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October 13, 2020

Via email

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, British Columbia V6Z 2N3

Attention: Marija Tresoglavic, Acting Commission Secretary

Dear Ms. Tresoglavic:

Re: Corix Multi-Utility Services Inc.
Burnaby Mountain District Energy Utility 2020-2023 Revenue Requirement and Rates Application
Presentation from Corix Workshop held on Tuesday, October 13, 2020

Corix Multi-Utility Services Inc. ("**Corix**") is pleased to submit its presentation from today's workshop. Please see the enclosed presentation. This version contains an edit that corrects a sentence in the presentation. This is described below.

Slide 27 contained a bullet point which read:

> "Property tax excluded from forecast rev. req. (for SFU and UniverCity) due to ongoing certainty surrounding the likelihood and the magnitude of property taxes.

This bullet point should have read:

> "Property tax excluded from forecast rev. req. (for SFU) due to ongoing certainty surrounding the likelihood and the magnitude of property taxes."

No other changes have been made to the presentation.

Yours respectfully,

Corix Multi-Utility Services Inc.

Per:

Errol South
Senior Regulatory & Financial Analyst, Energy Services Canada

Burnaby Mountain District Energy Utility

2020-2023 Revenue Requirements and Rates Application

Workshop Presentation (October 13, 2020)

Ask Questions:

From computer or mobile device

- From a computer or mobile device, click on ‘Raise Hand’

From phone

- Press *9 to raise your hand
- Call-in information, if not already on the phone:
  - 778 907 2071
  - Meeting ID: 865 3448 7742
  - Participant ID: press #

Agenda

1) Overview
2) CEP Project Update
3) Buildout, Capital, O&M
4) Break (5 min)
5) SFU
6) UniverCity
7) Conclusion

Corix Overview

- Corix Multi-Utility Services Inc. ("**Corix**") is a wholly-owned subsidiary of a privately held corporation, Corix Infrastructure Inc. ("**CII**"), which is owned by the British Columbia Investment Management Corporation.

- CII is a provider of utility infrastructure solutions, including energy, water and wastewater systems with approximately $2 billion in assets and 1,370 utility systems in operation across North America.

- Corix owns and operates small standalone utilities in communities throughout British Columbia

- The Burnaby Mountain District Energy Utility ("**BMDEU**") is one of multiple utilities owned and operated by Corix in British Columbia.

- BMDEU will provide low-carbon thermal energy utility service to Simon Fraser University ("**SFU**") and the adjacent UniverCity development.

UniverCity Neighbourhood Utility Service ("**NUS**") Overview

- UniverCity NUS has been providing thermal energy service to its customers since 2011.
  - CPCN granted through C-7-11

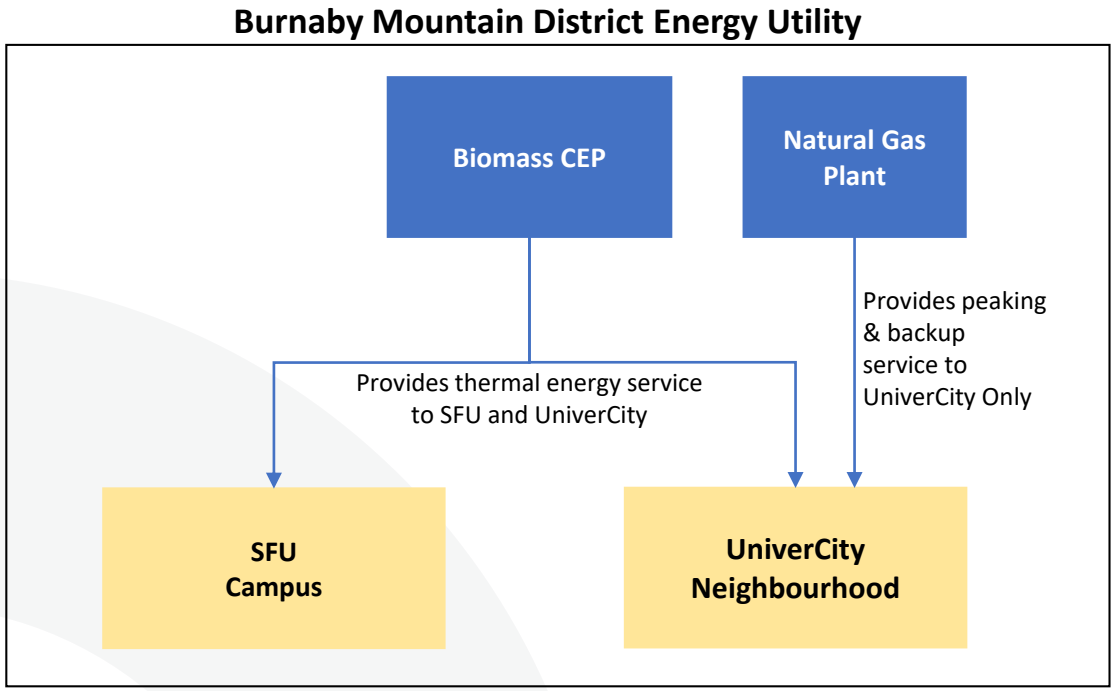
- It has been operating using two Temporary Energy Centres ("**TECs**") fired by natural gas boilers.

- TECs were designed and developed to be replaced with a permanent low-carbon energy facility when it became economically feasible.

TEC 1

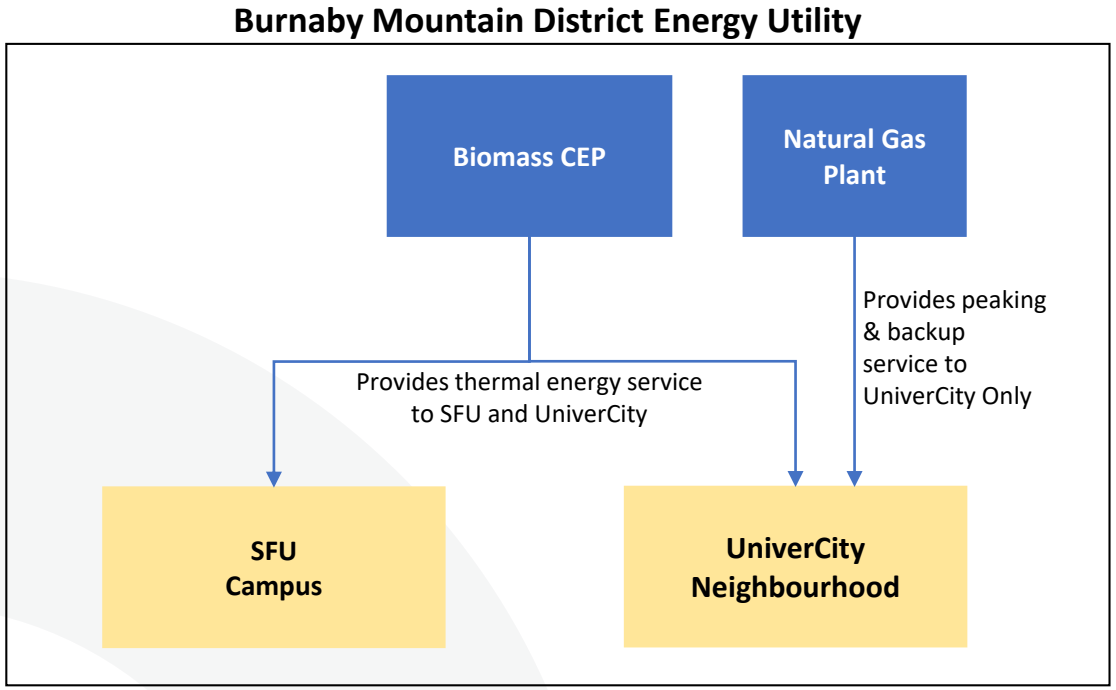
2017 BMDEU CPCN Application

- Corix sought approval:
  - To construct and operate a **13.5MW biomass central energy plant and associated facilities** (includes a natural gas peaking and backup plant).
  - Of the Amended and Restated Thermal Energy Services Agreement dated January 27, 2017 ("**TESA**") between Corix and SFU.
- TESA set out the terms and conditions for provision of service to SFU from the BMDEU.
- Approval granted through C-5-17, dated September 15, 2017.



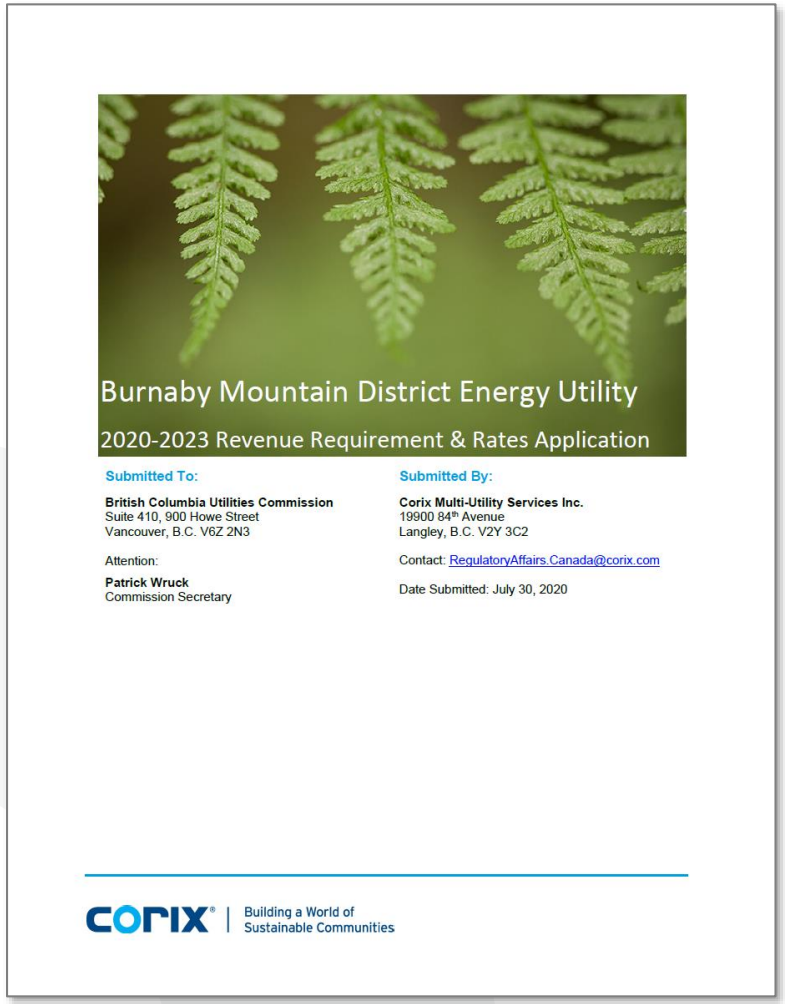
Benefits of the BMDEU Low-Carbon District Energy System

1. Fulfills low-carbon energy solution mandate for Burnaby Mountain
2. Reduces reliance on fossil fuel
3. Supports Metro Vancouver's solid waste management strategy by diverting wood waste from landfills
4. Reduces CO2 emissions
5. Reliable thermal energy supply
6. Stable biomass fuel prices
7. Potential for electricity generation in the future



2020-2023 Revenue Requirements and Rates Application

- Addresses costs associated with the new central energy plant and ongoing UniverCity build-out.
- Seeking approval of:
  - Revenue requirements and rates for 2020 through to 2023 inclusive
  - Flow-through energy costs for UniverCity customers
  - Interim rates until the final Decision is issued
- Request for confidential material to remain confidential
- Final project cost invoices to be received towards the end of 2020 or early 2021
- Evidentiary Update due February 4, 2021



CEP Project Update

(As at 2020/10/09)

- CEP and Fuel bin buildings are complete
- First delivery of biomass fuel has been received
- All static checks and testing are complete for biomass and hot water process equipment.
- COVID-19 protocols developed and implemented
- Employee training ongoing
- Experienced delays in permitting; and delays due to COVID-19 on foundation work and equipment supply
- **Target Commissioning:** Week of October 12th

CEP Project Update

(As at 2020/10/09)

- Outstanding
  - To complete and commission the Natural Gas Boiler Module
  - Final approval from Technical Safety BC
  - Obtain Occupancy Permit from City of Burnaby
  - Complete landscaping

- TEC1 will remain in service in its existing location until the CEP has been commissioned and is functional.

UniverCity Buildout Schedule

- Corix periodically obtains updates to the build-out schedule from the developers at UniverCity.
- No material change in forecast total floor area since 2017 BMDEU CPCN (0.1% incr.).
- Updated load demand intensities (kW/m^2) based on actual observed peak loads were used to reforecast future loads to a full build-out.
- A decrease in the forecast total diversified load of 1,331 kW (14.5%) at full build-out since the 2017 BMDEU CPCN.

Year	UniverCity Development Schedule					
	(2017 BMDEU CPCN)			(Actual and Updated Forecast – June 2020)		
	Parcels Completed	Total m^2	Load kW (diversified)	Parcels Completed	Total m2	Load kW (diversified)
2012	P22, P27, P28	14,522	710	P22, P27, P28	14,547	526
2013	P23, P29, P16 – Tower 1	20,554	867	P23, P29, P16 – Tower 1	20,565	835
2016	P16 – Tower 2, P25 – Townhomes, Apartments P25 – Commercial, P30	43,732	1,893	P16 – Tower 2, P25 – Townhomes, Apartments P25 – Commercial, P30	43,676	1,886
2017	P18	16,527	716	N/A	0	0
2018	P17, P21, P31, P33, P20	60,183	2,667	P18	16,480	838
2019	P36, P37	12,635	523	N/A	0	0
2020	P19, P34, P35	24,041	1,018	P17, P31	23,474	845
2021	P24	21,790	797	P21, P20	27,656	814
2022				P19, P33	17,826	536
2023				P34, P35, P36, P37	28,182	941
2024				P24	21,790	640
	Total	**213,984**	**9,191**	**Total**	**214,196**	**7,860**

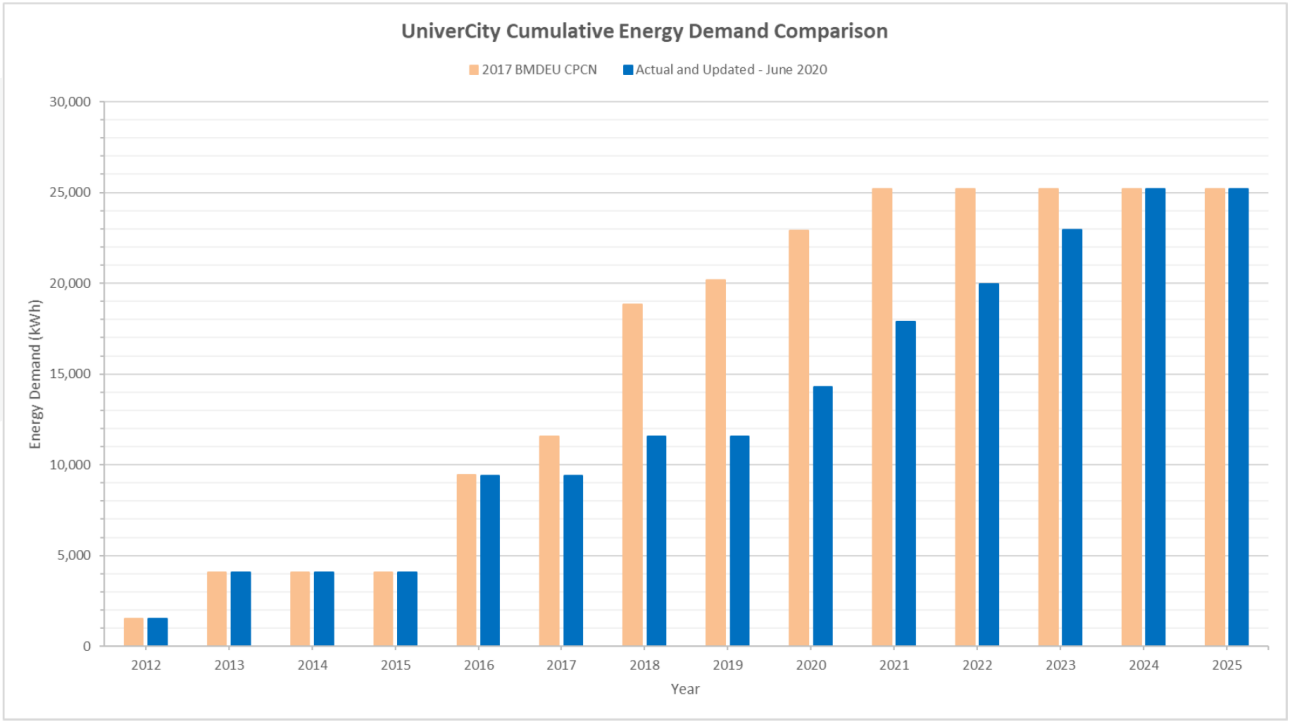
UniverCity Load and Energy Demand Forecast

- **Diversified Load Demand** used to plan capacity requirements for the district energy systems
- Diversified Load Demand forecast calculated using:
  - Build-out schedule;
  - Peak Load Demand ("**PLD**") Factor; and
  - Diversification Factor

- **Annual Energy Demand** used to plan fuel consumption requirements
- Annual Energy Demand Forecast calculated using:
  - Build-out schedule; and
  - Energy Use Intensities ("**EUI**").

- Operational Data & design requirements for upcoming buildings used to determine the PLD and EUIs used in this forecasting process.

UniverCity	Test Period				UniverCity Build-Out	
	2020	2021	2022	2023	2024	2025
Cumulative Diversified Load Demand (kW)	4,507	5,336	6,011	6,750	7,540	7,860
Annual Energy Demand (MWh)	12,922	16,086	18,926	21,447	24,071	25,215



BMDEU Energy Demand Forecast

Annual Energy Demand	2020	2021	2022	2023	2024	2025
UniverCity (MWh)	12,922	16,086	18,926	21,447	24,071	25,215
SFU (MWh)	14,596	43,787	43,787	43,787	43,787	43,787
Total (MWh)	27,518	59,873	62,713	65,234	67,858	69,002

- Energy Demand forecast used to inform fuel requirements and energy charges during rate design
- SFU Annual Average Energy Demand: 43,787 MWh
- SFU Biomass Baseload Demand: 10MW *(used for system capacity planning)*
- SFU load demand and energy demand data obtained directly from SFU's DES operational data.

BMDEU Energy Demand Forecast Comparison

Annual Energy Demand	2020	2021	2022	2023	2024	2025
UniverCity (MWh)	12,922	16,086	18,926	21,447	24,071	25,215
SFU (MWh)	14,596	43,787	43,787	43,787	43,787	43,787
Total (MWh)	27,518	59,873	62,713	65,234	67,858	69,002

- Since the 2017 BMDEU CPCN there have been no material updates to the annual energy demand forecast for UniverCity at full build-out
    - 25,193 MWh in the 2017 BMDEU CPCN versus 25,215 MWh in this Application
- The timing of the incremental annual energy demand for UniverCity has been updated to correspond with the updated build-out schedule

Biomass Demand Forecast

Energy Demand	2020	2021	2022	2023	2024	2025
Annual Energy Demand (MWh) (UniverCity)	12,922	16,086	18,926	21,447	24,071	25,215
Annual Energy Demand (MWh) (UniverCity)	14,596	43,787	43,787	43,787	43,787	43,787
Total Annual Energy Demand (MWh) - BMDEU	**27,518**	**59,873**	**62,713**	**65,234**	**67,858**	**69,002**
Biomass Demand (MWh) - SFU	14,596	43,787	43,787	43,787	43,787	43,787
Biomass Demand (MWh) – UniverCity	3,338	12,465	14,666	16,620	18,653	19,539
Natural Gas Demand (MWh) – UniverCity	9,584	3,621	4,260	4,828	5,418	5,676
Total demand (MWh) - BMDEU	**27,518**	**59,873**	**62,713**	**65,234**	**67,858**	**69,002**
Biomass % of Total Demand	**65%**	**94%**	**93%**	**93%**	**92%**	**92%**
SFU % of Total Biomass Demand	81%	78%	75%	72%	70%	69%
UniverCity % of Total Biomass Demand	19%	22%	25%	28%	30%	31%

Capital Costs for the Central Energy Plant ("CEP")

- Capital Costs are a key driver of this revenue requirements.
- The new biomass central energy plant accounted for a large portion of overall capital costs
- These figures exclude the capital costs associated with the build-out of UniverCity and are for the CEP capital project only.
- CEP projected to cost approx. $38.1M
  - Prior to AFUDC, CIAC and capitalized overhead.

Capital Cost Categories	Allocation ($)		Total Capital Costs ($)
	SFU	UniverCity	
Civil Works Included Items			
Upper Site Area	881,313	309,650	1,190,963
Lower Site Area	3,024,411	1,853,672	4,878,083
Buildings and Foundations			
Fuel Bin Building, Foundations and Site Preparation	1,026,003	360,488	1,386,491
CEP Building, Foundations and Site Preparation	2,199,279	1,347,945	3,547,224
Architectural Enhancements	359,341	193,491	552,832
Education Centre	195,275	--	195,275
Process			
Biomass Module within the CEP	10,750,244	3,777,113	14,527,357
SFU Interface	1,284,896	--	1,284,896
SFU Connection	2,473,155	--	2,473,155
SFU Energy Transfer Station	557,480	--	557,480
UniverCity *Connection Line, DPS and ETS*	--	2,538,907	2,538,907
Natural Gas Plant Equipment *(Used for UniverCity only)*	--	3,211,945	3,211,945
Soft Costs			
Project Development	356,495	356,495	712,990
Project Management	518,450	518,450	1,036,900
Subtotal Capital Costs	**23,626,342**	**14,468,156**	**38,094,498**
AFUDC	1,097,719	652,881	1,750,599
Total Capital Costs	**24,724,061**	**15,121,036**	**39,845,097**

Total Capital Costs

- Capital costs also include costs associated with the ongoing buildout of the district energy system to provide service to future UniverCity customers.
- The $45.7M total capital expenditure from 2016 through to full UniverCity build-out is 16.6% higher than forecasted in the 2017 BMDEU CPCN.
- This increase is primarily driven by an increase in CEP capital costs
    - Primarily due to increases in Building and Site Preparation costs by approximately 70% ($4.9M) caused by unforeseen underground conditions in the CEP site area.

BMDEU Total Capital Costs	2016 – 2019 (Actual)	2020 (Projected)	2021 (Forecast)	2022 (Forecast)	2023 (Forecast)	2024 (Forecast)	Total to UniverCity Build-out
Central Energy Plant							
Building and Site Preparation	345,122	11,555,593	--	--	--	--	11,900,715
Biomass Plant	--	14,527,357	--	--	--	--	14,527,357
Natural Gas Plant	1,300,254	3,211,945	--	--	--	--	4,512,199
Soft Costs	0	1,749,890	--	--	--	--	1,749,890
Campus Connection	0	2,668,430	--	--	--	--	2,668,430
Campus ETS and Interface at CEP	0	1,842,376	--	--	--	--	1,842,376
UniverCity Connection	0	2,546,912	--	--	--	--	2,546,912
UniverCity DPS	283,033	275,695	800,000	--	--	--	1,358,728
UniverCity ETS	987,647	760,850	784,450	661,470	1,124,760	290,500	4,609,677
Total Capital Costs	**2,916,055**	**39,139,048**	**1,584,450**	**661,470**	**1,124,760**	**290,500**	**45,716,283**
AFUDC	1,120,723	629,876					1,750,599
UniverCity Capitalized Overhead	--	45,618	16,179	15,227	15,532	15,842	108,399
Total Capital Costs *(incl. AFUDC & Capitalized Overhead)*	**4,036,779**	**39,814,542**	**1,600,629**	**676,698**	**1,140,292**	**306,342**	**47,575,282**
CIAC SFU	(1,900,000)	(2,850,000)					(4,750,000)
CIAC UniverCity: BC Hydro Grant	--	(297,138)	(297,138)	(297,138)	--	--	(891,415)
CIAC UniverCity: Developer Connection Fee	(511,992)	(343,215)	(692,235)	--	--	--	(1,547,442)
Total Capital Costs *(incl. AFUDC, Capitalized OH & CIAC)*	**1,624,786**	**36,324,189**	**611,256**	**379,559**	**1,140,292**	**306,342**	**40,386,424**

Capital Cost Allocation Methodology

- Biomass portion of CEP equipment allocated based on each customer group's share of the biomass capacity.
  - SFU 10 MW (74%); UniverCity 3.5 MW (26%)
  - Used for Fuel Bin building, foundation & civil works
  - Used for Biomass Module

- CEP Building, foundations and civil works allocated on a floor area first, before applying capacity requirements criteria.
  - Recognizes that CEP floor space also houses the natural gas module that is used for UniverCity only
  - SFU (62%); UniverCity (38%)

Capital Cost Categories	Allocation	
	SFU	UniverCity
Civil Works Included Items		
Upper Site Area - fuel bin building and truck loading/offloading areas	74%	26%
Lower Site Area - CEP and surrounding area, excluding Upper Site Area	62%	38%
Buildings and Foundations		
Fuel Bin Building, Foundations and Site Preparation	74%	26%
CEP Building, Foundations and Site Preparation *(as revised Jan 2020)*	62%	38%
Architectural Enhancements *(as revised Jan 2020)*	65%	35%
Process		
Biomass Module within the CEP	74%	26%
SFU Interface *(Interconnection, Connection Line and ETS)*	100%	0%
UniverCity Interface *(Interconnection, Connection Line, DPS and ETS)*	0%	100%
Natural Gas Plant Equipment *(Used for UniverCity only)*	0%	100%
Soft Costs		
Project Development	50%	50%
Project Management	50%	50%

Capital Cost Allocation Methodology

- Architectural Enhancement allocations take into account the footprint of the fuel bin building, the biomass module, the biomass capacity, and the entire CEP building footprint.
- UniverCity allocated 100% of capital costs associated with natural gas module in the new CEP.
- SFU allocated 100% of capital costs associated with its interconnection, connection line and ETS connecting SFU's DES to the biomass facility.
- Project Development & Project Management split 50-50.

Capital Cost Categories	Allocation	
	SFU	UniverCity
Civil Works Included Items		
Upper Site Area - fuel bin building and truck loading/offloading areas	74%	26%
Lower Site Area - CEP and surrounding area, excluding Upper Site Area	62%	38%
Buildings and Foundations		
Fuel Bin Building, Foundations and Site Preparation	74%	26%
CEP Building, Foundations and Site Preparation *(as revised Jan 2020)*	62%	38%
Architectural Enhancements *(as revised Jan 2020)*	65%	35%
Process		
Biomass Module within the CEP	74%	26%
SFU Interface *(Interconnection, Connection Line and ETS)*	100%	0%
UniverCity Interface *(Interconnection, Connection Line, DPS and ETS)*	0%	100%
Natural Gas Plant Equipment *(Used for UniverCity only)*	0%	100%
Soft Costs		
Project Development	50%	50%
Project Management	50%	50%

Capital Cost Allocation Methodology

- The Panel approved the methodologies through C-5-17 (p. 35).

- The Panel found that *"… 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."* (C-5-17, pp. 34-35)

Capital Cost Categories	Allocation	
	SFU	UniverCity
Civil Works Included Items		
Upper Site Area - fuel bin building and truck loading/offloading areas	74%	26%
Lower Site Area - CEP and surrounding area, excluding Upper Site Area	62%	38%
Buildings and Foundations		
Fuel Bin Building, Foundations and Site Preparation	74%	26%
CEP Building, Foundations and Site Preparation *(as revised Jan 2020)*	62%	38%
Architectural Enhancements *(as revised Jan 2020)*	65%	35%
Process		
Biomass Module within the CEP	74%	26%
SFU Interface *(Interconnection, Connection Line and ETS)*	100%	0%
UniverCity Interface *(Interconnection, Connection Line, DPS and ETS)*	0%	100%
Natural Gas Plant Equipment *(Used for UniverCity only)*	0%	100%
Soft Costs		
Project Development	50%	50%
Project Management	50%	50%

O&M Cost Allocation Methodology

- Shared Operating Expenses allocated to each customer group using methodologies approved through C-5-17, except for Corporate Services and Regional Services costs.
- Biomass Capacity refers to each customer groups share of the biomass capacity
- CEP and Fuel Bin Building Floor Area refers to the same allocation methodology used for Architectural Enhancement capital costs
- CEP Output capacity refers to each customer group's share of the CEP output capacity
- Composite Allocator is driven by the Corix Corporate Allocation Model, which is currently the subject of a BCUC hearing.

O&M Costs	Allocation Type	Allocation Percentage		Allocator
		SFU	UniverCity	
Biomass Plant Operators	Shared	74.1%	25.9%	Share of Biomass Capacity
Natural Gas Plant Operators	Direct	--	100%	--
Biomass Boiler Maintenance	Shared	74.1%	25.9%	Share of Biomass Capacity
Natural Gas Boiler Maintenance	Direct	--	100%	--
ETS Maintenance - UniverCity	Direct	--	100%	--
ETS Maintenance - SFU	Direct	100%	--	--
DPS Maintenance - UniverCity	Direct	--	100%	--
DPS Maintenance - SFU	Direct	100%	--	--
Building Maintenance	Shared	65%	35%	CEP and Fuel Bin Building Floor Area[40]
Utilities, Materials, Vehicles, Safety, Other	Shared	51.3%	48.7%	CEP Output Capacity
Licensing (Permits)	Shared	51.3%	48.7%	CEP Output Capacity
Chemical Treatment	Shared	51.3%	48.7%	CEP Output Capacity
Corporate Services	Direct	N/A	N/A	CAM Model
Regional Services	Direct	N/A	N/A	Composite Allocator
Liability Insurance	Shared	Changes Annually		Annual Revenue
Property Insurance	Shared	46.9%	53.1%	Forecast Asset Value at build-out
Land Lease Costs	Direct	--	100%	--
Franchise Fees	Direct	--	100%	--

Operating & Maintenance (O&M) Costs

- BMDEU O&M costs are fixed costs required to operate and maintain the utility on an annual basis.
- A description for each line item is included in Section 6.1 of the Application *(Exhibit B-1, pp. 36-43)*.
- Forecasts based on actuals (where applicable) or reasonable estimates for new costs.
- 2020 costs were prorated for September 1st Service Commencement date. This will be adjusted in the Evidentiary Update to reflect delays to the in-service date.
- O&M Costs can be split into Direct Operating Expenses, applicable to each customer group separately, and Shared Operating Expenses.

O&M Costs	Test Period				UniverCity Build-out
	2020	2021	2022	2023	2024
Direct Operating Expenses - SFU					
ETS Maintenance - SFU	3,071	9,396	9,584	9,776	9,971
DPS Maintenance - SFU	2,224	6,804	6,941	7,079	7,221
Direct Operating Expenses - UniverCity					
Natural Gas Plant Operators	26,400	80,784	82,400	84,048	85,729
Natural Gas Boiler Maintenance	8,269	8,434	8,603	8,775	8,950
ETS Maintenance - UniverCity	6,120	6,242	6,367	6,495	6,624
DPS Maintenance - UniverCity	6,347	9,711	9,906	10,104	10,306
Land lease Costs	40,950	40,950	40,950	40,950	40,950
Franchise fees	50,048	66,144	82,214	116,744	132,966
Shared Operating Expenses					
Biomass Plant Operators	192,700	589,662	601,455	613,484	625,754
Biomass Boiler Maintenance	29,055	88,907	90,686	92,499	94,349
Building Maintenance	3,289	10,065	10,266	10,471	10,681
Utilities, Materials, Vehicles, Safety, Other	8,637	8,810	8,986	9,165	9,349
Licensing (Permits)	3,996	4,076	4,157	4,241	4,325
Chemical Treatment	13,500	13,770	14,045	14,326	14,613
Corporate Services	92,937	343,423	409,453	417,642	425,995
Regional Services	73,314	191,780	184,135	187,818	191,574
Liability Insurance	1,222	8,474	15,613	17,447	21,094
Property Insurance	11,290	60,669	63,670	66,388	68,111
Total Operating Costs - BMDEU	**573,368**	**1,548,102**	**1,649,431**	**1,717,452**	**1,768,564**
Total Operating Costs Allocated to SFU	220,180	662,186	682,290	696,243	709,672
Total Operating Costs Allocated to UniverCity	353,189	885,916	967,141	1,021,209	1,058,891

Energy Costs

- Biomass costs are forecasted based on the energy demand forecast and confidential biomass rates in the supply agreement
    - Allocated based on respective share of biomass energy, subject to a risk sharing mechanism outlined in the TESA.
- Electricity costs are forecast based on forecast consumption and peak load and BC Hydro electricity rates.
    - Forecast consumption and peak loads determined by an independent engineering firm
    - Allocated based on share of total thermal energy demand
- Natural Gas costs are forecasted based on the energy demand forecast, FortisBC Energy Inc.'s rates and Sproule commodity forecasts

Forecast Energy Cost	Test Period				UniverCity Build-out	
	2020	2021	2022	2023	2024	2025
SFU Biomass	258,366	790,569	806,463	822,471	838,903	855,655
SFU Electricity	71,116	239,765	235,651	239,872	241,883	242,630
SFU Subtotal	**329,481**	**1,030,334**	**1,042,115**	**1,062,343**	**1,080,786**	**1,098,285**
UniverCity Biomass	59,085	225,063	270,090	312,198	357,395	381,868
UniverCity Natural Gas	350,210	157,959	176,388	202,413	228,948	245,798
UniverCity Electricity	75,342	88,081	101,853	117,490	132,968	139,718
UniverCity Subtotal	**484,638**	**471,104**	**548,330**	**632,101**	**719,312**	**767,385**
Total Energy Costs	**814,119**	**1,501,438**	**1,590,445**	**1,694,444**	**1,800,098**	**1,865,669**

BREAK

5 MINUTE BREAK

Financing Assumptions

CATEGORIES	FINANCING ASSUMPTIONS	2020 ONWARDS
Capital Structure	Debt/capital	57.5%
	Equity/capital	42.5%
Cost of Debt	Interest rate	3.60%
Return on Equity	Benchmark Utility ROE	8.75%
	Equity Risk Premium	0.75%
	Return on equity (ROE)	9.50%
Income Tax	Income tax rate	27.0%
Cost of Capital	Weighted average cost of capital (WACC)	5.55%

ASSET CATEGORIES	DEPRECIATION RATES
Building	1.5%
Biomass Plant	3.0%
Biomass Development	3.0%
Natural Gas Plant	3.0%
Distribution	1.5%
Equipment	3.0%

- Deemed Capital Structure with a Deemed Interest Rate and a ROE all consistent with the BCUC's determination for small TES utilities in the Generic Cost of Capital Stage 2 proceeding.
- Income tax calculations are done separately for each customer group.
- Depreciation Rates are all consistent with the TESA, presented in the 2017 BMDEU CPCN, and approved through C-5-17.
- CIACs contributed by SFU are applied to the Biomass Plant and have amortization rates of 3%. CIACs received for UniverCity are amortized at 3%.

Revenue Requirements - SFU

- Mid-year rate base is used for calculating capital financing requirements.
- Capital costs allocated to SFU are subject to the confidential risk reward mechanism negotiated between SFU and Corix and approved by the BCUC.
- An aggregate depreciation and amortization expense has been presented so that the details of the risk reward mechanism remains confidential.
- Total Rev. Req. for SFU is approx. $3.2M per year for 2021, 2022 and 2023.

SFU Rate Base	2020	2021	2022	2023
Total Rate Base	**8,196,008**	**18,178,120**	**17,821,611**	**17,418,101**
Debt Financing	4,712,705	10,452,419	10,247,426	10,015,408
Equity Financing	3,483,303	7,725,701	7,574,185	7,402,693
Total Financing	**8,196,008**	**18,178,120**	**17,821,611**	**17,418,101**

SFU Revenue Requirement	2020	2021	2022	2023
Operating Costs	220,180	662,186	682,290	696,243
Biomass Fuel	258,366	790,569	806,463	822,471
Electricity	71,116	239,765	235,651	239,872
Subtotal Energy Costs	329,481	1,030,334	1,042,115	1,062,343
Subtotal Depreciation & Amortization	131,910	406,319	406,319	406,319
Income Tax	--	--	--	--
Interest on Debt	169,657	376,287	368,907	360,555
Return on Equity	330,914	733,942	719,548	703,256
Subtotal Financing and Tax Costs	500,571	1,110,229	1,088,455	1,063,811
Total Revenue Requirement	**1,182,142**	**3,209,068**	**3,219,179**	**3,228,715**
Total Rev. Req. excluding Energy Costs	852,660	2,178,734	2,177,064	2,166,372

Deferral Accounts - SFU

- Through C-5-17, the BCUC approved for SFU:
    1. A Fuel Cost Deferral Account; and
    2. A Property Tax Deferral Account.

- Fuel Cost Deferral Account (Approved)
    - Captures difference between forecast and actual energy costs (biomass & electricity).
    - Recovery/Refund of the difference through Capacity Charge to ensure recovery/refund over 12 months.
    - Subject to a confidential adjustment based on actual biomass plant efficiency, as negotiated in the approved TESA.

- Property Tax Deferral Account (Approved)
    - Recovery/refund any difference between the forecast and actual property taxes for SFU, incurred between the Service Commencement Date and receipt of the first property tax assessment for the Infrastructure.
    - Would be closed in the test period that follows the test period within which the initial property tax assessment occurs.
    - No property tax assessment has occurred yet.
    - Property tax excluded from forecast rev. req. (for SFU) due to ongoing certainty surrounding the likelihood and the magnitude of property taxes.

Deferral Accounts - SFU

- Corix's proposals in this Application address the mechanisms for recovery/refund of the balances in the SFU deferral accounts.

- Fuel Cost Deferral Account and Property Tax Deferral Account Proposals
  - Amortize the balance through a rate rider over a 12-month period.
  - 12-month period would begin July 1st of the year following the year the balance was accrued.
  - Rate Rider units would be the same as the Capacity Charge ($/MW of Nominated Capacity/Month).
  - Compliance filing would be submitted by June 1st each year for BCUC approval of the rate rider.
  - Hypothetical example provided in Section 9.3 on page 67 of the Application.
  - Simple approach that promotes transparency and efficiency, reduces regulatory administrative costs and addresses the deferral account balances in a timely manner

Proposed Rates for SFU

Effective Date:	Sep 1st 2020	Jan 1st 2021	Jan 1st 2022	Jan 1st 2023
Capacity Charge ($/MW of Nominated Capacity/Month)	16,367	16,506	16,492	16,403
Consumption Charge ($/kWh)	0.0226	0.0235	0.0238	0.0243
Availability Charge ($/Month)	33,000	33,000	33,000	33,000
Effective Date:		Jul 1st 2021	Jul 1st 2022	Jul 1st 2023
SFU Rider 1 ($/MW of Nominated Capacity/Month)	--	TBD*	TBD	TBD
SFU Rider 2 ($/MW of Nominated Capacity/Month)	--	TBD	TBD	TBD

* TBD – To be determined

- Capacity Charge – a fixed monthly charge intended to recover capital costs and operating costs allocated to SFU, less an agreed amount that is reallocated to the Availability Charge.
- Commodity Charge – a variable charge based on energy consumption, intended to recover the biomass fuel and electricity costs allocated to SFU.
- Availability Charge – a fixed monthly charge payable by SFU based on Corix being able to meet specified plant availability hours and efficiency targets.
- SFU Rider 1 - Used to amortize the balance in SFU's Fuel Cost Deferral Account.
- SFU Rider 2 - Used to amortize the balance in SFU's Property Tax Deferral Account.

Estimated Bill Impact - SFU

	2020	2021	2022	2023
Capacity Charge Revenue ($)	654,660	1,980,734	1,979,064	1,968,372
Consumption Charge Revenue ($)	329,481	1,030,334	1,042,115	1,062,343
Availability Charge Revenue ($)	132,000	396,000	396,000	396,000
Total Revenue	**1,116,142**	**3,407,068**	**3,417,179**	**3,426,715**
Annual Change in Revenue	**N/A**	**N/A**	**10,111**	**9,536**
Annual Change in Revenue	**N/A**	**N/A**	**0.30%**	**0.28%**

- Corix has forecasted the full annual recovery of costs from SFU.
- Unlike the UniverCity customer group, SFU's rates are not levelized rates.

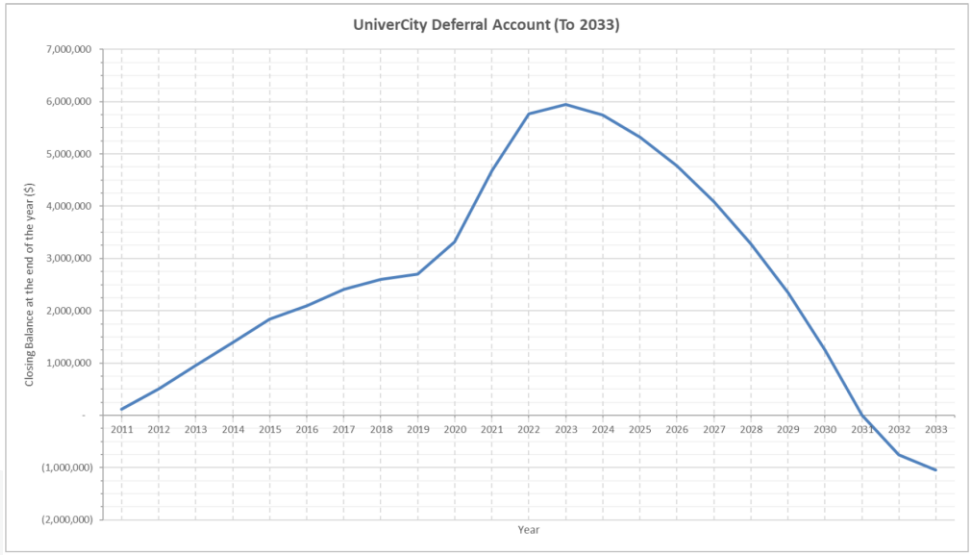
Revenue Requirements - UniverCity

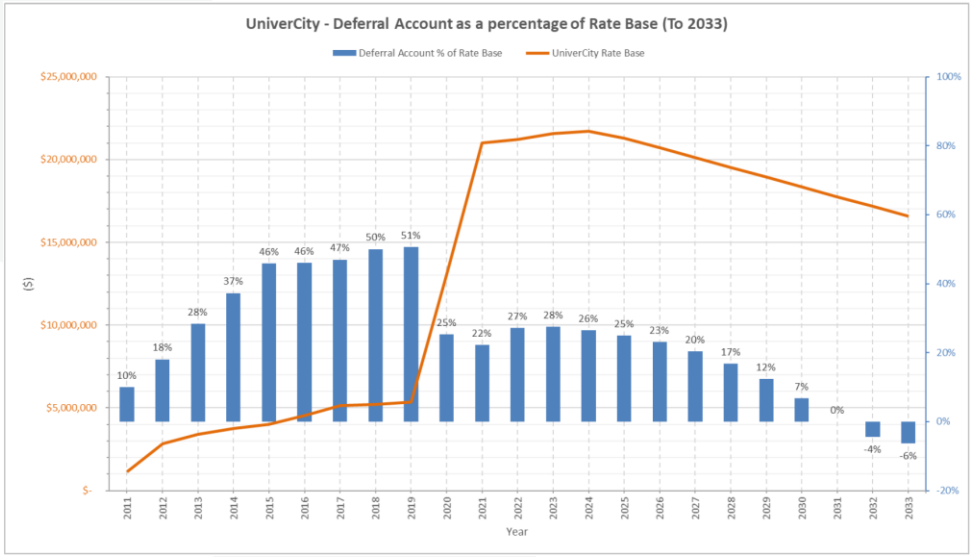
- After addition of the new biomass CEP with the natural gas module UniverCity's rate base increases from approximately $5.3M to $21M in 2021.
- Ongoing buildout of the UniverCity neighbourhood results in additions to rate base each year to 2024.
- Rate base is forecasted to be: $13.1M in 2020; $21M in 2021; $21.2M in 2022; $21.6M in 2023; $21.7M in 2024.
- Capital financing costs are calculated based on the deemed capital structure, ROE and deemed cost of debt.
- Total Rev. Req. is forecasted to rise from $2.1M in 2020 to $3.6M in 2023.

UniverCity Revenue Requirement	2020	2021	2022	2023
Operating Costs	262,191	778,822	843,977	863,515
Land Lease	40,950	40,950	40,950	40,950
Franchise Fees	50,048	66,144	82,214	116,744
Subtotal Land Lease and Franchise Fees	90,998	107,094	123,164	157,694
Biomass Fuel	59,085	225,063	270,090	312,198
Natural Gas	350,210	157,959	176,388	202,413
Electricity	75,342	88,081	101,853	117,490
Subtotal Energy Costs	484,638	471,104	548,330	632,101
Property Tax – Energy Centre	71,589	73,021	74,481	75,971
Property Tax – Residential Distribution	23,239	27,734	31,399	37,830
Subtotal Property Taxes	94,828	100,755	105,880	113,800
Depreciation - Building	37,687	68,272	68,272	68,272
Depreciation - Biomass plant	66,629	133,257	133,257	133,257
Depreciation - Biomass development costs	13,166	26,331	26,331	26,331
Depreciation – Natural Gas Plant	98,100	146,431	143,883	143,883
Depreciation - Distribution	57,765	69,476	80,556	94,183
Depreciation - Equipment	118,974	173,433	185,433	185,433
Amortization - CIACs	(50,166)	(74,612)	(93,910)	(98,367)
Subtotal Depreciation & Amortization	342,153	542,588	543,822	552,992
Income Tax	--	--	--	--
Interest on Debt	271,102	434,889	439,387	446,597
Return on Equity	528,781	848,243	857,018	871,080
Subtotal Financing and Tax Costs	799,883	1,283,131	1,296,405	1,317,677
Total Revenue Requirement	**2,074,691**	**3,283,494**	**3,461,578**	**3,637,780**
Total Rev. Req. excluding Energy Costs	1,590,053	2,812,390	2,913,248	3,005,679

UniverCity Revenue Deficiency Deferral Account

- Revenue Deficiency Deferral Account ("**RDDA**") had a **deficit balance of $2,700,852 at December 31, 2019**.
- RDDA will be used to reduce the impact of the bill increases due to the new CEP and ongoing UniverCity system buildout by absorbing the annual revenue shortfall until the end of 2023.
- **Forecasted to reach a peak deficit balance of $5.95M, representing 28% of total UniverCity rate base, in 2023.**
- Actual build-out schedule has a direct impact on the RDDA balances.
- RDDA excludes the impact of energy costs or associated Variable Energy Charge revenue from Jan. 1, 2021 onwards.
- No changes to the treatment of the balance in the RDDA. Financing costs for the RDDA are added to the RDDA based on the approved deemed weighted average cost of capital.





UniverCity Energy Cost Reconciliation Account

- Energy costs represent 15% to 23% of the total annual revenue requirement in the test period and are:
  - Variable costs that vary with customer consumption and energy prices.
  - Outside of Corix's control.

- Corix proposes to **flow-through energy costs for UniverCity customers.**
  - No markup.
  - Enhances energy cost transparency and sends the appropriate price signal to customers.
  - Consistent with treatment for SFU customer group.
  - Consistent with treatment for Corix's Dockside Green Energy customers, approved through G-248-19.

- Corix's Proposal
  - To establish a Variable Energy Charge ($/kWh) to recovery energy costs only, from Jan 1, 2021 onwards.
  - Existing Variable Charge would be discontinued effective Jan 1, 2021.
  - Requires an energy cost reconciliation account ("**ECRA**") to capture differences between actual energy costs and revenue from the Variable Energy Charge ($/kWh).
  - To amortize the balance in the ECRA over a 1-year period
    - consistent with Dockside Green Energy's and the BCUC's approach to energy and natural gas commodity cost reconciliation accounts respectively.
    - 1-year amortization period provides rate stability while minimizing the ECRA balance.
  - ECRA balance would be recovered through the Variable Energy Charge ($/kWh).

Proposed Variable Energy Charge Rate Setting Mechanism

$$ECRA\ Ratio = \frac{12\ mth\ Forecast\ Variable\ Energy\ Charge\ Revenue}{(12\ mth\ Forecast\ Energy\ Costs + ECRA\ Balance\ at\ beginning\ of\ 12\ mth\ Forecast\ period\ )}$$

- Proposes to establish a Rate Setting Mechanism that would use Trigger Ratios (0.95 and 1.05)
- No change to the Variable Energy Charge would be required if the ECRA Ratio is within the dead-band range bounded by the Trigger Ratios as follows: $0.95 \leq ECRA\ Ratio \leq 1.05$.
- If the ECRA Ratio is lower than the 0.95 or higher than the 1.05 Trigger Ratios, then Corix would request a change in the Variable Energy Charge that would result in the 12-month amortization of the balance in the ECRA.
- A filing would be submitted by March 1 each year to address the closing balance for the ECRA in the previous year.
- First filing anticipated to be March 1, 2022, which could lead to a rate change eff. April 1, 2022.

Proposed Rates for UniverCity

Rate:	Existing	Proposed			
Effective Date:	Jan 1st	Sep 1st	Jan 1st	Jan 1st	Jan 1st
	2020	2020	2021	2022	2023
Basic Charge ($/m² per Month)	0.5769	0.5769	1.0482	1.1321	1.2227
Variable Rate ($/kWh)	0.0588	0.0588	Discontinued		
2020 4-month Rate Rider ($/m² per Month)	N/A	0.2748	Discontinued		
Variable Energy Charge ($/kWh)	N/A	N/A	0.0293	TBD*	

* TBD – To be determined

- No change to the existing 2020 rates that were approved through G-48-16A.

- In 2020 there is an addition of a 4-month rate rider. This is not tied to the in-service date of the new CEP as it helps to:
  i. Smoothen the impact of the CEP going into service;
  ii. Transition UniverCity customers to flow-through energy costs with the use of an ECRA and a Variable Energy Charge; and
  iii. Reduce the $2.7M deficit already in the RDDA, thereby reducing financing costs for UniverCity customers.

Estimated Bill Impact - UniverCity

Est. Bill Impact for UniverCity End-Users	2019	2020	2021	2022	2023
Basic Charge ($/m^2 per Month)	0.5770	0.5769	1.0482	1.1321	1.2227
2020 Fixed Charge 4-month Rider (Sep to Dec)	--	0.2748	--	--	--
Variable Rate ($/kWh)	0.0576	N/A	N/A	N/A	N/A
Variable Energy Charge ($/kWh)	N/A	0.0588	0.0293	0.0290	0.0295
Annual Change in Bill (%)	**N/A**	**9.00%**	**6.91%**	**6.03%**	**6.73%**
Total Annual Bill – 1,000 sq. f.t Residential ($)	1,283	1,398	1,495	1,585	1,691
Total Annual Bill – 600 sq. f.t Residential ($)	772	842	900	954	1,018

- These are estimates for end-users, not customers.
- Proposed rates would not result in “rate shock” for the average end-user at UniverCity.
- Variable energy charge rates here are estimates only. If Corix’s proposal is approved the rate would only change based on the rate setting mechanism and trigger ratios.

UniverCity Rate Design Principles

- Proposed rate structure for UniverCity customers is aligned with all 8 rate design principles established by James C. Bonbright

Criteria for Desirable Rate Structure (Rate Design Principles)[1]

Corix's proposal is:

1. **Practical** – It is simple with a high degree of understandability.
2. **Uncontroversial as to interpretation** – No confusion/controversies caused by interpreting the rate.
3. **Effectively yield total revenue requirements** – Designed to recover all energy costs that were incurred.
4. **Provide revenue stability from year to year** – Designed for full cost recovery/refund within 12 months.
5. **Provide rate stability** – Use of ECRA and rate setting mechanism increases rate stability. Major rate changes not anticipated during the test period due to the fixed price nature of the biomass supply agreement.
6. **Fairness among customer classes** – Applied equally to all customers in UniverCity.
7. **Avoid undue discrimination** – Proposals result in energy cost for each customer tying their usage directly to the cost of energy.
8. **Promote economic efficiency and discourage wasteful use of service** – Provides the appropriate price signal to customers by flowing through costs.

(1) Source: Bonbright, J.C. (1961) Principles of Public Utility Rates. New York: Columbia University Press, pp. 290-291

Conclusion

- Biomass CEP reduces fossil fuel reliance and CO2 and diverts wood waste from landfills
- SFU's rates have been designed consistent with the TESA and the proposed rate riders.
- UniverCity's rate design reflects the nature of the costs and are aligned to rate design principles.
- The proposals result in rates that are not unjust, unreasonable, unduly discriminatory or unduly preferential.

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