



Shaping Tomorrow's
Built Environment Today

BUILDING ENERGY BENCHMARKING, ASSESSMENTS, AND PERFORMANCE TARGETS

THE ISSUE

Heating, ventilation, air conditioning, and refrigerating (HVAC&R) account for about 61% of commercial building site energy use.¹ While new buildings have realized improved energy performance, existing buildings represent the greatest opportunity for energy use performance improvement within the sector. Improving the energy performance of existing buildings requires the availability of a robust database of building energy data. Without understanding how a building is performing, it is difficult to effectively improve the building's energy footprint.

To address this concern, building energy benchmarking has become a critical tool for quantifying and evaluating building operational energy use patterns needed to develop the most effective ways to reduce energy use in a city or state's building stock. In addition, better understanding of true energy performance is needed; a building may be designed as energy efficient, but its operations may prove otherwise.

Over 39 US cities have building energy benchmarking programs.² Some jurisdictions require actions beyond benchmarking, such as performing energy assessments (audits, tune-ups, or retrocommissioning) or meeting performance targets (maximum energy use or carbon emissions). Municipalities such as Montréal, Dallas, Atlanta, and New York City have set aggressive carbon reduction goals for existing buildings that will require accurate benchmarking to determine emissions and energy savings.

ASHRAE's ROLE

ASHRAE disseminates credible evidence-based practices and technical information to professionals across the building sector by developing standards, guidance and educational resources informed by robust data on the actual energy performance of buildings. To achieve a carbon neutral world, ASHRAE is also leading the way in converting energy to carbon in selected standards. ASHRAE's tools and resources include:

- Benchmarking:
 - **ASHRAE Standard 105** *Standard Methods of Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions* provides a method for determining and comparing building energy performance and greenhouse gas emissions.
 - **ASHRAE Standard 214** *Standard for Determining and Expressing Building Energy Performance in a Rating Program* provides uniformity in the building energy labeling and disclosure process.

¹ Includes water heating; *2012 Commercial Building Energy Consumption Survey: Energy Usage Summary*. U.S. Energy Information Administration, 18 March 2016, <https://www.eia.gov/consumption/commercial/reports/2012/energyusage/>

² *Comparison of U.S. Commercial Building Energy Benchmarking and Transparency Policies*. Institute for Market Transformation, October 2021, <https://www.imt.org/resources/comparison-of-u-s-building-audit-tune-ups-and-retrocommissioning-policies/>



Shaping Tomorrow's Built Environment Today

- **ASHRAE Standard 228P** *Standard Method for Evaluating Zero Net Energy and Zero Net Carbon Building Performance* is a proposed standard that provides a consistent method of expressing qualifications for zero net energy and zero net carbon buildings associated with the design of new buildings and the operation of existing buildings.
- Energy Audits and Assessments:
 - **ASHRAE Standard 211** *Standard for Commercial Building Energy Audits* establishes consistent practices for conducting and reporting energy audits for commercial buildings. *Referenced by ordinances in Atlanta, GA; Boulder, CO; Los Angeles, CA; New York, NY; and San Francisco, CA.*
 - **Commercial Buildings Energy Audits Reference Manual** is a reference that defines best practices for energy survey and analysis for purchasers and providers of energy audit services, and serves as a reference for Standard 211.
- Building performance targets:
 - **ASHRAE Standard 100** *Energy Efficiency in Existing Buildings* sets energy use intensity (EUI) benchmarks for existing buildings in the commercial and residential sector and establishes methods for determining opportunities for improvement in EUI leading to compliance with the standard benchmarks. *Referenced by Washington State's Clean Buildings Act of 2019.*
 - **ASHRAE's Building EQ³** program calculates a building's energy performance in relation to other similar buildings, identifies the gap between "as designed" potential and actual performance in operation, and provides recommendations to reduce energy use. Building EQ can be used to publicly display building energy use and comply with disclosure requirements.

ASHRAE certification programs were developed to meet the industry needs of today and provide value to thousands of built-environment professionals, employers, and building owners. Certifications like Building Commissioning Professional (BCxP) and Building Energy Assessment Professional (BEAP) are recognized by the U.S. Department of Energy (DOE) as meeting the Better Buildings Workforce Guidelines (BBWG) and are used frequently by local jurisdictions to designate who is qualified to perform benchmarking and energy assessments.

ASHRAE's VIEW

Energy metrics that are widely accepted, robust, and validated, are critical to achieving desired policy objectives including benchmarking, code compliance and investment decisions. Standardized procedures for energy performance assessments ensure an appropriate level of rigor and scope of work. Within a building owner's portfolio or across a city's building stock, decision-makers need consistent language, metrics, and procedures to effectively communicate goals, evaluate potential investments, and measure success. ASHRAE remains dedicated to sharing technical resources with policymakers to support legislative and regulatory solutions that improve building energy efficiency.

³ For more information, see <https://www.ashrae.org/technical-resources/building-eq>