

APPENDIX 2D

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ATTACHMENT 1 ENERGY MODEL ASSUMPTIONS

APPENDIX 2D

ENERGY

1. INTERPRETATION

1.1 Definitions

In this Appendix, in addition to the definitions set out in Schedule 1 of this Agreement:

"Approved Energy Modeller" means an individual who is (i) listed on the CaGBD Experienced Modellers List or has the Building Energy Modeling Professional (BEMP) designation, (ii) is approved by the British Columbia Hydro and Power Authority to provide energy models for the BC Hydro Powersmart New Construction Program (if applicable), and (iii) and has experience with *IES VE (software)* for the purpose of the Project;

"Building Energy Modeling Professional (BEMP)" means an individual who has earned the ASHRAE BEMP designation, as listed on ASHRAE website <http://certificants.ashrae.org/>;

"CaGBC Experienced Modellers List" means the most recent version of the Canada Green Building Council's Experienced Modellers List (with IES software experience);

"Carbon Emissions" for a period means the total amount of carbon equivalent greenhouse gas emissions associated with Energy Consumption during that period, expressed in metric tonnes of equivalent carbon dioxide (tCO_{2e}) and calculated using the following formula:

$$(tCO_2e) = \text{electricity consumption (MWh)} \times 0.011 \text{ tCO}_2e/\text{MWh} + \text{natural gas consumption (eMWh)} \times 0.180 \text{ tCO}_2e/\text{eMWh}$$

"Carbon Guarantee" has the meaning given in Section 6 of this Appendix;

"Carbon Target" means _____ ;

"Energy" means electrical and thermal energy used within, by or for the Facility, including electrical and thermal energy used within, by or for exterior elements connected to the Facility's electrical and thermal systems;

"Energy Consumption" for a period means the total amount of Energy consumed during that period, expressed in MWh as reflected by the readings for the metered utilities (including electricity, natural gas and neighbourhood energy utility heat source supply), whether or not directly from utility providers, and as calibrated by the Independent Energy Consultant;

"Environmental Credit" means any income, credit, right, benefit or advantage relating to environmental matters including type and level of emissions (including Carbon), means of production of Energy, input sources and compliance with any environmental laws, regulations, rules or orders;

"Energy Dashboard" means a password protected web-accessible tool that can display real time (with up to 2 hour lag time) energy consumption for a range of time increments (including hourly, daily, monthly, and yearly) and broken down by energy type (electrical and thermal at a minimum) and major end uses, with comparison to the Energy Target;

"Energy Guarantee" has the meaning given in Section 5 of this Appendix;

"Energy Model" means the hourly energy simulation model produced using whole building energy modelling software (IES VE), identified as IES Virtual Environment Version, 2019.1.0.0, which energy

simulation model follows the energy methodology in Attachment 1 [Energy Model Assumptions] and the results of which are used to calculate Energy Consumption and Carbon Emissions and operating cost based on the assumptions in Attachment 1 [Energy Model Assumptions];

"Energy Modeller" means an Approved Energy Modeller engaged by Project Co to prepare the Energy Model and confirm associated Energy Consumption and Carbon Emissions;

"Energy Target" means MWh per/year;

"Independent Energy Consultant (IEC)" means the consultant acceptable to the Owner, in the Owner's discretion, that includes a team of specialized consultants in the following areas: Energy Modeling approved professional, Healthcare Designer, Building HVAC Controls Specialist, and Commissioning and M&V jointly retained by Project Co and the Owner, at Project Co's cost, in accordance with this Appendix;

"Megawatt hour", or **"MWh"**, is the unit of energy to be used throughout this Appendix and 1 MWh is equivalent to 3.6 GJ;

"Modelled Weather Data" means the weather data from CAN_BC_Vancouver.Intl.AP.718920_CWEC2016.zip file for Vancouver, British Columbia;

"Non-Targeted Carbon Emissions" means Carbon Emissions of the following:

- (a) Central Food Production equipment: ; and
- (b) MDRD steam process equipment:

"Non-Targeted Energy Consumption" means Energy consumed by the following:

- (a) Central Food Production equipment: ; and
- (b) MDRD steam process equipment: ;

"Renewable Energy" means on-site generation of Energy from renewable sources that results in zero greenhouse gas emissions, as approved by the Owner in the Owner's discretion;

"Targeted Carbon Emissions" means Carbon Emissions minus Non-Targeted Carbon Emissions;

"Targeted Energy Consumption" means Energy Consumption minus Non-Targeted Energy Consumption and minus Renewable Energy;

"Weather Data" means the actual historic weather data obtained from Environment Canada's "National Climate Data and Information Archive" including but not limited to daily temperature.

2. ENERGY SUPPLY AND PAYMENT DURING CONSTRUCTION

The Owner will from time to time as required enter into contracts with Energy suppliers for the supply of Energy to the Facility, and will be responsible for all payments related to such contracts. During the Construction Period Project Co will administer such contracts, including dealing with suppliers to resolve issues from time to time, and will provide such other reasonable assistance related to such contracts as may be requested by the Owner.

3. ENERGY INCENTIVE PROGRAMS

Project Co will, on behalf of the Owner, apply to the BC Hydro Power Smart New Construction Program (and any other applicable energy incentive programs) and take all commercially reasonable steps to obtain

for the Owner the maximum benefits (funding, incentives and cost savings) offered by BC Hydro and FortisBC under such program(s). The New Construction Program is administered by BC Hydro and supported by FortisBC. Without limitation, Project Co will:

- (a) meet with BC Hydro, the Owner's Energy Manager, and FortisBC (if necessary) at an early stage of the design of the Facility;
- (b) by 30 days (1 month), prepare and deliver to BC Hydro and the Owner the proposal required by BC Hydro for the energy studies and building Energy Model;
- (c) within 30 Business Days of acceptance of the proposal by BC Hydro, carry out any required energy studies and prepare and deliver to the Owner and BC Hydro a building Energy Model (developed in accordance ASHRAE Standard 90.1, 2016, Appendix G, or applicable codes at the time of application to BC Hydro) to establish baseline energy use for the purpose of measuring electrical and natural gas savings achieved through the program;
- (d) collaborate with BC Hydro, FortisBC, Clean BC, NRCAN to identify potential improvements to the Facility design that will achieve greater energy efficiency;
- (e) revise the Facility design as required to improve energy efficiency (to the extent possible without changing the Design and Construction Specifications or the intent of the Proposal Extracts (Design and Construction)), and use all commercially reasonable efforts to obtain for the Owner the maximum funding or incentives offered by BC Hydro and FortisBC and minimize the Owner's energy costs; and
- (f) provide to the Owner all invoices and other documentation reasonably required by the Owner to complete an incentive agreement with BC Hydro and for the Owner to receive incentive funds within the time frame agreed to in the incentive agreement;

4. ENERGY CONSUMPTION MONITORING EQUIPMENT

Project Co will install equipment, including metering in accordance with Schedule 3 [Design and Construction Specifications], satisfactory to the Owner to measure, record and monitor consumption of Energy in the Facility.

Metering equipment must be capable of measuring the input and output energy of major equipment.

Such metering equipment must be suitable and properly calibrated to enable a detailed measurement, recording and monitoring of Energy and to allow analysis of the data collected to enable various matters, including:

- (a) comparisons to be made with the Energy Target and Carbon Target;
- (b) early warning of malfunctions and deviations from norms; and
- (c) to provide an Energy Dashboard to the Owner.

Metering equipment must also be of a suitable quality to provide accurate measurements. Such equipment must secure all such properly recorded information so that it is not lost or degraded as a result of any equipment or service malfunctions and is secure from adjustment, modification or loss from any source.

Project Co will make submission to the Owner for review of the proposed equipment at the Design and Construction Documents - 30% phase described in Schedule 3 [Design and Construction Specifications].

5. ENERGY GUARANTEE

5.1 Facility to Meet or Beat Targets

Project Co warrants to the Owner that the Facility will be designed and constructed so that the Targeted Energy Consumption per year will not exceed the Energy Target (the "Energy Guarantee").

5.2 Construction Period

Project Co warrants to the Owner that at all times during construction and prior to and including as a condition of Service Commencement, the Facility will, upon completion of construction in compliance with the current Reviewed Drawings and Specifications, not exceed the Energy Target.

Project Co will, with each Submittal under the Review Procedure and with each Energy Model provided as required by this Section 5.2, identify any impacts on the Energy Guarantee or the assumptions set out in Attachment 1 [Energy Model Assumptions], for review by the Owner. Any such impacts will not be effective unless agreed in writing by the Owner. If Project Co does not identify any impacts, the Submittal will be deemed to have no impact on the Energy Guarantee or the assumptions set out in Attachment 1 [Energy Model Assumptions].

At each of the following Design phases:

- (a) Design and Construction Documents - 50%; and
- (b) Design and Construction Documents - 100%,

and together with the application for the Certificate of Service Commencement, Project Co will provide an updated Energy Model prepared by the Energy Modeller that demonstrates that the Energy Guarantee will be met.

If Project Co at any time prior to Service Commencement fails to demonstrate that the Energy Guarantee will be met, Project Co will:

- (c) revise the Design and re-submit the Reviewed Drawings and Specifications, together with an updated Energy Model prepared by the Energy Modeller demonstrating the Energy Guarantee will be met, to the Owner for review under the Review Procedure; and
- (d) modify the Facility as required to comply with the revised Reviewed Drawings and Specifications.

The Owner will not be required to make any payment for any Design or Construction that fails to comply with, or will cause Project Co to fail to comply with, the Energy Guarantee. The Independent Certifier will assess any such Design and Construction and apply a holdback for the value of correction of such Design and Construction, until the Design and Construction is modified to comply with the Reviewed Drawings and Specifications that demonstrate that the Energy Guarantee will be met.

The Owner reserves the right to require Project Co to retain an Independent Energy Consultant acceptable to the Owner, acting reasonably, to review the Energy Model updates and confirm that the Energy Guarantee will be met.

5.3 No Liability for Energy Consumption After Service Commencement

Project Co does not warrant and is not liable under this Section 5 for the actual Energy Consumption at the Facility after Service Commencement.

6. CARBON GUARANTEE

6.1 Facility to Meet or Beat Targets

Project Co warrants to the Owner that the Facility will be designed and constructed so that the Targeted Carbon Emissions per year will not exceed the Carbon Target (the "Carbon Guarantee").

6.2 Construction Period

Project Co warrants to the Owner that at all times during construction and prior to and including as a condition of Service Commencement, the Facility will, upon completion of construction in compliance with the current Reviewed Drawings and Specifications, not exceed the Carbon Target.

Project Co will, with each Submittal under the Review Procedure and with each Energy Model provided as required by this Section 5.2, identify any impacts on the Carbon Guarantee or the assumptions set out in Attachment 1 [Energy Model Assumptions], for review by the Owner. Any such impacts will not be effective unless agreed in writing by the Owner. If Project Co does not identify any impacts, the Submittal will be deemed to have no impact on the Energy Guarantee or the assumptions set out in Attachment 1 [Energy Model Assumptions].

At each of the following Design phases:

- (a) Design and Construction Documents - 50%; and
- (b) Design and Construction Documents - 100%,

and together with the application for the Certificate of Service Commencement, Project Co will provide an updated Energy Model prepared by the Energy Modeller that demonstrates that the Carbon Guarantee will be met.

If Project Co at any time prior to Service Commencement fails to demonstrate that the Carbon Guarantee will be met, Project Co will:

- (c) revise the Design and re-submit the Reviewed Drawings and Specifications, together with an updated Energy Model prepared by the Energy Modeller demonstrating the Carbon Guarantee will be met, to the Owner for review under the Review Procedure; and
- (d) modify the Facility as required to comply with the revised Reviewed Drawings and Specifications.

The Owner will not be required to make any payment for any Design or Construction that fails to comply with, or will cause Project Co to fail to comply with, the Carbon Guarantee. The Independent Certifier will assess any such Design and Construction and apply a holdback for the value of correction of such Design and Construction, until the Design and Construction is modified to comply with the Reviewed Drawings and Specifications that demonstrate that the Carbon Guarantee will be met.

The Owner reserves the right to require Project Co to retain an Independent Energy Consultant acceptable to the Owner, acting reasonably, to review the Energy Model updates and confirm that the Carbon Guarantee will be met.

6.3 No Liability for Carbon Emissions After Service Commencement

Project Co does not warrant and is not liable under this Section 6 for the actual Carbon Emissions at the Facility after Service Commencement.

7. ENVIRONMENTAL CREDITS

7.1 Entitlement to Environmental Credits

The Owner will be entitled to any and all Environmental Credits related to the Facility and its operation and Project Co will use commercially reasonable efforts to assist the Owner in achieving the maximum Environmental Credits available.

ATTACHMENT 1
ENERGY MODEL ASSUMPTIONS