

AGENDA
TC 7.6 Building Energy Performance
Monitoring and Energy Performance Subcommittee
2022 ASHRAE Winter Conference, Las Vegas, NV
Monday, January 31, 2022, 2:30 – 4:30 pm PST

Purpose: TC 7.6 is concerned with the estimation, measurement, analysis, benchmarking, and management of whole building and building systems energy and water performance. This includes performance and resource management of new and existing buildings. This sub-committee implements this scope by monitoring the state of governmental policy, data, and tools addressing building energy and water performance (especially building benchmarking and energy auditing), and by developing ASHRAE programs and courses on these topics.

1. Introductions

2. ASHRAE Standards and Guidelines

- a. **Standard 100-2018**, *Energy Efficiency in Existing Buildings* — 2022 update of the standard will affect energy use targets. Targets now based on CBECS 2012 and RECS 2015 data. Numbers have been generated for all of the tables and the targets for most building types decreased, with some exceptions.
- b. **Standard 105-2014**, *Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions* — 2021 version has been published
- c. **Standard 211-2018**, *Standard for Commercial Building Energy Audits* — Does not currently exist as a committee. Nothing going on here, although discussion about re-constituting. Looking for a chair.
- d. **Standard 189.1**, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings* — Changes to GHG emission factors; 2020 version has eGRID factors rather than national factors. Still working on potential addendum on outcome-based performance path.
- e. **Standard 228P**, *Standard Method of Evaluating Zero Energy Building Performance* — Second public review period will begin soon; Draft that will go out for review has a zero carbon section
- f. **Guideline 14-2014**, *Measurement for Energy, Demand, and Water Savings* — Committee reviewing draft updated version; should go out for public review soon.
- g. **Guideline 34-2019**, *Energy Guideline for Historic Buildings*
- h. **AEDG, Achieving Zero Energy series**

3. Project Announcements and Updates

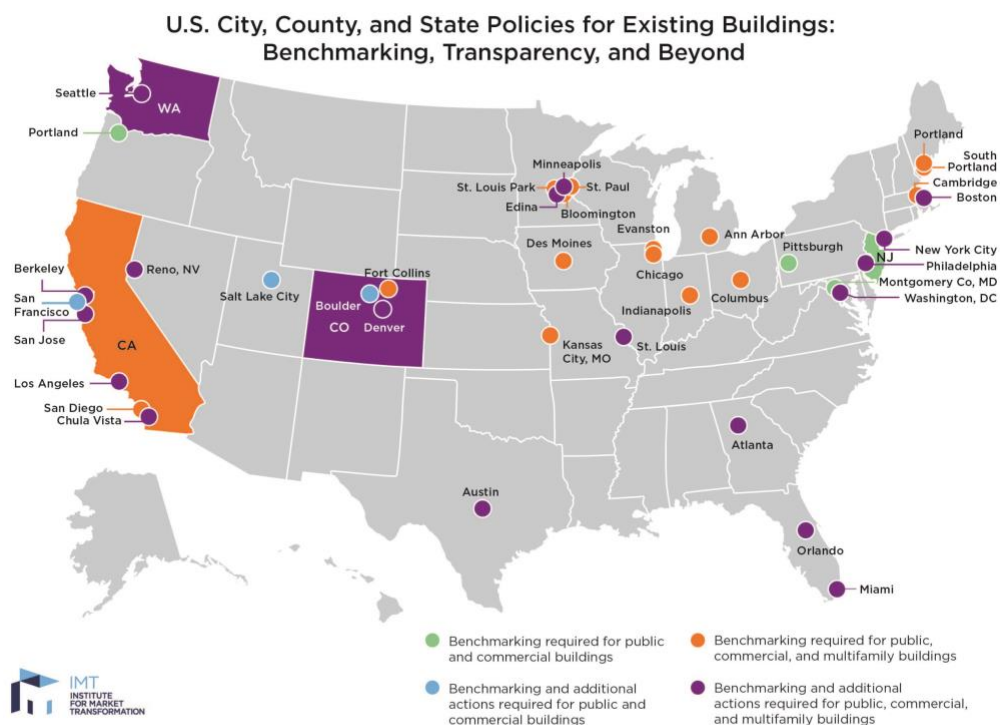
- a. ASHRAE Building Decarbonization Task Force, Building Performance Standards Working Group (Hinge) — BPS working group developing an ASHRAE guide to BPS, intended for technical staff involved in BPS in a city or state.
- b. BuildingEQ and standardized system-level key performance indicators for building performance evaluation (Hunn) — BuildingEQ in discussions with PNNL on adding TSPR into as-designed rating
 - i. PNNL has more info here: https://www.energycodes.gov/sites/default/files/2021-07/TechBrief_HSP_July2021.pdf
- c. Proposal to update ASHRAE Performance Measurement Protocol (PMP) into an ASHRAE Guideline (Kim and Hunn) — Proposal approved. Now officially GPC 45P, *Measurement of Whole Building Performance for Occupied Buildings except Low-Rise Residential Buildings*.

4. Buildings, Energy, and COVID-19

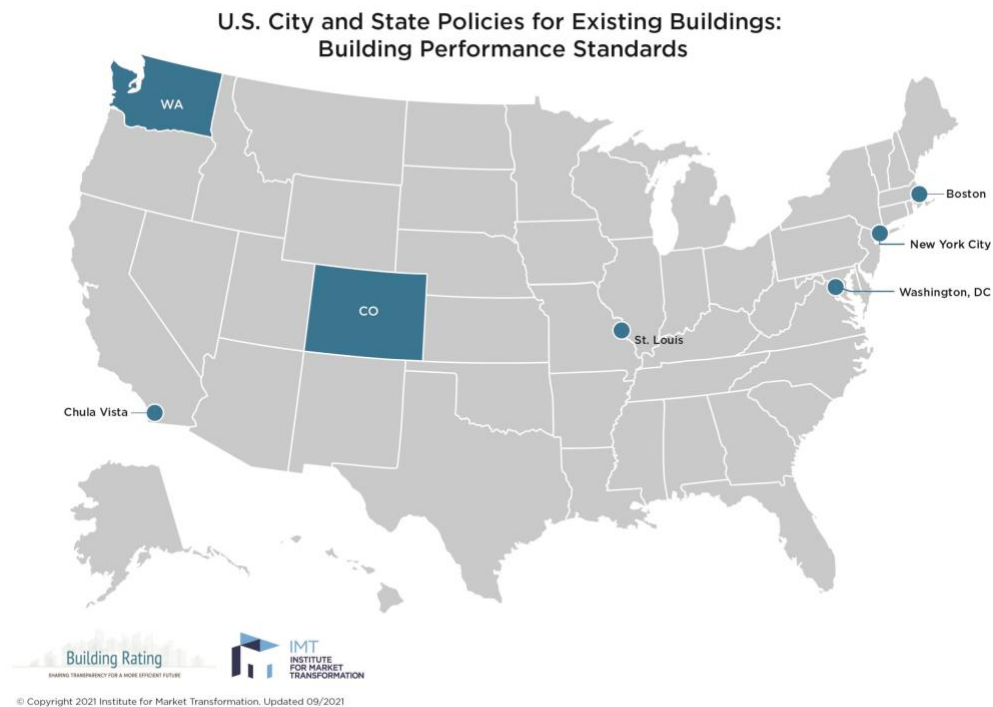
- a. Decarbonizing New York Offices project survey found that “only 5% of buildings experienced whole-building energy reductions above 30% even though occupancy dropped by as much as 95% at the height of the pandemic; similarly, more than 40% of buildings only experienced whole-building energy reductions between 10%-30% despite similar occupancy decreases.” <https://www.imt.org/decarbonizing-new-yorks-inefficient-buildings/>

5. Governmental Policy

- a. Municipal
 - i. In July 2021, Indianapolis passed a benchmarking ordinance. Covers municipal buildings over 25,000 ft² and commercial, multifamily, and industrial buildings over 50,000 ft²: <https://www.nrdc.org/experts/emily-barkdoll/indy-passes-benchmarking-policy-address-climate>
 - ii. In October 2021, Ann Arbor, MI passed a benchmarking ordinance. Covers municipal buildings over 10,000 ft² and commercial, multifamily, and industrial buildings over 20,000 ft²: <https://www.imt.org/ann-arbor-takes-climate-action-with-new-building-energy-policy/>
 - iii. Four other jurisdictions passed benchmarking ordinances in 2021: CO; Bloomington, MN; Chula Vista, CA; Miami, FL. As of October 2021, there are 43 jurisdictions with benchmarking ordinances, across 22 states and DC. Several cities requiring PE to verify data every 3 years.
 - 1. Comparison matrix: <https://www.imt.org/resources/comparison-of-commercial-building-benchmarking-policies/>
 - 2. Map: <https://www.imt.org/resources/map-u-s-building-benchmarking-policies/>



- iv. In late June 2021, the State of Colorado passed a combined benchmarking and building performance standard (BPS): <https://www.imt.org/colorados-new-building-performance-standards/>
- v. In September 2021, Boston passed a BPS. Covers buildings with 20,000 ft² or more and sets targets in kgCO₂e/ft². Targets set based on data from Boston's benchmarking ordinance: <https://www.imt.org/boston-city-council-passes-new-building-performance-standard/>.
 - 1. For more details on the targets: <https://www.imt.org/boston-introduces-building-performance-standard/>
- vi. In November 2021, Denver, CO passed a BPS. Covers commercial and multifamily buildings 25,000 ft² or more and sets targets in site EUI: <https://www.imt.org/denver-passes-building-performance-standard>
- vii. As of November 2021, eight jurisdictions have enacted BPS
 - 1. Comparison matrix: <https://www.imt.org/resources/comparison-of-u-s-building-performance-standards/>
 - 2. Map: <https://www.imt.org/resources/map-building-performance-standards/>



- viii. U.S. EPA ENERGY STAR has published a white paper on BPS metrics: https://www.energystar.gov/buildings/white_paper_metrics
- ix. In January 2022, the White House launched a National Building Performance Standards Coalition in partnership with 33 state and local governments. These jurisdictions encompass 20% of total U.S. building square footage, and goal is to advance legislation in each jurisdiction by 2024: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/01/21/fact-sheet-biden-harris-administration-launches-coalition-of-states-and-local-governments-to-strengthen-building-performance-standards/>

1. For more: <https://nationalbpscoalition.org/>
- x. In December 2021, NYC City Council passed a legislation phasing fossil fuels out of new construction starting in 2024. Does not impact existing buildings.: <https://www.urbangreencouncil.org/content/projects/local-law-154-nycs-all-electric-new-buildings-law>
- b. State
 - i. In December 2021, the Southern Nevada Water Authority Board of Directors passed a moratorium on evaporative cooling mechanisms in new commercial and industrial buildings in the Las Vegas Valley: <https://www.snwa.com/importance-of-conservation/responding-to-drought/index.html>
 - ii. In January 2022, the Governor of New York State proposed legislation to achieve net-zero emissions for all new construction by 2027: <https://www.archpaper.com/2022/01/new-york-governor-kathy-hochul-targets-zero-emissions-for-all-new-buildings-by-2027/>
- c. U.S. Federal
 - i. In December 2021, the White House committed to net-zero carbon emissions from federal government operations by 2050. Federal buildings portfolio to reach net-zero by 2045 via Federal BPS. Federal BPS targets will be emissions-focused, rather than energy-focused: <https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/08/fact-sheet-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/>
- d. International
 - i. In December 2021, the European Commission proposed several changes to its Energy Performance of Buildings Directive, notably a minimum energy performance standard (MEPS) requiring “the worst-performing 15% of the building stock of each Member State to be upgraded from the Energy Performance Certificate's Grade G to at least Grade F by 2027 for non-residential buildings and 2030 for residential buildings”. Dual goal is to decarbonize and alleviate fuel poverty: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6683

6. Data and Databases

- a. CBECS
 - i. 2018 CBECS building characteristics “flipbook” and microdata published in September 2021
 1. Flipbook: https://www.eia.gov/consumption/commercial/data/2018/pdf/CBECS_2018_Building_Characteristics_Flipbook.pdf
 2. Microdata: <https://www.eia.gov/consumption/commercial/data/2018/index.php?view=microdata>
 - ii. EIA is currently processing the consumption data and doing the end use modeling. Expects to publish preliminary consumption data in early summer and the detailed tables and microdata by the fall: <https://www.eia.gov/consumption/commercial/>
- b. RECS
 - i. 2020 RECS data currently slated to be released at end of 2022: <https://www.eia.gov/consumption/residential/>
- c. BPD
- d. GHG Emissions
 - i. California Market Informed Demand Automation Server (MIDAS) database provides info on GHG emissions associated with electrical generation:

<https://www.energy.ca.gov/publications/2021/market-informed-demand-automation-server-midas-documentation-connecting-and>

- ii. For another real-time emissions signal provider, see WattCarbon:
<https://www.wattcarbon.com/>
- iii. For another real-time emissions signal provider, see Carbonara:
<https://carbonara.energy/>

7. Benchmarking Tools

- a. ENERGY STAR
 - i. Updated score for medical office buildings expected in February 2022:
https://www.energystar.gov/buildings/benchmark/understand_metrics/score_updates#anchor2
 - ii. Planning to develop and release scores for convenience stores and vehicle dealerships in 2023: https://www.energystar.gov/buildings/benchmark/understand_metrics/score_updates#anchor3
- b. Other tools
 - i. Building EQ
 - ii. DOE Asset Score

8. ASHRAE Sessions of Interest (*Sponsored by TC 7.6)

Sunday, January 30, 8:00 AM - 9:00 AM, Paper Session 1

Virtual: Effect of Occupant Behavior and Occupancy Schedules on Buildings Energy Use and Consumption

Sunday, January 30, 9:45 AM - 10:45 AM, Seminar 7

Introduction of Building Decarbonization

Sunday, January 30, 11:00 AM - 12:30 PM, Seminar 11

Introduction to Research Knowledge and Building Standards Working Groups

*Sunday, January 30, 11:00 AM - 12:30 PM, Seminar 12

Renewables and the Smart Grid

Sunday, January 30, 1:30 PM - 3:00 PM, Paper Session 6

Energy Codes, Standards, Emission Trading Scheme to Achieve NetZero in 2050

Sunday, January 30, 3:15 PM - 4:45 PM, Seminar 15

Update on the Progress of the Task Force on Building Decarbonization

Tuesday, February 1, 8:00 AM - 9:30 AM, Panel 1

In Real Time: Charting the Pathway for Existing Buildings to Get to Carbon Neutrality

Wednesday, February 2, 8:00 AM - 9:30 AM Paper Session 21

Virtual: Refining ASHRAE COVID Guidelines and Standard 100

Wednesday, February 2, 11:00 AM - 12:30 PM, Seminar 40

Climate Change Considerations in Energy Audits

*Wednesday, February 2, 11:00 AM - 12:30 PM, Seminar 44

Upgrading Existing Building Control Systems for High Performance Operation