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River District Energy Limited Partnership

Application for a Certificate of Public Convenience and Necessity to Construct and Operate the Second Phase of the District Energy Utility System for the River District Development

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Decision
and Order C-3-23

June 27, 2023

Before:
E. B. Lockhart, Panel Chair
C. M. Brewer, Commissioner
B. A. Magnan, Commissioner

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Executive summary

On June 30, 2022, River District Energy Limited Partnership (RDE) applied to the British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN) for the construction and operation of the second phase of the District Energy Utility System (DEU) for the River District Development (River District) (Application). Phase 1 of the River District DEU, previously approved by BCUC Order C-14-11, consisted of a temporary boiler plant, the distribution piping and the energy transfer stations required to serve customer buildings within River District. RDE began providing thermal energy to customer buildings in 2012, and has to date connected 19 buildings. RDE states that now Phase 2 of the development of its DEU is required, which consists of a new, permanent Community Energy Centre, as well as additional distribution piping and energy transfer stations required by RDE to serve current and future River District customer buildings (Project).

The new, permanent Community Energy Centre is needed to serve the increasing thermal energy demand from RDE customers, as well as to allow future customer buildings to comply with low-carbon energy requirements currently established by the City of Vancouver. RDE estimates that by the fall of 2024, it will not have sufficient thermal energy generating capacity to serve its customers' needs. Without any permanent low carbon thermal energy offering in place by 2026, RDE may not be permitted by the City of Vancouver to connect any new customer buildings.

The proposed design of the Community Energy Centre includes the necessary equipment to receive thermal energy recovered as waste heat from Metro Vancouver's nearby Waste-to-Energy Facility (WTEF), as well as natural gas-fired boiler capacity. The thermal energy supplied to RDE by Metro Vancouver will displace thermal energy otherwise produced by RDE's natural gas-fired boilers, thereby reducing RDE's greenhouse gas (GHG) emissions by as much as 90 percent. Metro Vancouver is responsible for constructing and operating the necessary infrastructure to transfer thermal energy from the WTEF to RDE's permanent Community Energy Centre. RDE and Metro Vancouver have entered into a thermal energy sale and purchase agreement, a copy of which has been appended to the Application.

The estimated overall cost of the Project is approximately $87 million, comprising of an estimated $34 million to build the Community Energy Centre and approximately $53 million to build the remaining distribution piping and energy transfer stations. The Community Energy Centre is expected to be in service by 2024 and the remaining distribution piping and energy transfer stations will be installed as the River District community develops to full build-out in 2047.

Following review of the evidence and submissions in this proceeding, the BCUC finds that the public convenience and necessity require the construction and operation of the Project. Accordingly, for the reasons outlined in the accompanying Decision, and pursuant to sections 45 and 46 of the *Utilities Commission Act*, the BCUC grants a CPCN to RDE for the Project. The BCUC directs various reporting requirements relating to the Project, as set out in this Decision granting a CPCN for the Project.

1.0 Introduction

On June 30, 2022, pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), River District Energy Limited Partnership (RDE) applied to the British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN) to construct and operate the second phase of the District Energy Utility System (DEU) for the River District Development (River District) (Application). Phase 1 of the River District DEU, approved by BCUC Order C-14-11, comprises a temporary boiler plant, distribution piping and energy transfer stations to serve the first buildings constructed in the River District community. As part of the Phase 1 scope, RDE began providing thermal energy to customer buildings in 2012. To date, RDE has installed three temporary boiler plants and connected 19 buildings.[1] RDE states that now Phase 2 of the development of its DEU is required, which consists of a new, permanent Community Energy Centre (CEC), as well as distribution piping and energy transfer stations required by RDE to serve current and future River District customer buildings (Project).[2]

The overall Project cost is approximately $87 million, comprising of an estimated $34 million to build the Community Energy Centre and approximately $53 million to build the remaining distribution piping and energy transfer stations.[3] The Community Energy Centre is expected to be in service by 2024 and the remaining distribution piping and energy transfer stations will be installed as the River District community develops to full build-out in 2047.[4]

The Community Energy Centre will be sized to have adequate capacity to serve RDE's existing customer buildings, as well as all future buildings contemplated within the build-out of the River District community. The Community Energy Centre will replace the three temporary boiler plants currently in operation. The proposed design of the Community Energy Centre includes the necessary equipment to receive thermal energy produced from waste heat generated at Metro Vancouver's Waste-to-Energy Facility (WTEF) and to distribute it to River District DEU customers. Metro Vancouver Regional District (MVRD) will deliver thermal energy to the new Community Energy Centre in the form of hot water through a closed-loop pipeline delivery system originating at the WTEF.[5] Residual thermal energy needs will be met using natural gas-fired boilers installed by RDE in the Community Energy Centre.[6]

RDE states that thermal energy from waste heat will replace almost all of its natural gas use, thereby reducing its greenhouse gas (GHG) emissions by as much as 90 percent.[7] This will permit customer buildings served by RDE to meet the low-carbon energy requirements established by the City of Vancouver. These requirements are discussed in Section 2.2 below.

[1] Exhibit B-1, p. 12.
[2] Ibid., p. 1.
[3] Ibid., pp. 41-42.
[4] Ibid., pp. 32-33.
[5] Ibid., p. 1.
[6] Ibid.
[7] Ibid.

1.1 Approvals Sought

RDE seeks approval of a CPCN for the Project, pursuant to sections 45 and 46 of the UCA. The Project consists of the construction and operation of the following:[8]

- The new Community Energy Centre to house MVRD's energy transfer equipment required to transfer thermal energy from MVRD to RDE and RDE's natural gas-fired hot water boilers; and
- The distribution piping, energy transfer stations and related facilities required by RDE to serve the remaining phases of development of the River District community.

1.2 Regulatory Process

By Order G-234-22 dated August 17, 2022, the BCUC established a written public hearing process and a regulatory timetable for the review of the Application, which included public notice, intervener registration and one round of information requests (IRs). The regulatory timetable was amended to include a second round of IRs, as well as final and reply written arguments.[9]

Three parties registered as interveners in the proceeding:

- BC Sustainable Energy Association (BCSEA);
- Metro Vancouver; and
- Residential Consumer Intervener Association (RCIA).

Three parties registered as interested parties. The BCUC received one letter of comment.

1.3 Legal and Regulatory Framework

Sections 45 and 46 of the UCA set out the legislative framework for the BCUC review of CPCN applications. 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 require, or will require, the construction or operation of the plant or system proposed.[10]

Section 46 of the UCA sets out the procedure on a CPCN application. Section 46(3) of the UCA provides 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.[11]

Section 46(3.1) of the UCA provides that in deciding whether to issue a CPCN for a public utility other than the authority (defined in the UCA as the British Columbia Hydro and Power Authority), the BCUC must consider,

[8] Ibid.

[9] Orders G-323-22, G-26-23.

[10] *Utilities Commission Act*, RSBC 1996, c. 473, Section 45(1).

[11] UCA, Section 46(3).

among other things, the applicable of British Columbia's energy objectives, which are defined in Section 2 of the *Clean Energy Act*.[12]

The BCUC's CPCN Guidelines provide general guidance regarding the information that should be included in a CPCN application and 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.[13]

The BCUC's Thermal Energy Systems Regulatory Framework Guidelines (TES Guidelines) state that a thermal energy system (TES) that does not meet the requirements of a Micro TES or a Strata Corporation TES and does not meet the Stream A characteristics as described in section 2.3.1 of the TES Guidelines, is by default considered to be a Stream B TES. In such cases, a CPCN application is to be submitted to the BCUC. RDE is considered to be a Stream B TES by the BCUC, and it has accordingly submitted this CPCN application for the Project. CPCN applications for Stream B TES are generally expected to be prepared in accordance with the BCUC's 2015 Certificate of Public Convenience and Necessity Application Guidelines (CPCN Guidelines) as well as section 2.4.2 of the TES Guidelines, which outlines additional filing requirements for Stream B TES.[14]

1.4 Decision Framework

This Decision follows the general framework of the BCUC's CPCN Guidelines and addresses the following key issues arising from the Application:

- Whether RDE has established a need for the Project;
- Whether the preferred Project alternative is reasonable;
- Whether the Project capital cost estimate is reasonable;
- Whether RDE's consultation to date with First Nations and Indigenous communities is adequate;
- Whether RDE's engagement with the public regarding the Project is adequate; and
- Whether the Project is consistent with the Province's applicable energy objectives.

1.5 Background

River District is a large, mixed-use waterfront community located on former industrial lands along the Fraser River in southeast Vancouver, BC. Construction of the first building in the community began in 2011, although the planning process involving the City of Vancouver began much earlier.[15] In 2006, the City of Vancouver passed an Official Development Plan (ODP) for the River District site, which required that the development of the site achieve high levels of environmental performance, including through a community-wide heating system supplied by low GHG emitting resources such as, for example, biomass or waste heat recovery.[16]

[12] *Clean Energy Act*, section 2.

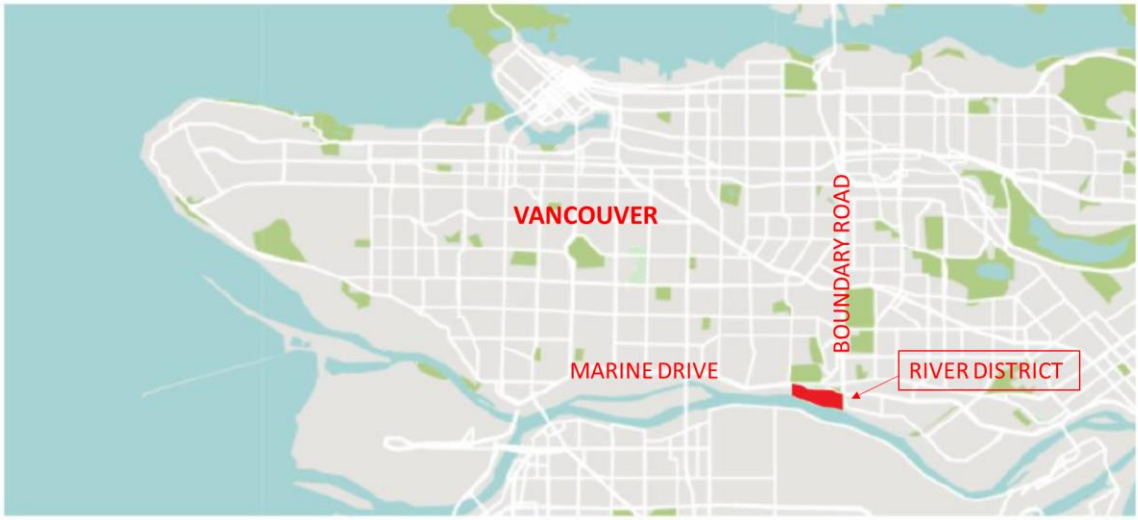
[13] BCUC Order G-20-15, 2015 Certificate of Public Convenience and Necessity Application Guidelines

[14] TES Guidelines, pp. 18-22.

[15] River District Energy Limited Partnership Application for a CPCN to construct and operate a District Energy System for the River District Development in Southeast Vancouver proceeding (Original CPCN proceeding), Exhibit B-1, p. 1.

[16] Exhibit B-1, p. 11.

Figure 1: Location of River District[17]



In 2011, RDE applied to the BCUC for a CPCN to build a community wide heating system, which included thermal generating facilities and the associated distribution piping and energy transfer stations. RDE proposed a phased approach for its DEU development. By Order C-14-11, the BCUC approved RDE's Phase 1 plan to provide thermal energy to serve the community's initial development parcels using temporary natural gas-fired hot water boilers to be followed by a permanent energy centre as load developed (Original CPCN).[18] Phase 1 envisioned that a permanent energy centre, which would generate thermal energy using natural gas-fired boilers, would be constructed by 2016.[19]

RDE explains that slower-than-anticipated development of the River District community led to the postponement of construction of the permanent energy centre.[20] To date, RDE has relied on the continued use of temporary natural gas-fired boiler facilities and currently has ten natural gas-fired hot water boilers located in three temporary energy centres (TECs). These temporary facilities comprise of natural gas-fired boilers mounted inside standard 8' by 40' shipping containers.[21] The total available capacity of the TECs is 15 MW. RDE states it expects the TECs will have sufficient capacity to meet projected demand until the fall of 2024, at which point additional capacity will be required.[22]

In the years since the River District ODP was passed and RDE was established by the Original CPCN, the GHG emission requirements for new buildings have evolved. Through the introduction of the Zero Emissions Building Plan (ZEBP) in 2016 and the Low-Carbon Energy Systems Policy (LCES Policy or LCES) in 2017, the City of Vancouver has mandated GHG intensity targets for new buildings. The ZEBP and LCES set limits on the GHG emissions from new buildings, thereby requiring buildings to incorporate the use of low carbon thermal energy

[17] Exhibit B-1, p. 1; Figure 1 annotated by the BCUC.
[18] Ibid.
[19] River District Energy Limited Partnership Application for a CPCN to construct and operate a District Energy System for the River District Development in Southeast Vancouver, Order C-14-11 and Decision dated December 19, 2011 (Original CPCN), p. 10.
[20] Exhibit B-1, p. 2
[21] Original CPCN proceeding, Exhibit B-1, p. 48.
[22] Exhibit B-1, pp. 11-12.

solutions into their designs. These policies, in addition to requirements in the River District Community ODP to develop a low carbon emitting community-wide heating system, have led RDE to seek approval of the Project.

2.0 Project Need and Justification

RDE states that it is seeking approval to construct and operate the new CEC and to complete the expansion of its distribution piping system so that it has the necessary equipment to serve the existing and future buildings within the River District community.[23] RDE states that the Project is needed to meet the forecast growth in thermal energy demand from the River District community, which is expected to shortly exceed the available capacity of the TECs. The Project is also needed for RDE to provide low carbon thermal energy to its customer buildings so that they are capable of complying with City of Vancouver GHG emission requirements. These Project justifications are discussed in the sections below.

2.1 Forecasted Thermal Energy Demand Growth

The River District community is expected to grow over the coming years and decades. RDE states that as of June 2022, it is providing thermal energy to 19 buildings with a total connected floor area of approximately 290,000 m^2. At full buildout by 2047, RDE expects it will have approximately 865,000 m^2 of connected residential floorspace and more than 46,000 m^2 of commercial and retail space.[24] RDE explains that this growth in customer buildings increases the expected diversified peak load[25] from 11.0 MW in 2022 to 26.1 MW in 2047.[26]

RDE explains that along with increased thermal energy generating capacity, the installation of additional distribution piping (DPS) and energy transfer stations (ETS) is required for RDE to connect and serve future customer buildings in the River District Community.[27] The DPS is an all-welded closed loop piping system that conveys a supply and return flow of hot water to customer buildings for the purpose of transferring thermal energy for space heating and domestic hot water.[28] An ETS consists of the equipment necessary for a customer building to receive thermal energy from the DPS. This equipment, which includes heat exchangers, control valves and thermal energy meters, is located within each customer building. The ETS are owned and operated by RDE, and represent the point of demarcation between RDE's system and the customer building's heating system.[29] RDE provides the following table outlining the forecast building connections, the required capacity (diversified peak load), the length of new DPS and the number of new ETS required through to 2047.[30]

[23] Ibid., p. 9.
[24] Ibid., p. 11.
[25] Exhibit B-5, BCUC IR 34.11.
[26] Exhibit B-5, BCUC IR 1.3.
[27] Exhibit B-1, p. 26.
[28] Ibid., p. 31.
[29] Ibid.
[30] Exhibit B-5, BCUC IR 1.3.

Table 1: Forecasted Building connections, required capacity, DPS and ETS

Year	Number of connected customer buildings	Required thermal energy generating capacity (MW)	Length of new DPS required (m)	Number of new ETS required
2022	19	11.0	0	2
2023	20	11.4	0	2
2024	23	12.9	0	3
2025	23	12.9	0	0
2026	26	15.2	0	3
2027	28	16.0	0	2
2028	29	16.2	0	1
2029	29	16.2	0	0
2030	32	17.5	660	3
2035	39	21.8	700	7
2040	43	23.3	1,000	4
2047	52	26.1	1,380	9

RDE states that, in addition to the requirements to implement a community-wide heating system within the River District ODP, each building within the River District community is subject to the City of Vancouver River District Design Guidelines which include conditions requiring a district energy system connection.[31] The following figures show RDE's assets and service area (Figure 2),[32] and the projected assets and service area at full-buildout (Figure 3).[33] The figures show the locations of the three TECs currently operated by RDE; however, RDE notes that these will be decommissioned after the permanent energy centre is built.

Figure 2: River District Energy Existing Assets and Service Area

[31] Ibid., BCUC IR 2.2.2.

[32] Exhibit B-1, p. 26.

[33] Ibid., p. 27.

Figure 3: River District Energy Projected Assets and Service Area at Full Buildout

RDE has divided the River District community into five service areas, which it uses to plan the development of DPS and ETS infrastructure (see Figure 4 below). To date buildings in Service Areas 1 and 2 have been constructed and connected to the existing DPS; work on Service Area 4 is underway.[34] Service Area 4 consists of a single building, which is currently under construction.[35] RDE states that the first building in Service Area 3 is expected to be connected in 2031, with subsequent building connections throughout the period 2031-2047.[36] Figure 3 above shows the future DPS piping required to connect new buildings that are expected to be developed in Service Area 3.

The River District ODP was updated in 2021 following extensive assessment of the future development of Service Area 3. RDE states that there is a high degree of certainty that Service Area 3 will be developed, and that these new buildings will need to be served by RDE.[37] All future River District development parcels have "No-Build" covenants under section 219 of the *Land Title Act*, requiring each parcel to receive confirmation from RDE that RDE is satisfied with the design of the new building's connection to RDE's thermal energy distribution infrastructure prior to the issuance of any building permit.[38] RDE further states that delays to the development of Service Area 3 will not change the length of DPS required nor the number of ETS required to serve new buildings in that area.[39] Delays to the development of Service Area 3 would only affect the timing of when RDE needs to construct the DPS and ETS facilities to connect these new buildings.[40]

[34] Exhibit B-1, p. 33.
[35] Exhibit B-5, BCUC IR 6.7.
[36] Exhibit B-1, p. 33.
[37] Exhibit B-5, BCUC IR 1.2.
[38] Ibid., BCUC IR 2.2.2.
[39] Exhibit B-5, BCUC IR 6.7.
[40] Ibid.

Figure 4: River District Energy Service Areas

As noted in Section 1.5 above, RDE states that without any increase to its thermal energy generating capacity, it will have insufficient boiler capacity by 2024 to meet projected demand.[41] In addition, RDE explains that as of 2022, the temporary natural gas-fired boilers have insufficient capacity to meet peak demand should one of the larger boilers fail.[42]

RDE provides the table below and explains that each TEC consists of natural gas-fired boilers with the following nominal capacity and expected remaining life to meet thermal energy demand of the River District Community:[43]

Table 2: Existing TECs

TEC	Boiler	Nominal Capacity (MW)	Expected Remaining Lifespan[44]
1	1	0.8	0
	2	0.8	0
	3	0.8	0
	4	0.8	0
	5	0.8	0
2	1	4.0	2-4 years
	2	4.0	2-4 years
	3	0.4	2-4 years
3	1	4.0	25-30 years
	2	4.0	25-30 years

[41] Exhibit B-1, pp. 12-13.
[42] Ibid., p. 12.
[43] Ibid., p. 12.
[44] Exhibit B-5, BCUC IR 5.3.

RDE states that the combined TECs are currently operating at a total capacity of 15 MW, which is below the aggregate nominal capacity,[45] for the following reasons:

- All five boilers within TEC 1 have exceeded their original service life, and only two of the five TEC 1 boilers are currently operable;[46]
- Insufficient FortisBC natural gas supply infrastructure to TEC 1 and TEC 3, which limits combined effective capacity to approximately 6.8 MW;[47] and
- Excessive boiler noise from TEC 2 when operating at full capacity.

TEC 1 and TEC 3 share the same FortisBC gas main connection. RDE explains that shortly after installing TEC 3, RDE was advised that FortisBC had interpreted that only one of the two 4 MW boilers in TEC 3 would be operated at any given time, and therefore, the FortisBC gas main connection was undersized.[48] FortisBC proposed to resolve this issue by installing a line upgrade, for which RDE would need to pay. The timing of the line upgrade was uncertain, as approval would need to be sought to cross the Canadian Pacific Railway line in the River District. Due to the cost and uncertain timing of the line upgrade, as well as RDE's plans to construct a CEC, RDE decided not to pursue the solution proposed by FortisBC.

RDE states that to avoid disturbance to nearby residences from excessive boiler noise, TEC 2 must operate below its rated capacity.[49] RDE also explains that a residential building is scheduled to be constructed on the site where TEC 2 now stands, and that the construction is set to begin as early as 2024. Removal and decommissioning of TEC 2 will need to be timed with the construction activities of this residential building.[50] As a result of the limited operability of some existing boilers, the natural gas supply constraints at TEC 1 and TEC 3, and the imminent decommissioning of TEC 2, RDE explains that without any increase to its thermal energy generating capacity, it will have insufficient boiler capacity to meet projected demand by the fall of 2024.[51]

RDE states that it assumes the two boilers from TEC 3 will be moved to the new, permanent CEC in the summer of 2027, although the exact timing of this move will be based on operational considerations.[52]

2.2 City of Vancouver Regulatory Requirements

As stated in Section 1.5 above, in 2006, Vancouver City Council passed an ODP for the River District. The ODP included requirements that the redevelopment of the area achieve high levels of environmental performance, including through a community-wide heating system using technologies such as waste heat recovery.[53]

Further, in 2016, the City of Vancouver introduced its ZEBP which requires new buildings in the city to achieve improved thermal energy efficiency and to meet GHG intensity targets. RDE explains that the introduction of the

[45] Exhibit B-1, p. 12.
[46] Exhibit B-5, BCUC IR 5.1.1.
[47] Ibid., BCUC IR 11.2.
[48] Ibid.
[49] Exhibit B-1, p. 12.
[50] Ibid., p. 31.
[51] Ibid., pp. 12-13.
[52] Ibid., p. 13.
[53] Ibid., p. 11.

ZEBP meant it had to reduce its forecast energy sales and revise its overall system plan to reflect significantly lower demand from new buildings that would be subject to the ZEBP.[54] RDE explains that the ZEBP requires new buildings to meet three normalized performance targets: [55]

- Thermal Energy Demand Intensity (TEDI);
- Total Energy Use Intensity (TEUI); and
- Greenhouse Gas Intensity (GHGI).

The remainder of this section of the Decision focuses on the GHG performance targets outlined in the ZEBP, as the thermal energy demand impacts of the ZEBP have been accounted for in the demand forecast discussed above in Section 2.1.

The GHG targets established by the ZEBP are reflected as maximum permitted GHG emission limits within the City of Vancouver's Building By-law (Vancouver Building By-law).[56] In 2017, the City of Vancouver adopted the LCES Policy which defines how new buildings can meet the ZEBP GHGI targets through the connection to a City-approved low carbon thermal energy system. The LCES policy defines a low carbon energy system as a thermal energy system that derives heat energy primarily from highly efficient and renewable sources in order to provide heating, such as space heating or domestic hot water, to buildings.[57] The LCES Policy defines low carbon heat as heat energy produced at a carbon intensity that is much less than the carbon intensity of heat energy produced using fossil fuels. Under the LCES policy, the low carbon heat must have a carbon intensity low enough to meet the GHG limits for buildings imposed by the Vancouver Building By-law.[58]

Specifically, the ZEBP requires new buildings in Vancouver to meet a GHGI target of 6 $kgCO_2e/m^2/yr$.[59] By 2030, the City of Vancouver's GHG emission target for all new buildings will decrease to 0 $kgCO_2e/m^2/yr$.[60] The City of Vancouver has already indicated plans to reduce the allowable GHGI target to below 6 $kgCO_2e/m^2/yr$ in advance of 2030. RDE states that amendments to the Vancouver Building By-law, which resulted from a Climate Emergency report approved by City of Vancouver Council in May 2022, will reduce GHGI targets to as low as 3 $kgCO_2e/m^2/yr$ for new residential buildings between four and six storeys and new residential buildings greater than seven storeys by 2023 and 2025, respectively.[61] The GHGI targets established by City of Vancouver policies and by-laws are summarized in the table below:

Table 3: City of Vancouver GHG Emission Targets from New Buildings

Current GHGI Target	6 $kgCO_2e/m^2/yr$
Intermediate GHGI Target (2023-2025)	3 $kgCO_2e/m^2/yr$
Future GHGI Target (2030)	0 $kgCO_2e/m^2/yr$

[54] Ibid., p. 3.
[55] Ibid., p. 11.
[56] Exhibit B-5, BCUC IR 17.4 & Zero Emissions Building Plan, p. 5.
[57] Low-carbon Energy Systems Policy, https://guidelines.vancouver.ca/policy-sustainability-low-carbon-energy-systems.pdf , p. 1.
[58] Ibid.
[59] Exhibit B-1, p. 16.
[60] Exhibit B-5, BCUC IR 17.4.
[61] Ibid., BCUC IR 8.14.

RDE also explains that it signed a memorandum of understanding (MoU) with the City of Vancouver in 2020 regarding the parties' shared goal of developing River District as a sustainable community through the transition of the River District DEU to a low carbon energy source. RDE explains that the MoU provides a timeline for completion of a permanent low carbon thermal energy source by December 31, 2025.[62] The City of Vancouver is permitting RDE to connect new customer buildings on the basis that RDE is pursuing a permanent low carbon thermal energy source. RDE may not be permitted to continue connecting new buildings if it does not have a permanent low carbon thermal energy source in service by 2026.[63]

With respect to forecast development and low carbon energy demand for buildings in the River District, RDE provides the following table:[64]

Table 4: River District Energy Forecasted Annual Energy Demand

Year	Connected Area (m^2)	Total Annual Thermal Energy Delivered (MWh)	Annual Low Carbon Energy Demand (MWh)
2022	278,348	26,750	0
2023	288,120	29,248	36
2024	341,708	31,280	910
2025	341,708	34,238	910
2026	418,226	36,005	4,826
2027	445,233	40,184	5,897
2028	456,707	41,603	6,260
2029	456,707	42,041	6,260
2030	502,199	43,068	8,743
2035	672,478	57,024	20,647
2040	735,393	61,474	24,927
2047	862,142	70,358	33,619

In Table 4, RDE provides the minimum amount of low carbon thermal energy it must supply to ensure that buildings in River District meet the GHGI limits required under the Vancouver Building By-law.[65] RDE clarifies that there is no requirement to supply low carbon thermal energy to any of the 19 customer buildings that it currently serves.[66] The annual low carbon energy demand shown in the table above is required to allow RDE's new building customers to meet the City of Vancouver GHG emission requirements. RDE estimates that it will require approximately 33,600 MWh of low carbon thermal energy annually at full buildout in 2047.[67] To deliver this annual low carbon energy demand, RDE determines that a low carbon energy source with a minimum capacity of 5 MW is required.[68]

[62] Ibid., BCUC IR 2.4.
[63] Ibid., BCUC IR 2.3.
[64] Ibid., BCUC IR 4.1.
[65] Exhibit B-5, BCUC IR 4.1.
[66] Ibid., BCUC IR 3.1.
[67] Ibid., BCUC IR 8.1.
[68] Exhibit B-5, BCUC IR 8.1

Current GHGI targets cannot be met using natural gas-fired boilers exclusively, as currently operated by RDE in its TECs. RDE states that it needs to adopt a low carbon energy source for its permanent energy centre in order to meet commitments to the City of Vancouver as part of the ODP for the River District, as well as the City of Vancouver GHG reduction targets established by policies and by-laws.[69]

Positions of the Parties

BCSEA states that it accepts the Project need.[70]

RCIA observes that to meet the thermal energy needs of the River District community, RDE requires a long-term sustainable low carbon energy solution.[71]

Panel Determination

The Panel finds that RDE has established the need for the Project. Relying exclusively on natural gas to meet RDE's thermal energy needs is no longer an option because of the changing regulatory requirements and therefore RDE needs to develop a low carbon energy source for its customers. We accept RDE's evidence that the ZEBP and LCES Policy now mandate that RDE adopt a low carbon energy source for the River District community.

RDE has contemplated a low carbon energy system from the outset of its development of the River District community. Although the community has grown more slowly than RDE originally projected, the Panel is persuaded that the evidence now demonstrates that the community is growing at a rate that means its current capacity of 15 MW is no longer sufficient to support the evolving River District community. Further, we are also persuaded that the current energy source lacks redundancy and will be soon insufficient due to growth in demand. Therefore, we are satisfied that RDE has established the need to build a permanent energy centre.

The Panel finds that RDE has demonstrated a need for the DPS and ETS required to serve future customer buildings that it anticipates will be included within the full build out of the River District community. This includes buildings to be developed within Service Area 3 during the period 2031-2047. The Panel is persuaded that the commitments made in the River District ODP to connect new buildings to a community wide heating system, as well as the requirements of the City of Vancouver's River District Design Guidelines, ensure RDE will serve new buildings developed in the River District community. The Panel also considers the covenants applicable to Service Area 3 development parcels, which require RDE approval of building/utility connection design, provide additional assurance that future buildings will connect to RDE.

The Panel considers there to be a low risk of stranded DPS or ETS assets should a delay in the development of Service Area 3 occur or should Service Area 3 never be developed. The timing of DPS and ETS construction occurs as new customer building construction is nearing completion, and therefore RDE is assured that its investments in DPS and ETS infrastructure are only expended prior to connecting a customer.

[69] Exhibit B-1, p. 13.

[70] BCSEA Final Argument, p. 4.

[71] RCIA Final Argument, p. 6.

3.0 Evaluation of Alternatives

RDE states that several low carbon heating technologies combined with natural gas-fired boilers could be considered in the design of a permanent energy centre that satisfy the City's requirements for a Low Carbon Energy System. The alternatives considered will need sufficient capacity to serve RDE's forecast diversified peak load, which is expected to increase to 26.1 MW at full buildout in 2047.

This section of the Decision summarizes RDE's evaluation of alternatives, which included the following steps:[72]

- Technology Screening – Assessment of five different low carbon resources;
- Option Assessment – Analysis of identified feasible low carbon resources; and
- Options Refinement – Further low carbon resource configuration and financial analysis.

3.1 Technology Screening of Low Carbon Sources

In the Technology Screening stage, completed for RDE in 2017 by Kerr Wood Leidal Associates Ltd. (KWL), RDE explains that five low carbon energy sources were explored for their suitability to meet RDE's heating, operational and low carbon requirements:[73]

1. Sewer heat recovery;
2. River water heat recovery;
3. Geoexchange;
4. Biomass (Single large capacity biomass boiler & Multiple small capacity biomass boilers); and
5. Waste Heat Recovery from the WTEF.

The following sources were screened out at this stage: sewer heat recovery, river water heat recovery and geoexchange. The reasons for screening out these sources are discussed below. With respect to the biomass source option, KWL assessed two different biomass boiler configurations: a single large boiler and multiple smaller boilers.

Of the five low carbon sources that RDE considered, as listed above, all except waste heat recovery from the WTEF require RDE to install and operate equipment to produce or extract thermal energy from local resources or sewer infrastructure.[74] Under the waste heat recovery from the WTEF option, RDE would enter into a thermal energy sale and purchase agreement (TESPA) with MVRD to receive thermal energy produced at the MVRD WTEF in Burnaby.[75] The thermal energy supplied by MVRD is delivered at a temperature which is sufficient for its direct delivery to RDE's customers. The WTEF is a mass burn facility that disposes of solid waste generated in the Vancouver region.[76]

[72] Exhibit B-1, p. 14.
[73] Ibid.
[74] Exhibit B-1, p. 19; RDE Final Argument, para. 46
[75] Exhibit B-1, p. 19.
[76] Ibid., Appendix B, p. 1.

The use of renewable natural gas (RNG) was not one of the five low carbon energy sources considered by RDE. RDE explains that it excluded RNG from the alternatives analysis due to concerns about the availability of supply and whether it would meet the City of Vancouver's GHG intensity requirements under the ZEBP.[77] RDE further explains that, in accordance with the LCES Policy, RNG can only be used as an interim measure, before the utility must implement a permanent low carbon energy plant, therefore RNG cannot be used as a permanent solution.[78]

The low carbon energy sources were evaluated by RDE at this stage of analysis based on the following qualities, considered by RDE to be essential for a permanent low carbon energy source:[79]

- Able to provide sufficient capacity to meet RDE's low carbon thermal energy requirements;
- Viable path to permitting; and
- Can be operated to meet RDE's energy demand profile.

Sewer Heat Recovery

RDE states that it explored sewer heat recovery but determined that the sewer lines, and by extension the amount of sewer heat available, near the River District neighbourhood are not large enough to meet RDE's low carbon energy needs. RDE states that this option would require RDE to construct and operate significant civil works and infrastructure to divert effluent from a Metro Vancouver sewer main to the CEC for heat extraction. RDE states that ongoing operation of the required infrastructure would consume approximately 2 MW of electricity to produce 5 MW of thermal energy.[80] RDE further explains that the nearest appropriately sized sewer line is over 1 km from River District, and that the combination of a sewer heat recovery facility plus a 1 km interconnection was determined not to be economical, and therefore this option was screened out.[81]

River Water Heat Recovery

RDE explains that river water heat recovery could be installed in the Fraser River close to the River District community. However, during winter months, the Fraser River would have much lower temperatures than a sewer line, resulting in much lower heat pump performance than the sewer heat recovery alternative. RDE also explains that the brackish quality of the water in the segment of the Fraser River near the River District could significantly increase system costs.[82] Additionally, RDE states that there is considerable uncertainty around the permitting requirements for this type of system.[83] Due to these concerns, RDE eliminated the river water heat recovery option.

Geoexchange

[77] Ibid., p. 14.
[78] Exhibit B-5, BCUC IR 6.2.
[79] Ibid., BCUC IR 7.1.
[80] Exhibit B-3, p. 4.
[81] Exhibit B-1, p. 14.
[82] Ibid.
[83] Exhibit B-1, pp. 14-15.

RDE states that it considered a geoexchange system alternative, however, it notes that geoexchange systems are better suited to heating and cooling systems that allow heat to be injected into the geoexchange field during the summer months, and then recovered during the winter months. As a heating-only district energy system, RDE states it would not be able to provide rejected heat to recharge the field.[84] Additionally, in the technology screening report, KWL explains that without more knowledge of the hydrogeological conditions at the River District site, it is not possible to conclude whether geoexchange is a viable option for the River District community.[85] RDE also explains that for a geoexchange project, RDE would be responsible for the full-cycle costs of installing, operating and maintaining the civil works and infrastructure associated with the geoexchange field, and RDE would also take on the risk of geoexchange field performance.[86] For these reasons, RDE did not pursue geoexchange.

Biomass – Single Large Boiler

RDE states that a single large boiler biomass option was also considered. RDE explains that a single boiler sized to meet the low carbon requirements of the River District community would result in significant operational constraints since there are limitations to the capacity turn down ability of a single large boiler. Consequently, RDE explains that it is unlikely the single boiler would be able to run during periods of low demand.[87] RDE screened out the single large biomass boiler alternative at this stage in its alternative assessment.

Biomass – Multiple Small Boilers

RDE's consultant KWL also considered a system of four 1.25 MW biomass boilers, with a total capacity of 5 MW. RDE explains that this option avoids the limitations of the single large boiler biomass option.[88] This is one of the two options that RDE progressed to the subsequent Options Assessment stage.

Waste Heat Recovery from the WTEF

RDE states that since the approval of the Original CPCN in 2011, it has continued discussions with MVRD regarding obtaining thermal energy from the WTEF.[89] RDE explains that MVRD has since decided to proceed with developing infrastructure which will allow it to recover waste heat from its WTEF and distribute and sell the heat to third party thermal energy utilities, such as RDE. To deliver heat to RDE, MVRD will construct, at its own cost, a heat recovery center at the WTEF and a 6 km closed loop hot water delivery system between the WTEF and RDE's CEC (MVRD Infrastructure).[90] The MVRD Infrastructure will deliver thermal energy to RDE at temperatures between 90°C and 120oC, although the actual temperatures will be optimized by RDE and MVRD during operation.[91] Thermal energy provided to RDE by MVRD within this temperature range can be delivered directly to RDE's customers, as RDE's DPS system operates between 60°C and 85°C.[92] To receive thermal energy

[84] Ibid., p. 15.
[85] Exhibit B-3, Attachment 2, p. 4.
[86] Exhibit B-7, BCSEA IR 17.1.
[87] Exhibit B-1, p. 15.
[88] Ibid.
[89] Exhibit B-1, p. 14
[90] Ibid., Appendix B, p. 5; Exhibit B-1, p. 3.
[91] Ibid., Appendix B, p. 40.
[92] Ibid., Appendix B, p. 40.

from MVRD, RDE is required to locate heat exchangers within the CEC, alongside natural gas-fired boilers which are required for peaking and back-up service.[93] The WTEF option is the second of the two options which RDE progressed to the subsequent Options Assessment stage.

Figure 5 below provides a diagram of the infrastructure MVRD would need to construct in order to transfer recovered waste heat from its WTEF to RDE. Figure 6 below shows the proposed demarcation between MVRD and RDE infrastructure within the CEC.

Figure 5: Overview of MVRD Waste Heat Recovery Infrastructure

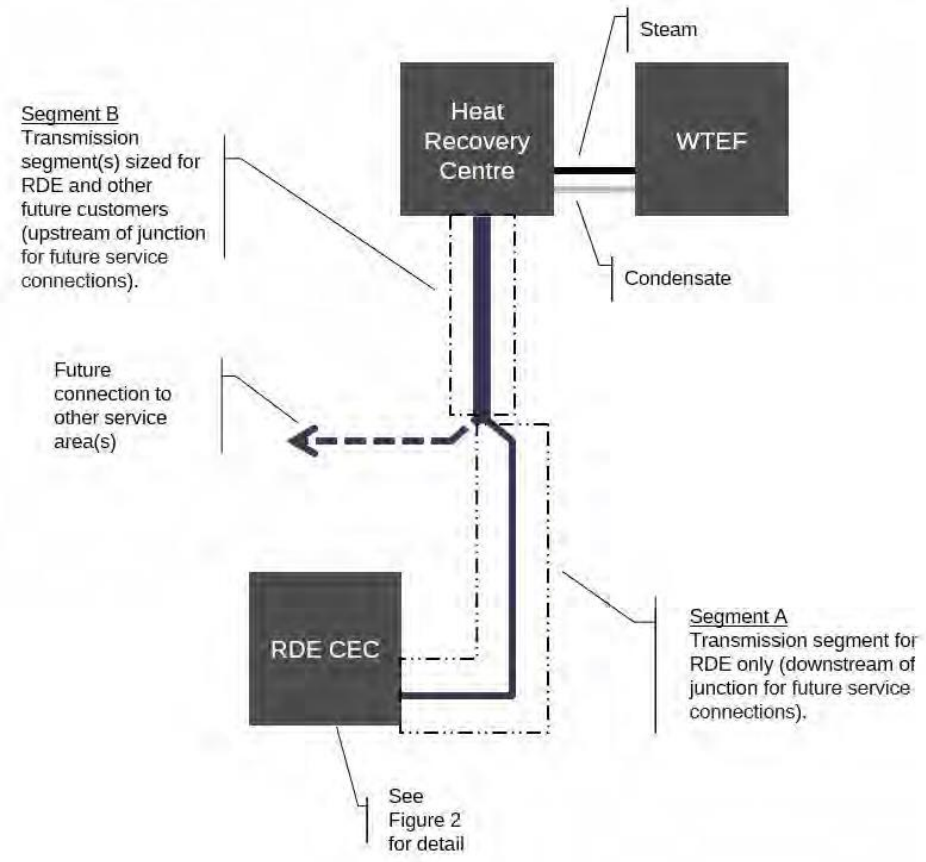
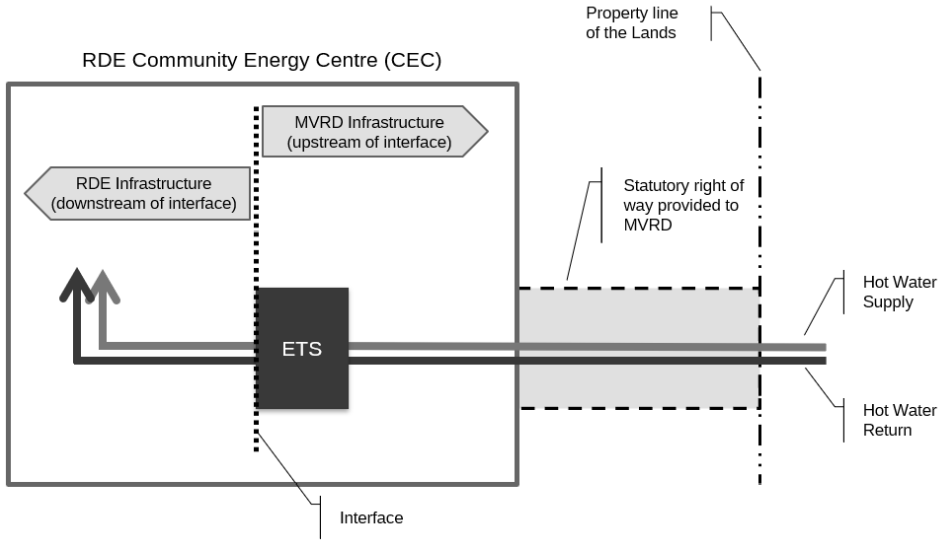


Figure 6: RDE & MVRD Waste Heat Recovery Infrastructure Interface

[93] Ibid., p. 4.



Following the Technology Screening stage of RDE's Alternative Evaluation in 2017, the sewer heat recovery, geoexchange and large single biomass boiler options were screened out and not pursued further. In the subsequent Options Assessment stage, RDE continued to assess the multiple small biomass boiler and waste heat recovery from the WTEF alternatives.

3.2 Options Assessment

Following its 2017 Technology Screening analysis, RDE determined that the multiple boiler biomass and the WTEF connection options were the only feasible alternatives for further assessment. At that stage of the evaluation of alternatives, RDE determined it would require a 5 MW low carbon energy source to meet the GHGI requirements applicable to new buildings which will connect to RDE through to full buildout in 2047 and which are subject to the ZEBP.[94] As noted in Section 2.2, RDE states that the required amount of low carbon thermal energy at full buildout in 2047 is approximately 33,600 MWh annually, and that a low carbon energy source with a capacity of 5 MW can supply this annual demand.[95] In determining the annual demand at full build out, RDE assumes that the GHGI requirements of the ZEBP declines to 0 $kgCO_2e/m^2/yr$ by 2030.[96]

The following is a summary of RDE's Options Assessment analysis.

Biomass

The Options Assessment conducted by RDE considered an alternative of a multiple-boiler biomass facility, consisting of four 1.25MW biomass boilers for a total of 5 MW of low carbon capacity.[97] RDE provides the following table of key attributes of the multiple-boiler biomass option:[98]

Table 5: Multiple-Boiler Biomass key attributes assessment (2017)

[94] Exhibit B-3, p. 5; Exhibit B-1, p. 15.
[95] Exhibit B-5, BCUC IR 8.1.
[96] Ibid., BCUC IR 17.4
[97] Exhibit B-1, p. 15.
[98] Ibid., p. 16.

Multiple-Boiler Biomass	Value
Capital Cost Estimate ($ million)	$15.7
Fraction of Annual Energy Demand at Buildout Met Through Low Carbon Source	63%
GHGI at Buildout ($kgCO_2e/m^2/yr$)[99]	6
Levelized Cost of Low Carbon Energy ($/MWh)	$82

RDE states that the biomass option allows new customer buildings to meet the GHGI requirements of the ZEBP. However, RDE explains that should GHGI requirements of the ZEBP become stricter than currently assumed, additional low carbon energy would be required.[100] RDE notes community impact concerns related to the use of heavy trucks to transport and manage the biomass, the need to manage local air quality and the need to mitigate fuel supply security and price risks.

Waste to Energy (WTEF)

RDE explains that a preliminary analysis indicated that the WTEF option can provide a thermal energy capacity of 10 MW, which exceeds the 5 MW required by RDE. The benefit of the 10 MW capacity is that it allows for additional low carbon energy if future regulations impose stricter GHGI limits for buildings in River District than those currently assumed. RDE explains that, in addition to the GHGI limits established for new buildings in Vancouver, existing buildings may also require low carbon energy in the future. For example, RDE states that on May 17, 2022, the City of Vancouver approved the Annual Carbon Pollution Limits for Existing Large Commercial and Multifamily Buildings Staff Report[101] that includes potential regulatory requirements which would impact some buildings in River District if enacted. RDE states that it has yet to complete a detailed analysis of which buildings will be affected when and to what extent.[102]

RDE states that increasing the WTEF connection capacity from 5 MW to 10 MW would increase capital costs by 3 per cent while providing 37 percent more low carbon energy on an annual basis. The impact to the Project's variable costs would be low.[103] Accordingly, RDE states that the 10 MW WTEF connection capacity is the preferred capacity option; RDE's further alternative analysis is based on a 10 MW WTEF connection capacity.[104]

RDE provides the following table of key attributes for the 10 MW WTEF alternative:[105]

Table 6: 10 MW WTEF Connection Key Attributes Assessment (2017)

10 MW WTEF	Value

[99] The 'GHGI at Buildout' value noted in Table 5 shows the GHG emission intensity of all RDE customer buildings, in aggregate (Exhibit B-1, p. 15; Exhibit B-3, p. 5.)
[100] Exhibit B-5, BCUC IR 8.1.1.
[101] https://council.vancouver.ca/20220517/documents/R1c.pdf
[102] Exhibit B-5, BCUC IR 3.2.
[103] Exhibit B-1, p. 15; Exhibit B-5, BCUC IR 8.1.
[104] Exhibit B-5, BCUC IR 8.4.
[105] Exhibit B-1, p. 16.

Capital Cost Estimate ($ million)	$24.5
Fraction of Annual Energy Demand at Buildout Met Through Low Carbon Source	93%
GHGI at Buildout ($kgCO_2e/m^2/yr$)	1
Levelized Cost of Low-Carbon Energy ($/MWh)	$38

RDE states that the GHGI that can be achieved by its customer buildings under the WTEF option is significantly lower than the current ZEBP requirements. RDE explains that the WTEF alternative therefore offers protection against the need to secure further low carbon energy in the event that the City of Vancouver pursues the reductions in allowable GHG emissions that it is considering for future years.[106]

RDE explains that following the Option Assessment stage, the 10 MW WTEF system was the preferred option as it can:[107]

- Provide heat at a lower levelized cost of energy than the 5 MW biomass option;
- Displace the use of natural gas at a lower marginal cost;
- Meet more of RDE's annual energy demand;
- Improve GHG performance; and
- Avoid other risks associated with the use of biomass.

As the Option Assessment stage was completed in 2017 and RDE did not sign the TESPA with MVRD until 2021, RDE states that it continued to study the 5 MW biomass option in the event the WTEF opportunity did not materialize.[108] More information on the TESPA is available in Section 4.4 of the Decision below.

3.3 Option Refinement and Selection of Preferred Alternative

RDE states that while it was negotiating the TESPA in 2021, it completed the Option Refinement stage. This included further financial analysis of the 10 MW WTEF and biomass options, using updated infrastructure and fuel cost estimates, and the pricing offered by MVRD. RDE explains that through the Option Refinement stage, it determined the 10 MW WTEF option to have a levelized cost of energy (LCOE) of $54/MWh based on the ceiling rate payable by RDE for thermal energy under the TESPA. RDE states that the previous $38/MWh LCOE for the 10 MW WTEF option relied upon during the Options Assessment phase was based on work undertaken in 2017 (see Table 6), while the $54/MWh LCOE for the 10 MW WTEF option was based on TESPA information negotiated in 2021.[109] Further, RDE states that this LCOE is considered a "high bookend" and could decrease in the future should additional connections be made to the MVRD system by other third party district energy utilities, as capital costs of the interconnection would be shared across a larger customer base.[110]

[106] Ibid.
[107] Ibid.
[108] Exhibit B-1, p. 16.
[109] Exhibit B-5, BCUC IR 8.16.
[110] Exhibit B-7, BCSEA IR 13.2.

To calculate a comparable LCOE for the 5 MW biomass option, RDE considered a 5 MW biomass facility plus enough natural gas-fired energy to provide the equivalent total thermal energy as the 10 MW WTEF alternative. In completing this analysis, RDE determined a LCOE for the biomass option of $66/MWh, subject to future increase in costs due to higher biomass facility and fuel costs.[111]

RDE states that the 10 MW WTEF option was determined to be the most cost-effective approach for RDE to source low carbon thermal energy.[112] On December 14, 2021, MVRD and RDE entered into a long-term TESPA that allows RDE the right to purchase up to 10 MW of thermal energy from MVRD for the River District DEU.[113]

Positions of the Parties

RCIA agrees that the evidence demonstrates that RDE's proposed facilities, including the use of thermal energy from MVRD via the TESPA, is the most cost-effective low carbon alternative for the River District DEU.[114]

BCSEA supports RDE's conclusion that the 10 MW WTEF interconnection was the preferred option, with a biomass plant as a viable alternative if RDE was unable to reach an agreement with MVRD. Further, BCSEA considers that RDE appropriately compared the WTEF thermal energy option based on costs under the TESPA with the option of RDE developing its own biomass plant.[115] BCSEA does not take issue with RDE's decision to exclude RNG from the screening analysis "due to concerns about the availability of supply as well as whether it would meet the City of Vancouver's GHG intensity requirements under the ZEBP."[116]

Panel Determination

The Panel finds that RDE's development and analysis of the alternatives are reasonable and that the evidence supports RDE's conclusion that the preferred alternative is the 10 MW WTEF option.

The Panel is satisfied that RDE appropriately screened out the options involving sewer heat recovery, river water heat recovery, geoexchange and large-boiler biomass, for reasons of cost, technical challenges or permitting uncertainty. The Panel also finds that a significant factor in favour of the heat recovery option from the WTEF is that it is the only one of the five low carbon sources that RDE considered that does not require RDE to install technologies to produce or extract thermal energy from local resources or sewer infrastructure. In addition, the Panel is satisfied that it was reasonable for RDE to consider the remaining two alternatives, the 5 MW biomass option and the 10 MW WTEF option that will use thermal energy from MVRD via the TESPA.

Finally, the Panel is also persuaded that RDE's decision to pursue a 10 MW source as its preferred option is reasonable; it will meet more of RDE's annual energy demand and displace the use of natural gas at a lower marginal cost than the biomass option. It is also reasonable because of the possibility that the GHGI requirements of the ZEBP could decrease further in future, thereby requiring RDE to provide additional low carbon energy.

The Panel accepts RDE's evidence that 10 MW of thermal energy capacity from the WTEF is sufficient to meet

[111] Exhibit B-1, pp. 17-18.
[112] Ibid., p. 18.
[113] Ibid., p. 3.
[114] RCIA Final Argument, p. 6.
[115] BCSEA Final Argument, pp. 6.
[116] BCSEA Final Argument, p. 5.

the GHGI requirements of RDE customer buildings to 2047. As noted above in Table 3, by 2030, the City of Vancouver's GHG emission target for all new buildings will decline to 0 $kgCO^2e/m^2/yr$. RDE has persuaded the Panel that although the biomass option, yielding 5 MW, would meet the GHG emission target, the issues associated with biomass, including community acceptance and air quality, plus the fact that GHG emission targets may yet extend to existing buildings, make the WTEF the preferred option.

4.0 Project Description

4.1 Project Components

The scope of the Project includes the design and construction of three elements:[117]

1. The CEC, which will house MVRD's energy transfer equipment required to transfer thermal energy from MVRD to RDE under the TESPA for baseload service and RDE's natural gas-fired boilers required for peaking and backup service;
2. DPS, which is an all-welded closed loop hot water system that delivers thermal energy to customer buildings. The proposed DPS piping will be built to the EN 253 standard,[118] in line with past practice for the existing DPS;[119] and
3. ETS, to transfer energy from the DPS to the new customer buildings served by RDE. Each ETS will include separate heat exchangers for space heating and domestic hot water and will also include a thermal energy meter, isolation and flow control valves, and temperature sensors and pressure transmitters.[120]

The CEC will provide all heating energy for the River District DEU and will consist of:[121]

- A hybrid concrete-mass timber building;
- 1 x 10 MW heat exchanger (owned by MVRD);
- 2 x 10 MW natural gas-fired boilers;
- 2 x 4 MW natural gas-fired boilers (relocated from TEC 3);
- 4 x recirculating pumps;
- 2 x heat recovery pumps;
- 3 x distribution system pumps;
- A chemical treatment system; and
- An automation controls system.

To connect the remaining development sites within the River District community to the River District DEU, 4440 m of new distribution piping (3740 m of main line and 700 m of branch line) will be constructed and installed

[117] Exhibit B-1 p. 26.
[118] EN 253 is a standard which establishes requirements for DPS; Exhibit B-1, p. 31.
[119] Exhibit B-1, p. 31.
[120] Ibid.
[121] Ibid., p. 29.

along with 33 new ETS for the associated buildings.[122] RDE states that it will install the DPS and ETS between 2022 and 2047, with the specific timing of installation aligning with the timing of new customer building construction.[123] For example, RDE states that it typically installs ETS approximately six months prior to building completion.[124] RDE provides the following table for building connections and required DPS and ETS installations for the River District up to the full buildout year (2047):[125]

Table 7: River District Energy Future Building Connections, Demand, DPS and ETS Requirements

Year	Number of connected customer buildings	Required thermal energy generating capacity (MW)	Length of new DPS Branch Service Line required (m)	Length of new DPS Main Line required (m)	Total Length of new DPS required (m)	Number of new ETS required
2022	19	11.0	**40**	0	**40**	**0***
2023	20	11.4	**20**	0	**20**	**1**
2024	23	12.9	**60**	0	**60**	3
2025	23	12.9	**0**	0	**0**	0
2026	26	15.2	**60**	0	**60**	3
2027	28	16.0	**40**	0	**40**	2
2028	29	16.2	**20**	0	**20**	1
2029	29	16.2	**0**	0	**0**	0
2030	32	17.5	**60**	660	**720**	3
2031 - 2035	**39 by 2035**	21.8	**140**	700	**840**	7
2036 - 2040	**43 by 2040**	23.3	**80**	1,000	**1,080**	4
2041 -2047	**52 by 2047**	26.1	**180**	1,380	**1,560**	9

RDE's CEC building will be built with low carbon concrete and mass-timber materials[126], and it will be located on the south side of the intersection between Sawmill Crescent and Marine Way in Vancouver.[127] In addition to the WTEF connection, the building will house four bays for natural gas-fired boilers. During initial construction, two new 10 MW natural gas-fired boilers will be installed. After the system is in-service, two 4 MW natural-gas boilers from TEC 3 will be relocated to the CEC. The system's thermal capacity has been sized to ensure that the peak load demanded by RDE customers can still be met in the event that the WTEF heat and one 10 MW natural gas-fired boiler are unavailable.[128] Figure 7 below shows an architectural rendering of RDE's proposed CEC:[129]

[122] Exhibit B-10, BCUC IR 35.1.
[123] Exhibit B-5, BCUC IR 6.7.
[124] Exhibit B-3, p. 8.
[125] Exhibit B-10, BCUC IR 35.1.
[126] Exhibit B-1, p.4.
[127] Ibid., p. 27.
[128] Exhibit B-1, p. 30.
[129] Ibid., p. 28.

Figure 7: Architectural Rendering of Proposed CEC

RDE has planned the system for future expansion capacity. In future, the two 4 MW natural gas-fire boilers relocated from TEC 3 can be replaced by two new 10 MW boilers if and when RDE's peak capacity requirements increase. The CEC's maximum boiler capacity could be increased up to 40 MW in that scenario. RDE confirms that it will need to seek a separate CPCN in the future when the replacement of the 4 MW boilers with two new 10 MW boilers is required.[130]

Further discussion regarding RDE's proposed natural gas boiler capacity is included below.

4.2 Sizing of the System

RDE designed the thermal generating capacity of the CEC such that if any one of the largest boilers fails to operate, the CEC can continue to meet the forecast peak demand of its customers. This approach to determining boiler capacity redundancy is referred to as N+1.[131] RDE states that in determining the required natural gas boiler capacity, it did not include the 10 MW of thermal generating capacity provided from the WTEF.[132] RDE expects the delivery of thermal energy from MVRD to be highly reliable, however states that there are times when service from the WTEF will be unavailable.[133]

RDE states that it must be able to meet its peak load using only natural gas boilers since there will be times when the WTEF will be unavailable.[134] For example, the WTEF will not be available when:[135]

[130] Exhibit B-10, BCUC IR 34.1.
[131] Exhibit B-5, BCUC IR 16.12.
[132] Exhibit B-1, p. 30.
[133] Exhibit B-10, BCUC IR 34.1.
[134] Ibid., BCUC IR 34.1.
[135] Exhibit B-5, BCUC IR 11.6.

- The WTEF heat exchange equipment at the CEC is down for maintenance or experiences an upset, either between the WTEF and CEC, or between the CEC and WTEF;
- The hot water interconnection pipe between the WTEF and the CEC and the associated equipment is down for maintenance or experiences an upset; or
- Major maintenance is undertaken at the WTEF which would see the facility temporarily halt operations.

As such, RDE states that it excluded the WTEF 10 MW capacity from the CEC N+1 resiliency calculations, and has designed the CEC to meet a diversified peak of 18 MW in 2030 using a boiler capacity of 28 MW, and a diversified peak of 28 MW in 2040 using a total boiler capacity of 40 MW, in accordance with RDE's system peak demand projections provided in Table 7 in Section 4.1 above.[136] As noted earlier, RDE will need to seek a separate CPCN to increase the CEC's natural gas-fired boiler capacity to 40 MW in the future.

RDE submits that the installation of two new 10 MW boilers required to maintain N+1 resiliency in the event that thermal energy from the WTEF is not available has only a small incremental impact on indicative rates.[137] RDE states that the cost of one 10 MW boiler, plus the associated boiler circulation pump, is approximately $1,040,000. If RDE installed only one 10 MW boiler in the CEC, rather than the proposed two 10 MW boilers, the indicative annual rate escalation would be lower by 0.8% during the period 2040-2047.[138] Otherwise, indicative rates are the same.

RDE provides the following figures which illustrate the proposed installed capacity at the CEC and the projected load duration curve in 2030:[139]

[136] Exhibit B-10, BCUC IR 34.1.
[137] RDE Final Argument, p. 14.
[138] Exhibit B-10, BCUC IR 47.1.
[139] Exhibit B-10, BCUC IR 34.11 - 34.5.

Figure 8: Installed Capacity at the CEC and Forecasted Diversified Peak Load

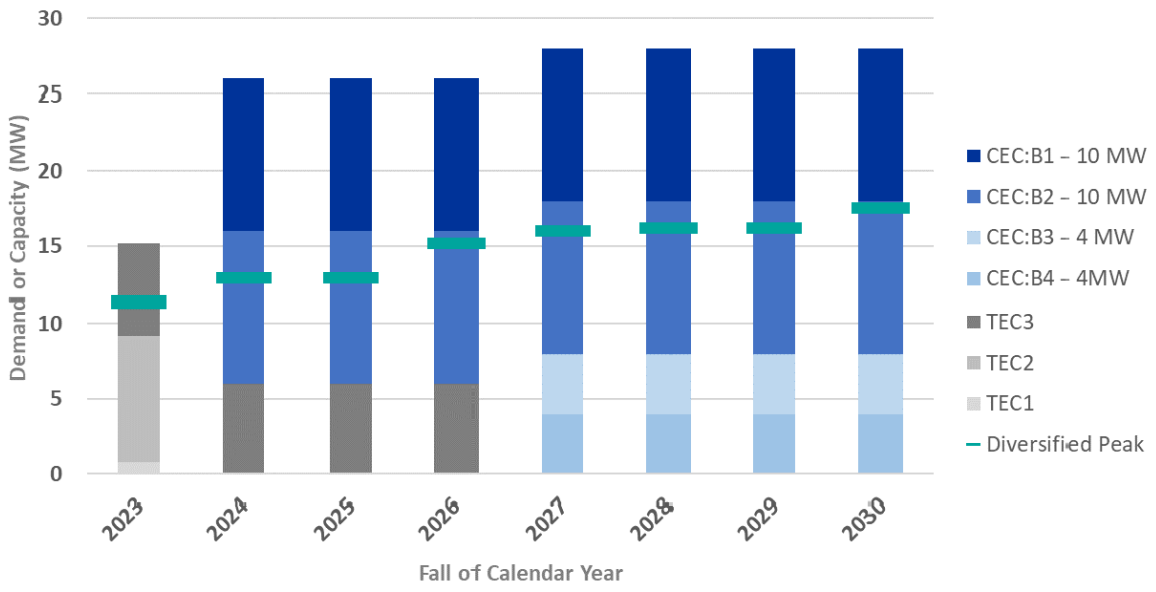


Figure 9: Load Duration Curve (2030)

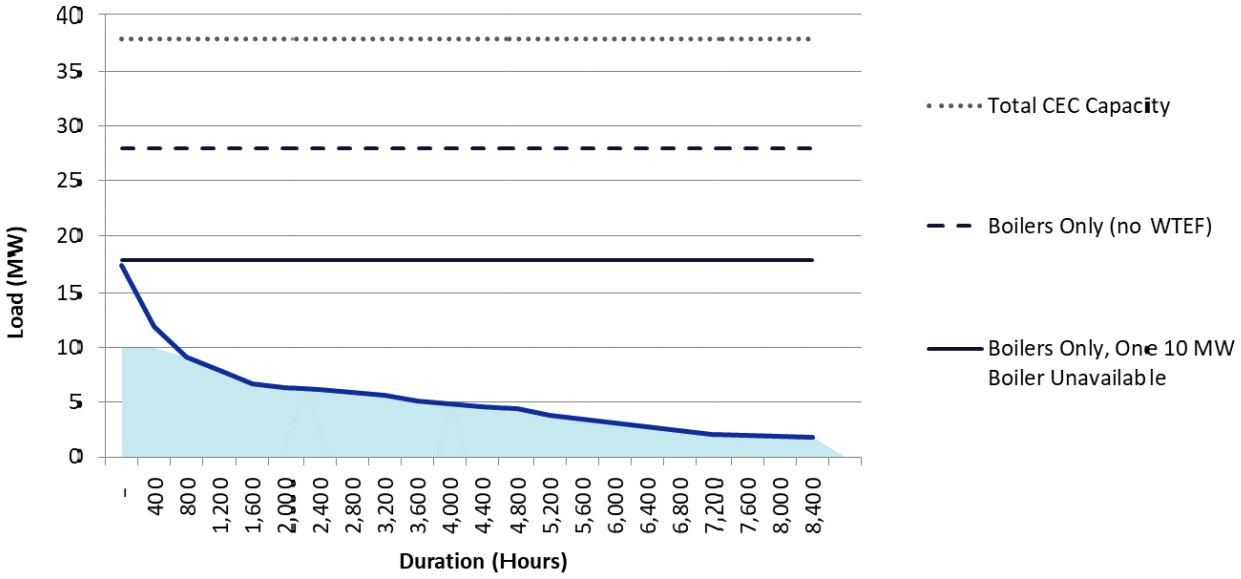


Figure 9 compares the duration of forecasted capacity requirements in 2030 (solid blue line) to available capacity at the CEC. For example, Figure 9 shows that RDE can meet the maximum forecasted capacity of approximately 18 MW in the event that thermal energy from the WTEF and one 10 MW natural gas-fired boiler is unavailable. The light-blue shaded area in Figure 9 above represents the amount of thermal energy provided by the WTEF.

4.3 GHG Intensity of WTEF Thermal Energy

The GHG emissions associated with the thermal energy delivered to RDE from MVRD's WTEF will be determined based on the sum of two factors:

1. the GHG emissions which result from recovering the waste heat at the WTEF; and
2. the GHG emissions which result from transferring the waste heat from the WTEF to RDE's CEC.

RDE states that factor 1, the recovery of waste heat from the WTEF, does not contribute any GHG emissions and that factor 2, the transfer of waste heat to RDE, results in a very small contribution of GHG emissions given the low carbon intensity of electricity supplied by British Columbia Hydro and Power Authority (BC Hydro).[140] Further explanation is provided below.

RDE states that the primary role of MVRD's WTEF is to manage municipal solid waste and that GHG emissions from the WTEF are unaffected by the recovery of waste heat for third-party district energy systems.[141] In other words, the GHG emissions from the WTEF itself will be the same regardless of whether the waste heat produced from incinerating solid waste is used to generate thermal energy for district energy or not.[142] Accordingly, RDE considers the waste heat recovered at the WTEF to be zero carbon at the point of recovery.[143]

GHG emissions associated with the delivery of the thermal energy to RDE are attributed to the use of electricity by MVRD to operate pumps and other equipment to transfer the heat through the closed loop connection between the CEC and the WTEF.[144] The GHG intensity of the thermal energy delivered by MVRD has not yet been calculated, because the amount of electricity will be determined during the design of the WTEF/CEC interconnection. RDE estimates that approximately 2 MWh of electricity will be required to transfer 100 MWh of thermal energy, and therefore the GHG intensity of the delivered thermal energy will be approximately 2 percent of the GHG intensity of electricity from BC Hydro.[145]

RDE clarifies that there is currently no integrated GHG emission reporting framework covering RDE, MVRD and the City of Vancouver, and that each entity will be required to report its own emissions consistent with its own legal or voluntary reporting requirements.[146] RDE will be required to report its emissions to the City of Vancouver; the City of Vancouver has indicated its understanding that the heat recovered from the WTEF is considered low carbon and that it supports the Application.[147]

4.4 TESPA

As noted in Section 3.3, RDE and MVRD entered into an energy supply agreement in 2021, known as the TESPA, for the purchase of heat supplied from the WTEF to the RDE CEC through a closed-loop, hot water delivery system. Under the TESPA, RDE is entitled to receive up to 10 MW of subscribed baseload capacity from MVRD.

[140] Exhibit B-5, BCUC IR 8.11.
[141] Ibid., BCUC IR 8.11.
[142] Ibid.
[143] Ibid.
[144] Ibid.
[145] Exhibit B-12, BCSEA IR 20.6.
[146] Ibid., BCSEA IR 21.1.
[147] Ibid.; Exhibit E-1.

The TESPA outlines pricing details, terms, and conditions between MVRD and RDE over a 30-year time frame with options to renew the agreement for two additional 10-year terms. Schedule B of the TESPA includes the Price Schedule, which outlines the fixed and variable rate that RDE will pay to MVRD for delivery of thermal energy. MVRD states it will make reasonable efforts to commission its system by December 31, 2025.[148]

Under the terms of the TESPA, MVRD is permitted to interrupt, suspend or reduce the supply of thermal energy to RDE under specific circumstances. MVRD also holds the right to suspend service for major rebuild and refurbishment work at the WTEF and is required to provide a minimum advance notice of five years if the WTEF is removed from service for periods of greater than six months. RDE states it will rely on natural gas boiler capacity when thermal energy is unavailable from the WTEF.[149]

RDE states that the provision of thermal energy under the TESPA will generate Environmental Attributes (as defined in the TESPA) in the form of GHG reductions that are greater than what is required for new buildings connected to RDE to meet the City of Vancouver's ZEBP.[150] In other words, Environmental Attributes are generated when MVRD supplies thermal energy to RDE and RDE will purchase more thermal energy from MVRD, and generate more Environmental Attributes, than are needed to meet the low carbon regulatory requirements of RDE's new building customers (see Table 4 above for the annual Low Carbon Energy Demand). Under the TESPA, RDE is entitled to only the portion of Environmental Attributes needed to sufficiently allow all new buildings in the River District community to meet the low carbon requirements of the City of Vancouver's ZEBP.[151] The amount of Environmental Attributes to which RDE is entitled to under the TESPA is defined as the Zero Carbon Energy Threshold. The Zero Carbon Energy Threshold is calculated each year to ensure that RDE receives sufficient Environmental Attributes to meet the GHGI limitations established for each building *at the time the building is permitted*.[152] The impact of the Zero Carbon Energy Threshold is that, in the event that, for example, RDE's currently connected customer buildings become subject to new or stricter GHG emission regulations in the future, RDE would need to procure additional low carbon thermal energy to meet any new regulations.[153] This is because RDE's currently connected buildings were not subject to any GHGI limitations at the time the buildings were permitted, and therefore RDE is not entitled to any Environmental Attributes under the TESPA that may be required to meet any new regulatory requirements imposed on these existing buildings.

Under the TESPA, RDE has the option to purchase additional Environmental Attributes from MVRD; however it is not required to do so.[154] RDE states that if at some point it requires additional Environmental Attributes to meet future changes to GHG emission regulations, RDE will consider feasible alternatives at that time and compare the cost of the alternatives to the cost of acquiring additional Environmental Attributes from MVRD under the TESPA.[155] RDE notes that the costs of acquiring Environmental Attributes under the TESPA are well known and

[148] Exhibit B-1, p. 19.

[149] Exhibit B-10, BCUC IR 34.1.

[150] Exhibit B-1, p. 20; Environmental Attributes are defined in the TESPA as generally meaning the rights to any of the benefits attributable to the use of MVRD's recovered waste heat that offsets the use of GHG emitting fuels, such as natural gas (Exhibit B-1, Appendix B, p. 4)

[151] Ibid.

[152] Exhibit B-5, BCUC IR 17.2.1.

[153] Exhibit B-1, p. 51.

[154] Exhibit B-5, BCUC IR 17.2.2.

[155] Ibid., BCUC IR 17.5.

certain, and that RDE is able to acquire only the precise amount of additional Environmental Attributes that it may require.[156]

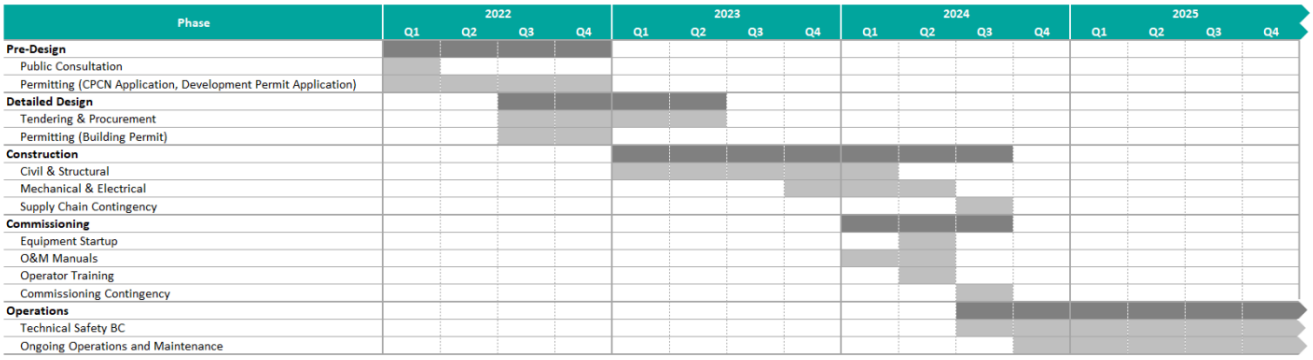
With respect to RDE's understanding of potential future policies which may require existing buildings to achieve GHG emission reductions, RDE states that it is aware of a recently enacted City of Vancouver By-Law which established GHG emission limits for existing large buildings. RDE states that no buildings within the River District community fall within the by-law's building size criteria, and therefore RDE is not impacted by the by-law.[157] However, RDE notes that the City of Vancouver issued a report in May 2022 which outlines possible future GHG emission limits applicable to large commercial and multifamily buildings, as discussed in Section 3.2.

RDE states that the TESPA does not involve the sale of electricity or natural gas by MVRD to RDE and therefore it is not an "energy supply contract" that must be filed with the BCUC for approval pursuant to section 71 of the UCA.[158]

4.5 Project Schedule

RDE states that expansion of the River District DEU will occur in step with development of the River District neighbourhood. RDE provides the following Project schedule for the CEC:[159]

Figure 10: RDE Community Energy Centre Project Schedule[160]



Upon commissioning of the CEC in 2024, RDE states that TEC 1 and TEC 2 will be decommissioned; TEC 3 will continue in operation until such a time when the boilers from TEC 3 will be relocated to the CEC.[161]

RDE states that the expansion of the DPS and installation of ETS will be done as the respective service areas are constructed.[162] As noted in Section 2.1, RDE continues to connect new customer buildings in Service Areas 1, 2 and 4. RDE expects to construct and connect new customer buildings in Service Area 3 to the DPS beginning in 2031. RDE states that not including the DPS and ETS required to connect customers in Service Area 3 as part of the current CPCN approvals would require RDE to seek a future CPCN for these DPS and ETS. RDE states that any

[156] Ibid., BCUC IR 17.5.1.
[157] Exhibit B-5, BCUC IR 3.2.
[158] Exhibit B-1, p. 9.
[159] Ibid., p. 32.
[160] Exhibit B-1 p. 32.
[161] Ibid.
[162] Exhibit B-1 p. 33.

delay in the pace of development of Service Area 3 will not change the length of required DPS or number of ETS.[163] Therefore, RDE states, any future CPCN for these DPS and ETS would introduce regulatory inefficiencies and additional costs for RDE, intervenors and other interested parties, and the BCUC.[164]

4.6 Permit Approvals

RDE outlines the permits required to construct the Project components. At the time of Application filing, RDE expected to commence preparation activities for CEC construction in February 2023 and to begin the construction of the CEC in March 2023. RDE provides its proposed permit schedule in the table below:[165]

Table 8: Proposed Permit Schedule

Permit	Status	Submission Date	Forecast Issuance Date
Community Energy Centre			
Development Permit	"prior to" conditions received and responded to.	June 22, 2022	March, 2023
Building Permit	With City of Vancouver for review.	October 12, 2022	March, 2023
Plumbing Permit	To be submitted.	N/A	March, 2023
Electrical Permit	To be submitted.	N/A	March, 2023
TSBC Operating Permit	To be submitted.	N/A	July, 2024
Occupancy Permit	To be submitted.	N/A	August, 2024
ETS Installation			
Building Permit	Submitted at same time as building BP.	N/A	N/A
DPS Construction & Operation			
TSBC Registration	Submitted upon construction	N/A	N/A

As mentioned previously, the City of Vancouver has indicated that RDE must have a low carbon thermal energy source on-line by 2026, or buildings in the River District community may face delays in receiving building permits.[166] The first buildings that are subject the City's GHGI limits and the LCES Policy are those scheduled to be connected in 2023.

The City of Vancouver has permitted RDE to connect new customer buildings in Service Areas 1, 2 and 4 on the basis that RDE is diligently pursuing the WTEF connection by entering into the TESPA with MVRD, filing the Application with the BCUC and acknowledging that it may not be permitted to continue connections of new buildings if a permanent low carbon source is not in service by 2026. RDE states that it will face no additional consequences, other than potential delays to building permits, as long as it has made reasonable efforts to pursue the WTEF connection.[167]

[163] Exhibit B-5, BCUC IR 6.7.
[164] Ibid., BCUC IR 1.2.
[165] Exhibit B-5, BCUC IR 19.1.
[166] Exhibit B-1, p. 13.
[167] Exhibit B-5, BCUC IR 2.4, IR 2.6.

4.7 Project Risks

RDE identified the following Project risks:[168]

- Development delay risk;
- Construction cost risk;
- Risk of WTEF reduced availability or closure;
- Risk of non-compliance with future GHGI requirements for RDE connected buildings; and
- Public acceptance risk.

Of these risks, RDE identified two to be at a medium-high level: 1) construction cost, and 2) changes in GHGI requirements for RDE connected buildings.[169] RDE assigned the level of risk of development delay, reduced availability of the WTEF and public acceptance as medium, low and low, respectively.[170] Within the public acceptance risk, RDE identified the concern raised by some customers with noise levels from the temporary gas boiler facilities and the future CEC.[171] Additional Project risks were identified through IRs including risks associated with the underutilization of the system at full buildout if load does not materialize.[172]

RDE states that it will mitigate the construction cost risk by working with an experienced cost estimator to estimate Project costs and draw upon Wesgroup Properties Limited Partnership's (Wesgroup) extensive procurement management expertise to mitigate the risk of construction cost increases. RDE acknowledges that cost escalation risk will persist for future DPS and ETS facilities, which will be constructed over many years.[173]

RDE describes the risk that the WTEF could have reduced availability, due to operational challenges at the WTEF or changes in how MVRD manages the solid waste system. It assesses this as low risk, however, because the TESPA provides for financial relief for RDE if the WTEF has outages in any given year which reduce the annual energy received by RDE by more than two percent. The TESPA also provides protection to RDE if MVRD closes the WTEF and terminates the contract: MVRD can either provide a replacement energy source (which would provide energy to RDE under the same terms) or compensate RDE for the cost to procure a new source of low carbon thermal energy.[174]

Section 4.4 above discusses the mitigations available to RDE in the event that GHGI requirements for RDE's existing buildings change in the future. These include, for example, the option to purchase additional Environmental Attributes from MVRD.

RDE explains that the risk of community opposition to the Project includes concerns regarding noise. It states that constructing the CEC and retiring the temporary gas boiler facilities will eliminate the noise associated with the temporary facilities and that all new equipment will be within a permanent structure with appropriate noise

[168] Exhibit B-1, p. 50.
[169] Ibid., p. 51.
[170] Ibid.
[171] Exhibit B-1, p. 52.
[172] Exhibit B-5, BCUC IR 14.4.
[173] Exhibit B-1, p. 50.
[174] Ibid.

mitigation measures.[175] RDE states that it has incorporated an extensive range of measures to achieve the 55dBA noise threshold recommended in a report prepared by an acoustical consultant.[176] Following conversations with other British Columbia district energy system operators, RDE has included the following elements in the design of the CEC:[177]

- Eliminated the need for any horizontal flue runs which can lead to increased noise generation;
- Dedicated exhaust flue for each boiler with as few bends as possible;
- Stack silencers included on each boiler exhaust flue;
- Air intakes include acoustical louvers to reduce noise; and
- The CEC walls include acoustical panels to absorb equipment noise.

RDE also confirms that the selected location for the CEC is the optimal location for minimizing noise and emission impacts on residential properties.[178]

Positions of the Parties

RCIA finds the Project to be a pragmatic approach to serving the current and future development of the River District community while meeting City of Vancouver and government GHG emissions objectives.[179]

In RCIA's view, the reliability configuration, as proposed by RDE, is sufficient and acceptable. Further, RCIA states that RDE satisfies the contingency requirements for the DES under a worst case scenario where thermal energy from WTEF is unavailable.[180]

BCSEA accepts RDE's submission that a delay in pace of future development at Service Area 3 would not impact the length of DPS and the number of ETS required to connect the new buildings in the Service Area. Further, BCSEA concurs with RDE that excluding Service Area 3 from the CPCN would introduce regulatory inefficiencies.[181]

BCSEA supports RDE's decision to exclude the 10 MW WTEF thermal energy capacity from the N+1 redundancy calculation as thermal energy will not be available under certain circumstances. In addition, BCSEA accepts RDE's requirement for two 10 MW boilers during the construction of the CEC to maintain N+1 redundancy and notes that the impact to indicative rates from the purchase of two boilers is relatively minor.[182]

[175] Exhibit B-1, p. 52.
[176] Exhibit B-10 BCUC IR 41.2 & 41.3.
[177] Exhibit B-10, BCUC IR 41.2.
[178] Exhibit B-5 BCUC IR 11.4.
[179] RCIA Final Argument, p. 7.
[180] Ibid., p. 6.
[181] BSEA Final Argument, p. 8.
[182] Ibid., p. 7.

While BCSEA maintains a high level concern that the location, design, and operation of the CEC should account for reasonable air and noise emissions impacts, it notes that RDE has completed a substantial analysis and is not aware of any specific improvements that can be made.[183]
BCSEA disagrees with RDE's submission that the GHGI of thermal energy from MVRD is zero carbon and asserts that the carbon intensity of thermal energy from MVRD is not defined. However, BCSEA clarifies that for the purposes of the Application, it accepts that thermal energy from the WTEF at the point of recovery is zero carbon.[184] While BCSEA states that RDE's approach to carbon intensity is "conceptually challenging," it accepts the TESPA as a legitimate approach to establishing the carbon intensity of thermal energy supplied by MVRD.[185]

Panel Determination

The Panel is satisfied that the Project as described is reasonable. As we discuss below, we find that the proposal to build the Project out before the full demand is needed is reasonable and economically prudent, and that there are adequate checks and balances on a project of such long duration.

The Project would see a centralized facility providing all the thermal energy for the River District development that houses both the existing and proposed buildout of the Project. The Project approvals sought include the CEC, the distribution system and the ETS for all the projected buildings at full build-out. It includes a justifiable level of built-in redundancy to provide services through both the purchase of thermal energy through WTEF and onsite gas boilers. The Project is also designed to meet the environmental requirements of the City of Vancouver and other government emission standards. In addition, the built-in redundancy provides for the possibility that the WTEF energy may not be available for a long time if the WTEF facility is shut down for maintenance. It should also be noted that all the interveners support the proposed Project.

RDE also identifies Project risks, and rates construction costs and GHGI requirement as having the highest risk levels being rated medium-high. In addition, RDE has examined options to purchase additional Environmental Attributes should more stringent environmental standards be enacted. The Panel finds that the evaluation of the risks is reasonable although the permitting schedule proposed may be the cause of additional risk to the Project should there be any delays in the granting of the various approvals sought.

The Panel is satisfied that the Project is properly sized to meet future expected demand. The CEC is to be built now, whereas the DPS and ETS can be built in increments, as customer buildings are completed and the demand arises. The CEC will have space for four natural gas boilers, which will initially accommodate 28 MW boiler capacity, but which will provide RDE with the flexibility to increase maximum boiler capacity to 40 MW if required, and subject to BCUC approval. In addition, we are persuaded that the system is adequately sized to provide for an N+1 level of redundancy, and that RDE appropriately excluded the 10 MW WTEF from its redundancy planning because of the possibilities it describes for the WTEF facility to become unavailable. Having said that, we also accept RDE's expectation that delivery of thermal energy from MVRD will be highly reliable.

Having accepted that RDE has appropriately identified one of the main drivers for the Project as the need for a low carbon energy source, the Panel is satisfied that the thermal energy supplied by MVRD will constitute a low

[183] BCSEA Final Argument, p. 8.
[184] BCSEA Final Argument, p. 9.
[185] Ibid.

carbon energy source. The thermal energy will have a low GHGI and we accept RDE's evidence that this meets the City of Vancouver's requirements.

The Panel also accepts RDE's submission that the TESPA is not an energy supply contract that it must file with the BCUC pursuant to section 71 of the UCA, since the TESPA does not involve the sale of electricity or gas. Accordingly, the Panel notes that it did not request RDE to provide justifications of the reasonableness of the terms of the TESPA as part of the Panel's review of this Application. However, the Panel is satisfied that RDE has considered the terms of the TESPA in its Project development decision making. For example, RDE has sized the natural gas-fired boiler capacity of the CEC to continue to meet its customers' thermal energy demands in the event that thermal energy from MVRD is unavailable, as the TESPA permits MVRD to interrupt, suspend or reduce the supply of thermal energy under specific circumstances. Further, the Panel is satisfied that RDE has accounted for the costs of the thermal energy supplied by MVRD under the TESPA in RDE's indicative rate impact analysis. The cost of thermal energy from MVRD and the indicative rate impact of the Project is further discussed in Section 5 of the Decision.

If the time comes that RDE must supply low carbon energy to those buildings connected to its system before RDE signed the TESPA, then RDE may need to buy Environmental Attributes from MVRD. The decision to buy Environmental Attributes from MVRD would be subject to BCUC review and approval, for example in a future revenue requirement.

We acknowledge that the Project schedule appears protracted because it extends to 2047, when RDE anticipates full buildout. We are satisfied that this is reasonable, however, noting that RDE will expand the DPS and install additional ETS only when the respective service areas are constructed. We accept RDE's position that although one CPCN for a project of such long duration is unusual, it is more efficient from a regulatory standpoint than multiple CPCN applications as the community develops. Specifically, we note that section 45(1) of the UCA requires a CPCN for any extension of a public utility plant or system, which would impact RDE each time it added to the DPS or installed new ETS.

Applying for a CPCN now for the entire Project is not carte blanche. In this case, the Panel is directing semi-annual progress reports and material change reports as set out in Appendix A, and RDE is responsible for ensuring it incurs costs prudently. This Application is seeking approval to construct and operate this specific Project, namely, the CEC to generate thermal energy, and the DPS and ETS to distribute this thermal energy to specific buildings within the River District community. In the event that RDE determines that its customers are best served by means of an alternate approach to generating and distributing thermal energy, RDE will need to file a new CPCN for approval by the BCUC.

The Panel finds that RDE has adequately identified the Project risks and mitigation strategies. We consider that RDE has methodically assessed the likelihood of a risk occurring as well as the impact of a risk on the Project should it occur and therefore, we are satisfied that its process to mitigate risks during Project execution is reasonable.

In particular, the Panel finds that RDE's strategy for managing the risk of changes in GHGI requirements, which it indicates is one of the highest level risks, reflects forward thinking that is important to risk management. The decision to contract with MVRD for 10 MW low carbon energy from the WTEF provides RDE with more low

carbon energy than it requires under established ZEBP policies, which gives RDE room to accommodate changes in the future if existing buildings become subject to GHG targets.

5.0 Project Costs, Accounting Treatment and Rate Impact

5.1 Project Costs

The estimated total capital cost of the Project is $87,031,300 including the CEC, DPS and ETS Project components.[186] RDE states that Turner & Townsend (T&T) prepared the base cost estimates for the CEC, DPS and ETS with a +/- 15 percent level of accuracy.[187] RDE retained T&T to provide cost planning and design cost control services, including preparation of the Class C construction cost analysis.[188]

CEC Costs

RDE states that T&T's $24.1 million cost estimate of the CEC includes the following:[189]

1. Costs related to site preparation, building shell and interior, boilers, pumps and system controls;
2. Interconnection piping within the CEC between the RDE thermal energy system and the MVRD-owned, onsite energy transfer equipment; and
3. Allowances for general requirements, construction management, and several different contingencies which total $5.6 million, or 28 percent of pre-contingency cost.

RDE states there are other costs not captured in the T&T base cost estimate which need to be added, and bring the total CEC cost estimate to $34,008,100, including:[190]

a. Allowance for Additional PST on Boilers – T&T's cost estimate includes 7 percent for PST. As of April 1, the PST rate on natural gas boilers increased to 12 percent. The higher PST rate applies only to the natural gas-fired boilers and not other ancillary items. This increases Project costs by $96,000.

b. Land – The CEC will be built on a site owned by Wesgroup; RDE will purchase the site from Wesgroup at the site's appraised value. As of September 2021, the site had an appraised value of $3,550,000; Wesgroup intends to secure an updated appraisal prior to the sale.

c. Temporary DPS – The CEC will require temporary DPS adjacent to the site, which RDE has estimated to cost $750,000. RDE elaborates that the temporary DPS is required to maintain service while the permanent DPS connecting the CEC to the existing DPS is constructed.[191]

d. Owner's Soft Costs – Owner's soft costs include property tax during construction, legal, financing and insurance costs, consultants & engineering, permit fees, development cost charges and administration costs. These are estimated to be $3,438,100.[192]

[186] Exhibit B-1, p. 40.
[187] Ibid., pp. 40-41.
[188] Ibid., p. 240.
[189] Ibid., p. 40
[190] Ibid., pp. 40–41.
[191] Exhibit B-5, BCUC IR 21.2.
[192] Ibid., BCUC IR 21.3.

e. Allowance for Funds Used During Construction (AFUDC) – AFDUC accounts for financing costs incurred during construction and is estimated to be $2,041,000.[193]

Table 9 below provides a detailed breakdown of the CEC capital cost estimate:

Table 9: CEC Cost Estimate[194]

ITEM	COST ESTIMATE
T&T Base Cost Estimate	$18,487,000
T&T Contingency	$5,646,000
Allowance for Additional PST on Boilers	$96,000
Land	$3,550,000
Temporary DPS	$750,000
Property Tax	$315,300
Legal, Financing & Insurance	$69,500
Consultants and Engineering	$2,035,000
Permit Fees	$138,700
Development Cost Charges	$169,600
Administration	$710,000
AFUDC	$2,041,000
Total CEC Cost Estimate	**$34,008,100**

DPS and ETS Costs

For the DPS and ETS, RDE states T&T's base cost estimate of $24,013,500 includes all DPS connections, ETS, and associated piping, plus allowances for general requirements and construction management. It also includes a 10 percent contingency, and assumes construction costs escalate at 6 percent into 2023, another 5 percent in 2024, and 4.5 percent for each year thereafter. RDE states there are other costs not captured in the T&T base cost estimate, which need to be added, and make the total cost estimate for the DPS and ETS $53,023,200, including:[195]

a. Adjustment to Include Three Sites and Exclude Three Sites – The T&T estimate did not include three future development sites within River District. RDE has included allowances for DPS and ETS costs to connect these three future customer buildings. The T&T estimate also included the costs to connect three potential customer buildings outside, though adjacent, to the River District community. RDE has excluded the estimated costs to connect the three potential customer buildings outside of the River District community. The net impact of these changes is to increase the base cost estimate by $1,263,000.[196]

[193] Ibid., BCUC IR 21.4.

[194] Exhibit B-1, Table 8-5, p. 41.

[195] Ibid., pp. 41 – 42.

[196] Exhibit B-5, BCUC IRs 2.7, 22.1 and 22.2.

b. Change in Timing and Escalation – T&T grouped buildings into "zones" and developed cost estimates and future escalation for each zone using an average year of completion for each zone. In some cases, RDE has escalated T&T's cost estimate based on the forecast completion year rather than an average year for a group of buildings, using the same escalation rates. This adds $17,459,000 in escalation allowance to the base cost estimate, which is approximately $3.4 million greater than T&T's original escalation allowance of $14,088,000).[197]

c. Soft Cost Allowances – Owner's soft costs include legal, financing and insurance costs, consultants & engineering, permit fees, and administration costs. Based on prior experience, RDE has added soft cost allowances of 12% on all DPS costs, and 10 percent on all ETS costs, for a total of $4,647,000.[198]

d. AFUDC Allowance – The T&T cost estimate did not include AFUDC, which has been estimated at $1,368,000.[199]

Table 10 below provides a detailed breakdown of the DPS and ETS capital cost estimates:

Table 10: DPS and ETS Cost Estimate[200]

	DPS	ETS	TOTAL
T&T Base Cost Estimate	$9,469,000	$14,544,600	$24,013,500
Net Impact from Addition and Exclusion of Sites	$1,094,100	$168,400	$1,262,500
Escalation Adjustment Based on Year of Connection	$8,135,400	$9,323,300	$17,458,700
Contingency	$1,869,800	$2,403,600	$4,273,500
Soft Cost Allowance	$2,243,800	$2,403,600	$4,647,400
AFUDC Allowance	$598,300	$769,200	$1,367,500
Total	**$23,410,400**	**$29,612,800**	**$53,023,200**

5.2 Indicative Rate Impact and Revenue Deficiency Deferral Account

In the Original CPCN, RDE requested a levelized rate mechanism so that it could provide competitive rates in the early years of its operations.[201] Under this levelized rate mechanism, RDE proposed to under-recover its costs and record this under-recovery in a deferral account, for future recovery from ratepayers. The BCUC, by Order C-14-11, approved the use of a revenue deferral account, which RDE refers to as the Revenue Deficiency Deferral Account (RDDA). Order C-14-11 contemplated recovery of the RDDA by 2031. As of December 31, 2021, the balance of the RDDA was $4,947,300.[202]

Table 11 below provides the indicative rate impact for select years. RDE explains several of the assumptions it has included in the indicative rate analysis. First, it assumes that RDE will apply to the BCUC for new rates as of

[197] Ibid., BCUC IR 22.3; Exhibit B-1, p. 42.
[198] Ibid., BCUC IR 22.5.
[199] Ibid., BCUC IR 22.6.
[200] Exhibit B-1, Table 8-6, p. 42.
[201] Exhibit B-1, p. 48.
[202] Ibid.

January 1, 2024. Second, the analysis assumes that the rate structure that the BCUC approved in the Original CPCN is retained, comprising a capacity charge and an energy charge.[203]

Third, RDE explains that the indicative rate analysis assumes that the RDDA will be recovered by 2047, instead of 2031 as approved in the Original CPCN. RDE explains that because of the delays in the development of buildings within River District, and corresponding delay in the construction of the CEC, RDE intends, in a future rate application, to request that the RDDA be recovered over a longer term. The assumed recovery period of the RDDA by 2047 is based on the year that the Project is expected to reach full buildout.[204]

Table 11: Indicative Customer Rates for Select Years based on RDDA Recovery by 2047[205]

	2025[11]	2030	2035	2040	2047
Capacity Charge ($/m²/month)	$0.74	$1.03	$1.23	$1.33	$1.14
Thermal Energy Charge ($/MWh)	$48.34	$67.14	$80.51	$86.91	$74.36

As part of its indicative rate analysis, RDE has assumed indicative future rate changes should the RDDA be paid down by 2047. In this analysis, RDE assumes periodic annual rate increases through to 2039, followed by annual rate decreases through to 2047.[206] For this reason, the indicative customer rates shown in Table 12 below increase until 2040, and then decrease for the years of 2040 through 2047. RDE notes that its indicative rate analysis is illustrative, with actual rate changes subject to future BCUC review and approval.[207]

Table 12: Indicative Rate Escalation on RDDA Recovery by 2047

	2024-29	2030-34	2035-39	2040-47
Annual Rate Escalation	7.5%	4.0%	2.5%	-2.2%

For comparison to Table 11, which contemplates recovery of the RDDA by 2047, Table 13 below provides the indicative rate impact for select years based on a RDDA recovery period by 2031:

Table 13: Indicative Customer Rates for Select Years based on RDDA Recovery by 2031[208]

	2025	2030	2035	2040	2047
Capacity Charge ($/m²/month)	0.85	1.73	0.95	0.94	0.94
Thermal Energy Charge ($/MWh)	55.54	112.84	61.98	61.60	61.16

[203] Exhibit B-1, p. 48.
[204] Ibid.
[205] Exhibit B-1, Table 8-17, p. 48.
[206] Exhibit B-1, p. 48.
[207] Ibid.
[208] Exhibit B-3, Section 5(b)(iv), Table 8-17, p. 10.

In calculating the indicative customer rates based on RDDA recovery by 2047, RDE makes the following forecasts in relation to formulating the revenue requirement:

a. Energy and fuel charges based on the terms and conditions outlined in the TESPA, estimated electricity rates and estimated natural gas rates assuming carbon tax reaches $170 per ton of carbon dioxide emission by 2030 as per the current federal policy;[209]

b. Other operating costs including maintenance, management and staff salaries, overhead costs, insurance and property tax;[210]

c. An assumed capital structure, rate of return on equity, and deemed cost of debt are the same as RDE's existing capital structure, return on equity and deemed cost of debt, as approved by the BCUC in its 2014 Decision in the Stage 2 Generic Cost of Capital proceeding;[211]

d. Income tax rate of 27 percent with no expected taxable income until 2039;[212]

e. Depreciation expense based on RDE's current depreciation rates, assuming the net book value of RDE's temporary TECs will remain in rate base following the completion of the CEC and dismantling. RDE states it will address the actual accounting and rate treatment of the retired equipment as part of its rate application covering the period immediately after the CEC goes into service. RDE's current estimate of the net salvage value from all three TECs is effectively zero;[213] and

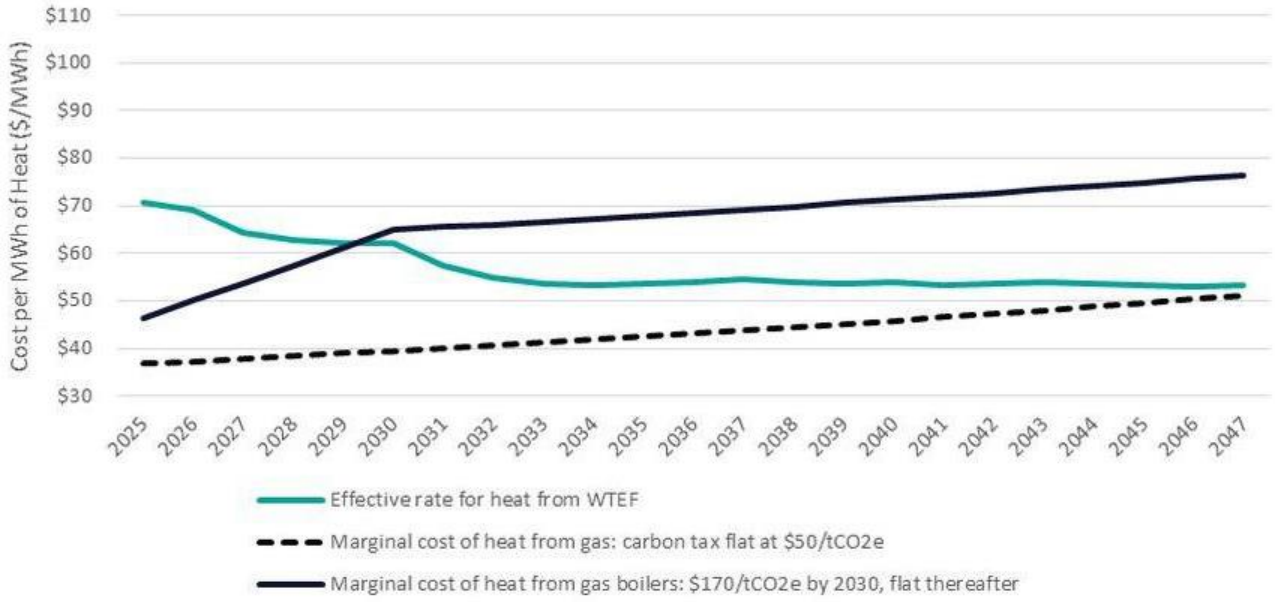
f. A rate base including plant in service, accumulated depreciation, the balance of the RDDA and working capital equivalent to 10 percent of total operating expenses.[214]

The impact of the Project on RDE's annual fuel costs has been incorporated into the indicative rate analysis in Tables 11 and 13, as well as the revenue requirement analysis in Tables 14 and 15 below. RDE anticipates that in the first year of operation of the CEC, thermal energy delivered by MVRD will make up over 95 percent of the thermal energy RDE delivers to its customers.[215] In other words, RDE will transition away from its historical reliance on natural gas-fired boilers to thermal energy generated almost entirely by the WTEF. The cost of the thermal energy delivered by MVRD is outlined in the TESPA. The effective cost of thermal energy from MVRD is based on the Energy Charge ($/MWh), the Capacity Charge ($/MW of capacity) and the Municipal Access fee (capped at 3 percent of the sum of the Energy and Capacity Charges).[216]

Based on the assumption that the carbon tax reaches $170 per ton by 2030, the effective rate of thermal energy from MVRD becomes lower than the marginal cost of thermal energy from natural gas boilers by approximately 2029 (as shown in Figure 11 below). RDE states that the marginal cost of thermal energy from MVRD continues to be lower than the marginal cost of thermal energy from natural gas boilers to the end of the analysis period in 2047.[217] The marginal cost of thermal energy from MVRD is equal to the Energy Charge; the initial rate used to calculate the Energy Charge and annual escalation is provided in the TESPA on a confidential basis.[218]

[209] Exhibit B-1, pp. 43– 44; Exhibit B-5, BCUC IR 26.2.
[210] Exhibit B-1, p. 45; Exhibit B-5, BCUC IR 27.1, 27.2; Exhibit B-10, BCUC IR 44.1, and 44.3.
[211] Exhibit B-1, pp. 45-46.
[212] Ibid., p. 46.
[213] Ibid.; Exhibit B-5, BCUC IR 29.4.
[214] Exhibit B-1, p. 46; Exhibit B-5, BCUC IR 30.1.
[215] Ibid., p. 34.
[216] Ibid., p. 4; Exhibit B-11, BCUC IR 6.4.
[217] Exhibit B-11, BCUC IR 6.4.
[218] CONFIDENTIAL Exhibit B-1-1, p. 44.

Figure 11: Comparison of WTEF and Natural Gas Costs[219]



Tables 14 and 15 below provide a summary of the forecast revenue requirements based on the items above:

Table 14: Forecast Revenue Requirements for Select Years based on RDDA Recovery by 2047[220]

	UNIT	2025[11]	2030	2035	2040	2047
Energy and Fuel	$000s	2,486	2,796	3,273	3,598	4,205
Other Operational Expenditures	$000s	2,011	1,953	2,181	2,399	2,729
Depreciation	$000s	599	1,789	2,179	2,367	3,111
Interest	$000s	675	2,270	2,510	1,970	1,584
ROE	$000s	862	2,898	3,205	2,516	2,022
Income Tax	$000s	-	-	-	1,556	1,230
Total	**$000s**	**6,634**	**11,707**	**13,348**	**14,406**	**14,882**

[219] Ibid., BCUC IR 6.3.

[220] Exhibit B-1, Table 8-15, p. 47.

Table 15: Forecast Revenue Requirements for Select Years based on RDDA Recovery by 2031[221]

	UNIT	2025	2030	2035	2040	2047
Energy and Fuel	$000s	2,486	2,796	3,273	3,598	4,205
Other OpEx	$000s	2,016	1,998	2,156	2,362	2,707
Depreciation	$000s	599	1,789	2,179	2,367	3,111
Interest	$000s	667	1,868	1,540	1,371	1,518
ROE	$000s	851	2,385	1,966	1,751	1,938
Income Tax	$000s	-	-	-	580	470
Total	$000s	6,619	10,836	11,114	12,029	13,949

Positions of the Parties

BCSEA considers that RDE's cost estimates appear reasonable and acknowledges that it did not access RDE's confidentially filed cost estimate report.[222] Further, BCSEA agrees that the indicative customer rate information provided by RDE demonstrates that the Project is financially viable, and that the Project costs can be recovered from customers with reasonable rate increases over time through the use of the RDDA.[223]

RCIA submits the capital expenditures appear to be reasonable given the scope of the Project.[224]

Panel Determination

The Panel finds that the approach taken by RDE to develop the capital cost estimate is reasonable. RDE prepared its capital cost estimate to a Class C level of accuracy, which it states is consistent with the BCUC's CPCN Guidelines.

Although RDE is not seeking approval of the indicative revenue requirements or customer rates at this time, the Panel is satisfied that the estimated capital costs and operating costs are reasonable for a project of this nature.

The Panel notes that RCIA finds the capital expenditures to be reasonable for the scope of the Project. We also note that although it did not review the confidentially filed information, BCSEA is satisfied that the indicative customer rate information demonstrates that the Project is financially viable and believes that the Project costs can be recovered from customers with reasonable rate increases over time through the use of the RDDA.

The Panel accepts that because of the delay in buildout of the River District, recovery of the RDDA by 2047 appears reasonable for the purpose of analyzing indicative rates. Table 13 above demonstrates that indicative rates for select years based on RDDA recovery by 2031 would be 'lumpy', spiking in 2030. By contrast, Table 11 reflects smoother indicative rates for select years based on RDDA recovery by 2047.

[221] Exhibit B-3, Section 5(b)(ii), Table 8-15, p. 10.
[222] BCSEA Final Argument, p. 9.
[223] Ibid., p. 7.
[224] RCIA Final Argument, p. 7.

The Panel considers the indicative revenue requirements and rates to be reasonable in light of the Project size and scope and the need for the Project. The Panel notes that RDE's proposed rate escalations will be subject to review and approval by the BCUC as part of RDE's next revenue requirement application. As part of that revenue requirement application, RDE will need to justify that its proposed rate escalations are not unjust, unreasonable or unduly discriminatory. In determining its proposed rate escalations, the Panel expects RDE to consider how to effectively begin recovering the costs of this Project while not exposing its customers to rate shock.

6.0 Consultation and Engagement

6.1 Indigenous Consultation and Engagement

RDE states that the River District community falls within the traditional territories of the Cowichan Tribes, Halalt First Nation, Lake Cowichan First Nation, Lyackson First Nation, Musqueam Indian Band, Penelakut Tribe, Seabird Island Band, Shxw'ow'hamel First Nation, Skawahlook First Nation, Soowahlie First Nation, Stó:lō Nation, Stz'uminus First Nation, Tsawwassen First Nation, and Tsleil-Waututh Nation.[225]

RDE states that it has not conducted any additional First Nations consultation, beyond that which was undertaken as part of the Original CPCN application[226] in 2011, because the Application involves the expansion of existing infrastructure and no new or novel impacts are expected from the construction of the CEC, DPS or ETS.[227] RDE explains that the CEC and the buildout of the DPS will be constructed entirely on land currently owned by Wesgroup or the City of Vancouver within the boundaries of the River District.[228]

On September 7, 2022,[229] RDE was directed to provide public notice to all First Nations notified as part of the Original CPCN application proceeding, and any other potentially affected First Nations.[230] On September 19, 2022, RDE provided confirmation that potentially affected Indigenous groups were provided notice of the Project via e-mail.[231]

RDE states that an Archaeological Overview Assessment was completed for the River District in 2018 which found that it is unlikely that significant precontact or historical archaeological resources have survived due to the site's prior use as a sawmill.[232] RDE further states that it has a Chance Find Management Plan in place in case any archaeological deposits are encountered during construction activities, and confirms it has a communication protocol to engage with the appropriate Indigenous parties.[233]

[225] Exhibit B-1, p. 23.
[226] River District Energy Limited Partnership Application for a CPCN to construct and operate a District Energy System for the River District Development in Southeast Vancouver.
[227] Ibid., RDE Final Argument, p. 19.
[228] Exhibit B-1, p. 23.
[229] Order G-247-22.
[230] Exhibit A-4, Order G-247-22.
[231] Exhibit B-4, p. 1.
[232] Exhibit B-1, p. 23.
[233] Exhibit B-10, BCUC IR 49.2.

Positions of the Parties

BCSEA does not take issue with RDE's submissions regarding First Nations considerations and states that it is not aware of any objection raised by a First Nation to the RDE Phase 2 Project.[234]

Panel Determination

The Panel finds that RDE's consultation with First Nations and Indigenous communities to date has been adequate, primarily because the Project involves the expansion of existing infrastructure on lands that have been previously developed and that are currently owned by either Wesgroup or the City of Vancouver. In addition, there is no evidence that there may be new or novel impacts from the construction of the CEC, DPS or ETS. Further, RDE has developed a communications protocol to engage with Indigenous communities in the event that it encounters 'chance find' archeological deposits during Project construction. Finally, RDE was directed, during the proceeding, to notify potentially impacted First Nations of the Application. To date, no First Nation has submitted notice to the BCUC of any issues with the Project.

6.2 Public Engagement

RDE states that it conducted public engagement between January 10, 2022 and February 28, 2022 to solicit feedback on the Project, most notably the construction and operation of a new CEC and the use of waste heat from the WTEF.[235] RDE states that public engagement included the following channels:

- Virtual Open House (January 20, 2022);
- Virtual Open House (February 5, 2022);
- Key Stakeholder outreach (May 16 to June 3, 2022);
- Project webpage on RDE website; and
- Online feedback form.

RDE explains that it received eleven feedback forms, with four being "very supportive," two "supportive", one of "no opinion," and one "very opposed" to the Project.[236] RDE states that it contacted commercial tenants by email and offered one-on-one information sessions, however no responses were received.[237] RDE states that it believes there has been ample public consultation prior to filing the CPCN Application.[238]

Positions of the Parties

Interveners had no submissions regarding RDE's public engagement.

[234] BCSEA Final Argument, p. 10.
[235] Exhibit B-1, p. 23.
[236] Ibid., p. 24.
[237] Ibid., p. 25.
[238] Ibid.

Panel Determination

The Panel finds RDE's public engagement efforts, including virtual open houses in 2022, emails to commercial tenants and inviting online feedback were sufficient to engage the public. Those efforts did not disclose any issues and no issues were raised within this proceeding regarding the Project.

7.0 Provincial Government Energy Objectives

Section 46(3.1)(a) of the UCA applies to the review of the Project and provides that in deciding whether to issue a CPCN to RDE, the BCUC must consider the "applicable of British Columbia's energy objectives" as they relate to the Project.[239]

As noted in Section 1.3 above, British Columbia's energy objectives are defined in section 2 of the *Clean Energy Act*. RDE identifies, in Table 16 below, the energy objectives which are supported by the Project:[240]

Table 16: BC Energy Objectives Supported by the Project

CEA SECTION[4]	CEA OBJECTIVE	PROJECT ALIGNMENT WITH OBJECTIVES
2(d)	To use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources.	This innovative project will enable the fuel switch from natural gas to waste heat, resulting in a very significant decrease in greenhouse gas emissions.
2(g)	To reduce BC greenhouse gas emissions.	
2(h)	To encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in BC.	
2(j)	To reduce waste by encouraging the use of waste heat, biogas and biomass.	This project will enable to use of waste heat from the WTEF.
2(k)	To encourage economic development and the creation and retention of jobs.	Short-term jobs will be created for the design and construction phases of the CEC (2021-2024). Long-term jobs will also be created for the ongoing operations & maintenance of the CEC and other River District DEU system assets.
2(o)	To achieve BC's energy objectives without the use of nuclear power	This project does not involve the use of nuclear power.

[239] UCA, section 46(3.1).

[240] Exhibit B-1, p. 22.

Positions of the Parties

BCSEA submits that consideration of the British Columbia's energy objectives supports a conclusion that the Project is in the public interest. The Project will foster the reduction of BC GHG emissions, encourage low carbon fuel switching, and use waste heat.[241]

Panel Determination

The Panel finds that the Project is consistent with the following British Columbia's energy objectives:

- 2(d) because its design uses waste heat recovery which is an innovative technology that uses clean or renewable resources;
- 2(g) and 2(h) because it will lead to a substantial reduction in BC greenhouse gas emissions;
- 2(j) because it uses waste heat recovery from the WTEF;
- 2(k) because it contributes to economic development by creating both short-term jobs during construction and long-term jobs during operation of the CEC and ETS; and
- 2(o) because it does not include the use of nuclear power.

8.0 CPCN Determination

Section 45(1) of the UCA[242] stipulates that a person must not begin the construction or operation of a public utility plant or system, without first obtaining from the BCUC a certificate that public convenience and necessity require, or will require, the construction or operation of the plant or system.

Sections 46(1) and (3) of the UCA state that:[243]

> (1) An applicant for a certificate of public convenience and necessity must file with the commission information, material, evidence and documents that the commission prescribes.
> …
> (3) … the commission may, by order, issue or refuse to issue the certificate… and may attach to the exercise of the right or privilege granted by the certificate, terms, including conditions about the duration of the right or privilege under this Act as, in its judgment, the public convenience or necessity may require.

RDE submits that the applied-for facilities should be approved by the BCUC.[244]

[241] BCSEA Final Argument, p. 7.
[242] *Utilities Commission Act*, RSBC 1996, c. 473.
[243] UCA, s.46(1), (3).
[244] RDE Final Argument, p. 20.

Positions of the Parties

BCSEA submits that the second phase of the River District DEU is in the public interest and should be granted a CPCN under sections 45 and 46 of the UCA.[245]
RCIA submits that the RDE thermal energy Project is in the public interest and supports approval of RDE's application for a CPCN.[246]

Panel Determination

For the reasons set out in this Decision, the Panel finds that public convenience and necessity require the construction and operation of the Project.

Accordingly, **the Panel grants a CPCN to RDE pursuant to sections 45 and 46 of the UCA for the following:**

- **The new Community Energy Centre that will house:**
    - **MVRD's energy transfer equipment required to transfer up to 10 MW of thermal energy from MVRD to RDE;**
    - **RDE's two new 10 MW natural gas-fired hot water boilers;**
    - **RDE's two 4 MW natural gas-fired hot water boilers relocated from RDE's TEC 3; and**
    - **Other Community Energy Centre related equipment outlined in Section 7.1.1 of the Application.**
- **The Distribution Piping System (DPS), Energy Transfer Stations (ETS) and related facilities required by RDE to serve future customer buildings identified in Figure 7-2 of the Application (Figure 3 of this Decision).**

The Panel directs RDE to provide ongoing reporting to the BCUC for the duration of the Project, as detailed in Appendix A of this Decision.

The Panel directs RDE to cease providing ongoing reporting for Phase 1 of the River District DEU, directed by BCUC Order C-14-11.

The Panel directs RDE to report to the BCUC, within 30 days of such event, any material changes to the terms of the TESPA, dated December 14, 2021, between MVRD and RDE, or if either RDE or MVRD ceases to be in material compliance with the terms of the TESPA.

[245] BCSEA Final Argument, p. 2.
[246] RCIA Final Argument, p. 7.

DATED at the City of Vancouver, in the Province of British Columbia, this 27th day of June 2023.

Original signed by:

E. B. Lockhart
Panel Chair / Commissioner

Original signed by:

C. M. Brewer
Commissioner

Original signed by:

B. A. Magnan
Commissioner

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ORDER NUMBER
C-3-23

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

and

River District Energy Limited Partnership
Application for Approval for a Certificate of Convenience and Necessity to Construct and Operate
the Second Phase of the District Energy Utility System for the River District Development

BEFORE:
E. B. Lockhart, Panel Chair
C. M. Brewer, Commissioner
B. A. Magnan, Commissioner

on June 27, 2023

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

WHEREAS:

A. On June 30, 2022, River District Energy Limited Partnership (RDE) submitted an application with the British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN) to construct and operate the second phase of the District Energy Utility System (DEU) for the River District Development (River District) (River District DEU), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA) (Application);

B. On December 19, 2011, pursuant to Order C-14-11, RDE was granted a CPCN to construct and operate temporary and permanent natural gas fuelled energy centres and related thermal distribution piping system and energy transfer stations. The construction of the permanent energy centre and the planned build out of the River District DEU was postponed due to the slower than anticipated build out of River District;

C. In the Application, RDE seeks approval to construct a new permanent Community Energy Centre (CEC) that will use thermal energy generated from waste heat produced at Metro Vancouver Regional District's (MVRD) Waste-to-Energy Facility (WTEF) in Burnaby, and delivered to RDE by pipeline through a closed loop hot water system. RDE's residual energy needs will be met with natural gas-fired hot water boilers located in the CEC. The proposed facilities also include the buildout of RDE's thermal energy distribution piping system to connect the remaining development sites within River District;

D. By Orders G-234-22 and G-323-22, the BCUC established and amended the regulatory timetable for the review of the Application, which included public notice, intervener registration, and two rounds of information requests to RDE from the BCUC and interveners;

E. By Order dated G-26-23, the BCUC further established the regulatory timetable to include RDE and intervener written final arguments, and RDE written reply argument; and

F. The BCUC has considered the Application, the evidence and submissions in this proceeding and determines that certain approvals are warranted.

NOW THEREFORE for the reasons set out in the Decision issued concurrently with this order and pursuant to sections 45 and 46 of the UCA, the BCUC orders as follows:

1. RDE is granted a CPCN to construct and operate the following:
   (a) a Community Energy Centre that will house:
      i. MVRD's energy transfer equipment required to transfer up to 10 MW of thermal energy from MVRD to RDE;
      ii. RDE's two 10 MW natural gas-fired hot water boilers;
      iii. RDE's two 4 MW natural gas-fired hot water boilers relocated from RDE's Temporary Energy Centre (TEC) 3; and
      iv. Other Community Energy Centre related equipment outlined in Section 7.1.1 of the Application.

   (b) The Distribution Piping System (DPS), Energy Transfer Stations (ETS) and related facilities required by RDE to serve future customer buildings identified in Figure 7-2 of the Application.
2. RDE is directed to file Project reports as outlined in Appendix A of the Decision.
3. RDE is no longer required to report to the BCUC for Phase 1 of the River District DEU, as directed by BCUC Order C-14-11.
4. RDE is directed to report to the BCUC, within 30 days of such event, any material changes to the terms of the Thermal Energy Sale and Purchase Agreement (TESPA), dated December 14, 2021, between MVRD and RDE, or if either RDE or MVRD ceases to be in material compliance with the terms of the TESPA.

DATED at the City of Vancouver, in the Province of British Columbia, this 27th day of June 2023.

BY ORDER

Original signed by:

E. B. Lockhart
Commissioner

River District Energy Limited Partnership
Application for Approval for a Certificate of Convenience and Necessity to Construct and Operate
the Second Phase of the District Energy Utility System for the River District Development

PROJECT REPORTING

The scope of Project reporting for the duration of the Project will comprise the following:

1 Semi-annual Progress Reports

Each report is required to detail:

- Actual costs incurred to date compared to the Project cost breakdown table estimate provided in Table 8-4 of the Application, highlighting variances with an explanation of significant variances;
- Updated forecast of costs, highlighting the reasons for significant changes in Project costs anticipated to be incurred; and
- The status of identified risks noted in Section 9 of the Application, highlighting the status of identified risks, changes in and additions to risks, the options available to address the risks, the actions that RDE is taking to deal with the risks and the likely impact on the Project's schedule and cost.

RDE must file semi-annual progress reports within 30 days of the end of each semi-annual reporting period, with the first report covering the period ending December 31, 2023. Each report must provide the information set out above.

2 Material Change Reports

A material change (Material Change) is a change in RDE's plan for the Project that would reasonably be expected to have a significant impact on the schedule, cost or scope, such that:

- There is a schedule delay of greater than six months compared to the schedule provided in Figure 7-5 of the Application;
- The total Project cost exceeds 10 percent of the estimated Project cost provided in Table 8-4 of the Application; or
- There is a change to the Project scope detailed in section 7.1 of the Application.

In the event of a Material Change, RDE must file a Material Change report with the BCUC explaining the reasons for the Material Change, RDE's consideration of the Project risk and the options available, and actions RDE is taking to address the Material Change. RDE 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.

3. Final Report

A Community Energy Centre (CEC) Final Report within three months of commissioning the CEC. The report is to include:

- The final cost of the Project, including a breakdown of the final costs;
- A comparison of the final costs to the estimates provided in Table 8-4 of the Application; and
- An explanation and justification for any material cost variances that exceed 10 percent for any of the cost items provided in Table 8-4 of the Application.

River District Energy Limited Partnership
Application for Approval for a Certificate of Convenience and Necessity to Construct and Operate
the Second Phase of the District Energy Utility System for the River District Development

GLOSSARY AND ACRONYMS

ACRONYM / GLOSSARY	DESCRIPTION
AFUDC	Allowance for Funds Used During Construction
Application	Application for a Certificate of Public Convenience and Necessity to construct and operate the second phase of the District Energy Utility System for the River District Development
BCSEA	BC Sustainable Energy Association
BCUC	British Columbia Utilities Commission
CEC	Community Energy Centre
CPCN	Certificate of Public Convenience and Necessity
DEU	District Energy Utility System
DPS	Distribution Piping
ETS	Energy Transfer Stations
GHG	Greenhouse Gas
GHGI	Greenhouse Gas Intensity
IRs	Information Requests
KWL	Kerr Wood Leidal Associates Ltd.
LCES Policy or LCES	Low-Carbon Energy Systems Policy
LCOE	Levelized Cost of Energy
MoU	Memorandum of Understanding
MVRD	Metro Vancouver Regional District
MW	Megawatt

ACRONYM / GLOSSARY	DESCRIPTION
ODP	Official Development Plan
Original CPCN	River District Energy Limited Partnership Application for a CPCN to construct and operate a District Energy System for the River District Development in Southeast Vancouver Order C-14-11 and Decision dated December 19, 2011
Project	Phase 2 of the development of the DEU, which consists of a new, permanent Community Energy Centre, as well as distribution piping and energy transfer stations to serve current and future River District customer buildings
RCIA	Residential Consumer Intervener Association
RDDA	Revenue Deficiency Deferral Account
RDE	River District Energy Limited Partnership
River District	River District Development
RNG	Renewable Natural Gas
T&T	Turner & Townsend
TECs	Temporary Energy Centres
TEDI	Thermal Energy Demand Intensity
TESPA	Thermal Energy Sale and Purchase Agreement
TEUI	Total Energy Use Intensity
UCA	*Utilities Commission Act*
Vancouver Building By-law	Maximum permitted GHG emission limits within the City of Vancouver's Building By-law
Wesgroup	Wesgroup Properties Limited Partnership
WTEF	Metro Vancouver's Waste-to-Energy Facility
ZEBP	Zero Emissions Building Plan

River District Energy Limited Partnership
Application for Approval for a Certificate of Convenience and Necessity to Construct and Operate the Second Phase of the District Energy Utility System for the River District Development

EXHIBIT LIST

Exhibit No.	Description
COMMISSION DOCUMENTS	
A-1	Letter dated July 26, 2022 – Appointment of Panel for the review of River District Energy Limited Partnership's Application for a Certificate of Public Convenience and Necessity (CPCN) for the District Energy Utility System dated June 30, 2022
A-2	Letter dated August 17, 2022 – BCUC issuing Order G-234-22 with the regulatory timetable and public notice
A-3	Letter dated August 24, 2022 – BCUC request for further information
A-4	Letter dated September 7, 2022 – BCUC issuing Order G-247-22 with an amended regulatory timetable and public notice
A-5	Letter dated October 4, 2022 – BCUC Information Request No. 1 to River District Energy
A-6	**CONFIDENTIAL** - Letter dated October 4, 2022 – BCUC confidential Information Request No. 1 to River District Energy
A-7	Letter dated November 8, 2022 – BCUC Order G-323-22 establishing a further regulatory timetable
A-8	Letter dated December 1, 2022 – BCUC Information Request No. 2 to River District Energy
A-9	**CONFIDENTIAL** - Letter dated December 1, 2022 – BCUC confidential Information Request No. 2 to River District Energy
A-10	Letter dated February 3, 2023 – BCUC Order G-26-23 establishing a further regulatory timetable
APPLICANT DOCUMENTS	
B-1	**RIVER DISTRICT ENERGY LIMITED PARTNERSHIP (RDE)** – Application for a Certificate of Public Convenience and Necessity (CPCN) for the District Energy Utility System dated June 30, 2022
B-1-1	**CONFIDENTIAL** – RDE submitting Confidential Appendices for a CPCN for the District Energy Utility System dated June 30, 2022

B-1-2	**CONFIDENTIAL** – RDE submitting Confidential Financial Model
B-2	Letter dated August 26, 2022 – RDE confirming notice of Application
B-3	Letter dated September 2, 2022 – RDE submitting further information – Attachments 1, 2, 4, 5, 6, 8, and 10
B-3-1	Letter dated September 2, 2022 – RDE submitting additional information related to Attachment 5
B-3-2	**CONFIDENTIAL** – Letter dated September 2, 2022 – RDE submitting Confidential Attachments 3, 7 and 9
B-4	Letter dated September 19, 2022 – RDE submitting confirmation of Order G-247-22 notification compliance
B-5	Letter dated October 25, 2022 – RDE submitting response to BCUC Information Request No. 1
B-5-1	**CONFIDENTIAL** – Letter dated October 25, 2022 – RDE submitting confidential response to BCUC Information Request No. 1
B-6	**CONFIDENTIAL** - Letter dated October 25, 2022 – RDE submitting confidential response to BCUC Confidential Information Request No. 1
B-7	Letter dated October 25, 2022 – RDE submitting response to BCSEA Information Request No. 1
B-8	Letter dated October 25, 2022 – RDE submitting response to RCIA Information Request No. 1
B-9	Letter dated November 1, 2022 – RDE submissions on further process
B-10	Letter dated January 9, 2023 – RDE submitting response to BCUC Information Request No. 2
B-11	**PUBLIC** - Letter dated January 9, 2023 – RDE submitting response to BCUC confidential Information Request No. 1 Questions 6.2 to 6.5
B-11-1	**CONFIDENTIAL** - Letter dated January 9, 2023 – RDE submitting response to BCUC confidential Information Request No. 1
B-12	Letter dated January 9, 2023 – RDE submitting response to BCSEA Information Request No. 1
B-13	Letter dated January 9, 2023 – RDE submitting response to RCIA Information Request No. 1

INTERVENER DOCUMENTS

C1-1	**BC SUSTAINABLE ENERGY ASSOCIATION (BCSEA) –** Letter dated September 8, 2022 Request to Intervene by Thomas Hackney and William J. Andrews
C1-2	Letter dated October 18, 2022 – BCSEA submitting Information Request No. 1 to River District Energy
C1-3	Letter dated October 31, 2022 – BCSEA submissions on further process
C1-4	Letter dated December 1, 2022 – BCSEA submitting Information Request No. 2 to River District Energy
C2-1	**METRO VANCOUVER (METROVAN) –** Letter dated September 8, 2022 Request to Intervene by Paul Henderson
C3-1	**RESIDENTIAL CONSUMER INTERVENER ASSOCIATION (RCIA)** – Letter dated September 28, 2022 Request to Intervene by Rory MacGregor
C3-2	Letter dated October 14, 2022 – RCIA submitting Information Request No. 1 to River District Energy
C3-3	Letter dated October 31, 2022 – RCIA submissions on further process
C3-4	Letter dated November 30, 2022 – RCIA submitting Information Request No. 2 to River District Energy

INTERESTED PARTY DOCUMENTS

D-1	S.U.C.C.E.S.S. (SUCCESS) **–**Request for Interested Party Status by D. Fung dated August 24, 2022
D-2	MAHDY, A. (MAHDY) - Request for Interested Party Status dated August 25, 2022
D-3	**BROID, D. (BROID)** – Letter dated November 28, 2022 submitting request for Interested Party Status

LETTERS OF COMMENT

E-1	**CITY OF VANCOUVER –** Letter dated October 21, 2022 – City of Vancouver submitting letter of comment supporting RDE application