CREATIVENERGY

13 January 2021

Via E-filing

Ms. Marija Tresoglavic
Acting Commission Secretary
BC Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Tresoglavic:

Re: British Columbia Utilities Commission (BCUC, Commission)
Creative Energy Vancouver Platforms Inc. (Creative Energy)
2021 Long-term Resource Plan (LTRP)

Creative Energy writes to submit its 2021 LTRP as enclosed.

Creative Energy has filed an Appendix A to the LTRP confidentially under separate cover pursuant to Section 18 of the Commission's Rules of Practice and Procedure regarding confidential documents. The reasons supporting our request for confidentiality are discussed in the cover letter to the filing of Appendix A.

For further information, please contact the undersigned.

Sincerely,

Rob Gorter
Director, Regulatory Affairs and Customer Relations

Enclosure.

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CREATIVENERGY

Creative Energy Vancouver Platforms Inc.

Long-Term Resource Plan - 2021

January 13, 2021

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1 Introduction

Creative Energy Vancouver Platforms Inc. ("**Creative Energy**") submits this Long Term Resource Plan ("**LTRP**") for the Commission's review pursuant to section 44.1(2) of the Utilities Commission Act ("**UCA**") and the Commission's Resource Planning Guidelines.

Additionally, pursuant to section 44.2(1) of the UCA, Creative Energy submits for acceptance by the Commission the enclosed expenditure schedule containing capital expenditures Creative Energy has made and anticipates making to study and develop a low carbon energy project, as discussed in further detail in Appendix A.

1.1 Creative Energy

Creative Energy owns and operates a centralized boiler plant located at 720 Beatty Street ("**Beatty Plant**") in the City of Vancouver, British Columbia. Creative Energy's steam utility has been in operation since 1968.

Creative Energy uses natural gas boilers to produce steam that is then distributed to individual buildings through a network of underground pipes. The Beatty Plant also supplies thermal energy to Creative Energy's Northeast False Creek hot water system ("**NEFC System**"), which serves four buildings in the NEFC neighbourhood of Vancouver. The NEFC System relies on the Beatty Plant for thermal energy. Accordingly, this LTRP addresses the planning for future resources to serve both the Core Steam System and NEFC System.

There are six natural gas-fired boilers currently installed at the Beatty Plant with a combined functional capacity of 630,000 pounds per hour ("**PPH**") of steam. The underground pipe steam distribution network extends over 14 kilometers to serve over 200 buildings, with a total floor area of about 45 million square feet, in Vancouver's downtown core. Creative Energy has a long-term Municipal Access Agreement with the City of Vancouver (the "**City**") that governs the use of Vancouver's streets for the steam distribution piping network.

The Creative Energy system is one of the largest district energy systems in Canada in terms of connected floor area. Creative Energy provides customers with the lowest cost thermal energy in Vancouver, and taking service from Creative Energy allows customers to forgo in-building boilers, fuel supply and stacks freeing space that the customer can use for other beneficial purposes.

1.2 Redevelopment Project

As approved by Commission Order No. C-1-20, Creative Energy is undertaking a project ("**Redevelopment Project**") to upgrade the Beatty Plant as part of a larger redevelopment of 720 Beatty Street and the adjacent 701 Expo Boulevard properties. The project involves first building a smaller off-site plant within BC Place Stadium that will be operational and serve steam customers during the summer and shoulder seasons while the existing Beatty Plant undergoes renovation work, all in coordination with redevelopment by others of the space above and adjacent to the existing plant.

In partnership with BC Pavilion Corporation, Creative Energy is re-purposing unused space at the base of BC Place Stadium across the street from the existing steam plant. In this space Creative Energy is building a new plant (the "**Expo Plant**") that will be approximately half the size of the existing Beatty Plant. The new Expo Plant will have two 200,000 PPH boilers with high-efficiency and ultra low-NO_x equipment, and will be interconnected with the existing Beatty Plant and steam distribution network.

When the Expo Plant is in service, Creative Energy will temporarily shut down the Beatty Plant during the summer and shoulder seasons and renovate it without interrupting service to customers.

The Beatty Plant component of the Redevelopment Project involves abating and demolishing three of the oldest boilers and related equipment, and the existing office space and structure, refurbishing and replacing certain equipment, and constructing a new structure to house the renovated plant. The renovated Beatty Plant will be smaller than the existing plant, and will

have space and ancillary equipment to accommodate some expanded generating capacity in the future.

When the Redevelopment Project is complete (Expo Plant to complete in 2022 and Beatty Plant in 2024), Creative Energy will have two smaller interconnected steam generation plants built to modern standards for fire and seismic resistance and with improved efficiency, which will enhance long-term service reliability for customers, reduce natural gas costs and greenhouse gas ("**GHG**") emissions, and improve local air quality.

This LTRP addresses Creative Energy's resource planning for the time period following completion of the Redevelopment Project. That is, this LTRP addresses what's next for Creative Energy's steam system.

1.3 Creative Energy's Long Term Resource Planning Objectives

The Beatty Plant has provided a reliable supply of steam for more than 50 years. The Redevelopment Project will ensure that Creative Energy is able to continue to reliably serve current demand levels for many years to come, and with improved safety and environmental performance.

Creative Energy continues to pursue initiatives to add customers and extend the system to serve them. A further and interrelated objective of Creative Energy's long term resource planning is to maintain existing customers.

Creative Energy provides the lowest cost thermal energy in Vancouver. Low rates for thermal energy have historically been Creative Energy's competitive advantage. However, the marketplace has changed and the pace of change is accelerating. For existing and potential new customers, the low cost of Creative Energy's thermal energy may not be sufficient to retain and attract these customers. In order for Creative Energy to align with current and future regulations and remain an attractive option for customers with corporate commitments for net zero emissions, for example, Creative Energy is therefore evaluating a transition to offer low carbon services.

Switching to less carbon-intensive fuel reduces the carbon-intensity of Creative Energy's steam. On the other hand, demand-side measures ("**DSM**") reduce steam consumption and therefore reduce Creative Energy's natural gas consumption, but do not change the carbon-intensity of Creative Energy's steam.

Therefore, while DSM may be part of the long-term planning solution it cannot be the entire solution as DSM will not change the carbon-intensity of Creative Energy's steam. Neither will DSM present any potential for Creative Energy to defer future investments in lower carbon-intensive supply infrastructure to meet current policy and future demand growth.

2 Regulatory Context

Section 44.1 of the UCA sets forth the requirement for Creative Energy to file a long-term resource plan with the Commission, the information the plan is to include, the Commission's powers in relation to a filed LTRP, and the matters that are to be considered by the Commission in determining whether to accept the plan.

2.1.1 Information to be included in a LTRP

Table 1, below, identifies the information required pursuant to section 44.1(2) of the UCA, and where each requirement is addressed in this LTRP.

Table 1: UCA Requirements and Where Addressed in the 2020 LTRP

Requirement of UCA section 44.1(2)	Addressed in the 2020 LTRP
(a) an estimate of the demand for energy the public utility would expect to serve if the public utility does not take new demand-side measures during the period addressed by the plan;	See Section 6
(b) a plan of how the public utility intends to reduce the demand referred to in paragraph (a) by taking cost-effective demand-side measures;	See Section 7
(c) an estimate of the demand for energy that the public utility expects to serve after it has taken cost-effective demand-side measures;	See Section 7.4
(d) a description of the facilities that the public utility intends to construct or extend in order to serve the estimated demand referred to in paragraph (c);	See Section 7.3
(e) information regarding the energy purchases from other persons that the public utility intends to make in order to serve the estimated demand referred to in paragraph (c);	See Section 8 and Appendix A
(f) an explanation of why the demand for energy to be served by the facilities referred to in paragraph (d) and the purchases referred to in paragraph (e) are not planned to be replaced by demand-side measures;	See Section 7.4
(g) any other information required by the commission.	N/A

2.1.2 Matters to be considered

In determining whether to accept a long-term resource plan, or part of such a plan, pursuant to section 44.1(8) the Commission is to consider:

a) the applicable of British Columbia's energy objectives,

b) the extent to which the plan is consistent with the applicable requirements under sections 6 and 19 of the *Clean Energy Act* ("**CEA**"),[1]

c) whether the plan shows that the public utility intends to pursue adequate, cost-effective demand-side measures, and

d) the interests of persons in British Columbia who receive or may receive service from the public utility.

Table 2, below, outlines the British Columbia energy objectives Creative Energy considers are applicable to this LTRP and where each of applicable energy objectives is addressed in this LTRP.

Table 2: Applicable CEA Objectives Directly Relevant to the LTRP

CEA Section	Energy Objective	Supported in the LTRP
2(a)	to achieve electricity self-sufficiency;	N/A[2]
2(b)	to take demand-side measures and to conserve energy, including the objective of the authority reducing its expected increase in demand for electricity by the year 2020 by at least 66%;	See Section 7

[1] Section 6 of the CEA prescribes the requirements for BC Hydro to achieve electricity self-sufficiency. Section 6 of the CEA is not applicable to this LTRP. Section 19 of the CEA empowers the Minister to make regulations requiring a person to pursue actions to meet prescribed targets in relation to clean or renewable resources. No such regulation has been issued with respect to Creative Energy, and accordingly section 19 of the CEA is not applicable to this LTRP.

[2] This energy objective is not directly applicable to this LTRP. Creative Energy does not generate electricity.

CEA Section	Energy Objective	Supported in the LTRP
2(c)	to generate at least 93% of the electricity in British Columbia from clean or renewable resources and to build the infrastructure necessary to transmit that electricity;	N/A[3]
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;	See section 7 and Appendix A
2(e)	to ensure the authority's ratepayers receive the benefits of the heritage assets and to ensure the benefits of the heritage contract under the ***BC Hydro Public Power Legacy and Heritage Contract Act*** continue to accrue to the authority's ratepayers;	N/A[4]
2(f)	to ensure the authority's rates remain among the most competitive of rates charged by public utilities in North America;	N/A[5]
2(g)	to reduce BC greenhouse gas emissions; (i) by 2012 and for each subsequent calendar year to at least 6% less than the level of those emissions in 2007, (ii) by 2016 and for each subsequent calendar year to at least 18% less than the level of those emissions in 2007, (iii) by 2020 and for each subsequent calendar year to at least 33% less than the level of those emissions in 2007, (iv) by 2050 and for each subsequent calendar year to at least 80% less than the level of those emissions in 2007, and (v) by such other amounts as determined under the ***Greenhouse Gas Reduction Targets Act***;	See Section 7, Section 8 and Appendix A
2(h)	to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia;	See Section 8 and Appendix A
2(i)	to encourage communities to reduce greenhouse gas emissions and use energy efficiently;	See Section 7, Section 8 and Appendix A

[3] This energy objective is not directly applicable to this LTRP. Creative Energy does not generate electricity.

[4] This energy objective is directed to BC Hydro as referenced in CEA by the term “the authority”.

[5] This energy objective is directed to BC Hydro as referenced in CEA by the term “the authority”.

CEA Section	Energy Objective	Supported in the LTRP
2(j)	to reduce waste by encouraging the use of waste heat, biogas and biomass;	The Beatty Plant renovation project includes a waste heat capture component.
2(k)	to encourage economic development and the creation and retention of jobs;	See Appendix A
2(l)	to foster the development of first nation and rural communities through the use and development of clean or renewable resources	N/A[6]
2(m)	to maximize the value, including the incremental value of the resources being clean or renewable resources, of British Columbia's generation and transmission assets for the benefit of British Columbia;	N/A[7]
2(n)	to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;	N/A[8]
2(o)	to achieve British Columbia's energy objectives without the use of nuclear power;	Confirmed[9]
2(p)	to ensure the commission, under the ***Utilities Commission Act***, continues to regulate the authority with respect to domestic rates but not with respect to expenditures for export, except as provided by this Act;	N/A[10]

[6] This energy objective is not directly applicable to this LTRP. Creative Energy is located in downtown Vancouver.

[7] This energy objective is not directly applicable to this LTRP. This energy objective is directed to BC Hydro.

[8] This energy objective is not directly applicable to this LTRP. Creative Energy does not generate electricity and does not export any of its generated steam.

[9] Creative Energy confirms that it is not planning to use nuclear power.

[10] This energy objective is directed to BC Hydro as referenced in CEA by the term “the authority”.

In addition to considering the applicability of British Columbia's energy objectives, the Commission is also to consider whether the plan shows that the public utility intends to pursue adequate, cost-effective demand-side measures.[11] The consideration of whether the public utility intends to pursue "adequate, cost-effective demand-side measures" is informed by the provisions of the *Demand Side Measures Regulation* (B.C. Reg. 326/2008) enacted under the UCA. Creative Energy's discussion of a plan to pursue demand-side measures is set out in section 7 of this LTRP.

2.1.3 BCUC Resource Planning Guidelines

The Commission generally evaluates the resource plans of energy utilities to assure the cost-effective delivery of secure and reliable energy services in a manner consistent with British Columbia's energy objectives. In 2003, the Commission issued Resource Planning Guidelines. Although these Guidelines pre-date section 44.1 of the UCA and the enactment of the CEA, they nonetheless assist in the development of resources plans to be filed with the Commission.

The Commission reviews resource plans in the context of the unique circumstances of the utility in question. Table 3 outlines the key elements of the Resource Planning Guidelines and the sections of this LTRP in which they are addressed.

Table 3: Commission Resource Planning Guidelines

Resource Planning Guideline	Addressed in the 2020 LTRP
1. Identification of the planning context and the objectives of a resource plan	See Section 4
2. Development of a range of gross (pre-DSM) demand forecasts	See Section 6

[11] Pursuant to section 1 of the UCA, "demand-side measure" has the same meaning as in section 1(1) of the CEA, which provides a "demand-side measure" means a rate, measure, action or program undertaken to (a) conserve energy or promote energy efficiency, (b) to reduce the energy demand a public utility must serve, or (c) to shift the use of energy to periods of lower demand, but does not include (d) a rate, measure, action or program the main purpose of which is to encourage a switch from the use of one kind of energy to another such that the switch would increase greenhouse gas emissions in British Columbia, or (e) any rate, measure, action or program prescribed.

Resource Planning Guideline	Addressed in the 2020 LTRP
3. Identification of supply and demand resources	See Sections 4, 6, and 7
4. Measurement of supply and demand resources	See Sections 4, 6, and 7
5. Development of multiple resource portfolios	N/A
6. Evaluation and selection of resource portfolios	N/A
7. Development of an action plan	See Section 8
8. Stakeholder input	See Section 5
9. Regulatory input	CEV will engage with the Commission and stakeholders through the regulatory process to review this LTRP
10. Consideration of government policy	See Section 4
11. Regulatory review	See Section 2.3

2.2 Approvals Sought

Creative Energy submits this long-term resource plan pursuant to section 44.1(2) of the UCA for the Commission's review and acceptance pursuant to section 44.1(6) of the UCA.

Creative Energy is also requesting the Commission's acceptance pursuant to subsection 44.2(3)(a) of the UCA specifically of the total actual and forecast expenditures set out in Appendix A, which are required to complete studies investigating the technical and economic feasibility of a low carbon energy project as discussed in Appendix A on the basis that making the expenditures is in the public interest. Creative Energy is of the view that completing these studies supports B.C.'s energy objectives and is in the public interest.

A draft Final Order is provided in Appendix B.

2.3 Regulatory Review Process

We offer the following comments for the Commission's consideration when determining a suitable regulatory process for review of the LTRP and expenditure schedule in specific view of our preferred timing for acceptance of the expenditure schedule.

Acceptance of the expenditure schedule for the low carbon energy project is integral to Creative Energy's objectives as set out in this LTRP. As reviewed in Appendix A, the investigation of the technical and economic feasibility of the project will continue to advance in 2021 and Creative Energy expects to file for approval of a Certificate of Public Convenience and Necessity ("**CPCN**") for the project in Quarter 2 of 2021.

In view of the targeted timing of a CPCN for the low carbon energy project, Creative Energy's preference is to seek acceptance of the expenditure schedule in advance within the next three months. We are able to support an expedited process that the Commission may consider warranted to review and decide upon the expenditure schedule component of the LTRP in that timeframe (through March 2021, for example).

Further process and review of the LTRP could continue in parallel with a targeted review of the expenditure schedule but its acceptance could still be subject to further review, beyond March 2021 for example. Additionally, we may expect that review of the LTRP could be leveraged as a component of the review of the CPCN upon its filing when confirmed, and thus there may be an opportunity for consolidated review of related aspects of the LTRP to the CPCN, outside of an initial expedited review of the expenditure schedule.

3 Steam Plant and Services Provided

This section reviews the capabilities of Creative Energy's steam generating plant, as at completion of the Redevelopment Project, the service the plant supplies to customers and how customers use the service. This is intended as a 'snap-shot' of the plant and its operations and services as at the end of 2024 when all components of the Redevelopment Project are expected to be in service, as the base case from which to plan for future resources.

3.1 The Beatty Plant and Distribution Systems (Core and NEFC)

The Commission approved Creative Energy's Redevelopment Project in March 2020 pursuant to Order C-1-20. This project includes construction of new and renovated steam plant works and related facilities at Creative Energy's existing site at 720 Beatty Street in Vancouver and at an adjacent site within BC Place Stadium.

The Redevelopment Project is comprised of the following major components:

- Construction of the new Expo Plant, including two new 200,000 PPH boilers in unused mechanical space within the BC Place Stadium to replace the end-of-life equipment at the Beatty Plant;
- Interconnection of steam, condensate and fuel oil services between the Expo and Beatty Plants;
- Abatement and demolition of Boilers #1, #2 and #4 and other equipment at end of life in the Beatty Plant;
- Relocation of Boiler #5 and other equipment within the Beatty Plant;
- Replacement of back-up fuel oil tanks, generator, and other major equipment at the Beatty Plant;
- Construction of a new structure to house the renovated Beatty Plant;

- Construction of new boiler flues for the Beatty Plant, routed to the roof of the new office tower; and

- Relocation of the Creative Energy team to temporary office space during construction, and to permanent office space in the new office tower when it is completed.

The Expo Plant will be built first and interconnected to the existing steam distribution system through the main steam system headers within the Beatty Plant.

The Beatty Plant component of the Redevelopment Project retains the equipment with design life remaining, and decommissions and removes equipment that is at end-of-life. When complete, the Beatty Plant will be located within a new office tower development. The surrounding public areas will be significantly enhanced and beautified with a large public plaza between Beatty Street and BC Place, which will be especially important once the viaducts on Georgia Street are lowered and this site becomes a gateway into downtown Vancouver.

3.1.1 Boiler Capacities

Creative Energy must be able to meet the peak demand requirement of the distribution network, including the demand of the NEFC system.

Prior to the Redevelopment Project, the capacity, size and age of Creative Energy's boilers are as shown in Table 4 below.

Table 4: Current Boiler Capacities

Boiler ID	Manufacturer	Year Built	Rated Capacity (lb/hr)	Functional Capacity (lb/hr)	Annual Contribution to Steam Generation	Design Life Remaining
No. 1	Foster-Wheeler	1967	100,000	50,000	6%	0
No. 2	Foster-Wheeler	1968	100,000	60,000	4%	0
No. 3	B & W	1969	135,000	100,000	20%	0

Boiler ID	Manufacturer	Year Built	Rated Capacity (lb/hr)	Functional Capacity (lb/hr)	Annual Contribution to Steam Generation	Design Life Remaining
No. 4	B & W	1973	215,000	180,000	39%	3
No. 5	Cleaver-Brooks	1983	75,000	70,000	3%	13
No. 6	Foster-Wheeler	1991	200,000	170,000	28%	21
TOTAL			825,000	630,000	100%	

Table 5 below shows the changes to overall boiler capacity as a result of the Redevelopment Project.

Table 5: Boiler Capacities after the Redevelopment Project

Boiler ID (lb/hr)	Manufacturer	Year Built	Rated Capacity (lb/hr)	Functional Capacity (lb/hr)	Annual Contribution to Steam Generation
~~No. 1~~	~~Foster-Wheeler~~	~~1967~~	~~100,000~~	~~50,000~~	-
~~No. 2~~	~~Foster-Wheeler~~	~~1968~~	~~100,000~~	~~60,000~~	-
No. 3* (Beatty)	B & W	1969	135,000	100,000	10%
~~No. 4~~	~~B & W~~	~~1973~~	~~215,000~~	~~180,000~~	-
No. 5 (Beatty)	Cleaver-Brooks	1983	75,000	70,000	10%
No. 6 (Beatty)	Foster-Wheeler	1991	200,000	170,000	20%
No. 1 (Expo)	B & W	2022	200,000	200,000	30%
No. 2 (Expo)	B & W	2022	200,000	200,000	30%
Total Connected Capacity			810,000	740,000	100%

* Boiler #3 currently has a functional capacity of 100,000 lb/hr; however, this boiler has reached the end of its design life. The Redevelopment Project retains Boiler #3 for the time being. In the absence of Boiler #3, the functional capacity of the new plant is 640,000 lb/hr.

Together, the Expo Plant and renovated Beatty Plant will maintain the reliability performance of the plant for the long-term.

Once the Redevelopment Project is complete, Creative Energy will have space and ancillary equipment to accommodate some expanded generating capacity within the Beatty Plant. The renovated Beatty Plant will have space and flue capacity to accommodate up to 75 MW of additional generating capacity at the Beatty Plant in the future if needed to serve load growth or internal process needs.

The Redevelopment Project retains Boiler #3 for the time being to manage risks related to the timing of customer additions and losses. Boiler #3 can be removed and replaced with a larger and more efficient boiler if and when needed after the Redevelopment Project is complete. Decommissioning and possible replacement of Boiler #3 and any further increase in overall generation capacity would be subject to review by the Commission.

Boilers #5 and #6 have 13 and 21 years of remaining design life respectively and Creative Energy expects that these boilers will remain in service for such time periods.

Creative Energy has carried a capacity reserve of approximately 8 percent in recent years, though that has declined due to a decision by Creative Energy operations staff to reduce the functional capacities of Boilers #1 and #2, which are being decommissioned and removed in the Redevelopment Project.

Creative Energy's capacity reserve will increase under the Redevelopment Project to 29 percent assuming that Creative Energy can continue to rely on Boiler #3 to its current functional capacity. If Boiler #3 fails or its capability is substantially de-rated, Creative Energy's reserve margin would still be approximately 11.7 percent supported by overall much newer equipment following the Redevelopment Project.

3.1.2 Boiler Fuel Supply

Effective as of November 1, 2019, as accepted by Commission Letter L-22-19, Creative Energy acquires its natural gas (both commodity and delivery) from FortisBC Energy Inc. ("**FEI**") under FEI Rate 7 bundled interruptible service.

Creative Energy previously acquired its natural gas supply (commodity) from a gas marketer, and gas transportation service from FEI under FEI Rate 22. Creative Energy changed to bundled service from FEI in 2019 in consideration of the following:

- FEI Rate 7 itself is deemed just and reasonable under the oversight of the Commission through its regulation of FEI and FEI's annual gas contracting plans, yielding an efficiency benefit to Creative Energy management and administration of our gas portfolio;

- Natural gas prices during the winter of 2018/2019 were extremely volatile and at times very high. Creative Energy considered that it would not be acceptable to go through a scenario like the 2018/2019 winter again; and

- Fuel costs are a flow-through to customers and FEI Rate 7 allows Creative Energy to achieve long-term price stability for our customers and to entirely avoid the risk of extreme price volatility, on a cost-effective basis.

The curtailment risk under FEI Rate 7 is low, and Creative Energy is able to fully meet customer demand with our backup fuel oil system if gas supply is curtailed.

- Creative Energy has on-site fuel oil storage, and fuel oil can be procured on short notice. The backup system has the generating capacity and demonstrated reliability to meet peak load and is able to run continuously and indefinitely.

- Other than the gas transportation curtailments following the Enbridge pipeline explosion in October 2018, FEI has not curtailed transportation service to Creative Energy in the past 11 years due to capacity issues on the FEI system.

Once the Expo Plant is operational and/or upon FEI offering a partial firm/partial interruptible bundled service, as applicable, we could consider the merits of an alternative bundled service option at that time.

3.1.3 GHG Emissions

Creative Energy is subject to GHG emissions reporting requirements. In British Columbia, facilities that emit 10,000 tonnes or more of carbon dioxide equivalent per year – and those that have emitted more than 10,000 tonnes in any of the previous three years – must report their GHG emissions annually. This is in accordance with the *Greenhouse Gas Emission Reporting Regulation*[12] made pursuant to the *Greenhouse Gas Industrial Reporting and Control Act*.[13]

There are also federal reporting requirements overseen by Environment and Climate Change Canada: the Greenhouse Gas Reporting Requirement Program ("**GHGRP**") if the facility emits 10,000 tonnes or more of GHG in carbon dioxide equivalent units per year.

Creative Energy's total emissions are approximately 100,000 t CO_2e per year.

3.1.4 Distribution Systems (Core and NEFC)

The existing distribution network forms the basis for what can be described as Creative Energy's service area. It is reasonable to expect that any new development in downtown Vancouver within reasonable proximity to the Creative Energy steam and hot water distribution networks will at least consider Creative Energy as an option for serving their heating needs.

Presently, Creative Energy has connected a total of four buildings in the NEFC, served by two hot water plants, with a total connected floor area of 162,481 m^2 and hot water demand of

[12] B.C. Reg 249/2015

[13] S.B.C. 2014, Chapter 29

19,162 MWh forecast for 2020, the first full year of forecast consumption for all four buildings in total.

The City has extended their connection bylaw to now include the future development in the NEFC neighbourhood, which means that the City will provide service to the future developments in NEFC, rather than Creative Energy.

Creative Energy intends to supply the hot water to serve the City's loads in the NEFC as it develops using the installed capacity and capital expansions as contemplated when the CPCN for the NEFC System was granted. However, the necessary arrangements with the City have not been made yet for Creative Energy to serve that load and are subject to the City's processes. At this point in time therefore, Creative Energy does not have a consolidated forecast of load growth in the NEFC neighbourhood and the timing of the required incremental capacity investments to support that load growth is uncertain.

Table 6: Capacity of the NEFC steam to hot water conversion stations (utilized and available)

Location	Installed Capacity	Potential Capacity
Parq Casino	8.8MW	17.6MW
Roger's Arena South	8.8MW	17.6MW
Total	17.6MW	35.2MW

3.2 Existing Customers served by the Steam Plant

As of September 31, 2020, Creative Energy had the following customers in the following categories.

Table 7: Creative Energy Customers

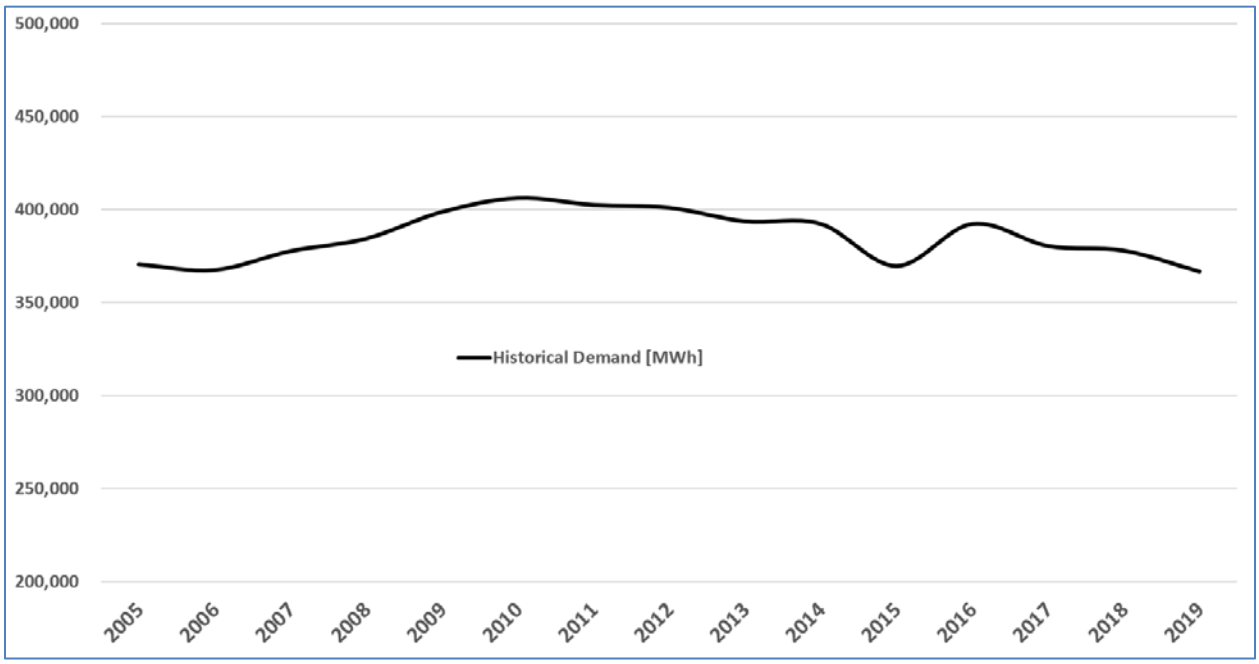
Customer Category	Number of Customer connections
Steam Customers	
Commercial	84 connections
Hotels	21 connections

Customer Category	Number of Customer connections
Institutions	23 connections
Restaurants	3 connections
Residential	67 connections
Retail	14 connections
Total Steam Customers	212 connections
Hot Water Customers (NEFC)	
Residential	2 connections
Hotel / Commercial	2 connection
Total Hot Water Customers	4 connections

Most of the thermal demand from the customers is used to provide space heating such that the demand is tightly linked to weather.

Figure 1 shows Creative Energy's actual steam sales since 2005 (measured from customer meters and aggregated to annual numbers). The historical demand fluctuates from year to year based on weather and other temporary events like major building renovations, and three new customers were added to the NEFC network between 2016 and 2017 offset by some reduction in load between 2011 and 2015 due to the loss of individual buildings and efficiency measures at several large customers. Weather normalized steam load over the same period is illustrated in Figure 5.

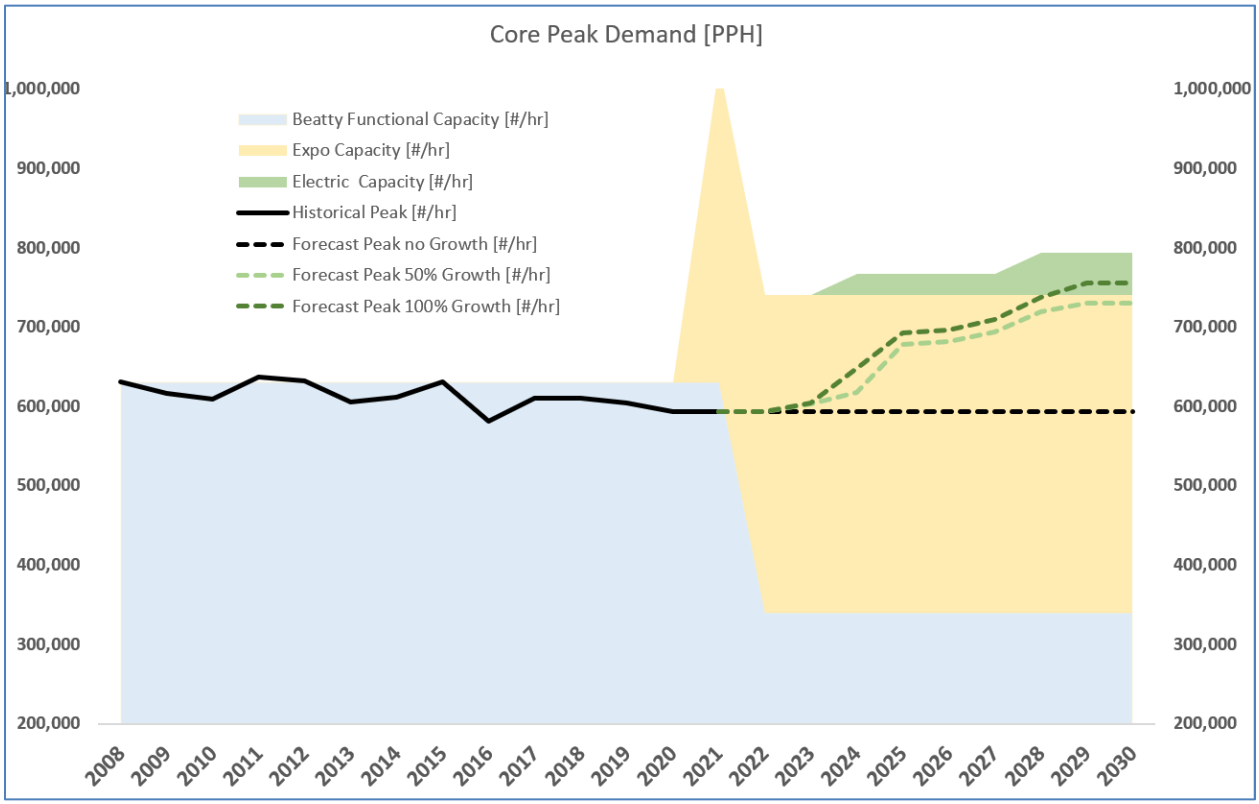
Figure 1: Creative Energy Actual System Load



In addition to annual sales, Figure 2 below shows actual system peak and a forecast of future peaks, based on potential growth scenarios. The historical peak reflects actual weather.

Weather and additions or losses of large customers have a greater effect on peak demand than changes within individual buildings, such as building upgrades or changes in occupancy and use. These factors are more likely to affect annual energy sales than peak system demand.

Figure 2: System Peak Demand



Without additional capacity investments, Creative Energy expects to be able to meet the peak demand requirements of the system under most growth scenarios for the next ten years, by virtue of the redevelopment project and the additional capacity resulting from the Expo plant.

There has been little customer attrition historically. The following Figure 3 illustrates relatively small amount of customer attrition, in terms of both the change in the number of accounts and partial load loss due to customer energy system projects.

Figure 3: Incremental Change in Number of Accounts

	Number of Accounts													
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Connect	3													
Disconnect	-1													
Connect		2												
Connect			9											
Connect			1											
Connect			1											
Disconnect				-1										
Disconnect					-1									
Disconnect					-1									
Connect					1									
Connect					1									
Connect						1								
Disconnect						-1								
Heat Recovery						-								
Heat Recovery						-								
Disconnect							-1							
Heat Recovery							-							
Disconnect								-1						
Disconnect								-1						
Disconnect								-1						
Connect								1						
Heat Recovery								-						
Connect									1					
Connect									1					
Heat Recovery									-					
Connect										1				
Connect										2				
Connect										1				
Geoexchange											-			
Connect											1			
Connect												1		
Heat Recovery												-		
Heat Recovery												-		
Heat Recovery													-	
Disconnect														-1
Connect														1
	2	2	11	-1	0	0	-1	-2	2	4	1	1	0	0

Historically, there has been little attrition of Creative Energy's customer base. Most historical disconnections were temporary while an older building at the customer site is under redevelopment.

The factors contributing to a specific instance of attrition or loss of load are readily understood through our communications with the customer and/or otherwise independently confirmed; for example, if the customer's building is being retrofit, redeveloped and/or the customer is moving to an alternative heating service, or if a customer is contending with some other emergent situation.

Overwhelmingly, permanent partial loss of load is due to customers undertaking projects to switch part of their heating energy system from reliance on steam to a lower carbon alternative and/or to add some form of heat recovery to their system. In recent years, nine Creative Energy customers have added some form of heat recovery to their heating system and/or partially switched their system to lower-carbon alternatives. These projects were largely to install heat

recovery systems, where heat recovered from cooling systems is used to provide heat or hot water to the building, thus reducing their steam demand. There was at least one project involving geo-exchange in combination with heat recovery.

1) The customers investing in on-site energy projects were all non-residential buildings. This is to be expected as residential buildings typically have lower cooling demands on a unit-area basis, and very limited cooling in shoulder and winter seasons, meaning that there is a much lower degree of coincidence between heating and cooling demands.

2) The buildings experienced a range of success. The percent reduction in steam use observed from metered data following commissioning ranged from 90 percent reduction to zero reduction. Most commonly, customers experienced about a 50 percent reduction in annual steam consumption, largely in the summer months.

3) There were a few cases where load reduced because the customer switched their energy supply to a different source, either electric baseboards, or installed a natural gas boiler for their domestic hot water production.

3.3 Customer Steam Service Uses

Creative Energy's long-term customers include BC Place Stadium, Roger's Arena, Vancouver Public Library, Queen Elizabeth Theatre, hotels and retail, office, commercial and residential buildings.

Creative Energy provides steam, and in the case of customers connected to the NEFC system, hot water, which customers use for residential and commercial uses, as follows:

Space Heating

- direct steam heating to in-suite radiators
- indirect heating through heat exchangers to building hydronic heating loop systems
    - finned radiator baseboard systems
    - in-floor/in-wall hydronic heating loops
    - heating coils in make-up air units
    - fan coil units
    - swimming pool heating

Domestic Hot Water ("**DHW**") Heating

- indirect heating through heat exchangers to DHW direct supply or storage tank

Commercial Uses

- heating to kitchen equipment, such as large soup kettles, brewing kettles and dishwashers
- steam to sterilizing equipment in St. Paul's hospital
- steam to humidification
- steam to steam irons

4 Planning & Policy Environment

4.1 Introduction

Creative Energy is a provider of thermal energy to buildings in downtown Vancouver, primarily for space heating of connected buildings. Creative Energy's LTRP must be aligned to Creative Energy's circumstances, and must therefore consider:

1) Current and future regulatory requirements and constraints applicable to Creative Energy, specifically as a producer of energy and emitter of GHGs. This includes the UCA, the CEA, and other applicable legislation and policies of all levels of government, including the City of Vancouver.

    - All levels of government in Canada have targets and plans to reduce GHG emissions. These targets have incentivized provincial governments and municipalities to implement programs to reduce overall emissions.

    - Government regulations and policies generally establish minimum requirements, for example, in relation to carbon intensity and GHG emissions of energy production.

2) Current and future regulatory requirements and constraints applicable to Creative Energy's current and potential new customers in downtown Vancouver.

    - Government regulations and policies generally establish minimum requirements, for example in relation to energy efficiency of new buildings and permissible energy sources.

    - New developments in Creative Energy's service area of downtown Vancouver will be limited in the options available to them for thermal energy for space heating and DHW heating.

3) The expectations of Creative Energy's existing and potential new customers in downtown Vancouver.

    - In some cases, such expectations are higher than the minimum requirements established by the regulations.

Creative Energy provides the lowest cost thermal energy in Vancouver. Low rates for thermal energy have historically been Creative Energy's competitive advantage. However, the marketplace has changed and the pace of change is accelerating. For existing and potential new customers, the low cost of Creative Energy's thermal energy may not be sufficient to retain and attract these customers. Customers are increasingly cognisant of the carbon-intensity of Creative Energy's energy.

New developments in downtown Vancouver might not be permitted to, or might choose not to, obtain their thermal energy requirements from Creative Energy unless Creative Energy offers low carbon energy at least as an optional service.

In order for Creative Energy to align with current and future regulations and remain an attractive option for customers with corporate commitments for net zero emissions, for example, Creative Energy is therefore evaluating a transition to offer low carbon and net zero services.

This section discusses the planning and policy environment considered by Creative Energy relevant to this LTRP.

4.2 Energy Emissions Policy

4.2.1 Canada

The Government of Canada ("**Canada**") has committed to reducing GHG emissions by 30 percent below 2005 levels by 2030 and achieving net-zero emissions by 2050. Canada is taking various sector-specific actions to reduce energy emissions. Those actions most applicable to

Creative Energy are the sector-specific actions to reduce GHG emissions and the implementation of the carbon tax.

In Canada, using energy to heat and cool buildings accounted for approximately 12 percent of national GHG emissions in 2014. The emissions in this sector, the built environment, created by burning fossil fuels, are projected to grow modestly by 2030 unless action is taken.[14] According to data from the Canada Green Building Council, retrofitting commercial and institutional buildings will reduce GHG emissions in less than ten years.[15] Canada's approach to reducing GHG emissions in the built environment includes making new buildings net-zero energy and retrofitting existing buildings, as well as fuel switching.

According to Canada's Energy Future 2019: Energy Supply and Demand Projections to 2040,[16] released by the Canadian Energy Regulator, Canada is making progress in transitioning toward a low carbon future. While energy use is projected to grow over the next 20 years, the mix of energy sources that Canadians use continues to change. Measures, such as the Pan-Canadian Framework on Clean Growth and Climate Change[17] are being developed along with various provincial and territorial initiatives to ensure Canada continues with this trajectory.

In 2018, the *Greenhouse Gas Pollution Pricing Act*[18] was enacted. Carbon pollution pricing systems are now in place in all provinces and territories across Canada (either provincial/territorial systems or the federal system). In the case of Creative Energy, the cost of

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[14] Government of Canada, "Pan-Canadian Framework on Clean Growth and Climate Change" (2016-12-14), online: <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/complementary-actions-reduce-emissions.html>.

[15] Government of Canada, "Pan-Canadian Framework on Clean Growth and Climate Change" (2016-12-14), online: <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/complementary-actions-reduce-emissions.html>.

[16] Canada Energy Regulator, "Canada's Energy Future" (2020-09-29), online: <https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2019/executive-summary/index.html>.

[17] Government of Canada, "Pan-Canadian Framework on Clean Growth and Climate Change" (2016-12-14), online: <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/complementary-actions-reduce-emissions.html>.

[18] S.C. 2018, c. 12, s. 186.

paying the carbon tax on natural gas purchased to generate steam is passed on to customers through the fuel cost adjustment charge. Customers, who themselves are not emitters of GHGs, end up paying a higher price for their thermal energy requirements so long as Creative Energy uses natural gas.

Finally, On November 19, 2020, Bill C-12[19] was tabled by the Minister of Environment and Climate Change in the House of Commons.[20] Bill C-12, the *Canadian Net Zero Emissions Accountability Act*, sets out legislated requirements for national targets for the reduction of GHG emissions in Canada with the objective of obtaining net zero emissions by 2050. The targets will be set by the Minister of Environment and Climate Change for 2030, 2035, 2040 and 2045. While Bill C-12 does not outline specific actions items, it acts as a broad framework in order for Canada to achieve the legislated targets. Included in this broad framework is the establishment of an advisory body to provide the Minister with advice with respect to achieving net zero emissions as well as requiring the Commissioner of Environment and Sustainable Development to examine and report on Canada's implementation measures.[21]

4.2.2 British Columbia

The Province of British Columbia has also committed to reducing GHG emissions. The *Climate Action Accountability Act*[22] includes legislated targets for reducing GHGs in British Columbia. The Act sets out interim reduction targets for 2030, 2040, and 2050 in order to reach the Province's overall reduction goals.

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[19] Bill C-12, An Act respecting transparency and accountability in Canada's efforts to achieve net-zero greenhouse gas emissions by the year 2050, 2nd Sess, 43rd Parl, 2020. See: https://parl.ca/DocumentViewer/en/43-2/bill/C-12/first-reading

[20] https://www.parl.ca/LegisInfo/BillDetails.aspx?billId=10959361&Language=E

[21] Government of Canada, "Government of Canada charts course for clean growth by introducing bill to legislate net-zero emissions by 2050" (2020-11-19), online: https://www.canada.ca/en/environment-climate-change/news/2020/11/government-of-canada-charts-course-for-clean-growth-by-introducing-bill-to-legislate-net-zero-emissions-by-2050.html

[22] S.B.C. 2007, c. 42.

British Columbia aims to reduce GHG emissions primarily through the CleanBC initiative introduced in 2018.[23] Among other things, CleanBC includes goals and programs for better buildings and reducing pollution from industry. Overall, emissions from buildings are targeted to drop by 40 percent.

For example, the BC Building Code is being improved and efficiency standards increased so that by 2032 every new building in B.C. is to have an ultra-efficient, net-zero energy ready design. CleanBC also offers incentives for retrofitting commercial buildings. The Province has committed to taking steps to increase energy-efficiency requirements in the BC Building Code. As part of the BC Building Code, the BC Energy Step Code limits the carbon footprint of new buildings and limits ratchet down over time. The BC Energy Step Code is an optional compliance path that local governments, such as the City of Vancouver, may use to incentivize or require a level of energy efficiency in new construction that goes above the requirements of the BC Building Code. By 2032, CleanBC intends for new buildings to be 80 percent more efficient through the BC Energy Step Code.

British Columbia has a price on GHG emissions through the *Carbon Tax Act.*[24] As discussed above, Creative Energy's carbon tax costs on account of natural gas purchased to generate steam are passed on to customers in the form of higher rates.

Finally, section 2 of the CEA outlines 16 energy objectives for British Columbia. Several of the energy objectives apply to BC Hydro specifically or the electricity generation sector generally, and are not applicable to Creative Energy and the energy services it provides. Those of the energy objectives that are directly or indirectly applicable to Creative Energy and this LTRP are reviewed in section 2.1.2.

[23] The Government of British Columbia, "CleanBC", online: https://cleanbc.gov.bc.ca/

[24] S.B.C 2008, c. 40.

4.2.3 City of Vancouver

The City has a long history of climate mitigation planning and action. This includes actions such as the Climate-Friendly City in 2005, the Strategic Approach to Neighbourhood Energy in 2012, the Renewable City Strategy in 2015, and others which will be addressed in this section.

In 2010, the City implemented the Greenest City Action Plan (the "**GCAP**")[25] with the goal of becoming the greenest city in the world by 2020, including reducing GHG emissions from all sources by 33 percent and reducing GHG emissions in existing buildings by 20 percent. As part of the City's GCAP, the City has enacted bylaws and building requirements for high levels of energy efficiency in all new buildings and the retrofitting of existing buildings.

The City also has a zero emissions space and water heating target (by 2030, the carbon pollution from buildings will be cut in half from 2007 levels). The City is targeting requiring all heating and hot water systems in new buildings to be zero emissions. However, existing buildings pose a challenge to meeting the City's targets. To achieve these targets, the City is considering staff proposals to make existing buildings much more energy efficient and switch space heating and hot water systems to renewable energy.[26]

4.2.3.1 Current and Future City Initiatives Applicable to Creative Energy

The City aims to reduce dependence on fossil fuels. In particular, the City has a goal to derive 100 percent of the energy used in Vancouver from renewable sources. As set out in the City's GCAP, the City is placing priority on working with partners, including Creative Energy, to reduce

[25] City of Vancouver, "Greenest City Action Plan", online: https://vancouver.ca/files/cov/greenest-city-2020-action-plan-2015-2020.pdf

[26] City of Vancouver, "Climate Emergency Action Plan Report" (22 October 2020), online (pdf): https://council.vancouver.ca/20201103/documents/p1.pdf.

the amount of fossil fuels used for major heat sources in the City.[27] The City is also aiming to require all new buildings to be carbon neutral in operations.[28]

The City has undertaken policy and by-law amendments to implement the Zero Emission Building Plan ("**ZEBP**")[29] to establish GHG limits for new buildings in Vancouver. Developers can choose one of two pathways for compliance with GHG reduction requirements: (a) the Envelope Pathway requiring additional improvements in envelope and ventilation systems to reduce heat loss and energy use, and (b) the Low Carbon Energy Systems ("**LCES**") Pathway requiring heat supply from a district-scale or on-site LCES.[30] LCES supply heat energy primarily derived from highly efficient and renewable sources in order to provide space heating for buildings seeking to meet GHG limits using the LCES Pathway.

The LCES Policy defines the requirements for LCES to provide assurance that these systems will be available to provide low carbon energy to developments in a timely manner which will result in permanent GHG reductions over the life of such developments, enable innovation, and use all energy responsibly. In order to attract new customers, Creative Energy must consider the LCES policy and offer an energy service that supports a developer taking the LCES Pathway.

There are various LCES types contemplated: (1) City-Owned, (2) Utility-Owned, (3) User-Owned On-Site LCES, and (4) Existing Utility-Owned District Energy System.[31] Presently, Creative Energy does not fall within any of the four types outlined in the LCES Policy. This effectively excludes

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[27] City of Vancouver, "Greenest City Action Plan: Part Two 2015-2020" online (pdf): <https://vancouver.ca/files/cov/greenest-city-2020-action-plan-2015-2020.pdf> at pages 10 and 15.

[28] Ibid.

[29] City of Vancouver, "Zero Emissions Building Plan" (12 July 2016), online (pdf): https://vancouver.ca/files/cov/zero-emissions-building-plan.pdf.

[30] City of Vancouver, "Low-Carbon Energy Systems Policy" (15 November 2017), online (pdf): https://vancouver.ca/files/cov/Low-carbon-energy-systems-policy.pdf.

[31] City of Vancouver, "Low-Carbon Energy Systems Policy" (15 November 2017), online (pdf): https://vancouver.ca/files/cov/Low-carbon-energy-systems-policy.pdf.

the Creative Energy Core Steam system from consideration by new developments in Vancouver as a provider of thermal energy services.

Finally, as Creative Energy's system is a neighbourhood energy system serving parts of downtown Vancouver, the City's Neighbourhood Energy Strategy[32] is applicable to Creative Energy. Neighbourhood renewable energy systems supply centralized heating, hot water and sometimes cooling for multiple buildings. Developing neighbourhood renewable energy systems through Vancouver is a key City strategy to meeting the GCAP. As such, the conversion of existing fossil-fuel based Energy Centres to energy that reduces overall GHG emissions is central to achieving the goals outlined in the GCAP.[33]

4.2.3.2 Current and Future City Initiatives Applicable to Customers

As outlined in section 3.2, Creative Energy's customers consist of buildings in downtown Vancouver. In order to maintain this customer base and also attract new customers, Creative Energy must be alive to the policies applicable to existing buildings and new construction.

The Green Buildings Policy for Rezoning[34] ("**Rezoning Policy**") aims to change land use regulations to allow development that align with Vancouver City Council's priorities. All rezoning must be either Near Zero Emissions Buildings (Passive House or other similar designation) or Low Emissions Green Buildings (LEED Gold certified or other similar performance limits).[35] Currently, the efficiency measures in Vancouver's Rezoning Policy focus on energy reduction not GHG emissions reductions. To achieve carbon neutral buildings, these

[32] City of Vancouver, "Neighbourhood Energy Strategy", online: < https://vancouver.ca/green-vancouver/neighbourhood-renewable-energy-system-providers.aspx>.

[33] City of Vancouver, "Neighbourhood Energy Centre Guidelines" (24 September 2012), online (pdf): <https://vancouver.ca/files/cov/neighbourhood-energy-centre-guidelines.pdf>.

[34] City if Vancouver, "Green Buildings Policy for Rezonings" (amended 2 May 2018), online (pdf): <https://guidelines.vancouver.ca/G015.pdf>.

[35] City if Vancouver, "Green Buildings Policy for Rezonings" (amended 2 May 2018), online (pdf): <https://guidelines.vancouver.ca/G015.pdf>.

policies will be periodically restructured in order to target stepped reductions in GHG emissions.[36]

New Construction

The City plans to transition to zero emissions buildings in all new construction by 2030. The City aims to achieve the goal of zero emissions buildings with the ZEBP, as outlined above. Carbon neutrality will be achieved through a combination of energy use reduction, transition to renewable energy sources, and by offsetting a building's operational GHG emissions with reductions in emissions elsewhere (typically through the purchase of a carbon offset).[37]

To make this transition, the City has set limits on emissions and energy use in new buildings. The ZEBP lays out action strategies to require new buildings in the City to have no operational GHG emissions by 2025 and all new buildings have no GHG emissions by 2030.[38] This plan is closely coordinated with the BC Energy Step Code. The ZEBP takes a stepped reduction timeline to reflect the targets as maximum permitted limits.

Existing Buildings

Approximately 55 percent of GHG emissions in Vancouver come from heating buildings. Given that the number of new buildings constructed each year is small relative to the stock of existing buildings, decreasing emissions from existing buildings is required to meet the City's overall GHG reduction targets.[39]

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[36]City of Vancouver, "Greenest City Action Plan: Part Two 2015-2020" online (pdf): <https://vancouver.ca/files/cov/greenest-city-2020-action-plan-2015-2020.pdf at page 17.

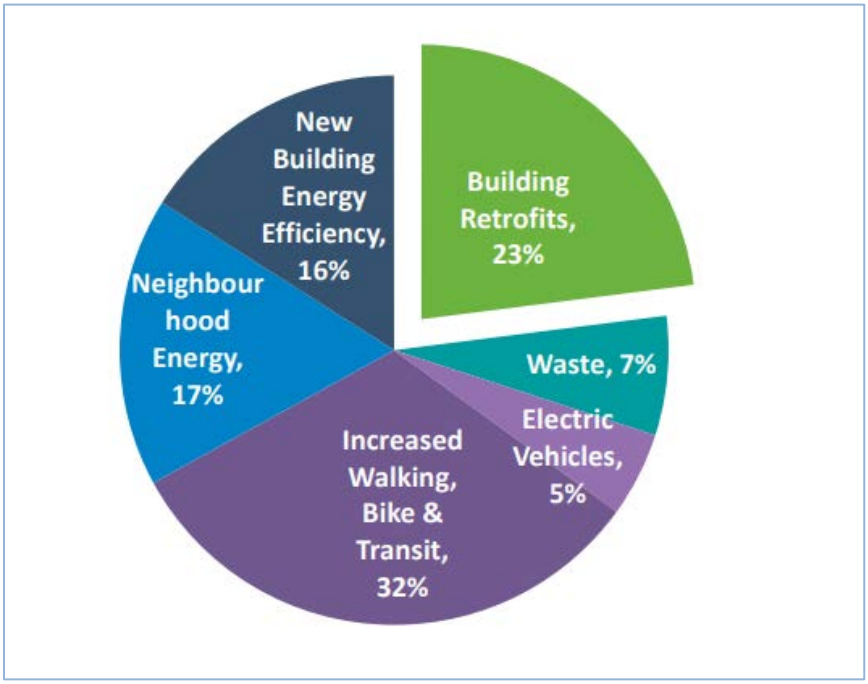
[37] City of Vancouver, "Zero Emissions Building Plan" (12 Julye 2016), online (pdf): <https://vancouver.ca/files/cov/zero-emissions-building-plan.pdf> at page 22.

[38] City of Vancouver, "Zero Emissions Building Plan" (12 July 2016), online (pdf): <https://vancouver.ca/files/cov/zero-emissions-building-plan.pdf>.

[39] City of Vancouver, "Energy Retrofit Strategy for Existing Buildings" (2 June 2014), online (pdf): <https://council.vancouver.ca/20140625/documents/ptec1.pdf> at page 3; and City of Vancouver, "Building Retrofits for Deep Carbon Reductions" (12 April 2019), online (pdf): https://council.vancouver.ca/20190424/documents/cfsc3.pdf>.

In order to reduce the emissions of existing buildings, the City has implemented the Energy Retrofit Strategy for Existing Buildings ("**Retrofit Strategy**"). The goal of the Retrofit Strategy is for existing buildings to perform like new construction. Retrofitting existing buildings will keep improvements to energy efficiency in buildings from being limited to the timeframes on which buildings are replaced. The approach allows for gradual improvement of individual buildings.[40]

Figure 4: Breakdown of GCAP Targeted GHG Reductions from City Actions[41]



The Retrofit Strategy focuses on specific building sectors where City actions will have the greatest impact in starting voluntary emission and energy use reductions, tailor the application of City enabled tools for each priority sector, and identify opportunities for strategic use of City regulations to require low cost, high energy savings improvements in existing buildings.[42]

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[40] City of Vancouver, "Greenest City Action Plan: Part Two 2015-2020" online (pdf): <https://vancouver.ca/files/cov/greenest-city-2020-action-plan-2015-2020.pdf> at page 19.

[41] City of Vancouver, "Energy Retrofit Strategy for Existing Buildings" (2 June 2014), online (pdf): <https://council.vancouver.ca/20140625/documents/ptec1.pdf> at page 3.

[42] City of Vancouver, "Energy Retrofit Strategy for Existing Buildings" (2 June 2014), online (pdf): <https://council.vancouver.ca/20140625/documents/ptec1.pdf>.

4.2.3.3 Climate Emergency Action Plan

In January 2019, Vancouver City Council unanimously declared a climate emergency in response to growing concerns about the climate crisis. This declaration allows the City to build on efforts under the GCAP to accelerate local climate action to align with global efforts. In April 2019, Vancouver City Council unanimously approved the Climate Emergency Response report, which established six new targets to guide the City's efforts in response to the climate emergency. This report—the Climate Emergency Action Plan ("**CEAP**")—set out accelerated actions and new objectives for this decade (the "**Big Moves**").[43] These six Big Moves are intended to then be incorporated into the development of the Vancouver Plan, which is an interdisciplinary, shared plan for the City into 2050.

In November of 2020, CEAP was approved by Vancouver City Council.[44] CEAP identifies the biggest source of carbon pollution generated in the City as burning natural gas for heating and hot water in buildings.[45] For buildings, the actions they can take are switching space heating and hot water equipment from natural gas to electricity; switching from natural gas to renewable natural gas; and reducing energy use through envelope improvements.[46]

One of the Big Moves outlined in the CEAP is to have zero emissions space and water heating. An action item falling under this Big Move is for the City to facilitate access to renewable

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[43] The six Big Moves, to be reported back to Council by fall 2020, consist of: By 2030, 90% of people live within an easy walk/roll of their daily needs (Big Move 1); By 2030, two thirds of trips in Vancouver will be by active transportation and transit (Big Move 2); By 2030, 50% of the kilometres driven on Vancouver's roads will be by zero emissions vehicles (Big Move 3); By 2025, all new and replacement heating and hot water systems will be zero emissions (Big Move 4); By 2030, the embodied emissions in new buildings and construction projects will be reduced by 40% compared to a 2018 baseline (Big Move 5); and By fall 2020, to develop "negative emissions" targets that can be achieved by restoring forest and coastal ecosystems (Big Move 6).

[44] See the Vancouver City Council Meeting Minutes for November 3, 5, and 17, 2020. https://council.vancouver.ca/20201103/documents/reguminutes20201103min.pdf.

[45] City of Vancouver, "Climate Emergency Action Plan Report" (22 October 2020), online (pdf): <https://council.vancouver.ca/20201103/documents/p1.pdf> at page 12.

[46] City of Vancouver, "Climate Emergency Action Plan Report" (22 October 2020), online (pdf): <https://council.vancouver.ca/20201103/documents/p1.pdf> at page 13.

energy.[47] In addition, the CEAP includes recommendations on how the City builds and renovates in order to achieve the City's zero emissions space and water heating target. Most notable for Creative Energy and this LTRP, the CEAP asks Council to direct staff to bring forward recommendations to:

- Limit annual carbon pollution from existing large commercial buildings and detached homes beginning in 2025;
- Require energy and emissions reporting by large commercial and multi-family building and detached home owners by 2023;
- Direct staff to seek authority in the Vancouver Charter to facilitate building owner access to favourable financing and third-party investment in deep emissions retrofits by enabling long-term and secure repayment of this investment as part of property tax collection, such as property assessed clean energy financing; and
- Direct staff to seek to implement the elements of the Retrofit Strategy, including the development of incentives, the removal of barriers, support for capacity building, and collaboration with utilities on the provision of renewable energy.[48]

4.2.4 Conclusions

Creative Energy must move toward low carbon energy in order to serve new developments in its service area of downtown Vancouver and also to retain existing customers. The City's Rezoning Policy requires new buildings to implement some form of renewable energy and the BC Provincial Step Code limits the carbon footprint of new buildings with limits ratchetting down over time. As a consequence, some large customers are looking to reduce emissions

[47] City of Vancouver, "Climate Emergency Action Plan Report" (22 October 2020), online (pdf): <https://council.vancouver.ca/20201103/documents/p1.pdf> at page 6.

[48] City of Vancouver, "Climate Emergency Action Plan Report" (22 October 2020), online (pdf): <https://council.vancouver.ca/20201103/documents/p1.pdf> at page 3.

inventories and prospective customers are looking for low carbon sources of thermal energy. In time, customers will look to be net-zero carbon energy.

New developments in Creative Energy's service area of downtown Vancouver will be limited in the options available to them for thermal energy for space heating and DHW heating. Such developments will not be able to obtain their thermal energy requirements from Creative Energy unless Creative Energy offers low carbon energy at least as an optional service.

5 Expectations & Requirements of Existing and Potential New Customers

In addition to the regulatory requirements of the City of Vancouver, British Columbia and Canada, as reviewed in section 4 above, some existing Creative Energy customers and potential new customers are looking to reduce emissions inventories even further than required by the regulations.

As part of the ongoing operations of the system, Creative Energy has regular communications with customers. In recent years the conversations have increasingly included discussions about low carbon options for the customers.

Broadly, there is increased interest, particularly from the owners of office buildings, in finding ways to reduce carbon emissions amongst operating buildings.

Large companies such as Amazon and Microsoft have corporate commitments of being net zero. Amazon, building an HQ2 location in Vancouver, has committed to reducing carbon emissions associated with its buildings and facilities and is transitioning its buildings to be net zero carbon, powered by renewable energy, and highly energy efficient. Amazon has also committed to improving the resource efficiency of its buildings with a focus on water and waste reduction strategies. Similarly, Microsoft has committed to being carbon negative by 2030.

To maintain and build its customer base, Creative Energy needs to understand the regulatory policy regime currently, and where it is going, that is applicable to (i) Creative Energy itself, (ii) current customers, and (iii) potential new customers. The regulatory policy regime sets the minimum standards; however, some existing customers and potential new customers are looking for environmental performance that is better than the minimum standards.

An increasing challenge for Creative Energy is the carbon intensity of its steam generation operations, and not offering low carbon services. This is of considerable concern.

6 Long-term Load Forecast

CEV is facing attrition almost exclusively in connection to existing customers wanting cleaner energy, and also facing challenges attracting new customers because new customers are required by regulations to use renewable energy and, in some cases, are committed to doing even better than compliance with the minimum standards

That therefore means that there are a range of load forecast scenarios, each dependent on decisions taken, or not taken, over the next several years. The growth load forecast scenarios below are entirely contingent on having a low carbon energy offer. The load attrition scenario is the loss under a business as usual ("**BAU**") plan with no low carbon energy offer. Under the base forecast, Creative Energy would continue to use natural gas as the primary fuel, with a nominal amount of fuel oil burned each year to test-fire each boiler on fuel oil and confirm reliable operations of the back-up fuel oil systems.

Figure 5: Aggregate Load Forecast Scenarios[49]

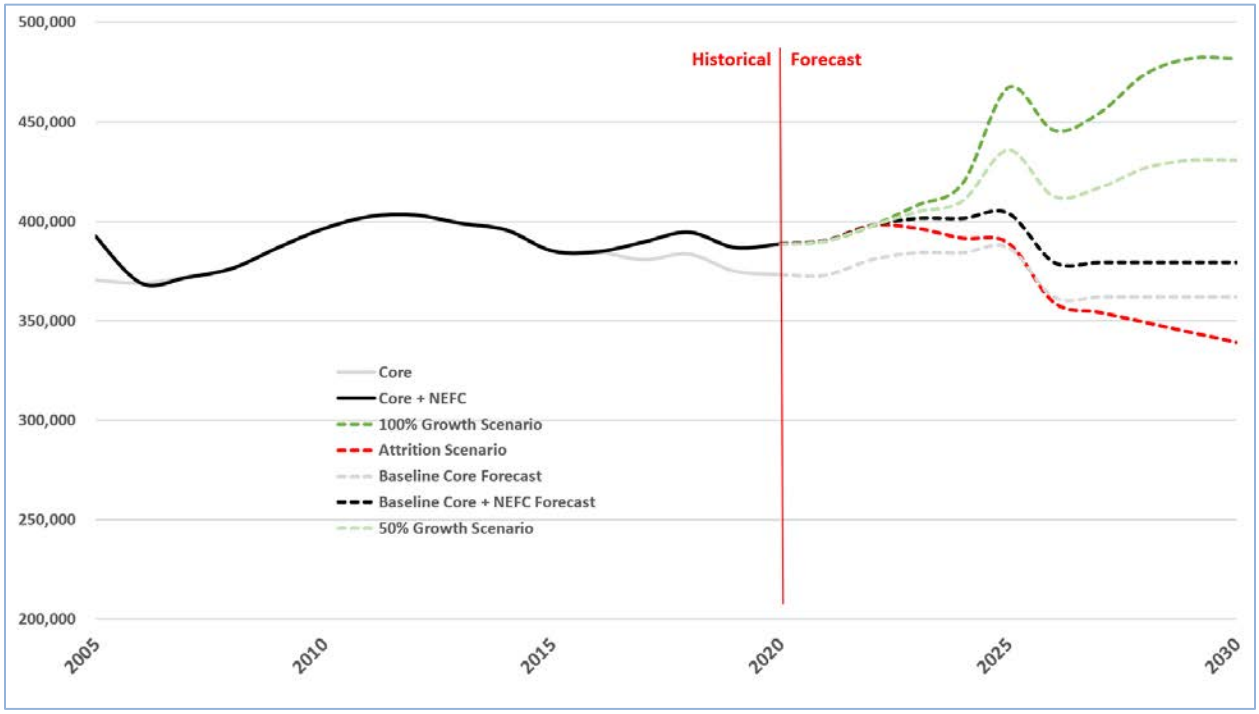

Table 8: Baseline Steam Load Forecast – Summary

Year	Core Steam MWh	NEFC Steam MWh	Total Steam MWh
2020	373,161	15,406	388,568
2021	372,948	16,177	389,125
2022	380,591	16,177	396,768
2023	384,131	16,177	400,308
2024	384,131	16,177	400,308
2025	386,731	16,177	402,908
2026	362,009	16,177	378,185
2027	362,009	16,177	378,185
2028	362,009	16,177	378,185
2029	362,009	16,177	378,185
2030	362,009	16,177	378,185

[49] Historical load is weather normalized for the purpose of this chart showing forecast amounts also.

In order to develop the above illustrated load forecast scenarios, Creative Energy has collected a database of upcoming developments planned for construction within a 500ft distance from the existing steam distribution network. The inputs to the database were sourced from public sources, including the City of Vancouver's on-line database of rezoning applications[50] and local development media such as Daily Hive Urbanized.

The public data typically includes planned occupied floor areas as well as expected use (office, residential, retail, etc.). By cross-referencing with the City's LCES Policy, we are able to make high level estimates of the annual heat energy required for each of the buildings, and further estimate what proportion of that energy will need to come from low-carbon sources, in order to satisfy the GHG emissions limits under the policy.

From this, a band of energy forecasts can be developed, spanning from no new connections to 100% of all known development projects eventually connecting. The results are the growth scenarios provided in Figure 5, above.

This approach to load forecasting of course has a limited horizon, as it relies only upon known development sites as publicly reported. This limited approach is sufficient however, to illustrate a looming demand for low carbon energy in the coming years.

[50] City of Vancouver Rezoning Applications Interactive map: https://rezoning.vancouver.ca/applications/

7 Demand Side Measures

This section outlines Creative Energy's plan to pursue demand-side measures.

7.1 Introduction

It is important to note at the outset that Creative Energy has not historically undertaken any DSM programs. Going forward, Creative Energy is investigating cost-effective DSM opportunities with its customers. The challenge is to identify the DSM opportunities and, in particular, those that are cost-effective for Creative Energy to support.

Any measures undertaken and supported by Creative Energy will be cost-effective and targeted to opportunities for its customer base.

In the overall context of the service Creative Energy provides, the customer base and how customers use the service, the strong focus on energy efficiency in the City of Vancouver already, the relatively low marginal cost of natural gas to produce steam and Creative Energy's rate structure, we consider that there are some but likely not many opportunities for cost-effective DSM.

Creative Energy does not have sufficient information at this time to make formal DSM program offers to its customers. Further work is required to identify the opportunities for cost-effective DSM, coordinate with the City of Vancouver's requirements and initiatives for energy efficiency of new and existing buildings, understand the customer response and the potential energy savings, and required expenditures. Creative Energy's plan at this time is therefore to advance such work.

7.2 City of Vancouver initiatives applicable to Creative Energy Customers

Creative Energy serves customers in downtown Vancouver. The majority if not all of Creative Energy's customers and prospective customers are subject to the City's ZEBP and the Retrofit Strategy as reviewed in section 4.2.3, above. Creative Energy therefore intends to work with

the City to ensure Creative Energy's efforts into DSM coordinate with and support the City's initiatives.

7.3 DSM Initiatives Creative Energy is exploring

Creative Energy is exploring various initiatives to offer DSM to its existing and new customers. This section outlines the initiatives being explored.

7.3.1 Rate Design

Creative Energy will be reviewing the declining block rate design that has been in place for many years and considering changes that improve the alignment of rate design to cost drivers, and also to encourage energy conservation and efficiency.

We caution, though, that recent experience suggests that our customers are much more sensitive to general trends in the economy such as the economic impacts of the COVID-19 pandemic, than they are to Creative Energy's rates. For example, the increase to Fuel Cost Adjustment Charges to customers following the extreme natural gas prices incurred during the winter of 2918/2019 – comprising an effective rate impact of approximately 20 percent – did not have a discernable impact on customer steam consumption; whereas, the economic impacts of the COVID-19 pandemic have had a significant impact on steam consumption.

7.3.2 Data to support DSM Program Development

Many of Creative Energy's customers are building owners or building managers. The customers operate in different business segments and have somewhat diverse needs and barriers in relation to making changes to reduce steam use. The buildings themselves are diverse also in terms of their age and energy efficiency.

Creative Energy is also developing data on Creative Energy's customers to help identify those customers that require support to identify and take opportunities to conserve energy, and have the greatest potential for a cost-effective DSM initiative.

7.3.3 DSM Initiatives

Creative Energy is looking into initiatives and programs to provide information to customers to that enables them to make informed choices about their energy consumption, and possibly partial funding to assist with implementing cost effective energy conservation opportunities.

As noted above, Creative Energy is aware that some customers are already doing this without funding from Creative Energy.

7.4 Total Annual Demand after DSM

Section 44.1(2)(e) of the UCA contemplates a description of why the demand for energy to be served by facilities referred to in (d) and the purchases referred to in (e) of the subsection are not planned to be replaced by demand-side measures. While Creative Energy is committed to pursuing cost effective demand side measures, based on the uncertainty with respect to DSM opportunities within Creative Energy's unique customer base, what DSM programs might be cost-effective to offer, and therefore customer uptake of DSM, modelling of cost savings is not possible at this time.

7.5 Summary

Creative Energy is investigating cost-effective DSM opportunities with our customers. To be successful, this initiative must start with developing a deeper understanding of how our customers use steam and their businesses, thereby to identify the opportunities for cost-effectively reducing overall steam consumption. Additionally, such initiatives are best implemented through coordination with the City to ensure Creative Energy's efforts coordinate with and support those of the City that might be designed to improve the energy efficiency of the very same buildings.

8 Renewable Natural Gas

A potential option to reduce carbon intensity of Creative Energy's steam is to purchase renewable natural gas ("**RNG**") from FEI to displace conventional natural gas use in Creative Energy's existing steam plant. A portion of the steam produced would be deemed to be low carbon or net zero, and Creative Energy might be able to offer to customers a 'low carbon steam' service option on that basis.

FEI acquires RNG from third parties under long-term contracts. Typical sources of RNG include gas recovered from landfills and waste-water treatment plants, and anaerobic digestion of agricultural and food wastes. After sufficient clean-up of raw biogas, biomethane (or RNG) is injected to the natural gas grid where it mixes with and is deemed to displace conventional natural gas. Customers that purchase RNG from FEI do not necessarily receive RNG directly; rather, they pay a premium in relation to attributes of RNG injected anywhere in the natural gas grid. RNG is considered GHG neutral under provincial GHG accounting standards.

RNG as an alternative is relatively easy to evaluate since it involves substituting RNG for a portion of conventional gas purchased from FEI for the existing plant. There would be no change in plant efficiency, no other changes in operating costs for the existing plant (other than the incremental cost of RNG, and costs to design and obtain Commission approval of a related service and rates), and no additional capital costs.

A major issue with an RNG option is access to a sufficient volume of RNG over a sufficient period of time to support a low carbon steam service option. We understand that FEI's total RNG supply portfolio at the end of 2024 is forecast to be about 5,000,000 GJ per year, and that demand for RNG may already exceed supply.

A low carbon energy project and using RNG are not mutually exclusive alternatives but as noted a major concern with respect to RNG is the long-term uncertainty of available supply. Subject to availability, RNG could be used as an interim bridge during the years prior to commissioning a low carbon energy project and on an opportunistic basis to fill in capacity shortages. Creative Energy will continue to evaluate this as an option.

9 Action Plan

Creative Energy continues to pursue initiatives to add customers and extend the system to serve them. A further and interrelated objective of Creative Energy's long term resource planning is to maintain existing customers.

In order for Creative Energy to align with current and future regulations and remain an attractive option for existing and potential new customers with commitments for low and net zero emissions, Creative Energy is evaluating a transition to offer low carbon services. Creative Energy must offer new and existing customers low carbon energy at least as an optional service.

As further context, the Redevelopment Project is planned to be complete by 2024 and this LTRP focuses on Creative Energy's resource planning for the period following completion of the Redevelopment Project.

The following Action Plan therefore describes the resource planning activities that Creative Energy intends to pursue over the next four years, which timing integrates with the current priority and imperative to successfully deliver the Redevelopment Project:

1. Creative Energy will continue to evaluate a low carbon energy project, and seeks the Commission's acceptance of the expenditure schedule in respect of the project pursuant to section 44.2(1) of the UCA.

2. Creative Energy will continue to evaluate the option of purchasing RNG from FEI to displace natural gas use in Creative Energy's existing steam plant and support a low carbon steam service, noting however that availability of RNG is an issue, particularly over the long-term, with demand for RNG potentially exceeding supply.

3. Creative Energy will investigate opportunities for cost-effective DSM with customers, noting however that DSM does not change the carbon intensity of Creative Energy's steam and that such initiatives should coordinate with and support those of the City that might be designed to improve the energy efficiency of the very same buildings.

Creative Energy Long Term Resource Plan

Appendix A

CONFIDENTIAL

Filed Separately

Creative Energy Long Term Resource Plan

Appendix B

Draft Order

ORDER NUMBER

●

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

and

Creative Energy Vancouver Platforms Inc.
2021 Long Term Resource Plan

BEFORE:
[Panel Chair]
Commissioner
Commissioner

on [Date]

ORDER

WHEREAS:

A. On January 13, 2021 Creative Energy Vancouver Platforms Inc. (**Creative Energy**) filed its 2021 Long Term Resource Plan (**LTRP**) pursuant to section 44.1(2) of the *Utilities Commission Act* (**UCA**)*,* for acceptance by the British Columbia Utilities Commission (**Commission**);

B. Pursuant to section 44.2(1) of the UCA, Creative Energy seeks approval of the expenditure schedule contained in Appendix A of the LTRP.

C. By [Order] dated [date], 2020, the Commission established a [process]; and

D. The Commission has reviewed the LTRP.

NOW THEREFORE the Commission orders as follows:

1. The Commission accepts Creative Energy' 2021 LTRP to be in the public interest pursuant to subsection 44.1(6) of the UCA.

2. The Commission accepts Creative Energy's expenditure schedule for the [low carbon energy project] pursuant to section 44.2(1) of the UCA.

DATED at the City of Vancouver, in the Province of British Columbia, this [xx] day of [Month Year].