While SFU intends to use Thermal Energy generated by Corix from the Biomass fired boilers in the CEP to meet the baseload Thermal Energy requirements of the Campus Distribution System during the Service Term, SFU will have no obligation to take and use Thermal Energy from the CEP under this Agreement.[90]

Corix confirmed in response to the Commission IRs that based on the wording of Section 2.2(a) of the TESA, it is possible that SFU could elect not to take any thermal energy from the combined biomass facility in any given month or year of the service agreement term. However, Corix stated that this clause only refers to energy use and that it does not relieve SFU from paying the capacity or availability charges.[91] The capacity charges would not change as they are fixed charges per MW of nominated capacity. The availability charges would not change since they are fixed charges per month. However, in the event SFU does not take any energy, its consumption charges would be nil because they are based on a rate per metered MWh consumed by SFU. The consumption charge only recovers fuel costs, which would be avoided in the event SFU does not elect to take thermal energy.[92]

Corix submitted that "[g]iven fixed capacity charges and the relative variable cost of biomass energy to natural gas (including added cost of offsets), SFU has an economic incentive and intention to maximize the use of the biomass energy."[93]

Section 2.2(b) of the TESA states:

> Notwithstanding Section 2.2(a), the Biomass facilities in the CEP will be designed to operate efficiently at or above the Threshold Capacity and SFU will, subject to having a need for Thermal Energy for the Campus Distribution System, take Thermal Energy from Corix under this Agreement in priority to generating Thermal Energy for the Campus Distribution System from the Existing Campus Plant at times when the Thermal Energy load from the Residents is below

[90] TESA, Section 2, p. 9. [Emphasis added]
[91] Exhibit B-2, BCUC IR 13.1, 13.1.1.
[92] Exhibit B-6, BCUC IR 13.1.2.
[93] Exhibit B-2, BCUC IR 13.1, 13.1.1.

> the Threshold Capacity… Notwithstanding the foregoing, SFU will not be required to take Thermal Energy from Corix in these low load conditions in priority to generating Thermal Energy from the Existing Campus Plant if taking Thermal Energy from Corix is less economic to SFU in comparison to the variable cost to SFU of generating Thermal Energy from the Existing Campus Plant having regard for the cost of natural gas to SFU, including any carbon taxes and the cost of acquiring greenhouse gas offsets, as required.[94]

Corix stated that "SFU is contractually obligated through the TESA to take an amount of energy to ensure the biomass facility operates at or above the 3 MW Threshold Capacity. Therefore, any adverse impact on UniverCity ratepayers due to a very low load condition event is extremely unlikely."[95]

Corix was also asked what steps it would take to mitigate the impact to UniverCity ratepayers if a situation occurred where SFU consistently determined that it was less economic to take thermal energy from Corix and as a result, the biomass plant was not available for UniverCity ratepayers. Corix responded that if this scenario were to occur, it would also be assumed that SFU would have elected to operate its system on natural gas and purchase GHG offsets. Thus, if thermal energy from biomass is "not economic for SFU, it is also not likely to be economic for the UniverCity customers, and it is therefore assumed Corix would elect to provide service to UniverCity customers using natural gas."[96]

None of the interveners commented on this issue.

Panel discussion

The Panel finds that Sections 2(a) and 2(b) of the TESA do not present a risk to UniverCity ratepayers. The Panel accepts Corix's assertions that based on the proposed rate structures for SFU and for UniverCity, if SFU elected not to take energy from the combined biomass facility there would not be any increased allocation of costs to UniverCity ratepayers. Further, the Panel notes that while the terms of the TESA do not eliminate the possibility that the biomass facility would not be available for UniverCity customers if SFU elected not to take energy in a "low load" situation under certain economic conditions, it is likely from an economic perspective that it would be preferable for UniverCity customers to utilize natural gas instead of biomass in these conditions. Thus, the rate impact to UniverCity customer from the lack of availability of the biomass facility in such circumstances would be no different than what would be expected under the status quo.

4.1.3 Changes to nominated capacity

A further issue with the TESA is the potential impact or risk to UniverCity customers of SFU electing to increase or decrease its nominated capacity of 10 MW. The "nominated capacity" is the maximum amount of thermal energy available to SFU from the CEP as presently configured.

Section 2.3 of the TESA specifies the requirements SFU must fulfill and steps that need to be taken in the event it wishes to increase its nominated capacity. Conversely, Section 2.4 of the TESA states that if at any time following the Service Commencement Date SFU desires a decrease in nominated capacity, it may deliver a notice to Corix detailing the desired decrease. Corix would then use commercially reasonable efforts to reallocate the thermal energy capacity to other potential customer groups. If successful in finding an entity to take on the additional

[94] TESA, Section 2, p. 9.
[95] Exhibit B-6, BCUC IR 37.3.
[96] Exhibit B-6, BCUC IR 37.4.

capacity, Corix would seek Commission approval to decrease SFU's rates to reflect the decreased nominated capacity.[97]

In the event there is a decrease in SFU's nominated capacity, a smaller portion of the fixed capital and operating costs would be allocated to SFU which could result in a potential increase in costs allocated to UniverCity if it chooses to increase its nominated capacity. Table 6 outlines the possible impact on: capacity charges, availability changes and consumption charges, capital cost allocation percentage and fixed operating cost allocation percentage under either scenario.

Table 6: Impact of Increasing or Decreasing Nominated Capacity[98]

PARAMETERS	INCREASE IN NOMINATED CAPACITY	DECREASE IN NOMINATED CAPACITY
Capacity Charge	We expect this parameter to change due to changes in SFU's share of rate base and fixed operating costs that are required to implement the increase. The capacity charge would likely decrease due to increased economies of scale, but that would depend on the unit cost of incremental capacity for SFU.	If Corix can reallocate the existing capacity, SFU's charge would be reduced accordingly. If Corix cannot reallocate the capacity, SFU's Nominated Capacity would not be reduced for the term of the contract and there would be no change to this parameter.
Availability Charge	No changes expected. The parameter could be renegotiated with SFU subject to approval by the BCUC.	No changes expected. The parameter could be renegotiated with SFU subject to approval by the BCUC.
Consumption Charge	No changes expected, unless efficiency changes result in changes in variable cost per MWh.	No changes, unless efficiency changes result in changes in variable cost per MWh.
Capital Cost Allocation Percentage	SFU's would increase and UniverCity's would decrease. Corix expects the change would reflect not only the change in relative capacity of each customer group but the incremental cost of any new capacity for each customer group, as relevant.	SFU's would decrease. UniverCity's would increase if UniverCity needs the reallocated capacity and UniverCity's would remain the same if the excess capacity is reallocated to another customer.
Fixed Operating Cost Allocation Percentage	SFU's would increase and UniverCity's would decrease to reflect the incremental costs to be allocated to SFU.	SFU's would decrease. UniverCity's would increase if UniverCity needs the reallocated capacity and UniverCity's would remain the same if the excess capacity is allocated to another customer.

A review of this table indicates that regardless of the scenario, UniverCity's rates would not be negatively impacted except in the circumstance where UniverCity has elected to increase its nominated capacity. Corix further confirmed this in response to BCUC IR 38.1. Moreover, any increases in nominated capacity charges will require Commission approval.[99]

[97] TESA, Section 2, p. 10.
[98] Exhibit B-2, BCUC IR 14.2.
[99] Exhibit B-2, BCUC IR 14.3.

None of the interveners commented on this issue.

Panel discussion

The Panel is satisfied with Corix's assertions that a change in nominated capacity by SFU as outlined in the TESA would only impact UniverCity ratepayers in those instances where there was a requirement to increase UniverCity's nominated capacity. Thus, the Panel finds this provision within the TESA results in no additional risk being undertaken by UniverCity ratepayers. Where a rate change for any of the parties occurs as a result of a change in nominated capacity, in accordance with section 61 of the UCA, Corix is required to file an application with the Commission.

4.1.4 Cost allocations

In this section, the Panel considers whether the proposed allocation of costs between UniverCity and SFU in the Application and outlined in the TESA are fair and reasonable. The service provided to SFU is for baseline supply only as the university provides its own peaking and backup from an existing boiler plant. The service provided to UniverCity is for baseload supply as well as peaking and backup supply. The TESA outlines the costs that are to be allocated to SFU with any remaining amounts allocated to other customers or more specifically, UniverCity ratepayers.

Where a cost is related to a single party, that is the only user and beneficiary, Corix has stipulated that party should bear 100 percent of the costs. Other capital and operating costs of a shared nature need to be allocated between the parties. Many of these are allocated on the basis of capacity entitlements of 10 MW for SFU and 3.5 MW for UniverCity resulting in an allocation of 74 percent to SFU and 26 percent to the residents of UniverCity. Other costs are allocated on the footprint utilized by each of the parties multiplied by the 74 percent/26 percent capacity ratio as a function of the total footprint to determine the allocation. Still, others are based on the share of the energy produced or on various nominated or deemed capacity factors applicable to the particular circumstance.[100]

The primary cost components for the project include the following:

1. Capital costs which include:
    a. The biomass CEP facility;
    b. Natural gas equipment and interconnection;
    c. Site preparation, building and foundations including improvements in architecture;
    d. Interconnection of the SFU and UniverCity hot water systems at the biomass CEP;
    e. Campus and UniverCity Connection lines;
    f. The Campus ETS; and
    g. Project development and management costs.
2. Fixed operating costs.
3. Fuel and commodity costs.

[100] Exhibit B-1, pp. 40–43; Exhibit B-1, Appendix II, Schedule 2, pp. 1–4.

Corix describes the CEP as having two sections:

1. A fully enclosed biomass fuel bin building that contains the fuel storage area and fuel feed equipment.
2. A CEP building which houses the biomass equipment to serve SFU and UniverCity as well as the natural gas equipment dedicated to UniverCity only.[101]

As outlined in the Application, specific costs are allocated as follows:

Direct capital costs

UniverCity has been allocated 100 percent of the costs for natural gas equipment, the UniverCity interconnection at the CEP, the UniverCity connection line and its DPS and ETS which serve UniverCity customers only. Similarly, the Campus connection line, as well as SFU's connection to the ETS and interconnection at the CEP which serve only SFU, are allocated 100 percent to SFU.[102]

Shared capital costs

The biomass portion of CEP equipment is allocated based on each party's share of the total 13.5 MW capacity. This results in a 74 percent for SFU and a 26 percent share for UniverCity. Corix explained that "the biomass module is a fixed asset and the price is directly related to the size of the module (output capacity it is able to deliver)" and the total output capacity resulting from the baseload capacity for each customer group.[103] Corix stated that another approach to such allocations would be to allocate on the basis of energy delivered to each customer. However, it noted that this is a variable parameter changing each year which would necessitate an annual calculation which could potentially result "in one customer group paying for the asset built for the other customer group in case they voluntarily do not take biomass energy."[104]

The shared Project Management costs for the CEP infrastructure are proposed to be split equally between the customer groups in recognition of the fact that most of such costs are fixed and do not change with the size of the plant.[105]

Building and foundations

With respect to the fuel bin building, foundation and site preparation, the allocation is based on the share of capacity (74 percent SFU/26 percent UniverCity) because it serves the biomass load only. For the CEP building, foundations and site Preparation, the allocation is 35 percent to UniverCity and 65 percent to SFU. This move away from relying only on capacity is in recognition that, in addition to biomass capacity, 100 percent of the natural gas equipment serves only UniverCity. Corix further explains that the CEP buildings and foundations are first allocated on a per square foot basis before applying the capacity requirements criteria.[106]

Direct operating costs

All costs for the operation of the natural gas portion of the CEP, the natural gas and the ETS and DPS operation and maintenance (O&M) are allocated 100 percent to UniverCity as these costs relate to the operation of

[101] Exhibit B-1, p. 39.
[102] Exhibit B-1, pp. 40–41.
[103] Exhibit B-2, BCUC IR 19.2.
[104] Exhibit B-2, BCUC IR 19.2.1.
[105] Exhibit B-2, BCUC IR 19.4; Exhibit B-1, p. 41.
[106] Exhibit B-1, p. 41, Appendix II, Schedule 2.

infrastructure that serves UniverCity only. Similarly, SFU has 100 percent responsibility for operating costs related to the Campus connection and Campus ETS which are for its sole benefit.[107]

Shared operating and commodity costs

Corix has not relied on a single method to determine its shared operating and commodity costs. Each cost component has been considered separately and a specific allocation methodology applied to each based on suitability. This has resulted in shared operating and commodity cost allocations which vary significantly based on the unique factors related to each. Cost allocations for shared operating and commodity costs are outlined in Table 7.

Table 7: Shared Operating and Commodity Cost Allocations[108]

Cost component	UniverCity (%)	SFU (%)
Biomass CEP O&M	26	74
Utilities, licensing and chemical treatment	54	46
CEP building O&M	32	68
Utility management	30	70
Corporate overhead	48	52
Property insurance	57	43
Other insurance	43	57

In addition, the cost of biomass fuel and electricity are paid in accordance with the customer share of the energy produced.

The shared O&M costs for the biomass CEP, like the capital costs, are allocated in accordance with capacity. However, in recognition of the natural gas facilities that serve UniverCity only, shared O&M costs in respect of the CEP building are allocated to the parties: "based on the quotient obtained by dividing (i) the footprint…multiplied by 74%... by the footprint of the entire CEP building." This approach results in 65 percent of the costs being allocated to SFU with the balance allocated to UniverCity.[109]

Property insurance will be allocated based on each customer's share of the original costs of all capital assets while the allocation of other insurance coverages are based on each customer's share of billed revenues to each customer group.[110]

Shared costs for utility management will be allocated on the basis of recorded time spent by personnel performing this function (to the extent possible). Otherwise, such costs will be allocated based on metered energy demand in kWh with forecast demand used at the commencement date.[111]

[107] Ibid., pp. 42–43.
[108] Ibid., p. 43.
[109] Exhibit B-1, p. 43; Exhibit B-1, Appendix II, Schedule 2, p. 2.
[110] Exhibit B-1, p. 43; Appendix II, Schedule 2, pp. 2–3.
[111] Exhibit B-1, p. 43.

Corix states that corporate overhead will be allocated to SFU by taking into account total CEP capacity for biomass and natural gas of 19.1 MW. The calculation is based on a quotient obtained by dividing its nominated capacity by the sum of its nominated capacity and the deemed capacity for UniverCity. Corix explained that this methodology is most appropriate because it is based on the infrastructure investment appropriately built to serve each party. Corix further explained that other methodologies considered were considered less desirable due to their being subject to greater variability year over year.[112]

Utilities, licensing, chemical treatment and any other shared costs not specifically addressed will be based on dividing SFU's nominated capacity by the total output capacity of the CEP from time to time with the remainder charged to UniverCity. Corix explains these costs change with the size of the facility or its installed capacity and therefore this approach is appropriate.[113]

Intervener submissions

BCSEA-SCBC is in agreement with Corix that the TESA fairly allocates capital and operations costs between SFU and UniverCity. It notes that the proposed allocations for the shared portion of the CEP and related operations ensure both parties benefit from the economies of scale while avoiding cross subsidization.[114]

SFU submits that all of the proposed cost allocators are principle-based and will produce a fair and reasonable allocation of costs minimizing ongoing administrative complexity. Further, "The allocation of shared capital and fixed operating costs based on fixed capacity allocations is not only fair, but also enables SFU to retain full rights over dispatch from the CEP for its own use while ensuring that this has no impact on UniverCity customers." SFU also points out that with regard to project development costs it has incurred significant internal and external costs in aid of conducting project due diligence and assessment in addition to negotiating the TESA.[115]

Commission determination

The Panel finds the cost allocation methodology employed in the TESA represents a principled approach to determining cost allocations based on either cost causality or implicit benefit and in doing so appropriately represents the interests of UniverCity residents as well as SFU. The cost allocation methodology is based on an examination of all costs and assigning them to the parties in accordance with principles designed to determine which party or parties uses and benefits from the cost and where shared, the extent to which either party uses or benefits from the particular service. Accordingly, the cost allocation methodology appropriately first identifies those areas where only one of the parties uses the services provided and allocates all such capital or operating costs directly to that party. For shared services, Corix employs a variety of appropriate methodologies.

With regard to capital costs like the biomass facilities which benefit both SFU and UniverCity, the amounts to be allocated are based on each party's share of the total capacity. The Panel accepts this approach as appropriate noting Corix's evidence that the fixed price of the asset is directly related to its size. Where costs are a combination of shared costs and are in part dedicated to one party, such as the building and foundations costs or the shared operating and commodity costs, the TESA details a more complex methodology. This involves the identification of factors influencing these costs and developing an approach to allocating them in recognition of

[112] Exhibit B-1, p. 43; Exhibit B-2, BCUC IR 22.4, 22.5.
[113] Exhibit B-1, p. 43; Appendix II, Schedule 2, p. 3; Exhibit B-2, BCUC IR 22.6.
[114] BCSEA Final Argument, pp. 14–15.
[115] SFU Final Argument, pp. 7–8.

cost causality or benefit to the parties. While the approaches vary by individual cost, Corix has provided its rationale behind each of these costs in its evidence.

Therefore, the Panel agrees with BCSEA-SCBC and SFU that the TESA fairly allocates capital and operational costs and that the proposed cost allocation methodology is principle based. **Based on this, the Panel finds the various methodologies employed to allocate costs among the parties to be reasonable and approves them.**

4.1.5 Rate design principles

Corix does not seek approval of actual rates for SFU in this Application as this will follow prior to the in-service date. However, Corix is requesting approval of its rate design principles as set out in its Cost of Service parameters listed in Schedule 1 and Schedule 2 of the TESA.

Rate structure

As outlined in the TESA, the SFU rate design will be a three-part rate consisting of a capacity charge, a consumption charge and an availability charge. Corix states that these were designed to recover costs as follows:

(a) The capacity charge will be a monthly fixed charge ($/MW of nominated capacity/month) based on the annual cost of service allocated to SFU, excluding $198,000 of such costs which are to be recovered through the availability charge and 100 percent of the biomass fuel and electricity costs allocated to SFU which are to be recovered through the consumption charge. The costs included in the capacity charge account for approximately 70 percent of the total projected cost of service allocated to SFU over the initial ten years of operations.

(b) The consumption charge will be a variable charge ($/kWh of thermal energy supplied by Corix to SFU) based on the biomass fuel and electricity costs allocated to SFU. The costs included in the consumption charge account for approximately 30 percent of the total projected cost of service allocated to SFU over the first ten years of operations.

(c) The availability charge will be a monthly fixed charge ($/month) based on $198,000 of the annual cost of service allocated to SFU and not recovered in the capacity charge plus an additional incentive payment of $198,000 per annum.[116]

Cost of service parameters

Corix states that SFU rates will be determined on a cost of service basis reliant on the following cost of service parameters: rate base, cost of capital, income taxes, depreciation expense, operation and maintenance costs, biomass and utility costs and property taxes with deferral account treatment as applied for. Corix has provided an estimate of its initial capital costs in Schedule 1 along with the agreed upon handling of income taxes and depreciation expense. Operation and maintenance and biomass and utility costs include all costs reasonably and prudently incurred and are collected as part of the capacity charge and the consumption charge.

The cost of capital will be determined by the Commission as part of the future rate application with the following conditions:

- the capital structure will not exceed that of the default capital structure for thermal energy services as determined by the Commission from time to time;

[116] Exhibit B-1, Appendix II, Schedule 2, p. 4.

- the return on equity (ROE) will not be higher than the default ROE for thermal energy system (TES) utilities as determined by the Commission from time to time; and
- the debt rate will not exceed the default debt rate as determined by the Commission from time to time.[117]

Deferral account treatment

Schedule 1 of the TESA states that Corix will assume the forecast risk for all costs between rate applications with the exception of property taxes and biomass and electricity fuel costs. The TESA therefore includes provisions for two deferral accounts: (i) a property tax deferral account; and (ii) a fuel cost deferral account.[118]

The property tax deferral account is described in the TESA as follows:

> Corix will be entitled to recover, or will be required to refund, any difference between the forecast and actual property taxes incurred between the Service Commencement Date and receipt of the first property tax assessment for the Infrastructure (if any such taxes are payable). Following the initial property tax assessment, Corix will be responsible for forecasting property taxes for each test period and will not be entitled or required to adjust for any difference between forecast and actual property taxes between BCUC rate cases.[119]

For the purposes of indicative rates, Corix has assumed that SFU will not be required to pay any property taxes; however, Corix explained there will be "ongoing uncertainty" as to whether or not SFU will be required to pay property taxes until it has received the initial property tax assessment. Corix submitted that because the "likelihood and magnitude" of property taxes are uncertain, Corix and SFU have made no determination as to the appropriate period of time to recover any variance in property taxes resulting from the initial property tax assessment.[120] Corix further explained that should a balance be required to be recorded in the property tax deferral account, Corix would seek Commission approval of an amortization period and recovery mechanism prior to recovering the balance from SFU.[121] Corix confirmed that proposing similar treatment of variances between forecast and actual property taxes for UniverCity customers and any variances between forecast and actual property taxes from the initial property tax assessment would be captured in the previously Commission-approved revenue deficiency deferral account (RDDA).[122]

The fuel cost deferral account is described in the TESA as follows:

> For the entire Service Term, Corix will, subject to BCUC approval, establish a deferral account to capture the difference between the forecast and actual costs incurred by Corix for Biomass and electricity to provide service to SFU under the Thermal Energy Services Agreement…and will recover or refund any such differences in future periods through adjustments to the Consumption Charge.[123]

[117] Exhibit B-1, Appendix II, Schedule 2, pp. 1–10.
[118] Exhibit B-1, Appendix II, Schedule 1, p. 10.
[119] Exhibit B-1, Appendix II, Schedule 1, p. 10.
[120] Exhibit B-2, BCUC IR 17.1.
[121] Exhibit B-6, BCUC IR 39.1.
[122] Exhibit B-2, BCUC IR 17.5; Exhibit B-6, BCUC IR 39.3.
[123] Exhibit B-1, Appendix II, Schedule 1, p. 10.

In response to BCUC IR 40.3, Corix revised its deferral account proposal to instead apply balances in the deferral account to the capacity charge as opposed to the consumption charge. This would require amending Schedule 1 of the TESA to reflect the revised wording.[124] Corix confirmed its revised approval request in its final argument.[125]

Corix confirmed in an IR response that it is requesting approval of the deferral account for biomass and electricity pricing variances as well as any volume variances that are not captured in the consumption charges.[126] Corix also explained it is not proposing to establish a similar deferral account for UniverCity customers because those customers already have an RDDA which is being used for fuel variances as well as other deferred costs. However, once the RDDA is fully amortized, Corix will consider a similar deferral account treatment for UniverCity's fuel and commodity costs as is proposed for SFU.[127]

Intervener submissions

None of the interveners made specific comments with respect to the rate design or cost of service parameters.

With regard to Corix's deferral account proposals, BCOAPO submits that while it "does not disagree" with the fuel cost deferral account request, it "does feel very strongly" that despite the fact that UniverCity has the RDDA for fuel variances and other deferred costs, "if such a deferral account is appropriate for SFU then it is for U[niver]C[ity] as well."[128]

Corix responds that it has no objection to a condition requiring a commodity pricing deferral account for UniverCity; however, the RDDA, which already captures variances in natural gas prices and volumes for UniverCity customers, will also capture biomass and electricity price and volume variances, and the current expectation is that the RDDA will be required until 2028. Corix therefore suggests that an option would be to establish a separate deferral account specific to biomass, electricity and natural gas pricing and volume variances for UniverCity once the RDDA is dissolved.[129]

Commission determination

The Panel approves the rate design principles, the cost of service parameters and the two deferral accounts as outlined in the TESA and as revised in Corix's final argument with regard to the fuel cost deferral account. The Panel notes that the TESA will need to be amended in order to reflect the revised deferral account wording; thus, approval of the TESA is subject to the amendment to Schedule 1 of the TESA. The Cost of Service methodology is a common approach to rate making and there is sufficient evidence in this proceeding as to why it is appropriate in this circumstance. Moreover, the methodology has been agreed to by both SFU and Corix. The Panel considers it reasonable to utilize a deferral account for property taxes up until the initial property tax assessment, as there is a high degree of uncertainty regarding whether or not property taxes will be assessed to SFU and, if so, what the amount of the assessment will be. It would not be reasonable for Corix to bear the forecast risk for property taxes until the initial assessment given this level of uncertainty. The Panel further considers establishment of the fuel cost deferral account to be reasonable given the potential unpredictability of fuel prices (in particular electricity prices) and volumes. We also note that it is common for utilities to utilize

[124] Exhibit B-6, BCUC IR 40.3.
[125] Corix Final Argument, p. 4.
[126] Exhibit B-2, BCUC IR 18.1.
[127] Exhibit B-2, BCUC IR 18.8.
[128] BCOAPO Final Argument, p. 5.
[129] Corix Reply Argument, p. 4.

deferral accounts for commodity costs. The Panel notes Corix's proposal to establish a separate deferral account specific to biomass, electricity and natural gas pricing and volume variances for UniverCity customers when required but agrees that such a deferral account would not be necessary until the RDDA is dissolved.

4.1.6 Capital cost risk reward sharing mechanism

Under the capital cost risk/reward sharing mechanism (RR sharing mechanism) the parties share risks and rewards for the CEP capital costs that are allocated to SFU. Put simply, the parties have established what is described as a [redacted] outside of which the following adjustments apply:

- [redacted]
- [redacted]

While there are specific conditions to which these provisions are subject, this provision is designed to protect SFU in the event capital costs are higher than expected and when they are lower, Corix is rewarded by being able to earn a return on these unspent dollars.[130]

Corix has confirmed that the agreement is between SFU and Corix and there is no direct impact on UniverCity customers as any excess costs for the SFU's portion of the system would be borne by Corix.

These costs would not be allocated to UniverCity because there is no expected direct benefit to UniverCity customers from the SFU portion of the assets.

However, Corix notes that UniverCity residents can benefit indirectly because there is incentive for Corix to manage all shared costs.[131]

Commission determination

The Panel approves the capital cost RR sharing mechanism as outlined in the TESA. The Panel finds there are a number of important features that support using such a mechanism. Firstly, the agreement is between two sophisticated parties. Each has had the opportunity to carefully examine the pros and cons of entering into such an agreement and determined that it is to their individual benefit. Secondly, the agreement directly impacts only the parties to the TESA agreement, SFU and Corix. Therefore, the provisions in the mechanism have no direct impact on UniverCity ratepayers. Thirdly, the mechanism is designed to promote the creation of efficiency and produce cost savings some of which might be beneficial to UniverCity ratepayers who could benefit from any capital expenditure savings resulting in a reduction in their part of the capital cost allocation from the CEP rate base. Collectively, the Panel finds that these features justify approving the capital cost RR sharing mechanism as proposed by Corix.

[130] Exhibit B-1-2, Confidential, Schedule 1, pp. 5–7.
[131] Exhibit B-3, Confidential, BCUC IR 3.1.1.

5.0 Financial modeling

As part of the Application, Corix includes a forecast of the revenue requirement for the Burnaby Mountain DEU as of the in-service date of the project based on the estimated capital and operating costs of the proposed biomass facilities and on the estimated capital and operating costs of the existing UniverCity NUS. Corix also includes a rate impact analysis for UniverCity customers based on the forecast revenue requirement, the proposed cost allocation and rate design for SFU, and the existing approved UniverCity NUS rate design.[132]

Corix is not requesting approval in this application of the actual SFU rates and rate schedule or the actual UniverCity residential rates and rate schedule which would take effect as of the in-service date of the project.[133] Corix indicated that based on the current timing and projections for the in-service date of the biomass facility, it anticipates filing the rate application in late 2018.[134]

In consideration of the fact that Corix is not requesting approval of rates or rate schedules for either SFU or UniverCity customers as part of the Application, the purpose of the following sections is to review and assess the reasonableness of the forecasts and assumptions to ensure that the actual rates applied for by Corix in the upcoming 2018 application are reasonably consistent with the indicative rates presented in the current Application.

5.1 Load demand and energy forecast

UniverCity is a development where the build-out has been ongoing for a number of years and previous CPCN's were applied for and approved to provide energy generation and distribution. The last CPCN was applied for and approved in 2015. In that proceeding, Corix provided the methodology and assumptions for the calculation of load demand for UniverCity including the continuing build-out of the development. Corix describes this as follows:

> The actual metered consumption data (weather normalized) are compared to the forecast. Average EUI's being used to calculate forecasted energy demand are the result of the average actual consumption data (weather normalized) for two types of buildings: low-rise and high-rise.[135]

Corix has used the information to project energy loads and annual energy demand as outlined in Table 8.

[132] Exhibit B-1, p. 3.
[133] Ibid.
[134] Exhibit B-6, BCUC IR 35.4.
[135] Exhibit B-2, BCUC IR 7.1.

Table 8: Energy Loads and Annual Energy Demand[136]

Customer	Peak Energy Load (MW)		Annual Energy Requirement (MWh)	
	Total (MW)	From Biomass (MW)	Total (MWh)	From Biomass (MWh)
UniverCity	9.1	3.5	25,200	19,500
SFU	26[1]	10	51,800	43,800
Total		13.5		63,300

These forecasts are for the full build-out of both the biomass project scheduled for completion in 2019 and UniverCity scheduled for completion in 2022. The energy load and the annual energy demand is calculated using estimated Energy Use Intensities (EUIs) based on the measured data collected during the first five years of the energy service to the existing buildings of UniverCity. The existing natural gas plant has sufficient capacity to cover all of UniverCity's energy requirements until the biomass plant is in operation.[137]

Corix acknowledges that to date, its actual UniverCity energy consumption from 2015 onward have differed from forecast energy consumption. It explains there was a delay in several buildings that were expected to connect in 2015. This resulted in a discrepancy in its 2015 peak load forecast which was also reflected in its actual energy consumption in 2016.[138] Corix provided further clarification of the issue stating that while some buildings consume less energy than forecasted, others consume more and on a cumulative basis "the actual annual energy demand is within an acceptable forecast range."[139]

Based on the first five years of development, Corix calculated the following EUIs in Table 9 to use as input for calculating the system load and total energy demand for the UniverCity development going forward.

Table 9: EUI Assumptions[140]

RESIDENTIAL ENERGY DEMAND	
Space heating - avg energy load (W/m2)	50
EUI - high rise concrete (kWh/m2)	130
EUI - low rise wood frame (kWh/m2)	105
Diversification factor	85%

Using these inputs, Table 10 below shows the calculation of the forecast cumulative load demand and annual energy demand for the UniverCity Residential Development over a five-year period.

[136] Exhibit B-1, Table 2, p. 16.
[137] Exhibit B-1, pp. 29–30.
[138] Exhibit B-5, BCOAPO IR 3.1, 3.2.
[139] Exhibit B-6, BCUC IR 34.2.1.
[140] Exhibit B-1, Table 6, p. 29.

Table 10: UniverCity Peak Load and Annual Energy Demand[141]

RESIDENTIAL LOAD AND ENERGY DE	2019	2020	2021	2022	2023
Load demand diversified (kW)	7,114	7,885	8,793	9,191	9,191
Annual energy demand (MWh)	19,505	21,536	24,049	25,193	25,193

Corix reports that SFU's demand forecast was established using the following information:

- Historical plant thermal peak [30 MWt] as provided by SFU operations.
- The expected thermal energy requirements established using 10-year average gas and oil consumption (April 2006 through March 2016). The raw input fuel data was normalized to a base year using the heating degree data for each year and the thirty year average. The normalized fuel data was then converted to thermal energy requirements by multiplying by a seasonal boiler efficiency of 80 percent.

The calculations described above are summarized as follows:

- 10-Year Average Input Fuel Energy: 222,386 GJ (61,774 MWh)
- HDD Corrected Fuel Data: 231,097 GJ (64,222 MWh)
- Expected Thermal Requirements: 64,222 x 80% = 51,378 MWht[142]

Corix quantifies the volume and percentage of SFU's historical energy demand and baseload forecasted demand as follows:

- SFU Peak Load = 30 MWt, Projected Annual Thermal Energy = 51,378 MWht
- SFU Biomass Baseload Capacity = 10 MWt (Table 9, Section 8.1.3, P30)
- SFU Demand Baseload Percent = 10 MWt / 30 MWt = 33%
- Total Estimated Biomass Energy Delivered to SFU =43,787 MWht[143]

Corix estimates that 85 percent of its total baseload will be supplied by the new 13.5 MW biomass facility.

None of the interveners commented on this section of the Application.

Commission determination

The Panel accepts Corix's annual load demand and energy forecast as submitted.

While there is a great deal of actual history for SFU energy use which can be relied upon, there is only 2015 and 2016 data to test the UniverCity forecast. However, as explained by Corix, the UniverCity forecast data is undermined by the fact that new buildings have not been brought on line and occupied as per the timelines originally outlined by the developer. As a result, consumption is less than expected and little can be derived from the variances between forecast and actual energy consumption for the UniverCity development.

[141] Exhibit B-1, Table 7, p. 29.
[142] Exhibit B-2, BCUC IR 9.2.
[143] Exhibit B-2, BCUC IR 9.3.

Moreover, little can be concluded with respect to the effectiveness of the forecast methodology employed by Corix.

The Panel has reviewed the methodology employed by Corix with respect to demand forecasting for UniverCity and SFU and both appear reasonable. However, until there is more actual data it is difficult to determine whether the methodology chosen is optimum or whether there is a need for adjustment or an enhancement to the methodology. Because of this, the Panel is of the view that the demand forecasts and their methodology should continue to be examined as this project moves forward. **Accordingly, the Panel directs Corix to provide an updated load demand and energy forecast along with its rates application that it expects to file in 2018.**

5.2 Capital costs

The forecast total capital cost for the Burnaby Mountain DEU, including the capital costs previously approved by Orders C-7-11 and G-48-16A, is $37,563,352. The majority of the capital costs are forecast to be incurred in 2018 (i.e. $30.225 million) with small amounts forecast to be incurred in years 2019 through 2021. Corix states it is using Class C cost estimates, which have an accuracy range of +/- 15 to 25 percent.[144]

The biomass CEP and building cost estimates are based on a fixed cost proposal from the technology supplier, Wellons, which is valid for 120 days from the agreement execution. The forecast capital cost for the building, including allowance for funds used during construction (AFUDC), is $7.35 million and the forecast capital cost for the biomass plant is $14.6 million.[145]

Project development, project management and construction management costs

Corix states that the project development commenced in 2010 when the parties agreed to undertake a feasibility assessment of a combined biomass-based CEP that would serve both the SFU Campus and UniverCity customers. Since the completion of the original feasibility study, various implementation strategies and scenarios and business case analyses have been completed, including conceptual and preliminary design of the proposed infrastructure, architectural improvements, environmental assessment, site/geotechnical evaluation, and detailed site preparation and site plan assessments of the preferred location. In addition, discussion and negotiations have been undertaken with third parties including the British Columbia Hydro and Power Authority (BC Hydro), FortisBC, and the City of Burnaby.[146]

As noted in Section 4.1.4, Corix states it will be seeking recovery of all development and project management costs, as well as conceptual and preliminary design costs incurred to date through customer rates applying to both SFU and UniverCity customers. Corix proposes to allocate the shared development and project/construction management costs to SFU and UniverCity customers based on a 50/50 allocation percentage, while the costs directly attributable to either the SFU or the UniverCity infrastructure will be allocated 100 percent to the appropriate customer group.[147]

The forecast amount to be allocated 50/50 between SFU and UniverCity customers is $1.34 million, while an additional $105 thousand is forecast to be directly allocated to SFU and $921 thousand is forecast to be directly allocated to UniverCity customers. The majority of the project development and project/construction

[144] Exhibit B-1, Table 11, p. 32; Exhibit B-2, BCUC IR 23.2.
[145] Exhibit B-1, pp. 32–33.
[146] Exhibit B-1, p. 33.
[147] Ibid.

management costs directly allocated to UniverCity customers (i.e. approximately $713 thousand) were incurred by Corix between 2009 and 2014 and were reviewed by the Commission as part of the previous applications submitted by Corix in 2010/2011 and 2015/2016.[148]

5.3 System operating costs

In the Application, Corix distinguishes between fixed operating costs and variable operating costs. Each is discussed in the following section.

Fixed operating costs

Corix describes fixed operating costs as including "all costs associated with day-to-day operations including routine operations and maintenance, emergency response, insurance, utility administration, corporate overhead/support, water and sewer, licensing and other fees, and other utilities such as phone and internet."[149]

The forecast fixed operating costs commencing in 2019 (i.e. the project in-service date) are $843,386 per year, escalating annually by a factor of two percent. The two largest annual fixed costs are biomass plant operators, estimated to be $276,020, and biomass boiler maintenance, estimated to be $219,016. Corix estimates that the biomass CEP will require 3.5 FTE employees and intends to subcontract out the biomass boiler maintenance due to specialized skill set and training requirements.[150] Corix's estimate of 3.5 FTEs is based on its expectations of the operational duties required to operate the biomass and natural gas systems and its understanding of the requirements of the BC Safety Authority Regulation. With regard to the forecast biomass maintenance costs, Corix based this amount on 1.5 percent of the biomass plant capital costs. Corix submitted that the percentage allocation approach is typically used to forecast new plant maintenance cost requirements and that it considers 1.5 percent to be an appropriate amount due to the fact that the biomass module has significantly more components, including moving parts. Thus, the maintenance of the biomass equipment compared to the ETS and natural gas boiler plants will be higher.[151]

The other large component of fixed operating costs is corporate overhead and utility management. Corix states that these costs are determined internally based on Corix's experience operating the UniverCity NUS over the last five years. The forecast amount of $144,000 per year includes legal, accounting, regulatory, administration, human resources, IT support and maintenance, telephones, office supplies, vehicle costs and operational management/support from Corix's Energy Western Canada division.[152]

Variable operating costs

Variable operating costs include biomass fuel, natural gas, and electricity. The total 2019 variable cost forecast is $1,461,602. Of this total, the largest component is biomass fuel with a forecast 2019 cost of $1,054,984. Natural gas and electricity are forecast to be $187,713 and $218,906, respectively, in 2019.[153]

Corix states that the cost of biomass fuel used to calculate the rates is a 2016 market price. A long-term supply agreement (10 years) with performance guarantees is currently SFU's preferred form of a supply arrangement,

[148] Exhibit B-2, BCUC IR 24.1, Attachment V; Exhibit B-6, BCUC IR 42.3.
[149] Exhibit B-1, p. 34.
[150] Exhibit B-1, p. 35.
[151] Exhibit B-2, BCUC IR 25.4, 25.5.
[152] Exhibit B-1, pp. 35–36.
[153] Exhibit B-1, p. 44.

which Corix submits reduces potential risks associated with the fuel availability and cost.[154] The long-term supply agreement is discussed further in Section 3.5 of this decision. With regard to UniverCity customers, Corix states that it will "review fuel availability and cost prior to the plant being put into service, and will select a portfolio of fixed longer-term and fixed and variable shorter-term supply arrangements that balance cost and risk considerations."[155]

Forecast natural gas costs are based on the Sproule commodity forecast and FortisBC Energy Inc. distribution and delivery charges, plus the provincial carbon tax. Forecast electricity costs are based on BC Hydro's short-term forecast until 2017 and annual escalation at 2 percent thereafter.[156]

5.4 Taxes, escalation, financing and depreciation

Property taxes

The 2019 property tax forecast is $169,108, escalating at 2 percent annually. Corix states that the UniverCity portion of the CEP building and the entire UniverCity distribution system is subject to property tax; however, the methodology for calculating property taxes has not yet been finalized. For the purposes of the Application, Corix has assumed that the property taxes will be charged at the mill rate and it will apply for any adjustments needed at the time of filing the final rate application. Corix assumes that SFU is exempt from property taxes, as previously discussed in Section 4.1.5 of this decision.[157]

Escalation assumptions

Corix provides the following table in the Application summarizing the escalation assumptions utilized in its financial modeling.

Table 11: Escalation Assumptions[158]

ESCALATION	
Capital costs	2.0%
Biomass	2.0%
Natural gas commodity	Sproule
Natural gas delivery	2.0%
Electricity	2.0%
Operating costs	2.0%
Insurance	2.0%
GHG offsets	2.0%
Property taxes	2.0%

Corix stated that with the exception of the Sproule commodity forecast, it has relied upon the Bank of Canada's inflation target for its escalation assumptions due to a lack of more specific forecast information on escalation rates.[159]

[154] Exhibit B-1, p. 36.
[155] Ibid.
[156] Ibid.
[157] Exhibit B-1, pp. 36, 44.
[158] Exhibit B-1, Table 14, p. 36.
[159] Exhibit B-2, BCUC IR 26.1.

Financing

Corix has utilized the guidance provided in the Commission's 2014 Generic Cost of Capital Stage 2 Decision (2014 BCUC GCOC Stage 2 Decision)[160] regarding "Minimum Default Capital Structure and Equity Risk Premium" for similar small thermal utilities. Accordingly, Corix has applied a deemed capital structure of 57.5 percent debt and 42.5 percent equity, and an equity risk premium of 75 basis points over the current benchmark low risk utility, resulting in an ROE of 9.5 percent. Corix determined the interest rate on debt financing using the credit spread between BBB and BBB (low) rated debt and the 10-year Government of Canada bond yield, which is consistent with the approach for calculating a "default debt" rate for TES utilities from the 2013 BCUC GCOC Stage 1 Decision[161] and confirmed in the BCUC GCOC Stage 2 Decision. The result is an interest rate of 3.8 percent.[162]

Based on the deemed capital structure, ROE and debt rate described above, Corix calculates its after-tax weighted average cost of capital to be 5.7 percent.[163]

Depreciation

Corix provides the following depreciation rates in Table 15 of the Application:

- Building depreciation – 1.5 percent
- Plant depreciation – 3.0 percent
- Distribution depreciation – 1.5 percent
- Equipment depreciation – 3.0 percent[164]

As part of Corix's 2015 Application for a CPCN for Additional Capital and Amended Rates for the UniverCity NUS on Burnaby Mountain (2015 Corix UniverCity NUS CPCN Application), Corix provided the following depreciation rates used in its financial analysis:

- Building depreciation – 2.0 percent
- Plant depreciation – 4.0 percent
- Distribution depreciation – 2.0 percent
- ETS depreciation – 4.0 percent[165]

Corix stated that the reason the depreciation rates have changed in the current Application is that Corix has updated the rates based on reconsideration of asset lives going forward.[166] Corix confirmed that the impact of decreasing the depreciation rates in the current Application means that Corix's assumptions are that the assets' useful lives will be longer than what was previously forecast in the 2015 Corix UniverCity NUS CPCN Application.[167]

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[160] British Columbia Utilities Commission Generic Cost of Capital Stage 2, Decision dated March 25, 2014.
[161] British Columbia Utilities Commission Generic Cost of Capital Stage 1, Decision dated May 10, 2013.
[162] Exhibit B-1, p. 37.
[163] Ibid.
[164] Exhibit B-1, Table 15, p. 37.
[165] Corix Multi-Utility Services Inc. Application for a Certificate of Public Convenience and Necessity for Additional Capital and Amended Rates for UniverCity NUS on Burnaby Mountain, Exhibit B-1, Table 13, p. 23.
[166] Exhibit B-2, BCUC IR 26.3.
[167] Exhibit B-6, BCUC IR 44.1.

Corix submitted that it has a number of projects in progress and has been using different assumptions for different projects. In Corix's view, the accounting and rates should be aligned amongst projects and, while it believes that either end of the range for each line item is a reasonable estimate of asset life, it proposes to align the Burnaby Mountain DEU project with the rates already in place at the University of British Columbia project. This approach has been agreed upon with SFU in the TESA.[168]

5.5 SFU and UniverCity rate base, revenue requirements and rate impacts

As discussed in the above sections, the main cost components of the project are capital costs, fixed operating costs, and variable operating costs. Some of these costs, including the natural gas equipment and interconnections, ETSs, SFU connection equipment and fuel costs, are directly attributable to either UniverCity customers or to SFU. However, capital costs related to the biomass building and plant and the majority of the fixed operating costs, are shared costs between UniverCity and SFU; thus, Corix has proposed various allocation methods for allocating costs between the two customer groups. These proposed cost allocations form part of the TESA with SFU and are discussed in greater detail in Section 4.1.4 of this decision.

Based on Corix's forecasts and its proposed cost allocations, the forecast of rate bases for SFU and UniverCity as at the project in-service date are $16,751,957 and $21,445,591, respectively. While SFU has been allocated approximately 75 percent of the biomass plant capital costs and approximately 68 percent of the building capital costs, UniverCity's rate base is higher overall due to the capital costs associated with the existing natural gas boilers and equipment as well as the previously approved RDDA.[169]

The forecast revenue requirements for SFU and UniverCity as at the project in-service date are $2,907,839 and $2,951,632, respectively. While SFU's share of the fixed operating costs and its biomass fuel costs are higher, UniverCity's revenue requirements overall are slightly higher due to additional costs which SFU is not subject to, including natural gas costs, property taxes, land lease costs and franchise fees.[170]

Based on Corix's forecast rate base, revenue requirements and proposed rate design, the 30-year levelized rate for UniverCity customers is $131.28 per MWh with an initial in-service rate in 2019 of $119.67 per MWh.[171]

Panel discussion on financial modeling

As noted at the start of Section 5.0 of this decision, Corix is not requesting approval of the revenue requirements and rates in this application. Instead, Corix has provided the financial modeling information as indicative of what the actual revenue requirements and rates will be at the time the rate application is filed in 2018.

Based on the evidence provided by Corix in the proceeding and discussed in the above sections, the Panel considers Corix's forecasts and assumptions for load and capital and operating costs to be reasonable. The Panel also notes that many of these costs and assumptions have been reviewed and tested in the 2015 Corix UniverCity NUS CPCN proceeding, particularly with regard to the UniverCity-specific capital and operating costs. Also, Corix now has five years of actual operating experience to draw on from the UniverCity NUS system which has helped to inform Corix's forecasts for various capital and operating costs.

[168] Exhibit B-6, BCUC IR 44.2.
[169] Exhibit B-1, Tables 17, 18, pp. 37–38.
[170] Ibid., Tables 23, 24, pp. 44–45.
[171] Ibid., Tables 25, 26, pp. 46–47.

The Panel considers Corix's capital forecast for the biomass plant, building and related equipment to be reasonable as the capital cost of the biomass plant is based on a quote from the chosen supplier Wellons; thus, there is reasonable certainty as to the overall cost of the biomass infrastructure.

With regard to the fixed operating costs, there appears to be more uncertainty regarding the biomass plant operator and boiler maintenance costs; however, the Panel notes that these costs are not final and will be updated as part of the rate application in 2018. The other cost which has a degree of uncertainty at this time is the biomass fuel cost, as Corix has not yet signed a long-term contract with a fuel supplier. This issue was discussed in detail in Section 3.5 of this decision.

Overall, the Panel finds the forecast costs and escalation assumptions to be reasonable and based on the best information available to Corix at this time. These costs will be reviewed further and in greater depth at the time that Corix files for approval of rates and rate schedules in 2018.

6.0 CPCN determination

Subject to and in accordance with the findings, approvals and determinations in this decision, the Panel finds the Burnaby Mountain District Energy Utility project to be in the public interest and grants a CPCN to Corix for its construction.

The Panel has reviewed the evidence and in accordance with the findings in this decision has determined that the CPCN Guidelines have been met and such approval is warranted.

Pursuant to sections 60 and 61 of the UCA, the Panel also approves the amended and restated TESA dated as of January 27, 2017 between Corix and SFU subject to those revisions discussed in Section 4.1.5 of this decision.

7.0 Reporting

Stream B General Reporting Requirements

The Burnaby Mountain DEU is classified as a Stream "B" TES under the Commission's TES Regulatory Framework Guidelines. The TES framework Stream B reporting requirements require Stream B providers to file an annual report with the Commission within four months of the TES provider's fiscal year end.

Other Reporting Requirements

As noted in Section 7.2 (figure 7) of the application, the construction and operation by Corix of the Burnaby Mountain DEU and associated facilities, including the Campus Connection, the Campus ETS, and the UniverCity Connection as defined in the Application, will take place over the next few years and small deviations from forecast which include material, permitting and/or contract delays, can translate into long-term carrying costs for ratepayers.

Commission determination

The Panel is of the view that, during the project build, consistent progress reporting is required. To strike an appropriate balance between the Commission's oversight of the execution of the project and Corix's

responsibility for the ongoing management of the project, the Panel finds semi-annual progress reporting is appropriate. **Accordingly, the Panel directs Corix to file semi-annual progress reports within 45 days of the end of each reporting period with the first due December 31, 2017.**

Specifically, **the Panel directs Corix to provide semi-annual progress reports on the following:**

- **Project schedule;**
- **Actual costs incurred to date compared to the CPCN estimate highlighting any variances or difficulties that the project may be encountering;**
- **The status of project permit approvals, highlighting the status of identified permit approvals, changes in and additions to permit approval requirements, the actions that Corix is taking to deal with any changes in and additions to permit approval requirements and the likely impact on the projects' schedule and cost;**
- **The status of the Biomass Fuel Supply Contract, highlighting any significant changes that impact the project and/or affect rates; and**
- **Reporting requirements as referenced in Sections 3.2 and 3.3.**

Corix is directed to file a Final Report within six months following the completion of the Project. The Final Report is to include a complete breakdown of the final costs of the Project, a comparison of these costs to the CPCN estimate and provide an explanation of all material cost variances.

Additionally, the Panel directs Corix to provide Material Change Reports on an exception basis, identifying deviations from forecasts that could affect costs and rates. A Material Change Report should identify and detail any significant delay (e.g. a significant six month delay in receiving fuel or a six month delay to the anticipated connection date as compared to what was forecast in the CPCN application) or a material cost variance (e.g. CEP costs being 30 percent or more higher than the estimates that approval of this CPCN is based on). Changes of this nature must be reported to the Commission as soon as practicable or if within 60 days of the Progress Report, should be included in the Progress Report. The Material Change Report must highlight the reasons for the delay or material cost variance, Corix's consideration of the options available and actions Corix is taking to address the issue.

Corix is directed to determine the form and additional content of the Progress Reports, Final Reports and Material Change Reports in consultation with Commission staff.

DATED at the City of Vancouver, in the Province of British Columbia, this 15th day of September 2017.

Original Signed By:

D. A. Cote
Panel Chair/Commissioner

Original Signed By:

D. J. Enns
Commissioner

Original Signed By:

W. M. Everett, QC
Commissioner

Original Signed By:

B. A. Magnan
Commissioner

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ORDER NUMBER
C-5-17

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

Corix Multi-Utility Services Inc.
Application for a Certificate of Public Convenience and Necessity
for the Burnaby Mountain District Energy Utility

BEFORE:
D. A. Cote, Panel Chair/Commissioner
D. J. Enns, Commissioner
W. M. Everett, QC, Commissioner
B. A. Magnan, Commissioner

on September 15, 2017

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

WHEREAS:

A. On February 28, 2017, Corix Multi-Utility Services Inc. (Corix) applied to the British Columbia Utilities Commission (Commission) to construct and operate the next stage of the development of its UniverCity Neighbourhood Utility Service (NUS) and to extend service to the Simon Fraser University (SFU) Campus. The expanded system will be named the Burnaby Mountain District Energy Utility (DEU). In its application, Corix requested approval of:

   i. A Certificate of Public Convenience and Necessity (CPCN) pursuant to section 45 of the *Utilities Commission Act* (UCA) authorizing the construction and operation by Corix of the biomass central energy plant and the associated facilities (Project Facilities); and

   ii. Approval pursuant to sections 60 and 61 of the UCA of the Amended and Restated Thermal Energy Services Agreement , dated as of January 27, 2017, between Corix and SFU including the cost of service, cost allocation and rate design principles set out in Schedule 1 (Cost of Service Parameters) and Schedule 2 (Cost Allocation and Rate Design Principles) (Application);

B. On November 26, 2010, Corix filed an application for a CPCN under sections 45 and 46 of the UCA to construct and operate an alternative energy-based district energy system for the UniverCity developments on Burnaby Mountain;

C. On May 6, 2011, by Order C-7-11, the Commission granted a CPCN to Corix to construct and operate the initial phase of the NUS district energy utility at UniverCity using temporary natural gas central energy plants;

D. On October 7, 2015, Corix filed an application for a CPCN for additional capital and amended rates for UniverCity NUS on Burnaby Mountain requesting approval for expenditures to replace and expand the capacity of the existing temporary natural gas facilities with a larger capacity boiler. According to Corix, when combined with expenditures on the NUS, the replacement would trigger the requirement to file a CPCN under the Thermal Energy Systems Regulatory Framework Guidelines (TES Guidelines). As part of that application, Corix also requested approval of amended levelized rates;

E. On December 30, 2015, the Commission issued Order G-215-15 and accompanying reasons for decision regarding Corix's Application for a CPCN for Additional Capital and Amended Rates for UniverCity NUS on Burnaby Mountain;

F. On January 20, 2016, Corix filed a response to Order G-215-15 and informed the Commission that it had elected not to proceed with the project as proposed in its October 7, 2015 CPCN application and instead elected to retain the existing temporary energy centre (TEC) in service and supplement the capacity with an additional TEC operating separately;

G. On April 11, 2016, the Commission issued Order G-48-16A, approving the updated rate base and revenue requirements as outlined in Corix's January 20, 2016 submission;

H. On March 20,2017, by Order G-40-17, the Commission established a written hearing process and Regulatory Timetable to review Corix's Application for a CPCN for the Burnaby Mountain DEU; and

I. The Commission has considered the evidence and submissions and finds the Burnaby Mountain DEU project is in the public interest.

NOW THEREFORE, the British Columbia Utilities Commission orders as follows:

1. Pursuant to sections 45 and 46 of the UCA, a CPCN is granted to Corix Multi-Utility Services Inc. authorizing the construction and operation of a biomass central energy plant and the associated facilities.

2. Pursuant to sections 60 and 61 of the UCA, the Commission orders that the amended and restated TESA as of January 27, 2017, including Schedule 1 and Schedule 2, is approved subject to the amendment of Schedule 1 as discussed in Section 4.1.5 of the decision issued concurrently with this order.

3. Corix is directed to file with the Commission an amended and updated TESA to reflect the revisions to Schedule 1 within 60 days from the date of this order.

4. Corix is directed to file with the Commission the following reports, the form of which is detailed in Section 7.0 of the decision issued concurrently with this order:

    - Semi-annual progress reports within 45 days of the end of each reporting period with the first due December 31, 2017;
    - As soon as practicable but no longer than 30 days upon the identification of a material change on an exception basis, a Material Change Report identifying deviations from forecasts that could affect costs and rates; and
    - Within six months of the final in-service date, a Final Report.

5. Corix is directed to file an updated load demand and energy forecast along with its rates application that it expects to file in 2018.

6. Corix is directed to comply with all the directives of the Commission set out in the decision issued concurrently with this order.

DATED at the City of Vancouver, in the Province of British Columbia, this 15th day of September 2017.

BY ORDER

Original Signed By:

D. A. Cote
Commissioner

Corix Multi-Utility Services Inc.
Application for a Certificate of Public Convenience and Necessity
for the Burnaby Mountain District Energy Utility

SUMMARY OF DIRECTIVES

This summary is provided for the convenience of readers. In the event of any difference between the directions in this summary and those in the body of the decision, the wording in the decision shall prevail.

Directive	Reference
Accordingly, the Panel directs Corix to refrain from the use of treated railway ties as a biomass fuel source as a condition of the issuance of the CPCN.	Page 22
Based on this, the Panel finds the various methodologies employed to allocate costs among the parties to be reasonable and approves them.	Page 35
The Panel approves the rate design principles, the cost of service parameters and the two deferral accounts as outlined in the TESA and as revised in Corix's final argument with regard to the fuel cost deferral account. The Panel notes that the TESA will need to be amended in order to reflect the revised deferral account wording; thus, approval of the TESA is subject to the amendment to Schedule 1 of the TESA.	Page 37
The Panel approves the capital cost RR sharing mechanism as outlined in the TESA	Page 38
Accordingly, the Panel directs Corix to provide an updated load demand and energy forecast along with its rates application that it expects to file in 2018.	Page 42
Subject to and in accordance with the findings, approvals and determinations in this decision, the Panel finds the Burnaby Mountain District Energy Utility project to be in the public interest and grants a CPCN to Corix for its construction.	Page 47
The Panel has reviewed the evidence and in accordance with the findings in this decision has determined that the CPCN Guidelines have been met and such approval is warranted.	Page 47
Pursuant to sections 60 and 61 of the UCA, the Panel also approves the amended and restated TESA dated as of January 27, 2017 between Corix and SFU subject to those revisions discussed in Section 4.1.5 of this decision.	Page 47
Accordingly, the Panel directs Corix to file semi-annual progress reports within 45 days of the end of each reporting period with the first due December 31, 2017.	Page 48
the Panel directs Corix to provide semi-annual progress reports on the following: • **Project schedule;** • **Actual costs incurred to date compared to the CPCN estimate highlighting any**	Page 48

variances or difficulties that the project may be encountering; • **The status of project permit approvals, highlighting the status of identified permit approvals, changes in and additions to permit approval requirements, the actions that Corix is taking to deal with any changes in and additions to permit approval requirements and the likely impact on the projects' schedule and cost;** • **The status of the Biomass Fuel Supply Contract, highlighting any significant changes that impact the project and/or affect rates; and** • **Reporting requirements as referenced in Sections 3.2 and 3.3.**	
Corix is directed to file a Final Report within six months following the completion of the Project.	Page 48
Additionally, the Panel directs Corix to provide Material Change Reports on an exception basis, identifying deviations from forecasts that could affect costs and rates.	Page 48
Corix is directed to determine the form and additional content of the Progress Reports, Final Reports and Material Change Reports in consultation with Commission staff.	Page 48

Corix Multi-Utility Services Inc.
Application for a Certificate of Public Convenience and Necessity
for the Burnaby Mountain District Energy Utility

LIST OF ACRONYMS

2010 CPCN Application	Corix Multi-Utility Services Inc. Application for a Certificate of Public Convenience and Necessity for the NUS at UniverCity, Burnaby
2013 BCUC Generic Cost of Capital Stage 1 Decision	British Columbia Utilities Commission Generic Cost of Capital Stage 1, Decision dated May 10, 2013
2014 BCUC Generic Cost of Capital Stage 2 Decision	British Columbia Utilities Commission Generic Cost of Capital Stage 2, Decision dated March 25, 2014
2015 Corix UniverCity NUS CPCN Application	Corix Multi-Utility Services Inc. Application for a Certificate of Public Convenience and Necessity for Additional Capital and Amended Rates for UniverCity NUS on Burnaby Mountain
AAQO	Ambient Air Quality Objectives
AFUDC	allowance for funds used during construction
Application	Corix Multi-Utility Services Inc. Application for a Certificate of Public Convenience and Necessity for the Burnaby Mountain District Energy Utility
BC Hydro	British Columbia Hydro and Power Authority
BCOAPO	British Columbia Old Age Pensioners' Organization, Council of Senior Citizens' Organization of BC, Disability Alliance of BC, and the Tenant Resource and Advisory Centre
BCSA	BC Safety Authority
BCSEA-SCBC	BC Sustainable Energy Association and Sierra Club BC
BCUC, or Commission	British Columbia Utilities Commission
Campus Connection	A distribution piping system including a connection pipeline to connect the energy transfer station for SFU to the central energy plant
Campus ETS	An energy transfer station for SFU
CEA	*Clean Energy Act*
CEP	central energy plant
Corix	Corix Multi-Utility Services Inc.

Corix Group	Corix Group of Companies
CPCN	Certificate of Public Convenience and Necessity
Cloverdale	Cloverdale Fuel Ltd.
DES	district energy system
DEU	district energy utility
DPS	distribution piping system
Engineered Products	Engineered Products and Packaged Systems
ETS	energy transfer station
EUIs	Energy Use Intensities
FTE	full-time equivalent
GCOC	generic cost of capital
GHG	greenhouse gas
IR	information request
MoE document	BC Ministry of Environment 2016/17 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions Report
MW	megawatt
NO_2	nitrogen dioxide
NUS	Neighbourhood Utility System
O&M	operation and maintenance
RDDA	revenue deficiency deferral account
RFP	Request for Proposal
ROE	return on equity
RR sharing mechanism	risk/reward sharing mechanism
SFU	Simon Fraser University
SFU Infrastructure Agreement	An infrastructure agreement between Corix Multi-Utility Services Inc. and Simon Fraser University in June 2016, and amended and restated on January 27, 2017

SFU Trust	Simon Fraser University Community Trust
TEC	temporary energy centre
TES	thermal energy systems
TESA	Thermal Energy Services Agreement
UCA	*Utilities Commission Act*
UniverCity Connection	A connection pipeline to connect the existing UniverCity distribution piping system to the central energy plant

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

Corix Multi-Utility Services Inc.
Application for a Certificate of Public Convenience and Necessity
for the Burnaby Mountain District Energy Utility

EXHIBIT LIST

Exhibit No.	Description
COMMISSION DOCUMENTS	
A-1	Letter dated March 3, 2017 – Appointing the Panel for the review of Corix Multi-Utility Services Inc. Application for a Certificate of Public Convenience and Necessity for the Burnaby Mountain District Energy Utility
A-2	Letter dated March 20, 2017 – Commission Order G-40-17 establishing the Regulatory Timetable
A-3	Letter dated March 20, 2017 – Panel Amendment
A-4	Letter dated April 20, 2017 – Commission Information Request No. 1 to Corix
A-5	**CONFIDENTIAL** Letter dated April 20, 2017 – Confidential Commission Information Request No. 1 to Corix –cover letter only on web
A-6	Letter dated May 25, 2017 – Commission Information Request No. 2 to Corix
A-7	**CONFIDENTIAL** Letter dated May 25, 2017 – Confidential Commission Request No. 2 to Corix – cover letter only on web
A-8	Letter dated June 15, 2017 – Regulatory Timetable Clarification

EXHIBIT LIST

Exhibit No.	Description
APPLICANT DOCUMENTS	
B-1	**CORIX MULTI-UTILITY SERVICES INC. (CORIX)** Letter dated February 28, 2017 - Application for a Certificate of Public Convenience and Necessity for the Burnaby Mountain District Energy Utility
B-1-1	Letter dated March 17, 2017 - Submitting addendum to application
B-1-2	**CONFIDENTIAL** Letter dated February 28, 2017 - Confidential Application for a Certificate of Public Convenience and Necessity for the Burnaby Mountain District Energy Utility
B-2	Letter dated May 4, 2017 – Corix submitting response to BCUC IR No. 1
B-2-1	**CONFIDENTIAL** Letter dated May 4, 2017 – Corix confidential attachments to BCUC IR No. 1 (Exhibit A-4)
B-2-1-1	**CONFIDENTIAL** Letter dated May 9, 2017 – Corix Submitting Additional Attachment IR 9.1
B-2-2	Letter dated May 9, 2017 – Corix Submitting Additional Responses to BCUC IR No. 1
B-3	**CONFIDENTIAL** Letter dated May 4, 2017 – Corix submitting response to BCUC Confidential IR No. 1 (Exhibit A-5)
B-4	Letter dated May 4, 2017 – Corix submitting response to BCSEA IR No. 1
B-5	Letter dated May 4, 2017 – Corix submitting response to BCOAPO IR No. 1
B-6	Letter dated June 8, 2017 – Corix submitting response to BCUC IR No. 2
B-7	**CONFIDENTIAL** Letter dated June 8, 2017 – Corix submitting response to confidential BCUC IR No. 2
B-8	Letter dated June 8, 2017 – Corix submitting response to FEI IR No. 2
B-9	Letter dated June 8, 2017 – Corix submitting response to BCOAPO IR No. 2

EXHIBIT LIST

Exhibit No.	Description
INTERVENER DOCUMENTS	
C1-1	**BC SUSTAINABLE ENERGY ASSOCIATION AND SIERRA CLUB BC (BCSEA)** Letter dated April 3, 2017 - Request to Intervene by Thomas Hackney and William J. Andrews
C1-2	Letter dated April 20, 2017 - BCSEA Submitting Information Request No. 1 to Corix
C1-3	Letter dated May 25, 2017 – BCSEA Submitting Comment on IR No. 2
C2-1	**FORTISBC ENERGY INC. (FEI)** Letter dated April 3, 2017 - Request to Intervene by Diane Roy
C2-2	Letter dated May 25, 2017 – FEI Submitting Information Request No. 2 to Corix
C3-1	**SIMON FRASER UNIVERSITY (SFU)** Letter dated March 30, 2017 - Request to Intervene by Joyce Chong
C4-1	**BRITISH COLUMBIA OLD AGE PENSIONERS' ORGANIZATION, ACTIVE SUPPORT AGAINST POVERTY, COUNCIL OF SENIOR CITIZENS' ORGANIZATIONS OF BC, DISABILITY ALLIANCE BC, AND THE TENANT RESOURCE AND ADVISORY CENTRE (BCOAPO)** Letter dated April 3, 2017 - Request to Intervene by Tannis Braithwaite
C4-2	Letter dated April 20, 2017 - BCOAPO Submitting Information Request No. 1 to Corix
C4-3	Letter dated May 25, 2017 – BCOAPO Submitting Information Request No. 2 to Corix
INTERESTED PARTY DOCUMENTS	
D-1	Niet, Taco Online registration dated March 26, 2017 – Request for Interested Party Status
D-2	**ONNI GROUP (ONNI)** Letter dated April 3, 2017 – Request for Interested Party Status by Michelle McLArty
LETTERS OF COMMENT	
E-1	James, Alan Letter of Comment dated March 27, 2017