



MINUTES

DRAFT

TECHNICAL COMMITTEE

2023 Winter Meeting

February 5, 2023

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 2/5/2023

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

DATE OF MEETING 2/5/2023 LOCATION Atlanta, GA/Virtual

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Joy Altwies	2021	Alara Apcin	2018	John Swift
Kevin Brown	2021	Mike Pascual (YEA)	2018	Tom Lawrence
Kevin Cross	2002			Yukiko Yoshida
Rafi Karim (YEA)	2017			Eric Peterson
Janice Means	2005			Paul Torcellini
Svein Morner	2023			James Sweeney
Ashish Rakheja	2023			Mae Underwood
Tania Ullah	2023			Nuria Casquero
				Mitchell Swann
				Frank Mills

EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE (continued)

Carrie Brown	Lisa Ng	Michael Deru
David Evers	James Bradburn	Ng Yong Kong
Renee Clair	Jonathan Hasler	Doug Fick
Rui Zhang	Jo Norris	Harvey Schowe
Juliana Pellegrini	Emmerich	Joe Zhou
Max Potthoff	Mary Kandaras	Stanton Stafford
Hailey Mick	Fred Betz	Natalie MacDonald (YEA)
Christine Do	Amin Delagah	Brittany Carl Moser

DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:

TAC Section Head: Jon Cohen	SH2@ashrae.net
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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

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

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Shaping Tomorrow's
Built Environment Today

TC 2.8 Building Environmental Impacts and Sustainability

February 5, 2023, 6 PM – 8 PM EDT

Online (Webex) and In-person, Atlanta, Georgia Omni CNN Center Atlanta, Oak (Lobby-South)

[Online Meeting Link](#)

Chair: Meeting Called to Order at 6:01 PM EDT

1. Roll call and Introductions

Altwies / Ng

In-person and virtual attendees introduced

Quorum present (8 out of 10 voting members present duration of meeting including Chair)

2. Review and Accept Agenda

Altwies / Brown

Moved by Janice Means, second by Kevin Brown to Accept

3. Review / Approval of June 2022 Meeting Minutes

Ng

Moved by Kevin Brown, second by Kevin Cross to Approve pending the following change: Edit → 5.6 Chapters 34 and 35 reports were given by Morner

4. Standing Committee Liaisons TAC / RAC / Standards / Programs

SH2: Not present

Standards (Fisk):

- BSR/ASHRAE Standard 228P, Standard Method for Evaluating Zero Net Energy and Zero Net Carbon Building Performance out for [2nd ISC Public Review](#)
- Decarbonization activities are being fast-tracked through Standards

RAC: Not present and Research Chairs' meeting not until tomorrow so nothing to report

Other discussion:

- Do we have liaison to [Task Force for Building Decarbonization](#)? This was discussed at the last meeting but we didn't come to a conclusion. We could formally add an update from the Taskforce to our agenda. Lawrence volunteered to give the report.

5. Subcommittee Reports

5.1 Green Guide

Lawrence

- It's out! <https://www.ashrae.org/technical-resources/bookstore/ashrae-greenguide-the-design-construction-and-operation-of-sustainable-buildings>
- Seminar this morning with 50+ attendees in-person
- Abdel (not present) willing to take over editor in 7th edition
- Task Force for Building Decarbonization Update
 - Lawrence to chair "training and education"
 - Board has approved a budget for guides (one guide out for bid is accepting bids for contractors), courses, and a certification program
 - Question on who are the contractors (or what kind) are they seeking?
 - Subcommittee developed work statement
 - Picking winner undergoes the same process as for research projects
 - The process is fast tracked (1-2 years) instead of 3-4 years
 - Welcome any help on the Task Force!

In related discussion:

- Standard 90.1 to be net zero by 2031; will add appendix later this year on that topic (Ashish)
- Standard 90.2 will double savings by 2023 or 2024 (net zero by 2025) (Ashish)
- Free download [Building Performance Standards: A Technical Resource Guide available](#) (Ashish) – 300 downloads already since released on Friday

5.2 International

Mills / Rakheja

- UK cities setting ambitious targets progress toward reaching goals are not clearly defined
- WELL Building Standard can't be applied in UK because of poor outdoor air quality – perhaps this committee could help guide them to another high performance standard
- 60% all new housing built today are gas
- Royal Academy of Engineering free document – could be a future program
- New initiative – International Standards Interaction (ISI) Task Force – to collaborate internationally with like minded societies and countries.
 - Finding ways to make ASHRAE resources available there.
 - Also an avenue for them to share information with us.
 - Creating a standard standing committee (called GPIC) made up of global members. We want more of our international members involved in the development of ASHRAE technical standards.
 - [Global Summit 2022](#) was well received with an overwhelming number of people wanting to attend
 - The ASHRAE [ASA \(Associate Society Alliance\)](#) meets every at Winter Meeting. They will meet tomorrow. They've identified 5 areas they'd like to introduce to the next Global Summit.
 - Excellent findings from Summit (draft report ready). Results sent to planning committee for the next event. Actions items to be sent to TCs. ASHRAE Board evaluating how frequent to attend Global Summit.

5.3 Water-Energy Nexus

Karim

- About 30 attendees at the meeting earlier last week
- Big announcement – Mike Pascual – stepping off of ASHRAE duties. Thank you, Mike, for your years of service
- Water-Energy Nexus Guide: new volunteers have stepped in for particular chapters
 - ASHRAE MTG.OBB (Occupant Behavior in Buildings) will champion Behavioral chapter
 - Design Options has a champion
 - Other volunteers identified. More volunteers always welcome!
- RTAR 1933 – Utility Source Water and Source Energy Dataset – was discussed
- Other research ideas – feel free coordinate with Research Subcommittee Chair (Kevin Cross) to discuss as well – fluid flow loss/research, benchmarking buildings (water side), water efficiency, plumbing system quality
- Would be great to have a new chair but Rafi is more concerned about identifying authors on WEN Guide

5.4 Research

Cross

- Met on 1/31
- Minutes sent to Lisa
- 3 highlights to share
 - Finished up 1814-RP: Actual Energy Performance of Buildings Designed to Comply with ASHRAE Standard 90.1-2010 led by Joe Zhou; hoping to present in June; confirmed that entire seminars can be dedicate to a single RP
 - 1929-WS: Jim and RAC scheduled to meet tomorrow but Kevin Cross heard it might need to be rescheduled
 - Co-sponsoring WS 1947 Climate change driven extreme temperature map for efficiency and resilience map of heat pump technology. TC2.5 meeting tomorrow (Means)

5.5 Programs

Altwhies

- Joe Zhou willing to give seminar (any length) at next meeting
 - Joe Zhou said he can split research projects talk into separate talks because lots of information – will coordinate
 - Kevin Brown volunteered to chair the session
- Joy filled in for Apcin at the Programs Meeting
- Co-sponsoring a series of programs with Daniel Villa (inconvenient truth lectures)

- ISI Task Force may be asking TC2.8 to sponsor a program – how are international partners applying ASHRAE standards local; how they could be used locally; ISI Task Force will reach out (Ashish)
 - Where Programs Chair alias emails going? Joy will talk to Staff but Chair should be cc'd on all messages
 - Anyone else have ideas? Email Joy ; 2/27 deadline for Tampa for submission
- 5.6 Handbook – Chapter 34 Morner
- Both Chapters 34 and 35 due in about a year in Fundamentals 2025 edition
 - Everything on basecamp
 - Meeting with HB liaison on Friday – hopefully Brundage can be involved since he did a lot of work for past editions
 - Looking for volunteers!
- 5.7 Handbook – Chapter 35 Morner
- Updates made with Chapter 34

6. Related Activities Reports

- 6.1 Standards
- SPC 189.1 High-Performance Green Buildings Lawrence
 - New: Jurisdiction option – explicitly pointing out to users of 189.1 out what sections could be made optional
 - Emissions Factors always being updated
 - IAQ – maybe removing flush out requirement since its shown to have limited benefits and the benefits are not easily documented
 - Discussion
 - Is 189.1 significantly better than 90.1? Not as a big difference as it used to be; more in single digit percentage difference now
 - Is 189.1 considering an envelope backstop requirement? IECC requires demonstrating envelope meets standards – can't use systems to overcome too much glass. Window to wall ratio not outlined in 189.1.
 - Been working on addendum for electrification but it's being met with resistance in committee
 - SPC 189.3 High-Performance Green Healthcare Facilities Moser
 - Meeting is tomorrow where they spend time tracking updates to 189.1 and 90.1 that may need to be included in 189.3
 - Decarbonization of healthcare facilities is a big topic of discussion
 - Please read doc and help fill in gaps and help to update (urgent)
 - Updating TPS to reflect 189.1 TPS
 - Would like to give target on reducing carbon footprint but need more data to support target
 - Would like to align with other xxx.3 Standards
 - SPC 191P Efficient Use of Water in Building Betz
 - Two milestones
 - Finished responding to all public review comments
 - Updated TPS
 - Sending out for public review on responses/comments
 - Could be finally published after 17 years!
 - Shifting to continuous maintenance after publication end of this calendar year
 - SPC 228P Standard Method of Evaluating Zero Energy Building Performance Torcellini
 - On the way to Board for final approval for publication
 - Shifting to continuous maintenance after publication
 - Could be out before next meeting
 - Note to Chair: Take Ps out of these proposed standards for next meeting
 - SPC 227P High Performance Envelope Torcellini
 - Working its way through draft
 - Hoping public review by end of society year
 - Not an official public review? Very rough draft

6.2 ASHRAE Advanced Energy Design Guides Update

Torcellini

- Last May, [AEDG multifamily](#) published and in bookstore
- Free downloads, printed version have a cost
- Seminar 53 – Tuesday afternoon
- Today, seminar on solar decathlon and science education

7. Old Business

- 7.1 [TC 2.8 Basecamp](#) site
- Fred needs access (Joy will add him)
 - Can post documents, agendas, minutes
 - Create an account on ASHRAE basecamp first
 - We have two websites – public one and basecamp
- 7.2 Main meeting schedule
- Unsuccessful to select new meeting time among members – considering moving 3:30-5:30pm – since we won't have subcommittee meetings in-person anymore
 - Joy will poll again – many at this meeting showed interested in 3:30-5:30pm though ASHRAE only has certain time blocks available now
 - Joy will take a look and see what works
- 7.3 Future volunteers for WS-1929 PES (Proposal Evaluation Subcommittee)
- Not needed yet but will need one eventually after WS is approved – still a ways out
 - Embodied carbon topic
 - Task Force ready to co-sponsor this research
 - Will need PMS after PES is done
- 7.4 No other old business

8. New business

- 8.1 Volunteers for WEN co-chair
- Mentioned earlier
 - Rafi more concerned with finding authors
- 8.2 Membership roster changes / New voting members for July 1
- Rolling off: ASHRAE asks Chairs to review their roster during the Winter Meeting and identify changes for Summer – Mike P. is rolling off
 - Rolling on: Might need one more person to roll-on to maintain 10 voting members – we have a spot – consider please – things to keep in mind: are you able to make the main meeting? We also conduct votes outside the meeting. We would like to have quorum so, if you've been active in a subcommittee and have time to participate, please contact Joy ASAP.
 - Joy is rolling off as Chair at end of Summer. In the TCs, its customary that the Secretary rolls into Vice Chair, and the VC rolls into Chair.
 - We will also need a Secretary for the next Winter Meeting.
- 8.3 Review and vote on co-sponsoring WS-1947 "Climate Change Driven Extreme Temperature Map for Efficiency and Resilience of Heat Pump Technology"
- Giving voting members more time to review – Cross will send reminder on the vote to be completed by 2/19. Respond to TC2.5 on 2/19.
- 8.4 News
- ✓ Janice recommended a program on hydrogen fuels at last meeting; TC6.10 doing a seminar at 8am on Wed
 - No more Swiss Innovation Days (Means)
 - Decarbonizing natural gas utilities seminar was this morning (Swann)
 - Janice is organizing a program on carbon sequestration but needs a speaker on how sequestration relates to buildings; please send her potential speakers

9. Adjourn

Moved by Brown

NEXT MEETING: June 25, 2023, Tampa FL

ASHRAE Code Of Ethics

In this and all other 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 we shall avoid all real or perceived conflicts of interests.

TC 2.8 Web Site

<http://tc0208.ashraetcs.org>

Upcoming Conferences:

June 24-28, 2023 – Tampa, FL
Jan. 20-24, 2024 – Chicago, IL
June 22-26, 2024 – Indianapolis, IN
Feb. 8-12, 2025 – Orlando, FL
June 21-25, 2025 – Phoenix, AZ
Jan 31-Feb. 4, 2026 – Las Vegas, NV

TC 2.8 Programs Coming Up AFTER this Meeting in Toronto (and click link for virtual)...

Seminar 37: LIVESTREAM: Accelerating Change in Building Design and Operation towards a Decarbonized and Net-zero Energy Future

Monday, February 6, 2023, 1:30 to 3 PM EDT
Georgia World Congress Center, A410

Seminar 53: LIVESTREAM: Advanced Energy Design Guidance for Zero Energy and Carbon Multifamily Buildings

Tuesday, February 7, 3:15 to 4:45 PM EDT
Georgia World Congress Center, A410

Seminar 65: LIVESTREAM: Embodied carbon vs. Operational Carbon: Tradeoffs and Choices for the Building Envelope

Wednesday, February 8, 11 AM to 12:30 PM EDT
Georgia World Congress Center, A410

FOR THE RECORD: TC 2.8 Programs Held BEFORE this Meeting in Toronto

Seminar 2: Building on Twenty Years of Guidance Toward Decarbonization: The ASHRAE GreenGuide

Sunday, February 5, 2023, 8 to 10 AM EDT
Georgia World Congress Center, A407

Seminar 19: Igniting a Carbon-free Fire around Building Science

Sunday, February 5, 2023, 1:30 to 3 PM EDT
Georgia World Congress Center, A404

Water-Energy Nexus Subcommittee 2023 Annual Conference Meeting Minutes

TC 2.8 Buildings' Environmental Impacts and Sustainability

Tuesday, January 31, 2023, 12:00pm-1:00pm EST ([WebEx Virtual Meeting](#))

Scope: The Water-Energy Nexus subcommittee is concerned with the coupled relationship between water and energy. The focus is on developing and standardizing methods for quantifying this relationship; raising awareness about the coupled nature of these two resources; and how this relationship affects the environmental impacts of water and energy usage. The areas of focus include building-scale end-uses (e.g. landscape, HVAC processes, flushing, etc.); quantifying and evaluating strategies for optimization to reduce building or campus level water/energy usage.

1. Roll call and Introductions – Introduction of 27 attendees with about 10 new guests
2. Virtual meeting minutes from 2022 Annual Conference.
3. Announcements/Current Events
 - a. TC2.8 Sponsored/co-sponsored sessions –
 - i. Seminar 2, 19, 37, 53, 60, 65
 - ii. Paper Session 22
 - b. Mike Pascual's transition; Call for volunteer for Water Energy Nexus subcommittee – Thank you Mike for years of ASHRAE service.
1. **ASHRAE Water Energy Nexus Guide, 1st Edition** (*a design guide for practicing professionals*) –
 - a. Status update –
 - New chapter champions – Tianzhen (Behavioral) and Eric (Design Options)
 - b. Request for additional volunteers
 - Adriana Roth is interested in getting involved with Guide development (potentially design options)
 - Ron noted that he can help with service water heating, 191 perspective, onsite water treatment
2. **Call for Seminars/Training – No discussions**
 - a. New ideas
 - b. **Timeline:** Program (Seminar, Workshop, Debate and Panel) Proposals Due - Monday, February 27, 2023.
3. **Future Research (RTAR) -**
 - Guide to receiving approval on RTAR submissions – \$150,000/ Joint Research between multiple TCs/ Coordinate early with Section 2 RAC liaison)
 - ASHRAE Funding status?
 - <https://www.ashrae.org/technical-resources/research>

- [RTAR Form](#)
- **RTAR 1933** – Utility Source Water and Source Energy Dataset - Data collection of source water (gallon/kWh) and source electricity (kWh/gallon) similar to eGrid (Data for US) – **Approved with comments;** (Fred Betz and Jim Sweeny)
 - Fred and Jim are working to get commitments from owners/institutions for data
 - Gary noted that CA has Water Energy Nexus data per zip code and it's best to reach out to Sandia Labs and CA for these data sources. Gary and Fred to connect.
- b. **Proposal I** – Friction Loss and Fluid Flow Research; TC1.3 is the most suited.
TC1.3 (heat transfer and fluid flow) meets Tuesday February 7th, 1:00-3:30pm EST.
 - Gary noted that he has self-funded a small project related to this; he also noted that NIST is establishing a test lab currently (Tania may have more info). Harvey to connect with Gary and Tania re this.
- c. Benchmarking Facilities, Processes and Equipment Water and Energy Usage (H. Schowe)
– *Upcoming collaboration with TC6.6, MTG.OBB and IAPMO groups*
 - Gary noted that TC6.6, MTG.OBB and IAPMO would be interested in joining efforts. Follow up call to be scheduled.
- d. How water efficiency effects plumbing system quality/performance (design focus) -
Tania Ullah is looking for someone with plumbing design experience to assist here.
 - *Modeling Effort (Andrew Welton, Purdue University)*
 - *Aging water in water mains (Michigan/Purdue/EPA study)*
 - Gary is interested in helping move this forward.
- e. **New ideas?**

4. Open Forum

- a. Discuss meeting formats for future meetings? (Virtual vs Hybrid)

- Adjourn -

NEXT MEETING: TBD (Reach out to Mike or Rafi for details)

For comments, suggestions, volunteering to help, etc. with anything dealing with TC 2.8: Water Energy Nexus subcommittee, please contact:

Rafi Karim

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TC 2.8 Web Site
<http://tc28.ashraetcs.org>

TC2.8 Research Subcommittee Notes

Tuesday, January 31st, 2023

5:00 p.m. to 6:00 p.m. EST

Attendees: Janice Means, Lisa Ng, Dan Faoro, Sumayyah Theron, Carrie Brown, Joy Altweis, Fred Betz, Jo Norris, Doug Fick, Harvey Schowe, Bill Hutzel, Yukiko Yoshida, Dunstan MacAuley, Paul Raftery, Michael Deru, Svein Morner, Nuria Casquero, Michell Swann, Kevin Cross (18)

1. Update on 1814-RP: *Actual Energy Performance of Buildings Designed to Comply with ASHRAE Standard 90.1-2010*
 - a. Final report submitted on 9/30/23, and approved by TC 2.8 on 12/9/22.
 - b. Next steps for TC 2.8: - Joy will follow up with Joe Zhou regarding giving a presentation at an upcoming ASHRAE meeting.
2. Comments by Section 2 RAC Liaison Bill Hutzel
 - a. The RAC is back after a COVID-related slow-down. They're looking at allocating a full suite of research grants for 2023.
 - b. There are many Project Evaluation Subcommittees (PESs) currently active.
 - c. The Research Committee Chairs breakfast will be held on Monday, 2/6 at 6:30 a.m. in the OMNI Center Grand Ballroom, Salon C. Kevin plans to attend.
3. Review current research topic ideas (see following table)

Research Topic Idea	Generated by	Update/Status	Next Steps
ACTIVE: 1929-WS: Evaluation of building life cycle analysis tools incorporating embodied carbon	Jim Sweeney, Kevin Cross	Version submitted to RAC on 8/15 returned with comments. Next version developed, approved by TC 2.8, and submitted to RAC on 12/14.	<i>We are waiting to hear from the RAC on this.</i>
ACTIVE: 1933-RTAR: Water-Energy Nexus: Utility Source Water and Source Energy Dataset	Fred Betz, Jim Sweeney, Rafi Kareem, Mike Pascual	Submitted August 2021. Approved with comments. Comments forwarded to authors in Oct 2021. Authors still interested in moving forward as of June 2022.	<i>Jim and Fred still intend to move forward with this.</i>
ACTIVE (Co-Sponsor): 1885-WS Guideline/Book for Design Installation and Operation of PV (Solar and Other Renewable)	TC 6.7	TC 6.7 is 90% done with this WS as of June 2021. Janice is on TC 6.7 and stated she would investigate current status at June 2022 meeting.	<i>Janice is putting the finishing touches on the WS, and hopes to be able to submit it to the RAC by 3/15/23. This will require a vote to cosponsor by TC 2.8.</i>
PENDING: Conservation vs. Water Quality from the Design Engineer's Perspective	Water-Energy Nexus Subcommittee (Rafi, Tania)	Idea was generated during the Feb 2020 Water-Energy Nexus meeting. Tania was working on developing the RTAR and also planned to submit it to TC 3.6 for potential co-sponsorship. No recent updates.	<i>This project was discussed in the Water-Energy Nexus Subcommittee meeting recently. Kevin will follow up with Rafi on this.</i>
PENDING: Methods of Carbon Accounting	Fred Betz	New topic idea generated at June 2022 meeting. What gets counted? What about upstream emissions? What methods/standards are used for ESG corporate reporting? Does this research already exist? American Carbon Registry might be a first step for investigation, as might Standard 189.1	<i>Michael noted that there already are international carbon accounting guidelines, and that ASHRAE Std 240P: Quantifying Lifecycle GHG emissions buildings is forthcoming. We will move this off our list until and unless we generate additional ideas on this.</i>
ON HOLD: Effect of Water Quality on HVAC Systems	Fred Betz	New topic idea June 2021 – cost-benefit analysis? Fouling factors? Continuous Cx/O&M impacts? TC	<i>Fred tried to develop a seminar addressing these topics. We will keep it on the list for now.</i>

		7.3 cosponsor? Fred changed status to “on hold” in June 2022.	
ON HOLD: Ground source heat pump technologies in hot climates – international	Ashish Rakheja	Idea generated by Ashish, who wants to find a primary RTAR author. Fred Betz stated that he would connect Ashish to Eric Peterson at January 2021 meeting. No update since.	<i>Fred will follow up with Eric on this.</i>
ON HOLD: Net Zero Energy Hospitals	Frank Mills	Frank provided an update at the Feb 2020 TC 2.8 meeting, that this is now a guide book and is being published. So there isn't a need for a research project to create a book. However, he asked to keep the idea on the list and will follow up.	<i>Kevin will follow up with Frank on this.</i>
ON HOLD: Do buildings built to Standard 189.1 perform as expected?	Kevin Cross, Joy Altwies, Tom Lawrence	Kevin Cross and Brent Stephens developed an early stage RTAR. Keep on list, pending research from 1814.	<i>Kevin will follow up with Tom to find out how many buildings have been built to Std 189.1? There may not be many at this point.</i>

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

New Research Topic Ideas	Generated by	Update/Key Questions	Next Step
Climate change driven extreme temperature map for efficiency and resilience map of heat pump technology	Daniel Villa et al, TC 2.5	Shall TC 2.8 co-sponsor this WS?	<i>TC 2.8 will consider cosponsoring. Joy will run the vote soon.</i>
Meta Materials for diverting solar radiation to where it will be most useful	Harvey Schowe	Would TC 4.4: Building Materials and Envelopes be interested in sponsoring this research?	<i>Harvey will check with TC 4.4 and get back to us.</i>
Carbon capture and sequestration in buildings	Janice Means		<i>Kevin will follow up with Janice to get more details.</i>
What is the potential for reducing embodied carbon in distribution systems and building renovations?	Paul Raftery	Is this addressed adequately in our proposed WS 1929? Other initiatives? Is there an additional need for research in this area?	<i>Kevin will send a copy of WS-1929 to Paul and Paul will get back to Kevin on the key questions.</i>

5. Other business

- a. None

6. Adjourn

- a. Meeting adjourned at approximately 6:05 p.m. 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

TC 2.8 Programs Subcommittee Meeting Minutes

2023 ASHRAE Annual Conference Toronto

January 31, 2023 1:00 - 2:00 PM **EST** (Virtual Meeting)

Attendees: Joy Altwies, Rafi Karim, Lee Salter, Nuria Casquero, Jonathan Hasler, Natalie MacDonald, Stephanie Mages, Sumayyah Theron, Carrie Brown, Rubens de Andrade Neto, Harvey Schowe

1) Roll call and introductions

2) Agenda / 2022 Toronto ON Conference Programs meeting minutes

3) Announcements

[Seminar 2: Building on Twenty Years of Guidance Toward Decarbonization: The ASHRAE GreenGuide](#)

Sunday, February 5, 2023, 8 to 10 AM EDT
Georgia World Congress Center, A407

[Seminar 19: Igniting a Carbon-free Fire around Building Science](#)

Sunday, February 5, 2023, 1:30 to 3 PM EDT
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[Seminar 37: LIVESTREAM: Accelerating Change in Building Design and Operation towards a Decarbonized and Net-zero Energy Future](#)

Monday, February 6, 2023, 1:30 to 3 PM EDT
Georgia World Congress Center, A410

[Seminar 53: LIVESTREAM: Advanced Energy Design Guidance for Zero Energy and Carbon Multifamily Buildings](#)

Tuesday, February 7, 3:15 to 4:45 PM EDT
Georgia World Congress Center, A410

[Seminar 65: LIVESTREAM: Embodied carbon vs. Operational Carbon: Tradeoffs and Choices for the Building Envelope](#)

Wednesday, February 8, 11 AM to 12:30 PM EDT
Georgia World Congress Center, A410

4) Old Business

- (PAST) Sewer Heat Rejection and Recovery: Rafi has a potential speaker for Atlanta. Fred will follow up with Rafi. **Status:** Rafi indicated to remove this idea from future plans.
- Swiss-US Energy Innovation Days inspired program on renewable energy storage. Janice, Eric. Was to be submitted for Atlanta. **Status:** No additional info.

- Refrigerants. Decarbonizing campuses. Rafi has one or two speakers. Alara to support. (Suggest submitting under Track 3 Refrigerants or 5 Pathways to Zero Energy Emissions and Decarbonization). Alara to follow up with Rafi. **Status:** Rafi also indicated this could be removed from future plans.
- Program proposal on 1814-RP to be presented by Joe Zhou. Joy to connect Joe and Alara. **Status:** Joy will reconnect with Joe to determine if a program was submitted.
- Track 4: Grid Resilience and Thermal Storage. A seminar proposal with three speakers. Alara has a potential speaker with a condenser water thermal storage project. Eric: Efforts in the UK to create micro-district systems facing legal hurdles. Ron spoke about heat recovery from waste-water treatment plants using a heat exchanger/heat pump. Ron will check with another committee to find a person and coordinate with Alara. **Status:** Not discussed in Jan 2023.
- Track 5: Pathways to Zero Energy Emissions and Decarbonization. Decarbonization of hospitals. Chris Miller has a Kaiser Permanente project to present. Travis English and one more potential speaker pending confirmation. Fred is working on a decarbonization design guide/ ASHRAE code overlay. **Status:** Not discussed in Jan 2023.
- Track 7: Operations and Maintenance: Opportunity to collaborate with TC 7.9 Building Commissioning. Alara to be the liaison. Fred brought up a facility managers survey regarding issues with highly complex buildings conducted by ASHRAE from 5 years ago that might be useful. Alara will talk to Kent Peterson to learn more. **Status:** Not discussed in Jan 2023.
- Track 8: Building Simulation and Virtual Design in Construction: It would be helpful to have IBPSA people to have a bigger reach. **Status:** Not discussed in Jan 2023.
- Hydropower to provide energy: Janice, Rafi. **Status:** Not discussed in Jan 2023.
- Rainwater Harvesting: Fred spoke about water efficiency helping to reduce carbon emissions and rainwater harvesting. Alara to add it to the agenda to keep on our radar for future conferences. **Status:** Not discussed in Jan 2023.

5) New Business

- Tampa: [2023 ASHRAE Annual Conference Tracks](#)
 1. **HVAC&R Systems and Equipment:** HVAC&R Systems and Equipment are constantly evolving to address the changing requirements of the built environment. Papers and programs in this track focus on the development of new systems and equipment, novel applications of existing systems and equipment, improvements to existing systems and equipment and the proper application and operation of systems and equipment.

2. **Fundamentals and Applications:** Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychrometrics, heat transfer, fluid and mass flow. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.
 3. **Research Summit:** Active research, and the exchange of those research findings, are critical to the development of our HVAC&R industry and built environment. The 2023 Annual Research Summit invites researchers to share those results, including ASHRAE-sponsored research and research of interest to the ASHRAE community. Researchers are invited to present papers, extended abstracts, seminars, forums or participate in panel discussions. The Research Summit includes a partnership with ASHRAE's archival journal, Science and Technology for the Built Environment.
 4. **Pathways to Net Zero Energy and Decarbonization:** Decarbonization is urgently needed to slow climate change that is affecting the wellbeing of our planet. Whether it is new construction, renovation or routine maintenance, ASHRAE and its members are leading in the advancement of carbon neutral, net zero energy and decarbonization strategies in building and HVAC&R design.
 5. **Future-Proofing the Built Environment:** In the face of climate change and weather extremes (hotter, colder, wetter, drier, wilder winds, wildfires, seawater rise, etc.) and energy supply disruptions and shortages, methods of designing, constructing and operating buildings and HVAC&R systems for resilience and sustainability are paramount to long-term success.
 6. **Building Automation and Control Systems:** As sensor systems, internet connectivity, building management software and data collection become more sophisticated and ubiquitous, there are substantial opportunities to make buildings and HVAC system and equipment "smarter", with improved security, performance, efficiency and maintenance, and better utilization of renewable energy resources, including wind and solar energy and energy storage.
 7. **Professional Development and Education:** We participate in ASHRAE functions for the great value of technical exchange, and also for valuable interpersonal connections and exchanges. This track is designed to provide opportunities to develop and share knowledge in the areas of presentation skills, leadership, teambuilding, understanding various business operations, interpersonal skills, etc., and an opportunity for educators to share knowledge in the teaching and education of current and future generations of professionals. It also provides a venue for presentations on the importance of ethics and benefits of diversity, equity and inclusion (DEI) in our professional and personal development.
- Sumayyah indicated she was planning a program for Chicago on IAQ for middle school students as part of the Host Committee activities. She will request TC .28 co-sponsorship if appropriate when more is known.

- Joy indicated that with Alara out of office for the next 3-4 months, we will try to keep Programs functioning for Tampa and Chicago meetings as best as possible. Please send her any Programs requests in the meantime.

Review Timeline for Future Meetings

2023 ASHRAE Summer Conference Tampa FL

June 24-28, 2023: <https://ashraem.confex.com/ashraem/s23/cfp.cgi>

Major Deadline:

- **Monday February 27, 2023** – Debate, Panel, Seminar Form, Workshop Proposals Due

2023 Winter Conference Tracks and Track Chairs:

<https://www.ashrae.org/conferences/2023-annual-conference-tampa/2023-annual-technical-program>

6) Adjourn.

Future Annual and Winter Conferences

Annual 2023 - Tampa, FL - June 24-28, 2023
Winter 2024 - Chicago, IL - Jan. 20-24, 2024
Annual 2024 - Indianapolis, IN - June 22-26, 2024
Winter 2025 - Orlando, FL - Feb. 8-12, 2025
Annual 2025 - Phoenix, AZ - June 21-25, 2025
Winter 2026 – Las Vegas, NV - Jan. 31-Feb 4, 2026

***For any questions, comments, suggestions please contact:
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