

October 2, 2020
BUILDING DIVISION

Low Carbon Energy System (LCES) Policy

DISCLAIMER: The information presented below is subject to addition and revision in future versions of this Building Division Bulletin. Notes below indicate some, but not all, items that may be revised. To be notified whenever this Bulletin is updated, sign up for email alerts at www.surrey.ca/stepcode.

Purpose and Background:

This bulletin is additional to the City’s **BC Energy Step Code for Part 3 Buildings** Bulletin¹, for projects that choose the low carbon energy system (LCES) pathway to comply with The City of Surrey’s approved Energy Step Code policy, as outlined in the table below. This bulletin describes the various types of LCES and specific documentation requirements for each, to ensure that projects will meet the intended GHG reduction outcomes and comply with applicable BCUC approvals, and to avoid unnecessary delays in the review and approval process.

It is incumbent on applicants to ensure their proposed building design will meet the City’s Energy Step Code requirements. Any revisions to building design may require applicants to reapply for updated rezoning and/or development permit approvals.

Building Permit application submitted on or after April 1, 2019		
Part 3 Buildings	Residential Buildings (Group C) (Including hotel and motel occupancy)	Step 3 OR Step 2 for buildings complying with the Low-Carbon Energy System Pathway
	Commercial Office and Mercantile Buildings (Group D, E)	Step 2

What is a low-carbon energy system?

A low carbon energy system is a highly efficient, professionally operated and maintained mechanical system that supplies a building’s space, heating, cooling and domestic hot water heating demand primarily from renewable energy sources, at a carbon intensity that is low enough so that when applied to modelled building energy use, the development satisfies the City’s defined GHG limits. The City’s District Energy System for Surrey City Centre is considered an LCES for the purpose of this policy.

What is greenhouse gas intensity (GHGI) and how it is determined?

GHGI is a measure of the total amount of GHG associated with a building’s energy use. It is a calculated value determined through energy modeling: energy (kWh) supplied to a building, multiplied by the emissions

¹ See this page, under heading “Key Resources > Bulletins > “Surrey Building Division for Part 3 Buildings”
<https://www.surrey.ca/renovating-building-development/green-buildings/bc-energy-step-code-for-new-buildings>

factor of the energy² (a measure of how much GHG emissions are associated with its use) and summed for each type of energy used (e.g. electricity, natural gas, hot water); the resulting value is divided by the building's floor area. GHGI is reported in kg of carbon dioxide equivalent (CO_{2e}) per m² of floor area per year (kg CO_{2e}/m²/y).

The equation is shown below:

$$GHGI \left[\frac{kgCO_{2e}}{m^2a} \right] = \frac{\sum \left(Site \ Energy \ Use \left[\frac{kWh}{a} \right] \times Emissions \ Factor \left[\frac{kgCO_{2e}}{kWh} \right] \right)}{Modelled \ Floor \ Area \ [m^2]}$$

A **maximum GHGI of 6kg/m²/y** is currently required under the LCES pathway in in Surrey's Policy for Part 3 Residential buildings.

Considerations of Choosing the LCES pathway

Some types of LCES require feasibility study, review and approval by the BC Utilities Commission (BCUC), and/or agreements with a utility, and sufficient time needs to be allowed for such processes and approvals. Any LCES and associated utility must comply with all requirements of the *Utilities Commission Act*, if applicable, as outlined in the Surrey Building Bylaw, S.75.7.

What types of low-carbon technologies would be supported under the LCES Policy?

Supportable low-carbon technologies include, but are not limited to, air and ground source heat pump systems, waste heat recovery systems, solar collectors, or other systems as approved by the City's Director of Engineering. Common types of LCES and their requirements are listed below. Requirements listed are as authorized in the Surrey Building Bylaw (Schedule B, Section D).

1. City Owned LCES

This type refers to a City-owned LCES that produces and supplies low carbon energy to numerous connected buildings, possibly with different owners. Details of Surrey's requirements for connection or future-readiness for connection to the Surrey City Centre District Energy System are outlined in the City's [District Energy Bylaw](#) and [DE Bulletin](#).

For the purposes of complying with Surrey's Energy Step Code requirements of the Building Bylaw, the development must connect to the City DES, through mandatory requirements of Service Area A, or as a condition of rezoning or voluntary connection in Service Area B (i.e. meeting the minimum Service Area B requirements for DE-readiness without connection does not qualify for the lower Step of the Energy Step Code).

2. Utility-Owned LCES

This type of LCES refers to a system that is owned and operated by a utility that is *authorized to operate in British Columbia, and to engage in the required activity, in accordance with the Utilities Commission Act* (Surrey Building Bylaw S75.7(b)).

Utility owned LCES may fall into one of two sub-categories as outlined below.

(a) Utility-owned On-Site LCES

This type of LCES is owned by a utility and services one or more buildings on a single development. This type of system must meet the following requirements:

² Refer to the City of Vancouver Energy Modelling Guidelines, which are also referenced for Energy Step Code methodology, for emissions factors. <https://vancouver.ca/files/cov/energy-modelling-guidelines-v1.0.pdf>

1. A qualified engineer must provide written verification that the LCES is designed to provide low carbon energy that meets the City's GHGI limits.
2. There must be evidence that a utility will purchase the LCES and supply energy service from the LCES to the development for at least 10 years.
3. The utility must have demonstrated experience with other similar successful LCES.
4. The developer must deliver evidence to the City's satisfaction that the LCES was successfully registered with the BCUC, and that the ownership of the LCES was, or will soon be, duly transferred to a utility.
5. Information about the LCES must be disclosed to future owners in advance of the time of sale.

(b) Utility-Owned District LCES

This type of LCES is owned by a utility and services multiple sites at a neighbourhood scale. This type of system must meet the following requirements:

1. There must be a feasibility study completed to the satisfaction of the City that confirms the LCES will provide low carbon energy such that the development(s) proposing to connect to the system will meet the City's GHGI limits.
2. The BCUC must have issued a Certificate of Public Convenience and Necessity in accordance with the *Utilities Commission Act*, approving the district-scale LCES.
3. There must be evidence of an agreement between the utility partner and building owner to supply low-carbon energy for at least a 10 year period to the proposed development.
4. There must be an agreement between the utility and the City for annual utility reporting on the energy used and provided by the district-scale LCES to each building, in accordance with the Energy Benchmarking requirements.
5. Information about the LCES must be disclosed to future owners in advance of the time of sale.

3. User-Owned On-Site LCES

This type of system is owned by, located within and serves a particular development. In order to ensure that this type of system is appropriately designed, optimized and maintained, and achieves a level of efficiency to meet the intent of the LCES policy, it must meet the following requirements, certified by a qualified engineer:

1. The system seasonal average co-efficient of performance must be greater than 2.
2. A GHGI value 33% below the required GHGI limit must be used.
3. There must be a minimum 2-year maintenance, warranty, and optimization contract with the system provider.
4. Any natural gas fired peak demand heating equipment is sized appropriately and is to augment the primary low-carbon system under peak demand conditions.
5. There must be a minimum 5-year owner-funded maintenance contract with a qualified provider.
6. In the case of a building owned by a residential strata corporation, prior to the application for an occupancy permit, the developer must deliver evidence to the City's satisfaction that the funding structure for long-term maintenance has been established. This may include an initial strata budget and strata fee structure that provides for maintenance and capital replacement of the LCES. (Note³)

Strata funding structure

³ The intent of this provision is to ensure transparency for strata members and an economically viable plan to ensure appropriate long-term management of the system.

For buildings to be owned and operated by a strata corporation, the City requires the strata budget and associated fees to be established to allow for the full estimated cost of all maintenance activities related to the LCES, including the 5-year minimum maintenance contract noted above. This also includes provisions for regular savings to prepare for planned capital replacements of components or equipment as may be required (e.g. key components such as compressors, and whole equipment, including at the end of the estimated life of the primary LCES equipment such as one or more heat pumps). This funding structure must be included in any disclosure to potential future owners. The intent of ensuring this funding structure is established is to ensure the strata is setup to successfully fund long-term maintenance and capital replacement requirements associated with the LCES from the beginning and as a normal course of operations, without any additional initiative required from the strata members to ensure successful operation of the LCES for the life of the building.

Submission Requirements

Rezoning and Development Permit Applications and Approvals:

The following must be provided prior to issuance of a Development Approval, or 3rd Reading of a Rezoning:

1. Type 1 (City-owned DES): Refer to **City District Energy Bylaw and Bulletin**.
2. Types 2(a), 2(b), and 3: A signed and sealed report and attestation letter including:
 - a. Preliminary summary of the planned LCES system design, confirming GHG limits will be achieved. It is understood that changes to preliminary LCES design may be required, however the Energy Step Code and GHGI requirements must still be met, and any changes to building design/form resulting from LCES changes must be approved by the Planning Department. (Required in order to meet Building Permit requirement 2, below).
 - b. Confirmation that the LCES has been registered or will be registered as a Stream A Thermal Energy System with the BCUC in accordance with the BCUC Thermal Energy Systems Regulatory Framework Guidelines, as amended or replaced from time to time, or attest that the LCES is exempted from active regulation by BCUC (**Surrey Building Bylaw, S.75.7(d)**).
3. Type 3 (user-owned LCES): the above-noted report (item 2b) must confirm that the system achieves reduced site GHG limits, a COP >2, and peak sizing limits, as noted above.
4. Type 2(a) or 2(b)
 - a. A plain-language explanation of the LCES that includes the minimum provisions included in section 2.3.2 of the BCUC Thermal Energy Systems Regulatory Framework Guidelines, as amended or replaced from time to time, and must attest that the contents of this plain-language explanation will be included in any subsequent property disclosure statement or similar disclosure document provided to a purchaser or potential purchaser of the lot (**Surrey Building Bylaw, S.75.7(e)**).
5. Type 2(a) – utility-owned on-site LCES:
 - a. A letter from the proposed utility partner, confirming their interest in purchasing the LCES. If requested by the City, a letter with additional documentation may be required to demonstrate the utility’s relevant past experience with on-site and/or district thermal energy systems, and system operating history (system costs, BCUC interactions, etc.).
6. Type 2(b) – utility-owned district LCES:
 - a. A feasibility study from the proposed utility partner, signed and sealed, referencing current drawings on file and the Energy Modeling and Design Report, confirming the design meets the required GHG limits.
 - b. A letter from the applicant confirming their intent to connect the development to the proposed utility partner.

Building Permit Submission Requirements:

The following documents must be completed and submitted with the Building Permit application package:

1. Type 1 (City-owned DES): Refer to **City [District Energy Bulletin](#)**.
2. Types 2(a), 2(b), and 3: A signed and sealed report with final LCES design report and associated drawings, and *Energy Design Report*, confirming GHG limits will be achieved. (Surrey Building Bylaw, S. 75.7(f)).
3. Types 2(a) and 2(b) – utility-owned LCES:
 - a. Documentation of agreement between utility and owner for purchase and long-term operation of the utility.
 - b. Draft property disclosure statement or document with plain-language explanation of the LCES as outlined in DP/Rezoning requirement 4a above.
4. Type 2(b) – utility-owned district LCES:
 - a. BCUC-issued CPCN for the LCES, in accordance with City-approved feasibility study.
5. Type 3 (user-owned LCES): Documentation detailing the proposed two-year minimum warranty and optimization, and five year minimum maintenance contracts, and strata funding structure, that will be established.

Final Building Inspection Requirements for Occupancy:

The following documents must be completed and submitted with the Final Building Inspection package for issuance of an Occupancy Permit:

1. Type 1 (City-owned DES): Refer to **City [District Energy Bulletin](#)**.
2. Type 2(a): documentation of purchase by utility and registration with BCUC of utility (or micro TES exemption).
3. Type 2(b): documentation of connection of the development to the utility.
4. Types 2(a), 2(b) and 3: Letter of agreement by utility or system provider, and registration of a S. 219 Covenant, to provide the City with annual reporting data (energy benchmarking).
5. Type 3: Report summarizing planned optimization and maintenance contract activities and outcomes, including documentation that owner funding structure has been established.

Reminder: All requirements outlined in the Part 3 Energy Step Code Bulletin must also be submitted at each stage of approval (see footnote on page 1 of this bulletin).

Additional Information:

BC Energy Step Code:

- Receive up-to-date information by signing up for the Province's BC Energy Step Code Stakeholder Update newsletter: bit.ly/StepCodeStakeholderNewsletter.
- To learn more about the BC Energy Step Code, including performance requirements, resources for industry, and upcoming events, visit energystepcode.ca.
- If you have additional questions regarding the BC Energy Step Code, visit energystepcode.ca/contact-us/ or email building.safety@gov.bc.ca.

City of Surrey's Implementation of the BC Energy Step Code:

- For more information about Surrey's Step Code policies, visit www.surrey.ca/stepcode or email stepcode@surrey.ca.