



**TC 7.6 Building Energy Performance**

<https://tc0706.ashraetcs.org/>

Virtual ([zoom meeting](#))

Tuesday, June 28<sup>th</sup>, 2022, 1:00-3:00 pm PDT

**TC/TG/MTG/TRG MINUTES**

TC/TG/MTG/TRG No. TC 7.6 DATE 2022-06-28

TC/TG/MTG/TRG TITLE Building Energy Performance

DATE OF MEETING 2022-06-28 @ 1-3:00pm EDT LOCATION Toronto, ON, CA (Hybrid)

*(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)*

**Attendees**

Summary: Total = 27, VM = 12, CM = 9, PCM = 6, G = 1, YEA = 4

Name	Email	Affiliation	Voting Status	YEA	Notes / Comments
Christine Reinders	<a href="mailto:christinereinders@gmail.com">christinereinders@gmail.com</a>	Iowa State University	CM	N	Program Subcommittee Chair
Dennis Landsberg	<a href="mailto:DLandsberg@LS-Energy.com">DLandsberg@LS-Energy.com</a>	L&S Energy Services, Inc.	CM	N	
Fredric Goldner	<a href="mailto:fgoldner@emra.com">fgoldner@emra.com</a>	Energy Mgmt & Research Associates	CM	N	
Terry Sharp	<a href="mailto:sharptr@ornl.gov">sharptr@ornl.gov</a>	Oak Ridge National Lab	CM	N	
Steven Carlson	<a href="mailto:carlson@xrganalytics.com">carlson@xrganalytics.com</a>	XRG Analytics	CM	N	
Kajen	<a href="mailto:kagen777@gmail.com">kagen777@gmail.com</a>		CM	Y	
Yeonjin Bae	<a href="mailto:baey@ornl.gov">baey@ornl.gov</a>	ORNL	CM	N	Webmaster
Alexander Z			CM	N	
Bruce Hunn			CM	N	
Sateesh K			guest	N	Section Head
Aykut Yilmaz	<a href="mailto:aykut.yilmaz@dc.gov">aykut.yilmaz@dc.gov</a>	District Department of Energy and Environ	PCM	N	
Amir Zare	<a href="mailto:azare@insightusa.com">azare@insightusa.com</a>	Insight Partners	PCM	N	
Kelly Majewski	<a href="mailto:kelly.majewski@am.jil.com">kelly.majewski@am.jil.com</a>	JLL	PCM	Y	
Rhys Davis	<a href="mailto:rhys@resourcerefocus.com">rhys@resourcerefocus.com</a>	Resource Refocus	PCM	N	
Ruben Abreu	<a href="mailto:rabreu@walkerreid.com">rabreu@walkerreid.com</a>	Walker Reid Strategies	PCM	N	
Oumou Sidibe	<a href="mailto:Oumou.sidibe@ici.com">Oumou.sidibe@ici.com</a>	Johnson controls	PCM	Y	
Scott West	<a href="mailto:scott.west@hfa-ae.com">scott.west@hfa-ae.com</a>	HFA	VM	N	
David Eldridge	<a href="mailto:Deldridge@grummanbutkus.com">Deldridge@grummanbutkus.com</a>	GBA	VM	N	SuperY AEDG Liaison
Hyojin Kim	<a href="mailto:hyojin.kim@njit.edu">hyojin.kim@njit.edu</a>	New Jersey Institute of Technology	VM	N	Research SC Chair
Barry Abramson	<a href="mailto:barry.abramson@servidyne.com">barry.abramson@servidyne.com</a>	Servidyne	VM	N	
Paul Mathew	<a href="mailto:pamathew@lbl.gov">pamathew@lbl.gov</a>	LBLN	VM	N	
Chonghui Liu (CL)	<a href="mailto:cliu@popligroup.com">cliu@popligroup.com</a>	Popli Design Group	VM	N	Std Subcommittee Chair, 90.1 liaso
Annie Smith	<a href="mailto:smithannelise314@gmail.com">smithannelise314@gmail.com</a>	Ross & Baruzzini	VM	Y	Vice Chair
Joe Hofstetter	<a href="mailto:jhofstetter@karpinskieng.co">jhofstetter@karpinskieng.co</a>	Karpinski Engineering	VM	N	
Amanda Webb	<a href="mailto:amanda.webb@uc.edu">amanda.webb@uc.edu</a>	University of Cincinnati	VM	N	Secretary, Monit Energy Perf. Sub
Nicholas Long	<a href="mailto:nicholas.long@nrel.gov">nicholas.long@nrel.gov</a>	NREL	VM	N	BDE Subcommittee Chair
Eric Yang	<a href="mailto:ericyangcem@gmail.com">ericyangcem@gmail.com</a>	Amazon web service	VM	N	Energy Management Subcommitte
John Constantidine	<a href="mailto:jmc@mail.ashrae.org">jmc@mail.ashrae.org</a>	US Space Force	VM	N	

**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.**

**1. Roll call and Introductions**

**Kelsey**

- Welcome new members and visitors
- [Sign in](#) (note check list for prior meeting info you can cut and paste)
- Agenda is on basecamp ([kelsey@kw-engineering.com](mailto:kelsey@kw-engineering.com))

**2. ASHRAE Code of Ethics Commitment**

**Kelsey**

In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity, and respect for others, and we shall avoid all real or perceived conflicts of interests.  
(See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics.>)

- 3. Accept agenda/approve minutes of January Hybrid meeting** **Kelsey**
- TC 76L listserve (170-ish names; Includes most TC 7.6 members + dozens more; is self-managed and not official). Mail to tc76-l@lists.onebuilding.org – or go to www.onebuilding.org to sign up.
  - Roster access by TC members (log into My Membership on ASHRAE website)
  - Approve minutes of 2022 Las Vegas (hybrid) Winter meeting
    - **Motion #1:** It was moved (Long) and seconded (Constantinide) that:
      - 1) Minutes of the TC 7.6 2022 Winter Meeting be approved as drafted
        - **Motion #1 – PASSED** 12-0-0-3 CV (In favor - Against - Abstaining - Not Present)
  - **Action Item:** Webb as incoming Vice Chair to resolve: (1) Hyojin Kim’s voting status as listed with ASHRAE and (2) that Voting Members are correctly listed on TC 7.6 roster.
- 4. Announcements and Chair Remarks**
- Chair Remarks **Kelsey**
    - Update on Chair’s emphasis – plans for future
      - Raise awareness of CO2 as fn(t) and electrification as guiding principles (WIP) [www.ashrae.org/decarb](http://www.ashrae.org/decarb)
      - Finalize Development of Best Practices / Green Book Update (WIP)
      - Setting charter for Energy Management Subcommittee (done)
  - Announcements **Kelsey**
    - Stepping down
    - Kelsey expresses his thanks to all TC 7.6 members for keeping this TC active.
- 5. Membership** **Smith**
- Currently 15 VMs
  - John Constantinide, Ricson Chude, Alexander M. Zhivov members rolling off 6/31/2022
  - Following this meeting, Annie Smith advances to Chair, Amanda Webb advances to VC
  - Christine Reinders-Caron re-joining TC as Voting Member – Secretary
    - Reinders will also remain Programs subcommittee chair for now. If others are interested in taking on that role, contact Christine.
  - Barry Abramson & Scott West join as voting members
  - Voting membership: please ensure attendance or lose your status
  - **Action Item:** Webb as incoming Vice Chair to ensure that Reinders is listed as included as a voting member and programs subcommittee chair in the TC 7.6 roster.
- 6. Standing Committee Liaison Reports (TAC/RAC/StdCom/Program/SpecPub/ALI/BuildingEQ)**
- Section Head (Satheesh) **Kulankara**
    - Recording of the TAC Chair’s Breakfast is available on [TAC website](#).
    - TAC has developed training modules (25 modules, 10 hours total) that are also available on the [TAC website](#).
    - ASHRAE (via Satheesh) provided Jim Kelsey with a certificate of recognition for his service to ASHRAE and as TC Chair (Thank you, Jim!)
    - TAC encourages TCs to hold interim virtual meetings between the ASHRAE conferences as needed.
    - **Action Item:** Kelsey to send TC activity form (by Midnight 6/28/2022) to Satheesh.
  - AEDG **Eldridge**
    - Zero energy multifamily building guide has been published and is available for download.
    - There have been 700,000 total AEDG downloads to date.

- Tom Phoenix rolling off as AEDG chair and Chuck Gullledge rolling on as new chair
- AEDG committee interested in: (1) additional zero energy guides; (2) developing more interactive formats for future guides; (3) potentially developing zero carbon guides; (4) addressing existing buildings; (5) updating the 50% AEDGs to current code reference.
- AEDG committee has developed a feedback questionnaire that Eldridge will circulate to TC 7.6 members.
- **BuildingEQ** **Hunn**
  - Building EQ portal continues to improve.
  - Building EQ committee currently considering updates to portal to add in features to accommodate an ASHRAE Level 2 energy audit.
  - Hunn proposes Supriya Goel or Michael Deru as new potential TC 7.6 liaisons to Building EQ.
  - **Action Item:** Kelsey to discuss role of Building EQ liaison with Goel and Deru.
- **Guideline 45P** **Kim/Hunn**  
 Measurement of Whole Building Performance for Occupied Buildings,  
 Except Low-Rise Residential Buildings
  - Interim committee meetings every 3 weeks. Next meeting on July 11 at 11:30 AM ([full schedule here](#)).
  - Committee currently has 16 VM, 7 NVM/liaisons, and 2 designated reviewers.
  - Progress since ASHRAE Winter Meeting: (1) defined target audience for each section; (2) drafted table of contents and authors for each section.
  - Major planned changes vs. PMP: (1) added section on occupants; (2) added section on IEQ interactions; (3) lighting section will be renamed “Visual environments” to encompass broader considerations such as views.
- **SSPC 90.1 Liaison** **Lui**
  - Most significant recent change for 90.1 is that addendum AG has been published, which introduced total system performance ratio (TSPR).
- **SSPC 90.2 Liaison** (need Liaison)
  - TC 7.6 has been without an SSPC 90.2 liaison for several years; Constantinide wondered whether a TC 7.6 liaison is needed, or whether another TC might be a better fit.
  - **Action Item:** Kelsey (with follow up from Smith and Webb) to (1) confirm that TC 7.6 is cognizant on 90.2 and (2) check with 90.2 chair on need for liaison to 90.2 from TC 7.6.
- **SSPC 100 Liaison** **Landsberg**
  - Target table update to use 2012 CBECS data is complete.
  - GHG emissions target tables are currently under development.
- **SSPC 189.1 Liaison (Roger Hedrick, Chair)** **West**
  - Roger Hedrick is no longer chair; current chair is Katherine Hammack.
  - Most recent (2020) version of 189.1 incorporated eGRID values in carbon calculations; committee is currently discussing incorporating marginal carbon and future carbon as a jurisdictional option in the next version (2023).

## 7. Multi-Disciplinary Task Group Reports

- PMP Working Group **Kim**  
 (Discussed above under Guideline 45P)

## 8. Subcommittee Reports

### A. Standing (Functional) Subcommittees

#### 8.1 Research

**Kim**

- 1 RP recently completed: 1836-RP. Contractor (Webb) is planning an RTAR for follow-up work.
- 3 RPs in progress: (1) 1771-RP (final report approved by PMS and up for TC vote today); (2) 1814-RP (awaiting update from PI); (3) 1815-WS was approved by TC 7.6 at last Winter Meeting and went out for bid this spring.
- 6 RTARs currently in progress; 3 RTARs will be dropped after this meeting due to similar ideas being pursued by other organizations.
- TC 7.6 looking for more RTAR ideas; PTAR ideas are also an option.
- Landsberg will roll onto RAC in July.

## 8.2 Handbook

**Constantinide**

- TC 7.6 voted out changes to the Handbook chapters at the Winter Meeting; only a brief subcommittee meeting at Toronto meeting.
- Constantinide rolling off as Handbook subcommittee chair; Ali Shirazi is rolling on.

## 8.3 Standards

**Liu**

- Std 90.1 **Liu**
- Std 100 – Continuous Maintenance **Landsberg**
  - New version of the target tables updated to 2012 CBECS will be going out for public review shortly.
- Std. 105 – 2021 Revision (Continuous Maintenance?) **Carpenter**
  - Landsberg provided update. Standard 105-2021 is published.
- Gdl. 14 – 2014 Revision **Landsberg**
  - Updated version should be voted out for public comment within the next week.
  - Guideline 14 is planning an ASHRAE journal article related to the updates
- Std. 211 – Seeking Chair **Kelsey**
  - Update is of interest to many, but the committee needs a Chair. If interested, get in touch with Jim Kelsey.
- Prop Std 228 on net-zero energy buildings (w/TC 2.8) **Landsberg**
  - Currently out for third public review (only sections addressing carbon).

## 8.4 Programs

**Reinders**

### Conference Paper Sessions

- TC 7.6 sponsored/co-sponsored two sessions at the Toronto conference.
- Seminar submission deadline for 2023 Winter Conference in Atlanta is August 9. Submission portal should open on July 15.
- For 2023 Annual Conference in Tampa, FL CEC is compressing the conference paper schedule so that the overall publication time will be reduced by 2.5 months.

## 8.5 Web Site

**Bae**

(Send your agendas and minutes if not already on basecamp)

## B. Topical Subcommittees

### 8.6 Monitoring & Energy Performance

**Webb**

- Roundup of the state of government policy, data, and tools
- Highlights:

- Two new jurisdictions – Montgomery County, MD and the State of Maryland - have passed Building Performance Standards. Ten total U.S. jurisdictions with BPS to date.
- Proposal in Vermont legislature to enact a “Clean Heat Standard” that would create a marketplace for “clean heat credits” in an effort to reduce fossil fuel use from heating.
- 2018 CBECS consumption data will be released by the end of 2022 and 2020 RECS consumption data will be released in early 2023.
- ENERGY STAR Portfolio Manager released a Building Emissions Calculator tool that allows users to estimate historical, current and future annual greenhouse gas emissions resulting from building energy use.

### 8.7 Energy Management

Yang

- Updates to ALI course on energy management were completed and course was delivered twice since Winter Meeting (once in May and once at Toronto conference).
- Have been holding monthly subcommittee meetings between ASHRAE conferences.
- Currently developing an RTAR idea on BAS data.

### 8.8 Commercial Building Audits

Hofstetter

- Making regular progress to Green Book updates via biweekly subcommittee meetings.
- Major next steps include assembling pictures and other graphics.
- Looking for additional help if others want to get involved.

### 8.9 Federal Buildings

Zhivov

- Completed Guide for Resilient Thermal Energy Systems in Hot and Humid climates. Looking for reviewers for this document. John Constantinide volunteered.
- Developed Energy Master Planning toward Net Zero Energy Resilient Public Communities Guide which is available on IEA EBC Annex 73 website.
- Developed Deep Energy Retrofit - A Guide to Achieving Significant Energy Use Reduction with Major Renovation Projects, as well as two complementary guides: Deep Energy Retrofit - Business Guide for Public Buildings and Deep Energy Retrofit - A Guide for Decision Makers. All of these, plus a collection of case studies, are available on IEA EBC Annex 61 website.
- Putting together a forum in November on energy security efforts in Europe and decarbonization.

### 8.10 Building Data Exchange

Long

- Roundup of building data exchange formats and workflows.
- Highlights:
  - New ASHRAE SPC 232P, Schema-Based Building Data Model Protocols is beginning work.
  - Guideline 20 has been reconstituted and has a new working title.
  - Discussed potential IBPSA and ASHRAE BDE subcommittee collaboration.
  - Discussed DOE tools developments and interconnections.

## 9. Other Topics

## 10. Old Business

## 11. New Business

- TRP-1771 Approved by PMS, Ready for TC approval
  - Final report was approved by PMS in March 2022
  - **Motion #2:** It was moved (Kim) and seconded (Liu) that:
    - 2) 1771-RP be approved as complete
      - **Motion #2 – PASSED** 12-0-0-3 CV (In favor - Against – Abstaining - Not Present)

- ASHRAE Journal Article review re: Chilled Beams **Kelsey**
  - TC 7.6 has a request for review of an ASHRAE Journal article on chilled beams. Looking for reviewers. Scott West and Eric Yang volunteered to review.
  - **Action Item:** Kelsey to follow up on review with West and Yang.
- Position Documents that TC 7.6 is responsible for **Kelsey**  
EE in Buildings last updated in 2019 (due for revision)
  - TC 7.6 is currently working to revise ASHRAE position document: Energy Efficiency in Buildings. It was published in 2019 and is due for revision by November 2022.
    - [https://www.ashrae.org/file%20library/about/position%20documents/pd\\_energyefficiencyinbuildings\\_2020.pdf](https://www.ashrae.org/file%20library/about/position%20documents/pd_energyefficiencyinbuildings_2020.pdf)
  - Adam Hinge, Barry Abramson, and Dave Eldridge have all volunteered to help with this. Looking for more volunteers. Amir Zare, Fred Goldner, and Reuben Abreu, Chonghui Liu, Kagen, and Eric Yang all volunteered.
  - **Action Item:** Kelsey will follow up with all volunteers to schedule a kick-off meeting.
- TC Recognition **Kelsey**
  - After many years of dedicated service to ASHRAE Bruce Hunn is stepping away from involvement, except for work on Guideline 45P.
  - Kelsey noted that Hunn has been an institution within TC 7.6 and ASHRAE and has made innumerable contributions to the Society, including as Chair of TC 7.6, and work on the PMP, Building EQ, Standard 211, Standard 100, the Handbook, and many other efforts, in addition to his many accomplishments beyond ASHRAE.
  - Kelsey noted that Hunn has set a true example of service to the TC and to ASHRAE.
  - Hunn noted his gratitude to the TC for their support and work together over the years.
  - **Motion #3:** It was moved (Kelsey) and seconded (Constantinide) that:
    - 3) The members of TC 7.6, Building Energy Performance, through this motion, expresses its sincere gratitude to Dr. Bruce Hunn, for his many, significant, and lasting contributions to this committee and ASHRAE. We thank him for his exemplary work on behalf of us all.
      - **Motion #3 – PASSED** 12-0-0-3 CV (In favor - Against – Abstaining - Not Present)

## 12. Adjourn