

Standard 100-2024



ANSI/ASHRAE/IES 100, *Energy and Emissions Building Performance Standard for Existing Buildings*

Summary

Standard 100-2024 establishes greenhouse gas (GHG) emissions and energy consumption performance levels for existing buildings. The standard provides compliance requirements to improve energy efficiency and reduce the GHG emissions of existing buildings. In doing so the standard provides a technical basis for setting building performance standards and policies and procedures to enforce building performance policies and to improve, maintain, manage and monitor the energy efficient operation of buildings.

Significance

Within the ASHRAE family of standards, only Standard 100 provides the structure and guidance needed by jurisdictions to develop and implement major retrofit policies and programs for existing buildings. Created in 1995, Standard 100 began as a building energy conservation standard, addressing a gap in how to approach energy conservation in existing buildings that were not undergoing a retrofit requiring compliance with Standard 90.1 energy code. Users of the standard were provided potential energy efficiency measures to consider. As the standard evolved, it added provisions to address energy auditing, performance data evaluation, and life-cycle costs of retrofits and renovations.

For the 2024 update the ASHRAE Standing Standard Projects Committee (SSPC) 100, with direction from ASHRAE's Task Force for Building Decarbonization (TFBD), worked to update the standard to make it a model for building performance standard (BPS) adoption in jurisdictions, across the US and internationally. The new edition of Standard 100 addresses key issues of climate change surrounding building performance, including new metrics for greenhouse gas (GHG) emissions targets, continuing to support the imperative of improving existing building stock and meeting global climate change commitments.

Scope

The standard applies to existing buildings, portions of buildings, and complexes, including the envelope and all systems in the building. It excludes industrial and agricultural processes in buildings for which the energy consumption and emissions targets do not include those processes.

Highlights

Being performance-based, the results associated with the implementation of the standard are real and measurable, not modeled or subjective. Jurisdictions using Standard 100 as the basis for their BPS will see quantifiable reductions in energy use and greenhouse gas emissions from their existing building stock. To achieve this, the standard includes:

- ✓ A standardized approach for gauging performance for single and multiple occupancy buildings with variable operating hours, for 55 building types in 20 international climate zones/subzones.
- ✓ Specific Energy Use Intensity and Greenhouse Gas Emissions targets by building type, occupancy and climate zone derived from the Commercial Buildings Energy Consumption Survey (CBECS) and the Residential Energy Consumption Survey (RECS) databases.
- ✓ A method to address performance in buildings without targets to promote efficiency and GHG reduction.
- ✓ Necessary forms and compliance information for off-the shelf enforcement of the Standard by a jurisdiction.

Changes and Improvements from the Previous Version

Key aspects of the updated standard include:

- ✓ Revised Title, Purpose, and Scope (TPS) to position the standard as a model BPS that includes carbon emission performance requirements alongside energy efficiency as performance requirements for existing buildings.
- ✓ Added GHG requirements in addition to the existing energy efficiency requirements. The standard now requires buildings to meet both EUI and GHGI targets.
- ✓ Revised EUI definition from “net” to “gross” requiring buildings operate efficiently and independent of their onsite power generation.
- ✓ An informative appendix to provide guidance to jurisdictions seeking to develop their own energy targets based on local energy or emissions data. The appendix discusses pros and cons of different energy metrics and target setting methodologies and includes additional information on target setting for healthcare and hospital facilities and an example of setting targets using data from British Columbia.
- ✓ U.S. regional energy conversion factors to the normative section of the standard that provides AHJs with the option to use regional U.S. energy conversion factor values for electricity.
- ✓ Revised “energy audit” to “energy audit with decarbonization assessment”, defined by the “building decarbonization assessment” in ASHRAE Standard 211 Standard for Commercial Building Energy Audits Annex H.
- ✓ For buildings without targets, an optimized bundle of emission reduction measures is defined by a cost effectiveness criterion of 10-year payback, including carbon costs.
- ✓ Updated EUI targets from CBECS 2003 and RECS 2005 to CBECS 2012 and RECS 2015. EUI targets across the standard were updated with this new data. This update includes two new commercial building types that were added in CBECS 2012 (Courthouse/Probation Office and Bar/Pub/Lounge).
- ✓ New ASHRAE defined international climate zones (0A, 0B, and 1B) were added.
- ✓ The compliance process for buildings with energy targets, buildings without energy targets, and residential buildings and dwelling units was simplified.
- ✓ Metering and Fault Detection and Diagnostics (FDD) were added to the Informative Appendix Energy Efficiency Measures.