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Creative Energy Thompson Rivers Limited Partnership Certificate of Public Convenience and Necessity for the Thompson Rivers University Low-Carbon District Energy System

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Decision
and Order C-1-23

May 3, 2023

Before:
E.B. Lockhart, Panel Chair
T. A. Loski, Commissioner
A. Pape-Salmon, Commissioner

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Executive summary

On November 25, 2021, Creative Energy Thompson Rivers Limited Partnership (Creative Energy) applied for a Certificate of Public Convenience and Necessity (CPCN, CPCN Application), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA),[1] for the construction and operation of a Thermal Energy System (TES) to provide low carbon heating (LCDES) for the Thompson Rivers University (TRU) in the City of Kamloops (Project). The objective of the Project is to replace the distributed heating system currently provided by natural gas boilers at eight campus buildings and to heat one new building currently under construction. The main impetus for the Project is TRU's strategic sustainability objective, namely the attainment of a carbon neutral or zero-carbon campus by 2030. Creative Energy's estimated capital cost for the LCDES is $9.47 million.

The thermal energy generating facility for the LCDES, the Energy Centre (EC), will be situated in a fully serviced building constructed and owned by TRU. TRU and Creative Energy have entered into an agreement whereby TRU will supply electricity and natural gas to the EC through its connections to electricity and gas utilities and bill Creative Energy on a flow-through basis, with the charges being equivalent to what TRU pays for electricity and natural gas metered and delivered to the EC.

Creative Energy also seeks approval pursuant to section 88(3) of the UCA, to be exempted from any requirement to file a contract with TRU under section 71 of the UCA, if any such obligation is triggered in relation to TRU's provision of electricity and natural gas to Creative Energy with respect to the TRU LCDES (Creative Energy Exemption Application).

TRU acknowledges that it will own and operate the infrastructure for the transmission, sale, delivery or provision of electricity or natural gas for compensation, and, therefore, falls under the definition of a public utility.

Accordingly, on December 9, 2021, TRU applied for an order under section 88(3) of the UCA to exempt TRU from section 71 and Part 3 of the UCA in respect of the transmission, sale, delivery or provision of electricity and natural gas by TRU to Creative Energy for use in the TRU LCDES (TRU Exemption Application).

The Panel established a written public hearing for the review of Creative Energy's CPCN Application and both parties' Exemption Applications at the same time, including one round of information requests, a Panel information request, and written final and reply arguments. One party, Commercial Energy Consumers Association of British Columbia, participated as an intervener in this proceeding.

This Decision relates to the Creative Energy CPCN Application while the TRU Exemption Application and Creative Energy Exemption Request are addressed in the Exemption Letter to the Ministry of Energy, Mines and Low Carbon Innovation.[2]

Having considered matters relevant to the approval of a CPCN, as set out in the BCUC CPCN Guidelines, the Panel finds that a CPCN for this Project is in the public interest. The Panel is satisfied with the analysis of alternatives conducted by Creative Energy, and that its approach to develop the Project capital cost estimate is reasonable. In addition, the Panel accepts that Creative Energy's consultation with First Nations and public engagement regarding the Project have been adequate. The Project will support BC's energy objectives of reducing greenhouse gas emissions and encouraging economic development and the creation and retention of jobs.

[1] *Utilities Commission Act*, R.S.B.C. 1996, c. 473.
[2] Exhibit A-16.

While the Panel is satisfied with Creative Energy's approach to developing the Project cost, there remains a risk that as the Project progresses and more information becomes available, the capital cost estimate will need to be revised, potentially leading to cost increases. The Panel therefore directs various reporting requirements which are set out in the Decision.

1.0 Introduction

1.1 Summary of Applications and Approvals Sought

On November 25, 2021, Creative Energy Thompson Rivers Limited Partnership (Creative Energy) applied to the British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN, CPCN Application), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA),[3] for the construction and operation of a Thermal Energy System (TES) to provide low carbon heating (Low Carbon District Energy System, LCDES) for Thompson Rivers University (TRU) in the City of Kamloops (Project).[4]

The thermal energy generating facility for the LCDES, the Energy Centre (EC), will be situated in a fully serviced building constructed and owned by TRU.[5] TRU will supply electricity and natural gas to the EC through its current connections to electricity and gas utilities.[6] Creative Energy will be billed by TRU on a flow-through basis, with the charges being equivalent to what TRU pays for electricity and natural gas metered and delivered to the LCDES.[7] This arrangement will be governed by a Contribution Agreement between Creative Energy and TRU.[8]

In the CPCN Application, Creative Energy also seeks approval pursuant to section 88(3) of the UCA, to exempt Creative Energy from any requirement to file a contract with TRU under section 71 of the UCA, if any such obligation is triggered in relation to TRU's provision of electricity and natural gas to Creative Energy with respect to the TRU LCDES.[9]

On December 9, 2021, TRU applied for an order under section 88(3) of the UCA to exempt TRU from section 71 and Part 3 of the UCA in respect of the transmission, sale, delivery or provision of electricity and natural gas by TRU to Creative Energy for use in the TRU LCDES (TRU Exemption Application).[10] The TRU Exemption Application is being addressed in the same proceeding as the Creative Energy CPCN Application.

This Decision relates to the Creative Energy CPCN Application while the TRU Exemption Application and Creative Energy's exemption request are addressed in the Exemption Letter to the Ministry of Energy, Mines and Low Carbon Innovation.[11]

1.2 Regulatory Process and Participants

The Panel established a written public hearing for the review of both Creative Energy's CPCN Application and TRU's Exemption Application at the same time, including one round of information requests, a Panel information request and written final and reply arguments. One party registered as an intervener in the proceeding: Commercial Energy Consumers Association of British Columbia (the CEC). No interested parties registered. TRU Community Trust submitted a letter of comment to register its support for the approval of the Project.

[3] *Utilities Commission Act*, R.S.B.C. 1996, c. 473.
[4] Exhibit B1-1, p.1.
[5] Ibid, p. 43.
[6] Ibid, p. 24.
[7] Creative Energy Final Argument, p. 5.
[8] Exhibit B1-1, Appendix G.
[9] Ibid, p. 7.
[10] Exhibit B2-1, p. 6.
[11] Exhibit A-16.

1.3 Legislative Framework

Section 45(1) of the UCA stipulates that a person must not begin the construction or operation of a public utility plant or system, or an extension of either, without first obtaining from the BCUC a certificate that public convenience and necessity requires, or will require, the construction or operation of the plant or system proposed.

The procedure on an application is provided in Section 46 of the UCA. Section 46(3) states that the BCUC may issue or refuse to issue a CPCN, or may issue a CPCN for the construction or operation of only a part of the proposed facility, line, plant, system or extension, and may attach terms and conditions to the CPCN.

The BCUC's CPCN Guidelines[12] and Thermal Energy System (TES) Regulatory Framework Guidelines[13] (TES Guidelines) provide general guidance regarding the BCUC's expectation of the information that should be included in a TES CPCN application while providing the flexibility for an application to reflect the specific circumstances of the applicant, the size and nature of the project and the issues raised by the application.

Section 88(3) of the UCA states that the BCUC may, on conditions it considers advisable, with the advance approval of the minister responsible for the administration of the Hydro and Power Authority Act, exempt a person, class of persons, equipment or facilities from the application of all or any of the provisions of this Act or may limit or vary the application of this Act.

Section 71(1) of the UCA stipulates a person entering into an energy supply contract with a public utility must file a copy of the contract with the BCUC under rules and within the time it specifies and provide to the BCUC any information it considers necessary to determine whether the contract is in the public interest.

1.4 Decision Framework

The structure of this Decision largely follows that of the CPCN Application and the BCUC's CPCN Guidelines. Relevant evidence submitted by the applicants and intervener is summarized in each section:

- Section 2 discusses Creative Energy Thompson Rivers Limited Partnership (Applicant);
- Section 3 addresses the Project need and its justification;
- Section 4 discusses the evaluation of alternatives;
- Section 5 addresses the Project description;
- Section 6 outlines the Project costs and indicative rate impacts;
- Sections 7 and 8 of the Decision address consultation, alignment with provincial energy objectives and Creative Energy's internal long-term resource planning, respectively; and
- Panel determinations are provided in Section 9 of the Decision.

[12] BCUC 2015 CPCN Application Guidelines, Final Order G-20-15, dated February 12, 2015.
[13] BCUC TES Framework Revisions to the TES Regulatory Framework, Final Order G-27-15, dated March 2, 2015, Appendix A (TES Guidelines).

2.0 Applicant

Creative Energy Thompson Rivers Limited Partnership (Creative Energy) was created for the purpose of developing, designing, constructing, owning, and operating the TRU LCDES. The TRU LCDES will be a separate utility system within the Creative Energy group of utilities. Creative Energy notes that the TRU LCDES will be classified as a Stream B TES according to the BCUC's TES Regulatory Framework Guidelines.[14] Creative Energy is an affiliate of Creative Energy Vancouver Platforms Inc.[15]

The shareholders of Creative Energy are Westbank Holdings Inc. (Westbank) and Instar Asset Management Inc. (Instar).[16]

3.0 Project Need and Justification

TRU's strategic sustainability objective, namely the attainment of a carbon neutral or zero-carbon campus by 2030, is the main impetus behind the LCDES.[17] Creative Energy submits that the proposed LCDES represents a significant achievement for TRU in its pursuit of a sustainable and carbon neutral future. The rationale for the LCDES is an outcome of a series of deliberate steps taken towards achieving this goal, including the exploration of centralized energy services in the Campus Master Plan, analysis of low-carbon building alternatives in the Campus Strategic Sustainability Plan, and the subsequent collaboration and accord with Creative Energy to develop a low-carbon district energy system.[18]

The idea for implementing a district energy system initially came from TRU's Campus Master Plan in 2013, which assessed the potential of a centralized natural gas boiler based on energy efficiency and cost reduction criteria.[19]

TRU's objectives were further developed in subsequent sustainability plans, which emphasized the need for low carbon solutions.[20] Following unsuccessful attempts to create a biomass project, TRU shifted its focus towards decarbonizing through electrification.[21]

To investigate the feasibility of converting nine of its academic buildings to building-scale electric-based heating utilizing air-sourced heat pumps, ground-source heat pumps, and electric boilers, TRU enlisted the services of Stantec Consulting in 2019 to conduct a study known as the TRU Electrification Study.[22]

In 2019, TRU initiated talks with Creative Energy to examine the feasibility of employing a district energy approach to electrify its facilities and compare it to building-scale alternatives. In February 2020, TRU and Creative Energy signed a Memorandum of Understanding to collaboratively assess the advantages of implementing a low-carbon electrified district energy system and, if determined to be more viable than building-scale alternatives, to create an AACE Class 3 design[23] and cost estimate, prepare commercial agreements, conduct public consultation, and submit a CPCN application.[24]

[14] Exhibit B1-1, p.4.
[15] Exhibit B1-5, response to CEC IR 1.1.
[16] Exhibit B1-1, p.5.
[17] Creative Energy Final Argument, p. 1.
[18] Exhibit B1-1, p. 11.
[19] Ibid, p. 11.
[20] Ibid, p. 12.
[21] Ibid, pp. 12-13.
[22] Ibid, p. 13.
[23] Class 3 design refers to a cost estimate classification system used by the Association for the Advancement of Cost Engineering (AACE).
[24] Exhibit B1-1, p. 14.

Positions of the Parties

The CEC acknowledges TRU's commitments are important and recommends that the BCUC should consider the need for the Project to be well-founded.[25]

Panel Discussion

The Panel is persuaded that Creative Energy has established the need for the Project. The evidence establishes that TRU has been exploring district energy systems for the last decade, having first explored the viability of district energy on campus part of its 2013 Campus Master Plan, which has resulted in its focus on decarbonizing through electrification. The highest priority identified in TRU's 2019 Campus Strategic Sustainability Plan is to achieve a carbon neutral or zero-carbon campus by 2030.

4.0 Description and Evaluation of Alternatives

This section of the Decision discusses the stepwise approach TRU and Creative Energy undertook to explore the options available for a LCDES. This approach involved an initial screening assessment that quantitatively compared a range of technology options, followed by an assessment of the economics and other attributes of a more targeted set of low carbon energy system alternatives, including a high-level comparative analysis of the Levelized Cost of Energy (LCOE) for the short-list options.

In the first step of its alternative assessment process, Creative Energy developed a long-list of six technology options and assessed various attributes of each option using qualitative descriptors. Each technology was assessed at a district scale considering 55,500 m^2 of floor space and included TRU buildings and the City of Kamloops buildings.[26] The assessment was informed by the professional judgment and knowledge of Creative Energy and Stantec engineers with expertise in green building principles.[27] The assessment of technologies was conducted with the overarching goal of achieving around 90 to 95 percent of the annual thermal generation from low-carbon sources.[28] A summary of the initial technology assessment is provided in Table 1.[29]

Table 1: Technology Assessment

Technology	Capital Cost	Fuel Costs	O&M Costs	Space & Complexity	Carbon Emissions	Screening Outcome
Condensing Natural Gas Boiler	low	low	low	low	high	**In**
Electric Boilers	low	high	low	low	low	**In**
Biomass Boilers	high	low	high	high	low	Out
Geo-Exchange	high	low	low	medium	low	**In**
Air-Source Heat Pumps[10]	medium	low	low	medium	low	**In**
Sewer Heat Recovery	high	low	high	high	low	Out

Based on its technology assessment and further discussions with TRU, Creative Energy screened out three of the six alternatives: condensing natural gas boiler, biomass boilers and sewer heat recovery. Biomass boilers were removed from consideration by TRU due to concerns with air quality, breach of city by-laws, lack of public

[25] CEC Final Argument, p. 7.
[26] Exhibit B1-4, BCUC IR 3.4; Exhibit B1-7 Panel IR 3.1, note 2.
[27] Exhibit B1-4, BCUC IR 3.2.
[28] Creative Energy Final Argument, para. 32.
[29] Exhibit B1-1, pp.16-17.

support, and lack of alignment with the CleanBC strategy.[30] Sewage heat recovery was screened out due to concerns with low generation capacity, high capital costs, and concerns from the City of Kamloops on operation of facilities near its sewer line.[31] The centralized condensing natural gas boiler option, although initially screened in, was subsequently eliminated as TRU did not consider it to have any additional economic or environmental benefits compared to the baseline scenario (distributed natural gas boiler option).[32]

TRU informed Creative Energy that it did not view renewable natural gas (RNG) as a viable strategy to achieving its carbon neutral goals but would consider using RNG as a fuel source for the natural gas peaking plant.[33]

In the second step of its alternatives analysis, Creative Energy conducted an assessment of the economics and other attributes of a short-list of low carbon thermal energy system alternatives, both building scale and district scale, and prepared a high-level comparative LCOE analysis of the short-list options.[34] The short-list of alternatives is comprised of three district scale options which were screened in from the initial technology assessment: air source heat pumps, electric boilers, and geo-exchange plus two additional building scale options: geo-exchange and air-source heat pumps. The distributed natural gas boiler system was not an option; it was used as a baseline to provide a high-level comparison of attributes between the short-listed alternatives.[35]

The assessment for both building scale alternatives was informed by the TRU Electrification Study. [36] The study is based on nine TRU buildings and used three-year historical data (2016-2018) for electricity, gas consumption and energy performance to assess the annual consumption of the site.[37] The study also assumed an auxiliary heating source such as an electric boiler to provide backup heating for the building scale air source heat pumps option when temperature drops below -5 C°.[38] Creative Energy explains that the TRU Electrification Study was used as "high-level proxies" to estimate the capital and operating costs for the building scale options because it only covered six of the nine buildings that the LCDES will serve and did not account for the costs associated with the remaining three buildings that are included in the current LCDES scope.[39]

The assessment for district scale alternatives was informed by an analysis commissioned by Creative Energy and completed by Stantec (Creative Energy Analysis).[40] The analysis is based on seven TRU and two City of Kamloops buildings.[41] A heating load profile was developed based on temperature data for Kamloops and space heating and domestic hot water demands for each of the nine buildings. It assumed an auxiliary heating source such as high efficiency natural gas boilers in the event the heating load exceeds the installed capacity of each district scale option.[42] The assumed heating capacity, and coefficient of performance (COP) value for each technology were used to determine the electricity and natural gas usage by each district scale alternative.

An assessment of the short-list alternatives, provided in the Application, was based on the load forecast used in the Creative Energy Analysis.[43] Creative Energy states that the preliminary load forecast used in this analysis was higher than the actual load forecast for the LCDES as the scope of the LCDES was still being adjusted and additional loads were initially included but later removed. Creative Energy explains that despite this, it is

[30] Exhibit B1-1, p.17; Exhibit B1-4, BCUC IR 6.2.
[31] Exhibit B1-1, p.18.
[32] Exhibit B1-4, BCUC IR 5.1, 5.2.
[33] Ibid, BCUC IR 20.1.
[34] Exhibit B1-1, p. 16.
[35] Exhibit B1-4, BCUC IR 10.1.
[36] Exhibit B1-1, Appendix B, p.1.
[37] Ibid, pp. 2, 6-26.
[38] Ibid, p.vi.
[39] Exhibit B1-1, p. 18.
[40] Exhibit B1-4, Attachment 13.1.
[41] Exhibit B1-1, Appendix B, p.4.
[42] Exhibit B1-4, Attachment 13.1.
[43] Exhibit B1-1, p.19.

confident that the indicative results presented in the Application are reliable even if the final decision is to choose a smaller scale for the preferred alternative.[44]

During the proceeding, however, Creative Energy updated its assessment of short-list alternatives to reflect actual load forecasts for the LCDES (discussed in Section 4.1 below). To update the assessment, Creative Energy adjusted its earlier estimates for natural gas and electricity use for each building scale and district alternative to reflect actual load forecasts.[45] It also adjusted hard costs for each building scale option by proportionally scaling the costs based on the observed variance in peak load [46] and adjusted hard costs for each district scale option based on the reduced system peak load. [47] Table 2 shows the short list assessment based on heating load forecast for campus buildings to be served by the LCDES.[48]

Table 2: Assessment of Short List Alternatives

	Hard Costs $	Nat. Gas Use (MWh)	Electricity Use (MWh)	CO2 Emissions (tonnes)	Staffing (FTE)	Non-Fuel O&M Costs $ (year 1)
Distributed Natural Gas Boilers Not an option	***n/a***	***5,698***	**-**	***1,014***	***n/a***	***n/a***
Building Scale Geo-Exchange	**18,684,944**	**-1,361**	**2,177**	**-218**	**1.5**	**150,000**
Building Scale Air-Source Heat Pumps	**15,853,395**	**-1,361**	**3,171**	**-207**	**1.5**	**150,000**
District Energy Geo-Exchange	**23,210,426**	**257**	**1,543**	**63**	**1**	**100,000**
District Energy Electric Boilers	**5,082,511**	**257**	**4,446**	**95**	**1**	**75,000**
District Energy Air & Water Source Heat Pumps	**7,443,191**	**439**	**3,171**	**99**	**1**	**100,000**

For the two building scale options, natural gas savings provided in the TRU Electrification Study were subtracted from natural gas usage under the baseline scenario or the distributed natural gas boiler option to estimate natural gas use.[49] Additional electricity usage provided in the TRU Electrification Study was added to the baseline electricity estimate under the distributed natural gas boiler option to calculate electricity use for each building scale option.[50]

For all options, carbon dioxide (CO2) emissions were determined based on the scaled estimates for natural gas and electricity use and carbon intensity values of 11 kg/MWh and 178 kg/MWh for electricity and natural gas respectively.

Creative Energy used a LCOE methodology as its approach to conducting an economic comparison of project alternatives. Creative Energy explains that a comparative LCOE approach normalizes both the stream of costs and energy of the alternatives and that the difference between alternatives is the incremental unit cost of the low carbon energy.[51] Table 3 summarizes the results of the economic analysis of project alternatives and associated carbon reductions based on heating load forecast for campus buildings to be served by the LCDES:[52]

[44] Exhibit B1-1, p. 19, Footnote 12.
[45] Exhibit B1-7, Attachment Panel 5, LCOE Comparison 4558 MWh.
[46] Exhibit B1-4, BCUC IR 4.3.
[47] Ibid, BCUC IR 4.3.
[48] Exhibit B1-7, Attachment Panel 5.0 - Comparative LCOE Analysis, 'LCOE Comparison 4558 mwh.'
[49] Exhibit B1-4, BCUC IR 7.3.
[50] Ibid, BCUC IR 7.3.
[51] Ibid, BCUC IR 20.1.
[52] Exhibit B1-7, Attachment Panel 5.0 - Comparative LCOE Analysis, 'LCOE Comparison 4558 mwh.'

Table 3: Estimates for LCOE and Carbon Reductions

	LCOE ($/MWh)	Carbon Reductions (%)
District Energy - Air-Source/Water Source Heat Pumps	$ 266	90%
District Energy - Geo-Exchange	$ 588	94%
District Energy - Electric Boilers	$ 275	91%
Building Scale - Geo-Exchange	$ 515	122%
Building Scale - Air-Source Heat Pumps	$ 481	120%

Based on the results presented in Table 3 above, the LCOE of the District Energy – Air Source/Water Source Heat Pumps alternative was the lowest cost option. Creative Energy submits that the LCOE methodology was an appropriate and accepted means of assessing Project alternatives and that the evaluation of alternatives is robust to the scale of load to be served.[53] Further, Creative Energy states that TRU supports the District Energy – Air Source/Water Source Heat Pumps alternative as it is the lowest cost option to meet the greenhouse gas emission reduction objectives.[54]

Creative Energy states that although the District Scale Electric Boilers option has the lowest capital costs, the high fuel costs of using electric resistive heat were found to be punitive to the project economics. Further, the higher electrical demand would require an upgrade to BC Hydro's distribution system at an incremental cost of approximately $4 to $4.5 million and a Project delay of two years.[55] This electrical upgrade cost is not included in the LCOE estimate for District Scale Electric Boilers shown in Table 3 above.

In addition, Creative Energy states that both the District Scale and Building Scale Geo-Exchange options were evaluated to have high LCOE related to higher upfront costs necessary to install an oversized geo-exchange field. Creative Energy explains that an oversized geo-exchange field is required to ensure the long-term performance of the field and associated heat pumps.[56]

4.1 Forecast Peak and Annual Heating Loads

Table 4 below provides a summary of the forecast peak and annual heating loads for the campus buildings to be served by the LCDES. This forecast was prepared by Stantec and is based on review of historical natural gas consumption in the buildings though TRU's energy management software. The consumption data was normalized against hourly ambient temperature data to create an hourly demand model which was then used to estimate the annual heating load. [57] The peak load for each building was estimated by linearly extrapolating the energy demand with the outside air temperature, with the one percent design day temperature of negative 25 degrees Celsius being the basis for the estimation. The peak and annual heating loads for the new School of Business and Economics (SOBE) Management building were estimated based on comparable factors at other TRU buildings, with an adjustment made to account for the higher envelope performance of the future building.[58]

[53] Creative Energy Final Argument, para. 33-34.
[54] Ibid, para. 36.
[55] Exhibit B1-1, p. 20.
[56] Ibid, Section 5.2, p. 26; Appendix B, p. vi.
[57] Ibid, p. 30.
[58] Ibid, p. 30.

Table 4: Peak and Annual Heating Demand for the TRU Campus Buildings[59]

Building		Floor Area	Estimated Peak combined Heating/DHW Load	Estimated Annual Combined Heating/DHW Load
#	Name	m^2	kW	MWh
1	Old Main	19,800	1,500	1,485
2	Science	10,800	700	714
3	Library (LIB)	2,400	200	269
4	BC Centre for Open Learning (BCCOL)	3,600	300	327
5	Culinary Arts (CA)	1,859	470	451
6	Clock Tower (CT)	2,340	230	243
7	Gymnasium (GYM)	3,700	500	417
8	International Building (IB)	5,620	450	356
9	SOBE (Future Building)	6,500	250	296
Total (undiversified)		56,619	4,600	4,558
Diversified design peak (90%)			4,140	

The total diversified peak heating load is estimated at 4,140 kW. A diversity factor of 90 percent was applied to the total undiversified peak heating load to account for diversity between the individual buildings. Creative Energy states that the diversity factor, which is used to size the capacity of the system, was estimated based on engineering expertise, building types and the nature of occupancy. Creative Energy explains that the buildings are solely for academic purposes and have comparable load profiles which are mainly influenced by outside air temperature and space heating.[60]

The total annual heating load is estimated at 4,558 MWh.

Positions of the Parties

The CEC accepts that the selected technology option is satisfactory, because the economic analysis demonstrates significantly better economics for the selected option than any of the other alternatives.[61] Despite its support for the selected option, the CEC notes that it would have preferred to see a similar analysis based on the reduced load information and submits that BCUC should consider the updated evidence submitted for Project load forecast over the original evidence presented in the Application.[62]

The CEC accepts that Creative Energy appropriately screened out both the biomass and sewer heat recovery options.[63] The CEC expects that there may be value in the Electric Boiler option but accepts Creative Energy's submission that TRU did not view the electric boiler alternative as an appropriate option.[64]

[59] Exhibit B1-1, p. 29.
[60] Exhibit, B1-1, p. 30.
[61] CEC Final Argument, para. 75.
[62] Ibid, para. 73.
[63] Ibid, para. 59.
[64] Ibid, para. 74.

Finally, the CEC acknowledges that although TRU does not consider RNG to be part of a viable strategy to achieving its carbon neutrality goals, TRU would consider using RNG as a fuel source for the natural gas peaking plant. The CEC states that it supports the use of natural gas for peaking and RNG for clean peaking to the extent that TRU wishes to move toward a carbon neutral campus.[65]

Panel Discussion

The Panel is satisfied that Creative Energy appropriately identified alternative technologies for consideration, and that it reasonably screened out those that did not satisfy the Project criteria. We accept that Creative Energy rejected biomass, sewer heat recovery, and natural gas boilers from consideration based on relevant considerations and expert input. We also accept that despite having the lowest capital cost, the electric boiler option would have a higher cost than what Table 3 above indicates, because Creative Energy would have to upgrade the distribution system.

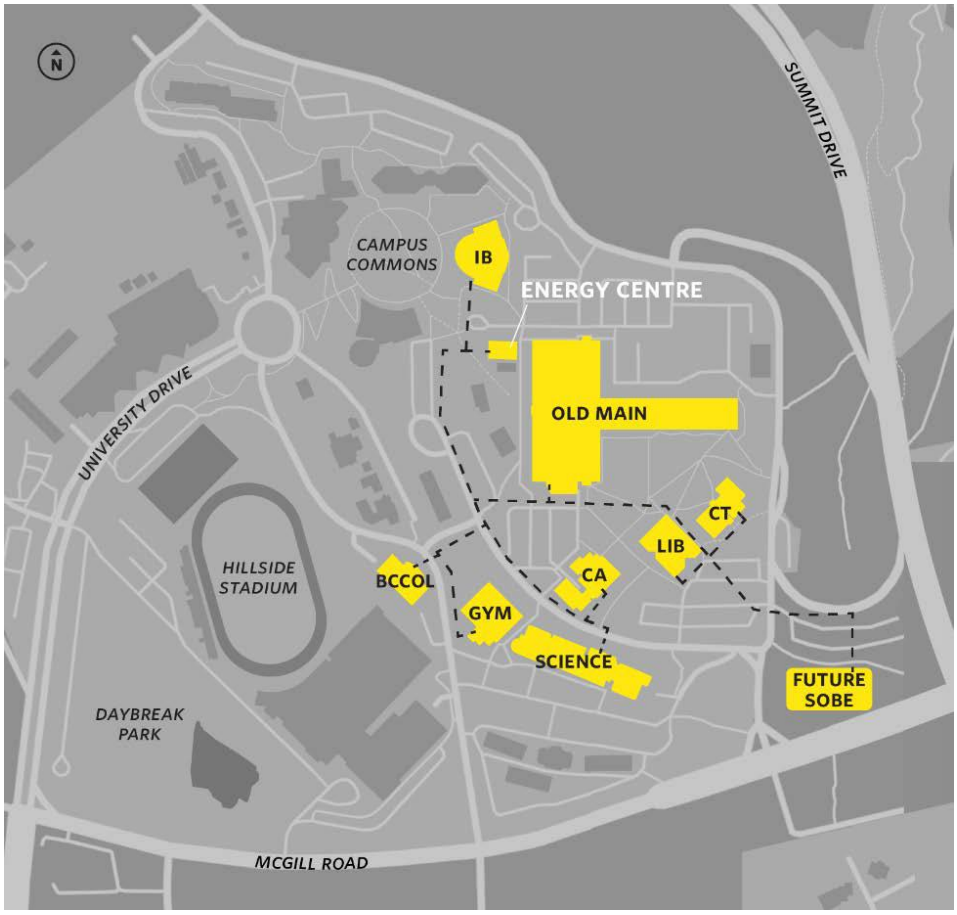
In addition, we accept that the preferred alternative, a two-stage air-source/water-source heat source pump system with high efficiency gas boilers to provide peaking and back-up capabilities, is the lowest cost option and that Creative Energy's decision to eliminate the remaining four alternatives due to high up front capital costs was reasonable. Furthermore, TRU regards the preferred alternative as the appropriate technology to achieve its decarbonization goals. Nevertheless, the Panel accepts that TRU may also consider using RNG in the future as a fuel source to further reduce its carbon footprint.

5.0 Project Description

The LCDES will be constructed at the TRU campus in Kamloops, BC. Figure 1 illustrates the LCDES service area. There will be nine TRU campus buildings served by the LCDES, including eight existing buildings and one new building currently under construction. Each building will have an energy transfer station (ETS) at the point of connection to the system.[66] Thermal energy will be generated at an Energy Centre (EC) and delivered to the ETSs through the distribution piping system (DPS), consisting of insulated supply and return pipes, isolation valves, and underground chambers.[67] The eight existing buildings and one new building (Future SOBE) to be connected to the LCDES are shown in yellow and the expected distribution piping routes are indicated by dashed lines. On November 8, 2021, TRU and Creative Energy entered into an Infrastructure Agreement.[68] This agreement details the terms of LCDES design, construction, ownership, and responsibilities.

[65] CEC Final Argument, para. 76.
[66] Exhibit B1-1, p. 27.
[67] Ibid, p. 27.
[68] Ibid, Appendix F.

Figure 1: LCDES Service Area[69]



The EC will be situated at the northwest corner of the Old Main building in a fully serviced building constructed and owned by TRU.[70] TRU will supply electricity and natural gas to the EC through its current connections to electricity and gas utilities.[71]

On November 8, 2021 TRU and Creative Energy entered into a Contribution Agreement, which sets out all payments to be made by Creative Energy to TRU in respect of the EC building housing the LCDES and TRU supplied utilities.[72] TRU will charge Creative Energy for electricity and natural gas on a flow through basis equal to what TRU pays for the amount of electricity and natural gas delivered to the LCDES as metered, and in accordance with the Contribution Agreement.[73]

The EC building will contain a heating plant, distribution pumps and a control room/office. The plant will consist of three air source heat pumps (ASHP), two water source heat pumps (WSHP) and three high-efficiency natural gas boilers. The operating mode of the heating system will vary based on outdoor air temperature, as shown in Table 5 below.

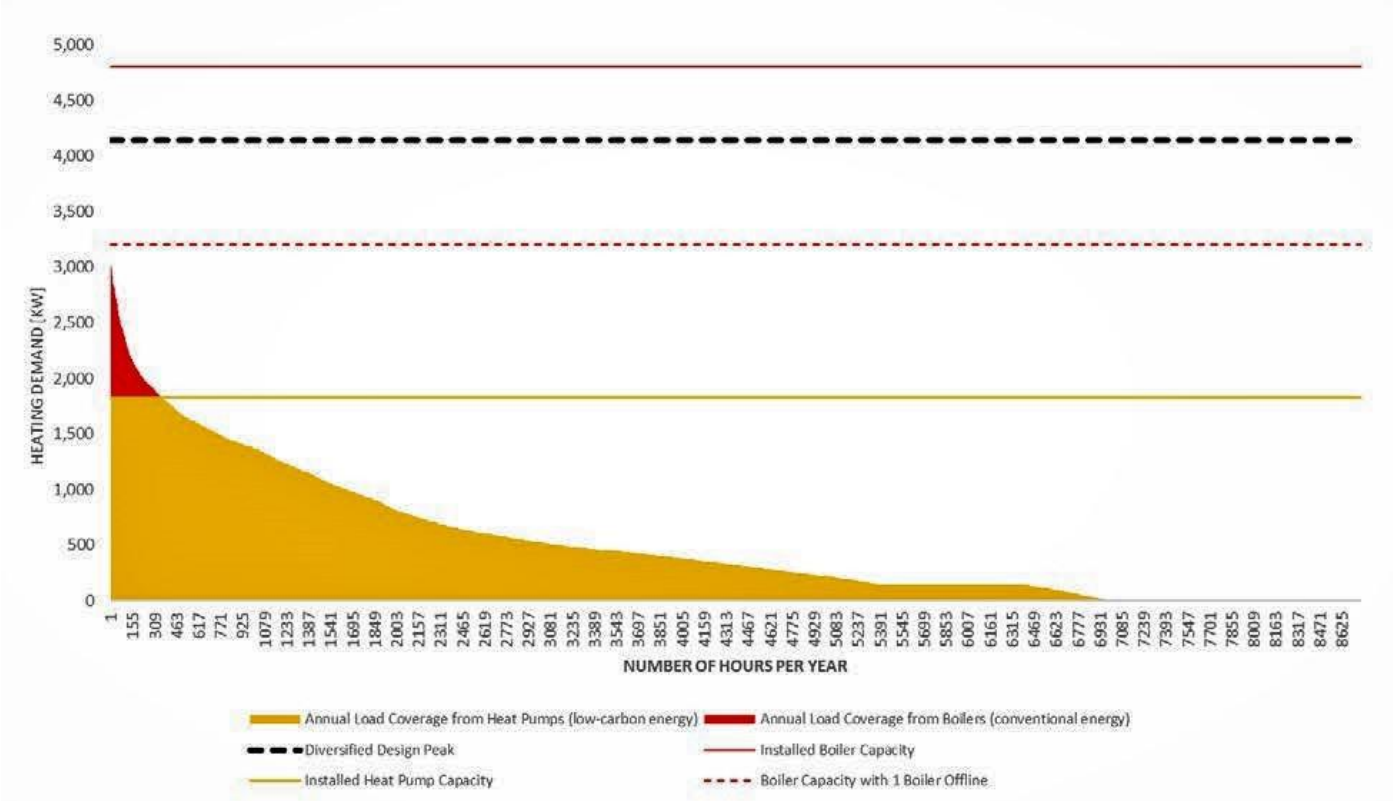
[69] Exhibit B1-1, p. 24.
[70] Ibid, p. 43.
[71] Ibid, p. 24.
[72] Ibid, Appendix G.
[73] Ibid p. 1.

Table 5: Heating System Operating Modes[74]

Outdoor Air Temperatures	Supply Temperature	Primary Heat Source	Secondary Heat source	Notes
< -15°C	70°C to 85°C	Gas Boilers	-	ASHPs will not operate effectively below -15°C
-15°C to 5°C	70°C	ASHP+WSHP	Gas Boilers	Gas boilers used for peaking
> 5°C	70°C	ASHP	ASHP+WSHP	ASHP directly heat DPS return water up to 55°C. ASHP and WSHP will raise the supply temperature to 70°C

Creative Energy states that the system has been designed to provide approximately 95 percent annual load coverage through heat pumps (ASHPs and WSHPs).[75] The load duration curve presented in Figure 2 below illustrates the comparative utilization of the heat pumps and natural gas boilers.

Figure 2: Load Duration Curve – Demand and Capacities[76]



The installed heat pump capacity of the LCDES will be 1,826 kW.[77] During winter operation the heat pumps will be backed-up with the high-efficiency natural gas boilers to meet peak demand.

[74] Exhibit B1-1, p. 25.
[75] Ibid, p. 31.
[76] Ibid, p. 32.
[77] Ibid, p. 31.

The three high-efficiency natural gas boilers will have a combined installed capacity of 4,800 kW at a design efficiency of 92%. This provides 116% of the estimated diversified peak demand of 4,140 kW. Creative Energy notes that with one boiler out of service, the boiler plant output reduces to 3,200 kW, providing 77% of the peak demand. Creative Energy confirms that the natural gas boilers will only be used for peaking and backup purposes.[78]

Creative Energy states that high efficiency natural gas boilers were selected to provide peaking and back-up heating because the use of a second fuel source (i.e., electricity for normal operation and natural gas for backup) would provide greater resiliency than use of one fuel source for both normal operation and back up services. Further, Creative Energy submits that an electric boiler as a back-up would require an upgrade to the BC Hydro service line which would make the electric boiler uneconomical and would eliminate the resiliency benefits noted above.[79]

5.1 Greenhouse Gas Emissions

Creative Energy states that the Project will reduce approximately 90 percent of greenhouse gas emissions from the existing buildings, which are currently heated with natural gas. It will also avoid approximately 90 percent of greenhouse gas emissions from the new building – as compared to heating with natural gas. The aggregate greenhouse gas emissions reduced or avoided are estimated to exceed 900 tonnes of CO2e/year.[80]

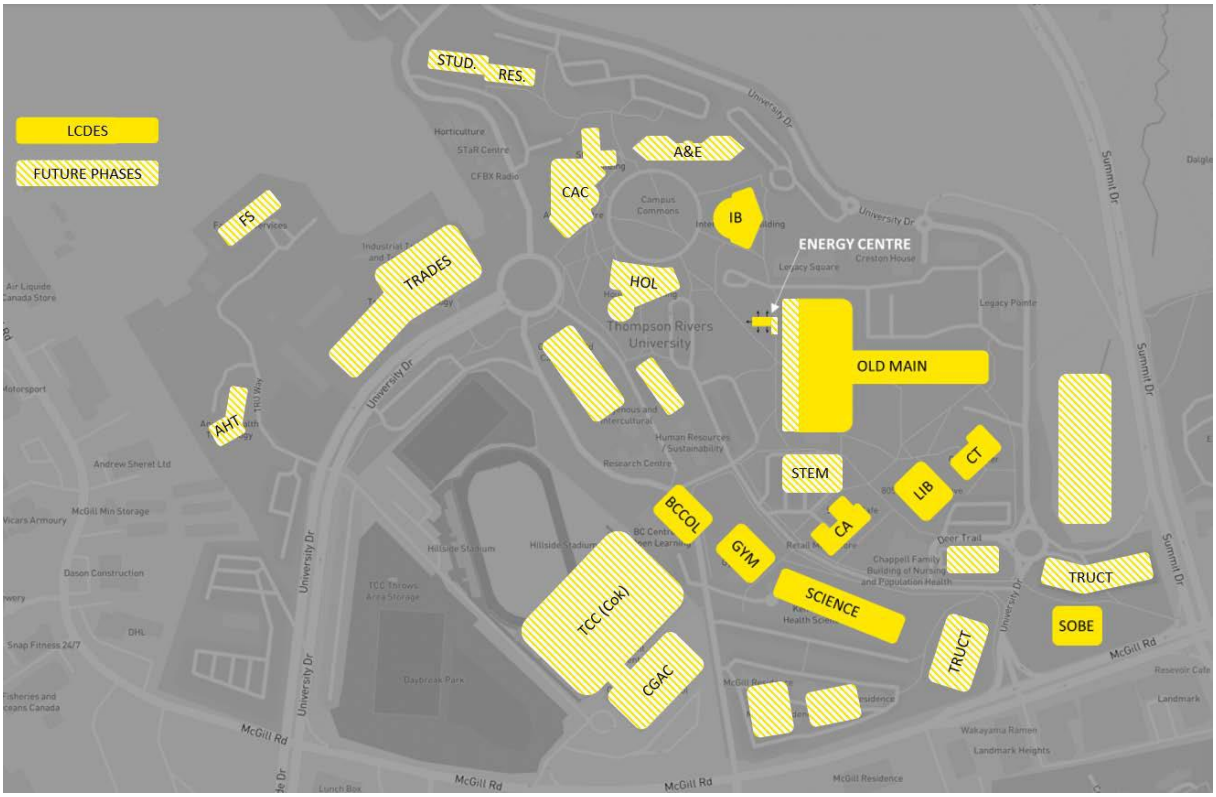
5.2 Future Expansion

Creative Energy states that the Project has been designed to fulfill the current customer load while allowing for the connection of additional TRU buildings and City of Kamloops buildings in the future. Creative Energy notes that this future use has not been confirmed and is outside the scope of the current Project and requested approvals in this Application.[81] Creative Energy states that it plans to request BCUC's approval of a CPCN for expanding the LCDES, depending on the specifics of the extension, such as its size, cost, and target customer.[82] Figure 3 shows the additional TRU and City of Kamloops buildings that might be connected to the LCDES area as part of future expansion projects.[83]

Creative Energy explains that to cater to any future expansion, the TRU building housing the EC will be sized to accommodate additional EC equipment as needed. Creative Energy states that this additional equipment could include a high efficiency boiler, heat pumps and thermal energy storage. Also, the distribution piping system will be sized to accommodate a peak load of 8,500 kW. This excess capacity will be achieved by installing larger diameter pipe mains at an incremental cost of $225,000. Creative Energy argues that it would be imprudent to size the distribution piping system to minimum requirements because the piping would have to excavated and replaced with larger diameter pipe when additional buildings connect.[84]

[78] Exhibit B1-1, p. 31.
[79] Exhibit B1-4, BCUC IR 12.1.
[80] Exhibit B1-1, p. 37.
[81] Creative Energy Final Argument, p. 5.
[82] Ibid, para. 42.
[83] Exhibit B1-1, p. 40.
[84] Ibid, p. 47.

Figure 3: LCDES Service Area and Potential Future Expansion[85]



Position of the Parties

The CEC submits that the design and sizing of the Project are appropriate.[86] Further, the CEC agrees that it is reasonable for the Project to be sized to allow for future expansion, and finds the additional costs are not excessive.[87]

Panel Discussion

The Panel finds that the Project scope is reasonable; it involves the construction of an Energy Centre serving eight current buildings, plus a ninth that is under construction, and connection to an Energy Transfer Station in each of these buildings via a distribution piping system. Creative Energy and TRU have entered into an Infrastructure Agreement that outlines the terms of LCDES design, construction, ownership, and responsibilities. These parties have also entered into a Contribution Agreement that outlines the terms of contribution toward costs such as utilities.

Further, the Panel finds that the LCDES is adequately sized at 116 percent of the diversified peak load estimate. The Panel is persuaded that the air-source and water-source heat pump system will supply approximately 95 percent of the estimated annual heating consumption and the high-efficiency natural gas boilers will supply the forecasted winter peak demand. We accept Creative Energy's evidence that the boilers are necessary and have been sized to meet the forecasted winter peak demand because Kamloops experiences a winter design temperature below the minimum operating temperature of the air source heat pumps.

[85] Exhibit B1-1, p. 40.
[86] CEC Final Argument, para. 94.
[87] Ibid, para. 113, p. 16.

In addition, the Panel accepts Creative Energy's evidence that the LCDES will avoid approximately 90 percent of greenhouse gas emissions as compared to heating with natural gas; in aggregate Creative Energy estimates that greenhouse gas emissions reduced or avoided are estimated to exceed 900 tonnes of CO2e/year.

In anticipation of expanding the system to include additional buildings, Creative Energy plans to build a bigger DPS than it currently requires and explains that this is a prudent cost to incur now, rather than waiting for future buildings. This raises the concern that the system might be oversized, because there is no guarantee that those future buildings arrive or that regulatory approval, if required, is achieved. However, the Panel accepts that the incremental cost associated with installing distribution piping now that is larger than required, is appropriate in comparison to the alternative of waiting until it is required because the cost would be so much greater in the latter instance.

Finally, we note that the CEC supports the scope of the Project.

6.0 LCDES Costs and Rate Impact

The capital cost includes predevelopment and development costs through to LCDES completion. These capital costs, as well as the forecast fixed and variable operating costs of the LCDES, are factored into Creative Energy's calculated annual indicative revenue requirement, rates and rate design. This section summarizes each of these items and provides the Panel's discussion on these LCDES elements at the end of the section.

6.1 Capital Cost

Creative Energy's estimated capital cost for the LCDES is $9.47 million, as shown in Table 6 below:

Table 6: LCDES Capital Cost Estimate[88]

Category	**Cost ($)**
Predevelopment	30,000
Engineering	
EC	228,800
ETS (Buildings 1 thru 9)	56,000
DPS	183,200
Construction	
EC	3,771,250
ETS (Buildings 1 thru 9)	476,000
DPS	2,498,000
Legal	80,000
Regulatory	90,000
Management	479,500
Contingency (20 percent)	1,578,550
Total	**9,471,300**

[88] Exhibit B1-1, p. 33; Appendix E.

Creative Energy states that the estimated capital cost is within a Class 3 degree of accuracy, as defined in the AACE International Recommended Practice. It is based on cost estimates generated by a professional quantity surveyor using Class 3 design drawings prepared by Stantec Consulting for the EC and ETS, as well as cost estimates generated by Rathco Engineering using the Class 3 design drawings prepared for the DPS. Creative Energy used these cost estimates to develop the Class 3 cost estimate for the LCDES.[89]

As shown in Table 6, the capital cost includes costs associated with: (a) business development and customer relationship management or predevelopment activities; (b) engineering, including feasibility, detailed design, and support during construction; (c) construction, including permitting, mechanical equipment and materials, electrical work, labour, installation, inspections, commissioning, and system start up; and (d) legal, regulatory and Creative Energy management costs. In addition, there is contingency of 20 percent of the total costs.[90]

Although Creative Energy did not provide a cost estimating accuracy range for the LCDES in this proceeding, it submits that the risk of changes to the project cost is "low" due to the 20 percent contingency and other factors.[91] For example, Creative Energy outlines that fixed price contracts will be used for the plant construction and mechanical works involved for the DPS to mitigate cost escalation. In addition, unit-pricing will be used for the civil works related to the DPS to control per-unit costing. Creative Energy states that unit-pricing is a common method of cost control in construction where the quantity of units can be estimated prior to construction with a known unit price.[92]

Creative Energy explained that the LCDES capital cost estimate, as outlined in Table 6 above, does not include the decommissioning cost of any existing facilities as a result of the LCDES as that work will be completed by TRU.[93]

In addition, Creative Energy noted that the LCDES capital cost estimate does not include a decommissioning provision for the LCDES's end of life stating:

> [...] we consider that the asset retirement obligations and decommissioning cost will be offset by the salvage value of the energy center and associated equipment, so a decommissioning provision is not a necessary construct for district energy systems [...]
>
> We also expect that there will be a preference to recapitalize district energy systems at the end of their useful life, in order to maintain useful operation of these assets for longer durations.[94]

6.2 Operating Costs

Operation of the LCDES will include fixed and variable operating costs. The basis of some estimated fixed operating costs is briefly described by Creative Energy below:

- Creative Energy will pay an annual contribution to TRU in an amount equal to $20 per square metre multiplied by the total usable area of the EC building. The payment will be increased annually as per the Contribution Agreement between Creative Energy and TRU.[95]
- Annual recurring maintenance costs are approximately 0.45 percent of the capital cost based on a combination of budgetary estimates provided by Olympic International and Creative Energy's

[89] Exhibit B1-1, pp. 32–33.
[90] Ibid, pp. 33–34; Appendix E.
[91] Ibid, p. 52.
[92] Ibid, p. 52.
[93] Exhibit B1-4, BCUC IR 21.2.
[94] Ibid, BCUC IR 21.2.1.
[95] Exhibit B1-1, p. 43.

experience operating thermal plants for the maintenance of the heat pumps, boilers and balance of the plant.[96]

- Recapitalization costs of $200,000 (estimated in 2021 dollars) in year 15 of the LCDES operation are needed to replace the compressors on the ASHPs to extend the life of that equipment.[97]
- Operator costs assume that the EC will be unsupervised with remote monitoring. The forecast labour cost is $50,000 per year (estimated in 2021 dollars) based on one-half of one FTE (full-time equivalent), assuming the all-in compensation of one FTE is $100,000.[98]
- Insurance costs consist of business interruption and replacement insurance and are estimated at 0.3 percent of the capital cost, consistent with other projects owned and operated by affiliates in the Creative Energy group.[99]
- Billing, support and administration costs are 0.79 percent of the capital cost and relate to allocated overheads amongst Creative Energy utility projects.[100]

Except for the annual contribution to TRU, Creative Energy assumes that all fixed operating costs will be escalated at 2 percent inflation per year.[101]

Variable operating costs consist of natural gas and electricity costs. Creative Energy states that these costs will be procured by TRU and supplied by TRU to Creative Energy to produce thermal energy. Specifically, Creative Energy states that TRU will sub-meter the energy and demand usage at the EC and apply the FortisBC (Rate Schedule 25) for transportation costs and BC Hydro Large General Service (LGS) tariff rates as if they applied directly to Creative Energy.[102] In addition, the rate charged to Creative Energy for TRU's natural gas, which is purchased directly from Shell, will be equal to the rates paid by TRU with no mark up.[103] Creative Energy explains that the assumed "all-in" rate[104] for natural gas, for modelling purposes, is $13 per GJ in 2020 and is inflated at 2 percent per year. Carbon taxes are modelled to increase in accordance with the Federal Carbon tax plan, under which the $50 per tonne tax in 2022 will increase by $15 per tonne per year starting in 2023 through to $170 per tonne in 2030. Creative Energy then inflates the tax at 2 percent per year from 2031 onwards.[105] With respect to the electricity costs, Creative Energy states that TRU's current cost as a BC Hydro LGS customer is $85-88 per MWh per month. Accordingly, Creative Energy applied the "mid-point" cost of $86.60 per MWh per month in 2021 to forecast the LCDES's electricity cost, and inflates it by 2 percent per year.[106]

There are no staff members employed by Creative Energy Thompson Rivers Limited Partnership. Instead, the staff of Creative Energy Vancouver Platforms Inc. (CEVP) will provide professional services to Creative Energy, and the costs associated with these services will be directly assigned to the TRU LCDES.[107] Creative Energy states that after the LCDES becomes operational, any remaining general and administrative expenses will be distributed and assigned to the cost of service of the LCDES, based on the Massachusetts Formula approved by the BCUC for assigning such expenses to all projects that are supported by the functions managed by CEVP.[108]

[96] Exhibit B1-1, pp. 34, 43–44, Footnote 17; Excel spreadsheet attachment: "Indicative Cost of Service and Rates Model", "CoS Build-Up" tab.
[97] Ibid, p. 44; Excel spreadsheet attachment: "Indicative Cost of Service and Rates Model", "Other supporting inputs" tab.
[98] Ibid, Excel spreadsheet attachment: "Indicative Cost of Service and Rates Model", "CoS Build-Up" tab.
[99] Ibid, p. 45; Excel spreadsheet attachment: "Indicative Cost of Service and Rates Model", "CoS Build-Up" tab.
[100] Ibid, p. 45; Excel spreadsheet attachment: "Indicative Cost of Service and Rates Model", "CoS Build-Up" tab.
[101] Ibid, Excel spreadsheet attachment: "Indicative Cost of Service and Rates Model", "CoS Build-Up" tab.
[102] Ibid, p. 46.
[103] Ibid, p, 46; Appendix F, Infrastructure Agreement, Section 2.2; Appendix G, Contribution Agreement, Section 9.
[104] The "all in" rate is inclusive of the market price of gas, supplier charges, shipping costs, carbon taxes and transportation costs (Exhibit B1-1, p. 47).
[105] Ibid, p. 47.
[106] Ibid, p. 47.
[107] Ibid, p. 4.
[108] Ibid, p. 4.

CEVP has been running the Core Steam district energy system in downtown Vancouver for over 50 years and has been involved in the development and implementation of various other district thermal energy systems. Creative Energy states that the CEVP team has the necessary technical skills and expertise to support Creative Energy with the design, development, and operation of the TRU LCDES.[109]

6.3 Indicative Cost of Service and Rates

Based on the operating costs noted above in Section 6.2, Creative Energy provided the forecast revenue requirement or cost of service for the LCDES, inclusive of depreciation, interest, ROE and taxes, as reproduced in Table 7 (summary values in 10-year increments) below:

Table 7: Indicative Cost of Service of the LCDES[110]

Component ($000)	2024 (partial)	2033	2043	2053
Depreciation	353	353	353	353
Cost of Debt	118	166	85	4
Cost of Equity	207	292	150	7
Income Taxes	17	82	112	79
Maintenance	47	56	69	84
Operators	53	63	77	94
Insurance	31	37	46	56
Contribution to TRU Costs	5	6	7	9
Billing, Support & Admin	80	95	116	141
Total Fixed Cost of Service	910	1,152	1,014	826
Cost of Gas	15	22	27	32
Cost of Electricity	207	247	301	367
Total Variable Cost of Service	222	269	328	399
Total Cost of Service	1,118	1,340	1,633	1,991

In the Application, Creative Energy submits that it has not finalized its "rate design, rate-setting and billing approach" for the LCDES at this time. However, Creative Energy states, if the CPCN is approved, that it will consult with TRU (as the sole customer of the LCDES) prior to bringing an application for rates forward to the BCUC for approval. Creative Energy submits that the timing of that application will be coordinated in advance of the planned Project completion and in-service date.[111]

At this time, for indicative purposes, Creative Energy calculates that the estimated levelized cost of energy of the LCDES over 30-years is $305 per MWh.[112] This is based on a forecast annual cost recovery under a simple levelized design, through which the recovery of fixed charges (as described above in Section 6.2) will escalate at 2 percent per year, and variable charges (as described in Section 6.2) will be recovered on a flow-through basis per MWh of energy.[113]

[109] Exhibit B1-1, p. 5.
[110] Ibid, p. 48, Table 16.
[111] Ibid, p. 49.
[112] Ibid, p. 50.
[113] Ibid, p. 49.

Positions of the Parties

The CEC states that it has reviewed the capital costs and related evidence and finds Creative Energy's costing to be adequate in that it is a Class 3 estimate and based on professional designs. In addition, the CEC finds the indicative cost of service and rates to be reasonable.[114]

The CEC believes it is crucial for the BCUC to ensure that CEVP's expenses related to the TRU LCDES or any other development projects are properly compensated, so that CEVP's ratepayers are not required to subsidize other projects. They believe this is a significant public interest matter, and the BCUC should consider maintaining regular oversight of it.[115]

Further, the CEC recognizes that there are established methodologies in place to facilitate the direct assignment of the CEVP costs to CEVP's development companies. Accordingly, the CEC proposes that the BCUC periodically review the direct costing methodologies and the Massachusetts Formula for overhead to ensure that steam heat ratepayers receive the full benefit of the resources they pay for, and that they are not unduly affected by demands from multiple development companies.[116]

Panel Discussion

The Panel finds that the approach taken by Creative Energy to develop the capital cost estimate is reasonable. Creative Energy prepared its capital cost to an AACE Class 3 degree of accuracy, which is consistent with the BCUC's CPCN Guidelines. The Class 3 cost estimates for the EC, ETS and DPS were prepared by Creative Energy based on cost estimates developed by professional engineering consultants.

The Panel recognizes that an AACE Class 3 cost estimate is based on limited information and assumptions, and therefore it carries a higher degree of uncertainty than more detailed estimates. As the project progresses and more information becomes available, it is possible that the estimate will need to be revised, potentially leading to cost increases. Another risk is that the estimate may not fully account for inflation, currency fluctuations, or changes in market conditions.

Creative Energy is not seeking approval of the indicative revenue requirements or customer rates; however, the Panel is satisfied that the estimated fixed and variable operating costs are reasonable for the Project. We accept that the variable costs, namely for gas and electricity, will be billed to Creative Energy on a flow through basis pursuant to the Contribution Agreement, which provides transparency and cost predictability. The Panel notes that the CEC finds the indicative cost of service and rates to be reasonable. Although the Panel finds the indicative rates to be reasonable for the purposes of the Application, the approval of the revenue requirements and rate design are matters for review and approval by the BCUC in a future proceeding.

The Panel notes Creative Energy's submission that any general and administrative services provided by staff employed by its corporate affiliate will be distributed and assigned to the cost of service of the LCDES, based on the Massachusetts Formula approved by the BCUC for assigning such expenses to all projects that are supported by the functions managed by CEVP. The Panel expects that these costs will also be subject to a BCUC-approved Inter-Affiliate Conduct and Transfer Pricing Policy, the approval of which is currently before the BCUC in a separate proceeding.

[114] CEC Final Argument, p. 13.
[115] Ibid, p. 4.
[116] Ibid, p. 4.

7.0 Consultation

Section 3 of the CPCN Guidelines lists the information that should be filed if the applicant is of the view that the application requires consultation with First Nations. Section 3 also lists the information that should be filed related to public consultation.

Creative Energy informed Tk'emlups te Secwepemc (TteS) about the project via email on March 31, 2021, and held a virtual meeting with them on April 6, 2021. During the meeting, Creative Energy presented an overview and attendees had the opportunity to ask questions. Creative Energy states that TteS expressed full support for the LCDES Project and indicated their interest in staying informed about its progress. No concerns were raised about the Project during the meeting.[117]

On May 4, 2021, Creative Energy organized a virtual information session to present the LCDES and answer questions from the community. Creative states that the project received positive feedback from the participants and no concerns were raised during the Q&A period.[118]

Further, notification of the Application was provided to the City of Kamloops, directly through City staff, and to the community through a newspaper publication, as well as through a TRU website posting.[119]

Creative Energy submits that overall, the level of support among participants was overwhelmingly positive.[120]

Creative Energy states that the City of Kamloops has expressed further interest and support in the Project. [121]

Positions of the Parties

The CEC agrees that the evidence indicates that there is generally a high level of support for the Project.[122]

Panel Discussion

The Panel finds that although this Project does not trigger the duty to consult because it is on privately owned lands and there is no Crown conduct that may infringe aboriginal rights or title, Creative Energy did engage with TteS whose traditional territory encompasses the area where the Project is located. There was no opposition to the Project.

In addition, the Panel is satisfied that Creative Energy's public engagement with community stakeholders is adequate.

[117] Exhibit B1-1, p. 55.
[118] Ibid, p. 56.
[119] Creative Energy Final Argument, para. 49.
[120] Ibid, p. 11.
[121] Ibid, pp. 11 and 12.
[122] CEC Final Argument, p. 17.

8.0 Provincial Government Energy Objectives and Long-Term Resource Plan

8.1 Energy Objectives

Section 46(3.1) of the UCA requires the BCUC to consider "the applicable of British Columbia's energy objectives" and the extent to which the Application is consistent with the requirements of the *Clean Energy Act* (CEA).[123]

Creative Energy states that the LCDES aligns with the following energy objectives as defined in section 2 of the CEA:[124]

(g) reduce BC greenhouse gas emissions;

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

(k) encourage economic development and the creation and retention of jobs; and

(o) achieve BC's energy objectives without the use of nuclear power.

8.2 Long-Term Resource Plan

Section 46(3.1) of the UCA requires the BCUC to consider "the most recent long-term resource plan filed by the public utility".

Creative Energy's most recent Long-Term Resource Plan (LTRP) was submitted to the BCUC on January 13, 2021, in accordance with section 44.1 of UCA. By Order G-283-21, dated September 27, 2021, the LTRP was rejected, and Creative Energy was directed to file its next LTRP no later than March 31, 2024.

Panel Discussion

The Panel finds that the Project is consistent with BC's energy objectives, including reducing greenhouse gas emissions and encouraging economic development. Moreover, the Panel notes that achieving a carbon neutral campus by 2030 is the highest priority identified in TRU's 2019 Campus Strategic Sustainability Plan.

The Panel accepts that Creative Energy's most recent LTRP is not relevant to this proceeding because the BCUC rejected it.

9.0 Panel Determinations

Having considered matters relevant to the approval of a CPCN, as set out in the BCUC's CPCN Guidelines, the Panel finds that a CPCN for this Project is in the public interest. The main driver behind the Project is achievement of TRU's strategic objective, namely, the attainment of a carbon neutral or zero-carbon campus by 2030. Following unsuccessful attempts to create a biomass project, TRU engaged Creative Energy to investigate alternatives for decarbonizing its buildings through electrification. We are satisfied with the analysis of alternatives conducted by Creative Energy, and the consultation undertaken. The Project will support BC's energy objectives of reducing greenhouse gas emissions and encouraging economic development and the creation and retention of jobs. **Therefore, the Panel grants a CPCN for the TRU LCDES Project pursuant to sections 45 and 46 of the UCA.**

[123] UCA, sections 46(3.1)(a) and (c).
[124] Exhibit B1-1, p. 15.

The Panel also finds that the approach taken by Creative Energy to develop the Project capital cost estimate is reasonable.

While the Panel recognizes that Creative Energy prepared its capital cost to a Class 3 degree of accuracy, which is consistent with the BCUC's CPCN Guidelines, there remains a risk to the capital cost as the Project progresses. **The Panel therefore directs Creative Energy to report to the BCUC as laid out below**.

1) **Semi-annual Progress Report**

   The Semi-annual Progress Report is required to detail:

   - **Actual costs incurred to date compared to the CPCN Class 3 cost estimate highlighting variances with an explanation and justification of variances;**
   - **Updated forecast of costs, highlighting the reasons for any variances in Project costs anticipated to be incurred; and**
   - **The status of Project risks, highlighting the status of identified risks, changes in and additions to risks, the options available to address the risks, the actions that Creative Energy is taking to deal with the risks and the likely impact on the Project's schedule and cost.**

   Creative Energy must file the semi-annual progress reports within 30 days of the end of each semi-annual reporting period, with the first report covering the period ending September 30, 2023. Each report must provide the information set out in Appendix A to this Decision.

2) **Material Change Report**

   A material change is a change in the Project that would reasonably be expected to have a significant effect on the cost or scope of the Project, such that:

   - **there is a cost variance of greater than 10 percent of the CPCN Class 3 cost estimate; or**
   - **there is a change to the scope of work for the Project (for example, but not limited to, a change to Creative Energy's preferred heating system design).**

   In the event of a material change, Creative Energy must file a material change report with the BCUC, explaining the reasons for the material change, Creative Energy's consideration of the Project risk and the options available and actions Creative Energy is taking to address the material change. Creative Energy must file the material change report as soon as practicable and in any event within 30 days of the date on which the material change occurs. If the material change occurs within 30 days of the date for filing a semi-annual progress report, Creative Energy may instead include the material change information in the progress report.

3) **Final Report**

   The Final Report must include a breakdown of the final costs of the Project compared to the CPCN Class 3 cost estimate and provide an explanation and justification of any cost variances of 10 percent or more of the Class 3 cost estimate.

   The Final Report must be filed within the earlier of six months of substantial completion or the in-service date of the Project.

DATED at the City of Vancouver, in the Province of British Columbia, this 3rd day of May 2023.

Original signed by:

E. B. Lockhart
Panel Chair / Commissioner

Original signed by:

T. A. Loski
Commissioner

Original signed by:

A. Pape-Salmon
Commissioner

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ORDER NUMBER
C-1-23

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

and

Creative Energy Thompson Rivers Limited Partnership
Application for Approval of a Certificate of Public Convenience and Necessity
for the Thompson Rivers University Low-Carbon District Energy System

BEFORE:
E. B. Lockhart, Panel Chair
T. A. Loski, Commissioner
A. Pape-Salmon, Commissioner

on May 03, 2023

ORDER

WHEREAS:

A. On November 25, 2021, Creative Energy Thompson Rivers Limited Partnership (Creative Energy) submitted an application with British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN) for the Thompson Rivers University (TRU) Low Carbon District Energy System (LCDES) pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA) (CPCN Application);

B. In the CPCN Application, Creative Energy also seeks approval, pursuant to section 88(3) of the UCA, for an exemption for any requirement to file a contract with TRU under section 71 of the UCA in relation to TRU's provision of electricity and natural gas to Creative Energy with respect to the TRU LCDES (Exemption Request);

C. On December 9, 2021, TRU applied to the BCUC for an order under section 88(3) of the UCA exempting TRU from section 71 and Part 3 of the UCA in respect of the transmission, sale, delivery or provision of electricity and natural gas by TRU to Creative Energy for use in the TRU LCDES (TRU Exemption Application);

D. By Order G-7-22 dated January 11, 2022, the BCUC among other things, ordered that both Creative Energy's CPCN Application and the TRU Exemption Application be heard at the same time, and established a written hearing process and a regulatory timetable for review of the applications, which consisted of, among other things, public notice, intervener registration, BCUC and intervener information requests (IR) and submissions on further process;

E. The Commercial Energy Consumers Association of BC was the sole intervener;

F. The regulatory timetable was subsequently amended by Order G-41-22, dated February 18, 2022, and by Order G-97-22 dated April 7, 2022 to include Panel IR, Creative Energy and TRU final arguments, intervener argument and reply arguments;

G. On May 3, 2022, Creative Energy and TRU filed their final arguments, and included a request to adjourn the proceeding pending the outcome of an application with the Ministry of Advanced Education and Skills Training (Ministry) for approval of the statutory right of way (SRW);

H. By Orders G-122-22 dated May 6, 2022 and subsequent letters, the BCUC adjourned the proceeding and granted extension requests made by Creative Energy to provide the BCUC an update on the SRW application;

I. By BCUC Order G-356-22 dated December 9, 2022, upon notice of Ministry approval of the SRW, the BCUC proceeded to intervener final argument and reply argument; and

J. The BCUC has considered the evidence and submissions and finds that the certain approvals are warranted.

NOW THEREFORE pursuant to sections 45 and 46 of the *Utilities Commission Act* and for the reasons set out in the Decision issued concurrently with this order, the British Columbia Utilities Commission orders as follows:

1. Creative Energy is granted a CPCN for the TRU LCDES Project.

2. Creative Energy is directed to comply with all the directives outlined in Section 9 of the Decision issued concurrently with this order.

DATED at the City of Vancouver, in the Province of British Columbia, this 3rd day of May 2023.

BY ORDER

Original signed by:

E. B. Lockhart
Commissioner

Creative Energy Thompson Rivers Limited Partnership
Application for a Certificate of Public Convenience and Necessity for the
Thompson Rivers University Low-Carbon District Energy System

Table of Contents of Semi-Annual Progress Report

1. Project Status

1.1. General Project Status

1.2. Milestones Completed

1.3. Project Challenges and Issues

1.4. Plans for Next Period

2. Project Schedule

2.1 Schedule Summary

2.1.1 Schedule Performance to Date

2.1.2 Schedule Projection Going Forward

2.1.3 Schedule Difficulties and Variances

2.2 Design Scope Change Summary with Description of Request, Explanation for Request, Request Amount, Approved Amount

2.3 Construction Scope Change Summary with Description of Request, Explanation for Request, Request Amount, Approved Amount

3. Project Costs

3.1 Project Cost Summary including explanation of variances relative to the cost estimate in the Application. The report should show: “amount in CPCN Application”, “spent to date”, “estimate to complete”, “forecast total to complete”, and “variances”

3.2 Financial Summary including explanation of variances for the total project costs

4. Project Risks

4.1 Significant Project Risks

4.2 Impacts to Project Schedule or Costs

4.3 Plans to Mitigate Risks

5. Public and Indigenous Communities Consultation

5.1 An ongoing report on the status of consultation efforts including description of issues raised and addressed

Creative Energy Thompson Rivers Limited Partnership
Application for a Certificate of Public Convenience and Necessity
for the Thompson Rivers University Low-Carbon District Energy System

GLOSSARY AND ACRONYMS

ACRONYM / GLOSSARY	DESCRIPTION
AACE	Association for the Advancement of Cost Engineering
ASHP	Air Source Heat Pump
BCUC	British Columbia Utilities Commission
CEA	Clean Energy Act
COP	Coefficient of Performance
CPCN	Certificate of Public Convenience and Necessity
CPCN Application	Creative Energy's application for a CPCN to build a thermal energy system at Thompson Rivers University
Creative Energy	Creative Energy Thompson Rivers Limited Partnership
Creative Energy Analysis	An analysis of the district scale alternatives commissioned by Creative Energy and completed by Stantec
DPS	Distribution Piping System
EC	Energy Centre (refers to the thermal energy generating facility)
ETS	Energy Transfer Station
FTE	Full-time Equivalent
LCDES	Low Carbon District Energy System
LCOE	Levelized Cost of Energy
LGS	Large General Service
LTRP	Long-Term Resource Plan
Project	The construction and operation of the thermal energy system at Thompson Rivers University
RNG	Renewable Natural Gas

ACRONYM / GLOSSARY	DESCRIPTION
SOBE	School of Business and Economics
TES Guidelines	BCUC's Thermal Energy System Regulatory Framework Guidelines
TRU	Thompson Rivers University
TRU Exemption Application	Thompson Rivers University's application for exemption from section 71 and Part 3 of the UCA in respect of the transmission, sale, delivery or provision of electricity and natural gas by TRU to Creative Energy for use in the Low Carbon District Energy System
TteS	Tk'emlups te Secwepemc First Nation
UCA	*Utilities Commission Act*
WSHP	Water Source Heat Pump

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

and

Creative Energy Certificate of Public Convenience and Necessity
for the Thompson Rivers University Low-Carbon District Energy System and
Thompson Rivers University Exemption under Section 88(3) of the UCA

EXHIBIT LIST

Exhibit No.	Description
COMMISSION DOCUMENTS	
A-1	Letter dated December 17, 2021 – Appointing the Panel for the review of the Creative Energy Thompson Rivers Limited Partnership Application for a Certificate of Public Convenience and Necessity Thompson Rivers University Low-Carbon District Energy System
A-2	Letter dated December 17, 2021 – Appointing the Panel for the review of the Thompson Rivers University Application for an Exemption Order Pursuant to Section 88(3) of the *Utilities Commission Act*
A-3	Letter dated January 11, 2022 – BCUC Order G-7-22 establishing a regulatory timetable and public notice
A-4	Letter dated February 14, 2022 – BCUC Information Request No. 1 to Creative Energy
A-5	Letter dated February 14, 2022 – BCUC Information Request No. 1 to TRU
A-6	Letter dated February 18, 2022 – BCUC Order G-41-22 establishing an amended regulatory timetable and public notice
A-7	Letter dated March 3, 2022 – BCUC Response to Creative Energy regarding Intervener Registration and Participant Assistance/Cost Awards
A-8	Letter dated April 7, 2022 – BCUC Order G-97-22 establishing a further regulatory timetable
A-9	Letter dated April 14, 2022 –Panel Information Request No.1 to Creative Energy
A-10	Letter dated April 14, 2022 –Panel Information Request No. 1 to TRU
A-11	Letter dated April 29, 2022 – BCUC Response to TRU Request for Filing Extension and Confidentiality
A-12	Letter dated May 6, 2022 – BCUC Order G-122-22 adjourning the proceeding

A-13	Letter dated September 13, 2022 – BCUC response to Creative Energy's update on the Statutory Right of Way
A-14	Letter dated October 17, 2022 – BCUC response to Creative Energy's 2nd update on the Statutory Right of Way
A-15	Letter dated December 9, 2022 – BCUC Order G-356-22 establishing a further regulatory timetable

APPLICANT DOCUMENTS

B1-1	**CREATIVE ENERGY THOMPSON RIVERS LIMITED PARTNERSHIP (CREATIVE ENERGY-TRLP)** - Application for a Certificate of Public Convenience and Necessity (CPCN) Thompson Rivers University (TRU) Low-Carbon District Energy System dated November 25, 2021
B1-2	Letter dated February 25, 2022 – Creative Energy-TRLP submitting letter regarding CEC intervention request
B1-3	Letter dated March 2, 2022 – Creative Energy-TRLP submitting further response regarding CEC intervention
B1-4	Letter dated March 8, 2022 – Creative Energy-TRLP submitting responses to BCUC Information Request No. 1
B1-5	Letter dated March 8, 2022 – Creative Energy-TRLP submitting responses to CEC Information Request No. 1
B1-6	Letter dated March 17, 2022 – Creative Energy TRLP submission on further process
B1-7	Letter dated April 26, 2022 – Creative Energy TRLP submitting responses to Panel Information Request No. 1
B1-8	Letter dated September 8, 2022 – Creative Energy submitting update on the Status of Statutory Right of Way (SRW)
B1-9	Letter dated October 14, 2022 – Creative Energy submitting further update on the Status of Statutory Right of Way (SRW)
B1-10	Letter dated December 6, 2022 – Creative Energy submitting Ministry approval to update on the Status of Statutory Right of Way (SRW)

APPLICANT DOCUMENTS

B2-1	**THOMPSON RIVERS UNIVERSITY (TRU)** - Application for an Exemption Order Pursuant to Section 88(3) of the *Utilities Commission Act* (UCA) dated December 9, 2021
B2-2	Letter dated February 14, 2022 – TRU submitting Public Notice in compliance with Order G-7-22
B2-3	Letter dated March 8, 2022 – TRU submitting responses to BCUC Information Request No. 1
B2-4	Letter dated March 8, 2022 – TRU submitting responses to CEC Information Request No. 1
B2-5	Letter dated March 17, 2022 – TRU submission on further process
B2-6	Letter dated April 26, 2022 – TRU submitting partial responses to Panel Information Request No. 1
B2-6-1	Letter dated April 28, 2022 – TRU submitting balance of responses to Panel Information Request No. 1
B2-6-2	**CONFIDENTIAL** - Letter dated April 28, 2022 – TRU submitting confidential responses to Panel Information Request No. 1 Questions

INTERVENER DOCUMENTS

C1-1	**COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BRITISH COLUMBIA (CEC)** – Letter dated February 7, 2022 submitting request to intervene by David Craig
C1-2	Letter dated March 1, 2022 – CEC submitting Information Request No. 1 to Creative Energy
C1-3	Letter dated March 1, 2022 – CEC submitting Information Request No. 1 to TRU
C1-4	Letter dated March 17, 2022 – CEC submission on further process

LETTERS OF COMMENT

E-1	TRU Community Trust (TRU-CT) – Letter of Comment dated March 29, 2022