

AGENDA
TC 7.6 Building Energy Performance
Monitoring and Energy Performance Subcommittee
2022 ASHRAE Annual Conference, Toronto, ON, Canada
Monday, June 27, 2022, 2:30 – 4:30 pm EDT

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* – Proposed change to Title, Purpose and Scope includes carbon/decarbonization (currently out for public review). Committee plans to establish GHG targets within the standard.
- b. **Standard 105-2021**, *Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions* – Done.
- c. **Standard 211-2018**, *Standard for Commercial Building Energy Audits* – Currently looking for a chair to re-form committee.
- d. **Standard 189.1**, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings* – Working towards 2023 version.
- e. **Standard 228P**, *Standard Method of Evaluating Zero Energy Building Performance* – Update nearing completion – Responded to third set of public review comments.
- f. **Guideline 14-2014**, *Measurement for Energy, Demand, and Water Savings* – Updated version is nearing completion.
- g. **Guideline 34-2019**, *Energy Guideline for Historic Buildings*
- h. **Guideline 45P**, *Measurement of Whole Building Performance for Occupied Buildings except Low-Rise Residential Building s*– Under active development.
- i. **AEDG, Achieving Zero Energy series** – New Advanced Energy Design Guide for Multifamily Buildings Available.

3. Project Announcements and Updates

- a. ASHRAE Building Decarbonization Task Force, Building Performance Standards Working Group (Hinge) – Working on BPS technical resource guide.
- b. BuildingEQ and standardized system-level key performance indicators for building performance evaluation (Hunn)
- c. New technical working group forming on environmental control systems for deep space and extraterrestrial environments (Constantinide)

4. Buildings, Energy, and COVID-19

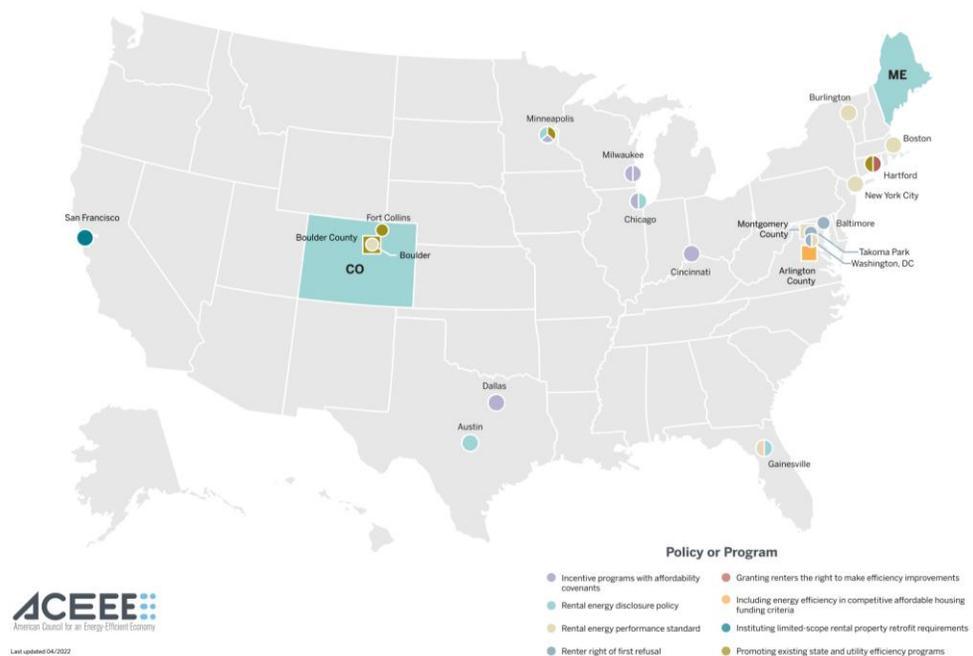
- a. Urban Green Council analysis of the 2020 benchmarking data from NYC:
<https://www.urbangreencouncil.org/content/projects/how-global-pandemic-shifted-nyc%E2%80%99s-energy-use>. Highlights:
 - i. Energy use fell citywide, but carbon emissions fell less because the grid got dirtier. Indian Point Energy Center’s Unit 2 was shut down in April 2020, and its roughly 7,500 MWh output of zero-carbon electricity was mostly replaced with gas-fired generation;

- ii. Office energy use only fell 14 percent, but occupancy dropped much further;
 - iii. Residential electricity use increased in every borough except Manhattan, which saw a significant drop;
 - iv. ENERGY STAR scores (and building letter grades) increased, partially because not all buildings reported the drop in occupancy.
- b. NYSERDA has developed The Great Energy Disconnect: Lessons Learned from the Pandemic on Commercial Office Energy Use: <https://www.nyserdera.ny.gov/All-Programs/Energy-Efficiency-for-Commercial-Tenants/Resources/The-Great-Energy-Disconnect>

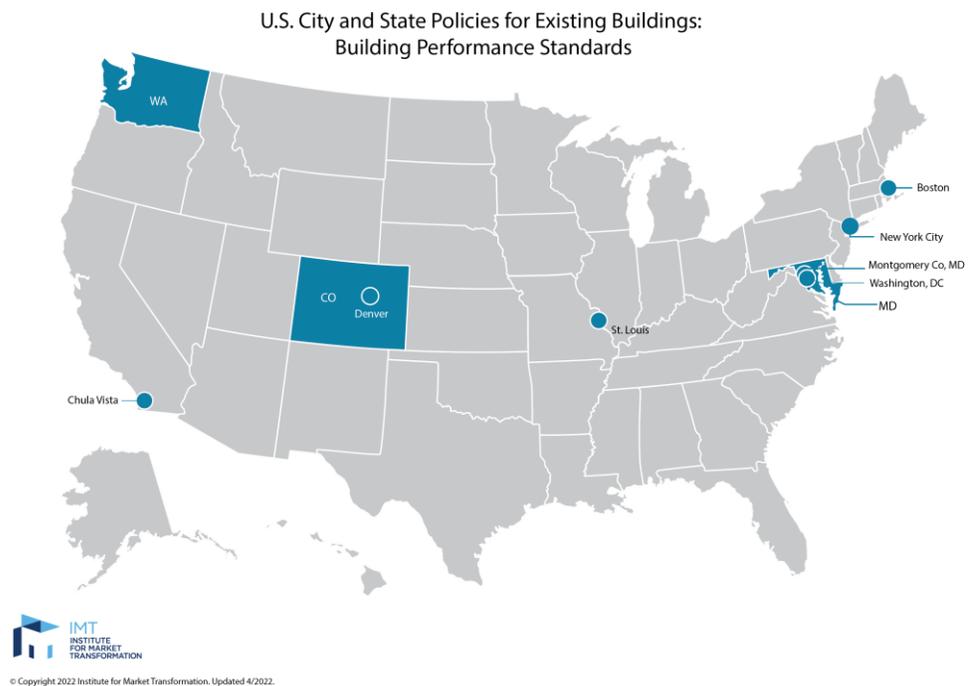
5. Governmental Policy

a. Municipal

- i. In December 2021 NYC released its Local Law 97 implementation action plan for city government: https://www1.nyc.gov/assets/dcas/downloads/pdf/energy/reportsandpublication/local_law_97_implementation_action_plan_2021_report.pdf
- ii. 15:31:55 From Adam Hinge to Everyone:
- iii. Proposal in Minnesota state legislature would allow cities to adopt building energy stretch codes, and “move a year or two quicker than the state”: <https://energynews.us/2022/03/24/minnesota-cities-want-permission-to-move-faster-than-state-on-energy-codes/>
- iv. NBI has developed a Model Government Zero Emissions Buildings Policy that provides plug-and-play policy language for jurisdictions taking a “Lead by Example” approach to building decarbonization: <https://newbuildings.org/new-zero-emissions-buildings-policy-helps-jurisdictions-lead-by-example/>
- v. ACEEE has developed an Energy Equity for Renters Policy Tracker that maps map of cities, counties, and states that have adopted policies and programs to promote both energy efficiency and equity in rental housing: <https://www.aceee.org/energy-equity-renters-policy-map>



- vi. Chicago's Decarbonization Group has been centering equity in its discussions: https://www.chicago.gov/city/en/depts/mayor/press_room/press_releases/2021/june/DecarbonizationWorkingGroup.html
- b. State
 - i. In April 2022 Montgomery County, MD and the State of Maryland both passed Building Performance Standards (BPS): <https://www.imt.org/news/two-new-building-performance-standards-adopted-in-maryland/>
 - ii. As of April 2022, ten jurisdictions have enacted BPS
 1. Comparison matrix: <https://www.imt.org/wp-content/uploads/2022/06/06.22-BPS-Matrix.pdf>
 2. Map: <https://www.imt.org/resources/map-building-performance-standards/>



- iii. In April 2022 Washington became the first state in the U.S. to mandate electric heat pumps for new buildings: <https://www.eenews.net/articles/building-codes-the-new-natural-gas-battlefront/>
- iv. An increasing number of cities, states, and utilities are developing programs to encourage electrification: <https://www.aceee.org/blog-post/2022/02/programs-electrify-buildings-are-heating-nationwide-report-shows>

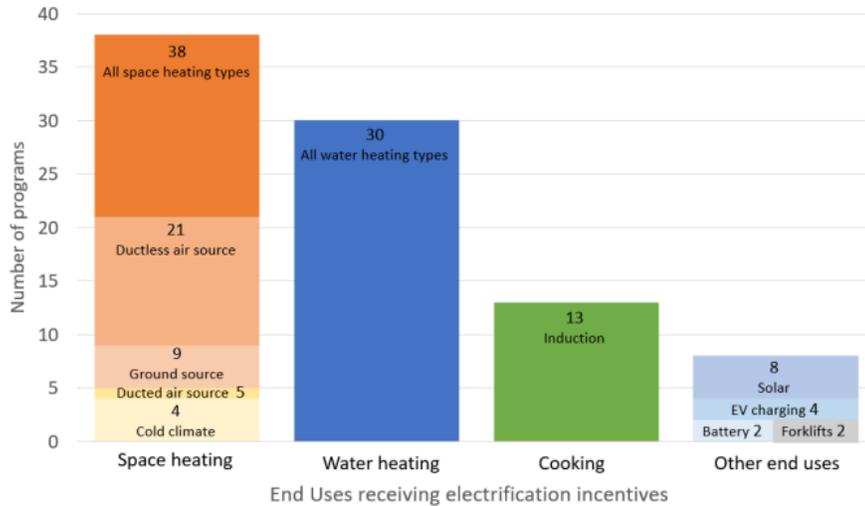


Figure 5. Targeted end uses across 42 electrification programs. Note: For space heating, many programs included more than one equipment type or did not specify the type of equipment included.

- v. In March 2022 Vermont’s House of Representatives passed a bill that would create a Clean Heat Standard. Creates a marketplace where fossil fuel supply companies buy and sell “clean heat credits”: <https://www.vermontpublic.org/vpr-news/2022-03-16/vermonts-house-passes-clean-heat-standard-major-climate-bill-aimed-at-reducing-emissions-from-buildings>
 - 1. For more, see the Regulatory Assistance Project Clean Heat Standard: <https://www.raponline.org/knowledge-center/the-clean-heat-standard/>
- vi. California state legislature is considering a bill (SB 1206) that supports the adoption of natural refrigerants and lowers acceptable GWP levels for HFC gases: <https://r744.com/california-weighs-new-bill-to-support-natural-refrigerants-and-require-lower-gwps-for-f-gases/>
- vii. 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 – Update (see Forum 2 under ASHRAE Sessions of Interest)
- c. U.S. Federal
 - i. In March 2022 the U.S. Securities and Exchange Commission proposed a new federal rule requiring all publicly traded companies to disclose climate risks and carbon emissions.
 - 1. Urban Green Council perspective: <https://hbr.org/2022/05/what-if-banks-had-to-disclose-the-climate-impact-of-their-investments>
 - 2. IMT perspective: <https://www.imt.org/news/sec-takes-historic-step-forward-on-climate-transparency/>
- d. International
 - i. Recent webinar outlines key features of EU’s Minimum Energy Performance Standards for existing buildings (passed in December 2021):
 - 1. Webinar: <https://www.renewable-ei.org/en/activities/events/20220517.php>
 - 2. Slides: https://www.renewable-ei.org/pdfdownload/activities/EN_Sunderland.pdf

- ii. In response to EU efforts to reduce energy use due to the war in Ukraine, Spain and Italy have both passed policies limiting heating and cooling setpoint temperatures in public buildings:
 - 1. <https://www.reuters.com/business/energy/heat-is-italy-plans-turn-down-air-conditioning-save-energy-2022-04-20/>
 - 2. <https://www.coolingpost.com/world-news/spain-limits-air-conditioning-to-27oc/>

6. Data and Databases

a. CBECS

- i. 2018 CBECS preliminary consumption data to be released in August 2022, and the detailed consumption tables and microdata in November 2022:
<https://www.eia.gov/consumption/commercial/>
 - 1. Link to flipbook:
https://www.eia.gov/consumption/commercial/data/2018/pdf/CBECS_2018_Building_Characteristics_Flipbook.pdf
- ii. EIA considering a change in climate zone definition for the 2018 CBECS published tables (to ASHRAE zones rather than Building America zones)

b. RECS

- i. 2020 RECS housing characteristics tables were released in spring 2022. Contain data on geographic characteristics, appliances, lighting, household demographics, household energy insecurity, fuels used, space heating, air conditioning, and water heating: <https://www.eia.gov/consumption/residential/>
- ii. For the first time in RECS program history, 2020 RECS will release data at the state level for all 50 states and DC. These state-level data tables to be released in late June 2022, and consumption and expenditure data to be released in early 2023.

c. BPD

7. Benchmarking Tools

a. ENERGY STAR

- i. ENERGY STAR Portfolio Manager released its Building Emissions Calculator tool. Allows users to estimate historical, current and future annual greenhouse gas emissions resulting from building energy use:
<https://portfoliomanager.energystar.gov/buildingEmissionsCalculator/>
- ii. Series of ENERGY STAR score updates planned for new (e.g., single family homes, convenience stores, vehicle dealerships) and existing property types:
https://www.energystar.gov/buildings/benchmark/understand_metrics/score_updates

Property Type	Score	New or Update?	Estimated Launch
Single Family Homes	Energy	New	Fall 2022
Convenience Stores	Energy	New	2023
Vehicle Dealerships	Energy	New	2023
Data Center*	Energy	Update	2023 - 2024
Data Center*	Water	New	2023 - 2024
Multifamily*	Energy	Update	2024 - 2025
Multifamily*	Water	Update	2024 - 2025
Multiple (CBECS Models)	Energy	Update	2025
Convenience Store*	Water	New	TBD
Medical Office*	Water	New	TBD
Hospital*	Water	New	TBD

*An asterisk indicates an update that we hope to do, but that is dependent on the collection and analysis of sufficient data.

- b. Other tools
 - i. Building EQ
 - 1. Application of Building EQ for Level 1 energy audits: Najafi, Constantinide and Lindsay. “ASHRAE Building EQ Empowers Schools, Teaches Students.” ASHRAE Journal, Vol. 64, no. 1, January 2022
 - ii. DOE Asset Score
 - 1. TSPR is now its own tool, rather than embedded in Asset Score: <https://energycode.pnl.gov/HVACSystemPerformance>

8. ASHRAE Sessions of Interest

*Sponsored by TC 7.6

*Sunday, June 26, 1:30 PM - 3:00 PM, Seminar 14 (Intermediate)
The Importance of O&M to Energy Efficiency, Comfort, IAQ and Energy System Decarbonization

Sunday, June 26, 3:15 PM - 4:45 PM, Seminar 15 (Basic)
LIVESTREAM: Update on the Progress of the Task Force for Building Decarbonization

*Monday, June 27, 9:45 AM - 10:45 AM, Forum 2 (Intermediate)
Moratorium on Evaporative Coolers: Giving a Whole New Meaning to the Energy-Water Nexus

Monday, June 27, 2:15 PM - 3:45 PM, Debate 2 (Intermediate)

LIVESTREAM: Building Performance Standards: Are They Good for ASHRAE Members?

Tuesday, June 28, 1:30 PM - 3:00 PM, Seminar 39 (Intermediate)

LIVESTREAM: A Tool to Decarbonize Existing Buildings: An Overview of ASHRAE's Technical Resource Guide on Building Performance Standards