

- [EAc1 | Annual energy use](#)
- [EAc1 | Optimize energy performance](#)
- [EAc1 | Optimize energy performance](#)
- [EAc1 | Optimize energy performance](#)
- [EAc1.1 | Optimize energy performance - lighting power](#)
- [EAc1.1 | Optimize energy performance - lighting power](#)
- [EAc1.1 | Optimize energy performance, lighting power](#)
- [EAc1.1-1.5 | Optimize energy performance](#)
- [EAc1.2 | Optimize energy performance - lighting controls](#)
- [EAc1.2 | Optimize energy performance - lighting controls](#)
- [EAc1.2 | Optimize energy performance, lighting controls](#)
- [EAc1.3 | Optimize energy performance - HVAC](#)
- [EAc1.3 | Optimize energy performance - HVAC](#)
- [EAc1.3 | Optimize energy performance, HVAC](#)
- [EAc1.4 | Optimize energy performance - equipment and appliances](#)
- [EAc1.4 | Optimize energy performance - equipment and appliances](#)
- [EAc1.4 | Optimize energy performance, equipment & appliances](#)
- [EAc1.5 | Optimize energy performance - building envelope](#)
- [EAc1.5 | Optimize energy performance, envelope](#)
- [EAc10 | Renewable energy](#)
- [EAc10 | Space heating and cooling equipment](#)
- [EAc11 | Residential refrigerant management](#)
- [EAc11 | Heating and cooling distribution systems](#)
- [EAc12 | Efficient domestic hot water equipment](#)
- [EAc13 | Lighting](#)
- [EAc14 | High-efficiency appliances](#)
- [EAc15 | Renewable energy](#)
- [EAc2 | Enhanced commissioning](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | Insulation](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | Enhanced commissioning](#)
- [EAc2 | On-site and off-site renewable energy](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | Efficient hot water distribution system](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | Enhanced commissioning](#)
- [EAc2 | On-site renewable energy](#)
- [EAc2 | On-site renewable energy, 1%](#)
- [EAc2.1 | Existing building commissioning - investigation and analysis](#)
- [EAc2.1 | Existing building commissioning - investigation and analysis](#)
- [EAc2.1 | Renewable energy - 5%](#)
- [EAc2.1-2.3 | Renewable energy](#)
- [EAc2.2 | Existing building commissioning - implementation](#)
- [EAc2.2 | Existing building commissioning - implementation](#)
- [EAc2.2 | Renewable energy - 10%](#)
- [EAc2.3 | Existing building commissioning - ongoing commissioning](#)
- [EAc2.3 | Existing building commissioning - ongoing commissioning](#)
- [EAc2.3 | Renewable energy - 20%](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3 | Measurement and verification](#)
- [EAc3 | Air infiltration](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3 | Energy use, measurement and payment accountability](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3 | Additional commissioning](#)
- [EAc3 | Additional commissioning](#)
- [EAc3 | Advanced utility tracking](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3 | Energy use, measurement & payment accountability](#)
- [EAc3 | Enhanced commissioning](#)
- [EAc3.1 | Performance measurement - building automation system](#)
- [EAc3.1 | Performance measurement - building automation system](#)
- [EAc3.1 | Building operations and maintenance - staff education](#)
- [EAc3.2 | Performance measurement - system-level metering](#)
- [EAc3.2 | Performance measurement - system-level metering](#)
- [EAc3.2 | Building operations and maintenance - building systems maintenance](#)
- [EAc3.3 | Building operations and maintenance - building systems monitoring](#)
- [EAc3.3 | Performance measurement - system-level metering](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Green power](#)
- [EAc4 | On-site and off-site renewable energy](#)
- [EAc4 | Green power](#)
- [EAc4 | Windows](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Green power](#)
- [EAc4 | Additional ozone protection](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Ozone protection](#)
- [EAc4 | Ozone depletion](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Active solar-ready design](#)
- [EAc4 | Enhanced refrigerant management](#)
- [EAc4 | Green power](#)
- [EAc4 | Enhanced refrigerant management](#)

- [EAc4.1 | On-site and off-site renewable energy](#)
- [EAc4.2 | On-site and off-site renewable energy](#)
- [EAc4.3 | On-site and off-site renewable energy](#)
- [EAc4.4 | On-site and off-site renewable energy](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Enhanced refrigerant management](#)
- [EAc5 | On-site renewable energy](#)
- [EAc5 | Heating and cooling distribution system](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Refrigerant management](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | HVAC Start-up credentialing](#)
- [EAc5 | Measurement and verification](#)
- [EAc5 | On-site renewable energy](#)
- [EAc5 | Measurement and verification](#)
- [EAc5.1 | Measurement and verification - base building](#)
- [EAc5.1 | Performance measurement - enhanced metering](#)
- [EAc5.1 | Measurement and verification - base building](#)
- [EAc5.1 | Measurement and verification - base building](#)
- [EAc5.2 | Measurement and verification - tenant submetering](#)
- [EAc5.2 | Measurement and verification - tenant submetering](#)
- [EAc5.2 | Performance measurement - enhanced metering](#)
- [EAc5.2 | Measurement and verification - tenant submetering](#)
- [EAc5.2 | Measurement and verification - tenant submetering](#)
- [EAc5.3 | Performance measurement - enhanced metering](#)
- [EAc5.4 | Performance measurement - emission reduction reporting](#)
- [EAc6 | Emissions reduction reporting](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Space heating and cooling equipment](#)
- [EAc6 | Green power](#)
- [EAc6 | Emissions reduction reporting](#)
- [EAc6 | Documenting sustainable building cost impacts](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc6 | Building orientation for passive solar](#)
- [EAc6 | Green power](#)
- [EAc6 | Green power](#)
- [EAc7 | Community contaminant prevention - airborne releases](#)
- [EAc7 | Water heating](#)
- [EAc7 | Air infiltration](#)
- [EAc8 | Lighting](#)
- [EAc8 | Envelope Insulation](#)
- [EAc9 | Appliances](#)
- [EAc9 | Windows](#)
- [EAp1 | Fundamental commissioning of building energy systems](#)
- [EAp1 | Fundamental commissioning of building energy systems](#)
- [EAp1 | Energy efficiency best management practices - planning, documentation and opportunity assessment](#)
- [EAp1 | Fundamental commissioning of building energy systems](#)
- [EAp1 | Fundamental commissioning of the building energy systems](#)
- [EAp1 | Energy efficiency best management practices - planning, documentation and opportunity assessment](#)
- [EAp1 | Fundamental commissioning](#)
- [EAp1 | Existing building commissioning](#)
- [EAp1 | Fundamental commissioning of the building energy systems](#)
- [EAp1 | Fundamental commissioning of the building energy systems](#)
- [EAp1 | Fundamental building systems commissioning](#)
- [EAp1 | Fundamental building systems commissioning](#)
- [EAp1 | Minimum energy performance](#)
- [EAp1 | Minimum energy performance](#)
- [EAp1 | Fundamental commissioning of the building energy systems](#)
- [EAp1 | Fundamental Commissioning](#)
- [EAp1 | Fundamental commissioning of building energy systems](#)
- [EAp1 | Fundamental commissioning of building energy systems](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy efficiency performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy efficiency performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Energy metering](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp2 | Minimum energy performance](#)
- [EAp3 | Fundamental refrigerant management](#)
- [EAp3 | Fundamental refrigerant management](#)
- [EAp3 | Fundamental refrigerant management](#)
- [EAp3 | Fundamental refrigerant management](#)
- [EAp3 | Refrigerant management - ozone protection](#)

- o [EAp3 | CFC reduction in HVAC/R equipment](#)
- o [EAp3 | Ozone protection](#)
- o [EAp3 | Fundamental refrigerant management](#)
- o [EAp3 | Fundamental refrigerant management](#)
- o [EAp3 | CFC reduction in HVAC/R equipment](#)
- o [EAp3 | CFC reduction in HVAC/R equipment](#)
- o [EAp3 | Education of homeowner, tenant, or building manager](#)
- o [EAp3 | Fundamental refrigerant management](#)
- o [EAp3 | CFC reduction in HVAC&R equipment](#)
- o [EAp3 | Fundamental refrigerant management](#)
- o [EAp4 | Home size](#)
- o [MEAc1 | Optimize energy performance in mid-rise buildings](#)

Our "watch" feature allows you to stay current on all aspects of this specific credit. In your account, you can control what you get updated on and how you receive your notifications. [Hide](#)

LEED BD+C: Core and Shell | v4 - LEED v4

Minimum energy performance

Required

1 result in **All**.

- [Glossary](#)

Intent

To reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.

Requirements

Option 1. Whole-building energy simulation

Demonstrate an improvement of 5% for new construction, 3% for major renovations, or 2% for core and shell projects in the proposed building performance rating compared with the [baseline building performance](#) rating. Calculate the baseline building performance according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata ([or a USGBC-approved equivalent standard for projects outside the U.S.](#)), using a simulation model.

Projects must meet the minimum percentage savings before taking credit for [renewable energy](#) systems.

The proposed design must meet the following criteria:

- compliance with the mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata ([or a USGBC-approved equivalent standard for projects outside the U.S.](#));
- inclusion of all energy consumption and costs within and associated with the building project; and
- comparison against a baseline building that complies with Standard 90.1–2010, Appendix G, with errata ([or a USGBC-approved equivalent standard for projects outside the U.S.](#)).

Document the energy modeling input assumptions for unregulated loads. Unregulated loads should be modeled accurately to reflect the actual expected energy consumption of the building.

If unregulated loads are not identical for both the baseline and the proposed building performance rating, and the simulation program cannot accurately model the savings, follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1–2010, G2.5). Alternatively, use the COMNET Modeling Guidelines and Procedures to document measures that reduce unregulated loads.

OR

Option 2. Prescriptive compliance: ASHRAE 50% Advanced Energy Design Guide

Comply with the mandatory and prescriptive provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.).

Comply with the HVAC and service water heating requirements, including equipment efficiency, economizers, ventilation, and ducts and dampers, in Chapter 4, Design Strategies and Recommendations by Climate Zone, for the appropriate ASHRAE 50% Advanced Energy Design Guide and climate zone:

- ASHRAE 50% Advanced Energy Design Guide for Small to Medium Office Buildings, for office buildings smaller than 100,000 square feet (9 290 square meters);
- ASHRAE 50% Advanced Energy Design Guide for Medium to Large Box Retail Buildings, for retail buildings with 20,000 to 100,000 square feet (1 860 to 9 290 square meters);
- ASHRAE 50% Advanced Energy Design Guide for K–12 School Buildings; or
- ASHRAE 50% Advanced Energy Design Guide for Large Hospitals. Over 100,000 square feet (9 290 square meters)

For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1–2010, Appendixes B and D, to determine the appropriate climate zone.

OR

Option 3. Prescriptive compliance: Advanced Buildings™ Core Performance™ Guide

Comply with the mandatory and prescriptive provisions of ANSI/ASHRAE/IESNA Standard 90.1-2010, with errata (or USGBC approved equivalent standard for projects outside the U.S.).

Comply with Section 1: Design Process Strategies, Section 2: Core Performance Requirements, and the following three strategies from Section 3: Enhanced Performance Strategies, as applicable. Where standards conflict, follow the more stringent of the two. For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1-2010, Appendixes B and D, to determine the appropriate climate zone.

3.5 Supply Air Temperature Reset (VAV)

3.9 Premium Economizer Performance

3.10 Variable Speed Control

To be eligible for Option 3, the project must be less than 100,000 square feet (9 290 square meters).

Note: Healthcare, Warehouse or Laboratory projects are ineligible for Option 3.

Pilot ACP Available

A pilot alternative compliance path is available for this prerequisite. See the [pilot credit library](#) for more information.

[EApC92: EA Pilot ACP: Advanced Buildings™ New Construction Guide](#)

Alternative Compliance Paths (ACPs)

Canada ACP - NECB

Projects in Canada may instead demonstrate a percentage improvement in the proposed building performance rating compared with the baseline according to the National Energy Code for Buildings (NECB) 2011. The same percentage improvement in energy performance is required to meet the Prerequisite, and the same points for percentage improvement in energy performance are applicable for the Credit.

The following conditions (where applicable) must be met. Note that unless otherwise noted, CanQUEST (the Canadian energy modelling software based on eQUEST that performs NECB 2011 compliance runs) does not implement these conditions correctly and would require corresponding modifications to the Reference case.

1. Comply with mandatory requirements of ASHRAE 90.1-2010

ASHRAE 90.1-2010 mandatory requirements must be met, in addition to the performance path limitations referenced in the NECB 2011 Sections 3.4.1.2, 5.4.1.2 and 6.4.1.2. In cases where ASHRAE and the NECBC reference requirements concerning the same item, the more stringent requirement shall be adhered to.

2. Apply fenestration area convention similar to ASHRAE 90.1-2010

Maintain the same FWR (as defined by NECB, including doors) for the Reference as exists in the Proposed Design, up to the prescribed maximum. If the Proposed Design's FWR exceeds the prescribed FWR, scale down the fenestrations in the Reference case accordingly.

3. Apply skylight area convention similar to ASHRAE 90.1-2010

Maintain the same SRR for the Reference as exists in the Proposed Design, up to the prescribed 5% maximum. If the Proposed Design's SRR exceeds 5%, scale down the skylights in the Reference case accordingly.

4. Model proposed and reference outside air similar to ASHRAE 90.1-2010

Proposed and reference (baseline) outside air rates shall be modeled as per ASHRAE 90.1 – 2010 (G3.1.2.6).

5. Apply ASHRAE kitchen exhaust demand ventilation requirements

Provide for the same demand ventilation requirements as described in ASHRAE Appendix G3.1.1.d.

6. Apply ASHRAE's chiller heat recovery requirements

Provide for the same chiller heat recovery requirements as applies to ASHRAE.

7. Apply supply air temperature reset controlled based on warmest zone

Reset the minimum supply air temperature to satisfy the cooling requirements of the warmest zone, as stipulated in NECB Section 5.2.8.8. Note that this control setting is already corrected in CanQUEST for the Reference case.

8. Account for uninsulated structural penetrations if they exceed 2% of net wall area

The 2% allowance may be applied, but based on the net opaque wall area, not the entire building envelope area.

9. Follow ASHRAE/LEED rules for renovations to existing buildings

Model existing components consistent with ASHRAE and LEED provisions.

10. Account for all anticipated energy use in building

Fully account for all energy end-uses in the energy performance modelling.

0 comments [Leave a comment](#)

Leave a comment [Don't have an account? Create one](#)

You must be signed in to leave a comment.

Email

Password