Submit a comment

Proposed Change 2009

Code Reference(s):	**NECB20 Div.B 8.4.2.3. (first printing)** **NBC20 Div.B 9.36.5.5.(1) (first printing)**
Subject:	NECB Climatic Values
Title:	Climatic Data for Energy Model Calculations
Description:	This proposed change updates the references to sources of climatic data used in modeling in the explanatory Notes about climatic data.

This change could potentially affect the following topic areas:

- [ ] Division A
- [ ] Division C
- [ ] Building operations
- [x] Small Buildings
- [ ] Fire Protection
- [ ] Accessibility
- [ ] Building Envelope
- [ ] Heating, Ventilating and Air Conditioning
- [ ] Construction and Demolition Sites
- [x] Division B
- [x] Design and Construction
- [x] Housing
- [x] Large Buildings
- [ ] Occupant safety in use
- [ ] Structural Requirements
- [x] Energy Efficiency
- [ ] Plumbing

Problem

The existing reference to the source of climatic data is outdated in explanatory Note A-8.4.2.3. of Division B of the National Energy Code of Canada for Buildings and explanatory Note A-9.36.5.5.(1) of Division B of the National Building Code of Canada. This situation may lead to the use of inappropriate climatic data by Code users while modeling building energy consumption, potentially resulting in oversized or undersized heating and cooling systems.

Justification

Climatic data has a significant impact on the modeled building energy consumption, and the Codes should refer to recent periods of record.

PROPOSED CHANGE

NECB20 Div.B 8.4.2.3. (first printing)
[8.4.2.3.] 8.4.2.3. Climatic Data

Note A-8.4.2.3. Climatic Data.

The following data formats are acceptable to represent climatic data:

- CSV (comma-separated values),
- EPW (EnergyPlus Weather),
- TMY2 (Typical Meteorological Year 2),
- TMY3 (Typical Meteorological Year 3),
- WYEC2 or WY2 (Weather Year for Energy Calculation 2),
- WYEC3 or WY3 (Weather Year for Energy Calculation 3),

- CWEC (Canadian Weather Year for Energy Calculations),
- IWEC (International Weather for Energy Calculations), and
- CWEEDS (Canadian Weather Energy and Engineering Datasets).

The CWEC datasets represent average heating and cooling degree-days, which impact heating and cooling loads in buildings. The CWEC datasets follow the ASHRAE WYEC32 format and wereare derived from the CWEEDS of hourly weather information for Canada from the 1953-1995 period of record. The CWEC are available from Environment and Climate Change Canada at www.climate.weather.gc.ca/prods_servs/engineering_e.html.

More information on CWEC and CWEEDS provided by Environment and Climate Change Canada, as well as climate data files for 564 Canadian locations, is available on the following websites:

a. www.climate.weather.gc.ca/prods_servs/engineering_e.html, containing CWEEDS (in CSV and WY3 formats) and CWEC datasets (in CSV, EPW and WY3 formats) for the 1998–2017 period of record,
b. https://nrc-digital-repository.canada.ca/eng/view/object/?id=92bfa9cf-6d35-4de4-80c2-799f53961f60, containing "Typical Meteorological Years," "Extreme Cold Years," "Extreme Warm Years" and other reference years for design and modeling (in CSV and EPW formats) for the 1991–2021 period of record and seven future time periods coinciding with various degrees of global warming, and
c. https://nrc-digital-repository.canada.ca/eng/view/object/?id=bd339698-5eb8-4635-b411-63d4f670382b, containing complete meteorological records (in CSV format) for the 1991–2021 period of record and seven future time periods coinciding with various degrees of global warming.

Where climatic data for a target location are not available, climatic data for a representative alternative location should be selected based on the following considerations: the same climatic zone, the same geographic area or characteristics, the heating degree-days (HDD) of the alternative location are within 10% of the target location's HDD, and the January 1% heating design criteria of the alternative location is within 2°C of the target location's same criteria (see Table C-1). Where several alternative locations are representative of the climatic conditions at the target location, their proximity to the target location should also be a consideration.

NBC20 Div.B 9.36.5.5.(1) (first printing)
[9.36.5.5.] 9.36.5.5.

[1] 1) To calculate the effect of heating and cooling consumption, the energy model calculations shall be performed using climatic data measured at time intervals no greater than one hour for one year (8 760 hours) based on the average of at least 10 years of measured data collected at the weather station nearest to the region in which the proposed house is located. (See Note A-9.36.5.5.(1).)

Note A-9.36.5.5.(1) Source of Climatic Data.

Climatic data sources include the Canadian Weather Year for Energy Calculations (CWEC) datasets and the Canadian Weather Energy and Engineering Data Ssets (CWEEDS). The CWEC represent average heating and cooling degree-days which impact heating and cooling loads in buildings. The CWEC follow the ASHRAE WYEC32 format and wereare derived from the CWEEDS of hourly weather information for Canada from the 1953-1995 period of record. The CWEC are available from Environment and Climate Change Canada at climate.weather.gc.ca/prods_servs/engineering_e.html.

More information on CWEC and CWEEDS provided by Environment and Climate Change Canada, as well as climate data files for 564 Canadian locations, is available on the following websites:

a. www.climate.weather.gc.ca/prods_servs/engineering_e.html, containing CWEEDS (in CSV and WY3 formats) and CWEC datasets (in CSV, EPW and WY3 formats) for the 1998–2017 period of record,
b. https://nrc-digital-repository.canada.ca/eng/view/object/?id=92bfa9cf-6d35-4de4-80c2-799f53961f60, containing "Typical Meteorological Years," "Extreme Cold Years," "Extreme Warm Years" and other reference years for design and modeling (in CSV and EPW formats)

for the 1991–2021 period of record and seven future time periods coinciding with various degrees of global warming, and

c. https://nrc-digital-repository.canada.ca/eng/view/object/?id=bd339698-5eb8-4635-b411-63d4f670382b, containing complete meteorological records (in CSV format) for the 1991–2021 period of record and seven future time periods coinciding with various degrees of global warming.

Where climatic data for a target location are not available, climatic data for a representative alternative location should be selected based on the following considerations: the same climatic zone, the same geographic area or characteristics, the heating degree-days (HDD) of the alternative location are within 10% of the target location's HDD, and the January 1% heating design criteria of the alternative location is within 2°C of the target location's same criteria (see Appendix C). Where several alternative locations are representative of the climatic conditions at the target location, their proximity to the target location should also be a consideration.

Impact analysis

This proposed change is not expected to result in additional cost for Code users, who would benefit from the use of more recent climatic data for the design of buildings and houses that more accurately reflect actual operating conditions.

Enforcement implications

This proposed change can be enforced by the existing Code enforcement infrastructure without additional resources.

Who is affected

Designers, engineers, architects, manufacturers, builders, specification writers and building officials.

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

NECB20 Div.B 8.4.2.3. (first printing)

[8.4.2.3.] 8.4.2.3. ([1] 1) [F99-OE1.1]

[8.4.2.3.] 8.4.2.3. ([2] 2) [F99-OE1.1]

NBC20 Div.B 9.36.5.5.(1) (first printing)

[9.36.5.5.] 9.36.5.5. ([1] 1) [F99-OE1.1]