BRITISH COLUMBIA UTILITIES COMMISSION
INFORMATION REQUEST NO. 1 TO CORIX MULTI-UTILITY SERVICES INC.

Corix Multi-Utility Services Inc.
Application for a Certificate of Public Convenience and Necessity (CPCN) for Additional Capital and Amended Rates for UniverCity Neighbourhood Utility Service (NUS) on Burnaby Mountain (Application)

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A. NEED FOR CPCN

1.0 Reference: PROJECT COVER LETTER
Exhibit B-1, Cover Letter; Section 5.1, p. 40;
British Columbia Utilities Commission Thermal Energy Systems (TES) Regulatory Framework Guidelines, dated March 2, 2015, Section 2.4.5
Stream B TES Guidelines

In its cover letter, Corix Multi-Utility Services Inc. (Corix) states that:

> Under the Commission's Thermal Systems Regulatory Framework Guidelines ('TES Guidelines'), Stream B Thermal Energy Utilities are required to file subsequent CPCN applications with the Commission based on certain capital expenditure or rate impact thresholds.

In section 2.4.5 of the TES Guidelines (Extensions to a Stream B TES), the British Columbia Utilities Commission (Commission) states:

> Once a CPCN is granted for a Stream B TES, a new CPCN Application may be required if the TES Provider plans to construct or operate an extension to the TES. An extension is a capital addition to the system of a material dollar amount to provide additional capacity to meet increased demand. If the ratio of the capital costs of the planned extension to the initial capital cost of the TES, plus any previous extensions, exceeds one, a CPCN is required. A CPCN is also required if, as a result of the extension, rates for existing customers will increase by an amount greater than 10 percent…

On page 40 of its Application, Corix provides Table 22 showing the approved CPCN capital of its fully built-out temporary solution as $3.252 million after Contributions in Aid of Construction (CIAC) and its actual costs to date of $4.404 million.

1.1 What is Corix's interpretation of the TES Guidelines in terms of its "initial capital cost of the TES" system? Is it the capital cost estimate as contemplated in the original CPCN application or the actual costs of the approved scope of the original CPCN? Please discuss. If so, does Corix believe that the projected capital costs of $3.252 million was *specifically* approved in Commission Order C-7-11?

CORIX RESPONSE:

For the purposes of this application, Corix interpreted the "initial capital cost of the TES" to be the dollar amount approved by the Commission in the 2011 CPCN decision. Based on this interpretation, the initial capital cost of the TES as approved by the Commission was $3.252 million.

1.2 What is Corix's interpretation of "the ratio of the capital costs of the planned extension to the initial capital cost of the TES?" Please provide the calculation of the ratio for both interpretations in 1.1 above.

CORIX RESPONSE:

Corix interpreted "the ratio of the capital costs of the planned extension to the initial capital cost of the TES" to be the ratio of all costs expended to date in excess of the original amount approved by the Commission in the 2011 CPCN decision, plus the estimated costs for the capital proposed in the current application, divided by the original amount approved by the Commission in the 2011 CPCN. The calculation for both interpretations as outlined in 1.1 are provided below:

Cost per original CPCN	a	$ 3,252	Cost per original CPCN		$ 3,252
			Costs to date in excess of original CPCN		$ 1,152
Costs to date in excess of original CPCN		$ 1,152	Total costs to date	a	$ 4,404
Forecast costs to completion		$ 2,946			
Total costs in excess of CPCN	b	$ 4,098	Forecast costs to completion	b	$ 2,946
Forecast total project cost		$ 7,350	Forecast total project cost		$ 7,350
Ratio of total costs in excess of CPCN to cost per original CPCN	b/a	1.26	Ratio of forecast costs to completion to total costs to date	b/a	0.67

1.3 What is Corix's interpretation of the 10 percent rate impact as outlined in the TES Guidelines? Should this impact be interpreted as the annual change in rates (before versus after planned extension without levelization) or should it be interpreted as the change in the leveled rates over a 15 or 20 year period? Please discuss.

CORIX RESPONSE:

Corix interpreted the 10% rate impact threshold as outlined in the TES Guidelines to apply to the levelized rates since these are the rates paid by customers.

1.3.1 For both interpretations, please confirm that Corix has not breached the 10 percent rate increase threshold for its proposed extension. If not confirmed, please provide calculations and a discussion on why a CPCN is necessary given the TES Guidelines.

CORIX RESPONSE:

The response is confirmed and under Corix's interpretation of the TES Guidelines it has not breached the 10% threshold on a revenue per MWh basis (levelized basis).

Comparison of 2016 Revenue

	Original CPCN	Current CPCN	Difference
Revenue Requirement	$ 825,667	$ 1,029,943	25%
Consumption (MWh)	5,884	8,040	37%
Revenue / MWh	$ 140.32	$ 128.10	-9%
Levelized Rates Billed	$ 857,742	$ 878,527	2%
Consumption (MWh)	5,884	8,040	37%
Revenue / MWh	$ 145.78	$ 109.27	-25%

B. BENEFITS OF SINGLE 8 MW TEC

2.0 Reference: BENEFITS OF SINGLE 8 MW TEMPORARY ENERGY CENTRE (TEC)
Exhibit B-1, Section 2.2, p. 12
Comparison of alternatives

Corix states on page 12 of the Application: "Compared to two 2.3 MW TECs, the proposed 8 MW TEC would result in estimated capital savings of $51,200/MW (including a salvage value of the existing 2.3 MW TEC) and estimated annual operating cost savings of $26,320."

2.1 Please provide the financial analysis in a fully functional excel spreadsheet, confidentially if necessary, of adding an additional 2.3 MW TEC module as opposed to the proposed 8 MW TEC. Please explain all assumptions.

CORIX RESPONSE:

Please see the model submitted in confidence for the 2.3 MW plant addition.

2.1.1 As part of the response, please provide a qualitative explanation of how the $51,200/MW capital savings and the $26,320 annual operating savings are achieved under Corix's preferred alternative.

CORIX RESPONSE:

Please see the capital and operating costs information in the table below. Please note the operating costs for the 2.3 MW facility were not stated correctly as the original calculation assumed a higher lease payment. The amended annual operating savings are provided in the table below:

	8 MW TEC	2.3 MW+2.3 MW TEC	SAVINGS $
Capital costs	$975,000*	$796,000**	
Capital costs per MW	$121,875	$173,043	$51,168
Annual Operating Costs (2017)	$205,832	$218,486	$12,654

*capital costs include the cost of 8 MW plant reduced by the sale of existing 2.3 MW plant
**capital costs include the cost of existing 2.3 MW plant and new 2.3 MW module

2.1.2 Please provide as part of Corix's non-confidential response the following tables from the Application under the assumption that Corix instead adds an additional 2.3 MW TEC module:

- Table 8 (Incremental Capital Costs);
- Table 10 (Fixed Operating Costs);
- Table 11 (Fuel Costs and Property Taxes);
- Table 12 (Project Balance Sheet);
- Table 14 (Revenue Requirements);
- Table 15 (Proposed Levelized Rates);
- Table 16 (NUS Rate Design); and
- Table 17 (Statement of Earnings).

CORIX RESPONSE:

Table 8 (Incremental Capital Costs):

CAPITAL COSTS ($)	PTD 2014	2015	2016	2017	2018	2019	2020	TOTAL
TCEP	565,966	30,000	400,000					$995,966
CURRENT CEP SALVAGE								$0
ETS	991,041		550,000	350,000	350,000			$2,241,041
DPS	3,280,187			40,000	896,000			$4,216,187
DEV/LEGAL/PM	406,610[1]	24,060	112,260	35,060	87,920			$665,910
CIAC	(840,037)	(347,000)	(288,000)	(223,000)	(463,000)			$(2,161,037)
TOTAL	$4,403,767	$(292,940)	$774,260	$202,060	$870,920	$0	$0	$5,958,067

Table 10 (Fixed Operating Costs):

OPERATING COSTS	2015	2016	2017	2018	2019	2020	2021	2026
Operating labour and supervision		8,500	52,020	53,060	54,122	55,204	56,308	62,169
TEC maintenance	18,000	14,000	9,000	9,180	9,364	9,551	9,742	10,756
Distribution maintenance	8,200	8,200						
ETS maintenance	21,250	34,000	23,000	29,900	29,900	29,900	29,900	29,900
Emergency call outs	4,000	4,080	4,162	4,245	4,330	4,416	4,505	4,973
Security/Safety	430	439	447	456	465	475	484	535
Land lease	12,840	12,840	21,828	21,828	21,828	21,828	21,828	21,828
Water and sew er	1,440	1,469	1,498	1,528	1,559	1,590	1,622	1,790
Licensing	740	755	770	785	801	817	833	920
Other utilites (phone, internet)	380	388	395	403	411	420	428	472
Tools and equipment	600	612	624	637	649	662	676	746
Parts/eqp rental	3,000	3,060	3,121	3,184	3,247	3,312	3,378	3,730
Insurance	5,563	6,653	7,464	9,441	9,913	10,409	10,929	13,949
Utility management - administratior	40,000	40,800	41,616	42,448	43,297	44,163	45,046	49,735
Corp Ovhd and support	50,500	51,510	52,540	53,591	54,663	55,756	56,871	62,790
Total operating costs	166,943	187,306	218,486	230,687	234,549	238,503	242,551	264,294

[1] Does not include construction management (CM) costs. CM costs of $306,650 allocated to each infrastructure component.

Table 11 (Fuel Costs and Property Taxes):

VARIABLE COSTS	2015	2016	2017	2018	2019	2020	2021	2026
Natural gas %	100%	100%	100%	100%	100%	100%	100%	100%
Natural gas efficiency	77%	80%	80%	80%	80%	80%	80%	80%
Natural gas (GJ)	19,552	36,181	42,824	57,178	66,165	66,165	66,165	66,165
Electricity (MWh)	55	55	55	55	55	55	55	55
Natural gas / GJ ($)	8.82	8.98	9.54	10.21	10.58	10.75	10.92	11.81
Natural gas basic charge	1,589.14	1,620.92	1,653.34	1,686.40	1,720.13	1,754.54	1,789.63	1,975.89
Electricity / MWh ($)	113.83	118.38	122.52	126.20	129.98	133.88	137.90	159.86
Property tax base - distribution (re	455,871	956,163	1,154,347	1,572,079	1,855,555	1,892,666	1,930,519	2,131,449
Natural gas	173,942	326,397	410,315	585,460	702,030	713,042	724,249	783,355
Electricity	6,260	6,511	6,739	6,941	7,149	7,364	7,584	8,793
Total fuel costs	180,202	332,908	417,053	592,401	709,179	720,405	731,834	792,148
Property taxes - distribution	10,011	13,676	28,685	34,630	47,162	55,667	56,780	62,690
Property taxes - total	10,011	13,676	28,685	34,630	47,162	55,667	56,780	62,690

Table 12 (Project Balance Sheet):

BALACE SHEET	2015	2016	2017	2018	2019	2020	2021	2026
Plant in service	5,297,864	6,336,543	6,769,766	8,155,402	8,155,402	8,155,402	8,155,402	8,155,402
Accumulated depreciation	(478,889)	(601,459)	(759,931)	(930,571)	(1,127,784)	(1,324,998)	(1,522,211)	(2,508,280)
Contributions for construction	(1,187,037)	(1,475,037)	(1,698,037)	(2,161,037)	(2,161,037)	(2,161,037)	(2,161,037)	(2,161,037)
Working capital	43,393	65,027	79,442	102,886	117,966	119,864	121,798	132,055
Revenue deficiency deferral	1,842,989	1,913,762	2,003,159	1,902,653	1,728,726	1,520,432	1,267,011	-
Rate base	5,518,321	6,238,836	6,394,400	7,069,333	6,713,272	6,309,662	5,860,963	3,618,140
Debt	3,173,034	3,587,331	3,676,780	4,064,866	3,860,132	3,628,056	3,370,053	2,080,431
Equity	2,345,286	2,651,505	2,717,620	3,004,466	2,853,141	2,681,606	2,490,909	1,537,710
Total financing	5,518,321	6,238,836	6,394,400	7,069,333	6,713,272	6,309,662	5,860,963	3,618,140

Table 14 (Revenue Requirements):

REVENUE REQUIREMENT	2015	2016	2017	2018	2019	2020	2021	2026
Operating costs	166,943	187,306	218,486	230,687	234,549	238,503	242,551	264,294
		41	43	46	48	48	49	53
Natural gas	173,942	326,397	410,315	585,460	702,030	713,042	724,249	783,355
Electricity	6,260	6,511	6,739	6,941	7,149	7,364	7,584	8,793
Total fuel costs	180,202	332,908	417,053	592,401	709,179	720,405	731,834	792,148
Property taxes - distribution	10,011	13,676	28,685	34,630	47,162	55,667	56,780	62,690
Property taxes - total	10,011	13,676	28,685	34,630	47,162	55,667	56,780	62,690
Depreciation	127,348	122,570	158,472	170,639	197,214	197,214	197,214	197,214
Interest	119,651	118,989	134,525	137,879	152,432	144,755	136,052	89,102
Return on equity	224,041	222,802	251,893	258,174	285,424	271,048	254,753	166,841
Total capital costs	471,040	464,361	544,890	566,692	635,070	613,017	588,018	453,157
Subtotal	828,196	998,250	1,209,114	1,424,410	1,625,961	1,627,592	1,619,183	1,572,288
Franchise fees	25,614	30,874	37,395	44,054	50,287	50,338	50,078	48,627
Total revenue requirement	853,810	1,029,124	1,246,509	1,468,464	1,676,249	1,677,930	1,669,261	1,620,916

Table 15 (Proposed Levelized Rates):

LEVELIZED RATES	2015	2016	2017	2018	2019	2020	2021	2026
Energy demand (MWh)	4,182	8,040	9,517	12,706	14,703	14,703	14,703	14,703
Annual rate per MWh		$ 118.92	$ 121.30	$ 123.73	$ 126.20	$ 128.72	$ 131.30	$ 144.96
Total revenue with escalation		956,163	1,154,347	1,572,079	1,855,555	1,892,666	1,930,519	2,131,449

Table 16 (NUS Rate Design):

RATE DESIGN	2015	2016	2017	2018	2019	2020	2021	2026
Square metres	35,112	64,791	78,850	103,386	122,406	122,406	122,406	122,406
Annual basic charge per sq metre	6.11	7.38	7.32	7.60	7.58	7.73	7.89	8.71
Monthly basic charge per sq metre	0.5092	0.6149	0.6100	0.6336	0.6316	0.6443	0.6571	0.7255
Commodity charge / kWh	0.0577	0.0595	0.0606	0.0619	0.0631	0.0644	0.0656	0.0725
Revenue / MWh	$ 109.01	$ 118.92	$ 121.30	$ 123.73	$ 126.20	$ 128.72	$ 131.30	$ 144.96
Revenue / MWh increase		9.1%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

Table 17 (Statement of Earnings):

EARNINGS	2015	2016	2017	2018	2019	2020	2021	2026
Basic charges	214,569	480,172	579,698	789,477	931,835	950,471	969,481	1,070,385
Commodity charges	241,301	480,172	579,698	789,477	931,835	950,471	969,481	1,070,385
Total revenue	455,871	960,344	1,159,395	1,578,954	1,863,669	1,900,942	1,938,961	2,140,770
Operating costs	166,943	187,306	218,486	230,687	241,449	250,003	254,051	275,794
Fuel costs	180,202	332,908	417,053	592,401	709,179	720,405	731,834	792,148
Property taxes	10,011	13,676	28,810	34,782	47,369	55,910	57,028	62,964
Franchise fees	13,676	28,810	34,782	47,369	55,910	57,028	58,169	64,223
Total operating expenses	370,832	562,700	699,131	905,238	1,053,907	1,083,347	1,101,082	1,195,128
Operating cash flow	85,038	397,644	460,264	673,716	809,762	817,596	837,880	945,642
Depreciation	127,348	122,570	158,472	170,639	197,214	197,214	197,214	197,214
Interest	119,651	118,989	134,437	137,683	152,084	144,387	135,754	89,091
Earnings before tax	(161,960)	156,085	167,354	365,393	460,464	475,995	504,912	659,337
Income tax	-	-	-	-	-	-	-	175,443
Earnings before deferral	(161,960)	156,085	167,354	365,393	460,464	475,995	504,912	483,895
Revenue deficiency deferral	386,001	66,717	84,375	(107,586)	(175,692)	(205,636)	(250,718)	(317,076)
Net earnings	224,041	222,802	251,729	257,807	284,772	270,360	254,194	166,819
ROE (including deferral)	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%

2.2 Please calculate the levelized cost of the proposed project (i.e. the preferred alternative of replacing the existing 2.3 MW TEC with the 8 MW TEC).

CORIX RESPONSE:

$121.68/MWh

2.3 Please calculate the levelized cost of the scenario described above (i.e. adding another 2.3 MW TEC module).

CORIX RESPONSE:

$131.30/MWh

2.4 Can additional boiler capacity be added to the existing 2.3 MW TEC module? If not, please explain why not.

CORIX RESPONSE:

Adding boiler capacity to the existing plant would not be a cost-effective option as it would require extensive re-piping and re-configuration. The existing container that houses the existing plant is also too small to accommodate the proposed 8.0 MW plant.

3.0 Reference: TEMPORARY ENERGY CENTRES CONTAINERIZED PLANTS
Exhibit B-1, Section 2.2, p. 12; Section 5.2.2, p. 43;
Corix Application for a CPCN for the Neighbourhood Utility Service at UniverCity Burnaby proceeding (2011 CPCN), Exhibit B-1, dated November 26, 2010, pp. 36–37
Timing of permanent solution and benefit of Temporary Energy Centre

To summarize from Corix's 2011 CPCN application, initially, the Production Facility would consist of a temporary Central Energy Plant (CEP), which, according to Corix, would be constructed in the fall of 2011 with a capacity of 1.9 MW. The temporary CEP would be able to meet forecast loads up to 2013. At that time, additional boilers would increase the capacity up to 4.4 MW which would be sufficient to meet forecast loads up to 2016, after which the permanent CEP will be in place.

On page 43 of the current Application, Corix states "the TEC is currently proposed to be developed in two phases, the container with two 3 MW boilers will be installed in 2016 and an additional 2 MW boiler will be added when the load develops. This is currently projected for 2019." Additionally, on page 12 of the Application, Corix indicates a benefit of the 8 MW TEC is "increased flexibility" where "adding additional capacity will extend the timing for implementation of the permanent low carbon energy facility."

3.1 Given that initially the permanent CEP was anticipated in 2016, and now the project timeline has moved forward where the final 2 MW boiler of the total 8 MW TEC is projected for 2019, when is the permanent CEP expected to be installed?

CORIX RESPONSE:

The permanent plant, as per the Infrastructure Agreement, needs to be installed when the load supports the installation, but no later than a threshold (number of residential units) as agreed between the SFU Trust and Corix. As per the current development schedule and load forecast, the permanent plant is anticipated to be installed in 2018 / 2019. The natural gas boilers from the 8 MW facility would be repurposed in the permanent plant to serve as peaking and back-up.

3.2 What are the factors preventing the implementation of the permanent CEP at this time or in the immediate future? Please discuss.

CORIX RESPONSE:

Corix, with support of SFU Trust, is concurrently working with Simon Fraser University (SFU) on a larger scale low carbon energy plant that would serve both SFU and UniverCity residents. This concept was presented in the 2011 CPCN application.

Corix expects to receive the necessary Provincial approvals by the end of 2016, and if approved, to file a CPCN with the Commission with a target of commissioning the low carbon energy plant in 2018 / 2019. If the approvals are not obtained, a smaller scale low carbon energy plant would be built for UniverCity within the timeline indicated above.

On page 12 of the Application, Corix states that two benefits of a single 8 MW TEC is "space reduction" and "cost savings."

3.3 The existing boiler is 2.3 MW. Explain the basis under which Corix changed its plan of increasing the capacity of the temporary CEP up to 4.4 MW by adding boilers?

CORIX RESPONSE:

Actual load experienced by the utility has been greater than originally projected and the addition of another facility to bring the total plant capacity to 4.4 MW is no longer sufficient to support the projected load demand for the NUS.

3.4 In addition to the container of two 3 MW boilers expected in 2016, Corix is looking to add a 2 MW boiler in 2019. Please confirm this implies that the 2 MW boiler expected in 2019 is an independent containerized unit that is not part of the two 3 MW boilers container.

CORIX RESPONSE:

All of the boiler equipment will be housed in a single containerized unit. The 2MW boiler unit will simply be added in the future when the NUS load demand requires it.

3.4.1 If confirmed, please indicate how the 2 MW boiler proposed for 2019 would be different than the existing 2.3 MW boiler in terms of physical size and cost. Is the difference substantial? If not, then please indicate why the existing 2.3 MW boiler cannot be retained to avoid the purchase of a similar unit in the future.

CORIX RESPONSE:

As per the response above, the 2 MW unit will be added to the new plant. It is not a cost effective option to retain the existing 2.3 MW plant as it would require additional space to accommodate the existing container and incur additional lease costs. The equipment that will be used in the proposed 8 MW boiler plant will ultimately be repurposed into the permanent facility for peaking and back-up energy production.

C. FINANCIAL INFORMATION ON ACTUAL AND ESTIMATED COSTS

4.0 Reference: FINANCIAL MODELING AND INPUTS
Exhibit B-1, Section 2.5.1, pp. 19–20, Table 9
Project development costs

Corix states on page 19 of the Application: "The 2011 CPCN included project development costs of $90,000 that represented the cost of the feasibility study to initiate and develop the project."

Table 9 on page 20 of the Application provides a breakdown by year of project development costs, including $210,861 Feasibility Study/External Consultant costs incurred in 2009/2010.

4.1 Please explain why the 2009/2010 Feasibility Study/External Consultant Costs are $120,861 higher ($210,861 less $90,000) than the amount of project development costs included in the 2011 CPCN.

CORIX RESPONSE:

At the time of the application (November 2010), Corix only included the development costs associated with the feasibility study completion and the cost of public consultation up to the date of the application. The additional costs include the remainder of the public consultation process, legal support for the BCUC submission, Corix project development costs during the feasibility study, and the costs associated with negotiating an agreement with the SFU Trust and the BCUC application process. These costs were accounted for later in 2010 and throughout 2011 and therefore were not included in the application.

4.2 For each year and each cost category in Table 9, please separately show how much of the project development costs were incurred to develop: (i) the project as approved in the 2011 CPCN; (ii) the revised project as applied for in this Application; and (iii) the permanent alternative energy solution.

CORIX RESPONSE:

All costs presented in Table 9 of the application relate to the project approved in the 2011 CPCN.

4.2.1 Are any of the project development costs included in Table 9 related to the development of the permanent alternative energy solution? If so, please explain why it is appropriate to capitalize these costs at this time, given that Corix has not yet put forth an application for the permanent solution.

CORIX RESPONSE:

A portion of the costs associated with the permanent low carbon energy plant were included in the original feasibility study, as the scope of work included the full project concept complete with a low carbon energy plant.

The 2011 CPCN application was therefore submitted for the full project concept including the permanent low carbon energy plant however the award of the order only allowed Corix to implement a natural gas based temporary energy centre and to wait for the system loads to reach a level where it would be economically feasible to implement the low carbon energy plant. These costs are appropriately capitalized since the development of the NUS would not have been possible without this level of effort.

Corix states on page 20 of the Application: “These costs have been accrued in the project revenue deficiency deferral account.”

4.3 Please provide a more detailed explanation of how these costs have been accrued in the project revenue deficiency deferral account (RDDA).

CORIX RESPONSE:

The project development costs have been capitalized and are therefore included in rate base. Depreciation and financing costs related to the asset are accumulating in the RDDA.

4.4 Given that Corix has been accruing all project development in the RDDA, including project development costs exceeding the originally budgeted amount of $90,000, does this mean that Corix has been earning an annual return (i.e. interest and return on equity) on these additional project development costs?

CORIX RESPONSE:

Yes.

4.4.1 If yes, please provide the total interest and return on equity which Corix has recorded on the project development costs in excess of the originally budgeted $90,000. Please show all calculations.

CORIX RESPONSE:

Please see below the interest, return on equity and deferral account financing related to the additional project development costs calculated for the period of 2011-2014.

	2011	2012	2013	2014	Total
Interest	$ 2,126	$ 4,237	$ 4,034	$ 2,775	$13,173
Return on Equity	$ 2,363	$ 4,708	$ 4,483	$ 3,649	$15,202
Financing	$ 150	$ 640	$ 1,334	$ 2,720	$4,845
Total	$ 6,651	$ 11,597	$ 11,864	$ 11,158	$33,220

4.5 Please confirm, or explain otherwise, that Corix did not request Commission approval to accrue the additional project development costs shown in Table 9 in the RDDA.

CORIX RESPONSE:

Corix did not specifically request the Commission to approve accrual of the additional project development costs into rate base. However, Corix met with the Commission staff in April of 2014 and presented the increased costs of the project, rationale for the increase and the status of the deferral account.

4.6 Please explain why it is appropriate to recover additional project development costs related to the 2011 CPCN-approved project beyond the amount reviewed and approved as part of the 2011 CPCN.

CORIX RESPONSE:

Corix believes it is appropriate to recover all prudently incurred costs. All project development costs in 2009 / 2010 / 2011 were incurred completing the tasks related to developing the 2011 CPCN application and the subsequent review and approval process. The costs incurred by Corix in the period following the submission of the 2011 CPCN are directly related to the project implementation, including legal costs related to the Statutory Rights of Way negotiations and filing, infrastructure construction, and the NUS service agreement negotiations with developers.

4.7 Please separately show the project management versus construction management costs for each year and provide a detailed explanation for how these amounts are calculated.

CORIX RESPONSE:

Please see the table below. Costs shown are based on job sheets.

COSTS ($)	2011	2012	2013	2014	TOTAL
PROJECT MANAGEMENT COSTS	$6,044	$ 5,228	$ 4,634	$ 29,280	$45,186
CONSTRUCTION MANAGEMENT	$69,700	$ 83,600	$ 65,880	$42,019	$261,200
TOTAL	$75,744	$88,828	$ 70,515	$ 71,299	$306,386

4.8 Please explain the change in circumstances subsequent to the approval of the 2011 CPCN which precipitated Corix incurring project management and construction management costs. Were these costs budgeted in the 2011 CPCN application? If not, why not?

CORIX RESPONSE:

As part of the ongoing cost optimization process, Corix identified that utilizing internal resources for the project and construction management was more cost efficient when compared to the costs for these services when sub contracted to a third party. Project and construction management costs were originally included in the capital costs presented in the 2011 CPCN application. They were forecasted to be 4% of total capital costs.

4.9 Please explain why Corix did not include legal external costs as part of its project development cost budget in the 2011 CPCN application.

CORIX RESPONSE:

The 2011 external legal fees were related to the CPCN submission and the approval process. These costs were not known at the time of application (Nov. 2010). External legal costs in subsequent years were related to the SRW negotiations and filing and NUS agreement negotiations with developers. At the time of the application the extent of the SRW process, which involved negotiations with three different parties for each parcel (SFU as the land owner, the developer and ultimately the stratas representing lessees) was not foreseen.

4.9.1 Please provide a more detailed breakdown and explanation of the external legal costs incurred each year (i.e. 2009/2010 through 2014).

CORIX RESPONSE:

An explanation is provided in the response to 4.9. The detailed breakdown is provided below.

Row Labels	Prior to 2010	2010	2011	2012	2013	2014	Grand Total
Legal Costs		$317	$82,606	$10,156	$22,087	$23,316	$138,482
External		$317	$82,606	$10,156	$18,391	$21,665	$133,135
Bull, Housser & Tupper LLP		$317	$80,029	$10,141	$17,018	$14,630	$122,133
Butler Sundvick						$6,516	$6,516
Other				$16	$14		$29
McCarthy Tetrault LLP						$519	$519
Simon Fraser University			$2,486		$1,359		$3,845
CCDC Document			$92				$92

5.0 Reference: FINANCIAL MODELING AND INPUTS
Exhibit B-1, Section 2.5.3, pp. 19–20, Table 8
Salvage value

Corix states on page 20 of the Application that the boilers from the existing 2.3 MW TEC would be "re-deployed to another Corix project."

Corix further states on page 20 that it "engaged an appraisal company, Universal Appraisal, to assess the plant and determine the market salvage value of the existing TEC" and that the appraisal resulted in an assessed value of $325,000.

Table 9 on page 19 of the Application shows the reduction of $325,000 salvage in 2020.

5.1 When does Corix anticipate that the boilers from the existing 2.3 MW TEC will be re-deployed to another Corix project?

CORIX RESPONSE:

Current projections show that the plant would be redeployed in the year 2020.

5.2 Please confirm, or explain otherwise, that this other project is not directly connected to the UniverCity project.

CORIX RESPONSE:

Confirmed.

5.2.1 If confirmed, please indicate which other Corix project these boilers are being re-deployed to.

CORIX RESPONSE:

The boiler plant will be redeployed to the Oval Village DEU project located in the City of Richmond.

5.3 Did Corix undergo a Request for Proposal (RFP) process to select the appraisal company?

CORIX RESPONSE:

No.

5.3.1 If yes, please generally describe the process and why Universal Appraisal was selected.

CORIX RESPONSE:

N/A.

5.3.2 If no, please explain why not and describe the process undertaken to select Universal Appraisal.

CORIX RESPONSE:

Corix contacted multiple contractors that we regularly conduct business with and sought referenced recommendations of an appraisal firm that is familiar with this type of equipment. Corix then directly contacted Universal and set up a formal on-site meeting to allow Universal to conduct its appraisal.

5.4 Please confirm, or explain otherwise, that Universal Appraisal has an arm's length, third party relationship to Corix.

CORIX RESPONSE:

Confirmed.

5.5 Please explain how the market salvage value of $325,000 was determined by Universal Appraisal.

CORIX RESPONSE:

Universal Appraisal provided the following definition of value and methodology for determination of plant value:

"*Within the context of this report, the basis of valuation for assets appraised has been established as "Market Value – As Is – Where Is".*

The subject property has been visually inspected and in establishing value, consideration has been given to market data and current economic factors along with make, age, condition, remaining life and serviceability. Accepted definition and valuation methodology are as follows:

Market Value – As Is – Where Is

The basis of this valuation relates to the physical property to be appraised on an "As Is - Where Is" basis. This approach to value considers the return that might be expected when the equipment is offered for sale and sold in an orderly fashion within an economical time frame which is estimated to be three months.

The Market Values which we show for items of equipment in general manufacture, have been based upon similar or comparable used equipment offered for sale in the open market. Where direct sales evidence for specific items of equipment has not been available, the basis of market value has been determined by the cost approach to value. This approach considers the new replacement cost of like kind and quality of equipment less the accrued depreciation as determined by the appraiser's inspection and investigation."

5.6 What is the net book value of the re-deployed boilers at the end of 2020? Please show all calculations.

CORIX RESPONSE:

TEC net book value in 2020 is $104,407.32. Detailed calculations are provided under Attachment One.

5.7 Please discuss whether the existing 2.3 MW TEC should be classified as no longer "used and useful" once the replacement 8 MW TEC is installed.

CORIX RESPONSE:

In the context of a mature utility, the asset would not typically be classified as used and useful. In the case of UniverCity, Corix believes special consideration should be given in determining treatment of the asset given the uncertainty surrounding build-out, energy demand, and the economic benefits of replacing the asset before the end of its useful life.

5.8 Please confirm, or explain otherwise, that Corix is not proposing to remove the 2.3 MW TEC from rate base in 2016 (i.e. when it is replaced with the 8 MW TEC).

CORIX RESPONSE:

Confirmed, under the current application Corix will continue to recover on the asset until 2020.

5.8.1 If confirmed, please provide justification for why it is appropriate to continue to recover the costs of the 2.3 MW TEC from UniverCity ratepayers once it is no longer being used by these ratepayers.

CORIX RESPONSE:

What Corix is proposing would result in a net benefit to rate payers when Corix sells the TEC to the Richmond DE project. As the asset will provide a net benefit to the ratepayers, Corix believes it would be appropriate to leave the asset in rate base.

5.9 Please provide the Net Book Value of the 2.3 MW TEC at the expected time of replacement by the 8 MW TEC.

CORIX RESPONSE:

The anticipated time of replacement will be April 2016, making net book value of the plant $200,544.87. Please see Attachment One for detailed calculations.

5.10 If Corix was directed to remove the 2.3 MW TEC from rate base in 2016 (i.e. at the time of replacement by the 8 MW TEC), how would this change the forecast capital costs, revenue requirement, and rate structure for the years 2016 through 2026? Please show all calculations and explain any assumptions made. Please also provide the revised levelized rate under this scenario.

CORIX RESPONSE:

For this scenario, Corix deducted the net book value of $200,544.87 from rate base in 2016 and reversed the previously assumed deduction of $325,000 in 2020. Under this scenario, the levelized rate decreased from $121.68 to $121.59 (0.07%).

The confidential UniverCity Financial Model with all assumptions and calculations is provided to the Commission.

5.11 Does Corix expect to incur any removal or remediation costs as a result of removing the 2.3 MW TEC? If yes, please describe and quantify these costs and please indicate where these costs are accounted for in the Application and in the financial model.

CORIX RESPONSE:

No removal or remediation costs are expected to impact the UniverCity NUS. All costs associated with removal and transport would be accrued to the Richmond DE utility.

6.0 Reference: FINANCIAL MODELING AND INPUTS
Exhibit B-1, Section 2.5.4, pp. 21–22, Table 10
Fixed operating costs

Table 10 on page 21 of the Application provides a breakdown of the annual fixed operating costs for years 2015 through 2021 and 2026.

6.1 Please provide the same breakdown of fixed operating costs for the actual fixed operating costs incurred in years 2012, 2013 and 2014.

CORIX RESPONSE:

The actuals for 2012 through 2014 are provided below.

2014 Fixed Operation Cost Table Breakdown of Actuals

	2012	2013	2014
Operating labour and supervision	-	-	-
TEC/ETS/Distribution Maintenance	6,031	21,233	32,313
UniverCity Childcare Solar Re-commissioning	-	-	7,863
Emergency Call Outs / Repairs and Maint	20	6,878	7,785
Security/Safety	-	-	220
Land lease	13,217	12,840	12,840
Water and sewer	-	-	-
Licensing	497	565	730
Other utilities (phone, internet)	1,830	4,282	2,378
Tools and equipment	27	40	-
Parts/eqp rental	24,389	1,303	(60)
Insurance	3,972	5,976	7,633
Utility management - adminstration	11,079	22,634	41,157
Corp Ovhd and support	-	50,000	260,663
	61,064	**125,753**	**373,522**

Corix states on page 21 of the Application: "After the new TEC is installed and starting in 2017, Corix will employ its own operator on a 0.5 full time equivalent (FTE) basis…The qualified operator FTE is assumed to cost $100,000 per annum in 2015 dollars."

6.2 Please provide a comparison of the following forecast operating costs for years 2016 through 2021 under the assumption that Corix added an additional 2.3 MW TEC. Please explain all assumptions and the reasons for any differences in costs between this option and Corix's proposed option.

- Operating labour and supervision;
- TEC maintenance;
- Distribution maintenance;
- ETS maintenance;
- Insurance; and
- Land lease.

CORIX RESPONSE:

Please see the table below.

OPERATING COSTS	2015	2016	2017	2018	2019	2020	2021	2026
Operating labour and supervision		8,500	52,020	53,060	54,122	55,204	56,308	62,169
TEC maintenance	18,000	14,000	9,000	9,180	9,364	9,551	9,742	10,756
Distribution maintenance	8,200	8,200						
ETS maintenance	21,250	34,000	23,000	29,900	29,900	29,900	29,900	29,900
Land lease	12,840	12,840	21,828	21,828	21,828	21,828	21,828	21,828
Insurance	5,563	6,653	7,464	9,441	9,913	10,409	10,929	13,949

The TEC maintenance changes due to adding a separate containerized module, containing the boilers, distribution pumps, expansion tank and all associated ancillaries.

The land lease cost increase with increased lease area needed to accommodate additional 2.3 MW containerized boiler unit.

The ETS maintenance is lower as there are less ETS units, 13 instead of 19 in the proposed 8 MW solution.

6.3 Why is the TEC maintenance cost forecast to decrease from $14,000 in 2016 to less than $5,000 for years 2017 through 2021?

CORIX RESPONSE:

Corix forecasts that the majority of the TEC maintenance work will be completed by the Corix employed FTE.

6.3.1 If the reason for this decrease in TEC maintenance is due to the fact that Corix plans to hire its own operator starting in 2017, please explain why the TEC maintenance is not reduced to zero.

CORIX RESPONSE:

There will still be routine maintenance functions that Corix plans to sub-contract. Some of these duties include annual boiler maintenance and inspection, monthly chemical treatment and an allocation for emergency call out situations.

6.4 Please explain why Distribution maintenance costs are no longer incurred commencing in 2017.

CORIX RESPONSE:

Distribution maintenance functions will be covered under the duties of the Corix employed operator. The ongoing distribution maintenance simply entails semi-annual valve exercising and visual inspections. The cost still exists but has been accounted for under the operator cost.

Corix states on page 22: "The insurance is calculated using $0.11 per $100 of the replacement value starting in 2017. The insurance escalates at 5% annually."

6.5 Please explain the basis for forecasting a 5 percent annual escalation in insurance.

CORIX RESPONSE:

The insurance escalation depends on the insurance market. 5% to even 10% is not unusual to use for budgeting purposes due to unknown development of the insurance market. The 5% annual escalation in insurance costs is based on the escalation of insurance premiums experienced by Corix over the past several years and the expectation from Corix's insurance broker that this trend is expected to continue.

6.6 How has the annual replacement value of the capital assets been determined? Please explain.

CORIX RESPONSE:

The replacement value was determined internally by Corix construction personnel, using actual construction costs of the infrastructure adjusted for inflation. For the actual insurance costs, the replacement value is estimated annually by internal personnel or a third party assessment company.

Corix states on page 22 of the Application:

> The combined charge of $90,500 per annum (in 2015 dollars) is for an average year and includes estimates for legal, accounting, regulatory, administration, human resources, IT support and maintenance, telephones, office supplies, vehicle costs, as well as operational management/support of Corix's Energy Western Canada division.

6.7 Please provide a more detailed breakdown and explanation of the costs included in the $40,000 "Utility management – administration" cost line item.

CORIX RESPONSE:

The "Utility Management – administration" costs cover day to day operational items such as monthly invoicing, customer care and relations, performance monitoring, oversight of operation, compliance of governance and general management. A detailed breakdown is provided in Attachment Two.

6.8 Please provide a more detailed breakdown and explanation of the costs included in the $50,500 "Corporate Overhead and Support" cost line item.

CORIX RESPONSE:

Please see Attachment Two for a more detailed breakdown of the costs included in the Corporate Overhead and Support line item.

6.9 In Table 10 on page 21 of the Application there is an operating cost line item titled "Other utilities (phone, internet)." Please explain how these costs differ from the combined administrative costs of $90,500 described in the above preamble.

CORIX RESPONSE:

The "Other" category covers the direct cost to the utility for the phone and internet services on site required for operation of the system and therefore are not classified as part of the combined administrative cost. These services are required for SCADA access and management.

6.10 Please provide a more detailed explanation of the costs related to "operational management/support of Corix's Energy Western Canada division" as described in the above preamble, including how much is being charged annually to the UniverCity NUS.

CORIX RESPONSE:

Based on historical information related to the accrual of cost related to this item, it accounts for both Management time and Administration time. 14 hours per month at a rate of $125/hour are forecasted for management time and 20 hours per month at $65/hour are forecasted for administration. A detailed breakdown is provided in Attachment Two.

6.10.1 If this is an allocated cost to the UniverCity NUS, please explain in detail how this allocated cost is calculated.

CORIX RESPONSE:

These costs cover day to day operational items such as monthly invoicing, customer care and relations, performance monitoring, oversight of operation, compliance of governance and general management. A detailed breakdown is provided under Attachment Two.

7.0 Reference: FINANCIAL MODELING AND INPUTS
Exhibit B-1, Section 2.5.4, pp. 21–22, Table 11
Property taxes

Corix states on page 21 of the Application: "As the NUS is located on SFU lands that are exempt from property taxes, to date Corix was not required to pay property taxes on the distribution system. Starting in 2015, the NUS system is subject to property taxation…"

7.1 Please explain why, starting in 2015, the NUS system will be subject to taxation.

CORIX RESPONSE:

At this time the UniverCity NUS has not been subject to taxation. However, through discussion with the BC Assessment, it is Corix's understanding that taxation of DEU systems is imminent and therefore Corix is prudently allocating a value for property taxation in its rates. These assumptions provided in the CPCN application are consistent with discussions Corix has had with BC Assessment over the past several years.

7.2 Please explain why Corix has made the assumption that property taxes will be charged as a percentage of revenue.

CORIX RESPONSE:

The use of this approach was based on discussions with BC Assessment. The percentage of revenue allocation was only used for the distribution piping system (DPS).

7.2.1 What is the likelihood that a different method for calculating property tax will be selected?

CORIX RESPONSE:

Corix is not in a position to speculate as to what approach BC Assessment will choose.

7.2.2 If a different method for calculating property tax is selected, what is the likely increase/decrease to the annual revenue requirement? Please show all calculations and provide the impact, if any, on the levelized rate.

CORIX RESPONSE:

An alternative method would be to use the City of Burnaby "utility" tax rate of $50.37 per thousand dollars of capital. Using this approach would have the following impact on the project revenue requirement and rates:

Total rate per MWh (2016)	$118.77
Levelized rate per MWh	$132.26
Revenue requirement in 2016	$1,196,088

The calculations above are based on the full cost of the DPS infrastructure.

7.3 Did Corix include an annual property tax amount for the University of British Columbia Neighbourhood District Energy System (UBC NDES) revenue requirement? If yes, please explain what methodology was utilized for the UBC NDES and why.

CORIX RESPONSE:

Yes, property tax was included. The methodology used was agreed upon with UBC, which has a special status. A percentage of net capital value was used to calculate the property taxes.

As stated in section 4.1.2 of Corix's "UBC NDES 2015 (Final) Rate Application":

> *A Service Levy, intended to emulate a municipal tax, is charged by UBC at a rate of 3.09% (2014 rate) of the value of leased land, buildings and pipes. Property owners on UBC's campus pay a Rural Property Tax to the Province of BC (i.e., 2.13%, 2014 rate for jurisdiction 739 Lower Mainland Rural) and the Services Levy to UBC. The two added together are substantially the same as the City of Vancouver municipal tax due on a property with the same assessed value. Although property assessment will be determined by the BC Assessment Authority, for purposes of the calculation, land value has been estimated at an indicative market rate of $590 per square meter based on input from UBC, buildings have been valued at net book value, and the pipes at 20% of their capital cost.*

8.0 Reference: FINANCIAL MODELING AND INPUTS
Exhibit B-1, Section 2.5.6, p. 23
Debt and equity financing

Corix states on page 23 of the Application that it set initial rates consistent with the British Columbia Utilities Commission Generic Cost of Capital (GCOC) Stage 2 Decision and is therefore proposing an equity risk premium of 75 points over the benchmark low risk utility.

On October 2, 2015, FortisBC Energy Inc. (FEI) filed an application for approval to increase its return on equity (ROE) from 8.75 percent, as established in the GCOC Stage 1 Decision, to 9.5 percent.

8.1 If FEI's request is approved, and in consideration of the fact that a decision on FEI's application will not be issued until sometime in 2016, please discuss how Corix plans to address any change to FEI's ROE (assuming the Commission determines that FEI shall remain the benchmark low risk utility).

CORIX RESPONSE:

Depending on the outcome of the FEI application, Corix may choose to make an application to the Commission for an amended ROE.

9.0 Reference: FINANCIAL MODELING AND INPUTS
Exhibit B-1, Sections 2.5.9 and 2.5.10, pp. 25–26
Levelized rate proposal and revenue deferral account

Corix states on page 25 of the Application: "Under the new levelized rate proposal, Corix would charge a 2016 rate of $109.27 per MWh and escalate the rate by 2.0% per annum over the next 10 years commencing on January 1, 2017."

9.1 Please explain why Corix considers $109.27 per MWh to be a reasonable initial rate for 2016.

CORIX RESPONSE:

The 2016 rate per MWh is based on Corix's objective of minimizing annual rate increases while fairly balancing the allocation of costs between current and future customers. Once the levelized rate is calculated for a particular forecast period, the opening rate for that period depends only on the annual escalation rate chosen. For this CPCN, Corix considered two scenarios as follows:

1. A 5.7% rate increase in 2016, followed by 1.0% annual escalation for 2017 to 2026 (the currently approved escalation rate).
2. A 0.2% rate increase in 2016, followed by 2.0% annual escalation for 2017 to 2026.

Corix proposes that the 2.0% escalation results in a reasonable allocation of costs over time and achieves the objective of minimizing the 2016 increase. Escalation rates approved for other small district energy systems are as follows:

- River District NEU – 3.94% annual escalation
- South East False Creek NEU – 3.22% until 2019, 2% from 2020 onwards
- UBC NDES – 2.9%

Corix states on page 25 of the Application: "As approved in Order C-7-11, the rates for the UniverCity NUS project have been levelized over 20 years. With the updated project assumptions, Corix expects to recover the deferral account by the end of year 15."

9.2 Please describe the main drivers which have resulted in Corix's proposal to shorten the levelization period by five years.

CORIX RESPONSE:

The main driver behind the proposal to shorten the levelization period by 5 years is that the energy volumes have increased in relation to the cost increases, resulting in a reduced levelized cost per unit of energy over time.

9.3 If Corix did not alter the originally approved RDDA recovery period and therefore planned to recover the RDDA by the end of year 20, what impact would this have on the proposed initial 2016 rate, the annual escalation rate, and the levelized rate? Please show all calculations and explain all assumptions/inputs.

CORIX RESPONSE:

Under the 15 year RDDA scenario assuming 2.0% escalation, the 2016 rate is $109.27 and the levelized rate for 2016 to 2026 is $121.68 (the proposal as filed with this CPCN).

Under the 20 year RDDA scenario assuming 2.0% escalation, the 2016 rate is $94.08 and the levelized rate for 2016 to 2026 is $104.76.

Under the 20 year RDDA scenario assuming 1.0% escalation, the 2016 rate is 101.24 and the levelized rate for 2016 to 2026 is $106.82.

These scenarios were calculated by extending the financial model and deferral account to 20 years and changing the escalation rates. These confidential financial models are provided to the Commission.

For reference purposes, according to the original CPCN the 2016 rate was $145.78 and the levelized rate for 2016 to 2026 was $152.31.

9.4 What are the advantages/disadvantages of reducing the RDDA recovery period by five years as proposed in the Application? Please discuss.

CORIX RESPONSE:

Advantages:

- Reduced financing costs: A reduced recovery period results in lower overall costs to customers over time because the deferral account accrues financing charges on the debt and equity required to finance the balances from year to year.
- Fairness between customers: A reduced recovery period results in fewer costs being deferred to future periods and potentially being charged to different customers.

Disadvantages:

- Rates: A reduced recovery period results in higher rates to customer in the earlier years, although this is offset by lower financing costs in the long term.

Corix states on page 26 of the Application: "Due to costs that exceed those originally forecast in the 2011 CPCN (see section 5.1), the 2014 year end deferral account balance totaled $1.45 million. Based on the estimated costs and revenues in this application, the account is expected to peak at $2.4 million in 2019."

9.5 In the form of two separate continuity schedules showing the opening and closing RDDA balance and the annual additions to the RDDA, please provide the following information for years 2011 through 2026 based on: (i) the original forecasts from the 2011 CPCN application; and (ii) the actual results for years 2011 through 2014 plus the updated forecasts as presented in the current application.

CORIX RESPONSE:

The continuity schedules below are from the financial models supporting the original CPCN and the current CPCN.

ORIGINAL MODEL *($000s)*	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Revenue requirement		303	384	541	793	826	824	829	834	839	853	869	876	884	892	899	907	915	922	931	939
Revenue billed		164	276	392	849	858	866	875	884	893	901	911	920	929	938	947	957	967	976	986	996
Revenue deficiency (surplus)		139	108	149	(57)	(32)	(42)	(46)	(50)	(54)	(49)	(42)	(43)	(45)	(47)	(48)	(50)	(52)	(54)	(55)	(57)
Financing			11	20	32	31	30	30	28	27	25	22	19	17	16	14	13	11	8	6	3
Change in income tax due to deferral											(9)	(20)	1	9	10	10	11	12	12	13	14
Net change in deferral account		139	119	169	(24)	(2)	(12)	(16)	(21)	(27)	(33)	(40)	(23)	(18)	(21)	(24)	(27)	(30)	(33)	(36)	(40)
Opening balance		-	139	258	427	402	401	389	373	352	324	291	251	228	210	189	166	139	109	77	40
Closing balance		139	258	427	402	401	389	373	352	324	291	251	228	210	189	166	139	109	77	40	(0)

NEW MODEL *($000s)*	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Revenue requirement	110	458	634	741	854	1,030	1,315	1,545	1,771	2,080	2,218	2,212	2,193	2,181	2,168	2,152					
Revenue billed	1	85	236	334	456	879	1,061	1,444	1,705	2,254	2,581	2,633	2,686	2,739	2,794	2,850					
Revenue deficiency (surplus)	110	373	398	407	398	151	255	100	66	(174)	(363)	(421)	(493)	(558)	(626)	(698)	0	0	0	0	0
Financing	4	23	54	89																	
Franchise fee impact					(12)	(5)	(8)	(3)	(2)	5	11	13	15	17	19	21					
Income tax													177	202	219	236					
Net change in deferral account	114	396	452	496	386	147	247	97	64	(169)	(352)	(409)	(301)	(339)	(388)	(441)					
Opening balance	0	114	509	961	1,457	1,843	1,990	2,237	2,335	2,398	2,230	1,877	1,469	1,168	829	441	0	0	0	0	0
Closing balance	114	509	961	1,457	1,843	1,990	2,237	2,335	2,398	2,230	1,877	1,469	1,168	829	441	0	0	0	0	0	0

Since the original CPCN was approved, the financial model has been refined as follows:

- Beginning in 2015, the annual cost of financing the RDDA is included within the revenue requirement (top line of schedule) and therefore not separately calculated within the RDDA.
- In the original model, the franchise fees were assumed to be fixed regardless of billed revenue. The new model adjusts the RDDA account by 3.0% of the revenue deficiency or surplus in each year.
- In the original model, revenue requirements were inclusive of income taxes assuming no RDDA mechanism and the change in income taxes due to the RDDA was then added in each year. In the new model, revenue requirements are calculated on a before tax basis, and the full amount of income tax is added to the RDDA in the years that the taxes become payable.

D. CHALLENGES & VARIANCES FROM ORIGINAL CPCN

10.0 Reference: INITIAL PHASE CAPITAL COST OVERVIEW
Exhibit B-1, Section 2.2, p. 12, Section 5.1, p. 41
TEC capital costs

On page 12 of the Application, Corix proposes "to replace the existing 2.3 MW containerized temporary energy centre (TEC) with a larger capacity TEC in the same location."

In regards to the variance in TEC capital costs, Corix states on page 41 of the Application:

> Cost to build a first module of the TEC were higher than originally estimated due to the City of Burnaby (CoB) building and planning requirements. These were not initially included as the plant was expected to be classified as a temporary structure. CoB considered the TEC a permanent building and Corix had to undertake the preliminary plan approval (PPA) and building permit process and comply with CoB requirements.

10.1 Please indicate whether Corix will have to undertake a new PPA and building permit process to comply with CoB requirements for the proposed larger capacity TEC.

CORIX RESPONSE:

It is Corix's understanding that a PPA will not be required as the impact to the surrounding environment will be minimal, however, a building permit will be required as the "building" is proposed to be replaced, which would mean that the equipment installed within the container itself would be subject to BC building code standards.

10.1.1 If confirmed, please indicate the impact to the project cost.

CORIX RESPONSE:

Corix has forecasted $100,000 to be allocated to this process. This number is inclusive of the total capital forecast of $1,100,000 for the new proposed plant. This number was estimated using historical costs incurred in the implementation phase of the 2.3 MW TEC.

10.2 Please indicate why the CoB's consideration of the TEC's temporary vs. permanent structure status was not confirmed during the original CPCN to thereby allow Corix to more accurately assess the project costs?

CORIX RESPONSE:

In developing the UniverCity NUS, Corix was aware that the installation of a temporary containerized plant had been used previously in developing the energy utility at South East False Creek. In that project the temporary containerized plant was not considered a permanent structure. During its initial discussions with the City of Burnaby, Corix received information that the containerized plant would most likely be considered as a piece of equipment but not as a permanent building, and therefore would not be subject to a full building permit. It was only subsequent to the 2011 CPCN submission and during the detailed design process and review of the by-laws that the City determined that the structure would be considered a permanent building and would require the PPA and building permits.

11.0 Reference: INITIAL PHASE CAPITAL COST OVERVIEW
Exhibit B-1, Section 5.1, p. 41
Distribution Piping System (DPS) construction costs

In regards to the variance in DPS construction costs, Corix states on page 41 of the Application:

> Scope of work (e.g., a new route, hauling and disposal of the excavation material off the Burnaby Mountain, etc.), CoB requirements and in-situ conditions (e.g., shoring, route changes to accommodate other infrastructure not captured on the drawings provided to Corix, etc.) led to significant increase in costs to complete the DPS to connect initial buildings... Corix has paid CoB a road access fee and road pavement degradations fees, which were not estimated in the original cost estimates. 2011 CPCN modelled cost per trench meter was $1,300/tm vs. $2,800/tm actual costs.

11.1 What cost per trench meter is being used for the estimated build-out of the system? Please explain basis and assumptions.

CORIX RESPONSE:

Corix has used $2,800/tm as the basis for future distribution extensions. Historically the costs incurred to date regarding distribution extensions have been in this range. This is also the same rage of cost per trench meter Corix has experienced in other utilities Corix is currently constructing.

11.1.1 How was the $1300/tm from the 2011 CPCN arrived at (basis and assumptions)?

CORIX RESPONSE:

The costs were calculated by the engineering consultant using a costing database available at the time the forecasts were produced.

11.2 Does Corix agree that within the scope of work, the hauling and disposal of the excavation material off the Burnaby Mountain could have been foreseen during the original CPCN? Please indicate reasons for why this was not included in the scope of work.

CORIX RESPONSE:

The projected cost estimates used for the 2011 CPCN were based on a conceptual design. While every attempt was made to ensure all of the costs were reflected in the project estimates, when detailed design was later undertaken, it was discovered that the conceptual design phase had inadvertently missed and / or underestimated the costs for some aspects of project. Corix worked and continues to work in close consultation with SFU, the City of Burnaby, and installation contractors to mitigate the effect of these changes / increases to the best of its ability and all future forecasts now consider these factors.

11.3 Does Corix agree that a road access fee and road pavement degradations fees to CoB could have been foreseen during the original CPCN? Please indicate reasons for why this was not included in the original cost estimates.

CORIX RESPONSE:

In preparing the 2011 CPCN, during the conceptual design stage, Corix and its civil engineer were informed that the City of Burnaby would not allow NUS infrastructure into their roadways. Preliminary design for the distribution system was undertaken using an alternative route in the SFU Statutory Rights of Way that would avoid the City's roadways, and it was this design and the associated cost estimate that was included in the 2011 CPCN. Because this alternative route was longer and more costly than a route using the City roadways, subsequent to the granting of the 2011 CPCN Corix initiated discussion with the City highlighting the benefits to UniverCity customers if the distribution pipeline was installed in the City's roadways. The result of these discussions was that the City granted Corix the right to install infrastructure in their roadways, which required the payment of a road access fee and pavement degradation fee.

E. ENERGY LOAD AND ANNUAL ENERGY DEMAND

12.0 Reference: SENSITIVITY ANALYSIS
Exhibit B-1, Section 2.3.1, p. 13; Section 2.5.13, Table 19, p. 28; Corix Application for a CPCN for the Neighbourhood Utility Service at UniverCity Burnaby (2011 CPCN) proceeding, dated November 26, 2010, Exhibit B-1, p. 16
Sensitivity

Corix presents its sensitivity scenarios in Table 19 on page 28 of its Application.

12.1 Please expand Table 19 to include the following additional sensitivity scenarios: i) consumption decrease by 25 percent; ii) consumption decrease by 35 percent; iii) consumption increase by 25 percent; iv) consumption increase by 35 percent.

CORIX RESPONSE:

Please see the table below. Note that the potential impact to changes in capital were not provided for scenarios six through nine as this information was not specifically requested.

SENSITIVITY SCENARIO	CONSUMPTION MWH	CAPITAL COSTS TO COMPLETE ($)	LEVELIZED RATE PER MWH
CPCN	21,398	2,947	$121.68
SCENARIO 1	15% increase in year 2022	No change	$117.24
SCENARIO 2	No change	20% increase	$125.81
SCENARIO 3	15% Increase	20% increase	$121.10
SCENARIO 4	15% decrease in year 2022	No change	$126.82
SCENARIO 5	15% decrease	20% increase	$131.28
SCENARIO 6	25% increase in year 2022	N/A	$114.59
SCENARIO 7	25% decrease	N/A	$130.74
SCENARIO 8	35% increase in year 2022	N/A	$112.16
SCENARIO 9	35% decrease	N/A	$135.13

Corix presents the UniverCity buildout comparison between the original buildout and updated buildout in Figure 5 on page 13 of its Application.

12.2 Please present the impact the buildout schedule has on energy demand, diversified capacity, and the revenue deficiency deferral account each year from 2011 to 2030 by completing the table in the excel spreadsheet attached. Please clearly identify actual data and forecasted data.

CORIX RESPONSE:

Please see Attachment Three. Note that the calculations under various scenarios are completed for the 8 MW TEC and the number of buildings that would be supplied by energy from the 8 MW TEC (18 buildings).

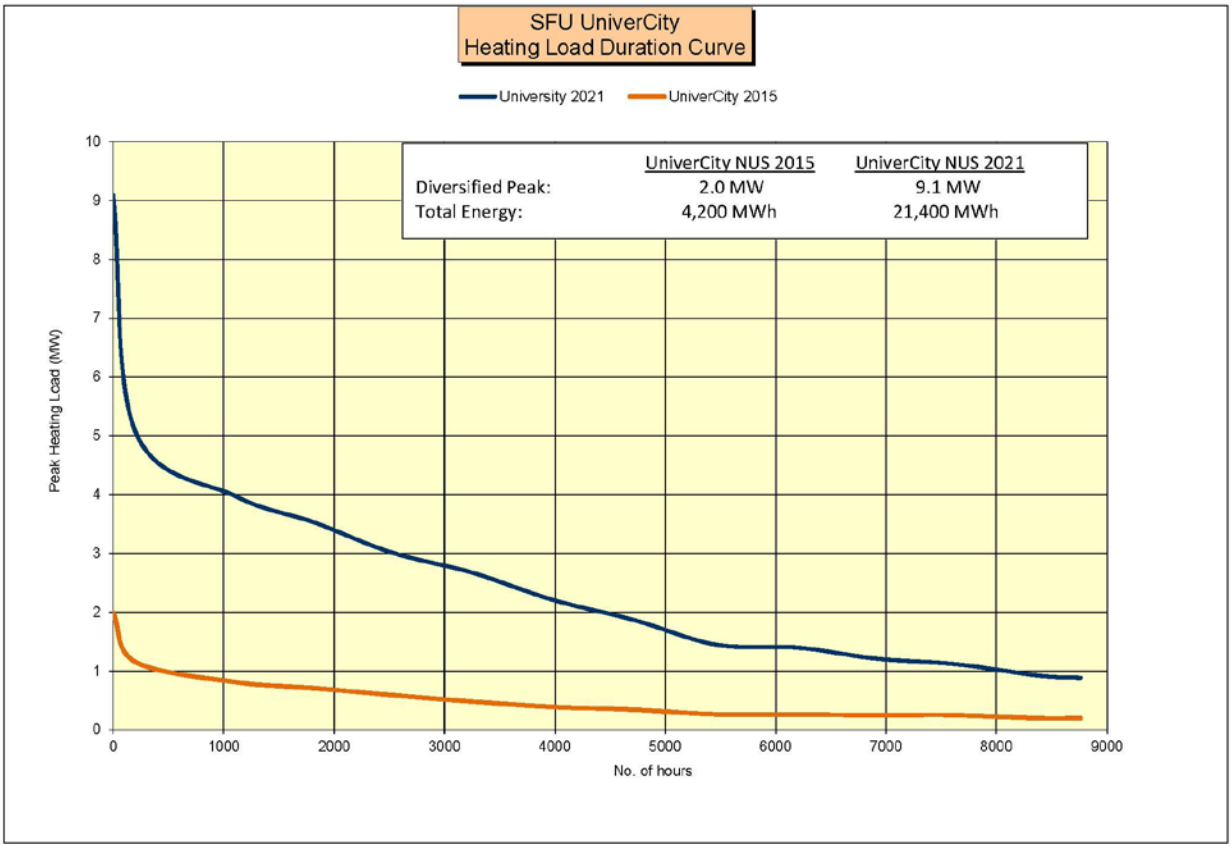
Corix presents a load duration curve on page 16 of its 2011 CPCN application.

12.3 Please provide a similar load duration curve as referenced in the preamble for 2015 actual load and 2021 forecasted load.

CORIX RESPONSE:

Please see the load duration curve provided below.

Corix - SFU UniverCity CONFIDENTIAL



13.0 Reference: ENERGY LOAD AND ANNUAL ENERGY DEMAND
Exhibit B-1, Section 2.3.2, p. 14
Demand forecast methodology

Corix states on page 14 of its Application: "Energy loads and annual energy demand is determined using the Energy Use Intensity (EUI)…"

13.1 Please provide the information used to inform the load forecast, and explain the source of the information obtained.

CORIX RESPONSE:

Corix uses the information sourced from developers during detailed design to develop demand forecasts for the buildings connecting to the NUS. This information is analyzed in depth by Corix's energy consultant and a load forecast / design for the energy transfer station is derived.

Attachment Four represents the basis for which Corix forecasts annual energy demand (kWh consumption). This information is gathered from the revenue grade thermal energy meters that Corix uses for billing purposes. The information is compiled and tracked in a Key Performance Indicator (KPI) matrix which Corix uses to forecast current annual energy demand and future demand.

13.2 Please explain in detail the process, calculations, inputs and any assumptions used to produce the forecasted energy demand and diversified capacity.

CORIX RESPONSE:

Actual energy and demand data has been collected and trended through the control and metering system since the NUS has been in operation. Energy load data is logged in kW for each building and total peak load in kW for the NUS plant. Energy demand data is logged in kWh for each building as well as for the total energy output from the NUS plant. From this data, average energy loads and demands were calculated.

To calculate the space heating energy load of 50 W/m^2 from Table 3 of the CPCN application, the total of each individual building peak load logged was divided by the total building area connected to the NUS. This was further compared and validated with building data from other buildings connected to district energy systems in the Vancouver area.

Buildings categorized as low rise were specifically analyzed to calculate the low rise energy demand of 105 kWh/m^2. Likewise, buildings categorized as high rise were specifically analyzed to calculate the high rise energy demand of 130 kWh/m^2. The average energy demand is the average between the low rise and high rise values.

A conservative approach has been utilized for forecasting the future peak loads and annual energy usage. The future building loads are forecasted based on load intensity of 50 W/m^2. The peak load noted in the load duration curve for 2021 corresponds to the full buildout area of 213,879 m^2 multiplied by 50 W/m^2 resulting in an undiversified peak load of 10,695 kW and diversified peak load of 9,091 kW. A diversification factor of 85% has been applied to the total peak load to estimate the total system load the NUS plant will experience. The annual energy

demand forecast is based on an annual energy usage of 100 kWh/m^2, to allow for anticipated future design improvements that reduce energy usage.

13.2.1 If available, please present any calculations and models in a functional excel spreadsheet.

CORIX RESPONSE:

These calculations are available in the confidential financial model Corix submitted as part of the application. This information can be found on the "Assumptions" tab on rows 27 through 51.

13.2.2 Please identify and explain any differences between the demand forecast methodology used in this Application versus the one used to produce the original forecast presented in the 2011 CPCN application.

CORIX RESPONSE:

Corix with the support of its consultant uses the same methodology for load demand and annual energy demand forecasts. The underlying difference between the 2011 forecast and the current forecast is that the assumed EUI is no longer based off of a feasibility study but rather real data collected by the utility which reflects the actual performance of the system in its entirety.

13.3 Please provide the occupancy rate of the completed buildings in NUS and the assumed occupancy rate used in the demand forecast.

CORIX RESPONSE:

It is Corix's understanding that all buildings currently connected to the NUS are fully occupied. Forecasts of demand are also based on fully occupied buildings.

13.4 Please state the percentage of existing building gross floor area connected to the current TEC, and state the percentage of building gross floor area expected to connect to the TEC in the load forecast.

CORIX RESPONSE:

This information is available in the confidential financial model submitted with the CPCN application and provided below:

Parcel	Max GFA (m2)	(815kW) NG boiler capacity(kW)	Biomass (kW)	Total Capacity	N-1 Capacity	Redundancy (N-1 to demand)
22	553					
27	6,843					
28	7,151	2,445		2,445	1,630	229%
23	6,513	2,445		2,445	1,630	164%
29	4,676			-		
16	9,376	2,445		2,445	1,630	103%
16A	9,376			-		
25	20,303	2,445		2,445	1,630	55%
30	14,059	8,000		8,000	5,000	144%
18	16,533			-		
21	8,003	8,000		8,000	5,000	110%
31	9,493	8,000		8,000	6,500	
37	6,225			-		
32	3,302	8,000		8,000	5,000	93%
19	8,497			-		
33	9,335			-		
24	21,602	8,000	3,500	11,500	5,000	72%
17	10,409			-		
34	9,411	8,000	3,500	11,500	5,000	65%
20	19,663			-		
35	6,141			-		
36	6,414	8,000	3,500	11,500	5,000	55%
Total	213,878					

In summary, the total current GFA connected to the 2.3 MW plant is currently servicing 35,112m^2 and has reached the limits of its ability to serve additional GFA. The proposed 8 MW plant would allow Corix to serve 181,660m^2 and would ultimately become a part of the permanent facility once constructed for provision of peaking and back up.

Corix states on page 14 of the Application "It is important to note that the energy intensities vary by building and are significantly impacted by whether the units are owned versus rented."

13.5 Please explain the methodology and inputs to calculate the EUI.

CORIX RESPONSE:

This statement is based on anecdotal observation. Corix has limited actual information regarding ownership of buildings but rather is able to gather high level information from the SFU Community Trust regarding the individual building type occupancy. It should be noted that there is no change in the methodology used to calculate and forecast EUI's as Corix uses historically trended data for forecasting as described above. The intent of this statement was to indicate that there are many factors which drive the EUI that are outside of the control of the utility.

13.6 Please state the assumptions and explain, with calculations, how the annual EUI in buildings with partial hydronic servicing was adjusted to account for reduced space heating provided through the temporary energy centre (TEC).

CORIX RESPONSE:

The UniverCity NUS does not contain buildings with partial hydronic servicing.

13.7 Please provide the average actual EUI for rental units and owned units within each connected building in a table and in a functional excel spreadsheet. Please also provide an overall average EUI for the following: i) rental units in concrete buildings; ii) owned units in concrete buildings; iii) rental units in wood frame buildings; iv) owned units in wood frame buildings.

CORIX RESPONSE:

Corix does not meter individual units within a building and therefore Corix is unable to provide the requested information. It should be noted that all metering information is collected and billed on a bulk level which is collected at the energy transfer station in each building.

Corix can provide the following information related to the average EUI's of both wood frame and concrete constructed buildings.

Wood frame	105 kWh/m^2
Concrete	130 kWh/m^2

The numbers above are calculated using the information provided in Attachment Four.

13.7.1 If the data request is unavailable, please support Corix's statement in the preamble.

CORIX RESPONSE:

N/A.

13.8 Please explain whether Corix incorporated rental versus owned EUI and the anticipated ratio of rented versus owned units in its demand forecast. If yes, please present the values and weightings. If not, please explain why not.

CORIX RESPONSE:

As explained in the response to 13.7, Corix does not have detailed information of ownership and therefore cannot factor rental versus owned into its assumptions and forecasts.

14.0 Reference: ENERGY LOAD AND ANNUAL ENERGY DEMAND
Exhibit B-1, Section 2.3.2, p. 14
Energy Use Intensity (EUI)

Corix states on page 14 of the Application:

> The EUIs used in the original studies were determined based on the development requirements to comply with the stringent energy efficiency requirements stipulated by the [SFU Community] Trust. To date the actual operating data as well as design requirements from the building developers show that the originally estimated EUIs were aggressive and that the load requirements as well as annual energy demands are significantly higher than originally projected.

14.1 Please explain whether the connected buildings to date conformed to the energy efficiency requirements stipulated by the Trust.

CORIX RESPONSE:

It is Corix's understanding that not all of the buildings constructed to date achieved the density bonus offered by the Community Trust. Four of the six building have received the bonus.

14.2 Please provide reasons why the EUI as observed from the actual operating data differ significantly from the initial forecast presented in the Commission approved 2011 CPCN application.

CORIX RESPONSE:

There are several potential reasons why the observed EUI values might be different from the 2011 CPCN forecast EUI values:

- The EUI values in the 2011 CPCN were estimates based on engineering criteria and these estimates may have been overly optimistic.
- As noted in the response to 14.1, not all of the buildings that were constructed qualified for the density bonus, which implies these buildings were not constructed in accordance with the Trust's guidelines designed to achieve the EUI values in the 2011 CPCN.
- Tenant behaviour may have a significant influence on energy use, however this is not something that was modeled.

Corix further states on page 14: "The comparison of the originally estimated EUI and actual data and assumptions used for the updates in the load forecast and annual energy demand are summarized in [Table 3]."

14.3 Please elaborate on the source, type of information and the time frame covered by the actual data referenced in the preamble.

CORIX RESPONSE:

Corix is able to access detailed historical information from the energy meters used for billing purposes. These meters contain data for supply temperatures, return temperatures, flow rates, energy consumption and load demand (Power - kW). The information is housed in the meters' internal memory for up to 15 years and is also stored in a revolving one year duration on Corix SCADA system which is back up to a server for an indefinite period of time.

14.4 Please present the updated EUI assumptions for energy load for space heating for low rise and high rise separately.

CORIX RESPONSE:

A low rise (wood frame) building is assumed at 105 kWh/m^2 and a high rise (concrete) building is assumed at 130 kWh/m^2.

14.4.1 Please explain whether the average energy load for UniverCity presented in Table 3 is a weighted average proportionate to the number of high rise and low rise buildings. If not, please explain.

CORIX RESPONSE:

Yes, it is a weighted average proportionate to the ratio of high rise building area versus low rise building area. See response to 13.2.

15.0 Reference: INITIAL PHASE CAPITAL COST OVERVIEW
Exhibit B-1, Section 5.1, p. 41;
Corix 2011 CPCN proceeding, Decision dated May 6, 2011, Order C-7-11, p. 10
Uncertainty

Order C-7-11 accompanying the Corix 2011 CPCN Decision states on page 10: "CMUS has noted that the demand forecast has a high level of uncertainty and will require actual operating experience before the energy demand can be forecasted with any degree of accuracy." Some of the uncertainties mentioned on page 33-34 of the decision include the number of units that will be connected to the NUS, development risk, and implementation of any supplementary energy sources at the building level by developers.

Corix states on page 41 of its Application: "In the time period since the 2011 CPCN was granted, the development schedule has changed and the gross floor area (GFA) being added have changed."

15.1 Please describe all uncertainties in Corix's updated demand forecast, and explain the directional and magnitudinal impact each uncertainty has on the confidence of the energy load and diversified capacity forecast.

CORIX RESPONSE:

Uncertainties related to the NUS demand forecast include:

- Build-out: the pace and extent of new building development depends on the real estate market.
- Weather: fluctuations in seasonal temperatures impact load requirements, and the utility must design capacity based on historical coldest day criteria.
- End user behaviour: in addition to the building envelope and in-building heating system impact on energy demand, occupant behaviour can significantly influence system energy demand.

The table in response to 12.1 provides sensitivity analysis of these factors on the demand forecast.

15.1.1 Please explain which of the uncertainties, if any, on the demand forecast presented in the 2011 CPCN has been minimized or alleviated from the operational experience to date.

CORIX RESPONSE:

Build-out is an exogenous factor outside of Corix's control, however the utility mitigates some of the risk related to fluctuations in build-out though timing the development of the NUS infrastructure whenever possible to coincide with new buildings coming online.

For weather impacts, careful monitoring of peak demand send out periods can facilitate planning of future capacity requirements.

End user behaviour has resulted in significantly larger EUI values over what was originally predicted based on engineering factors. Corix is developing a web site to better inform and encourage end users to adopt more energy efficient practices.

16.0 Reference: ENERGY LOAD AND ANNUAL ENERGY DEMAND *Clean Energy Act*, SBC 2010, Chapter 22, Section 2(b) Demand-side measures

Section 2 of the *Clean Energy Act* states "The following comprise British Columbia's energy objectives: (b) to take demand-side measures and to conserve energy…"

16.1 Please explain whether Corix has considered any demand-side measures (DSM) to reduce the energy demand forecasted from 2015 to 2022.

CORIX RESPONSE:

Corix actively seeks engagement with the community it serves and is always willing to provide information and suggestions as to how customers can lower their energy bills. Possible DSM measures for a district energy system would target thermal efficiency improvements for the building envelope and domestic hot water systems, and changes to occupant behaviour. Since the existing buildings have recently been constructed and future expansion of the NUS will serve new buildings that conform to up-to-date energy efficiency codes and standards, Corix is not aware of cost effective DSM measures that would target the physical systems.

Occupant behaviour can best be influenced by making energy consumption information available, along with information campaigns that promote energy saving strategies. At the time of the initial development of the NUS and prior to hooking up the initial buildings, Corix reviewed the economic feasibility of installing in-suite revenue grade meters and determined that this was not a practical option for the utility at that time.

Corix is developing a website for its customers, the building stratas, and developers which it expects to unveil sometime in Q1 of 2016. The website will include information on conservation measures, customer care, and billing and have a separate area for developers looking for connection information regarding the utility.

16.2 Please elaborate on whether Corix will actively seek conservation opportunities and implement any feasible DSM on an ongoing basis.

CORIX RESPONSE:

Corix constantly explores opportunities to run a more efficient thermal energy system, and any feasible cost effective energy conservation approaches will be instituted. One area that may have potential to influence system energy use is the installation of in-suite information meters. While these would not be used for direct utility billing at the suite level, in cooperation with strata management, they could be used by the stratas to allocate the variable cost component on their utility bills directly to each suite.

16.3 Please elaborate on whether Corix's energy load and annual energy demand forecast accounts for a reduction in energy demand by DSM. If not, please explain why not.

CORIX RESPONSE:

The current energy load and annual energy demand forecasts do not incorporate reductions due to DSM since it is not possible at this time to ascertain what impact the proposed web-based conservation information will have on occupant behaviour. However, Corix monitors energy load and consumption data and any impacts from this information campaign or future conservation programs will be evaluated and incorporated into future development of the NUS.

16.3.1 If applicable, please produce an energy load and annual energy demand forecast net of DSM. If not applicable, please elaborate.

CORIX RESPONSE:

Please see the response to 16.3.

16.4 Please discuss, in Corix's view, whether DSM is a feasible option to reduce the need to increase the capacity of boiler plants to fulfill future energy load.

CORIX RESPONSE:

As discussed in the response to 16.2, a DSM program for installing suite level information energy meters in cooperation with strata management may be a cost effect approach to encouraging energy conservation. Whether this also would result in decreased peak load and therefore capacity requirements is uncertain, but if such a program were to proceed, the Utility's ongoing energy monitoring would pick it up.

17.0 Reference: ENERGY LOAD AND ANNUAL ENERGY DEMAND
Exhibit B-1-1, Confidential Financial Model
Confidentiality

17.1 Please explain why the "assumptions" tab and the energy demand presented under the "forecast" tab are confidential. If the information contained is not confidential, please re-file on a non-confidential basis.

CORIX RESPONSE:

It is not the intent of Corix to keep this information confidential. The information contained in the confidential financial model from the demand forecast tab and the assumptions tab is also contained in the main CPCN document. The demand forecast information is contained in section *2.3.2 Energy Loads and Annual Energy Demand* beginning on page 14 while the information in the assumptions tab is provided in various sections throughout the CPCN document, mainly Section *2.5 Financial Modeling and Inputs*. For clarity, please see Attachment Five for a document containing the "Assumptions" tab information and energy demand from the "Forecast" tab of the financial model. What Corix has requested be kept confidential is the working Excel financial model.

17.1.1 If a portion of the information contained in the "assumptions" and "forecast" tabs are confidential, please file a redacted version on a non-confidential basis.

CORIX RESPONSE:

Please see the response to 17.1.

F. INFRASTRUCTURE AND PERSONNEL ADDITIONS

18.0 Reference: HUMAN RESOURCES REQUIREMENT
Exhibit B-1, Section 2.5.4, p. 21; Section 4.4, p. 35
Personnel addition

On page 35 of the Application, Corix states:

> Corix expects that the new TEC will not require full-time personnel and will be of the same unmanned status. Based on the current BC Safety Authority (BCSA) regulation (the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation) the temporary plant proposed will have less than 150 m^2 of heating surface area which is the threshold for a supervision required status.

In addition, on page 21 of the Application, Corix states, "after the new TEC is installed and starting in 2017, Corix will employ its own operator on a 0.5 full time equivalent (FTE) basis. The remaining 0.5 FTE will be allocated to another Corix district energy project."

18.1 If Corix had instead added an additional 2.3 MW TEC, would Corix still have likely employed its own operator on a 0.5 FTE basis? Please explain.

CORIX RESPONSE:

Yes, given the rate at which the utility service has grown Corix sees the benefit of employing its own operator to deal with majority of the day to day operational tasks.

18.2 Why has 2017 been decided as the time of hire for the new operator? Does this imply that TEC will grow beyond the 150 m^2 size in 2017 and therefore has to meet the BCSA Regulation (the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation) for plants greater than 150 m^2? If so, what infrastructure changes are taking place in 2017?

CORIX RESPONSE:

The total heating surface area of the plant will not exceed the 150m^2 threshold under the proposed 8 MW plant. 2017 is the year in which Corix has determined that the addition of a 0.5 FTE will add economic benefit and value to the operation and ultimately the rate payers. This decision is predicated on the growth and maturity of other DE utilities Corix is currently developing and operating. These utilities will also support approximately the same level of FTE involvement given their current level of maturity.

18.3 Please describe the roles and responsibilities to be performed by the operator starting in 2017 and how Corix determined the appropriate amount of time required for the operator to work on the UniverCity NUS. Also indicate what the BCSA Regulation specifically states regarding time commitment of an operator for supervision of a plant greater than 150 m^2? Please provide a reference to the Regulation.

CORIX RESPONSE:

The Corix operator will be primarily responsible for the day to day routine inspections and maintenance. This would include for all health and safety aspects assuring the system maintains a safe and compliant operation, all distribution maintenance, all schedule routine energy transfer station maintenance, majority of routine plant maintenance, primary contact for all sub-contractors used for additional maintenance items (i.e., annual boiler inspections and maintenance), some SCADA maintenance and the primary contact for emergency call outs.

The BCSA regulation states that a fluid heating plant under 150 m^2 is exempt from the requirement to have a certified power engineer / operator on-site (Section 6). The regulation also state that unless a plant is registered under section 54 or exempt under section 6 then the plant is subject to continuous supervision meaning that the certified power engineer / operator must be at the plant all times during its operation.

Section 54 of the regulation can deem a plant into one of two categories, a) a general supervision status, or b) a risk assessed status. Under general supervision the fluid heating plant must not exceed 500m^2 total surface heating area and the plant must be inspected at a minimum by a power engineer with the appropriate level certification in accordance with the

conditions as defined by the provincial safety manager. Risk assessed status is also given to a plant with 500m^2 or less of surface heating area but requires that a power engineer with the appropriate level of certification be at the plant not less than 7 hours per day or such greater time as may be required by the provincial safety manager.

18.4 Which Corix district energy project will the remaining 0.5 FTE be allocated to?

CORIX RESPONSE:

Richmond Oval Village and call out support for the UBC NDES.

Attachment One: UniverCity NUS – 2.3MW TEC Net Book Value

In support of IR's 5.6 and 5.9.

UniverCity NUS - 2.3MW TEC Net Book Value																
					7.95%	Average Depr %		Depreciation		Depreciation			Depreciation			
Description	**Description 2**	**Main Asset/Component**	**Net Book Value**	**Depreciation Start Date**	**Depreciation Rate**	**Useful Life in Years**	**Dec 2015 Net Book Value**	**12/1/2016**	**Dec 2016 Net Book Value**	**11/1/2017**	**12/1/2017**	**Dec 2017 Net Book Value**	**12/1/2018**	**Dec 2018 Net Book Value**	**Dec 2019 Net Book Value**	**Dec 2020 Net Book Value**
Central/Temp Energy Plant		Main Asset	-		0.00%	-										
Boiler 1 900 KWH - 3M BTU Cast	Iron Sectional Condensing (incl Vents)	Component	42,156.33	4/30/2012	6.67%	15.00	41,545.21	-305.56	37,878.49	-305.56	-305.56	34,211.77	-305.56	30,545.05	26,878.33	23,211.61
Boiler 2 900 KWH - 3M BTU Cast	Iron Sectional Condensing (incl Vents)	Component	42,156.33	4/30/2012	6.67%	15.00	41,545.21	-305.56	37,878.49	-305.56	-305.56	34,211.77	-305.56	30,545.05	26,878.33	23,211.61
Boiler 3 900 KWH - 3M BTU Cast	Iron Sectional Condensing (incl Vents)	Component	42,156.33	4/30/2012	6.67%	15.00	41,545.21	-305.56	37,878.49	-305.56	-305.56	34,211.77	-305.56	30,545.05	26,878.33	23,211.61
(ET-1) Expansion Tank 1	2000 Litre - HTS2000	Component	10,723.08	4/30/2012	5.00%	20.00	10,614.74	-54.17	9,964.70	-54.17	-54.17	9,314.66	-54.17	8,664.62	8,014.58	7,364.54
(ET-2) Expansion Tank 2	1600Litre - HTS1600	Component	8,248.50	4/30/2012	5.00%	20.00	8,165.16	-41.67	7,665.12	-41.67	-41.67	7,165.08	-41.67	6,665.04	6,165.00	5,664.96
(P-1) 5HP Pump 1 Sensorless	2x2x10 Impeller Vertical Pump	Component	3,730.67	4/30/2012	13.33%	7.50	3,575.11	-77.78	2,641.75	-77.78	-77.78	1,708.39	-77.78	775.03	- 0.00	- 0.00
(P-2) 5HP Pump 2 Sensorless	2x2x10 Impeller Vertical Pump	Component	3,730.67	4/30/2012	13.33%	7.50	3,575.11	-77.78	2,641.75	-77.78	-77.78	1,708.39	-77.78	775.03	- 0.00	- 0.00
Valves, Fittings, appurtenance		Component	9,593.33	4/30/2012	13.33%	7.50	9,193.33	-200	6,793.33	-200	-200	4,393.33	-200	1,993.33	-	-
Internal Piping in CEP plant		Component	24,084.25	4/30/2012	6.67%	15.00	23,735.13	-174.56	21,640.41	-174.56	-174.56	19,545.69	-174.56	17,450.97	15,356.25	13,261.53
CEP Container Shell	40ft Seacan	Component	7,938.49	4/30/2012	6.67%	15.00	7,823.41	-57.54	7,132.93	-57.54	-57.54	6,442.45	-57.54	5,751.97	5,061.49	4,371.01
Emergency alarms, sensors,	electrical, misc.	Component	14,297.27	4/30/2012	10.00%	10.00	13,930.53	-183.37	11,730.09	-183.37	-183.37	9,529.65	-183.37	7,329.21	5,128.77	2,928.33
Barnett Protalk Cv3 autodialer & accessories for	UniverCity TEC	Component	2,564.72	6/1/2015	10.00%	10.00	2,520.12	-22.3	2,252.52	-22.3	-22.3	1,984.92	-22.3	1,717.32	1,449.72	1,182.12
			211,379.97				207,768.27	- 1,805.85	186,098.07	- 1,805.85	- 1,805.85	164,427.87	- 1,805.85	142,757.67	121,810.80	104,407.32

Attachment Two:

In support of IR's 6.7, 6.8, 6.10 and 6.10.1.

UniverCity CPCN #2 IR 6.7 & 6.8																
			Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Totals**	Comments
Legal																
	Internal		900	900	900	900	900	900	900	900	900	900	900	900	10,800	Contract negotiations
	External		500	500	500	500	500	500	500	500	500	500	500	500	6,000	Contract negotiations, SRW Registrations
Accounting			1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	1,495	19,590	Accounting records; Capital tracking, set up;
															-	
Regulatory			600	600	600	600	300	300	300	300	300	600	600	600	5,700	Dir of Reg; CPCN; Rate Application
IT Support/Maintenance			700	700	700	700	700	700	700	700	700	700	700	700	8,400	Set up; Navision upgrades; systems requirements
															-	Support for Rate Application; Regulatory Reporting
CUI Management/Admin																
	Admin		1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	17,550	
	Mgr		1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718	22,460	
			7,375	7,375	7,375	7,375	7,075	7,075	7,075	7,075	7,075	7,375	7,375	7,375	90,500	
Hours																
Legal internal	150		6	6	6	6	6	6	6	6	6	6	6	6	72	
Legal external	250		2	2	2	2	2	2	2	2	2	2	2	2	24	
Accounting	75		20	20	20	20	20	20	20	20	20	20	20	20	239	
Regulatory	150		4	4	4	4	2	2	2	2	2	4	4	4	38	
CMUS Management	125		14	14	14	14	14	14	14	14	14	14	14	14	165	
CMUS Admin	65		23	23	23	23	23	23	23	23	23	23	23	23	270	

Attachment Three:

In support of IR 12.2.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2030
Buildout schedule accelerated consistently; all buildings connected by 2019																					
GFA (m2)	553	553	14,547	21,060	35,112	64,791	78,850	122,406	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660
Diversified Capacity (kW)	51	51	712	995	1,579	2,938	3,472	5,387	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714
Energy Demand (kWh)	8	728	2,094	2,949	4,182	8,040	9,517	14,704	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398
Revenue Deficiency Deferral Account ($)	113,142	452,183	884,099	1,456,988	1,842,989	2,012,594	2,289,448	2,387,262	2,164,881	1,917,007	1,612,167	1,296,023	1,039,618	740,392	395,012	(0)					
Base case; all buildings connected by 2022																					
GFA (m2)	553	553	14,547	21,060	35,112	64,791	78,850	103,386	122,406	161,840	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660	181,660
Diversified Capacity (kW)	51	51	712	995	1,579	2,938	3,472	4,536	5,387	6,903	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714	7,714
Energy Demand (kWh)	8	728	2,094	2,949	4,182	8,040	9,517	12,706	14,703	19,056	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398	21,398
Revenue Deficiency Deferral Account ($)	113,142	452,183	884,099	1,456,988	1,842,989	1,989,863	2,237,062	2,334,521	2,398,194	2,229,689	1,877,314	1,468,754	1,168,250	829,345	441,159	0					
Buildout schedule consistenty slower than anticipated; all buildings connected by 2025																					
GFA (m2)	553	553	14,547	21,060	35,112	64,791	78,850	103,386	103,386	103,386	122,406	122,406	161,840	161,840	181,660	181,660	181,660	181,660	181,660	181,660	181,660
Diversified Capacity (kW)	51	51	712	995	1,579	2,938	3,472	4,536	4,536	4,536	5,387	5,387	6,903	6,903	7,714	7,714	7,714	7,714	7,714	7,714	7,714
Energy Demand (kWh)	8	728	2,094	2,949	4,182	8,040	9,517	12,706	12,706	12,706	14,703	14,703	19,056	19,056	21,398	21,398	21,398	21,398	21,398	21,398	21,398
Revenue Deficiency Deferral Account ($)	113,142	452,183	884,099	1,456,988	1,842,989	1,919,869	2,080,396	2,054,081	2,031,267	2,069,661	1,997,775	1,901,932	1,466,334	1,127,051	591,670	-					
Buildout schedule consistently slower than anticipated; all buildings connected by 2030																					
GFA (m2)	553	553	14,547	21,060	35,112	64,791	78,850	95,383	103,386	103,386	112,879	119,104	122,406	130,903	140,238	161,840	161,840	172,249	181,660	181,660	181,660
Diversified Capacity (kW)	51	51	712	995	1,579	2,938	3,472	4,189	4,536	4,536	5,026	5,262	5,387	5,755	6,112	6,903	6,903	7,354	7,714	7,714	7,714
Energy Demand (kWh)	8	728	2,094	2,949	4,182	8,040	9,517	11,666	12,706	12,706	13,703	14,357	14,704	15,809	16,789	19,057	19,057	20,410	21,398	21,398	21,398
Revenue Deficiency Deferral Account ($)	113,142	452,183	884,099	1,456,988	1,842,989	2,050,519	2,372,828	2,628,736	2,838,536	3,086,206	3,309,890	3,486,176	3,671,147	3,757,518	3,801,159	3,666,706	3,042,376	2,463,229	1,675,858	879,543	0
Actual data																					
Forecasted data																					

Attachment Four:

In support of IR's 13.1 and 13.7.

UniverCity NUS - 2014 Performance Data																		
Month		**Jan**	**Feb**	**Mar**	**Q1**	**Apr**	**May**	**Jun**	**Q2**	**Jul**	**Aug**	**Sep**	**Q3**	**Oct**	**Nov**	**Dec**	**Q4**	**Totals**
Days in month		*31*	*28*	*31*	***90***	*30*	*31*	*30*	***91***	*31*	*31*	*30*	***92***	*31*	*30*	*31*	***92***	
Production Quantities																		
Electricity Consumed	*kWh*	*7,742*	*6,789*	*5,637*	***20,168***	*3,523*	*3,338*	*3,078*	***9,939***	*2,989*	*2,819*	*3,000*	***8,808***	*3,940*	*4,417*	*4,059*	***12,416***	***51,331***
Budget/Historical Consumption Volume	*kWh*	*6,500*	*6,000*	*5,000*	***17,500***	*5,000*	*5,000*	*5,000*	***15,000***	*5,000*	*5,000*	*5,000*	***15,000***	*5,500*	*6,000*	*6,500*	***18,000***	***65,500***
Natural Gas Consumed	*GJ*	*1,536*	*1,562*	*1,305*	***4,404***	*1,109*	*945*	*781*	***2,835***	*979*	*444*	*525*	***1,947***	*1,233*	*1,679*	*2,287*	***5,199***	***14,385***
Budget/Historical Space Heating&DHW Consumption	*GJ*	*2,053*	*1,670*	*1,511*	***5,234***	*1,237*	*613*	*587*	***2,437***	*342*	*317*	*662*	***1,321***	*1,347*	*2,026*	*2,435*	***5,808***	***14,800***
Thermal Energy Delivered																		
Parcel 22 (Space Heating/DHW)																		
Acutal Consumption	*kWh*	12,255	8,663	6,340	***27,258***	4,970	2,490	4,343	***11,803***	1,560	770	1,713	***4,043***	6,081	9,035	11,013	***26,129***	***69,233***
Budget/Historical Consumption	*kWh*	14,340	11,120	18,954	***44,414***	10,816	7,000	4,343	***22,159***	1,560	941	2,917	***5,418***	6,819	12,404	14,338	***33,561***	***105,552***
Parcel 23 (Space Heating/DHW)																		
Acutal Consumption	*kWh*	90,614	80,200	70,610	***241,424***	54,290	27,080	22,032	***103,402***	12,563	12,534	22,062	***47,159***	50,249	70,000	90,614	***210,863***	***602,848***
Budget/Historical Consumption	*kWh*	120,220	123,470	110,450	***354,140***	85,080	51,510	22,032	***158,622***	12,563	52,272	27,772	***92,607***	68,637	98,879	120,910	***288,426***	***893,795***
Parcel 27 (Space Heating/DHW)																		
Acutal Consumption	*kWh*	120,197	102,345	104,593	***327,135***	92,207	40,000	34,000	***166,207***	32,000	32,000	38,000	***102,000***	50,165	103,971	104,242	***258,378***	***853,720***
Budget/Historical Consumption	*kWh*	92,780	113,740	101,740	***308,260***	75,070	50,150	34,000	***159,220***	32,000	23,064	30,916	***85,980***	69,150	93,767	105,261	***268,178***	***821,638***
Parcel 28 (Space Heating/DHW)																		
Acutal Consumption	*kWh*	114,858	90,200	80,610	***285,668***	64,290	37,080	32,032	***133,402***	12,563	12,534	32,062	***57,159***	65,249	82,553	104,614	***252,416***	***728,645***
Budget/Historical Consumption	*kWh*	92,060	97,500	90,020	***279,580***	69,690	48,950	32,032	***150,672***	12,563	40,178	29,658	***82,399***	63,466	81,649	88,285	***233,400***	***746,051***
Parcel 29 (Space Heating/DHW)					-													
Acutal Consumption	*kWh*	61,275	43,315	31,700	***136,290***	24,850	12,450	21,715	***59,015***	7,800	3,850	8,565	***20,215***	30,405	45,175	55,065	***130,645***	***346,165***
Budget/Historical Consumption	*kWh*	-	-	-	-	-	33,420	21,715	***55,135***	7,800	40,537	5,356	***53,693***	30,405	82,892	77,473	***190,770***	***299,598***
Parcel 16 (Tower A) (Space Heating/DHW)																		
Acutal Consumption	*kWh*	-	-	-	-	-	-	-	-	-	-	26,254	***26,254***	59,796	83,300	107,831	***250,927***	***277,181***
Budget/Historical Consumption	*kWh*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83,180	***83,180***	***83,180***
Total Consumption		399,199	324,723	293,853	***1,017,775***	240,607	119,100	114,122	***473,829***	66,486	61,688	128,656	***256,830***	261,945	394,034	473,379	***1,129,358***	***2,877,792***
Total Budget/Historical Consumption		319,400	345,830	321,164	***986,394***	240,656	191,030	114,122	***545,808***	66,486	156,992	96,619	***320,097***	238,477	369,591	489,447	***1,097,515***	***2,949,814***

Attachment Five:

In support of IR 17.1 please see the following document:

UniverCity NUS Assumptions

UNIVERCITY NUS
ASSUMPTIONS

OPERATING COSTS (2015$)		
Corix Operator (100%)		100,000
TEC maintenance		4,500
ETS maintenance (per unit)		300
Land lease		12,840
Emergency call outs		4,000
Security and safety		430
Water and sewer		1,440
Licensing (BCSA, BCUC and CoB)		740
Other utilites (phone, internet)		380
Tools and equipment		600
Parts/eqp rental		3,000
Utility management - administration		40,000
Corporate overhead and support		50,500
Insurance (per $100 of assets)	$	0.105

SUBCONTRACTED OPERATING COSTS (2015$)	
Annual ETS Mech. Main. Cost	2,250
Annual ETS Scada Main. Cost	2,000
Annual TEC Main. Under War. Cost	14,000
Annual TEC Main. (No War.) Cost	18,000
Distribution maintenance / capital cost	0.25%

BIOMASS COSTS (2015$)		
Biomass per tonne	$	30.00
Biomass tonnes per MWh (heat)		0.508

FINANCING & TAX	
Debt / capital	57.5%
Equity / capital	42.5%
Interest rate	3.75%
Return on equity	9.50%
Income tax rate	26.0%
Weighted average cost of capital	5.6%
Depreciation - buildings	2.0%
Depreciation - plant	4.0%
Depreciation - DPS	2.0%
Depreciation - ETS	4.0%
CCA - buildings	4.0%
CCA - all other	8.0%

PROPERTY TAXES			
Rate on energy (per thousand)		$	19.02
Rate on distribution (per thousand)		$	-
Rate on distribution (% rev.)	Y		3.0%

OTHER		
Capital project management		6.0%
Franchise fees		3.0%
Working capital / expenses		12.5%
Biomass plant (Y/N)	N	0.0%

ENERGY DEMAND	
EUI - concrete (kWh/m2)	130
EUI - woodframe (kWh/m2)	105
EUI - average	118
Diversification factor	85%
Number of parcels	21

ESCALATION	
Capital costs	2.0%
Biomass	2.0%
Natural gas	2.0%
Electricity (long term)	3.0%
Operating costs	2.0%
Insurance	5.0%

RATE DESIGN		
Annual escalation		2.0%
Ending deferral account	$	0.00
Total rate per MWh (2016)	$	109.27
Levelized rate per MWh	$	121.68
Basic charge %		50.0%
Commodity charge %		50.0%

Reset Rate

BUILDOUT

Parcel	Completion Year	Max GFA (m2)	Max Units	Energy Demand (MWh)	Space Heat Demand (MWh)	DHW Demand (MWh)	Incremental Demand (kWh)	Incremental Capacity (kW)	Contracted capacity (kW)	Cumulative Capacity (kW)	Diversified capacity(kW)	(815kW) NG boiler capacity(kW)	Biomass (kW)	Total Capacity	N-1 Capacity	Redundancy (N-1 to demand)
22	2011	553	N/A	66	43	23		60								
27	2012	6,843	75	719	467	251		389								
28	2012	7,151	80	840	546	294	1,625	389	838	838	712	2,445		2,445	1,630	229%
23	2013	6,513	104	847	550	296	847	332	332	1170	995	2,445		2,445	1,630	164%
29	2014	4,676	50	491	319	172		210						-		
16	2014	9,376	105	1,219	792	427	1,710	478	688	1,858	1,579	2,445		2,445	1,630	103%
16A	2015	9,376	105	1,219	792	427		478						-		
25	2015	20,303	184	2,639	1,716	924	3,858	1,121	1,599	3,457	2,938	2,445		2,445	1,630	55%
30	2016	14,059	160	1,476	960	517	1,476	628	628	4,085	3,472	8,000		8,000	5,000	144%
18	2017	16,533	117	2,149	1,397	752		843						-		
21	2017	8,003	90	1,040	676	364	3,190	408	1,251	5,336	4,536	8,000		8,000	5,000	110%
31	2018	9,493	102	997	648	349		577				8,000		8,000	6,500	
37	2018	6,225	70	654	425	229		278						-		
32	2018	3,302	36	347	225	121	1,997	147	1,002	6,338	5,387	8,000		8,000	5,000	93%
19	2019	8,497	96	1,105	718	387		433						-		
33	2019	9,335	106	980	637	343		420						-		
24	2019	21,602	277	2,268	1,474	794	4,353	930	1,783	8,121	6,903	8,000	3,500	11,500	5,000	72%
17	2020	10,409	117	1,353	880	474		531						-		
34	2020	9,411	101	988	642	346	2,341	423	954	9,075	7,714	8,000	3,500	11,500	5,000	65%
20	2021	19,663	221	2,556	1,662	895		1,002						-		
35	2021	6,141	66	645	419	226		342						-		
36	2021	6,414	72	673	438	236	3,874	338	1,682	10,757	9,143	8,000	3,500	11,500	5,000	55%
Total		213,878	2,334	25,272	16,427	8,845	25,272	5,913	10,757							

Legend

- Woodframe
- Concrete
- Completed

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
ENERGY DEMAND													
Incremental floor are	14,052	29,679	14,059	24,536	19,020	39,434	19,820						
Incremental demanc	1,710	3,858	1,476	3,190	1,997	4,353	2,341						
Cumulative floor are	21,060	35,112	64,791	78,850	103,386	122,406	161,840	181,660	181,660	181,660	181,660	181,660	181,660
Cumulative demand	2,472	4,182	8,040	9,517	12,706	14,703	19,056	21,398	21,398	21,398	21,398	21,398	21,398