



MINUTES

DRAFT

TECHNICAL COMMITTEE

2022 Winter Meeting

January 30, 2022

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

DRAFT

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 1/30/2022

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

DATE OF MEETING 1/30/22 LOCATION Las Vegas, NV/Virtual

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Joy Altwies	2021	James Bradburn	2004	Jim Kendzel
Kevin Brown	2021	Mike Pascual	2018	Richard Liesen
Lisa Ng	2021			Tania Ullah
Alara Apcin	2018			Brittany Carl Moser
Rafi Kim	2017			William Truong
Kevin Cross	2002			Carrie Brown
Michael Deru	2004			Samir Hernandez
Janice Means	2005			Jim Newman
				Ashish Rakheja
				Yukiko Yoshida
EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE (continued)				
Thomas Lawrence		John Topmiller		Alfred Uzokwe
Katherine Hammack		Sumayyah Theron		
Yuqing Hu		Kevin Frost		
Jianli Chen		Stephanie Mages		
John Trouba		Mitchell Swann		
Eric Peterson		Joe Zhou		
Renee Clair		David Nosham		

DISTRIBUTION: <i>All Members of TC/TG/MTG/TRG plus the following:</i>	
TAC Section Head: Jon Cohen	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

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



Shaping Tomorrow's
Built Environment Today

TC 2.8 Building Environmental Impacts and Sustainability

January 30, 2022, 6 PM – 8 PM PST

Online (Webex) and In-person, Las Vegas, NV (Caesar's Palace, Livorno)

Chair: Meeting Called to Order at 6 PM PST

1. **Roll call and Introductions** Altwies / Bradburn
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
Moved by Kevin Brown, second by Janice, Approved 7-0-0-CNV.
3. **Review / Approval of June 2021 Virtual Meeting Minutes** Ng
Review accept after this meeting. Kevin Brown still working on them
4. **Standing Committee Liaisons** TAC / RAC / Standards / Programs
 - Moved Item 8.1 here: Report from the [ASHRAE Task Force on Building Decarbonization](#) by Katherine Hammack. Consider adding the topic to Green Guide and your Handbook chapter(s). A new chapter for the Handbook has been discussed but it should be incorporated into everything we do.
 - SH2 Jon Cohen introduced himself and offered to help with roster, activity forms, etc.
5. **Subcommittee Reports**
 - 5.1 **Green Guide** Lawrence
 - 5.1.1 Submitted files in June 2021
 - 5.1.2 ASHRAE staff is currently reviewing files – they will ask questions, provide proofs
 - 5.1.3 GG should be out by Toronto
 - 5.1.4 Connect with Alara on a seminar for updates on GG in Toronto
 - 5.2 **International** MillsRakheja
 - 5.2.1 Subcommittee hasn't met regularly but maintain contact electronically
 - 5.2.2 Active in decarbonization discussions
 - 5.3 **Water-Energy Nexus** Pascual / Karim
 - 5.3.1 Met on Thursday
 - 5.3.2 Discussed water-energy nexus guide to re-begin the draft
 - 5.3.3 Current [RTARs](#) – see subcommittee minutes
 - 5.3.3.1 Contact [TC5.7 Evaporative Cooling](#) for co-sponsorship on RTAR
 - 5.4 **Research** Altwies
 - 5.4.1 Progress update on 1814-RP given by Joe Zhou. Scheduled to finish in June
 - 5.4.2 Two active [RTARs](#) – see subcommittee minutes
 - 5.4.3 If you're interested in serving as Research Subcommittee Chair, let Joy know. Kevin Cross is considering it.
 - 5.5 **Programs** Apcin
 - 5.5.1 Met on Thursday
 - 5.5.2 This conference's programs listed at the bottom of the minutes
 - 5.5.3 Tania resubmitting seminar on plumbing re-commissioning after closure under Track 8 in Toronto. Alara will get co-sponsorship.
 - 5.5.4 Programs identified for multiple [tracks in Toronto](#). See subcommittee minutes

- 5.5.5 [Forum 3, 9:45 AM](#) Should Have Seen That Coming! Climate Impacts on Cleanrooms, Labs, Hospitals and other Critical Environment Operations (Mitchell Swann Chairing)
- 5.6 Handbook Fundamentals – Chapter 34 Brundage
 - 5.6.1 Energy Resources
 - 5.6.2 Members can log into [authoring portal](#) to edit chapters
 - 5.6.3 Refer to online version of Handbook for most correct version
 - 5.6.4 2025 is the next version
 - 5.6.5 John, Sumayyah, Janice volunteering to lead revisions
- 5.7 Handbook Fundamentals – Chapter 35 Sustainability Morner
 - 5.7.1 Updates combined with Item 5.6

6. Related Activities Reports

- 6.1 Standards
 - SPC 189.1 High-Performance Green Buildings Lawrence
 - 2023 is the next version
 - Updating CO₂ emission factors, how to treat methane as greenhouse gas, airtightness values, energy monitoring requirements, addressing decarbonization – making buildings electric-ready
 - Matching green roof definitions between 189.1 and 90.1
 - Reminded everyone to use [change proposal process](#) to submit a change to standards and guidelines
 - SPC 189.3 High-Performance Green Healthcare Facilities FickMoser
 - Meeting tomorrow - discussing decarbonization
 - Tracking addenda to 189.1 to make appropriate changes to 189.3
 - Maintain consistency with 189.1 and 189.3
 - SPC 191P Efficient Use of Water in Building Betz
 - Betz not in attendance. No update.
 - SPC 228P Standard Method of Evaluating Zero Energy Building Performance Torcellini
 - Out for second public review. Check the [Standards Page on the ASHRAE website](#). It is a 45 day review that started Jan 28—topic is a standard for determining zero energy and zero carbon buildings. Everyone should look at it and provide comments before the 45 day deadline.
 - Deru - Name changed to: Standard Method for Evaluating Zero Net Energy and Zero Net Carbon Building Performance.
 - SPC 227P High Performance Envelope Torcellini
 - Still being drafted
- 6.2 ASHRAE Advanced Energy Design Guides Update Torcellini
 - 6.2.1 Zero Energy AEDG for multifamily. Includes information on renovation, grid alignment, cost control measures, and starts to discuss using carbon as a metric. This is in ASHRAE publishing and should be out in the next couple of weeks after several COVID delays.
- 6.3 MTG.Resilience - determination of primary and alternate representatives - Brown/Rakheja/Karim?
 - 6.3.1 Three meetings held so far, and Kevin Brown is serving at TC2.8 voting member
 - 6.3.2 Ashish is backup
 - 6.3.3 Rafi agrees with this

7. Old Business

- 7.1. [TC 2.8 Basecamp](#) site
 - 7.1.1. If you want to be added, contact Lisa (lisa.ng@nist.gov) to get added.
- 7.2. Web site FAQs – approval

7.2.1. FAQ should be a quick way for a new visitor to get to know the TC – how it's organized, how to get involved, why you should get involved.

7.2.2. Janice moved to approve, Lisa second. Discussion: Kevin Cross and others would like more time to review it.

7.2.3. Alara amended to delay by one week, Kevin Brown second. Approved 7-0-0-CNV.

7.3. Membership roster updates – due Wed (then finalized Feb 15)

7.3.1. Electronic roster updates have had system errors. Add Sumayyah and Svein as voting members since Michael and James rolling off June 2022. Tania is also interested in membership.

7.3.2. [Apply for membership through ASHRAE](#)

7.4. TBD

7.4.1. Joe Zhou – TC7.5 contacted regarding smart building rating system similar to LEED. If you are interested in this topic, contact Chair TC0705@ashrae.net.

7.4.2. Carrie Brown – working with Decarb Knowledge Hub Group

8. New business

8.1 [ASHRAE Task Force on Building Decarbonization](#) – 9 Work Groups

- Reducing Building Operating Carbon Work Group – Liaison? Frank Mills?
- Embodied Carbon LCA Work Group – Liaison? Michael Deru or Paul Torcellini?
- Others? See above for report.

8.2 TBD

- Janice suggested that TC2.8 meeting earlier in the day. Joy will poll members before Toronto.

9. Adjourn

Moved by Janice, second by Alara

NEXT MEETING: June 26, 2022, Toronto, ON

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 25-29, 2022 – Toronto, ON
Feb. 4-8, 2023 – Atlanta, GA
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

TC 2.8 Programs Coming Up After this Meeting in Las Vegas...

Monday, January 31, 09:45 AM - 10:45 AM

Seminar 20

HVAC Design, Control and Operation of Hospitals After COVID-19 Fiasco

Sponsor: 1.4 Control Theory and Application, 9.6 Healthcare Facilities, TC-1.5, TC-7.3, TC-7.5, TC-2.8 Building Environmental Impacts and Sustainability

Monday, January 31, 11:00 AM - 12:00 PM

Seminar 3

Would Your Building Perform Satisfactorily During a Heatwave or Power-Blackout?

Sponsor: 4.2 Climatic Information, 2.8 Building Environmental Impacts and Sustainability

Tuesday, February 01, 08:00 AM - 09:30 AM

Panel 1

In Real Time: Charting the Pathway for Existing Buildings to Get to Carbon Neutrality

Sponsor: 2.8 Building Environmental Impacts and Sustainability

Tuesday, February 01, 11:00 AM - 12:30 PM

Seminar 31

High Efficiency Variable Speed Pumping Systems and Integration Challenges with Chiller Plant Design

Sponsor: 8.2 Centrifugal Machines, 6.1 Hydronic and Steam Equipment and Systems, TC 8.1, 2.8 Building Environmental Impacts and Sustainability

Wednesday, February 02, 11:00 AM - 12:30 PM

Seminar 41

Design Challenges to the Electrification of Heating in Mid to Large Buildings

Sponsor: 8.2 Centrifugal Machines, 2.8 Building Environmental Impacts and Sustainability

Wednesday, February 02, 11:00 AM - 12:30 PM

Seminar 44

Upgrading Existing Building Control Systems for High Performance Operation

Sponsor: 1.4 Control Theory and Application, 7.6 Building Energy Performance, 2.8 Building Environmental Impacts and Sustainability

TC 2.8 Programs Subcommittee Meeting Minutes

2022 ASHRAE Winter Conference Las Vegas

January 27, 2022 08:00 AM - 09:00 AM PT (Virtual Meeting)

Attendees: Joy Altives, Janice Means, Lisa Ng, Eric Peterson,
Ashish Rakheja, Fred Betz, Rafi Karim, Mitchell Swan, Sumayyah Theron,
Tania Ulah, Jim Newman, Alara Apcin

1) Roll call and introductions

2) Agenda / 2021 Virtual Annual Conference Programs meeting minutes

3) Announcements

Sunday, January 30, 11:00 AM - 12:30 PM

Seminar 12

Renewables and the Smart Grid

Sponsor: 7.5 Smart Building Systems, 6.7 Solar Energy Utilization, 7.6 Building Energy Performance and 2.8 Building Environmental Impacts and Sustainability

Monday, January 31, 09:45 AM - 10:45 AM

Seminar 20

HVAC Design, Control and Operation of Hospitals After COVID-19 Fiasco

Chair: Frank Shadpour, P.E. Fellow ASHRAE, SC Engineers Inc, San Diego, CA

Sponsor: 1.4 Control Theory and Application, 9.6 Healthcare Facilities, TC-1.5, TC-7.3, TC-7.5, TC-2.8 Building Environmental Impacts and Sustainability

Monday, January 31, 11:00 AM - 12:00 PM

Seminar 3

Would Your Building Perform Satisfactorily During a Heatwave or Power-Blackout?

Eric Peterson, Ph.D., P.E., Member, University of Leeds, Leeds, United Kingdom

Sponsor: 4.2 Climatic Information, 2.8 Building Environmental Impacts and Sustainability

Tuesday, February 01, 08:00 AM - 09:30 AM

Panel 1

In Real Time: Charting the Pathway for Existing Buildings to Get to Carbon Neutrality

Sponsor: 2.8 Building Environmental Impacts and Sustainability

Chair: Paul Torcellini, Ph.D., P.E., Fellow ASHRAE, National Renewable Energy Laboratory, Golden, CO

Kent Peterson, P.E., Presidential Fellow ASHRAE, P2S Inc., Long Beach, CA

Tuesday, February 01, 11:00 AM - 12:30 PM

Seminar 31

High Efficiency Variable Speed Pumping Systems and Integration Challenges with Chiller Plant Design

Chris Miller

Sponsor: 8.2 Centrifugal Machines, 6.1 Hydronic and Steam Equipment and Systems, TC 8.1, 2.8 Building Environmental Impacts and Sustainability

Wednesday, February 02, 11:00 AM - 12:30 PM

Seminar 41

Design Challenges to the Electrification of Heating in Mid to Large Buildings

Chris Miller

Sponsor: 8.2 Centrifugal Machines, 2.8 Building Environmental Impacts and Sustainability

Wednesday, February 02, 11:00 AM - 12:30 PM

Seminar 44

Upgrading Existing Building Control Systems for High Performance Operation

Sponsor: 1.4 Control Theory and Application, 7.6 Building Energy Performance, 2.8 Building Environmental Impacts and Sustainability

4) Old Business

- Plumbing recommissioning seminar led by Tania Ulah. To be submitted under Track 8: Buildings in the Aftermath of COVID-19. Alara to get co-sponsorship support.

5) New Business

- Track 4: Connected Buildings, Connected Communities: Opportunity to collaborate with TC 7.9 Building Commissioning, TC 1.4 Control Theory and Application. Discussion for a program with multiple stakeholders presenting. Alara to follow up with Mitchell Swan.
- Track 5: Cold Climate Building System Design, Operation and Resilience: Alara to find a speaker from Alaska. Discussion for potential speakers from Canada. Eric.
- Track 6: IAQ, Energy Use, Comfort and Health of Sustainable Buildings: Track focuses on sustainability. Open discussion for opportunities for TC 2.8 to sponsor. Janice has a speaker for IAQ and COVID. Alara to follow up with Sonya.
- Track 7: Professional Development and Education: Alara has a potential speaker. Open discussion for interactive sessions such as workshops, panels and forums. Janice in the loop. Mentoring girls in STEAM.
- One program, one paper session. To be updated.

Review Timeline for Future Meetings

2022 ASHRAE Annual Conference Toronto, ON, Canada

June 25-29, 2022: <https://www.ashrae.org/conferences/2022-annual-conference-toronto>

Deadlines:

Wednesday, January 05, 2022: Conference Paper Accept/Revise/Reject Notifications

Thursday, January 06, 2022: Website Opens for Seminar, Workshop, Panel, Debate, Forum and Extended Abstract Proposals

Friday, January 14, 2022: Revised Conference Papers/Final Technical Papers Due

Thursday, February 17, 2022: Extended Abstract Paper Due

Thursday, February 17, 2022: Program (Seminar, Forum, Workshop, Debate and Panel) Proposals Due

Friday, February 18, 2022: Conference and Technical Paper Final Accept/Reject Notifications

Tuesday, February 22, 2022: Program Submissions Due

Friday, March 18, 2022: Extended Abstracts Accept/Reject Notifications

Friday, April 01, 2022: Debate, Panel, Seminar, Forum, Workshop Accept/Reject Notifications

2022 Annual Conference Tracks and Track Chairs:

1. Fundamentals and Applications: Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychometrics, 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.

Track Chair: Erik D Sanchez esanchez@prmech.com

2. 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, improvements to existing systems and equipment and the proper application and operation of systems and equipment.

Track Chair: Marites Calad mcalad@norman-wright.com

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 9th 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*.

Track Chair: Brian Fronk brian.fronk@oregonstate.edu

4. Connected Buildings, Connected Communities: As buildings become smarter, and as sensor systems, internet connectivity and data collection become more ubiquitous, there are substantial opportunities to improve the performance and efficiency of buildings. Similarly, as renewable energy resources, including wind and solar energy and energy storage, becoming increasingly common, buildings can be used as electric grid assets, to strategically support energy efficiency and demand flexibility. To accomplish this requires many stakeholders, coordinated efforts and a diversity of buildings and buildings systems components and controls.

Track Chair: Ahmed Abdel Salam ahmed.abdel-salam@usask.ca

5. Cold Climate Building System Design, Operation and Resilience: The design, construction and operation of buildings in cold climate regions which experience extreme winter conditions

require specific considerations for the building envelope and HVAC&R systems and resulting thermal and hygrothermal performance. Resilience in the face of extreme temperature shifts, and in some cases remoteness and permafrost, should be considered to ensure building maintain interior design conditions. This track covers efforts and topics specifically focused on buildings, building systems and equipment in cold, arctic and subarctic climates.

Track Chair: Davide Ziviani dziviani@purdue.edu

6. IAQ, Energy Use, Comfort and Health of Sustainable Buildings: Indoor environmental quality, energy use and efficiency and occupant comfort and health are all priorities buildings must balance. Sustainability priorities in buildings continue to increase, requiring careful consideration of how to achieve sustainability goals without sacrificing other building functions and owner/operator priorities. This track covers each of these topics, and how they interact and impact one another.

Track Chair: Rafi Karim rkarim@aeieng.com

7. Professional Development and Education: As members of a professional organization, we not only participate for the great value of technical exchange, but also the interpersonal exchange. We recognize that the single greatest strength of our organization is its membership. This track is designed to allow those professionals and educators an opportunity to develop and share knowledge in the areas of presentation skills, leadership, team-building, understanding various business operations, lean collaboration strategies, interpersonal skills, etc., and an opportunity for educators to share knowledge in the teaching and education of current and future generations of professionals. Submissions to this track may lend themselves to interactive session types such as workshops, panels and forums.

Track Chair: Maggie Moninski maggie.moninski@gmail.com

8. Buildings in the Aftermath of COVID-19: The pandemic has had significant impacts on how buildings are used, and the priorities associated with building operations to ensure a healthy environment for occupants. More people are working remotely; commercial building interior design and functionality and occupant use of these buildings, ventilation and system needs and building owner, operator and occupant priorities have been impacted. This track covers these topics as our buildings transition to design and operation in the aftermath of the pandemic.

Track Chair: Andy Cochrane acochrane@industrialairinc.com

6) Adjourn.

Future Annual and Winter Conferences

Annual 2022 - Toronto, ON Jun 25-29, 2022
Winter 2023 – Atlanta, GA Feb 04-08, 2023
Annual 2023 – Tampa, FL June 24-28, 2023
Winter 2024 – Chicago, IL Jan. 20-24 2024
Annual 2024 – Indianapolis, IN June 22-16, 2024
2025 Winter – Orlando, FL Feb. 08-12, 2025
2025 Annual – Phoenix, AZ June 21-25, 2025

***For any questions, comments, suggestions please contact:
alara.apcin@p2sinc.com mobile: 907-330-9220***

TC2.8 Research Subcommittee Minutes
Friday, January 21, 2022, Online Webex Meeting
9:00 AM to 9:45 AM Pacific Time

Attendees: Joy Altwies, Lisa Ng, Brittany Moser, Kevin Cross, Chadwick Collins, Maddie Koolbeck, Carrie Brown, Joe Zhou, Tania Ullah, Gina Onodera, Mitchell Swann, Bill Hutzel, Alfred (?), Qi(?)

1. Introductions

2. Update on status of active TC 2.8 research:

1814-RP *Actual Energy Performance of Buildings Designed to Comply with ASHRAE Standard 90.1-2010*

- Joe Zhou from Slipstream will provide an update at this meeting...
 - Joe provided an overview of the current status and timeline of the project.
 - They are hoping to wrap up by June.
 - He gave an overview of the schools he visited for the project site visits, and the status of receiving the as-built drawings and IEQ surveys.
 - They are currently compiling the data to look for “common factors” in the building performance results and in preparation for writing the reports and papers.
 - They will schedule a follow-up meeting with the PMS to go into more detail on next and final steps.
 - He shared some observations about the data so far, including that the “typical” building energy model design used by PNNL for the 90.1 estimates doesn’t match many of the actual buildings closely, in terms of layout/envelope. Also, so far, the “best performing” buildings (compared to the PNNL model predictions) tend to be in the milder climates, while the “worst performing” seem to be in the extreme climates (very cold, very hot). He’s not yet sure if this might be a suggested improvement for the 90.1 committee.

3. Follow up on previous business and research topic ideas.

- Review of topics in table below

4. Info from RAC

- Bill Hutzel (RAC Section 2 Liaison) was on the Webex and suggested that TC 2.8 be more active on Basecamp for sharing of document and updates.
- Next deadline for submitting items to RAC: March 15 - they use 4 dates every year (March May August December).
- Updates from RAC section 2: Info from winter 1/31 “breakfast” meeting in Las Vegas:
 - Section 2 is the most active currently with over 30 active RTARs/WS
 - Note that proposals over \$200k get extra scrutiny and are harder to get approved.

- Research funding situation is anticipated to improve. There are several approved projects in the hopper – but RAC will prioritize which get funded first. Expected to get funding this year.
- General Reminders:
 - Please inform any research project contractors of various awards available, including student award (grant-in-aid funding) for students working on ASHRAE research projects. (NOTE: These funds are currently on hold due to pandemic.)
 - RAC would like us to create a “Plain English Abstract” to accompany Work Statements. This will help disseminate ASHRAE research to a wider audience of non-technical readers.
- There is a searchable database of past research reports. This link allows you to access final information, such as, title, source, contractor, principal investigator, start and end dates, resulting papers, and if final report is available. Find it here:
research.ashrae.org

List of research topic ideas (with update/status from PREVIOUS meeting):

Research Topic Idea	Generated by	Update/Status	Next Step
ACTIVE: 1929-RTAR: Evaluation of building life cycle analysis tools incorporating embodied carbon	Jim Sweeney, Kevin Cross	Accepted with comments. Comments forwarded to authors in July 2021 for WS development.	<i>Jan 2022 update: Kevin met with Jim and Joy after the Research meeting and Jim is planning to further develop Work Statement.</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. RAC suggested submitting WS for May 2022 deadline.	<i>Jan 2022 update: No authors on the Webex, no update.</i>
DROP: 1859-RTAR: “Residential Water Fixture Use Schedules Based on Occupant Behavior”	Bing Dong and Fred Betz	RTAR “Accepted with Comments” to develop into a Work Statement (WS) in August 2018. Update from June 2021 meeting: <i>Further investigation from Fred revealed that other organizations have already completed very similar work and published results. Will drop this topic from list.</i>	<i>Due to other existing research already completed, Joy will inform RAC that this topic is being dropped. Will no longer appear in this list for future meetings.</i>
ACTIVE (Co-Sponsor): 1868-RTAR: “Feasibility of Predicting Indoor Formaldehyde, VOC,	SSPC 62.1 Ventilation Subcommittee (Lisa Ng)	A WS must be developed and approved by the RAC liaison to SSPC 62.1	<i>Jan 2022 Update: Lisa indicated that there’s been no further info on this, and that it likely has fallen off the</i>

and Co2 Concentrations Using Simplified Inputs to Air Quality Models in New Office Buildings”		before submitting to the full RAC review. Update from 1/22/21 meeting: Lisa indicated that the SSPC 62.1 will need to work with the cognizant TC to further develop the work statement. Not currently on RAC’s list due to not being in a TC research plan. No update during June 2021 meeting.	<i>radar. It might be resubmitted later by going through the cognizant TC for 62.1. Joy will remove from list and re-add if it is restarted.</i>
ACTIVE (Co-Sponsor): 1885-RTAR Guideline/Book for Design Installation and Operation of PV (Solar and Other Renewable)	TC 6.7	Update from June 2021 meeting: TC 6.7 is 90% done with this WS, but could use assistance with compiling list of potential bidders for WS cover sheet. Joy sent Svein similar cover sheets for past TC2.8 research WS in summer 2021.	<i>Jan 2022 Update: No authors on Webex so no update.</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 is working on developing the RTAR and will also submit it to TC 3.6 for potential co-sponsorship. Update from 1/22/21 meeting: Tania was not on call, but Rafi will check on status. No update at the June 2021 meeting.	<i>Jan 2022 Update: No authors on Webex so no update.</i>
PENDING: 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 7.3 cosponsor?	<i>Jan 2022 Update: Fred not on Webex so no update.</i>
ON HOLD: Review of What Makes Water Reuse Systems Work (or Not Work) from an O&M Perspective	Michael Bobker (7.3, 3.6)- Energy-Water Nexus	Kevin Brown indicated that this is still active in TC 7.3, but not ready to submit. Awaiting a volunteer author. Kevin will check with Michael to see if there’s	<i>Jan 2022 Update: Kevin was not on Webex so no update. Since there’s been no updates in several meetings, Joy will remove from list and re-add if topic</i>

		still interest or a potential author. No update 1/22/21 meeting. No update June 2021.	<i>is restarted and an author identified.</i>
ON HOLD: Ground source heat pump technologies in hot climates – international	Ashish Rakheja	Ashish asked to keep this on hold. Next step is to find primary RTAR author. Ashish is willing to assist. Needs a volunteer author. Ashish is rolling onto the Board, so this may need to be set aside for awhile. Update from 1/22/21 meeting: Eric Peterson has done significant work in this area. Fred B will connect Eric and Ashish via email.	No update – continuing to hold.
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.	Continuing to hold – no update.
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.	Will keep this one as “special” long-term idea since it would be a follow-on in the same format as previous successful research projects.
New Research Topic Idea	Generated by	Update/Status	Next Step

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 this link:

<https://www.ashrae.org/technical-resources/research>

For reference: 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

Water-Energy Nexus Subcommittee Meeting Minutes

TC 2.8 Buildings' Environmental Impacts and Sustainability

Thursday, January 27, 2022, 7:00-8:00 am PST ([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 – Lot of new guest and members in attendance; total 27 attendees! Growing interest in the WEN subcommittee.
2. Virtual meeting minutes from Annual 2021 – No corrections.
3. Announcements/Current Events
 - a. Seminar 3: Would Your Building Perform Satisfactorily During a Heatwave or Power-Blackout? – Eric Peterson shared the summary of this seminar.
 - b. Seminar 12: Renewables and the Smart Grid
 - c. Seminar 20: HVAC Design, Control and Operation of Hospitals After COVID-19 Fiasco
 - d. Seminar 31: High Efficiency Variable Speed Pumping Systems and Integration Challenges with Chiller Plant Design
 - e. Seminar 41: Design Challenges to the Electrification of Heating in Mid to Large Buildings
 - f. Panel 1: In Real Time: Charting the Pathway for Existing Buildings to Get to Carbon Neutrality
 - g. Seminar 44: Upgrading Existing Building Control Systems for High Performance Operation
4. **ASHRAE Water Energy Nexus Guide** (*a design guide for practicing professionals*) – James Sweeny, Harvey, Fred are still interested in Guide development; Eric Yang, Constantinos Balaras and Eric Peterson showed interest in the Guide development. Rafi and Mike to follow up with original chapter champions and new volunteers to set up a kickoff meeting to restart the development efforts.
 - a. Discuss current status/progress with chapter champions
 - Harvey proposed to add data tables and conversion tables in the appendix of the guide.
 - Not all chapter champions were in attendance. Rafi and Mike to follow up.
 - b. Reassess involvement

- c. Updated Roadmap with Milestones

5. Call for Seminars/Training –

- a. New ideas - <https://www.ashrae.org/conferences/2022-annual-conference-toronto>
- b. How should standards and Guidelines for recommissioning plumbing systems be improved? Lessons learned from COVID era building shutdowns. – Tania Ullah; *previously submitted for winter conference; planning to submit again for annual conference.*
- c. **Timeline:** Program (Seminar, Forum, Workshop, Debate and Panel) Proposals Due - Thursday, February 17, 2022.

6. Future Research (RTAR) -

- *Guide to receiving approval on RTAR submissions – \$150,000/ Joint Research between multiple TCs/ Coordinate early with Section 2 RAC liaison)*
 - *General suggestion from 2020 virtual conference was to pause due to limited funding due to COVID. COVID research could get priority – water systems, energy associated*
 - <https://www.ashrae.org/technical-resources/research>
 - [RTAR Form](#)
 - *ASHRAE moratorium on new research projects. ASHRAE is continuing funding existing research. New RTAR's will continue to be pursued with the thought that formally developing new proposals and review process will still take time and can occur while moratorium is in place to get a head start for when moratorium is lifted.*
- a. **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 provided an update, one of the comments was does the data exist?**
 - b. **Proposal I** – Friction Loss and Fluid Flow Research; **RTAR draft developed and ready for TC2.8 committee's review** (H. Schowe to share details) – **Rafi and Mike to assist Harvey with draft RTAR proposal and identify which committee will be best suited to sponsor this – TC2.8 vs TC1.3 vs TC6.1**
 - c. Benchmarking Facilities, Processes and Equipment Water and Energy Usage (H. Schowe) – meta analysis – Harvey to revise drafts of these 2 research proposals in ASHRAE format for committee's review.
 - d. How water efficiency effects plumbing system quality/performance (design focus) (Tania Ullah, Fred Betz, Ron George) – could be COVID related/legionella – **Tania is still interested in developing this RTAR, she is looking for someone with plumbing design experience to assist here. Gary Klien (residential), Carmen Cejudo or Jim Lutz might be good candidates.**

- *Modeling Effort (Andrew Welton, Purdue University)*
- *Aging water in water mains (Michigan/Purdue/EPA study)*

e. **New ideas?**

7. Open Forum

– 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

AEI | Affiliated Engineers, Inc.

P: 626.768.7611

E: rkarim@aeieng.com

Mike Pascual

ISAT Total Support

P: 415.728-3219

E: mpascual@isatsb.com

TC 2.8 Web Site

<http://tc28.ashraetcs.org>