Shaping Tomorrow's Global Built Environment Today

BUILDING ENERGY BENCHMARKING, ASSESSMENTS, AND PERFORMANCE TARGETS

THE ISSUE

Heating, ventilation, air conditioning, and refrigeration (HVAC&R) account for 61% of commercial building site energy use.[1] While new buildings have realized improved energy performance, existing buildings represent the greatest opportunity for energy and greenhouse gas (GHG) emissions reductions. Improving the energy performance of existing buildings requires a robust building energy database. Without understanding a building's true performance, identifying effective improvements in energy efficiency is challenging. As the saying goes, "you can't manage what you don't measure."

To address this concern, building energy benchmarking has become a critical tool for quantifying and evaluating building operational energy use patterns. Benchmarking data can inform public policies that focus on the most effective ways to reduce energy use in a city or state's building stock. Benchmarking data can also be used to develop local energy and GHG emissions performance targets appropriate to local climate and building types.

Over 40 U.S. and Canadian 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 GHG emissions). Cities such as Boston, Denver, New York City, Vancouver, and Washington DC have set aggressive GHG emissions reduction goals for existing buildings that will require accurate benchmarking to determine emissions and energy savings.

ASHRAE's ROLE

ASHRAE develops standards, guidance and educational resources informed by robust data on the actual energy performance of buildings and offers evidence-based best practices and technical information for use by municipalities and professionals across the building sector as follows.

- **Benchmarking**:
  - ASHRAE Standard 105-2021, *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 214-2017, *Standard for Determining and Expressing Building Energy Performance in a Rating Program* provides uniformity in the building energy labeling and disclosure process.
  - ASHRAE Standard 228-2023, *Standard Method of Evaluating Zero Net Energy*

[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, July 2022, https://www.imt.org/resources/comparison-of-commercial-building-benchmarking-policies/

and Zero Net Carbon Building Performance provides consistent method definitions of "zero net energy" and "zero net carbon" for both the design of new buildings and the operation of existing buildings.
    - ASHRAE Standard 240P, *Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation* will provide a whole life carbon approach to support emissions reductions in buildings.
- **Energy audits and assessments:**
    - ASHRAE Standard 211-2018, *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:**
    - *Building Performance Standards: A Technical Resource* provides technical basis and resources to policymakers, building owners, facility managers, design professionals and ASHRAE members when developing and implementing a Building Performance Standard (BPS).
    - ASHRAE Standard 100-2024*, Energy and Emissions Building Performance Standard for E 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.* Future revisions will incorporate setting GHG emissions targets.
    - ASHRAE's Building EQ[3] 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 exist 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 policy objectives. 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 and reduce GHG emissions.

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