

AGENDA
TC 7.6 Building Energy Performance
Monitoring and Energy Performance Subcommittee
2021 ASHRAE Winter Conference, Virtual
Thursday, January 14, 2020, 2:00 – 4:00 pm

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*
- b. **Standard 105-2014**, *Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions*
- c. **Standard 211-2018**, *Standard for Commercial Building Energy Audits*
- d. **Standard 189.1**, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*
- e. **Standard 228P**, *Standard Method of Evaluating Zero Energy Building Performance*
- f. **Guideline 14-2014**, *Measurement for Energy, Demand, and Water Savings*
- g. **Guideline 34-2019**, *Energy Guideline for Historic Buildings*
- h. **AEDG, Achieving Zero Energy series**

3. Project Announcements and Updates

- a. Proposal to update ASHRAE Performance Measurement Protocol (PMP) into an ASHRAE Guideline (Kim and Hunn)
 - i. Distinct from Guideline 14 in that PMP includes IEQ, not focused on M&V
 - ii. Some attendees have used PMP for post-occupancy evaluations, and support the value of the PMP
 - iii. Concern about lack of other TC collaboration, balance of committee categories
 - iv. Subcommittee is supportive of proposal to turn PMP into a guideline
- b. Other

4. Buildings, Energy, and COVID-19

- a. Unprecedented (8.8%) decline in global CO₂ emissions in first half of 2020 compared to previous period in 2019, but strong rebound effects, with emissions mostly back to normal by July 2020: <https://www.sciencedaily.com/releases/2020/10/201014082806.htm>
- b. IEA report on COVID-19 impacts on electricity showed similar trends in the EU, with drops of between 10-20% during lockdown but rebound back to normal by October: <https://www.iea.org/reports/covid-19-impact-on-electricity>
- c. U.S. office building electricity consumption dropped 24% at height of COVID-19 pandemic in May 2020 but was back within 10% of pre-pandemic levels by October 2020. “Best in class” buildings were able to achieve 40% at height of lockdown: <https://facilityexecutive.com/2020/10/building-electricity-consumption-rising-faster-than-occupancy/> (includes speculation on why savings aren’t greater).
- d. kW Engineering has published an infection risk calculator and an OA calculator for COVID-19 impacts:

- i. <https://www.kw-engineering.com/covid-19-infection-risk-calculator-indoor-air-buildings-hvac-air-conditioning-heat/#Risk%20COVID-19%20Infection%20Commercial%20Building%20HVAC>
- ii. <https://www.kw-engineering.com/indoors-ventilation-spread-covid-19-mitigation-workplace-offices-schools/#Ventilation%20HVAC%20Impact%20COVID-19>

5. Governmental Policy

- a. Municipal: Building Energy Performance Standards and Zero Energy Buildings
 - i. ACEEE white paper profiles 17 jurisdictions in various stages of BEPS adoption; benchmarking highlighted as a foundational step: <https://www.aceee.org/white-paper/2020/06/mandatory-building-performance-standards-key-policy-achieving-climate-goals>
 - ii. In response to concerns that BEPS may disproportionately burden low-income residents in multifamily buildings, IMT has some recommendations for developing BEPS: <https://www.imt.org/resources/understanding-the-housing-affordability-risk-posed-by-building-performance-policies/>
 - iii. Zero-energy (and zero-energy ready) buildings are the focus of an increasing number of energy efficiency programs, with about 20 programs in the U.S. and Canada emphasizing this goal: <https://www.aceee.org/blog-post/2020/09/zero-energy-buildings-are-focus-growing-number-energy-efficiency-programs>



Figure 2. States and programs profiled in this brief. States that are shaded blue have programs that serve the majority of the state. Yellow dots indicate programs operated by individual program administrators that are not discussed in the sections on the shaded states.

- b. Municipal: Electrification and natural gas bans:
 - i. Programs to electrify space heating in commercial and residential buildings are growing: <https://www.aceee.org/blog-post/2020/09/zero-energy-buildings-are-focus-growing-number-energy-efficiency-programs>
 - ii. Some cities have faced barriers to natural gas bans, but BEPS could be a path towards electrification: <https://www.imt.org/the-challenge-facing-gas-bans-and-what-can-be-done/>

- iii. San Jose, CA has expanded its natural gas ban in newly constructed commercial and residential buildings: <https://www.sanjoseca.gov/Home/Components/News/News/2210/4699>
 - iv. Seattle has proposed a ban on natural gas for space heating in new commercial and large multifamily buildings, and for water heating in large hotels and multifamily buildings: <https://www.natlawreview.com/article/seattle-proposes-natural-gas-ban-new-buildings>
 - v. In November 2020, San Francisco passed a ban on natural gas heating, appliances, and fireplaces in new buildings: <https://www.sfgate.com/bayarea/article/San-Francisco-bans-natural-gas-in-new-buildings-15720536.php>
- c. Municipal: Other Policy News
 - i. NYC's building energy efficiency grading program went into effect on October 1, 2020. Of the 40,000 buildings required to post a letter grade, about half earned D grades: <https://www.curbed.com/2020/10/new-york-grading-buildings-energy-efficiency.html> and <https://cooperator.com/article/dobs-energy-efficiency-grading-program-launches/full>
 - ii. Philadelphia's Building Energy Performance Policy, which requires "tune ups" goes into effect this year: <https://www.phila.gov/2020-11-27-philadelphia-building-energy-performance-policy-goes-into-effect/> (related: ASHRAE Standard 230 is looking at what "tune ups" actually cover)
 - iii. Recent ACEEE analysis highlights small cities leading the way on energy efficiency (includes a separate category for buildings policies): <https://www.aceee.org/press-release/2021/01/aceee-analysis-finds-small-cities-can-lead-clean-energy-too>
 - iv. IMT released an updated benchmarking policy comparison matrix, with additional variables (e.g., number of buildings covered): <https://www.buildingrating.org/graphic/us-commercial-building-policy-comparison-matrix>
- d. State
 - i. At end of 2020, California adopted a rule to phase down the use of HFC refrigerants: <https://www.achrnews.com/articles/144212-california-approves-rules-to-phase-down-hfcs>
- e. U.S. Federal
 - i. COVID-19 omnibus spending bill included provisions for bringing US in alignment with Kigali Amendment to Montreal Protocol on HFC refrigerant phase-out and energy efficiency tax credits under Section 179D are made permanent: <https://www.linkedin.com/pulse/covid-19-stimulus-comes-hfc-phase-out-more-jim-kelsey/?trackingId=dOXYQqAHREKx%2FUDtq5SUoQ%3D%3D>
 - ii. DoD has released guiding principles compliance document: https://wbdg.org/FFC/ARMYCOE/SDP/GBI_GPC_DOD_Buildings_Tool_Overview.pdf
- f. International
 - i. A number of significant building energy performance initiatives are planned as part of the European Green Deal Renovation Wave: https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en.
 - ii. For perspective on the role of minimum energy performance standards in the EU renovation wave: <https://www.raponline.org/knowledge-center/filling-the-policy-gap-minimum-energy-performance-standards-for-european-buildings/> and <https://www.youtube.com/watch?v=0yOIRruhA&feature=youtu.be>

6. Data and Databases

a. CBECS

- i. The 2018 CBECS preliminary building characteristics are now available. This preliminary data release includes building counts, square footage, and age of buildings by building size, building activity, year of construction, and census region and division: <https://www.eia.gov/consumption/commercial>
- ii. EIA compiled the preliminary 2018 results into a handy flipbook: <https://www.eia.gov/consumption/commercial/pdf/CBECS%202018%20Preliminary%20Results%20Flipbook.pdf>
- iii. Major findings: U.S. commercial buildings have gotten larger, and include growth in lodging, health care, and public order and safety building types, which require longer operating hours (and may have implications for energy use): <https://www.eia.gov/todayinenergy/detail.php?id=46118>
- iv. CBECS 2018 consumption and expenditure data expected to be published in 2022.

b. RECS

c. BPD

- i. The BPD recently got a new user interface: <https://bpd.lbl.gov/>

7. Benchmarking Tools

a. ENERGY STAR

- i. U.S. EPA ENERGY STAR released guidance on benchmarking during COVID-19, which includes updating number of operating hours and number of workers: https://www.energystar.gov/buildings/use_portfolio_manager/covid_19_program_changes

b. Other tools

- i. Building EQ
- ii. DOE Asset Score

8. ASHRAE Sessions of Interest

TBD