



MINUTES

DRAFT

TECHNICAL COMMITTEE

2025 Winter Meeting

February 9, 2025

Note: These draft minutes have not been approved and not the official, approved record until approved by the Technical Committee.



1791 Tullie Circle, N.E./Atlanta, GA 30329

404-636-8400

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TC/TG/MTG/TRG MINUTES COVER SHEET

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

TC/TG/MTG/TRG No. TC 2.8 DATE 02/09/2025

TC/TG/MTG/TRG TITLE Building Environmental Impacts and Sustainability

DATE OF MEETING 02/09/2025 LOCATION Orlando, FL/Virtual

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Kevin Brown (Chair)	2021	Alara Apcin	2018	Nuria Casquero
Kevin Cross	2002	Rafi Karim (Secretary, non-voting)	2023	Tom Lawrence
Janice Means	2005			Diana Fisler (SH2)
Lisa Ng (Vice-Chair, nonvoting)	2023			Hailey Mick
Natalie MacDonald	2024			Michael Deru
Svein Morner	2023			Costas Balaras
Ashish Rakheja (non-quorum)	2022			Furhung Esmueili
James Sweeney	2016			Edith Blennerhassetts
Sumayyah Theron	2022			Wilmer Pasut
Juliana Pellegrini Trigo	2024			Douglas Fick
Tania Ullah	2023			Vik Patnaik
				Frank Mills

EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE (continued)

Nurayn Tiamiyu	Guillermo Soriano	Allora Novak
Mitchell Swann	Charles Biberg	Brittany Carl Moser
Parichehr Salimifard	Insung Kang	Fred Betz
Joy Altwies	Costas Balaras	Eric Yang
Coral Pais	Eric Peterson	Kajen Singhan
Lin Wang	Katherine Hammack	Patrick Ata
Chris Ahne	Jo Norris	Ramy Mohammed

Qilong Hong	Michael Vogel	Anthony Guerra
Harvey Schowe	Tracy McKeon	
DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:		
TAC Section Head: Diana Fisler		SH2@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)		See ASHRAE email alias list for needed addresses.
Mike Vaughn, Manager Of Research & Technical Services		MORTS@ashrae.net

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Shaping Tomorrow's
Built Environment Today

TC 2.8 Building Environmental Impacts and Sustainability

Sunday Feb 09, 2025, 3:30 PM – 5:30 PM EDT

Orlando Hilton, Key West A (LL)

Kevin Brown invited you to a Microsoft Teams Meeting:

TC 2.8 Main Meeting

Sunday, Feb 09, 2025

3:30 PM - 5:30 PM (EST)

Meeting link: [TC 2.8 Main Meeting](#) | [Microsoft Teams](#) | [Meetup-Join](#)

ASHRAE Value Statement – *In ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, inclusiveness and respect for others, which exemplify our core values of excellence, commitment, integrity, collaboration, volunteerism and diversity, and shall avoid all real or perceived conflicts of interest. Our culture is one of inclusiveness, acknowledging the inherent value and dignity of each individual. We celebrate diverse and inclusive communities, understanding that doing so fuels better, more creative and more thoughtful ideas, solutions and strategies for the Society and the communities our Society serves. We respect and welcome all.*

Chair: Meeting Called to Order at 3:34 PM Local Time

1. **Roll call and Introductions** Brown / Ng
In-person and virtual attendees introduced.
Quorum present (10 out of 12 voting members including Chair).
2. **Review and Accept Agenda** Brown / Ng
Agenda reviewed and accepted.
3. **Review / Approval of January 2024 Meeting Minutes** Brown
Cross moved. Theron second. No discussion. Approved 10-0-0-CNV (Y-N-A-CNV).
4. **Standing Committee Liaisons** TAC / RAC / Standards / Programs
 - Government Affairs is looking for SMEs
 - RAC
 - Updates coming to OSR system
 - Standards Committee tasked with harmonization of standards
 - TAC
 - Look out for new YEA mentor program where YEA member will shadow members during conferences (see TAC basecamp, or reach out to Kevin B)
 - Looking to streamline processes like activity reporting and roster updates
5. **Subcommittee Reports (detailed reports attached if available)**
 - 5.1 High Performance Buildings Simplified Lawrence
 - No current update, 2nd edition came out a year ago
 - Ensure Special Publications knows that TC2.8 is cognizant of this publication
 - 5.2 International Mills / Rakheja

- Update from GTIC – new committee; sent out global survey to international chapters to offer help to international chapters/members; survey identified areas of interest in high performance buildings and decarbonization
 - CIBSE Standard just published – [TM65](#) – embodied carbon and MEP components
- 5.3 Water-Energy Nexus Karim Betz
- WEN met twice last week
 - Open forum discussion on current events and issues we are seeing globally with the impacts of weather variability, including growth in markets like data centers. Discussed the importance of systems thinking with the lens of water energy nexus for future projects to mitigate environmental impacts.
 - Additional discussion of resources available for public use including US Drought Monitor, EDO European Drought Observatory and UC Davis Center for Water Energy Efficiency.
 - Update provided by Water Energy Nexus Guide authors on the progress made thus far on the draft guide. Current chapter 2 (Methods) will be moved down, and current chapter 3 (Design Options) will be moved up and rearranged for better flow. For Methods chapter Fred has 3 modeling papers that will need to be synthesized down to fit the chapter sections. Jeetika noted that Behavioral chapter authors have made significant progress. Fred has 3 modeling papers that needs to be synthesized into chapter 2. There were a couple of new volunteers from the guest attendees who expressed interest with the guide development. A working session meeting will be scheduled with the guide authors and new volunteers after the winter conference.
 - Fred and Jim shared the update regarding the research proposal/work statement for Water Energy Nexus that was previously accepted by ASHRAE. It will need to be reissued to ASHRAE for next steps.
- 5.4 Research Cross
- Met a week ago Friday, 1/31
 - Five active projects:
 - RP-1929: Evaluation of building life cycle analysis tools incorporating embodied carbon. Currently 10 months into this 24 month duration research project; progressing well. The lead investigator presented to us during the first part of our meeting.
 - WS-1977: Expand and update the ASHRAE Service Life Table in the HVAC Applications Handbook. This was completed by Natalie MacDonald on an expedited timeline late last year and approved by TC 2.8. Just got word that the RAC returned this to us for more work. We're currently looking at options for moving this forward through the CEBD and ASHRAE Board.
 - Work Statement -1885 Guideline/Book for Design Installation and Operation of PV (Solar and Other Renewable). TC 6.7 is lead on this. RAC returned RTAR and asked TC 6.7 to resubmit as PTAR. TC 6.7 to do this; we'll then need to revote on our cosponsorship.
 - WS-1947 Climate change driven extreme temperature effects map for efficiency and resilience map of heat pump technology. TC 2.5 is lead on this. Recently went out to bid; PES is in the process of recommending which bidder to select. Parichehr is on the PES.
 - Roadmap for Transitioning Existing Hospitals to Net Zero Energy Hospitals. Frank is planning to pursue this as a "special publication" to be developed by volunteers. This follows a guide developed by the CEBD Guide that is focused on New Hospitals. If you are interested in volunteering, see Frank.
- 5.5 Programs Theron
- TC2.8 will be sponsoring a seminar at the upcoming [Decarb conference](#) titled "From Mobilize to Manage: Navigating the 5M Decarbonization Journey"
 - ASHRAE College of Fellows available to co-sponsor programs
 - Phoenix deadline Feb 26
- 5.6 Handbook – Chapters 34 & 35 Morner
- Updates finished for 2025 Fundamentals
 - Next cycle of updates to be started soon
 - Could we produce online versions to have color figures? Need volunteers
 - New chapter in Fundamentals "Exergy" (contact Means for more info) – not responsibility of TC2.8 but we could coordinate and solicit volunteers from TC2.8

6. Related Activities Reports

6.1 Standards

- SSPC 189.1 High-Performance Green Buildings Lawrence
- SSPC 189.3 High-Performance Green Healthcare Facilities Fick
 Meet Monday 8am-12pm
 Want to align publication with 189.1 timeline
- SPC 191P Efficient Use of Water in Buildings Betz
 SPC 191P is meeting tomorrow (Monday) at noon in Clermont
 We completed the 4th public ISC review and have addressed all comments.
 We have a few changes that are stemming from that review that we're updating, which will likely trigger a 5th public ISC review of 3-5 changes.
 We're also cleaning up the definitions section as the last major update to the standard.
 The goal is to publish the standard this year.
- SSPC 228 Standard Method of Evaluating Zero Energy Building Performance ~~Forcellini~~
- SPC 227P Passive Building Design Standard ~~Forcellini~~
- SPC 240P Whole Life Greenhouse Gas Emissions? ~~Deru~~ MacDonald
 Seminar tomorrow, 11am
- SPC 242 Methods of calculating greenhouse gas emissions for buildings (Operational)? – ~~Deru~~
- Approved TPS re:Life Cycle assessment for product claims "Sustainability Assessment for MEP Assemblies"

6.2 ASHRAE Advanced Energy Design Guides Update

Forcellini

7. Old Business

7.1 [TC 2.8 Basecamp](#) site

7.2 Review Voting Membership roster

Consider going to 15 voting members; stretch to 13 for summer meeting

- Mills (international, MNQ)
- Ashish – on ballot to be ASHRAE Treasurer – so willing to roll off
- Brown will reach out to individuals and make edits to Roster
- Cross to be Secretary and Research Chair
- Ullah will roll off as VM since Ng as Chair needs to be voting and they are both at the same organization

Position	Name	End Year	Term Years	Voting Status
Chair	Kevin Brown	6/30/2025	2	Voting (2 Yrs.)
Vice Chair	Lisa Ng		2	Non-voting
Secretary	Rafi Karim			Non-voting
Handbook Subcommittee Chair	Svein Morner	6/30/2026	4	Voting (4 Yrs.)
Program Subcommittee Chair	Sumayyah Theron	6/30/2027	4	Voting (4 Yrs.)
Research Subcommittee Chair	Kevin Cross	6/30/2025	3	Voting (3 Yrs.)
Member Non Quorum	Ashish Rakheja	6/30/2026	4	Voting (4 Yrs.)
Member	Kinga Hydras	6/30/2028	4	Voting (4 Yrs.)

Member	Natalie MacDonald	6/30/2028	4	Voting (4 Yrs.)
Member	Juliana Trigo	6/30/2028	4	Voting (4 Yrs.)
Member	James Sweeney	6/30/2027	4	Voting (4 Yrs.)
Member	Alara Apcin	6/30/2025	4	Voting (4 Yrs.)
Member	Tania Ullah	6/30/2026	4	Voting (4 Yrs.)
Member	Janice Means	6/30/2025	4	Voting (4 Yrs.)

<https://tcroster.ashrae.org/rosterReport?cmtKey=518c6007-fd40-49d5-b8d9-0972f75f3155&fiscalYear=2024-2025>)

www.ashrae.org/joinatc

- 7.3 Voted on Seminar Proposal "From Mobilize to Manage: Navigating the 5M Decarbonization Journey for Summayah at the upcoming Decarbonization Conference in October in Chicago
- 7.4 Voted on moving SPC227P to sustaining (SSPC) at the request of the SPC.
- 7.5 Voted on Research work statement "Expand and update the ASHRAE Service Life Table in the HVAC Applications Handbook." From Natalie MacDonald.
- 7.6 Voted on Research work statement "Photovoltaics on Buildings: A Comprehensive Design Guide." For Janice Means and TC 6.7.

8. New business

- 8.1 ASHRAE TEC (Training and Education Committee). ASHRAE is looking for SME instructors interested in reviewing and teaching a 3h course based on the ASHRAE publication [Grid-Interactive Buildings for Decarbonization: Design and Operation Resource Guide](#), developed by the ASHRAE CEED.
- 8.2 Crawley gave additional updates for 1947-WS Climate change driven extreme temperature effects map for efficiency and resilience map of heat pump technology (which TC2.8 is co-sponsoring)
 - PES meet this week
 - Making recommendation to TC2.5 on winning bid
 - Means to be liaison to TC2.8 on TC2.5
 - Salimifard on PES and moving to PMS so will be liaison to TC2.8 on the project
- 8.3 No additional new business

9. Adjourn

Adjourned 4:45pm.

10. NEXT MEETING: June 22, 2025, Phoenix, AZ

TC 2.8 Web Site

<http://tc0208.ashraetcs.org>

Upcoming Conferences:

Annual, June 21-25, 2025 – Phoenix
 Winter, January 31-February 4, 2026 – Las Vegas
 Annual, June 27-July 1, 2026 – Austin
 Winter, January 23-27, 2027 – Chicago
 Annual, June 12-16, 2027 – New Orleans
 Winter, February 6-10, 2028 – Orlando

TC 2.8 Sponsored Programs in Orlando...

Sunday, Feb 9

9:45 AM – 10:45 AM EDT

Seminar 6: Applying Trusted Fundamentals to Address Our Changing Climate through New Technology and Vernacular Architecture Applications

Sponsoring Committee: 2.5 Global Climate Change

Co-Sponsoring Committee: 2.8 Building Environmental Impacts and Sustainability

Co-Sponsoring Committee: College of Fellows

C. Lamono

Wednesday, Feb 12

9:45 AM – 10:45 AM EDT

Seminar 53: Building Decarbonization: Policy Goals, Performance Standards and Pathways for Optimizing both Climate and Health

Sponsoring Committee: 2.8 Building Environmental Impacts and Sustainability

Other Sponsoring Committee: TC 2.5

J. Means

TC2.8 Research Subcommittee Minutes

Friday, January 31, 2025

4:00 p.m. to 5:00 p.m. EST

Present: Kevin Cross, Jaya Mukhopadhyay, Joy Altwies, Jim Sweeney, Frank Mills, Parichehr

Salimifard, Nuria Casquero, Janice Means, Mike Vogel, Lisa Ng, Carrie Brown, Jo Norris,

Rafi Karim, Natalie MacDonald (taking notes)

1. Agenda review (Kevin)

a. See below

2. Presentation on RP-1929: Evaluation of Building Lifecycle Analysis Tools Incorporating Embodied Carbon

a. Introduction (Kevin)

b. Presentation (Jaya Mukhopadhyay, Montana State University)

i. Involves Montana State Univ. & ZGF Architects & Mckinstry

ii. Goal of project was to evaluate Building Lifecycle Analysis Tools

iii. Objectives include:

1. Cataloging & Evaluating Building LCA Tools

2. Review Literature

3. Recommend Potential Improvements

iv. Survey of A&E Firms in US & Canada conducted; Literature Review Conducted

v. From this, 12 LCA Tools Selected for further assessment

1. Then evaluated if Software included MEP

vi. From then, different base case buildings were selected

vii. 6 software tools were then selected

viii. Various Characteristics of LCA software tools were evaluated for comparison between each software

ix. Madaster, OpenLCA, OneClick, GaBi, and on other(?) purchased for comparison

x. Reviewed methodology and framework for comparison analysis

- xi. Have completed OneClick evaluation
 - xii. Analysis was “cradle to grave” (A1-C4, D)
- c. Questions and response (all)
- i. About 10 months into project; 24 month total project when final results expected

3. Review current research topic ideas (see following table) (20 minutes)

Research Topic Idea	Generated by	Update/Status	Next Steps
ACTIVE: 1929-TRP: Evaluation of building life cycle analysis tools incorporating embodied carbon	Jim Sweeney, Kevin Cross	Project is now in month 10 of 24. Refer to presentation given under agenda item #2/	<i>Research project is moving forward. Jaya may present to us again at our June meeting.</i>
Active: Expand and update the ASHRAE Service Life Table in the HVAC Applications Handbook	Natalie MacDonald, Kevin Cross	Natalie took this project on at the Main TC 2.8 Committee meeting in June 2024, and prepared a Work Statement, which was submitted on 12/14/24. The Work Statement is under consideration by both the RAC and the CEBD.	<i>Lisa said that the project has been submitted to Board for approval. Unclear whether this will go through RAC process or CEBD process. We'll know more after the Winter Conference.</i>
ACTIVE (Co-Sponsor): 1885- Guideline/Book for Design Installation and Operation of PV (Solar and Other Renewable)	TC 6.7: Solar Energy and Other Renewables	In August, TC 2.8 voted to cosponsor this work statement. No one from TC 2.8 has yet expressed interest in serving on the PES.	<i>Janice: Returned to TC 6.7 to write as PTAR instead of RTAR. No one on call indicated they had experience with PTAR process. TC 6.7 does intend to move forward with the PTAR.</i>
ACTIVE (Co-Sponsor): 1947-WS Climate change driven extreme temperature effects map for efficiency and resilience map of heat pump technology	TC 2.5: Global Climate Change	Parichehr volunteered to serve on the PES after the June 2024 meeting. The project may have gone out to bid last fall.	<i>Parichehr: Approved by RAC; under review by panel currently; meeting next week to review proposals/bidding. Seven bids were submitted. Unsure when decision will be made.</i>
ACTIVE: Roadmap for Transitioning Existing Hospitals to Net Zero Energy Hospitals	Frank Mills	Frank prepared a draft RTAR on 6/11/2024. We discussed turning this into a PTAR. Chis Gray recommended	<i>Frank: Evaluating Special Publication Path or PTAR Path. PTAR is written by outside group; Special Publication written by</i>

		that Frank discuss how to move forward with Cindy Michaels of the Publication Committee in late June of 2024.	<p><i>ASHRAE volunteers. This is different than Guide published by CEBD that is focused on New Hospitals. Will discuss which path to go forward with in publication meeting next week.</i></p> <p><i>Frank is proposing this to be a Special Publication Path (ASHRAE Volunteers).</i></p> <p><i>People in mind to work on this? Yes – Keiser Health, mostly in Europe, Heather Burply, and others to tap into. The Research Subcommittee supports Frank moving forward with volunteers.</i></p>
PENDING: Integration of Thermal Energy Storage with Stirling or ORC Engine for Building Decarbonization	John Willis	In January 2024, John said that he is waiting for feedback from TC 1.10 (Combined Heat and Power Systems), and will let Kevin know when he receives same.	<p><i>Kevin will follow up with John via email for updates. If no updates after June 2025; will take off list.</i></p> <p><i>Jim S. requested to be included in correspondence with John.</i></p>
PENDING: Conservation vs. Water Quality from the Design Engineer's Perspective	Water-Energy Nexus Subcommittee (Rafi Karim, Tania Ullah)	In June 2024, Jim said that he would follow up with Rafi on Rafi's suggestion for a potential RTAR author.	<i>Rafi – no update; will take off list for our next meeting.</i>
PENDING: Carbon capture and sequestration in buildings	Janice Means	As of June 2024, Janice was continuing to look for an RTAR author. Jim has expressed interest in helping with this one.	<p><i>Janice: TC 2.5 would like to lead this. Jo Norris has offered to work on this.</i></p> <p><i>Jo: Fairly new to process; going to meet with Janice in Orlando to chat more. Very involved in Carbon Seq. Industry.</i></p> <p><i>Janice & Jo will work together on discussing collab for an RTAR.</i></p> <p><i>Jim is also interested in helping.</i></p>
PENDING: What is the potential for reducing embodied carbon in distribution	Paul Raftery	Kevin and Paul exchanged e-mails on this last summer. Paul is not interested in	<i>Paul not on call; Kevin will follow up with him before removing from list.</i>

systems and building renovations?		moving forward with this one at this time (?)	
ON HOLD: 1933-RTAR: Water-Energy Nexus: Utility Source Water and Source Energy Dataset	Parichehr Salimifard	This RTAR was approved with comments in 2021. Due to the lack of activity since then, the RAC told us we'd have to start over if we're interested. In June 2024, Parichehr expressed in working on this.	<p><i>Parichehr; hoping to focus on this for summer conference. Aiming for May meeting. Will need to re-submit RTAR and if approved, work towards WS. But if clear idea of what the project is, could go straight to WS.</i></p> <p><i>Kevin said he will check with our RAC liaison on this.</i></p> <p><i>Kevin stressed need for submission to be complete at least 2 weeks before RAC meets on May 15th to ensure time for the TC vote.</i></p> <p><i>Anyone helping on this? (Q from Kevin). Patrichehr was intending to reach out to past authors but open to other help as well.</i></p>

4. Discuss new research topic ideas (see following table) (10 minutes)

New Research Topic Ideas	Generated by	Update/Key Questions	Next Step

No new topics proposed on call.

5. Other business

- a. Gauge interest in Research Subcommittee dinner following Main Committee meeting on 2/9

- i. *No one expressed unequivocal interest in doing this. Let Kevin know by end of weekend if interested so he can make a reservation.*

6. Adjournment

- a. We adjourned at about 4:55 EST.

Reference Items

For more information, visit ASHRAE's research web site here: [ashrae.org/research](https://www.ashrae.org/research)

Anyone interested in pursuing research topics (including those who generated ideas above) are asked to take a look at the RTAR form to start fleshing out their ideas. The most recent RTAR and Work Statement forms can be downloaded from the link provide above.

The ASHRAE Strategic Research Plan was updated in 2021. The formal roll out took place at the 2022 Las Vegas meeting.

The published information indicates that future research topics should address one of these topics/goals. Details and specifics on each topic area can be found at this link:

<https://www.ashrae.org/file%20library/technical%20resources/research/research%20strategic%20plan/research-strategic-plan.pdf>

1. Resilience
2. IEQ – Environmental Quality in Occupied Spaces and Impacts on Work and Learning Health and Well Being, and Transmission of Airborne Infectious Viruses
3. Sustainability, Decarbonization, Energy and Resources
4. HVAC&R Equipment, Components, and Materials
5. Tools and Applications
6. Education and Outreach